2009/2010 Demand-Side Management Biennial Plan

Electric and Natural Gas

Public Service Company of Colorado

Docket No. 08A-366EG

Original Filing August 2008

Revised February 2009

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➢ Executive Summary

Public Service Company of Colorado ("Public Service" or the "Company") submits this combined electric and natural gas 2009/2010 DSM Biennial Plan ("Plan") to the Colorado Public Utilities Commission ("Commission") as the initial phase of a new era in demand-side management ("DSM") for the Company. In this filing, Public Service proposes annual energy savings goals of approximately 176 GWh in electric and 318,000 Dth in natural gas in 2009 and 237 GWh in electric and 403,000 Dth in natural gas in 2010, at proposed costs of $63 million and $80 million, respectively. Table 1 provides a summary of the Company's proposed goals and budgets for the overall portfolio of programs.

Table 1: Public Service's 2009/2010 Biennial DSM Plan Budgets and Goals

Proposed Programs	Expenditures ($)	Energy Savings (Gen kWh or Dth)	Demand Savings (Gen kW)
2009			
Total Electric Conservation	$32,720,629	175,789,951	34,319
Total Load Management	$12,286,434	45,359	22,218
Total Electric Indirect	$5,531,221	--	--
Total 2009 Electric DSM	**$50,818,284**	**175,835,310**	**56,537**
Total Gas Conservation	$9,667,787	318,141	--
Total Gas Indirect	$2,960,743	--	--
Total 2009 Gas DSM	**$12,628,529**	**318,141**	**--**
2009 Total	**$63,446,813**	**175,835,310 kWh, 318,141 Dth**	**56,537 kW**
2010			
Total Electric Conservation	$46,379,674	237,419,603	44,731
Total Load Management	$12,286,434	45,359	22,218
Total Electric Indirect	$4,981,038	--	--
Total 2010 Electric DSM	**$63,650,147**	**237,464,961**	**66,949**
Total Gas Conservation	$12,829,651	402,808	--
Total Gas Indirect	$3,301,713	--	--
Total 2010 Gas DSM	**$16,516,364**	**402,808**	**--**
2010 Total	**$80,166,511**	**237,464,961 kWh, 402,808 Dth**	**66,949 kW**
2009/2010 Biennium Total	**$143,613,324**	**413,300,271 kWh, 720,949 Dth**	**123,486 kW**

Settlement Agreement

Subsequent to the filing of the Company's initial DSM Plan, the parties in Docket No. 08A-366EG entered into a Settlement Agreement approved by the Commission that included a number of program and associated budget changes, described in the table below. In addition, Appendix A of the Settlement Agreement outlined a number of design changes to Residential Segment programs to occur over the first six months of 2009. These changes will be publicized either through 60-day notice of Public Service's DSM Roundtable distribution list, or through a

May 1, 2009 DSM Plan Amendment to be filed with the Commission. This DSM Plan Errata contains only changes that have already been approved and whose impacts have been analyzed. All other changes will occur through the 60-day notice process or Plan Amendment as contemplated in the Settlement Agreement.

Table 2: Budget Changes to Public Service's 2009/2010 Biennial DSM Plan Resulting from the Settlement Agreement

Program	2009 Electric	2009 Gas	2010 Electric	2010 Gas
Original Budget	**$48,713,284**	**$12,553,529**	**$60,322,147**	**$16,056,364**
Central AC Rebate	+$1,220,000		+$2,150,000	
Central AC Tune-Up	+$150,000		+$250,000	
Evaporative Cooling	+$280,000		+$365,000	
School Education Kits			+$385,000	+$388,000
Product Development	+$175,000	+$75,000	+$175,000	+$75,000
Final Approved Budget	**$50,818,284**	**$12,628,529**	**$63,650,147**	**$16,516,364**

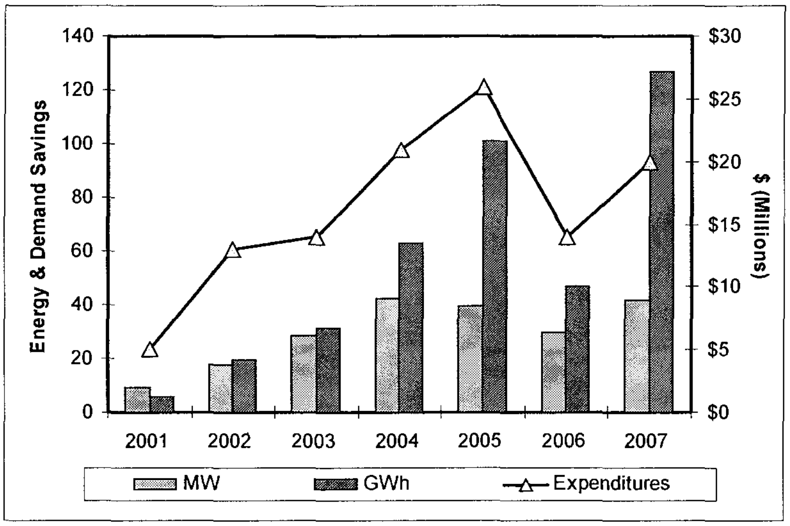
History of Recent DSM Activity in Colorado

During the last decade, Public Service has entered into several regulatory settlements involving demand-side management in conjunction with its integrated resource/least-cost planning process. The following paragraphs describe those settlements:

- In the 1996 Integrated Resource Plan Settlement Agreement (Decision C98-1042, Docket No. 97A-297E), the Company committed up to $10M for DSM over four years through two bid processes. The first focused on residential air conditioning load control and lighting for commercial customers ("Bid 2000") and the second followed the completion of the Bid 2000 program.
- In the 1999 Integrated Resource Plan DSM Stipulation and Settlement Agreement (Decision C00-1057, Docket No. 00A-008E), the Company committed to use its best efforts to acquire 124 MW of cost-effective DSM resources through the 1999 IRP Resource Acquisition Period ending December 31, 2005. The Company was authorized to spend no more than $75 million (Year 2000 dollars) to obtain the 124 MW of DSM. This amount included total capital costs and operating expenses incurred by the Company, but excluded expenses for the natural gas Energy $avings Partners ("E$P") low-income weatherization program. The 1999 Agreement identified target savings by customer class and program type.
- As part of the 2003 Least-Cost Resource Plan Settlement Agreement (Decision C05-0049, Docket Nos. 04A-214E, 04A-215E, 04A-216E), the Company committed to obtain 320 MW and 800 GWh of cost-effective conservation for $196 million (year 2005 dollars) between 2006 and 2013.

The following figure shows Public Service's demand and energy savings over the past seven years. Note that energy and demand savings achievements, as well as spending, ramped up during the 1999 Settlement period (2001 to 2005), and that 2006 represented the launch of the 2004 Settlement.

Figure 1: Public Service's 2001-2007 Electric DSM Achievements



Goals By Segment

For the 2009/2010 Biennial Plan, Public Service has developed a full portfolio of electric and natural gas DSM programs to serve all customer segments. For the purposes of this filing, the programs are split into four segments: Business, Residential, Low-Income, and Indirect. Public Service will market its energy efficiency programs to each customer segment based on the number of customers, relative size of each customer, and amount of conservation potential at a customer site. The goals for these segments are described in more detail below.

<u>Business Segment</u>
Energy efficiency sales to the Business Segment are achieved through Public Service's account managers, end-use equipment vendors, and energy service companies (ESCOs), as well as our Business Solutions Center. The Company's total proposed goals and budgets for the Business Segment in the 2009/2010 biennium include:

- 282.5 GWh and 60.8 MW in electric savings and 176,056 Dth in gas savings;
- $53.7 million in electric budget and $2.7 million in gas budget; and
- 5,404 electric and 561 gas participants.

Although economies of scale enable this customer segment to provide the lowest cost DSM per unit of energy saved, Business DSM is some of the most difficult to achieve over time. This is the case because business customers tend to require very short paybacks on investments and do not readily respond to traditional mass-market appeals. Further, on the gas side, the majority of large customers, who present some of the largest energy efficiency potential, are transport customers who will neither pay into the Demand-Side Management Cost Adjustment, nor be eligible to participate in the program offerings.

Residential Segment

Public Service has over 1.13 million electric and 1.18 million natural gas customers in its Residential Segment in Colorado. This segment includes single-family homes, townhomes, apartments and condominiums. The Company's total proposed goals and budgets for the Residential Segment during the 2009/2010 biennium include the following:

- 120.0 GWh and 61.8 MW in electric savings and 335,290 Dth of gas savings;
- $46.7 million in electric budget and $13.0 million in gas budget; and
- 654,510 electric and 80,550 gas participants.

Public Service developed its Plan to recognize that this market requires choices of conservation opportunities that accommodate various lifestyles, convenient participation, and information to make wise energy choices presented in useable and understandable forms and formats.

Low-Income Segment

The primary objective of the Low-Income Segment is to reduce energy consumption in low-income customers' homes and thereby reduce low-income customer bills. The Company's total proposed goals and budgets for the Low-Income Segment during the 2009/2010 biennium include the following:

- 10.7 GWh and 0.8 MW in electric savings and 209,603 Dth in gas savings;
- $3.2 million in electric budget and $7.2 million in gas budget; and
- 47,807 electric and 49,856 gas participants.

Indirect Segment

The Indirect Segment includes the indirect programs and activities that are not directly affiliated with any specific direct impact program. The Education/Market Transformation area includes four programs: Business Energy Analysis, Customer Behavioral Change-Business, Customer Behavioral Change-Residential, and Residential Home Energy Audits. The Planning & Research area includes four additional programs: DSM Market Research, DSM Planning & Administration, DSM Product Development, and Evaluation, Measurement & Verification. Public Service proposes an electric budget of $10.5 million and a gas budget of $6.3 million over the 2009/2010 biennium for this segment. Because this segment is not directly affiliated with specific direct impact programs but rather indirectly supports those programs, this segment does not have its own savings goals.

New Program Offerings

This Plan will be the first time that Public Service has offered gas DSM programs to its entire customer base, rather than solely to its low-income customers. As such, the Company has proposed 15 new gas programs, including the following Business programs:

- Boiler Efficiency;
- Custom Efficiency;
- Energy Management Systems;
- Furnace Efficiency;
- New Construction;
- Recommissioning;
- Segment Efficiency; and
- Standard Offer.

On the Residential side, Public Service will offer the following new gas programs:

- ENERGY STAR® New Homes;
- Energy Efficient Showerheads;
- Heating System Rebates;
- Home Performance with ENERGY STAR;
- Insulation Rebates;
- School Education Kits; and
- Water Heater Rebates.

Although the Company has offered electric DSM programs for many years, this Plan will introduce a number of new or enhanced electric programs, including the following Business programs:

- Data Center Efficiency;
- New Construction;
- Process Efficiency;
- Segment Efficiency;
- Self-Direct;
- Small Business Lighting Efficiency; and
- Standard Offer.

In the Residential segment, Public Service will offer the following new or enhanced electric programs:

- ENERGY STAR Retailer Incentive;
- ENERGY STAR New Homes;
- Home Performance with ENERGY STAR; and
- School Education Kits.

Major Initiatives: Market Transformation and Customer Education

In this biennium, Public Service will place greater emphasis on programs and services that help to redefine the energy efficiency marketplace through market transformation and customer education. The Company believes that market transformation and customer education are some of the least-cost ways to influence customer decisions and behaviors for the long term.

Public Service defines market transformation as marketing strategies that result in a permanent decrease in energy usage by inducing changes either in the product supply chain or in the behavior of the end-user. Often these structural and behavioral changes in the marketplace result in an increased or earlier adoption of energy efficient technologies and energy efficient practices that remain even after the program stimulus is removed.

The Company will be offering two types of Market Transformation programs in the 2009/2010 biennium. The Customer Behavioral Change for Residential and Customer Behavioral Change for Business programs will be indirect, meaning that they produce no direct energy savings, and the ENERGY STAR Retailer Incentive Pilot, a direct impact pilot program. In addition to these programs, Public Service has interwoven market transformation into many of its direct-impact programs by offering rebates on a variety of efficiency measures in order to make the efficient products more popular and more available in the marketplace, even if not cost effective on their own. By offering rebates for efficient measures, Public Service hopes to create a demand for the high efficiency products, thereby driving down their overall cost.

With this Plan, Public Service has also reaffirmed its commitment to transforming the energy efficiency market through new construction. The Company is offering new construction rebate and design assistance programs for all of its customer segments. Customers will receive rebates for construction that exceeds local codes and standards.

Also in this biennium, Public Service is offering a number of programs dedicated to customer education, such Business Energy Analysis and Residential Home Energy Audits. These are both indirect programs that provide customers with specific feedback and potential actions regarding their own homes and buildings. In addition, many of the other program offerings contained in this Plan have an educational component.

Stakeholders

Public Service believes that successful implementation of its Biennial Plan will be the result of active participation of its many stakeholders. These stakeholders include the Commission, the Governor's Energy Office ("GEO"), other state agencies, local governments, environmental groups, external consulting groups, efficient equipment manufacturers, distributors and vendors, installation contractors, and customer advocates. Each of the Company's programs offers its own opportunities for stakeholder involvement and feedback. In addition, Public Service will continue to host its semi-annual DSM Roundtable as a forum for open dialogue and discussion.

Pilot and Start-up Programs

In Docket No. 07A-420E, the Commission distinguished start-up and pilot programs from existing or continuing programs. These would be programs in their first few years of implementation, that have long sales cycles, or that are testing unproven methods. For any of these reasons, start-up and pilot programs may not necessarily achieve a Modified Total Resource Cost ("MTRC") Test ratio greater than one. In Decision No. C08-0560, the Commission allowed for such programs under these special circumstances to achieve an MTRC Test ratio of less than one. This is to allow Public Service time for new programs to reach cost-effectiveness status before ending the programs or disallowing cost recovery. Many of the new or enhanced programs proposed in this Plan could fit into the definition of a pilot or start-up; however, for the purposes of this Plan, Public Service has identified one pilot program, the ENERGY STAR Retailer Incentive Program, and five start-up programs, Data Center Efficiency, Process Efficiency, Segment Efficiency, Small Business Lighting, and Standard Offer in the 2009/2010 biennium. For any program that does not pass the MTRC Test at the end of the year, Public Service will explain the causes and provide recommendations on the program's continuation in the annual status report.

Document Layout

This document has seven major sections, organized primarily by customer segment: Executive Summary, Business Segment, Residential Segment, Low-Income Segment, Indirect Segment, Technical Assumptions, and Appendices. Each of these sections is described in more detail below:

- Executive Summary – provides a high-level overview of the strategic direction of the overall 2009/2010 DSM Biennial Plan; provides program-level goals and budgets in a table;
- Business, Residential, Low-Income, and Indirect Segment – detail the specific programs and goals associated with each segment;
- Technical Assumptions – displays the forecasted technical assumptions used to calculate the energy and demand savings of every measure included in the Plan; an electronic file of the detailed technical assumptions for each program will be provided as part of the overall filing;
- Appendices – presents detail on the budget categories, a description of the types of avoided costs used, the background on the benefit-cost tests, and a list of acronyms.

UPDATE: Table 3, below, provides the program-level goals and budgets. In accordance with the recent Settlement Agreement, this table has been updated to reflect the revised Home Lighting & Recycling Program energy and demand savings goals. Table 3 does not reflect any other program changes being implemented as a result of the Settlement Agreement, as the impacts of those changes have not yet been analyzed.

Table 3a: Public Service's 2009 Electric DSM Program Budgets and Goals

2009	Electric Participants	Electric Budget	Customer kW	Net Generator kW	Net Generator kWh	Modified TRC Ratio
Business Segment						
Boiler Efficiency						
Compressed Air Efficiency	231	$1,009,956	1,672	1,474	9,181,365	4.03
Cooling Efficiency	234	$2,288,950	4,198	3,035	6,168,583	1.96
Custom Efficiency	43	$2,474,819	1,786	1,372	7,467,223	2.06
Data Center Efficiency	10	$531,350	703	571	5,920,281	4.57
Energy Management Systems	29	$777,692	535	47	4,238,885	2.31
Furnace Efficiency						
Lighting Efficiency	632	$4,418,019	9,208	7,989	31,856,916	3.13
Motor & Drive Efficiency	1,100	$2,582,081	5,056	3,681	20,711,411	4.96
New Construction	46	$3,971,921	5,697	5,506	20,784,026	4.09
Process Efficiency	0	$414,850	100	77	487,371	1.37
Recommissioning	28	$562,633	651	354	3,947,516	2.05
Segment Efficiency	51	$644,452	120	80	528,904	0.86
Self-Direct	5	$348,300	531	478	2,182,451	4.46
Small Business Lighting	50	$789,234	350	316	1,153,540	1.86
Standard Offer	24	$706,200	893	813	1,766,186	2.50
Energy Efficiency Subtotal	**2,483**	**$21,520,457**	**31,501**	**25,793**	**116,394,660**	**3.29**
Business Segment Total	**2,483**	**$21,520,457**	**31,501**	**25,793**	**116,394,660**	**3.29**
Residential Segment						
Energy Efficient Showerhead						
ENERGY STAR New Homes	100	$56,000	136	10	117,030	1.74
ENERGY STAR Retailer Incentive	16,469	$2,658,384	3,171	640	2,455,560	1.17
Evaporative Cooling Rebate	3,800	$1,195,900	6,551	3,803	2,071,569	8.32
Heating System Rebate						
Home Lighting & Recycling	250,000	$3,127,951	46,250	3,307	46,237,797	6.39
Home Performance w/ ENERGY STAR	300	$171,949	343	31	374,715	1.94
Insulation Rebate						
Refrigerator Recycling	3,250	$659,703	453	297	2,189,309	2.01
School Education Kits	6,600	$164,211	673	54	815,800	2.99
Water Heating Rebate						
Energy Efficiency Subtotal	**280,519**	**$8,034,098**	**57,578**	**8,142**	**54,261,780**	**5.11**
Saver's Switch	19,500	$12,286,434	58,500	22,218	45,359	4.21
Load Management Subtotal	**19,500**	**$12,286,434**	**58,500**	**22,218**	**45,359**	**4.21**
Residential Segment Total (w/o Low Income)	**300,019**	**$20,320,532**	**116,078**	**30,360**	**54,307,139**	**4.52**
Low-Income Segment						
Easy Savings Energy Kits	20,000	$591,185	2,040	163	2,472,121	2.39
Multi-Family Weatherization	518	$106,432	249	28	323,820	2.41
Non-Profit Energy Efficiency	322	$68,991	155	17	201,875	2.28
Single-Family Weatherization	1,958	$749,466	1,593	175	2,135,695	2.54
Energy Efficiency Subtotal	**22,798**	**$1,516,075**	**4,037**	**384**	**5,133,511**	**2.45**
Low-Income Segment Total	**22,798**	**$1,516,075**	**4,037**	**384**	**5,133,511**	**2.45**
Indirect Segment						
Education/Market Transformation						
Business Energy Analysis	400	$697,191				
Customer Behavioral Change - Business	1,385	$162,968				
Customer Behavioral Change - Residential	30,000	$882,428				
Residential Home Energy Audit	7,176	$654,672				
Education/Market Transformation Subtotal	**38,961**	**$2,397,259**				
Planning and Research						
DSM Market Research		$1,427,266				
DSM Planning & Administration		$293,496				
DSM Product Development		$498,560				
Evaluation, Measurement & Verification		$739,640				
Planning and Research Subtotal		**$2,958,962**				
Indirect Total	**38,961**	**$5,356,221**				
2009 TOTAL	364,261	$48,713,284	151,616	56,537	175,835,310	3.36

Table 3b: Public Service's 2009 Gas DSM Program Budgets and Goals

2009	Gas Participants	Gas Budget	Net Annual DTH Savings	Annual Dth/$M	Total Modified TRC Net Benefits with Adder	Modified TRC Ratio
Business Segment						
Boiler Efficiency	146	$475,834	31,650	66,514	$2,355,668	2.68
Compressed Air Efficiency						
Cooling Efficiency						
Custom Efficiency	14	$198,578	13,492	67,944	$919,827	2.42
Data Center Efficiency						
Energy Management Systems	14	$132,121	6,286	47,579	$167,242	1.69
Furnace Efficiency	50	$44,346	4,204	94,803	$330,424	4.25
Lighting Efficiency						
Motor & Drive Efficiency						
New Construction	9	$184,291	11,747	63,743	$675,996	1.87
Process Efficiency	6	$39,300	9,049	230,261	$1,636,291	7.22
Recommissioning	8	$88,363	2,199	24,883	$44,366	1.38
Segment Efficiency	5	$25,754	0	0	-$26,294	0.00
Self-Direct						
Small Business Lighting						
Standard Offer	12	$21,000	473	22,503	$11,607	1.35
Energy Efficiency Subtotal	**264**	**$1,209,587**	**79,100**	**65,394**	**$6,115,126**	**2.69**
Business Segment Total	**264**	**$1,209,587**	**79,100**	**65,394**	**$6,115,126**	**2.69**
Residential Segment						
Energy Efficient Showerhead	20,000	$199,514	14,280	71,576	$1,345,979	5.99
ENERGY STAR New Homes	2,200	$3,002,604	34,658	11,543	$1,157,304	1.25
ENERGY STAR Retailer Incentive						
Evaporative Cooling Rebate						
Heating System Rebate	4,500	$789,360	35,868	45,440	$2,086,235	1.85
Home Lighting & Recycling						
Home Performance w/ ENERGY STAR	300	$328,250	9,617	29,299	$207,378	1.23
Insulation Rebate	1,500	$529,900	28,210	53,237	$1,887,085	1.72
Refrigerator Recycling						
School Education Kits	6,600	$163,273	14,315	87,674	$854,817	4.16
Water Heating Rebate	1,250	$81,796	1,513	18,502	$29,038	1.16
Energy Efficiency Subtotal	**36,350**	**$5,094,697**	**138,462**	**27,178**	**$7,567,835**	**1.67**
Saver's Switch						
Load Management Subtotal						
Residential Segment Total (w/o Low Income)	**36,350**	**$5,094,697**	**138,462**	**27,178**	**$7,567,835**	**1.67**
Low-Income Segment						
Easy Savings Energy Kits	20,000	$591,599	36,666	61,978	$2,329,354	3.65
Multi-Family Weatherization	518	$292,290	6,298	21,547	$318,497	1.42
Non-Profit Energy Efficiency	322	$393,258	4,064	10,333	$165,783	1.23
Single-Family Weatherization	2,946	$2,086,355	53,551	25,667	$2,058,491	1.36
Energy Efficiency Subtotal	**23,786**	**$3,363,503**	**100,579**	**29,903**	**$4,872,125**	**1.60**
Low-Income Segment Total	**23,786**	**$3,363,503**	**100,579**	**29,903**	**$4,872,125**	**1.60**
Indirect Segment						
Education/Market Transformation						
Business Energy Analysis	100	$155,262			-$155,262	
Customer Behavioral Change - Business	593	$70,644			-$70,644	
Customer Behavioral Change - Residential	30,000	$920,287			-$920,287	
Residential Home Energy Audit	7,774	$710,484			-$710,484	
Education/Market Transformation Subtotal	**38,467**	**$1,856,677**			**-$1,856,677**	
Planning and Research						
DSM Market Research		$587,266			-$587,266	
DSM Planning & Administration		$178,000			-$178,000	
DSM Product Development		$129,440			-$129,440	
Evaluation, Measurement & Verification		$134,360			-$134,360	
Planning and Research Subtotal		**$1,029,066**			**-$1,029,066**	
Indirect Total	**38,467**	**$2,885,743**			**-$2,885,743**	
2009 TOTAL	**98,867**	**$12,553,529**	**318,141**	**25,343**	**$15,669,344**	**1.60**

Table 3c: Public Service's 2010 Electric DSM Program Budgets and Goals

2010	Electric Participants	Electric Budget	Customer kW	Net Generator kW	Net Generator kWh	Modified TRC Ratio
Business Segment						
Boiler Efficiency						
Compressed Air Efficiency	249	$1,208,969	1,804	1,591	9,941,064	4.04
Cooling Efficiency	252	$2,582,748	4,597	3,253	6,951,439	2.04
Custom Efficiency	50	$3,085,144	2,077	1,595	8,682,818	2.06
Data Center Efficiency	14	$1,026,465	1,407	1,142	11,846,949	4.91
Energy Management Systems	38	$1,093,870	701	62	5,554,401	2.27
Furnace Efficiency						
Lighting Efficiency	678	$5,066,713	10,096	8,759	35,890,773	3.24
Motor & Drive Efficiency	1,100	$2,832,479	5,056	3,681	20,711,411	4.93
New Construction	65	$5,313,990	8,336	8,051	30,410,718	4.41
Process Efficiency	4	$1,574,800	1,606	1,233	7,797,936	2.76
Recommissioning	38	$858,540	858	471	5,122,522	1.91
Segment Efficiency	175	$2,227,436	2,178	1,368	10,716,550	2.75
Self-Direct	10	$654,000	1,062	956	4,364,903	4.73
Small Business Lighting	200	$3,156,935	1,401	1,264	4,614,158	1.92
Standard Offer	48	$1,509,800	1,786	1,625	3,532,372	2.53
Energy Efficiency Subtotal	**2,921**	**$32,191,888**	**42,964**	**35,053**	**166,138,016**	**3.35**
Business Segment Total	**2,921**	**$32,191,888**	**42,964**	**35,053**	**166,138,016**	**3.35**
Residential Segment						
Energy Efficient Showerhead						
ENERGY STAR New Homes	200	$97,550	272	21	234,059	1.90
ENERGY STAR Retailer Incentive	18,116	$2,964,229	3,488	704	2,701,058	1.14
Evaporative Cooling Rebate	4,000	$1,287,696	6,899	4,005	2,181,848	7.91
Heating System Rebate						
Home Lighting & Recycling	300,000	$3,433,520	55,500	3,969	55,485,357	6.69
Home Performance w/ ENERGY STAR	1,000	$484,778	1,145	103	1,249,049	2.15
Insulation Rebate						
Refrigerator Recycling	4,375	$885,382	609	400	2,947,146	2.04
School Education Kits	7,300	$188,938	745	60	902,324	2.96
Water Heating Rebate						
Energy Efficiency Subtotal	**334,991**	**$9,342,093**	**68,658**	**9,261**	**65,700,842**	**5.00**
Saver's Switch	19,500	$12,286,434	58,500	22,218	45,359	4.03
Load Management Subtotal	**19,500**	**$12,286,434**	**58,500**	**22,218**	**45,359**	**4.03**
Residential Segment Total (w/o Low Income)	**354,491**	**$21,628,527**	**127,158**	**31,479**	**65,746,200**	**4.44**
Low-Income Segment						
Easy Savings Energy Kits	22,000	$650,410	2,244	180	2,719,334	2.38
Multi-Family Weatherization	556	$125,458	267	30	347,783	2.19
Non-Profit Energy Efficiency	350	$92,602	168	19	219,700	1.92
Single-Family Weatherization	2,103	$827,223	1,711	188	2,293,929	2.46
Energy Efficiency Subtotal	**25,009**	**$1,695,693**	**4,391**	**417**	**5,580,745**	**2.38**
Low-Income Segment Total	**25,009**	**$1,695,693**	**4,391**	**417**	**5,580,745**	**2.38**
Indirect Segment						
Education/Market Transformation						
Business Energy Analysis	400	$820,467				
Customer Behavioral Change - Business	1,385	$171,781				
Customer Behavioral Change - Residential	34,000	$1,381,488				
Residential Home Energy Audit	7,416	$762,937				
Education/Market Transformation Subtotal	**43,201**	**$3,136,672**				
Planning and Research						
DSM Market Research		$247,610				
DSM Planning & Administration		$298,896				
DSM Product Development		$501,030				
Evaluation, Measurement & Verification		$621,830				
Planning and Research Subtotal		**$1,669,366**				
Indirect Total	**43,201**	**$4,806,038**				
2010 TOTAL	425,622	$60,322,147	174,514	66,949	237,464,961	3.39

Table 3d: Public Service's 2010 Gas DSM Program Budgets and Goals

2010	Gas Participants	Gas Budget	Net Annual DTH Savings	Annual Dth/$M	Total Modified TRC Net Benefits with Adder	Modified TRC Ratio
Business Segment						
Boiler Efficiency	146	$555,188	31,650	57,007	$2,282,794	2.54
Compressed Air Efficiency						
Cooling Efficiency						
Custom Efficiency	14	$177,505	13,492	76,010	$943,302	2.51
Data Center Efficiency						
Energy Management Systems	14	$129,649	6,286	48,486	$162,553	1.68
Furnace Efficiency	50	$50,139	4,204	83,850	$324,443	4.02
Lighting Efficiency						
Motor & Drive Efficiency						
New Construction	12	$313,864	15,510	49,415	$838,981	1.77
Process Efficiency	12	$60,600	18,099	298,656	$3,328,553	7.55
Recommissioning	8	$100,477	2,199	21,883	$29,747	1.23
Segment Efficiency	17	$84,100	3,627	43,126	$141,312	2.00
Self-Direct						
Small Business Lighting						
Standard Offer	24	$34,000	1,890	55,597	$77,491	1.93
Energy Efficiency Subtotal	**297**	**$1,505,522**	**96,956**	**64,400**	**$8,129,177**	**2.84**
Business Segment Total	**297**	**$1,505,522**	**96,956**	**64,400**	**$8,129,177**	**2.84**
Residential Segment						
Energy Efficient Showerhead	22,950	$227,224	16,387	72,118	$1,547,842	5.94
ENERGY STAR New Homes	3,200	$4,345,000	50,411	11,602	$1,738,471	1.26
ENERGY STAR Retailer Incentive						
Evaporative Cooling Rebate						
Heating System Rebate	6,500	$1,091,733	51,810	47,456	$3,071,127	1.88
Home Lighting & Recycling						
Home Performance w/ ENERGY STAR	1,000	$1,031,721	32,058	31,072	$752,548	1.25
Insulation Rebate	1,500	$534,755	28,210	52,753	$1,905,707	1.73
Refrigerator Recycling						
School Education Kits	7,300	$187,736	15,833	84,336	$921,511	4.01
Water Heating Rebate	1,750	$110,766	2,119	19,129	$43,592	1.17
Energy Efficiency Subtotal	**44,200**	**$7,528,935**	**196,828**	**26,143**	**$9,980,798**	**1.60**
Saver's Switch						
Load Management Subtotal						
Residential Segment Total (w/o Low Income)	**44,200**	**$7,528,935**	**196,828**	**26,143**	**$9,980,798**	**1.60**
Low-Income Segment						
Easy Savings Energy Kits	22,000	$651,246	40,333	61,932	$2,525,556	3.61
Multi-Family Weatherization	556	$353,615	6,760	19,116	$346,773	1.41
Non-Profit Energy Efficiency	350	$494,471	4,417	8,932	$179,552	1.21
Single-Family Weatherization	3,164	$2,295,861	57,515	25,051	$2,194,696	1.35
Energy Efficiency Subtotal	**26,070**	**$3,795,193**	**109,024**	**28,727**	**$5,246,578**	**1.59**
Low-Income Segment Total	**26,070**	**$3,795,193**	**109,024**	**28,727**	**$5,246,578**	**1.59**
Indirect Segment						
Education/Market Transformation						
Business Energy Analysis	100	$156,091			-$156,091	
Customer Behavioral Change - Business	593	$71,275			-$71,275	
Customer Behavioral Change - Residential	34,000	$1,418,512			-$1,418,512	
Residential Home Energy Audit	8,034	$820,356			-$820,356	
Education/Market Transformation Subtotal	**42,727**	**$2,466,233**			**-$2,466,233**	
Planning and Research						
DSM Market Research		$247,610			-$247,610	
DSM Planning & Administration		$180,100			-$180,100	
DSM Product Development		$130,400			-$130,400	
Evaluation, Measurement & Verification		$202,370			-$202,370	
Planning and Research Subtotal		**$760,480**			**-$760,480**	
Indirect Total	**42,727**	**$3,226,713**			**-$3,226,713**	
2010 TOTAL	**113,294**	**$16,056,364**	**402,808**	**25,087**	**$20,129,840**	**1.61**

DSM PORTFOLIO-ELECTRIC 2009 ELECTRIC GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$539	$539	$539
Transmission & Distribution Capacity		$113	$113	$113
Marginal Energy		$734	$734	$734
Avoided Emissions (CO2, SOx)		$163	$163	$163
Subtotal		$1,550	$1,550	$1,550
Non-Energy Benefits Adder (10%)				$155
Subtotal		$1,550	$1,550	$1,705
Other Benefits				
Participant Rebates and Incentives	$148			$148
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$13			$10
Subtotal	$161			$158
Reduction in Sales Revenue				
Electric	$833		$736	
Subtotal	$833		$736	
Utility Program Costs				
Program Planning & Design		$11	$11	$11
Administration & Program Delivery		$73	$73	$73
Advertising/Promotion/Customer Ed		$42	$42	$42
Participant Rebates and Incentives		$148	$148	$148
Equipment & Installation		$32	$32	$32
Measurement and Verification		$17	$17	$17
Miscellaneous		($1)	($1)	($1)
Subtotal		$321	$321	$321
Participant Costs				
Incremental Capital Costs	$248			$233
Incremental O&M Costs	$0			$0
Subtotal	$248			$233
Total Benefits	$994	$1,550	$1,550	$1,863
Total Costs	$248	$321	$1,058	$555
Net Benefit (Cost)	$746	$1,229	$492	$1,309
Benefit/Cost Ratio	**4.00**	**4.82**	**1.47**	**3.36**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	14 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	38.15%
Gross Load Factor at Customer	E	13.98%
Net-to-Gross (Energy)	F	88.4%
Net-to-Gross (Demand)	G	91.1%
Transmission Loss Factor (Energy)	H	6.64%
Transmission Loss Factor (Demand)	I	6.80%
MTRC Net Benefit (Cost)	J	$1,309
MTRC Non-Energy Benefit Adder	K	$155
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.3729 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,225 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,083 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,160 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	0.42 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.16 kW
Gross Annual kWh Saved at Customer	(B x E x L)	510 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	451 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	484 kWh

Program Summary All Participants		
Total Participants	M	364,261
Total Budget	N	**$48,713,284**
Gross kW Saved at Customer	(M x L)	151,616 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**56,537 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	185,671,333 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	164,153,629 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**175,835,310 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$198,417,277**
TRC Net Benefits without Adder	(M x L x (J - K))	**$174,864,873**

Utility Program Cost per kWh Lifetime	**$0.0191**
Utility Program Cost per kW at Gen	**$862**
Participant Payback with Rebate	**1.7 years**
Participant Payback without Rebate	**4.3 years**

DSM PORTFOLIO-GAS			2009	GAS	GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$71.33	$71.33	$71.33
Variable O&M Savings		$0.37	$0.37	$0.37
Demand Savings		$4.23	$4.23	$4.23
Subtotal		$75.93	$75.93	$75.93
Emissions and Non-Energy Benefits Adder (5%)				$3.80
Subtotal		$75.93	$75.93	$79.73
Other Benefits				
Participant Rebates and Incentives	$15.17			$15.17
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$16.62			$12.33
Subtotal	$31.78			$27.50
Reduction in Sales Revenue				
Gas	$96.13		$80.88	
Subtotal	$96.13		$80.88	
Utility Program Costs				
Program Planning & Design		$1.36	$1.36	$1.36
Administration & Program Delivery		$8.20	$8.20	$8.20
Advertising/Promotion/Customer Ed		$4.18	$4.18	$4.18
Participant Rebates and Incentives		$15.17	$15.17	$15.17
Equipment & Installation		$0.03	$0.03	$0.03
Measurement & Verification		$3.90	$3.90	$3.90
Miscellaneous		-$0.51	-$0.51	-$0.51
Subtotal		$32.33	$32.33	$32.33
Participant Costs				
Incremental Capital Costs	$40.37			$34.54
Incremental O&M Costs	$0.00			$0.00
Subtotal	$40.37			$34.54
Total Benefits	$127.92	$75.93	$75.93	$107.22
Total Costs	$40.37	$32.33	$113.21	$66.87
Net Benefit (Cost)	$87.55	$43.60	-$37.29	$40.36
Benefit/Cost Ratio	**3.17**	**2.35**	**0.67**	**1.60**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	15.11 years
Net-to-Gross (Weighted on Dth)	B	81.94%
Net-to-Gross (Weighted on Incremental Capital)	C	85.55%
Program Totals:		
Participants	D	98,867
Average Net Dth/Yr Saved	E	3.2
Total Dth/Yr Saved	F	**318,141**
Utility Costs per Net Dth/Yr	G	$39.46
Net Benefit (Cost) per Gross Dth/Yr	H	$40.36
Non-Energy Benefits Adder per Gross Dth/Yr	I	$3.80
Annual Dth/$M	($1M / G)	**25,343**
Total Utility Budget	(G x F)	**$12,553,529**
Total MTRC Net Benefits with Adder	(F x H)	**$15,669,344**
Total MTRC Net Benefits without Adder	(H - I) x F	**$14,195,246**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$2.61**
Participant Payback with Rebate		**1.9 years**
Participant Payback without Rebate		**3.4 years**

DSM PORTFOLIO-ELECTRIC 2010 ELECTRIC GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$564	$564	$564
Transmission & Distribution Capacity		$115	$115	$115
Marginal Energy		$850	$850	$850
Avoided Emissions (CO2, SOx)		$225	$225	$225
Subtotal		$1,754	$1,754	$1,754
Non-Energy Benefits Adder (10%)				$176
Subtotal		$1,754	$1,754	$1,930
Other Benefits				
Participant Rebates and Incentives	$163			$163
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$32			$26
Subtotal	$195			$189
Reduction in Sales Revenue				
Electric	$987		$878	
Subtotal	$987		$878	
Utility Program Costs				
Program Planning & Design		$11	$11	$11
Administration & Program Delivery		$76	$76	$76
Advertising/Promotion/Customer Ed		$53	$53	$53
Participant Rebates and Incentives		$163	$163	$163
Equipment & Installation		$28	$28	$28
Measurement and Verification		$17	$17	$17
Miscellaneous		($1)	($1)	($1)
Subtotal		$346	$346	$346
Participant Costs				
Incremental Capital Costs	$299			$279
Incremental O&M Costs	$0			$0
Subtotal	$299			$279
Total Benefits	$1,182	$1,754	$1,754	$2,119
Total Costs	$299	$346	$1,224	$625
Net Benefit (Cost)	$883	$1,409	$530	$1,494
Benefit/Cost Ratio	**3.96**	**5.07**	**1.43**	**3.39**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	15 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	39.28%
Gross Load Factor at Customer	E	16.31%
Net-to-Gross (Energy)	F	88.9%
Net-to-Gross (Demand)	G	91.1%
Transmission Loss Factor (Energy)	H	6.62%
Transmission Loss Factor (Demand)	I	6.75%
MTRC Net Benefit (Cost)	J	$1,494
MTRC Non-Energy Benefit Adder	K	$176
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.3836 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,429 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,271 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,361 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	0.41 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.16 kW
Gross Annual kWh Saved at Customer	(B x E x L)	586 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	521 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	559 kWh

Program Summary All Participants		
Total Participants	M	425,622
Total Budget	N	**$60,322,147**
Gross kW Saved at Customer	(M x L)	174,514 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**66,949 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	249,321,043 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	221,755,998 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**237,464,961 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$260,758,844**
TRC Net Benefits without Adder	(M x L x (J - K))	**$230,091,657**

Utility Program Cost per kWh Lifetime	**$0.0172**
Utility Program Cost per kW at Gen	**$901**
Participant Payback with Rebate	**2.0 years**
Participant Payback without Rebate	**4.4 years**

DSM PORTFOLIO-GAS	2010	GAS	GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$71.57	$71.57	$71.57
Variable O&M Savings		$0.37	$0.37	$0.37
Demand Savings		$4.24	$4.24	$4.24
Subtotal		$76.18	$76.18	$76.18
Emissions and Non-Energy Benefits Adder (5%)				$3.81
Subtotal		$76.18	$76.18	$79.99
Other Benefits				
Participant Rebates and Incentives	$15.02			$15.02
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$17.85			$13.36
Subtotal	$32.87			$28.38
Reduction in Sales Revenue				
Gas	$96.87		$81.20	
Subtotal	$96.87		$81.20	
Utility Program Costs				
Program Planning & Design		$1.24	$1.24	$1.24
Administration & Program Delivery		$6.54	$6.54	$6.54
Advertising/Promotion/Customer Ed		$5.75	$5.75	$5.75
Participant Rebates and Incentives		$15.02	$15.02	$15.02
Equipment & Installation		$0.02	$0.02	$0.02
Measurement & Verification		$4.49	$4.49	$4.49
Miscellaneous		-$0.44	-$0.44	-$0.44
Subtotal		$32.62	$32.62	$32.62
Participant Costs				
Incremental Capital Costs	$41.05			$34.86
Incremental O&M Costs	$0.00			$0.00
Subtotal	$41.05			$34.86
Total Benefits	$129.73	$76.18	$76.18	$108.37
Total Costs	$41.05	$32.62	$113.82	$67.48
Net Benefit (Cost)	$88.69	$43.56	-$37.64	$40.89
Benefit/Cost Ratio	**3.16**	**2.34**	**0.67**	**1.61**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	15.21 years
Net-to-Gross (Weighted on Dth)	B	81.83%
Net-to-Gross (Weighted on Incremental Capital)	C	84.92%

Program Totals:		
Participants	D	113,294
Average Net Dth/Yr Saved	E	3.6
Total Dth/Yr Saved	F	**402,808**
Utility Costs per Net Dth/Yr	G	$39.86
Net Benefit (Cost) per Gross Dth/Yr	H	$40.89
Non-Energy Benefits Adder per Gross Dth/Yr	I	$3.81
Annual Dth/$M	($1M / G)	**25,087**
Total Utility Budget	(G x F)	**$16,056,364**
Total MTRC Net Benefits with Adder	(F x H)	**$20,129,840**
Total MTRC Net Benefits without Adder	(H - I) x F	**$18,254,739**

Utility Program Cost per Net Dth Lifetime	(G / A)	**$2.62**
Participant Payback with Rebate		**2.0 years**
Participant Payback without Rebate		**3.4 years**

➢ Business Segment

A. Description

In the 2009/2010 Plan, Public Service's Business Segment consists of commercial and industrial customers in the Colorado service territory. As of June 30, 2008, Public Service had a total of 196,733 gas and electric commercial and industrial customers in Colorado. The majority of high natural gas consumption customers in Public Service's territory are transportation-only customers that do not purchase gas directly from the Company. Such customers are exempt from paying the Demand-Side Management Cost Adjustment ("DSMCA") and, therefore, are ineligible to participate in the Company's energy efficiency programs. A further breakdown of Business customers is shown in the table below, excluding the natural gas transportation customers.

Table 4: Business Segment Customer Counts

Type	Natural Gas Only	Electric Only	Both Gas & Electric	Subtotal
Commercial	32,843	88,229	71,100	192,172
Industrial	3,846	499	216	4,561
Total	**36,689**	**88,728**	**71,316**	**196,733**

The Business Segment has been identified as having the largest potential for energy savings according to the results of the 2005 KEMA DSM Market Potential Assessment. That study indicates that, at a rebate level covering 50% of incremental customer costs, excluding projects with less than a one-year payback, the net achievable energy savings by 2013 were 559 GWh for commercial customers and 36 GWh for industrial customers.[1]

Public Service divides business customers into two subsegments for marketing purposes: large customers and small business customers. Large customers are typically single or aggregated electric customers with demand usage of over 500 kW, natural gas customers with annual loads of 5,000 Dth or more, or national customers, such as fast-food chains. Large customers have a Company account manager assigned to them to serve as a liaison with Public Service. Small business customers work with our Business Solutions Center ("BSC") to answer any questions they may have on their accounts and to investigate potential energy efficiency projects. In addition to large versus small customers, Public Service often studies individual customer sectors, as described in the table below.

[1] *Colorado DSM Market Potential Assessment, Volume I – Main Report*, KEMA Inc., March 31, 2006, p. E-7.

Table 5: Business Segment Market Sectors

Market Sector	# of Electric Customers	# of Gas Customers	# of Combo Customers	% of Total Customer Base
Chemicals	105	121	137	0.18%
Electronics	85	159	251	0.25%
Fabricated Metals	145	162	345	0.33%
Food	2,883	649	852	2.23%
Food Store/ Grocery	695	587	1,154	1.24%
Hospital/Healthcare	1,559	1,404	1,986	2.52%
Hotel/Motel	741	725	420	0.96%
Industrial Machinery	226	262	536	0.52%
Instruments	176	141	246	0.29%
Lumber, Furniture	203	146	389	0.38%
Mining	86	22	45	0.08%
Misc. Manufacturing.	8,920	2,080	11,186	11.28%
Miscellaneous	17,680	5,376	4,318	13.91%
Office	15,463	7,293	13,349	18.35%
Paper	35	24	61	0.06%
Petroleum	257	130	135	0.27%
Primary Metals	37	30	51	0.06%
Printing	281	165	531	0.50%
Restaurant	1,716	1,847	4,044	3.87%
Retail	6,696	4,778	12,294	12.08%
Rubber, Plastics	57	63	134	0.13%
School College	1,543	1,600	895	2.05%
Stone, Clay, Glass	196	131	164	0.25%
Textiles	75	68	193	0.17%
Transportation Equip.	51	72	73	0.10%
Transportation	1,060	452	844	1.20%
Warehouse	2,382	1,545	4,126	4.09%
Water/Wastewater	442	135	94	0.34%
Unknown Categories	24,933	6,522	12,463	22.32%

Programs

An extensive portfolio of programs is planned for the Business Segment in 2009 and 2010. These programs are shown in the table below along with rankings and other market data. Public Service is proposing to continue offering eight existing electric DSM programs as well as adding seven new electric and eight new gas DSM programs. The existing programs have been expanded wherever possible to meet the higher goals set forth in this Biennial Plan. In addition to a robust suite of new natural gas efficiency programs, Public Service is proposing several start-up programs that are targeted to customers within specific market segments or with specific customer processes. In their start-up phase, these programs may have difficulty meeting cost-effectiveness requirements due to higher initial costs and potentially slow initial customer response. The start-up programs include:

- Data Center Efficiency;
- Process Efficiency;
- Segment Efficiency;
- Small Business Lighting; and
- Standard Offer.

Table 6: Business Program Rankings

Program Name	Program Ranking[2]	Type	Fuel
Boiler Efficiency	30	Prescriptive	Gas
Cooling Efficiency	12	Prescriptive	Electric
Compressed Air Efficiency	21	Custom	Electric
Custom Efficiency	19	Custom	Both
Data Center Efficiency	34	Custom	Both
Energy Management Systems	17	Custom	Both
Furnace Efficiency	35	Prescriptive	Gas
Lighting Efficiency	5	Prescriptive	Electric
Motor and Drive Efficiency	7	Prescriptive	Electric
New Construction	10	Custom	Both
Process Efficiency	28	Custom	Both
Recommissioning	25	Custom	Both
Segment Efficiency	23	Custom	Both
Self-Direct	31	Custom	Both
Small Business Lighting	32	Custom	Electric
Standard Offer	18	Custom	Both

Xcel Energy has extensive experience offering DSM programs throughout its service territories, with its most long-standing programs coming from Minnesota. It intends to use its experience gained in other states to provide Colorado with the best of its program offerings. Xcel Energy also participates in larger regional and national efforts to design and develop the best programs for customers. For example, Xcel Energy participates in the Consortium for Energy Efficiency's planning and research efforts. This group's primary purpose is to promote energy efficiency technologies through partnerships with utilities, manufacturers and other interested parties. In addition, Xcel Energy is a member of the Lighting Research Center. This organization provides relevant technical data on state-of-the-art lighting technologies and design practices.

[2] Rankings are determined by determining market segments that could participate in the program, customer classes available, total projected savings, cost per kW/Dth, participation, and participation % of market. The entire portfolio ranking can be found in the introduction of the DSM Biennial filing.

The current program profile includes several programs that began their launch in Minnesota. There are also new programs being developed and launched in the Colorado market, including: Data Center Efficiency, Process Efficiency, Segment Efficiency, Self-Direct, Small Business Lighting, and Standard Offer programs. These programs were developed based on a need identified by stakeholders or an established gap found in reviewing utility best practices.

B. Overall Budgets & Goals

The Business Segment contributes a significant portion of Public Service's planned conservation and load management achievements in this Biennial Plan, accounting for 283 GWh and 176,056 Dth over the two-year period. This equates to 68% of the Company's total electric energy savings goal and 24% of the total natural gas savings goal. The most significant Business Segment energy savings will come from the Lighting Efficiency, New Construction, Motor and Drive Efficiency, and Boiler Efficiency Programs. The following table shows the Company's proposed electric and natural gas Business Segment goals and budgets by program.

Table 7a: 2009 Business Segment Budgets and Goals

2009	Electric Participants	Electric Budget	Customer kW	Net Generator kW	Net Generator kWh	Modified TRC Ratio	Gas Participants	Gas Budget	Net Annual DTH Savings	Annual Dth/$M	Total Modified TRC Net Benefits with Adder	Modified TRC Ratio
Business Segment												
Boiler Efficiency							146	$475,834	31,650	66,514	$2,355,668	2.68
Compressed Air Efficiency	231	$1,009,956	1,672	1,474	9,181,365	4.03						
Cooling Efficiency	234	$2,288,950	4,198	3,035	6,168,583	1.96						
Custom Efficiency	43	$2,474,819	1,786	1,372	7,467,223	2.06	14	$198,578	13,492	67,944	$919,827	2.42
Data Center Efficiency	10	$531,350	703	571	5,920,281	4.57						
Energy Management Systems	29	$777,692	535	47	4,238,885	2.31	14	$132,121	6,286	47,579	$167,242	1.69
Furnace Efficiency							50	$44,346	4,204	94,803	$330,424	4.25
Lighting Efficiency	632	$4,418,019	9,208	7,989	31,856,916	3.13						
Motor & Drive Efficiency	1,100	$2,582,081	5,056	3,681	20,711,411	4.96						
New Construction	46	$3,971,921	5,697	5,506	20,784,026	4.09	9	$184,291	11,747	63,743	$675,996	1.87
Process Efficiency	0	$414,850	100	77	487,371	1.37	6	$39,300	9,049	230,261	$1,636,291	7.22
Recommissioning	28	$562,633	651	354	3,947,516	2.05	8	$88,363	2,199	24,883	$44,366	1.38
Segment Efficiency	51	$644,452	120	80	528,904	0.86	5	$25,754	0	0	-$26,294	0.00
Self-Direct	5	$348,300	531	478	2,182,451	4.46						
Small Business Lighting	50	$789,234	350	316	1,153,540	1.86						
Standard Offer	24	$706,200	893	813	1,766,186	2.50	12	$21,000	473	22,503	$11,607	1.35
Energy Efficiency Subtotal	**2,483**	**$21,520,457**	**31,501**	**25,793**	**116,394,660**	**3.29**	**264**	**$1,209,587**	**79,100**	**65,394**	**$6,115,126**	**2.69**
Business Segment Total	**2,483**	**$21,520,457**	**31,501**	**25,793**	**116,394,660**	**3.29**	**264**	**$1,209,587**	**79,100**	**65,394**	**$6,115,126**	**2.69**

Table 7b: 2010 Business Segment Goals and Budgets

2010	Electric Participants	Electric Budget	Customer kW	Net Generator kW	Net Generator kWh	Modified TRC Ratio	Gas Participants	Gas Budget	Net Annual DTH Savings	Annual Dth/$M	Total Modified TRC Net Benefits with Adder	Modified TRC Ratio
Business Segment												
Boiler Efficiency							146	$555,188	31,650	57,007	$2,282,794	2.54
Compressed Air Efficiency	249	$1,208,969	1,804	1,591	9,941,064	4.04						
Cooling Efficiency	252	$2,582,748	4,597	3,253	6,951,439	2.04						
Custom Efficiency	50	$3,085,144	2,077	1,595	8,682,818	2.06	14	$177,505	13,492	76,010	$943,302	2.51
Data Center Efficiency	14	$1,026,465	1,407	1,142	11,846,949	4.91						
Energy Management Systems	38	$1,093,870	701	62	5,554,401	2.27	14	$129,649	6,286	48,486	$162,553	1.68
Furnace Efficiency							50	$50,139	4,204	83,850	$324,443	4.02
Lighting Efficiency	678	$5,066,713	10,096	8,759	35,890,773	3.24						
Motor & Drive Efficiency	1,100	$2,832,479	5,056	3,681	20,711,411	4.93						
New Construction	65	$5,313,990	8,336	8,051	30,410,718	4.41	12	$313,864	15,510	49,415	$838,981	1.77
Process Efficiency	4	$1,574,800	1,606	1,233	7,797,936	2.76	12	$60,600	18,099	298,656	$3,328,553	7.55
Recommissioning	38	$858,540	858	471	5,122,522	1.91	8	$100,477	2,199	21,883	$29,747	1.23
Segment Efficiency	175	$2,227,436	2,178	1,368	10,716,550	2.75	17	$84,100	3,627	43,126	$141,312	2.00
Self-Direct	10	$654,000	1,062	956	4,364,903	4.73						
Small Business Lighting	200	$3,156,935	1,401	1,264	4,614,158	1.92						
Standard Offer	48	$1,509,800	1,786	1,625	3,532,372	2.53	24	$34,000	1,890	55,597	$77,491	1.93
Energy Efficiency Subtotal	**2,921**	**$32,191,888**	**42,964**	**35,053**	**166,138,016**	**3.35**	**297**	**$1,505,522**	**96,956**	**64,400**	**$8,129,177**	**2.84**
Business Segment Total	**2,921**	**$32,191,888**	**42,964**	**35,053**	**166,138,016**	**3.35**	**297**	**$1,505,522**	**96,956**	**64,400**	**$8,129,177**	**2.84**

Budgets
For the 2009-10 biennium, DSM budgets were developed using a well-defined process. For the electric programs, targets from the resource plan were allocated across customer segments, specifically to Business, Residential, Low-Income, and Indirect. Then each program's rebate budget was established according to the desired number of program participants. Next, other budget components, such as advertising and promotion, were developed as part of the program planning process. Then, program delivery budgets, including Company labor and external resources, were calculated. Some programs, such as New Construction, issue competitive bids to secure consultant resources. Finally, the budgets are totaled and reviewed for reasonableness given the historical and projected performance of each program. The resulting goals and budgets from this planning process are shown in each respective program description.

Goals
Electric goals were established first at the portfolio level by the Commission in Docket No. 07A-420E.[3] The Company's DSM management team reviewed these goals and completed an initial allocation to the Business, Residential, and Low-Income Segments. This allocation was accomplished through a review of historical data, discussions from the DSM Roundtable meetings, and the knowledge that residential goals would be significantly higher for 2009 and 2010.

Once the overall portfolio goal was allocated to the individual segments, the segment goals were allocated to each program. This allocation process was based primarily on a review of program performance for the past two and half years and longer-term experience with similar programs in Minnesota. Each product team then reviewed the information and informed the segment manager on whether the goals set forth are achievable.

C. Market Analysis

The 2005 KEMA DSM Market Potential Assessment separated the market analysis between commercial and industrial customer classes to determine the potential for energy efficiency opportunities. The study found that the commercial segment had the highest potential for energy savings; further, it identified lighting, office equipment, cooling and ventilation, and refrigeration as the end-uses with the greatest potential. On the industrial side, the following end-uses show the greatest-end use potential: pumps, compressed air, lighting, fans, drives and cooling.

Public Service's Biennial Plan shows the Company strengthening its efforts within the Business Segment to address specific market segments and their needs. Data Efficiency, Segment Efficiency and Process Efficiency are the beginning of this effort. Further analysis will be conducted in future process and impact research to identify other likely candidates for such targeted efforts.

Transactional research is also conducted by Public Service to identify who is participating in our DSM programs. Specific detail from our rebate applications, including customer name, vendor, type of equipment, etc, is collected on each transaction and added to a database. This

[3] Note that there were no natural gas DSM goals established by the Commission, Rule, or Statute, but rather that the gas DSM rules require utilities to propose a savings target.

information helps monitor trade allies that may not be participating in DSM programs, which market segments are missed and what equipment types our customers are using. By analyzing specific end-use data, Public Service can begin to shape the Business Segment to meet the further needs of the market.

D. Marketing/Advertising/Promotion

Trade allies, end-use equipment vendors, energy services companies, and Public Service's account managers primarily drive conservation and load management achievements in the Business Segment. Although sales to the largest business customers typically require personal visits, Public Service also utilizes newsletters, customer events, direct mail, email communications, and awareness advertising to reach Business Segment customers. The challenge of communicating with Business customers is that energy efficiency is not top of the mind – they are busy running other aspects of their businesses. Customers tend to focus on purchase price rather than lifetime costs and are unlikely to replace equipment until it is broken. Customers may also not be aware of available energy efficiency options when the need arises to make purchase decisions. Yet, there are several opportunities in marketing the Business Segment to customers who have a growing focus on energy efficiency and the need to conserve. Energy supply and climate change issues have increased this awareness and affinity for energy-saving actions. To support marketing efforts, Public Service employs an integrated approach to marketing communications, where the tactics are designed to work in concert with each other and reinforce key messages over time.

Strategy

Public Service follows the "AIDA" (awareness, interest, desire, action) process for encouraging customers to use the rebate programs. The following are the steps in this process:

1. Create awareness of electricity and/or natural gas impacts on bottom-line profits, potential savings and available rebates.
2. Create interest by offering more information about program offerings as details become available, including payback examples and case studies.
3. Create desire by showing hard numbers, based on available product and industry information, for a bundle of solutions for each targeted segment.
4. Move the customer toward action by offering a variety of options with varying degrees of commitment/long-term involvement.

Key Messages and Target Audience

When communicating with customers, Public Service uses several overarching key messages including:

- Energy efficiency reduces operating costs and improves the bottom line;
- Public Service helps lower energy bills by giving rebates and incentives for installing highly efficient equipment, using energy-saving building designs and running existing equipment to optimize comfort and energy savings;
- Rebates and incentives shorten payback periods for energy-efficient equipment and systems, providing lasting savings for years to come; and
- Energy efficiency helps reduce the customer's impact on the environment.

Public Service also markets its programs differently to the various business subpopulations, depending on the target audience. Each of these target audiences are identified by key shared characteristics before analyzing their motivations. Once motivations are identified, Public Service can adjust the above key messages to meet the customers' specific needs.

Small business customers traditionally own or work in buildings in segments such as offices, retail, healthcare, education, lodging, light manufacturing and grocery. They are motivated differently than larger businesses and are busy trying to keep their businesses successful and running smoothly which means energy is a low-interest category. Small business owners are motivated by how to save money and how to make things more convenient. Key messages used to address these needs include:

- Energy savings go right to profits; and
- Partnering with the property manager (where applicable) to employ energy savings lowers energy costs, often improves ambiance, and increases the owner's property value.

Large commercial customers traditionally are own or work in buildings in segments such as office, retail, education, healthcare, restaurants, auto dealerships and congregations. These customers recognize the value of environmental responsibility and sustainability efforts; but in doing so want to weave these efforts into their long-term financial strategies. Industrial customers traditionally own or work in food processing, chemicals, fabricated metals, rubber and plastics and warehouses. These customers focus on energy conservation, not to benefit the environment, but to keep operating costs low. They are highly engaged in getting the most production from every unit of energy, eliminating waste and making smarter energy choices. In all, these customers are the most energy-savvy and are constantly monitoring processes. Key messages used to address both these customer groups include:

- Energy is a large part of the operating budget;
- Rebates help reduce up-front costs, shorten payback periods and provide ongoing savings for years to come;
- Energy savings go right to the bottom line as increased profits;
- Investing in energy savings is a smart decision;
- Energy-efficient equipment and systems help increase reliability while decreasing maintenance costs; and
- Saving energy helps to reduce customer's impact on the environment and meet sustainability goals.

<u>Marketing Tactics</u>

Program- and segment-specific promotions

Program-specific marketing efforts tie back to the overriding message, offering specific examples of concrete ways to do more. These examples show customers and trade partners the direct, personal impacts of their efforts, offering examples of energy savings, paybacks and lifetime savings or personal rewards.

Solutions-based marketing
These communications focus on program combinations that offer solutions for a specific customer segment (e.g., schools) or for common customers concerns (e.g., weather, energy costs, environmental) to offer customers several solutions rather than a product.

Communications vehicles

- Program collateral, including feature sheets, applications, customer case studies, savings calculators, participating vendor lists and cross-program energy-savings guides;
- Newsletters for specific programs or cross promotion, such as the Energy Exchange for trade partners and Energy Solutions for Public Service customers;
- Websites;
- Direct mail campaigns for specific program end uses announcing new incentives or for customer education, as well as general direct mail pieces targeted at specific market segments;
- Events, including program and technical training, customer education and customer recognition;
- Speaking opportunities in local industry meetings, business events (i.e. Chambers, National Association of Industrial and Office Properties, and Building Owners and Managers Association) and local conferences;
- Media relations, including free placement in appropriate media, focusing primarily on customer stories and program information and changes; and
- Advertising in business magazines, newspapers, the internet and radio spots.

E. Segment-Level Policies

The Company has adopted several general policies that are followed in the Business Segment. Individual programs may follow different policies as noted in the program descriptions. The general policies provide overall product management direction; however, they may be relaxed for specific time periods when warranted for promotional events or other purposes.

The segment-level policies include:

- Proof of installation: All programs require documentation of installation, whether it be proof of purchase (e.g., invoices) or a site verification
- Installation date: Rebates are provided for equipment installed within a 24-month period.
- Payback requirements: The payback policy for conservation products is more than one year and less than 15 years.
- Studies: Study funding cannot exceed 75% of the study cost and studies must be completed within three months.
- Incremental cost: Rebates cannot exceed 60% of the total incremental cost of the efficiency measure.
- Load Shifting: Load shifting occurs when a measure shifts electrical energy and demand usage to an off-peak period, without reducing the total load served over a defined time period. Potential load shifting projects need to meet all existing eligibility requirements of the applicable program as well as additional persistence requirements.

F. Stakeholder Involvement

Through 2008, the primary avenue for external party involvement has been the DSM Roundtable. The Roundtable is open to all interested parties that want more information on Public Service's DSM programs and would like to provide feedback into the design, planning, and implementation of the programs. The group currently meets twice per year and the current plan is to continue this process. Public Service appreciates this group's efforts and takes into consideration what is learned through this event. For example, Public Service recently requested feedback from the group on the design of a small business program originally designed to address lighting needs. Feedback from the group indicated the program design as sound, but suggested adding in steps to address other measures besides lighting. In response to this feedback, Public Service will focus on lighting in the Small Business Lighting Efficiency program, but address other measures to the extent the customer is interested when the lighting audit is undertaken. DSM Roundtable events have been well attended by a diverse group of participants. These participants include the Governor's Energy Office, Commission staff, trade partners, large customers, Environmental Pollution Control Agency staff, Office of General Council staff, and environmental activists.

Beyond the DSM Roundtable, each program manager individually involves the applicable trade allies and other groups in the development of the programs. Public Service is fully cognizant that the programs will only be successful if all the participants are fully satisfied with how the program is delivered and the results achieved.

G. Evaluation, Measurement & Verification

Program-specific evaluation, measurement and verification plans are detailed in the M&V section of the Indirect Segment in this DSM Plan.

➢ Boiler Efficiency Program

A. Description

The Boiler Efficiency Program provides rebates for business customers who purchase high efficiency natural gas or dual-fuel boilers for heating or process loads. Program rebates are designed to promote the installation of high-efficiency boilers and boiler system auxiliary equipment that improves combustion and seasonal efficiency. This program is for Public Service's natural gas business customers. The Boiler Efficiency Program has three components: energy efficiency boiler systems, boiler auxiliary equipment such as controls and system improvements, and custom boilers. The details of each program component are described below.

1) Energy Efficient Boiler Systems

Public Service rebates boilers that exceed the minimum efficiency levels established by the ASHRAE 90.1 Energy Standard and the Federal Energy Management Program (FEMP). These boiler systems are generally 5 to 7% more efficient than standard boilers.

2) Boiler Auxiliary Equipment

The performance of a boiler system can be enhanced with controls and system efficiency improvements. Rebates are based on the incremental cost of efficient equipment with the exception of boiler tune-ups. Tune-up rebates include labor cost as well. The following will be rebated:

a) Boiler Tune-Ups, including the following activities:

- Adjustment of draft control;
- Measurement of combustion efficiency using an electronic flue gas analyzer at steady state conditions;
- Installation of flue restrictions;
- Verification of adequacy of the combustion air intake;
- Weather or operating schedule permitting, clean fire-side of the heat exchanger, burners, and the combustion chamber;
- Sealing of the combustion chamber;
- Uprate or derate the fuel input;
- Adjustment of air flow and reduction of excessive stack temperatures;
- Cleaning and inspection of burner nozzles;
- Complete visual inspection of system piping and insulation;
- Inspection of fan belts and blowers; and
- Lubrication of moving parts.

b) Boiler Efficiency Retrofits:
   - Modular Burner Controls (add controls to existing equipment)
     5 to 1 Turndown Ratio or Greater;
   - O_2 Trim Controls;
   - Outdoor Air Reset Controls;
   - Stack Dampers; and
   - Steam Trap Replacement/Parts.

3) <u>Custom Boilers</u>
While every attempt is made to create prescriptive rebates for high efficiency options, some energy saving solutions require individual evaluation to determine cost-effectiveness. These projects are evaluated under the Custom Efficiency process and require preapproval following all of the guidelines of the Custom Efficiency Program. Exceptionally large boiler systems (greater than 10 million BTUH) or unusual systems will be analyzed for rebates in the Custom Efficiency Program.

B. Budgets & Goals

<u>Budgets</u>
For the Boiler Efficiency Program, rebates, labor, promotions and consulting drive most of the budget. The following was used to identify these specific drivers.

- Rebates: determined by calculated average rebate cost per Dth and the gas savings goal.
- Labor Charges: determined by estimating the number of full-time employees needed to manage the program and execute the marketing strategy and rebate process.
- Promotions: The estimated promotional budget anticipates several customer and trade communications during the year and a contribution to the general conservation advertising campaign. 2009 and 2010 promotional dollars are important to quickly build awareness of the program and education of the benefits of higher efficiency boiler systems.
- Consulting: The Company receives consulting and professional services from the University of Wisconsin's Heating, Ventilating, Air Conditioning and Refrigeration Consortium and analytical services from outside consultants those boiler projects that are analyzed through the Custom Efficiency Program.

<u>Goals</u>
Program participation was determined by looking at the market in our Colorado service territory and our understanding of how new programs typically ramp up. The energy goal was built from the bottom up by looking at our projected participation level and the average savings per boiler. Public Service reviewed the "typical" equipment and project characteristics of historical projects in its Minnesota program in order to develop a projected average savings per participant. This average savings was used for the benefit-to-cost analysis. Reported energy savings for the program will be determined by using project specific inputs of actual boiler capacity and efficiency.

Once goals were established, the budget process is generally the same for Boiler Efficiency as with the other DSM programs. Experience from Minnesota programs is used as a checkpoint.

Table 8: Boiler Efficiency Program Budgets and Goals

Boiler Efficiency	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	N/A	$54,565	N/A	$76,760
Admin & Program Delivery	N/A	$128,064	N/A	$134,650
Ad, Promo, & Customer Ed.	N/A	$46,242	N/A	$92,375
Customer Incentives	N/A	$223,463	N/A	$223,463
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	N/A	$23,500	N/A	$27,940
Miscellaneous	N/A	N/A	N/A	N/A
Total	**N/A**	**$475,834**	**N/A**	**$555,188**
Generator kW	N/A	N/A	N/A	N/A
Generator kWh	N/A	N/A	N/A	N/A
Annual Dth	N/A	31,650	N/A	31,650
Annual Dth/$M	N/A	66,514	N/A	57,007
Participants	N/A	146	N/A	146
Participation as % of Segment	N/A	0.135%	N/A	0.135%
Modified TRC Test Ratio	**N/A**	**2.68**	**N/A**	**2.54**

C. Application Process

Customers will learn of the Boiler Efficiency Program and its benefits through newsletters, direct mail, the trade, and Public Service's account managers and Business Solutions Center representatives. Applications for the program will be available both on Xcel Energy's website and from trade allies. Participants in the program may submit their application through their account manager or via the call center. Customers must apply for rebates within 12 months of purchase and installation. Participants are required to complete an application and provide an invoice as proof of purchase. The following equipment information must be included on the application: boiler type (condensing, non-condensing), manufacturer, model number, boiler serial number(s), boiler age, size (MMBTUH), % efficiency, and estimated full load operating hours. Preapproval is not required before the customer buys or installs.

D. Marketing Objectives, Goals, & Strategy

The objective of the Boiler Efficiency Program is to provide education and incentives that motivate customers to purchase efficient boilers and run their existing boilers at optimum efficiency. Boiler systems are typically installed in mid to large sized customer facilities and the Program will work to identify and target these facilities for efficiency improvement.

The Boiler Efficiency Program will follow the marketing strategy of our other prescriptive programs and create a base level of knowledge in the marketplace through the Energy Solutions newsletter and at least three direct mail campaigns to customers and trade allies. These tactics make customers aware of the key benefits of energy efficiency and its applicability to heating systems. The program provides fact sheets and rebate applications for the customers and trade to evaluate rebates and incorporate them into purchase decisions. Over time case studies and guidebooks will be developed to support the energy and non-energy benefits of new, high efficiency equipment and auxiliary equipment. In addition, Public Service's account managers and Business Solutions Center representatives will educate them on energy efficiency, how to evaluate rebate potential, and the rebate application processes. The trade can find similar assistance through the Trade Relations Manager. The Boiler Efficiency Program will also benefit from opportunities identified for participants in the Energy Analysis and Recommissioning Programs. Marketing communications will revolve around the benefits of energy efficiency through paybacks, lifecycle costs, and environmental benefits.

E. Program-Specific Policies

There are no policies specific to this program.

F. Stakeholder Involvement

Public Service consulted with several of the major equipment vendors for guidance when designing the Boiler Efficiency Program for Colorado. These vendors provided insight into the types of products to rebate, the incremental and total equipment costs to be expected, and how the application process should work. The Company will also rely on the trade to help promote the program to their customers.

G. Rebate Levels

For Boiler equipment, we have chosen to focus the prescriptive program on hot water boilers (non-condensing and condensing). This is different from the program in Minnesota where we don't differentiate between non-condensing and condensing and we offer prescriptive rebates for high and low-pressure steam boilers. Several vendors we spoke with in Colorado suggested the program focus on the larger hot water boiler market and that steam boilers are a very small market. Steam boilers can be analyzed through our Custom Efficiency program as needed.

Boiler equipment rebate levels were established to provide a rebate that ranges from $400 to $2,000 per MMBTUH saved. This equates to approximately $6 to $9 per Dth saved. Cost information was gathered from various vendors in Colorado to confirm we would not exceed 60% of incremental equipment cost.

Boiler Efficiency rebates are based on the efficiency of the equipment – the higher efficiency equipment purchased, the larger the incentive. Further, Public Service will rebate combinations of controls and features that increase the overall system combustion and/or seasonal efficiency.

Table 9: Boiler Efficiency Rebate Levels

Hot Water Boiler	Non-condensing	Condensing
Minimum Efficiency	85%	92%
Rebate	$400/MMBTUH	$2,000/MMBTUH

Notes: (1) Boiler must use natural gas fuel as the primary fuel but can have dual fuel capability for backup. (2) Efficiency based on either thermal or combustion efficiency (natural gas fuel) or efficiency determined from a combustion analyzer test (boiler systems with optional controls). (3) MBH or MMBTUH is based on boiler input capacity.

Retrofit Controls, Heat Recovery and System Improvements

a. Boiler Tune-Ups: 25% up to $250
b. Boiler Efficiency Retrofits:
   - Modular Burner Controls;
   - 5 to 1 Turndown Ratio or Greater: 25% up to $5,000;
   - O_2 Trim Controls: 25% up to $5,000;
   - Outdoor Air Reset Controls: 25% up to $500;
   - Stack Dampers: 25% up to $250; and
   - Steam Trap Replacement/Parts: 25% up to $250/trap maximum of $10,000.

H. Evaluation, Measurement & Verification Plan

All rebate applications will be audited with a two-step process. On the front-end, as rebates are received, all critical customer information, equipment eligibility and proper rebates amounts are reviewed, validated, and corrected if inaccurate. The second step takes place prior to the rebate being issued where Rebate Operations audits 100% of the rebate applications to ensure that the information from the form was entered correctly into the tracking database. The second step includes ongoing verification and is split between prescriptive and custom measures.

The M&V process for prescriptive measures is detailed in the M&V section of the Indirect Segment of this Plan. The savings factors that will be verified for the Boiler Efficiency Program are detailed in the Deemed Savings Technical Assumptions section. The M&V process for custom measures is detailed in the M&V section of the Indirect Segment of this Plan. A comprehensive process and impact evaluation of the Boiler Efficiency Program will be conducted in 2011.

I. Technical Assumptions

Hot water boilers ranging in size from 175,000 Btu/h to 2,000,000 Btu/h were analyzed for prescriptive equipment rebates. A baseline efficiency of 80% was used. Higher efficiency equipment ranged from 85% (nameplate) for non-condensing hot water boilers to 92% (nameplate) for condensing. Boilers were assumed to be oversized with a maximum input capacity at 65% of nameplate. Condensing boiler efficiencies at part loads were taken from AERCO International Inc Thermal Efficiency curve for condensing boilers. Though the BTU input and output are affected by altitude, the efficiency stays the same, so the elevation effect was not considered

Rebates were based on $400 per MMBtu/h for non-condensing and $2,000 per MMBtu/h for condensing hot water boilers. For auxiliary equipment rebates, the estimated rebate amounts are based on a maximum payout of 25% of incremental costs. For Custom Boiler projects, the incremental costs were estimated from historical project averages from the Minnesota program.

The net-to-gross ratio for this program is set at 97%. It was approximated to be half of the free-rider factor for similar electric programs because this is the first exposure of the Colorado market to gas energy conservation measures and gas energy conservation measures are more difficult to market and install. Therefore, Public Service has assumed that the Boiler Efficiency net-to-gross is equal to one-half of the Cooling Efficiency net-to-gross factor. [Boiler NTG = 1 - (1-1/2 Cooling NTG]. In this example, the Cooling Efficiency net-to-gross factor is equal to 94% and so Boiler Efficiency is equal to [1- (1-0.94)/2)] = 97%.

➢ Compressed Air Program

A. Description

The Compressed Air Program provides Public Service electric customers in Colorado with assistance to address inefficiencies in their compressed air systems. The program offers study funding to perform system diagnostics, as well as rebates for energy-saving compressed air equipment. System diagnostic studies, or leak studies, are partially funded by Public Service as a means to identify and correct inefficiencies within customer's compressed air systems. Leak studies often identify additional measures to improve compressed air system efficiency.

Equipment rebates are then provided through prescriptive or custom programs. Equipment rebates are available for any size equipment. Prescriptive rebates are available for no-loss air drains and variable frequency drive compressors of less than 50 horsepower. For equipment of 50 horsepower and larger, it is expected that the customer will participate in the study portion of the program prior to requesting a Custom Efficiency rebate. Examples of equipment replacement that qualify for the custom equipment rebate include:

- Replace an oversized 50 horsepower compressor with a 40 horsepower compressor;
- After completing a compressed air study, replace an existing 150 horsepower air compressor with two 75 horsepower compressors and controls; and
- After completing a compressed air study, replace an existing 150 horsepower air compressor with a 150 horsepower variable frequency drive compressor.

All electric commercial and industrial customers within Public Service's service area are eligible to participate in the Compressed Air Efficiency Program. The primary target is a larger business customer that has some or all of the following characteristics:

- Demand of 500+ kW;
- Operates within energy intensive industries (e.g., food processing, mining, etc);
- Owns facilities with large cooling or refrigeration needs; and/or
- Is energy aware and has longer planning project lead times.

In addition, there is a secondary target of small business customers that may have these characteristics:

- Demand of less than 500 kW;
- Limited internal resources to purchase, install and finance projects;
- Limited technical expertise; and/or
- Focus on short-term paybacks.

Members of the trade are also targeted, including:

- Manufacturers of equipment;
- Installers; and

- Design engineers, architects and electricians.

B. Budgets & Goals

Budgets

Once goals were established, the budget process is generally the same for Compressed Air as with the other DSM programs. Historical cost and goal information is tracked and analyzed to project budgets two years in advance. Given the significant increase in goals for 2009 and 2010, additional time was spent reviewing the information for reasonableness. For Compressed Air, a team including management, program managers, marketing assistants, and regulatory staff reviewed the initial historically based projections and adjusted them using experience from Minnesota programs and the expertise of the staff. The results of this planning process are shown in Table 10 below.

For the Compressed Air program, rebates, internal labor and third-party consulting drive most of the budget. The following is information pertaining to these specific drivers.

- Rebates – this category includes the study reimbursement and incentives paid through the prescriptive or custom programs for equipment/process upgrades. Incentive payments are typically half of the program costs.
- Internal labor – Compressed Air Efficiency is a labor-intensive program due to the preapproval process and analysis component of the program. Labor is approximately one quarter of the total cost of the program.
- Third-party consulting – This expense is the third largest category and is primarily the assistance to conduct project analyses and M&V. Consulting expenses are expected to decrease, as a percentage of total costs, over time as Public Service uses internal labor to conduct more of the analysis work.

Goals

For the biennial, goals were established first at the portfolio level through the Commission hearing process.[4] The management team reviewed these goals and completed an initial allocation of the goals to each program. This was based primarily on a review of program performance for the past two and half years and longer-term experience with similar programs in Minnesota. For Compressed Air, this information was reviewed in the context of individual projects being approved and adjusted accordingly. Since the overall portfolio goal is fixed, it becomes an iterative process to ensure that the sum of individual program goals will meet the portfolio goal.

The Compressed Air team also considered the fact that the economy has slowed down significantly and that the easily identifiable opportunities have already occurred.[5] In addition, two new technology options are added to the mix: 1) Variable Frequency Drive ("VFD") Compressors less than 50HP, and 2) No air loss drain valves. These two measures are smaller in the nature of individual measure savings, but account for the bulk of the participant count shown

[4] Additional information on the general process is included in the Business Segment section.

[5] While it is still early for 2009, there is only one compressed air study in the pipeline.

in the table below. While smaller in number, the studies and larger compressed air equipment projects produce the bulk of the savings.

Table 10: Compressed Air Efficiency Program Budgets and Goals

Compressed Air Efficiency	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$50,165	N/A	$52,427	N/A
Admin & Program Delivery	$351,481	N/A	$390,889	N/A
Ad, Promo, & Customer Ed.	$54,197	N/A	$171,960	N/A
Customer Incentives	$518,253	N/A	$555,271	N/A
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	$35,860	N/A	$38,422	N/A
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$1,009,956**	**N/A**	**$1,208,969**	**N/A**
Generator kW	1,474	N/A	1,591	N/A
Generator kWh	9,181,365	N/A	9,941,064	N/A
Annual Dth	N/A	N/A	N/A	N/A
Annual Dth/$M	N/A	N/A	N/A	N/A
Participants	231	N/A	249	N/A
Participation as % of Segment	0.144%	N/A	0.156%	N/A
Modified TRC Test Ratio	**4.03**	**N/A**	**4.04**	**N/A**

C. Application Process

The Compressed Air Efficiency Program follows a similar application process to the Custom Efficiency program. Applications must be signed by the customer but can be submitted by customer representatives including: building owners, contractors, architecture and engineering firms, energy services companies, equipment manufacturers and distributors, or project financing entities. Typically, the customer or a vendor selling to the customer identifies a project and starts the application process, as described below.

The customer can learn about the program through various channels including the account manager, compressed air vendor, website literature or program advertising. The customer then contacts a participating compressed air vendor/contractor and requests a study estimate. A trade network list is available from Public Service if the customer has not chosen a vendor. The customer submits the Compressed Air Efficiency study application and the proposed cost of the study to the Public Service representative. The customer must obtain preapproval from Public Service prior to proceeding with the study.

The program manager receives the completed application from the account manager or Business Solutions Center representative. The application is reviewed for completeness. In order to receive preapproval, the study application must propose to include the following components:

- An ultrasonic leak survey — locate and tag air leaks; estimate the cost of inefficiencies due to system leaks and misuses;
- An efficiency report — system recommendations and estimate of energy cost savings due to each recommendation;
- Characterization of major compressed air system components including:
    - Compressor number, type, capacity, pressure rating and age;
    - Compressor motor size, efficiency and age;
    - Type, capacity and age of dryers and other conditioning equipment;
    - Type of automatic compressor controls, if any;
    - Description of major compressed air end uses;
    - Location and layout of piping and major system components;
    - Inspection of all compressed air system components and identification of problem areas;
- Identification of system loading of major compressed air users including size, frequency and duration of use;
- Flow and/or electric metering results;
- Summary of the results of the leak and unregulated demand inspection, including the location and approximate size of each leak;
- Summary of the execution steps and cost estimate to repair the leaks, unregulated end-uses and inefficient compressed air applications;
- Recommendations for improvements to customer's maintenance procedures; and
- Recommendations for follow-up actions to improve operation and efficiency, including the installation of new equipment.

Customers are typically notified within ten business days of approval or rejection of their application.

When a project is completed, the customer will inform their Public Service account manager. Payment of the rebate is dependent on verification of the results of the study. A project is considered complete once the customer repairs at least 50% of the air loss due to leaks and/or waste as identified in the study. The customer and account manager sign the verification section of the application and submit it to the product manager along with copies of invoices and other required information as stipulated in the preapproval letter. Public Service will reimburse the customer for the study portion of the project within six weeks of when the information described above is received.

If the customer chooses to implement recommended capital improvements to the compressed air system, they may submit measures for prescriptive rebate or apply for preapproval of their equipment replacement through the Custom Efficiency Program application process. Please see the Custom Efficiency section for a description of the process to be followed.

D. Marketing Objectives, Goals, & Strategy

Marketing Strategy

Account managers and compressed air vendors are the primary marketing conduits for this program and market the program through their direct relationships with customers. In addition, following are strategies that will help meet program goals in 2009 and 2010.

Target Industrial Customers

Industrial customers make up a sizeable untapped market that has the potential to bring in large compressed air projects. Public Service will target these customers with direct mailings to create awareness and answer initial questions about the program.

Partner with Trade Allies

Trade allies will be a significant factor in the success of this program. The compressed air product team feels many of the trade ally concerns would be relieved if they had a greater understanding of the program and the processes in place. Working directly with these trade allies will help them to identify customers for the program early in the planning stages of a project. The trade allies must be educated to see how incorporating Public Service's rebates into their bids can be beneficial to their business.

Vendor Training

Currently there are only three major providers of compressed air studies in the Denver market. Competition amongst this group is high due to the limited market size. For this reason, it is best to approach these trade allies individually rather than offer a group-training format. Throughout 2009, we will schedule several one-on-one meetings with these trade allies. The meetings will provide a forum to review the vendor's work, make recommendations for a better end product and solicit feedback on the effectiveness of the program. Initial time frame would be to have these meetings in March, July, and October.

Improve Marketing Collateral

Marketing collateral is an important tool to provide customers with useful, easy to follow guidelines for the program. Public Service continuously solicits feedback from customers and trade allies to improve these materials. Collateral is available in soft and hard copy format for customers, trade allies, and internal Public Service staff. Customers and trade allies can request hard copies of the material or they can access material on Xcel Energy's website. The collateral available includes:

- Compressed Air Feature Sheet – Tool that helps describe the program to customers and trade allies. It provides examples of projects that may qualify, business reasons to participate and a summary of the procedures to follow.
- Compressed Air Study Application – The document that customers fill out to start the process of participation. The customer or vendor is asked to fill out several sections including information on the business location, account manager, applicable rates, project description, technical information related to proposed and existing equipment, equipment supplier and project verification upon completion.

- Vendor List – A list of trade allies who have submitted studies in the past or expressed an interest in participating in the program. The list is provided for the convenience of customers who do not have a working relationship with a vendor. Public Service does not endorse any particular company over another.
- Compressed Air Study Template – This tool is a detailed example of what Public Service would like to see at the completed stage of a study.

E. Program-Specific Policies

All custom compressed air projects require pre-approval before purchase and installation. This process is in place to help insure free-ridership is kept to a minimum and that rebates are awarded to projects that are technically and financially sound. All custom compressed air equipment projects must have a payback period between one and fifteen years.

The system requirements include:

- Electrically driven compressed air systems;
- Minimum 50 horsepower total installed air compressor capacity (excluding backup equipment);
- Systems must operate at least 40 hours per week (2,000 hours per year).

F. Stakeholder Involvement

Customers, trade allies, and other stakeholders are currently engaged at the specific project level. Feedback is garnered individually from each participant and once a trend develops (positive or negative), Public Service makes a change to the program design. If it is a small change, it is then discussed internally and possibly with a few key trade allies and, if deemed acceptable, implemented. A larger change would possibly involve review by the program's external technical resources or other third-party consultant.

G. Rebate Levels

Participating facilities must be Public Service electric business customers. The program helps these customers lower operating costs by offering rebates on compressed air studies (for 50-99 horsepower, Public Service pays 100 percent of study cost up to $2,500; for 100+ horsepower, Public Service pays up to 75 percent of costs up to $15,000) and by providing prescriptive rebates of $200 per no air loss drain, and $4,000 for 10 to 20 horsepower, and $4,500 for 21 to 49 horsepower VFD compressors, and by providing custom rebates on compressed air equipment, up to $400 per kW saved, through the Custom Efficiency Program. The custom rebate cannot exceed 50 percent of the incremental costs. Rebates apply to new and leased equipment, but not to used equipment. These are similar rebate levels to what Xcel Energy offers in Minnesota.

H. Evaluation, Measurement & Verification Plan

All rebate applications will be audited with a two-step process. On the front-end, as rebates are received, all critical customer information, equipment eligibility and proper rebates amounts are reviewed, validated, and corrected if inaccurate. The second step takes place prior to the rebate being issued where Rebate Operations audits 100% of the rebate applications to ensure that the information from the form was entered correctly into the tracking database. The second step includes ongoing verification.

The M&V process for prescriptive measures is detailed in the M&V section of the Indirect Segment of this Plan. The savings factors that will be verified for the Compressed Air Efficiency Program are detailed in the Deemed Savings Technical Assumptions section._The M&V process for custom measures is detailed in the M&V section of the Indirect Segment of this Plan.

I. Technical Assumptions

Public Service estimated a net-to-gross factor to adjust the gross savings estimates for free riders and free drivers. The estimate for Compressed Air is 87%. This is based on a third-party consultant review of net to gross factors in programs considered best practices. The net-to-gross factor for Compressed Air was set similar to the factor for motors since it serves a similar customer base (i.e., primarily industrial). Additionally, the program screening criteria justify changing the net-to-gross ratio from 2007 values. All Compressed Air studies must be preapproved and equipment follows the Custom guidelines.

The general assumptions used in the forecasted technical assumptions include the following:

- Average study – The average is derived from all studies that were turned in during 2006 & 2007 in Minnesota. Compressed air vendors conducted studies, which included leaks and waste analysis, and provided Public Service with projected energy and demand savings for each project using standard "Compressed Air Challenge" assumptions. These studies are meant to find things that the customer would not find on their own that have a 1 year payback or less. The customer would not have purchased a study so the average baseline product costs would be $0 (i.e., all of the cost is incremental).
- Average custom project – The average is derived from all applications turned in during 2007 for Colorado projects. Customers provided data from a study or from a compressed air vendor and the data included the expected savings estimates. Each application used typical estimates for the type of system using standard assumptions used by the "Compressed Air Challenge" or from vendor's equipment models. To establish incremental costs, two cases are used. One is the replacement of old equipment and the other case is when new high efficiency equipment is purchased instead of standard efficiency equipment. The average baseline product costs is a weighted average of both cases and incremental is the additional cost to achieve the higher efficiency option.
- VFD Compressors less than 50HP – The estimated average horsepower unit purchased is 25 horsepower according to available data from Colorado in 2007. Public Service applied the average savings percentage to this estimate based upon <50HP compressor.

In addition, Public Service took into consideration that a compressor system must be less than 50 horsepower to qualify and must be proposing to stay under 50 horsepower.

- No air loss drain valves – Savings assume that the customer is replacing a timed drain or solenoid drain set at 8.5 minutes closed and 12.5 seconds open. Compressed air system also must be the following control type for the trim compressor:
    - Load/no-Load with at least 5 gal/CFM of storage (180 CFM compressor would need to have 5*180=900 gallons of storage or more)
    - Variable speed drive compressor
    - Variable displacement

➢ Cooling Efficiency Program

A. Description

The Cooling Efficiency Program will encourage Public Service business customers to choose the most efficient air conditioning equipment that best meets their needs. The program will offer rebates in two tiers, new construction and retrofit, while focusing on the most common air conditioning equipment available, and will encourage customers to make the most appropriate equipment choice. This program is similar in structure and technology to the Minnesota Cooling Efficiency Program and many other programs nationally.

This program has broad applicability within the Business segment, as most businesses in Public Service's Colorado service territory air-condition their facilities, and cooling is typically the second or third largest user of electricity in a facility.

While every attempt is made to create prescriptive rebates for high efficiency options, some energy saving solutions require individual evaluation to determine cost-effectiveness. These projects are evaluated under the Custom Efficiency process and require preapproval following all of the guidelines of the Custom Efficiency Program.

Program participants will benefit from newer equipment and therefore better reliability and lower maintenance costs, lower utility bills in the form of energy savings and rebates that help to buy down the initial capital cost and shorten payback. Public Service reviewed and adopted best practices for DSM program development and structure from across the country. Specifically the Company reviewed the Best Practices Benchmarking for Energy Efficiency Programs Non-Residential HVAC study available from Pacific Gas and Electric. The Company also used the guidelines of the American Society of Heating, Refrigeration and Air conditioning Engineers (ASHRAE) for equipment definitions, standard formulas and minimum recommended efficiencies. These sources along with Public Service's historical experience allowed the Company to develop influential prescriptive rebates that encourage the most efficient choice of equipment in the majority of equipment categories. For instance, a 10-ton rooftop air-conditioner at 11.0 EER and a 10-ton rooftop air conditioner at 11.8 EER both qualify for rebates. The 11.0 EER unit is eligible for $500 dollars while the 11.8 EER receives $820.

B. Budgets & Goals

<u>Budgets</u>

Once goals were established, the budget process is generally the same for Cooling Efficiency as with the other DSM programs. Historical cost and participation information is tracked and analyzed to project budgets two years in advance. Furthermore, external resources and discussion with local stakeholders are used to ascertain expenditures and market equipment cost. Comparative spending analysis of past year activity is generally conducted but is not the determining annual factor, since other external variables like promotions, materials and staffing exist. Given the increase in goals for 2009 and 2010, additional time was spent reviewing the information for reasonableness. Experience from Minnesota programs is used as a checkpoint.

For the Cooling Efficiency Program, rebates, labor, promotions and consulting drive most of the budget. The following was used to identify these specific drivers.

- Rebates: Developed using the average project rebate cost from the detailed technical assumptions and multiplying by anticipated participation.
- Labor Charges: determined by estimating the number of full-time employees needed to manage the program and execute the marketing strategy and rebate process.
- Promotions: The estimated promotional budget anticipates several customer and trade communications during the year and a contribution to the general conservation advertising campaign.
- Consulting: The Company also receives consulting and professional services from the University of Wisconsin's Heating, Ventilating, Air Conditioning and Refrigeration Consortium and analytical services from outside consultants for Custom – Cooling projects

Goals
The Cooling Efficiency Program goals are rolled-up into the total goal for the business portfolio. Therefore, the initial process of goal setting begins with our management team. They review the entire portfolio's goal and from that allocate individual program goals along with input from the product portfolio manager. Individual program goals, including the Cooling Efficiency goals, are based on the achievements of past years for both the Minnesota and Colorado programs, estimates of market penetration and a review of potential cooling technology improvement in the area of efficiency.

Table 11: Cooling Efficiency Program Budgets and Goals

Cooling Efficiency	**2009 Electric Goal**	**2009 Gas Goal**	**2010 Electric Goal**	**2010 Gas Goal**
Budget				
Planning & Design	$81,140	N/A	$83,980	N/A
Admin & Program Delivery	$151,076	N/A	$175,964	N/A
Ad, Promo, & Customer Ed.	$103,033	N/A	$219,999	N/A
Customer Incentives	$1,872,941	N/A	$2,008,005	N/A
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	$80,760	N/A	$94,800	N/A
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$2,288,950**	**N/A**	**$2,582,748**	**N/A**
Generator kW	3,035	N/A	3,253	N/A
Generator kWh	6,168,583	N/A	6,951,439	N/A
Annual Dth	N/A	N/A	N/A	N/A
Annual Dth/$M	N/A	N/A	N/A	N/A
Participants	234	N/A	252	N/A
Participation as % of Segment	0.146%	N/A	0.157%	N/A
Modified TRC Test Ratio	**1.96**	**N/A**	**2.04**	**N/A**

C. Application Process

Customers learn of the Cooling Efficiency Program and its benefits through newsletters, direct mail, the trade, and Public Service's account managers and Business Solutions Center representatives. Applications for the program are available both on Xcel Energy's website and from trade allies. The application process for the prescriptive program is similar to our other prescriptive programs. Customers may apply for rebates by completing the application and providing a detailed invoice for the newly installed equipment. The customers may submit for a rebate after the equipment has been purchased and installed. The equipment must be new and meet all the qualifications detailed on the application. After the customer has installed the equipment, the application and invoice must be submitted to Public Service within twelve months of the invoice date. Once the paperwork is completed and submitted, rebate checks will be mailed to the customer as indicated on the application within six to eight weeks. Participants in the program may submit their application to their account manager or the Business Solutions Center.

Customers with projects that save cooling energy but do not have a corresponding prescriptive rebate can participate in the Custom component of the program. Custom Cooling is governed by all of the requirements of the Custom Efficiency Program including pre-approval.

The sales cycle for cooling projects is typically influenced by the size and complexity of equipment. It may take two years to study, purchase and install a new, large system, while smaller rooftop units can take only two weeks to replace. For this reason, the Cooling Efficiency Program makes every effort to remind customers to evaluate high efficiency options when they are faced with a purchasing decision.

D. Marketing Objectives, Goals, & Strategy

The Cooling Efficiency Program creates a base level of knowledge in the marketplace through newsletters and direct mail to customers and trade allies. These tactics make customers aware of the key benefits of energy efficiency and its applicability to cooling systems, and gives the trade a platform from which to educate customers on high efficiency solutions for their particular applications. The program provides literature and tools for the customers and trade to evaluate rebates and incorporate them into purchase decisions. One popular piece is the Cooling Guidebook, which combines low cost strategies to save energy with capital-intensive projects to install high efficiency equipment. In addition, customers are served by Public Service's Account Managers and Business Solutions Center representatives who educate them on energy efficiency, evaluating rebate potential, and the rebate application process. The trade can find similar assistance through the Trade Relations Manager. The Cooling Efficiency Program also benefits from opportunities identified for participants in the Energy Analysis and Recommissioning Programs.

Marketing communications will revolve around the benefits of energy efficiency through paybacks, lifecycle costs, and environmental benefits. Newer cooling equipment is typically more efficient, more reliable and may have more effective controls than an older system providing both energy and non-energy benefit to the end user. Public Service uses generally accepted information from sources such as ENERGY STAR, the American Society of Heating, Refrigeration and Air conditioning Engineers, the Federal Energy Management Program and others to educate customers on no and low cost ways to save energy, such as maintenance to capital investments such as system replacement. The Company has created and made available the popular Cooling Guidebook as a quick reference on these issues. In mid 2008 the Company will be launching the Pledge to Energy Conservation promotion asking customers to employ the strategies in the guidebook and participate in Public Service programs.

To reach its energy savings goal, Cooling Efficiency needs to continue to penetrate the centrifugal chiller market. These systems provide the largest per project savings for the lowest transactional costs, making them the most cost-effective opportunities. The program has been successful in penetrating this market through strong relationships between Public Service account managers and customers and increasingly strong relationships with the trade. Custom - Cooling strategies, such as flat plate heat exchangers, cooling controls and energy recovery ventilators, have also been identified as an area of growth. Rooftop units, condensing units and split systems round out the portfolio with high participation and moderate savings.

Future strategies will involve more online tools to help customers evaluate the benefits of high efficiency equipment. Rebate and payback calculators are planned as well as lifecycle costing tools. Online submission of rebate applications will also be a priority. The program also intends to continue to develop prescriptive rebates to add to the portfolio including ground source heat pumps, evaporative cooling and condensing and hotel room occupancy controllers.

E. Program-Specific Policies

The Cooling Efficiency Program does not rebate back up equipment since assumed energy savings will not be realized.

F. Stakeholder Involvement

Because cooling systems can be very complex, trade support is imperative to achieving our goals. Public Service has engaged trade allies in program design and improvement through the creation of the Cooling Council. This group meets roughly once per quarter to discuss new technologies, program issues, and general market topics. The Cooling Council members are representatives from all levels of the cooling equipment distribution chain. Members include manufacturer's representatives, mechanical engineering firms and equipment contractors. The first meeting was held in May of 2008 and was well attended. The council brought forth several ideas for Public Service to consider including ground source heat pumps, under floor cooling systems and evaporative cooling. The Company will continue to hold these meetings quarterly. Also, Public Service will work with the trade on specific projects to evaluate energy saving strategies through the trade relations manager.

G. Rebate Levels

Most of the components of the program provide prescriptive rebates based on the size of the unit in tons combined with an efficiency bonus to encourage customers to exceed minimum to qualify efficiencies. The rebate structure by component is listed below:

Table 12: Cooling Efficiency Program Rebate Levels

EQUIPMENT		MINIMUM TO QUALIFY	REBATE
PTACs		11.0 EER	every 0.1 EER above min
Water-Source Heat Pumps		14.0 EER	every 0.1 EER above min
Rooftop AC Units			
	< 65,000 BTUH (<5.4 tons)	13.5 SEER	every 0.1 EER above min
	65,000 - 135,000 (5.5 - 11.3 tons)	11.0 EER	every 0.1 EER above min
	135,000 - 240,000 (11.4 - 19.9 tons)	10.8 EER	every 0.1 EER above min
	240,000 - 760,000 (20 - 63.3 tons)	9.8 EER	every 0.1 EER above min
	> 760,000 (> 63.3 tons)	9.35 EER	every 0.1 EER above min
Condensing Units	>65,000 BTUH (>5.4 tons)	11.0 EER	every 0.1 EER above min
	>/= 65,000 BTUH and ? 5.4 tons	11.0 EER	every 0.1 EER above min
Split Systems	< 65,000 BTUH and < 5.4 tons	14.0 SEER	every 0.1 EER above min
Variable Air Volume (VAV) Boxes		Replace CAV	$100/VAV
Air Cooled Chillers		10 EER	$8/ton + $2/ton for every 0.1 EER above min
Chillers - Scroll or Rotary Screw			
	< 150 Tons	0.61 kW / ton	every 0.01 kW/ton below max
	>/=150 tons and < 300 tons	0.56 kW / ton	every 0.01 kW/ton below max
Chillers - Centrifugal			
	All sizes	Determined by ASHRAE 90.1 2004	every 0.01 kW/ton below max

Generally, Public Service has set the minimum qualifying efficiency at the mid-point between the Center For Energy and Environment's Tier I and II levels in order to encourage customers to purchase the most efficient equipment, while ensuring the manufacturers have equipment that meets the criteria of the program.

The proposed rebate levels average 33% of the incremental cost. This level balances the cost-effectiveness of the program with the influential value to the customer and a payback less than 5 years in most cases. These rebate levels are higher than what we have offered in Minnesota, $14/ton in Minnesota versus $50/ton in Colorado, due to more stringent code levels and therefore higher minimum qualifying efficiencies in Colorado, requiring customers to make a larger investment for the incremental savings.

H. Evaluation, Measurement, & Verification Plan

All rebate applications will be audited with a two-step process. On the front-end, as rebates are received, all critical customer information, equipment eligibility and proper rebates amounts are reviewed, validated, and corrected if inaccurate. The second step takes place prior to the rebate being issued where Rebate Operations audits 100% of the rebates applications to ensure that the information from the form was entered correctly into the tracking database. The second step includes ongoing verification and is split between prescriptive and custom measures.

The M&V process for prescriptive measures is detailed in the M&V section of the Indirect Segment of this Plan. The savings factors that will be verified for the Cooling Efficiency Program are detailed in the Deemed Savings Technical Assumptions section. The M&V process for custom measures is detailed in the M&V section of the Indirect Segment of this Plan. Cooling Efficiency deals directly with one of the most complex and common systems for customers. For this reason a comprehensive process and impact study of this program's delivery processes, customer satisfaction, technical assumptions, and net savings impacts is planned for 2009. The budget for this study is included in the portfolio level EM&V budget.

I. Technical Assumptions

Unless noted, efficiency values are taken at the Air Conditioning and Refrigeration Institute's standard operating conditions published by the manufacturer. Water-cooled centrifugal chillers are the exception. These systems are engineered to operate for specific customer applications. The American Society of Heating Refrigeration and Air Conditioning Engineers ("ASHRAE") developed a series of tables setting recommended minimum efficiencies for various operating conditions. Public Service makes these minimum efficiencies available to customers and provides rebates for systems that are better than standard efficiency by 0.016 kW/ton or more.

Energy savings are calculated on a project-by-project basis comparing the baseline efficiency annotated in the technical assumptions and the installed unit's actual efficiency. For units measured in Energy Efficiency Ratio ("EER") or Seasonal Energy Efficiency Ratio ("SEER"), this formula is:

$$\text{Energy Savings (kW)} = \text{Tons} \times (12/\text{baseline EER} - 12/\text{actual EER})$$

For units measured in kW/ton this formula is:

$$\text{Energy Savings (kW)} = \text{Tons} \times (\text{baseline kW/ton} - \text{actual kW/ton})$$

The Cooling Efficiency Program assumes that the minimum efficiencies set forth in ASHRAE 90.1 2001 are the lowest efficiency a customer will purchase. All energy saving calculations are based on these minimum efficiencies and are detailed in the technical assumptions included in this filing. The program follows the ASHRAE methodology of categorizing equipment by technology and size and sets minimum qualifying criteria at a level above the ASHRAE minimum efficiency. The levels were chosen based on exceeding minimum ASHRAE efficiencies while ensuring manufacturers had qualifying equipment available. In general Public Service chose minimum qualifying efficiencies at the midpoint between the Consortium for Energy Efficiency's Tier I and Tier II recommendations.

Technical assumptions used to develop the program were derived from nationally recognized agencies including ASHRAE and the Efficiency Vermont Technical Reference Manual. Adjustments were made based upon regional factors or more relevant information from engineering firms, national engineering societies or agencies. Average project size and efficiency for each measure are determined by historical participation.

The net-to-gross factor was derived from the Non-Residential HVAC Best Practices Report (Volume NR2) conducted by Quantum Consulting. Cooling conservation programs are similar across the nation. Lacking a Public Service specific study in this service territory relevant data from other utilities is a valuable input in determining NTG factors. These values are in line with product team assessment of participants given the fact that qualifying units are so far above commonly stocked equipment they must be special ordered. Averaging the studied utilities results in a 94% NTG factor.

➢ Custom Efficiency Program

A. Description

The Custom Efficiency ("Custom") Program is designed to provide rebates on a wide variety of equipment and process improvements that do not fall within Public Service's prescriptive rebate programs. Similar to prescriptive programs, the primary goal is to obtain verifiable and persistent on-peak electric demand reduction and energy savings in the Colorado service territory. Colorado's Custom Efficiency Program was modeled after Xcel Energy's Custom Efficiency Program in Minnesota, which has been successfully operated since 1994 and received numerous ACEEE awards and recognitions. Most recently, the program received honorable mention in ACEEE's report on utility programs.[6]

Custom is designed to incorporate measures that save demand and/or energy, but currently are not included in any of the prescriptive rebate programs. This does not mean that Public Service will rebate every energy-saving technology. Each measure must be screened using a detailed engineering analysis. The analysis is described in more detail in Section C. Key criteria used to screen the measures include:

- Evidence that the measure is cost-effective to the customer and Public Service include:
  - Simple payback before rebate of 1 to 15 years.
  - A Total Resource Cost Test (TRC) ratio of greater than or equal to 1.0.
- Evidence of measure persistence which could include:
  - A measure life of 10 years or greater.
  - Description that supports permanent installation (e.g., no plug-in devices)
  - Capital investment undertaken by customer.
  - Independent, third-party verification if technology is new to the marketplace.
  - Other research conducted for energy efficiency technologies that demonstrate persistence (e.g., utility impact evaluations, DOE lab testing of technologies).

Many types of energy saving measures are not currently eligible for a prescriptive rebate, but could be eligible for a Custom rebate, including the measures listed in the table below.

[6] *Compendium of Champions: Chronicling Exemplary Energy Efficiency Programs from Across the U.S.*, Dan York, Marty Kushler, and Patti Witte, Feb. 2008, p. 14.

Table 13: Examples of Possible Custom Efficiency Measure

Equipment	Application
Compressed Air	New equipment, reduction in horsepower (hp) of compressors, storage, vacuum pumps, and variable frequency drive compressors
Controls	CO_2 based ventilation, compressed air and refrigeration controls
Cooling	Economizers, heat exchangers, and ventilation fans
Lighting	Lumen output changes, exterior lighting, LED and daylighting, retrofits not one to one
Miscellaneous	Energy efficient windows (film, argon, Low E), humidification, printing presses, welders, and elevator modernization (DC to AC motor conversion)
Motors & Drives	Motors > 500 hp. Drives > 200 hp and outside the prescriptive program parameters
Refrigeration	Ammonia compressors, freezer doors, and evaporative condensers
Process changes	New system produces more output than the old system while using the same amount of energy as the old system New system produces the same output as the old system using less energy Reconfigure system layout

The Company's engineering team determines if a project is covered under Public Service's prescriptive programs and, if not covered, warrants analysis through Custom. The product team, including an external consulting firm, then conducts the analysis to determine rebate eligibility. The review process typically is completed within two weeks of receiving an application.

The Custom Efficiency Program strives for consistency of its project analyses. All projects are reviewed to make sure they do not meet the requirements of our prescriptive programs, as a prescriptive project cannot be analyzed under Custom. Any assumptions made in the review of a project are clearly documented within the analysis and all projects of a similar type are reviewed using the same set of assumptions.

Public Service's Colorado Custom Efficiency Program was launched in February 2006. Since that time, over 530 projects have been analyzed. Customers have completed 199 projects for over 29 GWh of savings. Of these projects, 157 were claimed through the Custom Efficiency Program (meaning that they had no end-use program where savings would have been claimed. These Custom-Custom projects accounted for 6.7 GWh in savings in the end-uses shown in the following table:

Table 14: Cumulative Custom Efficiency-Custom End-Uses and Program Savings[7]

Program Component	Savings (GWh)
Compressed Air	5.99
Custom	6.70
Energy Management Systems	0.87
Lighting	12.83
Motors	0.79
Total	**29.13**

B. Budgets & Goals

Budgets

Once goals were established, the budget process is generally the same for Custom Efficiency as with the other DSM programs. Historical cost and participation information is tracked and analyzed to project budgets two years in advance. Furthermore, external resources and discussion with local stakeholders are used to ascertain expenditures and market equipment cost. Comparative spending analysis of past year activity is generally conducted but is not the determining annual factor, since other external variables like promotions, materials and staffing exist. Given the increase in goals for 2009 and 2010, additional time was spent reviewing the information for reasonableness. Experience from Minnesota programs is used as a checkpoint.

For the Custom Efficiency Program, labor, consulting, and rebates drive the vast majority of the budget. The following is information pertaining to these specific drivers:

- Internal labor – Custom Efficiency is a labor-intensive program due to the preapproval process and analysis component of the program. Labor is typically more than half of the total cost of the program.
- Third-party consulting – This expense is the second largest category and is primarily the assistance to conduct project analyses and M&V. Consulting expenses are expected to decrease, as a percentage of total costs, over time as Public Service uses internal labor to conduct more of the analysis work.
- Rebates – This is the third largest program expense. The budget for rebates is established by estimating participation for the program and multiplying by the rebate per kW amount plus an additional amount in the event that Public Service runs special promotional incentives in 2009 or 2010.

Goals

For this Plan, goals were established first at the portfolio level through the Commission hearing process.[8] The management team reviewed these goals and completed an initial allocation of the goals to each program. This allocation was based primarily on a review of program performance for the past two and half years and longer-term experience with similar programs in Minnesota.

[7] Net generator GWh from program inception through June 2008

[8] Additional information on the general process is included in the Business Segment section.

For Custom, this information was reviewed in the context of individual projects being approved and adjusted accordingly.

The estimated goals for the Custom Efficiency Program are heavily dependent on the specific projects that come in. For the 2009/10 Biennium, Public Service reviewed historical performance and those projects that are in the pipeline to get a sense of the number and magnitude of future projects. This information was translated into the goals provided here. Given the significant increase in goals for 2009 and 2010, additional time was spent reviewing the information for reasonableness. This included internal Custom Efficiency team review of the goals for 2009 and 2010.

Table 15: Custom Efficiency Program Budgets and Goals

Custom Efficiency	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$317,647	$1,457	$334,731	$1,457
Admin & Program Delivery	$668,122	$128,018	$815,132	$60,386
Ad, Promo, & Customer Ed.	$122,627	$17,746	$327,724	$64,304
Customer Incentives	$1,286,588	$47,600	$1,513,633	$47,600
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	$79,835	$3,758	$93,923	$3,758
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$2,474,819**	**$198,578**	**$3,085,144**	**$177,505**
Generator kW	1,372	N/A	1,595	N/A
Generator kWh	7,467,223	N/A	8,682,818	N/A
Annual Dth	N/A	13,492	N/A	13,492
Annual Dth/$M	N/A	67,944	N/A	76,010
Participants	43	14	50	14
Participation as % of Segment	0.027%	0.013%	0.031%	0.013%
Modified TRC Test Ratio	**2.16**	**2.06**	**2.15**	**2.06**

C. Application Process

The application process for Custom is more involved than for the prescriptive programs. Each project must be evaluated to assure it meets the eligibility requirements. This process can be broken into five distinct steps: Application Submission, Application Review, Project Analysis, Project Acceptance or Rejection, and Completion:

1. Application Submission

Typically, the Public Service account manager works with a customer and their vendor to identify a project with energy efficiency opportunities and starts the application process. The application form is available from the account manager, Xcel Energy website or from the product manager. Applications must contain a well-defined scope of work with enough detail to allow Public Service's internal engineers to analyze the savings opportunities. Applications must be signed by the customer but can be submitted by others on their behalf, including: building owners; lighting, HVAC, refrigeration, or building controls contractors; architecture and engineering firms; energy services companies; equipment manufacturers and distributors; or project financing entities.

2. **Application Review**
The product manager receives the completed application from the account manager or Business Solutions Center (BSC) representative. The application is reviewed for completeness of information. This process is in conjunction with a technical consultant review prior to the information being officially submitted. Once the program manager and technical consultant feel all necessary information has been provided, the marketing assistant assigns a project number and enters the application into the tracking system.

3. **Project Analysis**
Analysis of the project begins with our external consulting resource. Engineers review the project information and enter pertinent data into a spreadsheet model to determine the projected energy savings, benefit/cost ratio (i.e. TRC) and payback. These models were developed originally in Minnesota and adapted for Colorado (e.g., different avoided costs, climate, and other factors). The models calculate energy savings for various end-uses (lighting, motors, cooling, compressed air, etc.) to ensure consistency in analysis from one project to another. All calculations are based on approved ASHRAE methods or other similar industry standards.

   Based on the modeled results, the external consulting company will approve or reject a project and forward the results to Public Service's internal technical staff. The technical staff reviews the project analysis. Should an error be discovered, the engineer will document it and send the information back to the outside consultant for reanalysis. If everything was analyzed correctly, the engineer will concur with the analysis.

4. **Project Acceptance or Rejection**
Once the engineer has approved the analysis, a preapproval or rejection letter is sent to the customer. The preapproval letter provides critical information regarding the project, including: the project rebate amount, the project description and costs, and any conditions that must be met to receive the rebate (e.g., measurement and verification). Should a project be rejected, a rejection letter is sent informing the customer their project will not be eligible and explaining why. A copy of the preapproval/rejection letter is also sent to the account manager for project tracking. The marketing assistant collects all project documentation, including the application, specification sheets, proposals, and analysis, and stores it in the program files (both electronically and in hard copy).

5. **Completion**
When a project is completed, the customer will inform their account manager. The customer and account manager sign the verification section of the application and submit it to the

product manager along with copies of invoices and other required information as stipulated in the preapproval letter. The product manager reviews final documentation for accuracy and completeness. Should clarification or additional materials be needed the product manager will work with the account manager to obtain the information from the customer. If the final documentation matches the preapproved project information, the product manager will approve the project and submit paperwork to rebate operations for issuance of the rebate check.

Occasionally, projects must undergo re-analysis because the final project parameters do not match the original project application. This discrepancy may be due to minor changes in project scope, changes in final project cost, or the purchasing of similar, but not identical, equipment to what was analyzed. In these cases, the actual project information will be given to the technical staff for review and reanalysis. The original analysis will be updated with the new information to determine if the project still meets passing criteria. A passing project will be awarded a rebate based on the calculated savings from the updated analysis. A project that fails on reanalysis will not be issued a rebate.

D. Marketing Objectives, Goals, & Strategy

Marketing Strategy
Marketing of the Custom Efficiency Program will be conducted primarily through account managers and their direct relationships with customers. In addition, the following are some strategies we will use to achieve our goals in 2009 and 2010:

Target Industrial Customers
Colorado's industrial base is relatively small, but these few customers offer tremendous opportunity. Many of the opportunities will come from specialized applications or processes requiring a greater insight into the individual customer's operations. To achieve this, we will rely heavily on leads from account managers and outreach to the vendor community.

Use of Collateral
Public Service has developed a wealth of marketing collateral for the Custom Efficiency Program. This information is available in soft and hard copy format for customers, trade allies, and internal Public Service staff. Customers and trade allies can request hard copies of the material, or they can access material on Xcel Energy's website. This material is continually reviewed and revised based on feedback from participants and as changes are made to the program. The key collateral includes:

- Custom Efficiency Brochure – This is the primary tool account managers use to describe the program to customers and trade allies. It provides examples of projects that may qualify, business reasons to participate and a summary of the procedures to follow.
- List of potential projects – Projects that have fared well in Colorado and Minnesota serve as the basis for this list. The list includes both electric and natural gas measures.

- Custom Efficiency Worksheets – The application itself is general in nature and does not provide enough direction on additional material needed for each technology. Therefore, Public Service created worksheets that cover some of the more common technologies that are submitted for analysis. Existing worksheets include:
    - Custom Efficiency - Lighting Worksheet
    - Custom Efficiency - Motor Worksheet
    - Custom Efficiency - VFD Worksheet
    - Custom Efficiency - Elevator Worksheet
    - Custom Efficiency - Window Worksheet
    - Custom Efficiency – Roofing Worksheet
- Trade Ally website – This resource was designed specifically for all of the trade allies involved with Public Service DSM programs. The website includes all of the collateral indicated above and other helpful information.
- Information kit – A CD with program information on it. This disk is available to trade allies through the trade relations manager.
- Energy Exchange – a quarterly email newsletter that goes out to all trade allies who have registered to be part of our trade ally network.

Target Market
As with the other business rebate programs, the bulk of savings is anticipated to come from the large commercial and industrial segment. The Custom Efficiency Program has an even greater reliance on this segment as most projects are from customers involved in manufacturing and processing. The total potential customer base is comprised of 196,231 business customers in Colorado. Approximately 80% of these customers are concentrated within the Denver metro area, which will enable us to provide concentrated marketing campaigns on the Front Range. Account managers manage the largest 800 accounts. Based on Minnesota's history with the Custom Efficiency Program and results in Colorado from the past two years, we expect the bulk of Custom-custom projects to come from these largest accounts.

A key difference between Xcel Energy's Colorado and Minnesota service territories is the size of the industrial base. Minnesota has approximately ten times the number of industrial customers as Colorado. The lack of industrial base in Colorado will require the Colorado Custom Efficiency Program to develop a marketing approach that caters to small business customers. Many of Colorado's industrial customers may not have an account manager. This poses a hurdle to implementing Custom projects as historical projects were typically initiated with the help of Public Service account managers.

E. Program-Specific Policies

All Custom projects require: preapproval before order, purchase, and installation, a Total Resource Cost Test ratio of equal to or greater than 1.0, and simple payback criteria of one to fifteen years. Rebates are capped at 60 percent of the incremental project cost. This process is in place to help ensure free-ridership is kept to a minimum and that rebates are awarded to projects that are technically and financially sound.

Additional policies are developed for issues as they arise and the primary one to date is the Load Shifting Policy. Additional policies may be added as issues arise and the program matures.

F. Stakeholder Involvement

Customers, trade allies, and other stakeholders are currently engaged at the specific project level. Feedback is garnered individually from each participant and once a trend develops (positive or negative), Public Service makes a change to the program design. If it is a small change, it is then discussed internally and possibly with a few key trade allies and, if deemed acceptable, implemented. A larger change would possibly involve review by the program's external technical resources or other third-party consultant.

G. Rebate Levels

Rebates apply to new and leased equipment, but not to used equipment. To determine eligibility for a rebate, all projects are analyzed as described in the application process. Rebates are calculated based on the demand savings of the project. Additional information on this process is described in the technical assumptions section. For 2009 and 2010, Public Service is proposing an incentive level of $400 per kW for electric savings projects and $7 per Dth for gas savings projects.

H. Evaluation, Measurement & Verification Plan

All rebate applications will be audited with a two-step process. On the front-end, as rebates are received, all critical customer information, equipment eligibility and proper rebates amounts are reviewed, validated, and corrected if inaccurate. The second step takes place prior to the rebate being issued where Rebate Operations audits 100% of the rebate applications to ensure that the information from the form was entered correctly into the tracking database. The second step includes ongoing verification.

The M&V process for custom measures is detailed in the M&V section of the Indirect Segment of this Plan.

I. Technical Assumptions

The Custom Efficiency Program is unique in that energy and demand savings are recorded for each project that is approved and paid a rebate. These savings are then aggregated to the program level. The Custom program receives projects from all end-use technologies (lighting, motors, cooling, etc.) When reporting program results, energy savings are allocated to the appropriate program based on the technology rebated. For example, savings from a custom lighting project are added to the prescriptive lighting program savings to account for total Lighting Efficiency Program savings. Custom-custom projects (those for which we have no prescriptive end-use program) are the only projects in which savings are directly attributable to the Custom Efficiency Program.

Public Service also estimated a net-to-gross factor to adjust the gross savings estimates for free riders and free-drivers. The estimate for Custom electric is 0.87. This is based on a third-party consultant review of net-to-gross factors in programs considered best practices. Additionally, the program screening criteria justify changing the net to gross ratio from 2007 values. Custom projects must be preapproved before equipment is ordered or purchased. Only projects which have a TRC > 1.0 and meet a simple payback criteria of between 1 and 15 years qualify for a Custom incentive. These screening criteria justify raising the net-to-gross ratio. The Custom gas ratio is higher at 93%. This is the first exposure to gas energy conservation measures to the market and gas energy conservation measures are more difficult to market and install, thus justifying the higher net-to-gross estimate.

The general technical assumptions used in the forecasted benefit-cost analysis are established for an average Custom project. This average is derived from Custom Efficiency projects completed during 2007 in Colorado. The data is stored in a database and includes original data from the customer or equipment provider and individual project analysis results. For the gas component of the program, an average of the Minnesota Gas Custom Efficiency projects from 2006 to 2008 is used. To establish incremental costs, two cases are used. One is the replacement of old equipment and the other case is when new high efficiency equipment is purchased instead of standard efficiency equipment. The average baseline product costs is a weighted average of both cases and incremental is the additional cost to achieve the higher efficiency option.

➢ Data Center Efficiency Program

A. Description

The Data Center Efficiency Program is designed to help customers address energy conservation opportunities in both new and existing data centers. The decision to build a program for the data center market was based on the significant energy savings potential of the customer sector and the huge projected growth in energy use over the next several years as determined by the Environmental Protection Agency (EPA). This Program is considered a start-up program during 2009 and 2010 and, therefore, may not meet cost-effectiveness thresholds. However, the Company will make every effort to run the Program cost-effectively.

A holistic approach will be taken to package energy efficiency information and rebate opportunities through the use of site evaluations and design assistance. The Program will consist of two separate paths: one for existing data centers and one for new construction. There are numerous ways data centers can become more energy efficient including the following:

- High-efficiency servers: The EPA, by way of the ENERGY STAR program, is currently working to define the "standard" server and the "high-efficiency" server energy usage. Their first standard, focused on a more efficient power supply, is expected by the end of 2008. Experts estimate that high-efficiency servers could be around 25% more efficient than the standard used today.
- Server virtualization: Currently, the most common method for use of computer operating systems is to have one system per server. Software now exists to consolidate several operating systems on one server (while making each system look like it's still on its own unique server). This process is called Virtualization and enables the number of actual servers to be reduced at ratios as high as 30:1. Along with the reduced electricity usage due to the servers, reducing the amount of hardware also decreases the amount of cooling needed.
- Air flow improvements: Proper placement of equipment and management of cable raceways can optimize air flow, reduce temperature hot spots in the data center, and reduce the cooling needed.
- High-efficiency cooling equipment: Data centers, depending on their size, can obtain their cooling from the overall building cooling plant, from dedicated computer room A/C systems, or both. Options exist for high-efficiency building cooling as well as new technologies for "in-rack" cooling of the data center server racks.
- High-efficiency lighting equipment: Although generally a small portion of the total energy usage in the data center (around 5%), there is opportunity to install higher-efficiency lighting when retrofitting existing or designing new data centers.

Design assistance will be available separately or in conjunction with our existing Energy Design Assistance Program for new facilities utilizing a third-party expert for the analysis. For existing facilities, the Program will provide funding towards an on-site evaluation and analysis and rebates based on the demand savings resulting from implementing energy conservation opportunities recommended in the study.

Custom and prescriptive rebates will also be part of the package of information to the customer. Current prescriptive high-efficiency cooling and lighting equipment rebates will be available and, in time, new prescriptive rebates will be developed for high-efficiency servers, server optimization, and data storage/archiving practices. In the mean time, these measures will utilize our existing Custom Efficiency rebates and analysis process.

Data centers are often discussed in terms of their size. This Program focuses on the following three categories as defined by the EPA: Localized Data Centers (500-1,000 sq. ft.), Mid-tier Data Centers (1,000-5,000 sq. ft.), and Enterprise-class Data Centers (5,000+ sq. ft.). However, any size data center will be accepted in the Program.

Public Service will conduct a competitive bidding process for third parties to conduct data center studies and analysis. As a result of that process, the Company will develop a list of qualified contractors whose studies may be rebated by Public Service. If the facility also participates in the Energy Design Assistance Program, that contractor will partner with our contractor for that Program to oversee the data center portion of the study.

B. Budgets & Goals

Budgets

Public Service built the Data Center Efficiency Program budgets from the desired participation level of four existing data centers being retrofitted and two new data centers being built each year. The largest cost in the budget is for implementation and study rebates, which represent 70% of the overall Program budget.

Goals

The demand and energy goals were determined by defining different categories of data centers based on square footage and assuming an average number of servers/energy use. Then the various energy efficiency options that could arise from a data center design study were defined (e.g. install high-efficiency servers, virtualize servers, install more efficient lighting, etc.) and the estimated savings of the individual measures was calculated and totaled. Our estimation of the data center market in Colorado is based on the August 2007 EPA Report "EPA Report to Congress on Server and Data Center Energy Efficiency". The data center load is estimated at 1.5% of the total energy use in our territory and is expected to grow to 2.5% by 2011 according to the EPA study. The demand savings of installed projects as a result of a data center design analysis will determine energy savings. Energy conservation opportunities will be identified within the study report.

Table 16: Data Center Efficiency Program Budgets and Goals

Data Center Efficiency	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$81,766	N/A	$84,622	N/A
Admin & Program Delivery	$22,306	N/A	$23,069	N/A
Ad, Promo, & Customer Ed.	$68,300	N/A	$254,740	N/A
Customer Incentives	$333,676	N/A	$615,155	N/A
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	$25,302	N/A	$48,879	N/A
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$531,350**	**N/A**	**$1,026,465**	**N/A**
Generator kW	571	N/A	1,142	N/A
Generator kWh	5,920,281	N/A	11,846,949	N/A
Annual Dth	N/A	N/A	N/A	N/A
Annual Dth/$M	N/A	N/A	N/A	N/A
Participants	10	N/A	14	N/A
Participation as % of Segment	0.006%	N/A	0.009%	N/A
Modified TRC Test Ratio	**4.57**	**N/A**	**4.91**	**N/A**

C. Application Process

Customers will learn about the Program through a variety of channels, including: the Xcel Energy website, account managers, Business Solutions Center representatives, and trade allies. In addition, the Company will recruit data center experts to help promote the program to customers. Program applications will be made available through all of these channels. Customers may submit an application through their account manager, trade allies or by mailing it to Public Service.

Customers building a new data center need to submit their application in the early phases of design to make sure our recommended strategies make it into their final plans. Preapproval for the design study will be required and only customers will be able to apply for rebates.

D. Marketing Objectives, Goals, & Strategy

The goal of the Data Center Efficiency Program is to build and retrofit data centers, with their copious electronic equipment, to be as efficient as possible. Because the market for this program is so specific, Public Service will have an account manager focused on data center customers. It will be necessary to provide good face-to-face contact with our customer base in order to engage them in the program. Research on this customer segment suggests that data center customers look to their utilities to be the energy expert.

The marketing strategy for Data Center Efficiency will include a variety of channels, including account managers, trade relations managers, professional organizations, and direct customer communications. Tactics include, but are not limited to, the creation of collateral materials, newsletter articles, direct mail campaigns, advertising, and event marketing outreach. Much of the marketing plan and the supporting processes for this program are in progress. This is a brand new product and intention is to build all that is needed to implement and market the program during the third and fourth quarters of 2008 with the plan to launch the program January 1, 2009.

E. Program-Specific Policies

As this program is still in development, we have not yet determined any policies specific to this program. Policies may be defined around the Data Center Design Expert as we develop our list of qualifications and customers hire their own contractor.

F. Stakeholder Involvement

As part of the program design effort, Public Service conducted focus groups with data center facility managers and one-on-one interviews with information technology executives in order to better understand their needs and interest in energy efficiency. Some of the recommendations on program design that resulted from the focus groups were to create:

- An audit program that is specific to data centers and utilizes experts in data center design and operation;
- Audit programs so they are more dynamic and better reflect the nature of the data center;
- Materials to help data centers select energy efficient equipment;
- Materials that show how a carefully managed, energy efficient data center may be more reliable than a standard data center. Connect reliability to energy efficiency;
- A quick "hit list" of things that data center operators should be aware of to aid in conservation of energy; and
- Programs to increase the awareness that information technology strategies have an impact on energy conservation in a facility.

All of these ideas will be considered as we develop collateral and education materials to support the Program.

Xcel Energy has also been an active participant in the Consortium for Energy Efficiency ("CEE") Data Centers and Servers workgroup where we are working with other utilities collaboratively to push for energy efficiency standards for data center equipment and provide guidance to one another as individual data center efficiency programs are developed.

G. Rebate Levels

Prescriptive rebates will be applied where applicable, such as for lighting or cooling equipment upgrades. Other energy efficiency upgrades will be handled through the Custom Efficiency analysis process. All measures will be rebated at $400 per kW saved. The data center design study will follow the existing Energy Analysis Program guidelines and pay up to 50% of the incremental cost of the study not to exceed $15,000. This cap may be reevaluated if a very large data center is being reviewed.

H. Evaluation, Measurement & Verification Plan

All rebate applications will be audited with a two-step process. On the front-end, as rebates are received, all critical customer information, equipment eligibility and proper rebates amounts are reviewed, validated, and corrected if inaccurate. The second step takes place prior to the rebate being issued where Rebate Operations audits 100% of the rebate applications to ensure that the information from the form was entered correctly into the tracking database. The second step includes ongoing verification.

The M&V process for custom measures is detailed in the M&V section of the Indirect Segment of this Plan.

I. Technical Assumptions

The net-to-gross factor for this Program will be set at 90% initially, based on projects that have come through the Custom Efficiency Program and reports that have determined 10% of the market is currently doing virtualization of servers. For virtualization activities we assumed a ratio of 15:1. The industry is showing as high as a 30:1 ratio for virtualization, meaning that if you virtualize your servers, up to 30 servers could be replaced with 1 server.

For retrofit lighting, we assumed no change in the number of fixtures, only changes to the type of lamp installed. We will only allow delamping if the actual fixture is altered to only accept a reduced number of lamps, similar to the existing Program in Colorado.

➢ Energy Management Systems Program

A. Description

The Energy Management Systems Program is designed to offer customers rebates for installing systems that control and reduce a building's energy usage both on and off-peak. Electric and gas customers are eligible for participation in this program.

An energy management system ("EMS") is a system of controls and sensors that are centrally operated, typically via a computer software package. Such systems may control the heating, cooling, ventilation, and lighting in a facility, either through operator action or automatic programming, potentially saving energy. Systems covered in the program include new energy management systems in an existing building, replacing a non-functional energy management system, replacing an obsolete energy management system, and adding functionality to a current system. The duplication of existing systems or replacement of an obsolete system does not qualify for rebate under the EMS Program. Potential measures that fit well into the program are shown in the diagram below.

Figure 2: Typical Efficiency Measures Adopted in the EMS Program

Scheduling

- Holiday scheduling
- Zonal scheduling
- Override control and tenant billing
- Night setup/setback
- Optimum start
- Optimum stop
- Morning warm-up/cool-down

Resets

- Supply air/discharge air temperature
- Hot deck and cold deck temperature
- Entering condenser water temperature
- Chilled water supply temperature
- VAV fan duct pressure and flow
- Chilled water pressure

Miscellaneous

- Simultaneous heating/cooling control
- Zone-based HVAC control
- Dual duck deck control
- Chiller staging
- Boiler control
- Building space pressure
- Variable speed drive control
- Heat recovery

Ventilation Control

- Carbon dioxide
- Occupancy sensors
- Supply air volume/OSA damper compensation routines
- Exhaust fans

Lockouts

- Boiler system
- Chiller system
- Direct expansion compressor cooling
- Resistance heat

Lighting

- Lighting sweep
- Occupancy sensors
- Daylight dimming
- Zonal lighting control

Air-Side Economizers

- Typical air-side
- Night ventilation purge

Energy Monitoring

- Whole building or end-use
- kWh or demand

Demand Control

- Demand limiting or load shedding
- Sequential startup of equipment
- Duty cycling

Source: Energy Management Systems A Practical Guide, O&M Best Practices Series, Portland Energy Conservation Inc.

B. Budgets & Goals

Budgets

In order to develop the 2009/2010 budgets, Public Service used the historical performance (costs and participation) of the program as a guide. For the EMS Program, rebates, consulting and labor drive the vast majority of the budget. The following is information pertaining to these specific drivers.

- Rebates – This is the largest program expense accounting for approximately 60% of costs. The budget for rebates is estimated by looking at historical data and then checking anticipated payouts per kW and kWh to check for reasonableness plus an additional amount in the event that Public Service runs special promotional incentives in 2009 or 2010.

- Third-party consulting – This expense is the second largest category and is primarily the assistance to conduct project analyses and M&V. Consulting expenses are expected to decrease, as a percentage of total costs, over time as Public Service uses internal labor to conduct more of the analysis work.
- Internal labor – EMS is a labor-intensive program due to the preapproval process and analysis component of the program. Labor is approximately 15 percent of the total cost of the program.

Goals

The estimated goals for the EMS Program are heavily dependent on the specific projects that come in. For the 2009/10 biennium, Public Service reviewed historical performance and those projects that are in the pipeline to get a sense of the number and magnitude of future projects. This information was translated into the goals provided here. Given the significant increase in goals for 2009 and 2010, additional time was spent reviewing the information for reasonableness.

Table 17: Energy Management Systems Program Budgets and Goals

Energy Management Systems	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$45,020	$1,329	$49,850	$1,329
Admin & Program Delivery	$324,314	$76,741	$413,762	$74,563
Ad, Promo, & Customer Ed.	$52,410	$7,225	$172,611	$6,931
Customer Incentives	$325,698	$43,400	$418,754	$43,400
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	$30,250	$3,426	$38,893	$3,426
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$777,692**	**$132,121**	**$1,093,870**	**$129,649**
Generator kW	47	N/A	62	N/A
Generator kWh	4,238,885	N/A	5,554,401	N/A
Annual Dth	N/A	6,286	N/A	6,286
Annual Dth/$M	N/A	47,579	N/A	48,486
Participants	29	14	38	14
Participation as % of Segment	0.018%	0.013%	0.024%	0.013%
Modified TRC Test Ratio	**2.31**	**1.69**	**2.27**	**1.68**

C. Application Process

The application process for the EMS Program is similar to the Custom Efficiency Program as energy management systems were initially covered through Custom. Applications must be signed by the customer but can be submitted by other participants including: building owners, contractors, architecture and engineering firms, energy services companies, equipment manufacturers and distributors, and project financing entities. Typically, the customer or a vendor selling to the customer identifies a project with energy efficiency opportunities and starts the application process. The general application steps and requirements are as follows:

6. Application Submission

Typically, the Public Service account manager works with a customer and their vendor to identify a project with energy efficiency opportunities and starts the application process. The application form is available from the account manager, Xcel Energy website or from the product manager. Applications must contain a well-defined scope of work with enough detail to allow Public Service's internal engineers to analyze the savings opportunities. Most applications include:

- General Building Information – Square footage, year built, building use type, and annual electric and gas use
- Types of Equipment In Use – Including lighting fans/air handling, cooling and heating, and each piece of equipments specifications and operating conditions.
- Process - Existing and new connected kW and operating hours; existing and new gas BTUh and full load hours
- Controls - Existing and new temperature setbacks and resets, outside air optimization, DDC conversions, variable air volume boxes

7. Application Review

The program manager receives the completed application from the account manager or Business Solutions Center (BSC) representative. The application is reviewed for completeness. This process is in conjunction with an energy engineer review prior to the information being officially submitted. Once the program manager and energy engineer feel all necessary information has been provided, the marketing assistant assigns a project number and enters the application into the tracking system.

8. Project Analysis

Analysis of the project begins with our outside consultant. The consultant will review the project information and enter pertinent data into a spreadsheet model to determine the projected energy savings, benefit-cost ratio (i.e., TRC) and payback. The model for energy management systems was developed originally in Minnesota and adapted for the differences in Colorado (e.g., different avoided costs, climate and other factors). The model is used to ensure consistency in analysis from one project to another. All calculations are based on approved ASHRAE methods or other similar industry standards.

Based on the modeled results, the consultant will approve or reject the project and forward the results to Public Service's internal engineering staff. The engineer reviews the consultant's work. Should an error be discovered, the internal engineer will document it and send the information back to the external consultant for reanalysis. If everything was analyzed correctly, the Public Service engineer will approve the analysis.

9. Project Acceptance or Rejection

Once Public Service's engineer has approved the analysis, a preapproval or rejection letter is sent to the customer. The preapproval letter provides critical information regarding the project, including: the project rebate amount, the project description and costs, and any conditions, which must be met to receive the rebate (e.g., measurement and verification). Should a project be rejected, a rejection letter is sent informing the customer their project will not be eligible and explaining why. A copy of the preapproval or rejection letter is also sent to the account manager for project tracking. All project information is then documented, including the application, specification sheets, proposals, and analysis, and stores it in the program files (both electronically and in hard copy).

10. Completion

The final step in the application process is verification that savings occurred. Payment of the rebate is dependent on verification of the results of the project. The customer first fills out the verification section of the application and provides invoices for the completed project. In rare instances, customers may submit American Institute of Architects project continuation sheets in lieu of invoices.

D. Marketing Objectives, Goals, & Strategy

Marketing Strategy

Marketing of the EMS Program is primarily conducted through account managers and their direct relationships with customers. In addition, the following are some strategies that will help meet program goals in 2009 and 2010.

<u>Use of Collateral</u>

Public Service has developed a wealth of marketing collateral for the EMS Program. This information is available in soft and hard copy format for customers, trade allies, and internal Public Service staff. Customers and trade allies can request hard copies of the material or they can access material on the Xcel Energy website. Internal staff involved with the program usually has hard copies available within their departments and can access material from the company's intranet site. The marketing material available includes:

- Program Brochure – The primary tool for sales staff that helps describe the program to customers and vendors. It provides examples of projects that may qualify, business reasons to participate and a summary of the procedures to follow.
- Program Application – The document that customers fill out to start the process of participation. The customer or vendor is asked to fill out several sections including information on the business location, account manager, applicable rates, project description, technical information related to proposed and existing equipment, equipment supplier and project verification upon completion.
- Project Worksheet – This tool is used to gather all of the necessary information about the project and the building. This tool should be filled out to the best of the account manager and vendor's ability to make the analysis process smoother.
- Payback Calculator – This tool is a simple way to calculate whether a project is a good, fair or poor project in terms of passing payback and getting approved.

Improve Vendor Communications
Public Service will continue to communicate via email to all energy management system vendors. The email will reintroduce the program and remind vendors that the program exists and how they can take advantage of it with their customers. Communications will also include links to tools that will help with project analysis.

Other efforts to further strengthen relationships include:

- Informational kit—A CD with detailed program information on it. This disk is available to vendors through the trade relations manager.
- Energy Exchange- a quarterly email newsletter that goes out to all vendors who have registered to be part of our trade ally network.
- Training Programs—Public Service has also held program training for vendors. That was done when the program was launched. Public Service will hold future program training as it is deemed necessary.

Target Market
All electric commercial and industrial customers within Public Service's service area are eligible to participate. The bulk of energy management systems are installed in commercial facilities (office buildings, schools). Due to the complexity of the analysis process, it is unlikely small customers will have a high participation rate. The programs focus will be on the larger managed accounts in Colorado. Approximately 80% of these customers are concentrated within the Denver metro area, which will enable us to focus any marketing campaigns on the Front Range. Additional information on target markets includes:

Primary Market
The primary target is a large business customer that has some or all of the following characteristics:
- Demand of 500+ kW
- Operate within energy intensive industries (e.g. food processing, mining)
- Own facilities with large cooling or refrigeration needs
- Are energy aware and have longer planning project lead times

Secondary Market
The secondary target is a small business customer that has these characteristics:

- Demand of 100 kW to 500 kW
- Have limited internal resources to purchase, install and finance projects
- Have limited technical expertise

The program is also marketed to our trade allies, which primarily consists of:

- Manufacturers of equipment
- Installers
- Design engineers, architects and electricians

E. Program-Specific Policies

Much like the Custom Efficiency Program, EMS projects require preapproval before any equipment is purchased or installed, and must have a TRC ratio equal to or greater than one, and have a payback between one and 10 years within our analysis. Preapproval must occur prior to purchase and installation of the equipment, and the rebate cannot exceed 50 percent of the incremental costs. Generally, any energy management system project should have a minimum of 10 kW or 100,000 kWh of savings as projects with less than these predicted energy savings levels typically do not pass the tests. The information pertaining to minimum requirements is included on the application.

F. Stakeholder Involvement

Customers, trade allies, and other stakeholders are currently engaged at the specific project level. Feedback is garnered individually from each participant and once a trend develops (positive or negative), Public Service makes a change to the program design. If it is a small change, it is then discussed internally and possibly with a few key trade allies and, if deemed acceptable, implemented. A larger change would possibly involve review by the program's external technical resources or other third-party consultant.

G. Rebate Levels

The Energy Management Systems Program is designed to offer customers rebates for installing energy management systems that control and reduce a building's energy usage. The program separately rebates on-peak electric savings, off-peak electric savings, and natural gas savings. Measures qualifying for the on-peak electric reduction rebate must reduce demand during the on-peak period (8 a.m. to 6 p.m. Monday through Friday) and specifically impact the company's system coincident peak during the hours of 2 p.m. to 6 p.m. June 1st through September 30th (holidays excluded). These measures receive a rebate of up to $400 per kW saved. Measures qualifying for an off-peak rebate provide savings between 6 p.m. and 8 a.m. Monday through Friday and all day Saturday, Sunday, and holidays. Off-peak savings qualify for a rebate of $0.08 per kWh saved. Natural gas rebates are provided up to $7 per Dth.

H. Evaluation, Measurement & Verification Plan

All rebate applications will be audited with a two-step process. On the front-end, as rebates are received, all critical customer information, equipment eligibility and proper rebates amounts are reviewed, validated, and corrected if inaccurate. The second step takes place prior to the rebate being issued where Rebate Operations audits 100% of the rebate applications to ensure that the information from the form was entered correctly into the tracking database. The second step includes ongoing verification.

The M&V process for custom measures is detailed in the M&V section of the Indirect Segment of this Plan.

I. Technical Assumptions

Public Service also estimated a net-to-gross factor to adjust the gross savings estimates for free riders and free-drivers. The estimate for EMS electric is 0.87. This is based on a third-party consultant review of net-to-gross factors in programs considered best practices. Additionally, the program screening criteria justify changing the net-to-gross ratio from 2007 values. EMS projects must be preapproved before equipment is ordered or purchased. Only projects which have a TRC greater than 1.0 and meet simple payback criteria of between one and 10 years qualify for an EMS incentive. These screening criteria justify raising the net-to-gross ratio. The EMS gas ratio is higher at 93%. This is the first exposure of gas energy conservation measures to the market and gas energy conservation measures are more difficult to market and install, thus justifying the higher net-to-gross estimate. Also, there is less implementation of EMS and advanced controls in gas systems because of higher costs and longer paybacks. The lower cost/benefit for gas EMS and controls are due to the higher cost of measuring flows (instrumentation), and for the generally smaller energy savings from gas heating systems in most of Colorado.

The general technical assumptions used in the forecasted benefit cost analysis are established for an average EMS project. The data supporting the average is derived from EMS projects completed in Colorado through mid-2007. Electric end-use projects for this program were calculated using 8,197 operating hours and are not connected to gas projects. Additionally, there is a small amount of real kW for cooling savings incorporated into the analysis. For gas projects, gas savings estimates are derived from data available for 2006 projects. Incremental costs for an energy management system are determined to be zero since a customer is adding a new system or new system components.

➢ Furnace Efficiency Program

A. Description

The Furnace Efficiency Program will encourage business natural gas customers to purchase energy efficient furnaces. The program will offer prescriptive rebates in two tiers, available for new construction and retrofit situations. The program is modeled after Xcel Energy's existing Heating System Rebate Program in Minnesota.

Eligibility requirements for Colorado participation include having a business natural gas account with Public Service. The program is applicable only for the purchase of qualifying new furnaces installed in new or replacement applications. Furnaces must have a minimum efficiency of 92% Annual Fuel Utilization Efficiency ("AFUE"), in line with ENERGY STAR. Furnaces of 94% AFUE or higher efficiency receive a larger rebate.

This program will be offered to Residential natural gas customers as the Heating System Rebate program using the same two-tiered rebate structure.

B. Budgets & Goals

Budgets

Budgets for the Furnace Efficiency Program were determined based on historical cost and participation data from Xcel Energy's Minnesota furnace program. In the Furnace Efficiency Program, rebates, labor, and promotions drive most of the budget. The following was used to identify these specific drivers.

- Rebates: Developed using estimated participation and average rebate per participant as part of the technical assumptions.
- Labor Charges: determined by estimating the number of full-time employees needed to manage the program and execute the marketing strategy and rebate process.
- Promotions: The estimated promotional budget anticipates several customer and trade communications during the year and a contribution to the general conservation advertising campaign.

Goals

Goals for the Furnace Efficiency Program were developed based on the historical performance of a similar program in Xcel Energy's Minnesota service territory.

Table 18: Furnace Efficiency Program Budgets and Goals

Furnace Efficiency	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	N/A	$10,257	N/A	$15,687
Admin & Program Delivery	N/A	$15,859	N/A	$16,222
Ad, Promo, & Customer Ed.	N/A	$4,750	N/A	$4,750
Customer Incentives	N/A	$8,480	N/A	$8,480
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	N/A	$5,000	N/A	$5,000
Miscellaneous	N/A	N/A	N/A	N/A
Total	**N/A**	**$44,346**	**N/A**	**$50,139**
Generator kW	N/A	N/A	N/A	N/A
Generator kWh	N/A	N/A	N/A	N/A
Annual Dth	N/A	4,204	N/A	4,204
Annual Dth/$M	N/A	94,803	N/A	83,850
Participants	N/A	50	N/A	50
Participation as % of Segment	N/A	0.046%	N/A	0.046%
Modified TRC Test Ratio	**N/A**	**4.25**	**N/A**	**4.02**

C. Application Process

Customers will learn of the Furnace Efficiency Program and its benefits through newsletters, direct mail, the trade, and Public Service's account managers and Business Solutions Center representatives or the Company's other DSM programs, including Recommissioning and Energy Analysis. The Furnace Efficiency Program will follow the same application process as the existing prescriptive rebate programs. Applications for the program will be available both on Xcel Energy's website and from trade allies. Participants may submit their application online or via the call center. Customers must apply for rebates within twelve months of purchase and installation. Participants are required to complete an application and provide an invoice as proof of purchase.

D. Marketing Objectives, Goals, & Strategy

The Furnace Efficiency Program marketing strategy is to create a base level of knowledge in the marketplace through newsletters and direct mail to customers and trade allies. The program will take advantage of the existing Energy Solutions newsletter and co-op direct mail with other electric and natural gas communications to inform and educate customers while managing costs. These tactics will make customers aware of the key benefits of energy efficiency and its applicability to heating systems. The program will create fact sheets from ENERGY STAR and trade information as well as rebate applications for the customers and trade to evaluate rebates with respect to the decision to purchase. In addition, Public Service's account managers and Business Solutions Center representatives will educate customers on energy efficiency, evaluating rebate potential, and the rebate application process. The trade can find similar assistance through the Trade Relations Manager. The target market for this program is small business commercial customers in Public Service's gas territory.

E. Program-Specific Policies

Installed equipment must match the Gas Appliance Manufacturers Association (GAMA) specifications and be certifiable via the online GAMA site.

F. Stakeholder Involvement

The stakeholders for the Furnace Efficiency Program include the Governor's Energy Office, heating equipment vendors and installation contractors, and potential customers. Equipment vendors were contacted to give input on typical furnace sizing and pricing. Public Service met with the Governor's Energy Office staff to discuss programs filed by the utility in the state of Colorado and recommendations from that meeting were considered in the development of this program. The Company followed ENERGY STAR guidelines and policies on energy efficient products to ensure that only quality products are rebated. In the future, Public Service will conduct surveys of past participants and contractors to allow them the opportunity to provide feedback about their experiences with the program. The Trade Relations manager will play a key role in obtaining feedback from the trade to continually improve the program.

G. Rebate Levels

Rebates offered through the Furnace Efficiency Program will be consistent with those offered through the Heating Systems Rebate Program in the Residential customer segment. The minimum efficiency requirements for participating furnaces align with the ENERGY STAR guidelines. Customers may receive a rebate of $80 for purchase of a 92% AFUE and $120 for purchase of a 94% AFUE.

The best information available presently on incremental costs is from the California Database for Energy Efficient Resources (DEER). As the Company gets more specific data on product costs in Colorado and monitors customer response to the program, it will increase the rebate amount if warranted.

H. Evaluation, Measurement & Verification Plan

All rebate applications will be audited with a two-step process. On the front-end, as rebates are received, all critical customer information, equipment eligibility and proper rebates amounts are reviewed, validated, and corrected if inaccurate. The second step takes place prior to the rebate being issued where Rebate Operations audits 100% of the rebate applications to ensure that the information from the form was entered correctly into the tracking database. The second step includes ongoing verification.

The M&V process for prescriptive measures is detailed in the M&V section of the Indirect Segment of this Plan. The savings factors that will be verified for the Furnace Efficiency Program are detailed in the Deemed Savings Technical Assumptions section.

I. Technical Assumptions

Public Service has estimated the net-to-gross ratio for the Furnace Efficiency and Heating Systems Rebate Programs to be 77%, and based on the Summit Blue 2006 Midwest Residential Market Assessment and DSM Potential Study. It is reasonable for the net-to-gross ratio to be the same for both programs because small business and residential customers tend to have similar responses to energy efficiency programs.

The average furnace size of 90,000 BTU/hr and 93% efficiency for the high-efficiency furnace used for the forecasted technical analysis is taken from actual rebates distributed for the 2007 program in Minnesota. The average incremental cost is based on the California DEER database of $9.71 per 1,000 Btu/h. The annual operating hours are based on the 2005 ASHRAE Handbook Fundamentals Chapter 32; page 22, Table 7 Sample Annual Bin Data for Denver, Colorado.

The Company assumes that the typical furnace is oversized by 15% thus making the equivalent full-load operating hours equal to 2,864. Further, the Company assumed that space heating comes on at 62.5° Fahrenheit and that furnace load is linear with outside air temperature between 62.5° F and -2.5° F.

➢ Lighting Efficiency Program

A. Description

The Lighting Efficiency Program offers rebates to customers who purchase and install qualifying energy-efficient lighting products in existing or new construction buildings. Rebates are offered to encourage customers to purchase energy-efficient lighting by lowering the up-front premium costs associated with this equipment. This program is available to commercial and industrial customers in Public Service's electric service territory.

The Lighting Efficiency Program incorporates several features designed to influence decision-makers to choose the higher efficiency options. These features include application forms with full instructions to make it easy for the customer and/or vendor to apply for the rebates, and additional resources such as feature sheets, brochures, and web pages to help explain the advantages of efficient lighting sources.

For businesses, the cost of lighting is one of the main components of energy bills. Installing energy efficient lighting or reducing the number of lights needed, can significantly lower energy bills. The main goals of energy efficient lighting is to ensure good visibility for the task required, increase productivity and safety for employees, provide an attractive and comfortable work environment, and reduce operating and maintenance costs.

There are four ways customers can lower their lighting costs and earn rebates:

<u>Retrofit rebates (prescriptive)</u>
Rebates are available for existing facilities of any size to help offset the cost of installing new equipment that is more energy efficiency than their current lighting systems. Rebates are based on a one-for-one replacement of existing fixtures. Situations where a lighting retrofit can be beneficial are when employees are complaining of comfort issues, such as eyestrain from overlit conditions or where high energy bills are a concern.

A common retrofit application is replacing an existing fluorescent T12 system in a typical office space with more efficient T8 fluorescent lamps and a high-efficiency electronic ballast. In some instances, the number of lamps installed per fixture can be reduced, while still providing ample light levels. This yields significant energy savings. In warehouse buildings, or spaces with high ceilings, replacing a High Intensity Discharge lighting (HID) system with a more efficient fluorescent option is a typical retrofit project. Replacing HID lamps such as mercury vapor, high-pressure sodium and metal halide fixtures with high-bay fluorescent options can reduce energy costs and improve light levels. In addition, installing fluorescent T5 systems, compact fluorescent bulbs, and several other technologies can receive a rebate when replacing less efficient systems.

<u>New Construction rebates (prescriptive)</u>
Rebates are available for new facilities of any size as well as existing facilities that are going through a major renovation. There are several lighting options available to building owners and architects. Influencing better energy efficient lighting options in the first place is the goal of the

building. Fluorescent high-bay fixtures and low-wattage lamps are examples of the technologies rebated for new construction facilities.

Custom Lighting
Energy saving lighting projects that do not fit into the prescriptive programs above will be reviewed through the custom program. Preapproval is required before equipment purchase and installation. The examples of projects that would be reviewed through the Custom Efficiency program are LED light sources other than LED exit signs, retrofit situations where it is not a one-for-one replacement of the existing fixtures, and daylighting.

Lighting Redesign
Lighting redesign offers rebates for studies as well as for the implementation of energy saving opportunities. Studies must be performed by a lighting professional with one of the following credentials: Lighting Certified professional (LC), Certified Lighting Efficiency Professional (CLEP), or membership with International Association of Lighting Designers (IALD). Customers may select a lighting professional of their choice to perform the study so long as the professional holds one of the qualifications listed above. For customer reference, Public Service also provides on our website a list of qualified lighting professionals who have agreed to participate in the Lighting Efficiency Program.

The Colorado program was patterned after the Lighting Efficiency Program in the Minnesota territory, which has operated since the mid 1980's. The Minnesota program recently received Exemplary Honors for best practices from the American Council for an Energy-Efficient Economy (ACEEE) for using proven approaches and providing consistent, reliable and cost-effective savings[9]. In 2003, the Minnesota program received Honorable Mention for best practices from ACEEE[10]. Best practices were identified on four major program components. The first is program theory and design. Secondly, program management, including project management, reporting and tracking, quality control and verification. Thirdly, program implementation such as the participation process, marketing and outreach strategies and finally, program evaluation.

B. Budgets & Goals

Budgets
Once goals were established, the budget process is generally the same for Lighting Efficiency as with the other DSM programs. Historical cost and participation information is tracked and analyzed to project budgets two years in advance. Given the increase in goals for 2009 and 2010, additional time was spent reviewing the information for reasonableness. Experience from Minnesota programs is used as a checkpoint.

For the Lighting Efficiency Program, rebates, labor and promotional expenses drive the majority of the budget. The following was used to identify these specific drivers.

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[9] Compendium of Champions: Chronicling Exemplary Energy Efficiency Programs from Across the U.S., February 2008. Report Number U081.
[10] America's Best: Profiles of America's Leading Energy Efficiency Programs, March 2003. Report Number U032.

- Rebates: The majority of the Lighting Efficiency budget is dedicated to rebates, so the energy savings goal is the main contributor to the overall Lighting Efficiency budget. The rebate budget is an average of all the rebate amounts by lighting technology (or end-use), which has been tracked in previous years.
- Labor Charges: determined by estimating the number of full-time employees needed to manage the program and execute the marketing strategy and rebate process.
- Marketing and Advertising: cross-promotional vehicles used to reach the business customers including print, web, direct mail, email, radio and television marketing efforts.

Goals

The Lighting Efficiency Program goals are rolled-up into the total goal for the business portfolio. Therefore, the initial process of goal setting begins with our management team. They review the entire portfolio's goal and from that allocate individual program goals along with input from the product portfolio manager. Individual program goals, including the Lighting Efficiency goals, are based on the achievements of past years and the extensive experience from the Minnesota Lighting Efficiency Program. The Lighting Efficiency Program historically is one of the largest contributors to Public Service's DSM portfolio savings and therefore is allocated a large percentage of the Annual goal.

Table 19: Lighting Efficiency Program Budgets and Goals

Lighting Efficiency	**2009 Electric Goal**	**2009 Gas Goal**	**2010 Electric Goal**	**2010 Gas Goal**
Budget				
Planning & Design	$4,704	N/A	$4,869	N/A
Admin & Program Delivery	$635,331	N/A	$711,980	N/A
Ad, Promo, & Customer Ed.	$170,383	N/A	$413,500	N/A
Customer Incentives	$3,402,161	N/A	$3,690,544	N/A
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	$205,440	N/A	$245,820	N/A
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$4,418,019**	**N/A**	**$5,066,713**	**N/A**
Generator kW	7,989	N/A	8,759	N/A
Generator kWh	31,856,916	N/A	35,890,773	N/A
Annual Dth	N/A	N/A	N/A	N/A
Annual Dth/$M	N/A	N/A	N/A	N/A
Participants	632	N/A	678	N/A
Participation as % of Segment	0.392%	N/A	0.424%	N/A
Modified TRC Test Ratio	**3.13**	**N/A**	**3.24**	**N/A**

C. Application Process

Customers may hear of the Lighting Efficiency Program through several channels, including the Xcel Energy website, direct mail, email promotions or through the lighting trade. Company account managers work directly with our largest customers to help them identify energy saving opportunities in lighting and our Business Solutions Center is available for all business customers, particularly the small business customers who need information on our rebate programs.

Retrofit and New Construction Applications
The application process for the prescriptive retrofit and new construction programs is similar to our other prescriptive programs. Customers may apply for rebates by completing the application and providing a detailed invoice for the newly installed equipment. The customers may submit for a rebate after the equipment has been purchased and installed. The replacement of fixtures for retrofit situations must be a one-for-one replacement that will result in energy savings. If the retrofit is not a one-for-one replacement but still results in energy savings, customers may apply for preapproval through the Custom Efficiency Program. The equipment must be new and meet all the qualifications detailed on the application. After the customer has installed the equipment, the application and invoice must be submitted to Public Service within twelve months of the invoice date. Once the paperwork is completed and submitted, rebate checks will be mailed to the customer as indicated on the application within six to eight weeks.

Lighting Redesign
The lighting redesign study requires preapproval. Once the customer has identified a qualified lighting professional to perform the study, they can complete the Lighting Redesign Preapproval application and submit it to Public Service along with a brief proposal from the lighting professional. The proposal includes a description of the facility, the current lighting system in the facility, the customer's concerns or issues with their current lighting system, and what alternatives the lighting professional recommends. During this process, Public Service's internal engineering staff is available to the lighting professional and customer to work alongside and assist with energy calculations as needed.

Public Service will review the preapproval application and proposal for the estimated energy saving potential. If approved, the Company will send a preapproval letter to the customer and the lighting professional approving the study detailing the amount of the study Public Service will fund.

After the lighting professional completes the study, they will prepare a report that identifies the energy saving opportunities in the facility. The purpose of the report is to provide the customer with a business case justification to implement the energy efficient lighting redesign opportunities. The report must be submitted to Public Service within three months after the study is completed to ensure the results are presented in a timely manner to the customer. If they are unable to meet the three-month window, they can request an extension. The report should include the following: the customer's information, an executive summary, the study summary (project costs, capital costs, energy reduction (in kilowatts), kilowatt hours, footcandle levels and rebate amounts where applicable), the project description, the project's non-energy impacts, all calculations (energy savings, payback) and implementation recommendations.

Once the report is completed, the lighting professional will organize a meeting with the customer and the Public Service account manager to present their study findings. At this point, the customer may choose to implement the recommended energy saving opportunities at their discretion.

D. Marketing Objectives, Goals, & Strategy

Marketing Strategy

The Lighting Efficiency marketing strategy is comprised of several vehicles. The target market is electric commercial customers in the Colorado Public Service territory. The marketing strategy is directly linked to the type of customer we are trying to target. For lighting, there are two main segments of customers, large and small business customers. Each group has their own needs and requires different marketing approaches. The majority of our savings will come from the large customers. Office space, retail, schools and universities, warehouse space, and healthcare facilities are a few segments that comprise the large customer base in Colorado. Marketing to the large customers is primarily done through account managers.

Public Service's relationship with the lighting trade is another key to reaching the larger customer base and the Company intends to strengthen its relationship with them in order to make more lighting professionals aware of the program. Several vehicles are used to reach them, including:

- The Trade Advisory board, which is described in the Stakeholder Involvement Section below;
- Trade Website. Including applications, specific brochures and informational pieces directed toward the trade and updates on program offerings.
- Energy Exchange: A quarterly email that is sent to the trade discussing energy efficiency lighting applications, case studies, program changes, and other pertinent topics.
- Trainings and events as needed. Examples include the launch of the lighting redesign program and the Public Service Efficiency Expo held in February 2008 for both customers and trade allies.

Marketing to the small business customers is primarily through direct mail, email and the Business Solutions Center. Historically, they have been a harder market to reach. Several vehicles have been tried in the past, such as holding a small business seminar in 2007, which resulted in little success due to low attendance. The Lighting Efficiency Program will continue to reach out to small business customers with direct marketing approaches as well as offer another distinct program directed specifically toward their unique needs.

In addition, several collateral pieces are available on the Xcel Energy website and we will continue to improve upon them. These pieces are geared toward both large and small business customers as well as the trade. The websites offers information on lighting technologies, case studies of successful lighting upgrades, and external sources highlighting reasons to pursue lighting upgrades or implement efficient lighting sources.

- Prescriptive Rebate Applications – Applications are designed to include all program requirements, rebate levels and additional information to help complete the form and attach needed documentation quickly and easily.
- Lighting Efficiency Program Brochure – This is available on the Public Service web page and is used by the account managers to describe the program and discuss reasons to upgrade to more efficient lighting and identify projects in facilities.
- Resource Documents – The Lighting Efficiency web page links to several documents on energy-efficient lighting technologies written by an outside organization such as E-Source further identify lighting efficiency sources and opportunities.
- Managing Costs by Segment Documents – Documents identifying specific energy savings ideas for key segments, such as grocery stores, office buildings, schools and universities.

<u>Lessons Learned and Critical Success Factors</u>
A lesson learned from the past couple years is that there is market saturation of T12 to T8 retrofits. According to the Trade Advisory Board, T12 to T8 retrofits for the large commercial customers are mostly exhausted. However, the small business segment has for the most part been untapped. This discrepancy is being addressed by strengthening our marketing efforts for that customer group.

Another lesson learned is to keep up with the changing lighting technology. This includes adding measures to the prescriptive programs as they become readily available and eliminating obsolete technologies. Utilizing the expertise of the Trade Advisory board and identifying similar projects that have passed through the Custom Efficiency Program is typically how new emerging technologies have been identified.

Engaging the trade is critical to the success of the program. Establishing the Trade Advisory board has led to implementing several improvements to the program. The recommendations from the board are fed into the Product Development process and have resulted in several new offerings, including the lighting redesign program launched in the spring of 2008, the Parking Garage Lighting application, and the inclusion of delamping in the prescriptive retrofit application.

Finally, the rebate levels for the prescriptive programs have been too low to continue to influence customers to choose the more energy efficient lighting options. The Colorado rebate levels for several prescriptive measures have been lower than what is currently offered in Minnesota and other utilities across the country. As a whole, the prescriptive rebate levels for 2009 are higher than what is currently offered in 2008.

E. Program-Specific Policies

The Lighting Efficiency Program has a number of program-specific policies, as follows:

- All equipment rebated through the Lighting Efficiency Program must be new and meet all program rules and requirements and the application must be submitted within twelve months of the invoice date.
- In cases where the customer is unable to obtain an equipment invoice, Public Service will send an account manager to complete an on-site field verification to confirm that equipment was installed as stated on the application.
- Lighting redesign studies must be submitted no later than three months after the study is completed.
- The parking garage lighting retrofit rebate application is available for prescriptive projects to replace high intensity discharge technologies (high-pressure sodium and metal halide) with more efficient fluorescent options.

F. Stakeholder Involvement

Stakeholder involvement in the Lighting Efficiency Program comes through a Lighting Advisory Board and the semiannual DSM Roundtable meetings. The Lighting Advisory Board was formed as a collaborative effort between fourteen key lighting professionals and Public Service's Lighting Efficiency Program management team. The objectives of the board are to identify gaps in our Light Efficiency Program offerings, suggest areas of improvement, and to offer a forum for open discussion of lighting topics. Several recommendations from the board have been addressed through Public Service's product development process and incorporated into the Lighting Efficiency Program, including the recent product launch of lighting redesign, parking garage lighting, and high-efficiency ballasts. The board will continue to meet on a quarterly basis or as long as needed.

G. Rebate Levels

The Lighting Efficiency Program offers rebates through the retrofit and new construction prescriptive components, the lighting redesign component, and through the Custom Efficiency Program. (See Custom Efficiency Program for rebate details.)

The rebate levels in 2009 are increased over what was offered in previous years. These 2009 rebates are slightly higher in most instances than what is currently offered in Minnesota.

Table 20a: Lighting Efficiency Retrofit Rebates

Equipment Type	Rebate Amount
Fluorescent T8 lamps with electronic ballasts	\$10-\$18
Low-wattage 4-Foot fluorescent T8 lamp (28W or less)	\$1.00 per lamp in addition to the standard rebate
High-efficiency electronic ballasts	\$1.50 per ballast in addition to the standard rebate
Fluorescent Super T8 lamps with electronic ballasts	\$13-\$22
Fluorescent T5 lamps with electronic ballasts	\$13
High-bay fluorescent T8, T5HO, T8VHO with various options	\$85-\$210
Compact fluorescent fixtures (CFL)	\$3-\$30
Industrial multi-CFL fixtures	\$45
Metal halide & high pressure sodium fixtures	\$30-\$45
Pulse start metal halide fixtures	\$25-\$140
Ceramic metal halide fixtures	\$25-\$75
LED exit signs	\$15
Delamping and T8 Optimization	\$12-\$22
Occupancy Sensors and Photocells	\$30-\$50
Custom Efficiency	Custom Efficiency rebate amount is based on energy savings. See Custom Efficiency Program for details.

Table 20b: Lighting Efficiency New Construction Rebates

Equipment Type	Rebate Amount
Low-wattage 4-Foot fluorescent T8 lamp (28W or less)	\$1 per lamp in addition to the standard rebate
High-bay fluorescent T8s, T5HO and T8VHO with various options	\$12-\$50
Compact fluorescent fixtures (CFL)	\$1.50-\$8
Pulse start metal halide fixtures	\$8-\$18
Ceramic metal halide fixtures	\$12-\$25
Custom Efficiency	Custom Efficiency rebate amount is based on energy savings. See Custom Efficiency Program for details.

The lighting redesign component offers study rebates that cover up to 50% of the cost of the lighting redesign study, not to exceed \$15,000. Rebates for implementation of identified equipment may reach \$400 per kW.

H. Evaluation, Measurement, & Verification Plan

Measurement & Verification

All rebate applications will be audited with a two-step process. On the front-end, as rebates are received, all critical customer information, equipment eligibility and proper rebates amounts are reviewed, validated, and corrected if inaccurate. The second step takes place prior to the rebate being issued where Rebate Operations audits 100% of the rebate applications to ensure that the information from the form was entered correctly into the tracking database. The second step includes ongoing verification and is split between prescriptive and custom measures.

The M&V process for prescriptive measures is detailed in the M&V section of the Indirect Segment of this Plan. The savings factors that will be verified for the Lighting Efficiency Program are detailed in the Deemed Savings Technical Assumptions section. The M&V process for custom programs is detailed in the M&V section of the Indirect Segment of this Plan. A comprehensive Lighting Efficiency process and impact evaluation is underway for 2008. An external vendor will conduct interviews of both past participating and non-participating customers and contractors.

I. Technical Assumptions

The net-to-gross factor for the Lighting Efficiency program is 96%. This ratio is derived from the National Energy Efficiency Best Practices Study[11] (of which Xcel Energy's Minnesota Lighting Efficiency Program was one).

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11 National Energy Efficiency Best Practices Study, Volume NR1-Non Residential Lighting Best Practices Report. Quantum Consulting, Inc. December 2004

➢ Motor and Drive Efficiency Program

A. Description

Public Service's Motor and Drive Efficiency Program is designed to reduce the barriers that prevent customers from purchasing high efficiency motors and variable frequency drives. To overcome these barriers, Public Service offers rebates to customers who install National Electrical Manufacturers Association ("NEMA") Premium Efficiency® motors and variable frequency drives in existing and new construction facilities. NEMA premium motors allow customers to: optimize motor systems efficiency, reduce electrical power consumption and costs, and improve system reliability. Properly designed variable frequency drive applications will match the motor speed to the workload providing overall machine operating efficiency, while saving energy and reducing maintenance costs.

The benefits of installing premium efficiency motors and VFDs include:

- Reduced downtime that can be caused by motor failure;
- Increased reliability since premium motors are manufactured with high quality materials and standards, which reduce internal losses and heat;
- Longer warranties than standard motors;
- Longer product lifetimes, allowing customers to save on capital expenses; and
- Increased productivity due to reduced maintenance activities and fewer repairs.

Public Service rebates cover both prescriptive and custom motor and drive purchases, which are used throughout their facilities for pumps (water), heating and cooling (fans and air handlers), process, and other applications. Prescriptive rebates are available for motors that meet or exceed the NEMA premium efficiency standards and drives up to 200 hp. Custom rebates are available for other non-prescriptive eligible equipment: replacement of oversized motors with properly sized motors and/or implementation of proposed overall process improvement resulting in energy and demand savings due to new motors.

Xcel Energy has offered a Motor Efficiency Program in Minnesota for 12 years and in Colorado for two years. The Colorado program has exceeded expectations in both of its years of operation. The Company's experience with these programs was used to help design the program proposed here.

B. Budgets & Goals

<u>Budgets</u>

For the Motor and Drive Efficiency Program, rebates, labor and marketing/advertising drive most of the budget. Public Service reviewed historical cost and participation information for the past two years for guidance on expected program performance. The Company also held discussions with external consultants and local stakeholders to determine likely expenditures and market equipment cost. Xcel Energy's experience with its Minnesota Motor Efficiency Program was all used as a guide.

Goals
The individual program goals are based on empirical research from primary and secondary research sources available like: the Motor Decision Matters workgroup, 2007 Minnesota Motor Efficiency Program Process and Impact Evaluation, Best Practices - Non-Residential Large Comprehensive Programs and the Electric Apparatus Service Association State of the Industry Report, proxy values from our historical program performance, and analysis in other state jurisdictions, adjusted as warranted to meet the local conditions.

Table 21: Motor & Drive Efficiency Program Budget and Goals

Motor & Drive Efficiency	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$9,800	N/A	$10,143	N/A
Admin & Program Delivery	$273,207	N/A	$278,224	N/A
Ad, Promo, & Customer Ed.	$88,000	N/A	$321,000	N/A
Customer Incentives	$2,084,986	N/A	$2,085,100	N/A
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	$126,088	N/A	$138,011	N/A
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$2,582,081**	**N/A**	**$2,832,479**	**N/A**
Generator kW	3,681	N/A	3,681	N/A
Generator kWh	20,711,411	N/A	20,711,411	N/A
Annual Dth	N/A	N/A	N/A	N/A
Annual Dth/$M	N/A	N/A	N/A	N/A
Participants	1,100	N/A	1,100	N/A
Participation as % of Segment	0.687%	N/A	0.687%	N/A
Modified TRC Test Ratio	**4.96**	**N/A**	**4.93**	**N/A**

C. Application Process

Customers become aware of the Motor and Drive Efficiency Program through the Xcel Energy website, direct and email promotions, and Public Service's internal sales force, end-use equipment trade allies, and energy services companies. The rebate applications are available to download via the Internet, from our sales force, or from our participating vendors. Whether a prescriptive or custom option is pursued, completed applications (only on installed equipment) and the supporting documentation (invoice and equipment specifications) is reviewed. Customers, who purchase motors in batches for current needs and future inventory for emergency situations, are served through our program. The inventoried equipment is recognized at the year it is installed and the claim filed, using the rebate offer terms and funding level at that time.

Custom equipment measures must receive pre-approval for their potential claim, and undergo engineer review and subsequent analysis to confirm viability and cost-effectiveness. Customers with successful projects will receive their rebate within six weeks. They may also reassign their rebate to their vendor.

D. Marketing Objectives, Goals, & Strategy

The Motor and Drive Efficiency Program plans to meet its energy savings goals using a variety of resources and communications paths. Although sales to the largest business customers typically require personal visits, Public Service also utilizes newsletters, customer events, direct mail, email communications, and awareness advertising to reach our business segment customers.

The Company participates in customer fairs, trade shows, and customer meetings, and works with trade organizations and service providers in order to raise customer awareness throughout the year in conjunction with other groups. There are generally three planned events each year--one customer fair and two trade group meetings, as well as ad-hoc functions when warranted.

To overcome market barriers, marketing materials specifically addressing the importance of planning for a motor failure, the need for taking inventory of existing equipment, and the need to develop an understanding for when to replace or rewind a particular motor were created based on insights of primary and secondary research regarding customer needs.

We also have collaborative efforts with the following organizations:

- Motor Decision Matters - Motor Decisions Matter^{SM} is a national public-awareness campaign sponsored by a consortium of motor manufacturers, motor service centers, trade associations, electric utilities and government agencies of which Public Service is a contributor. Within our program and other external links, we employ a best practices mentality and approach for planning and analyzing, software tools for motor management and how to guides.

- National Electrical Manufacturers Association – The member companies established premium energy efficiency motors thresholds to provide energy efficient products that meet the needs and applications of users and original equipment manufacturers based on a consensus definition of "premium efficiency" and use of the NEMA Premium® logo for premium products. NEMA Premium labeled electric motors will assist purchasers to optimize motor systems efficiency, reduce electrical power consumption and costs, and improve system reliability.

E. Program-Specific Policies

For custom installations, Public Service realizes that a pre-approved project is not always installed immediately for several reasons; therefore, customers have up to 12 months from the pre-approval date to file their claim. Projects that exceed this timeframe or have significant equipment deviations from the original preapproval, require reanalysis and approval. For prescriptive products, customers must submit their rebate application claim for motors and VFDs rebates within 24 months from the purchase date on the invoice. The Minnesota Motor and

Drive Efficiency Program was subject to a process and impact evaluation in 2007. The recent evaluation findings were used to make program adjustments for the Colorado program as applicable in 2007 and moving forward.

F. Stakeholder Involvement

Public Service's Motor and Drive Efficiency Program has been successful because of external support from trade allies and others who understand our program and assist us with customer support, education and awareness. Customers benefit from hearing a consistent message from a variety of sources. Input for program comes for our customers, sales representative, roundtable workgroups, primary and secondary research, and through discussions with other utilities. Comments are considered and implemented if and when appropriate.

G. Rebate Levels

The Motor and Drive Efficiency Program offers the following rebates for installing NEMA Premium efficiency motors and/or VFDs:

Table 22: Motor and Drive Efficiency Program Rebates

Description	Horsepower (hp)	Rebate Amount
New NEMA Premium motor application (due to new equipment installation or burnout replacement) Plan A Premium, and "Enhanced" NEMA Premium	1 – 500 hp	Variable $/hp depending on size which is demonstrated on our rebate application.
Operating Motor Replacement Premium (Plan B) and "Enhanced" NEMA Premium	1 – 500 hp	Variable $/hp depending on size which is demonstrated on our rebate application.
VFDs	1 hp – 200 hp	Variable $/hp depending on size which is demonstrated on our rebate application.
Custom Motors: All motors > 500 Drives	> 500 hp > 200 hp	Individually determined under the Custom Efficiency Program

Customers will continue to receive a rebate for new and non-operating replacement motors (Plan A), drives, and custom applications. New to this biennial plan is a rebate offer to customers who replace an existing, less efficient, operating motor with a NEMA Premium efficiency model. This "early retirement" effort aims to remove less efficient, functioning motors from the marketplace (Plan B). This component is identical to offers available for our Minnesota customers. Also, new is an "enhanced" rebate offer for motors (Plan A and B) that exceed the

NEMA Premium standards. Customer will be rewarded for buying "enhanced" products above even higher NEMA efficiency standards.

H. Evaluation, Measurement & Verification Plan

All rebate applications will be audited with a two-step process. On the front-end, as rebates are received, all critical customer information, equipment eligibility and proper rebates amounts are reviewed, validated, and corrected if inaccurate. The second step takes place prior to the rebate being issued where Rebate Operations audits 100% of the rebate applications to ensure that the information from the form was entered correctly into the tracking database. The second step includes ongoing verification and is split between prescriptive and custom measures.

The M&V process for prescriptive measures is detailed in the M&V section of the Indirect Segment of this Plan. The savings factors that will be verified for the Lighting Efficiency Program are detailed in the Deemed Savings Technical Assumptions section. The M&V process for custom measures is detailed in the M&V section of the Indirect Segment of this Plan.

I. Technical Assumptions

The forecasted technical assumptions for the New Motors (Plan A) & Operating Motors (Plan B) were derived from data obtained from the National Electrical Manufacturers Association, US Department of Energy MotorMaster+ software, Efficiency Vermont and other utilities, and historical program participation data for 2007. The NEMA Premium program standards are utilized for the high efficiency baseline for both programs. Plan A uses Energy Policy Act of 2005 standards as the low efficiency baseline. Plan B uses historical efficiency data for motors manufactured 15-20 years ago as the low efficiency baseline.

The forecasted technical assumptions for the Variable Frequency Drives or Adjustable Speed Drives ("ASD") are derived from data obtained from historical applications for ASDs in Colorado for 2007 and Minnesota 2007. Each application was custom analyzed for energy savings based on type of application, motor size, and profile of operational hours. The formulas for calculating energy savings were utilized to calculate the individual energy savings on a per-project basis. These individual analyses were stratified to eliminate applications that would not qualify for incentive, and develop the technical results for applications that would qualify for incentive. Only Fans and Pumps qualify for ASD rebates through this program.

The forecasted technical assumptions for Custom Motors were derived from historical completed project data for Custom Efficiency projects in Colorado and Minnesota in 2006 and 2007. A 2003 Northern States Power Company Custom Efficiency for Business Program Impact and Process Evaluation concluded:

> *Analyzed in aggregate, the on-site assessments were just over 3% higher for energy savings. When the analysis was completed for demand savings the on-site estimates were 1% higher than the tracking savings. This indicates that project implementation was doing a very good job of estimating the savings potential from an engineering perspective.*

The net-to-gross factor of 87% was extrapolated using Quantum Consulting Inc. Best Practices - Non-Residential Large Comprehensive Programs this value is warranted given anecdotal comments from both vendors and sales representatives about spill over (free-driver) The Quantum study was managed by Pacific Gas and Electric Company under the auspices of the California Public Utility Commission in association with the California Energy Commission, San Diego Gas and Electric, Southern California Edison, and Southern California Gas Company.

➤ New Construction Program

A. Description

The New Construction Program influences building owners, architects, and engineers to include energy-efficient systems and equipment in their design for new construction and/or major renovation projects. Since Public Service services building owners of different areas and size, the offering consists of two individual programs: Energy Design Assistance and Energy Efficient Buildings. Both programs are available to non-residential customers in Public Service's electric and natural gas service territory.

Energy Design Assistance
The Energy Design Assistance offering provides a source of energy expertise to encourage energy efficient building design and construction practices. As part of Public Service's Business New Construction portfolio, Energy Design Assistance offers design assistance in support of integrated design process by providing computer modeling of the planned design, funding to offset the cost of design time associated with the increased energy analysis, financial incentives to improve the cost effectiveness of a package of energy-efficient measures, and field verification to ensure that the strategies are installed per the design intent. The program is a free service to Public Service customers.

According to the *Best Practices Benchmarking for Energy Efficiency Programs*[12], it is crucial for new construction programs to begin in the early part of design and utilize the integrated design process. The report states that, "Integrated design adds value because cost-effective energy savings opportunities decline as the project progresses through the various design stages." The Energy Design Assistance program uses computer energy models and a well-established, collaborative method for exchanging information with the design professionals, contractors, developers and building owners in this integrated design process. Important information is provided at critical points in the design process about the value and application of strategies for reducing peak demand and energy use. By analyzing integrated systems in the beginning of the design process, customers can make a building significantly more efficient, more comfortable for the occupants and less costly to operate in the future.

In addition to technical assistance, Public Service provides financial incentives to building owners to improve the cost-effectiveness of energy-efficient materials and equipment. Incentives are paid only after a verification process is completed, which typically occurs within two months of building occupancy. Verification ensures the measures are installed as proposed and provides an added degree of confidence with associated savings.

Energy Design Assistance offers two tracks for customer involvement: (1) Basic and (2) Enhanced. The Basic track is for all Public Service customers interested in the opportunity to participate in a collaborative design process and identify energy savings opportunities using new technologies and energy methodology. The following requirements apply to the Basic track:

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[12]National Energy Efficiency Best Practices Study, Quantum Consulting Inc., Dec. 2004, pg. NR8-2

- Square footage: Greater than 50,000 square feet (new construction, major renovation or addition)
- Design phase: Schematic Design or early Design Development
- Energy Savings: 5% energy demand savings required to receive incentives

The Enhanced track is for Public Service customers interested in obtaining sustainable building certifications, such as the United States Green Building Council's Leadership in Energy and Environmental Design ("LEED®"). The Enhanced track allows for further analysis in daylighting and mechanical system changes. The following requirements apply to the Enhanced track:

- Square footage: Greater then 50,000 square feet (new construction, major renovation or addition.[13]
- Design phase: Pre-design or early Schematic Design
- Energy Savings: 16% energy cost savings in new buildings and 12% for existing buildings required to receive incentives
- Must be registered with the US Green Building Council for LEED certification

The Enhanced track is currently in final development; therefore, additional requirements may be included depending on input from architects and engineers in Colorado.

Public Service administers the program with help from outside energy design consultants who facilitate meetings with the design teams, including the owner, and complete energy modeling activities. Our energy consultants are a key contributor to Energy Design Assistance by identifying program candidates, facilitating the design process, and completing the energy models. While Public Service approves all models and reports, we rely heavily on the expertise these consultants bring to the table. A request for proposal is completed every three years to select these resources. A request for proposal was completed a year ago to identify our current contractor. This contract is in effect until June 2010.

Since 2006, the program has achieved 8 GWh in savings with fourteen completed projects. Acceptance into the Colorado market has exceeded Public Service's expectations with over seventy projects in the pipeline to be completed through the year 2012. We expect increased participation and therefore higher energy savings in future years. All segment types can participate in the Energy Design Assistance program; however, many of our projects fall in the sectors of office, schools, retail and healthcare due to the square footage requirements.

<u>Energy Efficient Buildings</u>
The Energy Efficient Buildings offering is intended to provide a simplified approach to optimizing energy efficiency options in new construction or major renovations. This component addresses the portion of the new construction market not suited for the full-blown energy modeling of the Energy Design Assistance offering. Projects are generally less then 50,000 square feet and past the schematic design stage of new construction.

[13] Smaller buildings, which anticipate high energy and demand savings, may be considered on a case-by-case basis.

Focusing on the needs of small building owners, the Energy Efficient Buildings offering provides a comprehensive list of typical energy efficiency measures that can be incorporated into the new building design, as well as the rebate amount available for each measure. Incentives are provided for heating and cooling, lighting, building envelope, electric motors and custom opportunities. Customers will receive a rebate tailored to their building after the project has been constructed.

National Industry Review
Public Service's Colorado Energy Design Assistance offering was developed based on a similar award-winning program in our Minnesota territory. The Minnesota Energy Design Assistance Program has been recognized by the American Council for an Energy Efficient Economy ("ACEEE") for its approach and use of best practices. Specifically, they said, "Energy Design Assistance is an exemplary program as recognized by ACEEE in its 2003 and 2007 national reviews. It has been and continues to be a model program." The European Council for an Energy Efficient Economy also recognized the Minnesota program as *"The Program Most Likely to Meet the Intent of the Kyoto Protocols in the Shortest Time"*. The Colorado program benefits from the lessons learned in the 15-year history of the Minnesota program.

B. Budgets & Goals

Budgets
Once goals were established, the budget process is generally the same for the New Construction Program as with the other DSM programs. Historical cost and participation information is tracked and analyzed to project budgets two years in advance. Given the increase in goals for 2009 and 2010, additional time was spent reviewing the information for reasonableness. It is important to note that the Energy Design Assistance offering goals include five projects to be completed from the Building Energy Modeling Pilot closed in July 2007.

For the New Construction Program, customer project modeling drives the budget, construction incentives, measurement and verification and promotional dollars. The following was used to identify these specific drivers:

- Consulting Charges: Much of the program delivery budget is associated with the cost of modeling specific customer projects. Modeling costs are estimated to be approximately $260 per kW saved for the basic track and $300 to $400 per kW saved for the enhanced track. Modeling costs are then split between the year modeling begins and the year in which the project will be completed due to final as-built modeling used in final rebate calculations. There are no consulting dollars allocated for the Energy Efficient Buildings offering.
- Incentives: Incentives are determined by establishing a dollar value per participant at the appropriate rebate level.
- Measurement and Verification: Measurement and verification is completed in two steps for the offering and described in the M&V Section of the Indirect Segment of this Plan. Cost estimates are based on construction document and site review and are analyzed on a per project basis. Estimates of verification costs are between $8,000 and $12,000 per project.

- Promotions, Advertising and Customer Education: Promoting the program through specific advertising campaigns, trade shows and lunch and learn opportunities is an important part of the Business New Construction offering and aids in shifting the new construction market towards higher efficiency. As such, historical data in both Minnesota and Colorado were used to determine the appropriate level needed for the biennial plan.

Goals

The Energy Design Assistance offering energy goals were estimated based on the average energy savings of participating buildings when compared to the usage of a baseline building. The baseline building is defined as a building compliant with the ASHRAE 90.1-2004 Energy Standard with addenda. This estimation was based primarily on a review of program performance for the past two and half years and longer-term experience with similar programs in Minnesota. Since the sales cycle for Energy Design Assistance is typically two to four years, from project initiation in the beginning of project design to the completion and occupancy of a physical building, goals are established by reviewing projects in the current pipeline and establishing a historical factor of additional projects that will begin in 2008.

The design of the Energy Efficient Buildings offering was based on a similar program in Minnesota, the Plan Review component of the Energy Design Assistance Program. Xcel Energy used its historical experience with the Minnesota program to develop goals for Colorado, recognizing that new buildings generally take one to two years from project initiation to completion and occupancy. The Minnesota program generally has between five to 20 participants per year. Since we are expected a slow ramp up for the program we have been conservative in our participation estimates for Colorado.

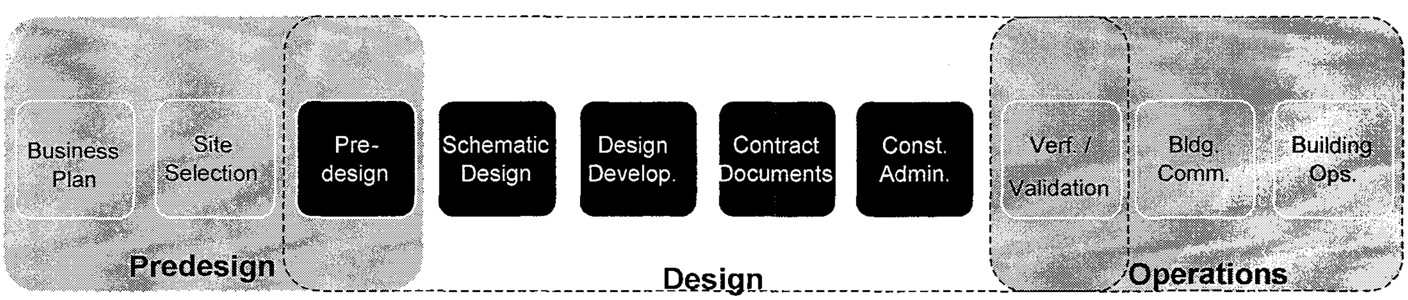
Table 23: New Construction Program Budgets and Goals

New Construction	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$4,981	$500	$4,981	$518
Admin & Program Delivery	$1,639,480	$62,961	$1,801,533	$65,578
Ad, Promo, & Customer Ed.	$172,864	$38,260	$474,008	$131,440
Customer Incentives	$1,579,400	$51,577	$2,249,796	$72,818
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	$575,196	$30,993	$783,672	$43,510
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$3,971,921**	**$184,291**	**$5,313,990**	**$313,864**
Generator kW	5,506	N/A	8,051	N/A
Generator kWh	20,784,026	N/A	30,410,718	N/A
Annual Dth	N/A	11,747	N/A	15,510
Annual Dth/$M	N/A	63,743	N/A	49,415
Participants	46	9	65	12
Participation as % of Segment	0.029%	0.008%	0.041%	0.011%
Modified TRC Test Ratio	**4.09**	**1.87**	**4.41**	**1.77**

C. Application Process

Energy Design Assistance
The application process for Energy Design Assistance is more involved than for prescriptive programs and follows the design schedule of a new construction project as outlined in the following diagram. The average time frame for project completion can range from two to four years depending on project schedules. Thus, projects beginning modeling in 2009 will likely be completed in 2011 or beyond.

Figure 3: Building Design Process



The application steps for the program are detailed below.

1. **Application Submittal:** Each project is evaluated by Public Service and our third-party consultants to ensure the project meets the eligibility requirements:

   Customers who are interested in participating in the program but whose projects are later in the design schedule are considered depending on their flexibility and timeline. Once approved to participate in the Energy Design Assistance offering, the customer and design team receives an email approving the project and a note explaining next steps.

2. **Introductory Meeting:** An Introductory Meeting takes place within two weeks of approval, depending on the design schedule. This meeting sets the tone for the collaborative approach, by explaining how the process works, who is involved and what results should be expected. Initial project details, such as base systems, are collected during this meeting.

3. **Preliminary Analysis:** Using project details and costs from the design team, the Energy Design Assistance consultant begins the modeling process. Analysis is completed using a whole-building energy simulation computer program. eQUEST is often used as the interface tool in conjunction with the DOE-2.2 energy simulation engine. Modeling protocols are established using ASHRAE 90-1 – 2004 Energy Standard. Further analysis on protocols continues with our third-party consultants and utilizes ASHRAE 90.1-2004 Performance Rating System (PRM), which is outlined in Appendix G of the Standard.

   Within this analysis, different conservation opportunities are explored that fit into the project criteria—payback analysis, energy expectations, and original design strategy. A meeting is then held to review these strategies to find the ones that meet the original project criteria and which ones should be considered moving forward.

4. **Bundle Analysis:** Conservation opportunities are then packaged together in a bundle to show expected building energy savings, paybacks and incentives. A whole building approach is used to identify the net effect of multiple strategies on a project. This approach provides opportunity for more energy savings impact, by trading less effective ideas that may be in the budget for more effective, new concepts. The bundling of strategies also provides protection against the typical value-engineering phase of the design/construction process, which typically cuts individual elements of projects based on their first cost and impact on the tangible elements of the building, with little regard for on-going energy use. These are then presented to the design team who chooses the best bundle for their project.

5. **Final Energy Analysis:** Once the design team completes Construction Documents, the external consultant completes a final energy model. This final energy model is used to determine the expected Public Service incentives and to verify compliance with the energy savings commitment given in writing by the Bundle Selection form. A meeting is held to review this final energy analysis before construction.

6. **Verification:** The final step in the Energy Design Assistance offering occurs when Public Service completes an on-site verification of energy opportunities addressed within the energy model. Equipment and systems are logged to evaluate performance variables as

appropriate to verify consistency with modeling assumptions. The actual results are compared to the estimated savings to determine the final customer rebate.

Energy Efficient Buildings

Customers may hear of the Energy Efficient Buildings offering through several channels including account managers, Business Solutions Center, architects and engineers, general contractors or equipment trade. The application process is similar to other Public Service prescriptive programs, however, preapproval is required via an agreement between Public Service and the customer to complete energy efficient measures with the building, to allow verification of project design and to accept a final verification of actual installation.

The first step in the process is for the customer to submit a preapproval application and agreement to Public Service. Once received, Public Service will review the project to confirm the project timing, square footage, and customer engagement (interest in energy efficiency options).

Once preapproved, the customer will receive a letter from Public Service explaining the terms of the program and how to participate. The owner will then submit the rebate application and project data for review by Public Service throughout the construction and completion of the project. The customer will receive the final construction rebate once the project and onsite verification have been completed.

D. Marketing Objectives, Goals & Strategy

The New Construction Program is often marketed through our energy consultants directly to architects, engineers and general contractors. The Company fosters a collaborative approach, meeting with design teams to show how the program works and how it is beneficial to their customers. Marketing strategies used within the program scope include trade shows, electronic newsletters, face-to-face meetings, advertising and participation with various trade organizations including American Institute of Architects, Association of General Contractors, and ASHRAE.

Over the last two years, Public Service has identified ways to increase program participation as well as the value of our service to customers. Three changes in the program for 2009 are a result of what was identified:

1. Baseline Change: The program began by adjusting the baseline for savings to IECC 2003, which references the ASHRAE 90.1-2001 Energy Standard. This is the energy code across most of our service territory. In order to meet the changing standards across the state of Colorado, as well as meet the needs of certifications such as LEED®, we are adjusting our baseline to reflect the ASHRAE 90.1-2004 Energy Standard with addenda. The baseline is then adjusted up for areas in which have mandatory energy codes above this standard to meet their specific criteria.
2. Addition of Enhanced Energy Design Assistance track: Approximately 30 percent of all Energy Design Assistance projects are registered with the USGBC for LEED certification. With the additional motivation toward energy efficiency, due to the requirement of two energy points in the Energy and Atmosphere credit of LEED certification, additional modeling in daylighting and mechanical systems will benefit

Public Service customers, as would the submittals for these credits[14]. The Enhanced track was added to provide these highly motivated customers assistance in achieving their certification goals.

3. Natural Gas Incentives: Energy Design Assistance looks at a whole building approach and therefore identifies both electric and gas savings. The PUC approval to include natural gas incentives within the DSM portfolio will add further motivation and strategies for customers to achieve energy savings.
4. Energy Efficient Buildings: The program is being developed to meet the need of customers who may be too far along in design or smaller than 50,000 square feet to participate in Energy Design Assistance.

Energy Design Assistance is primarily marketed to the design community and secondarily to building owners, as detailed below. The Energy Efficient Buildings offering, on the other hand, will be marketed to primarily developers and customers.

Primary Market- General Contractors, Architects, Mechanical and Electrical Engineers:

- Implements energy efficiency
- Influences customer/developer decisions
- Trusted by owner
- Often suggests program to owners and developers
- Key to actual inclusion of strategies and cooperation

Secondary Market-Owners and Developers:

- Makes initial decision on budget
- Hires and contracts with architect, engineers and general contractor
- Initiates conversations on energy efficiency
- Makes final decision on equipment choices
- Key to moving general contractors to energy efficiency strategies within a limited budget

There are several pieces of collateral used for the New Construction Program and Public Service continually tries to improve and update these pieces available to customers via events or a unique website.

- Program feature sheet: explains the features and the benefits of the program
- Case Studies: office facility – provides examples of how other customers benefited from participating in the program
- Process flow chart: detail information on the program process
- White Papers: will explain different options for energy efficiency in lighting, heating, cooling and process.

[14] Please refer to the United States Green Building Council website (www.usgbc.org) for further information on the LEED rating system.

The launch of the Energy Efficient Buildings offering will provide Public Service with the opportunity to begin a larger marketing effort for New Construction. Several strategies will be implemented:

- Direct Mailings: Direct mail to architects, engineers, developers and contractors will begin the launch of this program aimed at new construction.
- E-newsletters: Another avenue to educate our market on the program and benefits of reviewing new construction for energy efficient opportunities.
- Trade and Customer seminars: In person opportunities to educate customers and trade on the benefits of new construction review are an important part of the marketing strategy.

E. Program-Specific Policies

The following policies are in place for the New Construction Program:

- Natural Gas Impacts – In taking the whole building approach, there are times when an efficiency measure might cause a decrease in one fuel, but an increase in another fuel, such as when the change from an incandescent light to a compact fluorescent bulb reduces the lighting heat output, thereby increasing the heating need for the space. This results in a net decrease in BTU consumption and a decrease in electricity consumption, but a slight increase in gas consumption (assuming a space heated with natural gas). In these situations, Public Service will account for both the decreases (energy savings) and increases in fuel consumption and will rebate accordingly.
- Multi-Family Buildings – Multi-family buildings, including condominiums and apartment complexes, must exceed 150,000 square feet, not including parking garages, in order to qualify for the Energy Design Assistance offering. Mixed-use buildings that include both retail/office and residential space must only exceed 50,000 square feet. This policy was established due to the magnitude and specialty of this market sector.
- Completion of several opportunities: The Energy Efficient Buildings offering will require installation of new equipment in both the electrical and mechanical sections of the building. Major renovations that only require adjustments to lighting will be referred to our current prescriptive program. The same will be required for any other stand-alone equipment or systems.

F. Stakeholder Involvement

Customers, trade allies, and other stakeholders are currently engaged at the specific project level. Feedback is garnered individually from each participant and once a trend develops (positive or negative), Public Service makes a change to the program design. If it is a small change, it is then discussed internally and possibly with a few key trade allies and, if deemed acceptable, implemented. A larger change would possibly involve review by the program's external technical resources or other third-party consultant.

The Energy Efficient Buildings offering is being developed with feedback from Fort Collins Utilities and Platte River Authority, both of which currently have similar programs available to their customers. In addition, a survey is also being developed to send to program participants at the end of each project to begin a feedback loop between participants and program management for continuous program improvement

G. Rebate Levels

The Energy Design Assistance offering covers energy modeling services valued at $30,000 to $40,000 per project. Public Service also reimburses architects and engineers to offset the incremental cost of their participation from $8,000 to $12,000 per project depending on the square footage of the building.

In addition to energy modeling, Public Service provides financial incentives to building owners to improve the cost-effectiveness of the chosen energy efficiency measures. Customer incentives are based on demand and energy savings set at a base rate of $300 per kW saved and natural gas savings of $7 per dekatherm saved.

H. Evaluation, Measurement & Verification Plan

The New Construction Program has a M&V plan that is unique to its special design elements and is detailed in the M&V section of the Indirect Segment of this Plan. A comprehensive process and impact evaluation of this program's delivery processes, customer satisfaction, technical assumptions, and net savings impacts is planned for 2009. The budget for this study is included in the portfolio level EM&V budget.

Performance Indicators

Performance indicators are tracked monthly such as how many new applications are received and how far along projects are in the New Construction process. These indicators show strong performance for the Energy Design Assistance offering, including over twenty-five applications received in the first two quarters of 2008.

More so than other programs, this offering is significantly impacted by market and economic trends. When the economy slows, projects may slow their construction schedules and/or stop construction all together. Public Service tracks these market trends to better understand how they may impact program achievements.

Program Evaluations

A comprehensive process and impact study of this program's delivery processes, customer satisfaction, technical assumptions, and net savings impacts are planned for 2009. The budget for this study is included in the portfolio level EM&V budget. This evaluation will only include the Energy Design Assistance offering and will be conducted concurrently with the evaluation of our Minnesota program in 2009 in order to get a larger picture of overall needs and participant value. There are only fourteen completed projects in Colorado at this time and in order to establish a statistically significant sampling, the evaluation will need to include both territories. The Company does, however, intend to ask specific questions in Colorado and Minnesota to account for differences in the markets.

I. Technical Assumptions

Energy Savings Calculations

Energy savings are calculated based on the energy use of each bundled strategy over the identified baseline building energy use, as defined by the IECC 2003 code. Beginning in January 2009, Public Service is adjusting this baseline to reflect the ASHRAE 90.1-2004 Energy Standard with addenda (referenced as the Energy Design Assistance baseline) as the minimum energy standard for energy comparisons.

For projects in counties or cities with more stringent energy codes, compared to ASHRAE 90.1-2004, the model can be adjusted to reflect that county's regulations or rules and Public Service will also claim savings based on those rules for Energy Design Assistance projects. The savings calculations will remain the same for all projects under Energy Efficient Buildings. A minimum of three different bundled strategies are created and used in the energy model. These bundles are explained below:

- Baseline Building: The Energy Design Assistance offering baseline building is one, which complies with ASHRAE 90.1-2004, with addenda.
- Cost Base: Includes the strategies that will likely be incorporated into the building for multiple reasons including aesthetic value, operational benefits, occupant comfort, owner preference, and other non-energy specific criteria.
- Bundle 1: Adds to or modifies strategies from the Cost Base to include additional energy saving features that could potentially be acceptable to the owner and occupants from an operational perspective, with the understanding that additional background or training may be required to confirm acceptance. From a cost standpoint, some of these items may have longer paybacks and/or require additional funding.
- Bundle 2: Adds to or modifies strategies from Bundle 1 to include additional energy saving features that could potentially be acceptable to the owner and occupants from an operational perspective, with the understanding that additional background or training may be required to confirm acceptance. From a cost standpoint, some of these items may have longer paybacks and/or require additional funding.
- Bundle 3: Includes all strategies that optimize energy savings, to serve as an illustration of maximum potential given the list of strategies considered, regardless of payback.

Modeling Protocols

Public Service is working towards documenting modeling guidelines and protocols for the Energy Design Assistance offering. Analysis is completed using a whole-building energy simulation computer program. eQuest is often used as an interface tool in conjunction with the DOE-2.2 energy simulation engine. In recent years, Public Service has begun to use the Performance Rating Method outlined in ASHRAE 90.1-2004 Appendix G as a guiding methodology for our modeling. This is a starting point for making building performance comparisons. However, there are certain application challenges to the method – specifically exceptions to these rules including specific guidelines around chiller plants and district heating and cooling projects. As future protocols are developed and reviewed, they will be available to customers and design teams via a protocol document to be completed in 2009. Current adjustments to the Performance Rating Method are below:

District Energy
When district heating or cooling systems serve a building, reductions in hot water and chilled water loads must be converted to energy savings. The conversion factor value is dependent on the efficiency of the system that provides the heating and cooling. To estimate this, detailed knowledge of the system design and an engineering or simulation analysis is required.

For the Energy Design Assistance offering, Public Service has specified conversion factors to apply to buildings connected to district energy systems. For purchased chilled water, the conversion factor to determine electric savings is 0.58 kW/ton. For purchased hot water or steam, the conversion factor to determine natural gas savings is 1.25 Btu/Btu. Public Service only accounts for natural gas savings if the fuel saved is from the Company, so credit is only taken for the percentage of fuel the Company serves.

Chiller Plant Modeling Policy
When chillers, air or water-cooled are modeled as part of the baseline, the operating conditions, type, number and sizes of the chillers are assumed to be the same as the proposed design. In unique circumstances, the baseline chiller may be of different type than the Design, but must be approved by Public Service before modeled. When boilers are modeled as part of the baseline, the operating conditions, number and sizes are assumed to be the same as the proposed design. When no new heating or cooling equipment is included as part of the project, the heating and cooling equipment is modeled as being the same as the existing equipment at minimum code level efficiencies.

Net-to-gross
According to the Summit Blue analysis completed in 2006, the Energy Design Assistance offering had a free-rider rate of 29.6% based on incentives not being the main factor in participating in Energy Design Assistance, but rather the technical analysis. However, best practices indicate much higher free-ridership levels across the United States (up to 40%). There is also consideration to be made that many buildings aiming for LEED certification would have completed the analysis on their own in the first place. With the increase in the Energy Design Assistance code base and raising incentives to at least 5% over this new base, Public Service is lowering the potential for free-riders. As a result, assuming no spillover, the Company would use a net-to-gross factor of 20% for this Plan.

However, according to the Summit Blue analysis, the spillover rate for Energy Design Assistance is 8%. This rate only includes the spillover within the existing building. There are several things that were not included in the analysis of spillover including: outside-project spillover of A&E firms and outside-project spillover of customers such as developers and retail chains that build outside our territory. According to the research and analysis conducted on the New York Energy $mart program, outside spillover resulted in an average spillover rate of 33%. This may be a high number to use in Colorado due to the differences in market and the change of priorities since the LEED rating system became an overriding effect on new construction. Therefore, a 10% spillover rate would be a conservative estimate of this value.

Taking into account all three of these parameters, the resulting net-to-gross that Public Service will use in this Plan is 98% for the Energy Design Assistance portion of New Construction. (NTG = 1-20%+8%+10% = 98%) A 98% net-to-gross ratio is 17% higher then our current net-to-gross ratio, but with the Energy Design Assistance offering changing its baseline to the ASHRAE 90.1-2004 Energy Standard with addenda and increasing the potential for incentives to at least 5% over this base, we are lowering the potential for free-ridership and taking into consideration the spillover effect on the new construction market. It is to be noted that this is on the high level of best practices across the United States, which range from 65% to100%. Our natural gas incentives use a net-to-gross factor of 99%. Public Service is beginning to offer natural gas incentives for Energy Design Assistance projects in 2009. Since many of our large customers do not purchase natural gas from Public Service, this sell is much more difficult then it is for electric opportunities. Therefore, the free-ridership numbers are decreased.

The Energy Efficient Buildings offering uses a weighted average of other end-use prescriptive programs to be consistent with other program offerings. This is a result of 93% for electric and 97% for natural gas.

Forecasted Assumptions

Several other factors were considered when developing our forecasted assumptions.

- Assumptions for Energy Design Assistance for kWh per project are from Energy Design Assistance -Custom Consulting verified results for Minnesota and Colorado programs in 2007;
- Average hours of operation calculated from actual verified projects kWh/kW;
- Assumed Enhanced Modeling will see 55% increase in energy savings and incremental cost from Basic as was seen from actual Colorado Custom Consulting projects;
- Assumptions for Energy Efficient Buildings from Energy Design Assistance -Plan Review results for Minnesota program from 2006 and 2007; due to stricter Colorado codes, savings will be approximately 70% of Minnesota projects; and
- Incremental cost for Energy Efficient Buildings based on dollar per square foot implementation for Minnesota Energy Design Assistance -Custom Consulting and average building size from Energy Design Assistance -Plan Review projects.

Credit for Completed Projects

The following checkpoints are verified for M&V purposes in the Energy Design Assistance offering by a third-party verifier:

The Construction Document review for energy conservation opportunities identified in modeling analysis will include:

- Final Energy Model based on Construction Documents;
- A submittal checklist is completed for Design Teams to submit their submittals for review;
- Final site verification checklist created for energy conservation opportunities based on submittals;
- Site Verification for installation of energy conservation opportunities;

- Data logging on particular measures to capture operation data (usually for daylighting and controls);
- As-built model as needed; and
- Final verification report.

➢ Process Efficiency Program

A. Description

Process Efficiency is a new program targeting energy intensive processes at large industrial facilities. The program is primarily intended to identify and incent large process changes that are not currently completed through Custom Efficiency or the prescriptive programs, and establish business practices that drive additional conservation measures in the future. Although the program is available to all Colorado industrial customers, the minimum conservation impact thresholds will require the customer to have significant energy use. This program is considered a start-up program during 2009 and 2010 and, therefore, may not meet cost-effectiveness thresholds. However, the Company will make every effort to run the program cost-effectively.

Public Service will work with customers participating in the Process Efficiency Program to develop a long-term relationship that results in a multi-year energy management action plan (E-MAP). There are three main phases to the Process Efficiency Program: identification of energy savings, further refinement of the scope of the projects and opportunities, and implementation.

The identification process (Phase 1) starts with a walkthrough of the customer facility to identify significant technical energy saving opportunities. A cross-section of the customer's management and workforce participate in a facilitated energy management self-assessment session with EnVinta. This results in the customer identifying where the unique priorities are for their business in moving towards sustainable energy management. The result of this session is an estimate of total energy that can be saved at the facility and an action plan describing priorities to achieve these savings. This phase is usually completed in one day.

Public Service will use the information from Phase 1 in conjunction with other available data regarding the customer, industry, and any additional environmental concerns to develop a proposal to assist and support the customer's action plan. This proposal may incorporate funding for a variety of activities to support conservation at the customer. Examples include: specific process studies, further refining and scoping of conservation opportunities, identification and tracking for key parameters driving energy use or training. Phase 2 may take anywhere from ten weeks to six months.

In Phase 3, the customer, in cooperation with Public Service, will develop a three to five year energy management action plan with goals and targets. In addition to the standard rebate offering, customers will be eligible for bonuses for system optimization and for exceeding their annual goals. Over the three to five year period, the customer will implement their identified conservation projects. Public Service representatives will meet with the customer as often as once per year to review progress against the E-MAP and repeat the EnVinta assessment if the customer so chooses.

The industrial market represents a significant pool of conservation opportunity where program penetration is not approaching saturation due to barriers to customer participation, including inadequate resources to research, develop and package the improvements. Several factors have been incorporated into the design of the Process Efficiency Program to provide significant differences between this offering and the other DSM products. Process Efficiency is designed to provide external resources and expertise to these customers in order to overcome such barriers. The program will also establish tracking metrics to provide the customer internal justification to drive access to the capital investments necessary to implement measures and to quantify the business and financial impact of the changes.

Xcel Energy implemented a similar Process Efficiency Program in Minnesota in 2007. The Minnesota program is growing and is anticipated to bring in significant energy conservation in 2008. The Company used its experience with the Minnesota program to help guide its design of the Colorado program.

B. Budgets & Goals

Budgets

The majority of the 2009 budget will be spent on consulting services to provide the assessment and scoping phases of the program. It is anticipated that customer incentives (rebates) will account for a small portion of the 2009 budget, but increase in the 2010 budget. The budgets and goals were developed by reviewing the performance of the Minnesota Process Efficiency Program while considering the industrial customers in Colorado. The most significant difference between the Minnesota program and the anticipated performance of the Colorado Program is that the majority of the large industrial customers in Colorado will not be allowed to participate in our DSM programs because they do not pay the gas DSMCA rider. The gas goals for Colorado were adjusted accordingly.

Participation levels were based on a review of historic electric usage for large Colorado industrial customers. It should be noted that the impacts for the first year reflect only a portion of the impact anticipated for a single participant. This is the result of the extended sales cycle for the large process-related capital intense conservation improvements we are targeting. Although we anticipate an 18 to 24 month period before we see that type of project installed we do anticipate being able to influence the installation of some smaller, energy efficient projects in the interim.

Goals

Due to the long lead times associated with this program, the Process Efficiency goals were developed under the assumption that the Program would have high expenditures and low savings in its first year of operation. The majority of the work in 2009 will "fill the pipeline" with conservation projects which will be completed in later years.

The majority of the high natural gas consumption customers in the Public Service territory are transport-only customers who do not purchase gas directly from the Company. Such customers are exempt from paying the DSMCA and therefore, are ineligible to participate in the Company's energy efficiency programs. As a result, Public Service anticipates very limited gas savings from the Process Efficiency Program.

Table 24: Process Efficiency Program Budgets and Goals

Process Efficiency	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	N/A	N/A	N/A	N/A
Admin & Program Delivery	$333,858	$15,435	$586,060	$14,370
Ad, Promo, & Customer Ed.	$4,000	$600	$10,000	$600
Customer Incentives	$56,250	$21,300	$900,000	$42,600
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	$20,743	$1,965	$78,740	$3,030
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$414,850**	**$39,300**	**$1,574,800**	**$60,600**
Generator kW	77	N/A	1,233	N/A
Generator kWh	487,371	N/A	7,797,936	N/A
Annual Dth	N/A	9,049	N/A	18,099
Annual Dth/$M	N/A	230,261	N/A	298,656
Participants		6	4	12
Participation as % of Segment	N/A	0.006%	0.002%	0.011%
Modified TRC Test Ratio	**1.37**	**7.22**	**2.76**	**7.55**

C. Application Process

Due to the narrow focus of this program, Public Service will initially identify potential program participants by cross referencing historic electric usage with general industry energy consumption and conservation potential data for Colorado industrial customers using over 10 GWh per year. We will begin with our largest customers and those who have expressed an interest in comprehensive programs.

A Public Service account manager serves each large industrial customer. The account manager will approach the customer with a description of the Program and facilitate an informational meeting, if appropriate, with the customer, program manager, and other relevant parties. If the customer chooses to proceed with participation in the Process Efficiency Program, the account manager will coordinate the walk-thru of the customer facility described in Phase 1 above. The remainder of a customer's progression through the Process Efficiency Program follows the description presented in Section A.

Although custom type projects that receive a rebate through this process will require a preapproval to determine the rebate level, the comprehensive nature of the relationship Public Service establishes with the customer provides a significant sphere of influence that drives energy efficiency into a broad array of business decisions. The result is that a type of conditional preapproval is established for the measures the customer chooses to pursue after being accepted into this Program. This also allows us to cost-effectively manage this Program because projects are not analyzed until the data is collected to accurately project energy savings.

D. Marketing Objectives, Goals, & Strategy

This Program will be marketed primarily to large industrial customers through Public Service's internal account managers. In addition, the Company will offer segment-specific seminars - to introduce new energy-efficient technologies to the market and attract customers to participate in the Program. The comprehensive nature of the EnVinta process will evaluate energy use throughout a customer's operations instead of focusing on implementation of specific technologies or efficiency upgrades. This holistic approach can lead to the identification of significant conservation opportunities resulting from process or business practice changes.

The Program will be available to all industrial customers but because of the minimum conservation potential requirements of the E-MAP, it is expected to attract participants primarily from the large industrial segment. The process load associated with this group of customers has historically been difficult to penetrate with conservation measures.

E. Program-Specific Policies

Target customers and projects must be Public Service electric and/or gas customers who have a minimum annual conservation potential of 2 GWh or 8,000 Dth. Gas transport customers are ineligible for rebates.

Conservation opportunities may be grouped into a single, or multiple projects in the E-MAP. The E-MAP will identify the expected sequencing and scheduling for the projects.

If measures are identified through Company-funded studies with simple payback periods less than the minimum for rebates in Custom Efficiency, currently nine months, Public Service will not provide rebates for incremental costs; however, it will take credit for the conservation as study induced savings.

The anticipated time from project initiation to completion is expected to be 18 to 24 months. No impact will be recorded until a project is fully installed, operational, and the final rebate (if applicable) is issued. This results in significant investment by the utility in the year preceding the impact. There will also be customers who start the sales cycle but withdraw before completing any projects resulting in stranded investments by Public Service. The risk for this should be mitigated through monitoring corporate commitment throughout the energy management self-assessment process.

The incentive to optimize a system versus implement individual projects may also result in a lag between when individual components are installed and when the rebate is paid. These rebates will not be paid until all projects associated with a system are completed.

F. Stakeholder Involvement

During development of this Plan, Public Service met with representatives of large industrial customers to solicit input on the proposed Self-Direct, Custom Efficiency, and Process Efficiency Programs. Customers conveyed different levels of internal resources and expertise in energy conservation, and requested programs to address these various levels. The Process Efficiency Program is being offered in direct response to requests from customers who have significant conservation potential and a willingness to complete efficiency projects, but do not have available resources or internal expertise.

G. Rebate Levels

Participants will be eligible for both study funding and end-use rebates. The funding for studies will be based on the customer contributing 25% of the cost up to a maximum customer contribution for Phase 2 studies of $7,500. Projects will be rebated based on the measures installed and the energy and demand savings. Rebates will be valued according to the levels established in each of the end-use programs. Bonus incentives may be given for completion of milestones within the E-MAP, or achievement of conservation exceeding that detailed in the E-MAP.

H. Evaluation, Measurement & Verification Plan

All rebate applications will be audited with a two-step process. On the front-end, as rebates are received, all critical customer information, equipment eligibility and proper rebates amounts are reviewed, validated, and corrected if inaccurate. The second step takes place prior to the rebate being issued where Rebate Operations audits 100% of the rebate applications to ensure that the information from the form was entered correctly into the tracking database. The second step includes ongoing verification and is split between prescriptive and custom measures.

The M&V process for prescriptive measures is detailed in the M&V section of the Indirect Segment of this Plan. The savings factors that will be verified for the Process Efficiency Program are detailed in the Deemed Savings Technical Assumptions section. The M&V process for custom measures is detailed in the M&V section of the Indirect Segment of this Plan.

I. Technical Assumptions

Net-to-gross

The electric net-to-gross assumption, 87% , is based on the average of the net-to-gross factors from similar programs offered by other utilities. For natural gas, the net-to-gross value was determined to be 93% using a similar methodology, but reducing the difference by one half to account for the fact that we have not previously rebated natural gas measures. The predicted values will be used for calculation of 2009 and 2010 actual results. The net-to-gross assumptions will be re-evaluated for the next Biennial filing. It is anticipated that the weighted average of the net-to-gross factors determined for individual technologies by Energy Efficient Best Practices California will be weighted by the mix of technologies implemented in the Process Efficiency Program will be used for the 2011-2012 filing.

General Assumptions

The technical assumptions used to estimate forecasted energy conservation and savings for this Program were derived from historical Custom Efficiency projects (greater than 1 GWh or 8,000 Dth) from industrial customers in Colorado and Minnesota, and completed and pre-approved Process Efficiency projects in Minnesota. Specific technical assumptions will be developed for each project completed under the Process Efficiency Program, and savings will be verified in accordance with individual, project specific M&V plans.

➤ Recommissioning Program

A. Description

Building Recommissioning is the process of reviewing existing equipment and systems within a building to ensure that they are working as efficiently as possible and operating as intended. Public Service's program covers both recommissioning and retrocommissioning. Recommissioning is commissioning a building that has already been commissioned in the past. Retrocommissioning is commissioning a building that has never been commissioned. Public Service's Recommissioning program is designed to assist electric and/or natural gas business customers to improve the efficiency of their existing building operations. Through the completion of an investigative study, Recommissioning identifies existing functional systems that can be "tuned up" to run as efficiently as possible through low- or no-cost improvements. With Recommissioning, a customer may:

- Optimize HVAC equipment operations;
- Fine-tune time of day schedules;
- Improve indoor air quality;
- Suggest new and advanced equipment control strategies;
- Improve productivity of facility maintenance personnel; and
- Reduce equipment wear and tear.

Recommissioning consists of two main steps: diagnosis and implementation. Public Service offers rebates for Recommissioning studies and the implementation of Recommissioning measures. To facilitate participation from a variety of Recommissioning professionals, the customer selects and hires a qualified engineering firm to complete the study and implementation.

The Recommissioning Program has three different paths a customer can choose:

1. Study and implementation –Customers receive funding for both the study and implementation from Public Service. Public Service works with the customer from the beginning of the project until the end. This path has historically been the most popular choice for Public Service's customers.
2. Fast track - Customers have two options for receiving implementation rebates:
    a. Fast track study – For customers who have completed a Recommissioning study on their own and have not received study funding from the Company. Before a customer implements any measures, they can apply for implementation only rebates. To qualify, Public Service will review their study and recommendations/savings opportunities to determine Recommissioning implementation rebates.
    b. Fast track proposal – For customers who are not completing a full Recommissioning study, but would rather look at one or two specific opportunities that a vendor may identify. To qualify, Public Service will review their project proposal and savings calculations to determine Recommissioning implementation rebates.

3. Refrigeration Recommissioning – This path is focused on analyzing grocery/convenience store refrigeration systems to determine how their refrigeration systems can be tuned up to save energy. Due to the nature of the recommended measures, implementation of the energy savings recommendations occur as the provider is conducting the study.

Xcel Energy offers a similar program in Minnesota, which has been in existence since 2000. To benefit customers and providers, we have applied lessons learned in Minnesota to the Colorado program. An example of lessons learned that have been applied to the program development are:

- Education – Time needs to be spent on educating both customers and trade allies so they understand what Recommissioning is and how to participate in our program. Not all customers know about Recommissioning.
- Providers – Having active participation by providers is essential to meeting goals.
- Implementation – Most customers will implement measures found within their study, but it may take a while to get budget approval after their study is complete.

B. Goals & Budgets

Budgets

Once goals were established, the budget process is generally the same for Recommissioning as with the other DSM programs. Historical cost and participation information is tracked and analyzed to project budgets two years in advance. Given the increase in goals for 2009 and 2010, additional time was spent reviewing the information for reasonableness. Experience from Minnesota programs is used as a checkpoint.

The following factors were also used while determining the budget: total participants, rebate levels offered, promotional, advertising, and educational opportunities, and labor requirements to achieve the goals

For the Recommissioning Program, most of the budget is driven by the number of studies completed and the number of customers who implement projects in a given year. The Company assumed that for every two customers who implement Recommissioning measures, there need to be an additional three customers complete studies in order to keep the pipeline flowing.

Goals

Due to the long sales cycle of each project, approximately one to two years, and our dependence on Recommissioning providers, Public Service expects that the Recommissioning program will continue to grow for a few more years, increasing the project pipeline during this time.

To achieve the program goal, Public Service recognizes energy and demand savings as a customer implements the measures identified in their study. Participants are allowed to pick which measures they want to implement and a typical Recommissioning study may suggest anywhere from five to ten measures, with varying cost and paybacks.

Table 25: Recommissioning Program Budgets and Goals

Recommissioning	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	N/A	N/A	N/A	N/A
Admin & Program Delivery	$125,446	$29,650	$168,951	$38,888
Ad, Promo, & Customer Ed.	$82,422	$21,320	$199,275	$21,400
Customer Incentives	$327,973	$33,185	$449,431	$33,185
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	$26,792	$4,208	$40,883	$7,004
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$562,633**	**$88,363**	**$858,540**	**$100,477**
Generator kW	354	N/A	471	N/A
Generator kWh	3,947,516	N/A	5,122,522	N/A
Annual Dth	N/A	2,199	N/A	2,199
Annual Dth/$M	N/A	24,883	N/A	21,883
Participants	28	8	38	8
Participation as % of Segment	0.017%	0.007%	0.024%	0.007%
Modified TRC Test Ratio	**2.05**	**1.38**	**1.91**	**1.23**

C. Application Process

Customers learn of the program though their Public Service account manager, direct marketing efforts and through Recommissioning providers. If a customer is interested in participating in a study, they must receive preapproval before they begin the study. To obtain preapproval, the customer will submit an application and a proposal from their Recommissioning provider that outlines the scope of the project. After the customer receives preapproval, they can begin the study on their building. When the study is completed, Public Service's internal engineer reviews the study to ensure that it meets our requirements and that the energy savings calculations are reasonable. After Public Service approves the study, the provider will present their final recommendations to the customer and then the customer can receive their study rebate. At this point, the customer will review the study internally and select individual measures to implement. After they finish implementing, they will receive their implementation rebate check for the individual measures.

The typical sales cycle for a regular Recommissioning project (study and implementation) takes one to two years to complete. Once preapproved, the study can typically take three to six months to complete and receive Public Service approval. Another year or more may be required for the customer to receive internal budget approval and complete their project.

If a customer wants to participate in our fast track option, where they receive implementation rebates only (no study funding), they must obtain preapproval for implementation rebates before they complete the measures. To obtain preapproval, they need to submit either their study or their project proposal for review. The sales cycle for fast track projects is typically shorter than a regular Recommissioning project since they have already completed a study and/or are just requesting a proposal from the provider.

To participate in our refrigeration Recommissioning program, a customer can receive instant preapproval via the Xcel Energy website by entering relevant information regarding the project. After their investigation/implementation is, Public Service's technical staff reviews the project to determine energy savings.

D. Marketing Objectives, Goals, & Strategy

Our marketing strategy is to educate customers and trade allies on what Recommissioning entails and the benefits of Recommissioning a building. Due to the long sales cycle, it is important to continually build the study pipeline to meet future years goals. To build the pipeline and to attract customers and Recommissioning providers, we use various marketing tactics such as direct mail, educational seminars, targeted email newsletters, in person meetings, case studies, and the website. Another tactic we have used is to provide increased study funding to customers if participation is low.

The most common target market for Recommissioning is commercial customers that are 50,000 square feet and larger but particularly offices, hospitals and schools. These are markets are good candidates due to the following reasons:

- Office real estate owners are looking for quick paybacks on their buildings and want to cut their operating costs without sacrificing the tenant comfort. This is the ideal situation for Recommissioning, which measures cost little to implement and have a very fast payback.
- Hospitals are intense energy users, and their energy systems frequently run as if there is full load, although that often isn't the case. There are many opportunities for low cost savings in hospitals and medical centers.
- Schools are closed down for more periods than most buildings and have more opportunities for optimizing their energy systems.

Over the years a comprehensive list of marketing materials has been developed to provide to customers, providers and our account management team. Available materials include:

- Program feature sheet – explains the features and the benefits of the program
- Study preapproval application – used to obtain study preapproval
- Study rebate application – used to receive study rebate after study has been approved
- Fast track preapproval application – used to obtain fast track preapproval
- Recommissioning guidebook – information booklet that explains Recommissioning, benefits, process, etc.
- Provider list – contains providers who have participated in our program in the past

- Case Studies: Hospital, school, office building, medical and research facility – provides examples of how other customers benefited from participating in Recommissioning
- Process flow chart – detail information on the program process
- Customer website – snapshot of our program and links to many useful resources and all of our literature
- Provider website – contains information on our program and tips that are specific to providers participating in the program. The website also has links to all of our literature for easy access.

Periodically, specific marketing materials that cover timely information are developed, such as:

- Direct mail pieces – promotional piece that is sent to a specific target market either based on size or segment
- Customer newsletters – reminds customer of program offering, highlights program changes/enhancements
- Customer email – a brief email that is available to our account management team to send to their customers
- Customer seminar – educate customers about Recommissioning and the benefits
- Provider newsletters – highlights program tips, changes, announcements
- Provider seminar – educate providers on how to participate in the program

Recommissioning providers play a key role in the success of the program since customers rely on providers to identify energy saving opportunities in their building. While provider interest in participating in the program is increasing, we need to identify additional providers to help meet future demand. Our goal with providers is to make sure they understand our expectations for the program and to provide the necessary tools so that they can help customers through the process. In order to participate in the program, we prefer that the provider be a Professional Engineer, or have enough experience to prove that they are capable of completing a study. To help providers participate in our program, we meet with them one on one to explain the process and requirements and encourage them to work through their projects with us.

E. Program-Specific Policies

Study driven credit: If a customer implements measures that are less than nine months or greater than 15 years, they will not receive a rebate, but Public Service will claim those savings. The Company believes that our help identifying and/or analyzing energy efficiency measures provides sufficient influence on the customer's decision to implement those measures.

Maintenance: The Recommissioning program claims energy savings for maintenance items identified and implemented through the recommissioning process.

Rebate/energy savings validity: If at least two years has passed since a project was approved, the technical staff reanalyzes it with current rates to determine if the savings/payback has changed. This reanalysis is conducted prior to issuing a rebate check.

F. Stakeholder Involvement

Public Service values feedback from customers and providers and make an effort to gather their input to ensure the program is effective. As ideas are generated, the team will review and implement if feasible. The program team as well as the trade relations manager has met with all of our active trade allies to discuss program specifics and to obtain feedback. Continuous communication with this group through informal conversations and project work, provide opportunities to keep this line of feedback open.

G. Rebate Levels

The Recommissioning Program offers two types of customer rebates: study and implementation.

Study Rebate
Public Service will pay up to 75% of the Recommissioning study cost. Funding is based on the potential energy savings of the project and the cost of the study. Payment of the remaining balance by the customer shows customer interest in identifying and implementing measures found within their study.

Implementation Rebate
Public Service will pay up to $400 per peak summer kW or $0.08 per kWh saved, whichever is higher, and an additional $7 per Dth saved for Public Service natural gas customers, up to 60% of the measure cost for Recommissioning measures that are identified in Recommissioning studies or preapproved through our fast track option.

Typical Recommissioning measures include:

- Calibration/tune-up of Energy Management System points;
- Adjustment of outside air and return air dampers;
- Resetting the chilled water and hot water supply temperatures;
- Optimum start/stop of air handlers and makeup air units (early shutdown in the evening, late start in the morning); and
- Resetting of condenser water temperature.

By providing rebates, Public Service helps influence the customer's decision to participate in the program to identify ways to use energy more efficiently.

H. Evaluation, Measurement & Verification Plan

The Recommissioning Program has a unique M&V plan that is detailed in the M&V section of the Indirect Segment of this Plan. A comprehensive process and impact study of this program's delivery processes, customer satisfaction, technical assumptions, and net savings impacts is planned for or 2010. The budget for this study is included in the portfolio level EM&V budget.

I. Technical Assumptions

The average reductions (kW reduction = 10%; kWh reduction =12%), costs, and rebates for the forecasted assumptions are based on identified potential in studies completed in Colorado since 2006. Measure life taken to be 7 years.

The low coincidence factor reflects the fact that some implementation measures have only energy savings and no demand component. Savings, however, are expressed by calculating an "equivalent kW" for all measures in order to have a common metric. Therefore, the high Efficient Product demand represents the "equivalent kW," not an actual new peak demand. The annual energy savings is not affected by this restatement.

Since many measures have very quick or even instantaneous rebates, the average rebate, derived from the study data, is less than the $400/kW or $0.08/kWh potential rebate.

Rebates and capital costs include for implementation only pertain to the completion of identified measures. Rebate and costs for studies are shown on the "Study" component. Baseline cost is $0 since the customer would have done nothing without the study.

Optimized Building Performance is determined as the difference between the Baseline and the Estimated Savings per implementer.

Since participation includes both those who implement in a given calendar year as well as all those customers that had studies performed in that calendar year, the actual number of participants is necessarily higher than the number of implementing participants. Since Study funding is provided as a Rebate, those costs, on the customer and utility side, needed to be considered as well.

Number of study participants is estimated to be 150% of implementing participants for forecasting purposes.

For purposes of the electric component of this program, the electric-related components were looked at exclusively. Any Public Service gas-related costs or savings were reviewed only in the context of the natural gas benefit-cost analysis. In actual application, rebates that might pertain to both fuels are evaluated on the basis of total costs and then rebate expenses are split between the electric and gas sides. In all cases, all savings are considered, rebates are restricted to 60% of implementation cost, and rebates will not push the payback to less than one year.

Energy O&M Savings in the forecast are based on natural gas savings of participants who are not Public Service natural gas customers. Approximately 32% of participants have Public Service as their natural gas supplier.

The net-to-gross number is 100 percent. Without having completed a recommissioning study through our program, the customer would not have known about the energy savings opportunities. If they had known about them, they would have done them on their own due to the likelihood they are no/low cost items with very quick paybacks.

➢ Segment Efficiency Program

A. Description

The Segment Efficiency Program targets particular market sectors with specialized packaged conservation offerings to overcome unique barriers to customer participation. In this biennium, Segment Efficiency will focus on the commercial real estate sector, specifically office space, to address a historic lag in participation. The program is considered a start-up program during 2009 and 2010 and, therefore, may not meet cost-effectiveness thresholds. However, the Company will make every effort to run the program cost-effectively.

The commercial real estate effort will yield four main benefits:

- Large energy savings projects;
- Whole building customer-focused analysis;
- A large percentage of projects that reach completion; and
- Increased probability that decision-making processes will incorporate energy efficiency best practices in the future.

The commercial real estate component will target owner-occupied and leased buildings of at least 50,000 square feet. The buildings within this segment are, in many cases, greater than one million square feet: This program is a comprehensive whole building evaluation of energy savings opportunities. The Segment Efficiency Program will offer customers one-on-one energy efficiency counseling as well as financial incentives for energy efficiency improvements based on technical and financial studies. The Company will provide a preliminary report identifying energy efficiency opportunities, a financial engineering study providing an investment grade analysis, and incentives for measure implementation and installation. The Company's existing prescriptive and/or custom offerings will then be incorporated into rebate packages that are attractive to this customer segment.

In addition to commercial real estate office space, the Company will be reviewing other sectors within commercial real estate such as retail and hospitality.

<u>National Industry Review</u>
The Company's Commercial Real Estate Program in Minnesota has been recognized by the American Council for an Energy Efficient Economy for its innovative approach and use of best practices. Specifically, ACEEE said:

> We are encouraged by this approach as it recognizes that sub-categories within the broad class of business customers have unique needs and face different barriers than other customer sub-categories.
>
> This is exactly the type of finer customer segment differentiation that we have observed may boost participation and savings in some of Xcel Energy's existing business programs. Efforts like this begin with analysis of why certain customer types have not been reached by programs. Once unique barriers and needs are identified for such groups, program designs

can be developed that provide appropriate marketing and program services to achieve desired participation levels among the targeted customer population. Xcel Energy should closely monitor and evaluate initial results from this program---both to refine this specific initiative (commercial real estate) as necessary and to determine if similar targeted segment approaches may be effective in other areas. Some possibilities may be schools, lodging, restaurants, small retail and government/municipal customers.

Xcel Energy already has an extensive portfolio of programs built around end-uses and technologies. Initiatives like the Segment Efficiency provide opportunities to package such programs and services so as to best elicit positive responses from eligible customers. Such efforts are not so much as creating new programs and services, but rather to bundle these in ways that best meet the needs of readily differentiated customer segments.

The Company will partner with a commercial real estate industry specialist to administer the program. The partner will be identified and contracted with through our sourcing process. The partner will bring substantial experience in the commercial real estate industry.

B. Budgets & Goals

<u>Budgets</u>
Once goals were established, the budget process is generally the same for Segment Efficiency as with the other DSM programs. Since the Program will be new to the Colorado service territory, historical cost and participation information from our existing Minnesota Commercial Real Estate Program was tracked and analyzed to project budgets two years in advance.

For the Segment Efficiency Program, the program rollup includes the rebates and costs associated with performing the studies, which will identify the measures, as well as the implementation-related costs and rebates. Program planning and design, study rebates, and implementation rebates drive the majority of the budget. The following was used to identify these specific drivers.

- Study Rebates: Based on a $3,500 rebate for preliminary reports and an estimated $20,950 rebate for investment-grade engineering studies.
- Implementation Rebates: Based on the number of participants in each end-use. An average rebate for each end-use was used to come up with a total implementation rebate for each year.
- Contract Outside Vendor: Based on an estimate of the contract amount with the commercial real estate partner. The partner will complete customer phone interviews, on-site visits, preliminary reports, and provide marketing and project management assistance.

In 2009, there will be rebates for preliminary reports and some implementation but due to the sales cycle length, most implementation and associated implementation rebates will happen in 2010.

Goals
Estimated savings were determined by utilizing the historical achievement and forecasts of the Minnesota Commercial Real Estate Program offering that launched in January of 2007. We also analyzed the market size of commercial real estate in Colorado versus Minnesota to make adjustments. Savings will come through myriad prescriptive (lighting, motors/drives, cooling, boilers), custom (lighting, motors/drives, cooling, energy management system), and recommissioning measures. Estimated energy savings are based on participation estimates and the average savings per participant from existing programs.

Table 26: Segment Efficiency Program Budgets and Goals

Segment Efficiency	**2009 Electric Goal**	**2009 Gas Goal**	**2010 Electric Goal**	**2010 Gas Goal**
Budget				
Planning & Design	$81,393	$3,040	$84,233	$3,146
Admin & Program Delivery	$270,773	$6,199	$722,021	$6,235
Ad, Promo, & Customer Ed.	$75,842	$15,900	$262,475	$62,500
Customer Incentives	$214,516	$615	$1,058,717	$8,214
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	$1,928	N/A	$99,990	$4,005
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$644,452**	**$25,754**	**$2,227,436**	**$84,100**
Generator kW	80	N/A	1,368	N/A
Generator kWh	528,904	N/A	10,716,550	N/A
Annual Dth	N/A	N/A	N/A	3,627
Annual Dth/$M	N/A	N/A	N/A	43,126
Participants	51	5	175	17
Participation as % of Segment	0.032%	0.005%	0.109%	0.016%
Modified TRC Test Ratio	**0.86**	N/A	**2.75**	**2.00**

C. Application Process

Segment Efficiency will be introduced primarily through the Company's account managers to commercial real estate customers. In most cases, the Company will leverage existing relationships with this customer group to bring participants to the Program. Customers will submit an application to enter the Program. Once the information is received, the CRE industry expert will contact the customer to set up a phone interview and on-site walk-through.

There are three primary phases within the Program process:

- Preliminary Detailed Findings Report;
- Investment-Grade Engineering Study;
- Implementation Phase.

In the preliminary phase, the Company's commercial real estate partner and account manager will interview the customer by phone and an engineer will visit the site for a building walk-through. Customers receive a report with their building's ENERGY STAR Benchmark Score, Energy Systems Rating and an exhaustive list of energy conservation opportunities identified within their buildings. This process typically will take three to four weeks following the on-site walk through. The commercial real estate partner will bill the customer for the total report cost of $7,000. Once the customer pays for the report, they will submit a study rebate application to receive their 50% funding ($3,500) rebate from Public Service.

The customer, vendor and account manager will then determine the measures that will require additional engineering analysis and/or a bid cycle. This process is extremely dependent on customer resources and can take three to six months to execute. If the customer chooses to go through the investment-grade engineering study, they will determine what vendor they'd like to use, submit a study preapproval application with a project proposal, estimated energy savings, and a study cost. Public Service will review the application and determine funding levels of 50% of the cost of the study, not to exceed $20,000.

Upon completion of the engineering investigation, the team will review the financial and building analysis and build an implementation plan to capture identified energy savings. Once the customer pays for the study they will submit a study rebate application to receive their rebate.

Typically, customers will plan for a phased approach based on resource availability. In some cases, customers will implement findings immediately based on the preliminary report. For those requiring additional analysis, measures may not be implemented for 24 to 36 months following Program enrollment. Customers will utilize our existing end-use Program rebate applications to apply for implementation rebates.

D. Marketing Objectives, Goals, & Strategy

The commercial real estate sector was identified as the first target of the Segment Efficiency Program because it presents unique challenges in the inherent complexity with landlord-tenant lease and ownership issues. Primary customer research clearly indicates that commercial real estate customers require sophisticated consultation and analysis to illustrate the energy and non-energy benefits of conservation measures before they will act. Therefore, Public Service's marketing of this program will focus on addressing these barriers by providing a credible, consistent message to customers.

In order to establish credibility with commercial real estate customers, Public Service will seek out endorsements from trade partners such as the National Association of Industrial and Office Properties ("NAIOP") and the Building Owners and Managers Association ("BOMA"). The Segment Efficiency Program will be marketed through trade newsletters and events to members of participating building organizations. Program awareness will be generated at multiple levels. Account management, trade publications, trade relations managers and local associations such as NAIOP and BOMA will be utilized.

This program will:

- Deliver cost-shared financial and engineering consultations, benchmarking, building triage and related outreach/assessment activities.
- Propose a specific call to action within the Program lifecycle to capitalize on additional benefits such as a 30% incentive bonus for all measures that are implemented.
- Provide instruction to Public Service program managers on how to optimize their interaction with Segment Efficiency stakeholders and the trade allies that serve them.
- Provide demonstration pilots of best practices.
- Educate customers about energy efficiency technical assistance and financial incentive programs with the goal of increasing uptake for these programs among this hard-to-reach sector.

Table 27: Marketing Strategies Used in the Segment Efficiency Program

Marketing Strategy	Description
Program Collateral	• Feature Sheet • Frequently asked questions • Sample preliminary report • Program process flow chart
Newsletter Articles	• Energy Solutions business newsletter • Energy Exchange trade newsletter • BOMA newsletter • NAIOP newsletter
Direct Mail	• Program introduction, benefits, and how to sign up.
Advertising	• BOMA newsletter • NAIOP newsletter • Denver Business Journal • CO Real Estate Journal
Customer Outreach	• BOMA meetings • NAIOP meetings

E. Program-Specific Policies

The Segment Efficiency Program is open to commercial real estate buildings equal to or greater than 50,000 square feet. The individual measures will follow end-use program guidelines and policies.

F. Stakeholder Involvement

<u>Program Training Sessions:</u>

- The Account Management team will be trained on the Program and how to inform customers of the opportunity.
- Our energy efficiency engineers and program manager will train the commercial real estate partner on our DSM program offerings. This training will ensure that the proper rebate levels and payback information is on the final list of efficiency measures.

- Our energy efficiency engineers and commercial real estate partner will train potential investment-grade engineering study providers on the Program and our other DSM offerings.
- Commercial real estate customers will be trained on the Program through BOMA and NAIOP events as well as one-on-one with our account managers.

Bi-Weekly Status Meetings

- The program manager, energy efficiency engineer, commercial real estate partner, and account managers will meet to review the status of all projects.
- The meetings will ensure that we are meeting customer needs and deadlines.
- The meetings will help us accurately forecast implementation measures to identify gaps and make sure we are on track to meet goal.

G. Rebate Levels

The Segment Efficiency Program will provide financial incentives in the form of study subsidies and rebates for the purchase of energy efficiency measures. Engineering studies will be reimbursed at 50% of their cost. Measures will be rebated at end-use program levels with an additional bonus of 30%.

H. Evaluation, Measurement & Verification Plan

The Commercial Real Estate Program manager, technical consultant, partner, and account managers will meet bi-weekly to review the status of all projects. The bi-weekly meetings will ensure that we are meeting customer needs and deadlines. The meetings will also help us accurately forecast implementation measures to make sure we are on track to meet our goals.

All rebate applications are audited as rebates are received and as they are being issued. On the front end, as rebates are received, all critical customer information, equipment eligibility and proper rebate amounts are reviewed, validated, and corrected if inaccurate. The second step takes place prior to the rebate being issued where Rebate Operations audits 100% of the rebate applications to ensure that the information from the form was entered correctly into the tracking database.

The M&V process for prescriptive measures is detailed in the M&V section of the Indirect Segment of this Plan. Since rebates will be offered by the Segment Efficiency Program for lighting, motors, cooling, and boilers prescriptive measures, the savings factors that will be verified are detailed in those respective programs' Deemed Savings Technical Assumptions section. The M&V process for custom measures is detailed in the M&V section of the Indirect Segment of this Plan. The Segment Efficiency Program will use the custom processes followed for typical custom programs (lighting, motors, cooling, custom, and EMS) as well as the unique M&V process for the Recommissioning Program.

I. Technical Assumptions

The Segment Efficiency Program will bundle prescriptive and custom rebates from Public Service's other DSM offerings into one project proposal. Because this program relies heavily on the Company's other DSM programs (including: Lighting Efficiency, Motor and Drive Efficiency, Cooling Efficiency, Boiler Efficiency, Energy Management Systems, Custom Efficiency, and Recommissioning), the forecasted technical assumptions are closely aligned with other offerings in the portfolio.

Table 28: Source of Segment Efficiency Technical Assumptions

Measure	Source
Prescriptive:	
Lighting	Actual commercial real estate projects in Minnesota
Motors	Actual commercial real estate projects in Minnesota
Cooling	Actual commercial real estate projects in Minnesota
Boilers	New Colorado Boiler Efficiency Program
Custom:	
Lighting	Actual Custom Efficiency projects in Colorado
Motors	Actual Custom Efficiency projects in Colorado
Cooling	Actual Custom Efficiency projects in Colorado
EMS	Actual EMS projects in Colorado; Rebate based on Minnesota program average payout of $319 per kW
Custom	Actual Custom Efficiency projects in Colorado
Recommissioning:	Actual Recommissioning projects in Colorado

Net savings goals include a net-to-gross factor of 89% in 2009 and 94% for 2010 for electric. For gas, a net-to-gross factor of 97% was used for both 2009 and 2010. The net-to-gross factors were determined utilizing the net-to-gross factors of the end uses listed above. The factors were then weighted based on the amount of achievement we expect for each end use to come up with an average program net-to-gross factor.

➢ Self-Directed Custom Efficiency Program

A. Description

The Self-Directed Custom Efficiency Program (Self-Direct Program) will provide large commercial and industrial electricity customers in Colorado the opportunity to self-fund energy conservation projects at their facilities. Customers who engineer, implement, and commission qualifying projects will receive rebates to offset their costs to implement efficient projects. The dollar value of the rebates will be based on the amount of conservation attained. Because the Self-Direct Program shares many of the features of the Custom Efficiency Program, it should be viewed as a traditional self-direct program a custom program targeted towards a unique subset of customers, as opposed to a traditional self-direct program.

Xcel Energy also offers a Self-Direct Program in New Mexico; other utilities offer, or plan to offer, similar programs in Arizona, Montana, Oregon, Utah, Washington, Wisconsin, and Wyoming. Participation in these programs is typically limited to large customers. During the legal proceedings surrounding Public Service's filing of the enhanced DSM program application, the Commission accepted input related to the Company offering a Self-Direct DSM program. In Decision No. C08-0560, the Commission directed Public Service to include a self-direct DSM program in the 2009/2010 Biennial filing.

A fundamental principle and differentiating factor of the Self-Direct Program is that the customer performs the majority of the design, engineering, measurement, verification, and reporting work associated with the energy conservation projects. Large customers with energy conservation resources may choose participate in the Self-Direct Program because they believe that it is beneficial for them to perform more of the administrative activities, and in doing so, receive a higher rebate over Public Service's other DSM programs.

Participation in the Self-Direct Program will generally follow the sequence below. Public Service prequalifies customers who are eligible for participation in the Self-Direct Program. Once prequalified, a customer identifies the opportunity, then develops and submits a project application. Public Service provides confirmation of application receipt, reviews the application, and asks for additional information if necessary. Public Service notifies the customer of approval or denial of the application, expected rebate, and mutually agreed on M&V plan. The Customer can request a meeting to discuss Public Service's decisions related to the application.

If the customer chooses to implement the measures, they sign a letter, which includes an M&V plan, stating that they intend to implement the preapproved measures. After the customer signs their letter of intent, they must conduct any pre-installation monitoring required in the M&V plan, and submit the data to the Company. The Company must approve this data before the customer may implement the efficiency measures. The customer then implements the measures and performs follow-up monitoring as described in the M&V plan.

The customer then submits a project completion report. Public Service will review the report, request any additional data, and calculate the final rebate. The rebate will be paid by check upon completion of project and Public Service's approval of project completion report.

B. Budgets & Goals

The Company used the average savings from historical Custom Efficiency projects completed by large Colorado customers to develop program budgets and goals for this Plan. The program is expected to experience significant growth between 2009 and 2010. The majority of the budget will go towards rebate dollars for customers.

Table 29: Self-Directed Custom Efficiency Program Budgets and Goals

Self-Directed Custom Efficiency	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$7,500	N/A	$4,000	N/A
Admin & Program Delivery	$49,000	N/A	$86,000	N/A
Ad, Promo, & Customer Ed.	$11,800	N/A	$4,000	N/A
Customer Incentives	$280,000	N/A	$560,000	N/A
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	N/A	N/A	N/A	N/A
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$348,300**	**N/A**	**$654,000**	**N/A**
Generator kW	478	N/A	956	N/A
Generator kWh	2,182,451	N/A	4,364,903	N/A
Annual Dth	N/A	N/A	N/A	N/A
Annual Dth/$M	N/A	N/A	N/A	N/A
Participants	5	N/A	10	N/A
Participation as % of Segment	0.003%	N/A	0.006%	N/A
Modified TRC Test Ratio	**4.46**	**N/A**	**4.73**	**N/A**

C. Application Process

Customers are most likely to hear about the Self-Direct Program through their account managers. Customers must be prequalified for participation in the Self-Direct Program before submitting a Self-Direct project application. The customer is responsible for providing the Company with justification for eligibility (prequalification) in the Self-Direct Program. The Company will respond to a customer request for prequalification within 30 working days or other agreed on period. Justification must include, but is not limited to, a list of the customer's account numbers, locations, and meter numbers to be aggregated.

Once prequalified, the customer will submit a project application for each Self-Direct project. Self-Direct project applications may contain a single measure, or a combination of multiple measures at a single or multiple locations. All energy conservation measures must be at customer locations receiving electric service from the Company.

D. Marketing Objectives, Goals, & Strategy

The Self-Direct Program will be marketed initially to large customers who have expressed an interest in overseeing their own DSM program. Specifically, we will focus on those customers who have participated in the Self-Direct Program development process. Other marketing efforts will focus on customers based on their energy use, conservation potential, and in-house experience and expertise with conservation projects.

E. Program-Specific Policies

The Self-Direct Program is open to Public Service commercial and industrial electric customers who have an aggregated peak load of at least 2 MW in any single month and an aggregated annual energy usage of at least 10 GWh. The customer of record must be the same for all aggregated meters to qualify for this program. New customers or customers with new facilities that demonstrate, to the satisfaction of the Company, predicted demand and usage above the minimum requirements, may participate in the Self-Direct Program.

In the Commission's Decision No. C08-0560, it was stated that each Self-Direct project must have a TRC ratio greater than the TRC ratio for Public Service's overall DSM portfolio. During the Commission's review of the Plan, the Settlement Parties recommended that the Commission modify this policy to allow the Company to provide rebates for projects that meet eligibility requirements and achieve a TRC Test ratio equal to or greater than one.

The TRC ratio for each application will be calculated based on the combination of all measures proposed in the application. The customer will calculate a final project TRC ratio in the completion report using the actual implementation costs, energy conservation data, non-energy costs and/or benefits and the calculation methodology provided by the Company. The Company will verify the final TRC for the completed project during the review of the project completion report.

Participants in the Self-Direct Program will be allowed to participate in other conservation programs offered by the Company, but may not be rebated for the same efficiency measure through two different programs. Customers may enroll their new buildings in either the Self-Direct Program or the New Construction Program, but not both. If the customer chooses to participate in the Self-Direct Program for a new building project, the design work and energy modeling shall follow the protocol established in the New Construction Program; however, the customer will be required to perform the energy modeling internally, or pay for all energy modeling costs. Rebate levels for new buildings participating in the Self-Direct Program are described in Section H.

The Company understands that some of the information provided by customers to document project assumptions and calculations may be of a sensitive nature. Specifically, operation and maintenance (O&M) savings associated with implementation of a project may contain information that the customer deems privileged. The Company will treat Participant O&M data in accordance with Section 4 of the Stipulation and Settlement Agreement. Specifically, in the absence of a written agreement signed by the Participant authorizing disclosure of the

Participant's operations and maintenance savings or expense data ("Participant O&M data"), all such Participant O&M data shall be treated as proprietary and trade secret information that is privileged and highly sensitive. Accordingly, the Company will use Participant O&M data to evaluate the cost-effectiveness of all DSM projects and programs that use the Custom Efficiency analysis process. Public Service will not include Participant O&M data in its incentive calculations unless it has been authorized to disclose such data by written agreement.

The Company will only disclose the results, by cost category, of calculations made using the privileged values, but not the values themselves, upon request by members of the Commission, its Staff, or the Office of Consumer Counsel. The Company will provide the Participant 10 business-days notice of the place and time of the inspection and provide the opportunity for a customer representative to be present during the inspection. The Company shall maintain a log of the persons, dates, times and documents reviewed.

Within 45 days following the end of each quarter, the Company will provide a report to the Commission, its Staff, and the Office of Consumer Counsel on the number and value of rebates spent on measures whose cost effectiveness depends on the Participant O&M data. In addition, based on the ALJ Decision No. R08-1243, this report will include the TRC calculations on the Self-Directed Custom Efficiency projects approved by Public Service.

Incremental Costs

Incremental costs are all actual, incremental expenses reasonably incurred by a customer in connection with the construction, installation, or implementation of an approved Self-Direct project, including but not limited to equipment costs, engineering and consulting expenses, and removal of old equipment. Incremental costs represent the cost incurred to achieve energy efficiency levels that exceed industry standards or existing equipment efficiency based on practices generally utilized by energy engineering professionals and/or reference to publicly available resources for energy engineering.

Project Application

The format of the project application will be determined by the customer, but at a minimum, must include the following components:

- Description of the customer including electric and gas rate classifications, business activities at involved sites, roles of personnel involved in the project, history of and expertise with conservation projects.
- Description of the proposed project(s) including technology, locations, implementation schedule, expected measure life, how the projects fit into the customer's operations, and a description of previous implementations of similar technology or projects. The project description should include product specification sheets, white papers, quotes from vendors to validate cost estimates, and other supporting documentation. Self-Direct project applications may contain a single measure, or a combination of multiple measures at a single or multiple locations. All energy conservation measures must be at customer locations receiving electric service from the Company.
- For new buildings, the application must contain computer energy modeling specific to the planned building to forecast the base case and efficient energy use. Computer modeling

should be in accordance with the protocol specified in the Energy Design Assistance program.

- Engineering calculations to forecast energy and demand savings, non-energy benefits and costs, and the estimated rebate.
- Benefit-cost calculations to determine the Total Resource Cost (TRC) Test, including a discussion of the sensitivity of the TRC and payback to various inputs, and the perceived accuracy of the inputs.
- Description of the controls the customer will use to reduce the likelihood of project cost and schedule overruns.
- Description of the proposed monitoring activities that will be used to document demand and energy savings. Pre- and post-installation metering and verification will be required for all projects with predicted energy savings greater than 0.25 GWh unless the Company and customer agree upon other methodology. The Company reserves the right to require measurement and verification on projects of any size.
- Any information reasonably requested by the Company to document and support the application.

Project Completion Report

The format of the project completion report will be determined by the customer, but at a minimum, it must include the following components:

- Description of all deviations from the application package including equipment substitution, cost adjustments, operating procedures, etc.
- Documentation of all actual costs incurred including invoices, internal labor, incremental operation and maintenance costs, etc.
- Raw monitoring results and engineering calculations to demonstrate actual energy and demand savings based on monitoring results.
- Requested rebate amount.
- Any information reasonably requested by the Company to document and support the completion report.

F. Stakeholder Involvement

Public Service reviewed similar programs and best practices from other utilities, and then requested input from industry experts and some of our large customers to aid in development of this program. The Company met with and/or received program input from representatives of Southwest Energy Efficiency Project, the Governor's Energy Office, Suncor USA, Lockheed Martin, Coors Brewing Company, Anheuser-Bush, Ball Corporation, Air Liquide, Western Metals Recycling, Metals Management, University of Denver, Johnson & Wales University, Rocky Mountain Steel Mills, Kroger, and Wal-Mart. These groups were provided opportunities to review drafts of the filing description and meet to discuss the proposed program. Comments and discussions from these meetings were incorporated into the program proposed herein.

G. Rebate Levels

Public Service will pay rebates based on the actual savings from a project, up to $525 per customer kW or $0.10 per customer kWh. Rebates will be given for either peak demand or energy savings for a project, not both, and will be limited to 50% of the incremental costs of the project. Rebates will apply to new and long-term leased equipment, but not to used equipment. The maximum lifetime and payback for a measure is limited to the lease duration. All measures submitted in a Self-Direct application will be combined for calculation of financial tests and rebate levels. Rebates will not be given for applications with expected paybacks of less than one year or paybacks greater than fifteen years. Rebate levels will be adjusted downward so that no project (with rebates included) has a payback less than one year. For rebate calculation purposes, kW saved shall reflect the reduction in the customer's peak demand (kW) as a result of the energy efficient project. For rebate calculation purposed, kWh saved will be the annual kWh saved as a result of the energy efficiency projects.

The expected rebate for the project will be communicated to the customer upon preapproval. The final rebate amount will equal the preapproved rebate amount if the actual project costs and energy/demand savings are within 10% of the estimated values and the TRC ratio for the completed project meets the criteria stated above. If actual project costs, energy or demand savings differ from the estimated values by more than 10%, the customer should include revised calculations for the requested rebate in the project completion report. Customers may be required to return their rebate, or a portion thereof, if the Commission determines that the Company is not allowed to recover costs associated with the project.

H. Evaluation, Measurement & Verification Plan

The Self-Directed Custom Program has a unique M&V process that is detailed in the M&V section of the Indirect Segment of this Plan. A comprehensive evaluation of the process and impacts of this program's delivery processes, customer satisfaction, technical assumptions, and net savings impacts will be completed in 2011.

I. Technical Assumptions

<u>Net-to-Gross</u>
The net-to-gross assumption (90.6%) was developed based on the weighted average of the net-to-gross factors determined for individual electric conservation technologies by Energy Efficient Best Practices California. The weighting for technologies was based on Custom Efficiency projects completed by large Colorado customers from 2006 to 2008.

Individual project technical assumptions will be provided by the customer in the application. The customer will be responsible for developing, documenting, and supporting these assumptions.

➢ Small Business Lighting Program

A. Description

The Small Business Lighting Program will offer free lighting audits and attractive rebates for lighting upgrades and special services to small and mid-sized business facilities with peak demand of up to 400 kW in Colorado's electric service territory. In addition to lighting, the customer will be informed of other energy-saving opportunities available for rebates such as heating, ventilation, cooling, motors, and recommissioning of their existing equipment. This Program is considered a start-up program during 2009 and 2010 and, therefore, may not meet cost-effectiveness thresholds. However, the Company will make every effort to run the Program cost-effectively

This Program will be focused on saving energy through the installation of energy-efficient lighting retrofits. The Program specifically targets barriers that often prevent small businesses from investing in energy efficiency products, such as: limited financial resources and time, limited knowledge of lighting products, and a lack of access to quality contractors. To address these issues the Program will offer:

- Intensive outreach to bring the service to the customer, rather than relying on the customer to seek it out;
- Simple, one-stop services that hold customer time requirements to a minimum;
- Computerized lighting audits and reporting systems that generate site-specific feedback and reports;
- Objective recommendations backed by the credibility of Public Service; and
- Substantial incentives potentially combined with convenient and attractive financing.

A similar program currently exists in Minnesota, the One-Stop Efficiency Shop, administered by the Center for Energy & the Environment (CEE). That Program has been offered to Xcel Energy's Minnesota customers since 2000 and has been quite successful in bringing lighting efficiency to small businesses. Of note, the CEE One-Stop Efficiency Shop Program was selected as a finalist for the 2005 Minnesota Environmental Initiative Award for Energy and Climate Protection.

Public Service will issue a Request for Proposal to select a third-party administrator. The third-party administrator will be responsible to provide a walk-through audit of facility focusing on the lighting systems, provide a report with recommendations including level of potential energy savings, serve as a liaison between the customer and the contractor during the retrofit, and complete and submit all rebate paperwork.

The California "Best Practices Benchmarking for Energy Efficiency Programs" recognized turnkey installations opportunities to non-residential customers, such as this Small Commercial Lighting Program proposal, as a best practice. Although several of the programs mentioned offered a range of measures (e.g., refrigeration and HVAC), lighting measures accounted for the bulk of energy savings attributed to such programs.

B. Budgets & Goals

Budgets
The budgets were developed based on costs from the first two years of the Minnesota Program. Public Service reviewed the average cost per kW to arrive at the current projections for Colorado. The largest budget driver in the Small Business Lighting Program is the lighting audit because it is free to the customer. The Company has projected an increase in costs in 2010 to accommodate increased participation.

Goals
Actual results of energy savings achievements including an average energy savings per customer from CEE's first two years of running the Minnesota Program were used to determine the Colorado goals. The Minnesota Program is a good proxy because the market size is similar between Minnesota and Colorado.

Table 30: Small Business Lighting Program Budgets and Goals

Small Business Lighting	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$72,609	N/A	$145,219	N/A
Admin & Program Delivery	$408,914	N/A	$1,780,874	N/A
Ad, Promo, & Customer Ed.	$50,025	N/A	$200,099	N/A
Customer Incentives	$243,012	N/A	$972,046	N/A
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	$14,674	N/A	$58,697	N/A
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$789,234**	**N/A**	**$3,156,935**	**N/A**
Generator kW	316	N/A	1,264	N/A
Generator kWh	1,153,540	N/A	4,614,158	N/A
Annual Dth	N/A	N/A	N/A	N/A
Annual Dth/$M	N/A	N/A	N/A	N/A
Participants	50	N/A	200	N/A
Participation as % of Segment	0.031%	N/A	0.125%	N/A
Modified TRC Test Ratio	**1.86**	**N/A**	**1.92**	**N/A**

C. Application Process

Public Service will promote the Small Business Lighting Program through several channels, including the Xcel Energy website, direct mail, email promotions and through the lighting trade. Our Business Solutions Center is available for all business customers, particularly the small business customers, who may need information on our rebate programs. Public Service also expects that the third-party administrator hired for this Program will aggressively promote it to increase participation.

The Small Business Lighting Program does not require preapproval for participation. The application process is similar to our Lighting Efficiency Program. The first step in the process is to conduct a lighting audit at the customer's facility. Public Service will request that third-party administrator bidders include an explanation of how they plan to implement the lighting audit within their proposals.

Customers may apply for rebates by completing the application and providing a detailed invoice for the newly installed equipment. The customers may submit for a rebate after the equipment has been purchased and installed. The replacement of fixtures for retrofit situations must be a one-for-one replacement that will result in energy savings. The equipment must be new and meet all the qualifications detailed on the application. After the customer has installed the equipment, the application and invoice must be submitted to Public Service within twelve months of the invoice date. Once the paperwork is completed and submitted, rebate checks will be mailed to the customer as indicated on the application within six to eight weeks.

D. Marketing Objectives, Goals, & Strategy

The Small Business Lighting Program will be marketed primarily through the third-party administrator who has not yet been selected. The administrator will be required to meet the implementation goals for which they are contracted and will determine the marketing strategies needed to meet them.

Public Service will also take lessons from the Minnesota program. The Center for Energy and Environment has had a great deal of success in lining up audits through the use of telemarketing and through referrals from contractors, customers, and Public Service staff. Over time, referrals have become a significant portion of the audits and we would hope to have that same result with the third-party administrator hired for the Colorado program.

The target customers for this service are small businesses of up to 400 kW annual average demand. All market segments are eligible and the Program will be available to all customers. Our Strategic Marketing group identified Small Business as a customer segment that has historically had low participation in energy efficiency programs due to barriers such as:

- Lack of awareness of energy savings potential in lighting system upgrades;
- Lack of time to complete all the necessary steps to upgrade lighting system;
- Lack of capital to make lighting improvements;
- Uncertainty of value when facility is not owner-occupied; and
- Limited availability of qualified contractors due to small margins on small business lighting projects.

Also, stakeholders and interested parties who participated in the Colorado Roundtable recommended implementing a program of this type for our Colorado Small Business customers.

Public Service will issue a request for proposal to hire a third-party administrator to implement the Small Business Lighting Program and will act as the contract administrator. The following guidelines will be provided to bidders:

- Customer is to receive a free lighting audit when they agree to participate in the Program;
- Third-party administrator will look for other energy savings opportunities during the audit and, at a minimum, make customers aware of other rebate opportunities;
- Third-party administrator will build a network of qualified contractors, approved by Public Service, to aid the customer in implementation of lighting retrofits;
- Third-party administrator will serve as a liaison between the customer and the contractor; and
- Third-party administrator will follow up with the customer to ensure that recommended measures get implemented and assist the customer as needed to hire a contractor and apply for rebates.

E. Program-Specific Policies

There are no program-specific policies identified at this time.

F. Stakeholder Involvement

The third-party administrator will have considerable importance in the success of the Program. They will be the face of Public Service to the Program participants. The Company will request that bidders for this Program address how they will engage all stakeholders in the design and implementation of this Program. For example, the administrator might propose to contact the Chambers of Commerce in cities within Public Service's service territory and invite them to a meeting regarding the program.

Lighting contractors will be an important part of the program as they will not only be doing the lighting retrofits, but will also help market the Program to customers. Public Service will encourage the third-party administrator to develop a list of qualified contractors available for program participants. The contractors on this list will have a vested interest in the program's success, as they will benefit from the work generated by the audits.

G. Rebate Levels

Prescriptive rebates will be paid based on technologies listed in the Lighting Efficiency Program.

H. Evaluation, Measurement & Verification Plan

All rebate applications are audited with a two-step process. On the front-end, as rebates are received, all critical customer information, equipment eligibility and proper rebates amounts are reviewed, validated, and corrected if inaccurate. The second step takes place prior to the rebate being issued where Rebate Operations audits 100% of the rebate applications to ensure that the information from the form was entered correctly into the tracking database.

The M&V process for prescriptive measures is detailed in the M&V section of the Indirect Segment of this report. The savings factors that will be verified for the Small Business Lighting Program are detailed in the Lighting Efficiency Program's Deemed Savings Technical Assumptions section.

Public Service will require the following data to be provided by the third-party administrator as part of an annual report: number of audits completed, number of jobs installed, total demand kW) savings, total energy (kWh) savings, total rebates paid, and audit costs.

I. Technical Assumptions

Public Service will use an initial net-to-gross factor of 100% for the Small Business Lighting Program, as the Small Business segment has not historically completed energy efficiency projects on their own, according to an analysis of this customer segment by the Company's internal Strategic Marketing department.

Energy savings used in the forecasted technical assumptions are based on actual reported savings in 2000 and 2001 (the first two years of the Minnesota Program) for the Center for Energy and Environment's One-Stop Efficiency Shop. In the Colorado Program, actual savings will be based on deemed savings for lighting lamps and fixtures.

➤ Standard Offer Program

A. Description

The Standard Offer Program will allow business customers to identify conservation opportunities and develop a bundled package of conservation measures to be implemented. The program will offer funding for customers to receive a technical energy audit and provide rebates to help offset the cost of implementation. This is considered a start-up program during 2009 and 2010 and, therefore, may not meet cost-effectiveness thresholds. However, the Company will make every effort to run the Program cost-effectively.

The initial phase of the Standard Offer Program will involve completion of a technical energy audit. The audit is typically performed by an Energy Service Company (ESCO), but also may be performed by the customer. A list of prequalified auditors is available through the Governor's Energy Office. The audit will follow the format established by GEO.[15] It will provide the customer with a final report detailing the energy conservation opportunities, financial analysis, and potential funding mechanisms. Additionally, the audit report will provide a summary page, which will detail the technical inputs required for the project benefit-cost analysis.

The Standard Offer Program is intended to serve customers with limited financial and human resources who have conservation potential. There are many key aspects of the Program that differentiate it from our other DSM offerings, which were developed specifically to address this group of customers. This Program, along with GEO support and prequalification of ESCOs, adds credibility to performance contracting as a method to implement conservation projects for customers who are locked into capital and operating budgets for long periods into the future. These customers typically do not have qualified internal personnel available to identify, develop, and implement the conservation projects. The Standard Offer Program can support these customers with financial resources and a framework for conservation to pursue these opportunities internally, or alternatively, Standard Offer is designed to align with the typical process of implementing conservation measures using an ESCO. Specifically, bundling measures together, and determining savings for the comprehensive project based on actual M&V data aligns this Program with typical performance contracts.

Public Service will provide a rebate of 50% of the technical energy audit cost if the customer agrees to implement the bundled conservation measures. Study funding at 50% for the Standard Offer Program is lower than study funding for other DSM programs because some of the work to generate the technical energy audit focuses on measures and technologies that fall outside of the scope of the Company's DSM programs. Public Service will also rebate a portion of the incremental costs to implement the recommended measures.

The Standard Offer Program provides customers with an opportunity to identify and implement a comprehensive package of cost effective efficiency measures whether they have internal resources and funding or they want to use outside resources such as those from an ESCO. The

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[15] GEO Technical Energy Audit & Project Proposal Contract, Scope of Work, (Exhibit A), Section 7.

Program differs from Public Service's other DSM offerings in that it allows customers to work with Energy Service Companies if desired. By doing so, customers are open to alternative funding mechanisms for their conservation projects that may not be available through the Company's other programs. The technical energy audit used in this Program is an investment grade audit, which can be used by the customer to secure internal or external funding for the project. Additionally, bundling individual measures into comprehensive projects minimizes required Company and customer resources, and increases the size of the projects, which draws more interest from contractors, equipment suppliers and ESCOs.

Public Service anticipates that the majority of participants in the Standard Offer Program will utilize ESCOs to perform the technical energy audit as well as to implement the bundled project using a performance contract. Performance contracting has been used in Colorado for many years, however it has not historically been supported by the GEO and Public Service at the levels proposed. We therefore anticipate significant growth for this contracting mechanism, which will allow entities with capital constraints to implement conservation measures.

B. Budget & Goals

Budget

The majority of the budget will provide rebate dollars to customers. Of the budget proposed for customer rebates, it is estimated that approximately one third will be study rebates and the remaining two thirds will be implementation rebates.

Goals

Public Service worked with GEO and the Colorado Energy Services Coalition to develop estimated participation rates for the Standard Offer Program. The Program is expected to experience significant growth between 2009 and 2010. The Company used the average savings from historical projects completed by government and education customers under the Colorado and Minnesota Custom Efficiency Programs to develop program budgets and goals for the Biennial Plan.

Table 31: Standard Offer Program Budgets and Goals

Standard Offer	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$20,000	$1,000	$5,000	N/A
Admin & Program Delivery	$133,600	$11,000	$257,600	$16,000
Ad, Promo, & Customer Ed.	$19,000	N/A	$28,000	N/A
Customer Incentives	$533,600	$9,000	$1,219,200	$18,000
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	N/A	N/A	N/A	N/A
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$706,200**	**$21,000**	**$1,509,800**	**$34,000**
Generator kW	813	N/A	1,625	N/A
Generator kWh	1,766,186	N/A	3,532,372	N/A
Annual Dth	N/A	473	N/A	1,890
Annual Dth/$M	N/A	22,503	N/A	55,597
Participants	24	12	48	24
Participation as % of Segment	0.015%	0.011%	0.030%	0.022%
Modified TRC Test Ratio	**2.50**	**1.35**	**2.53**	**1.93**

C. Application Process

Due to the comprehensive nature of the Standard Offer Program, Public Service expects the sales and completion cycle to range from 12 to 24 months. The Standard offer Program will be marketed through the account managers, as well as supported by the GEO. The Standard Offer process follows these steps:

1. The customer signs an intent document with Public Service rebate clause included. For public sector projects (schools, government buildings), the intent document is a Memorandum of Understanding between the customer and GEO. For private sector clients, it is a letter of intent signed by Public Service and the customer.
2. GEO, ESCO (if selected), or Public Service representative performs a walkthrough of the customer's building(s). The walk through identifies potential projects, and evaluates the approximate conservation potential for each building.
3. The customer selects an ESCO to perform the technical energy audit or decides to perform the audit internally.
4. The ESCO or customer applies to Public Service for pre-approval for the technical energy audit rebate.
5. If the customer is using an ESCO to perform the technical energy audit, a contract to perform the audit is signed by the ESCO and the customer.

6. The draft technical energy audit, including identified energy conservation measures is submitted to Public Service, reviewed by all applicable parties, and discussed to determine which measures will be implemented.
7. The technical energy audit is revised to reflect measures to be implemented, finalized, and submitted to Public Service. Public Service determines the project implementation rebate.
8. If the customer is using an ESCO to implement the measures, a construction contract is executed between the ESCO and the customer. If the customer is not using an ESCO to implement the measures, a letter of intent to implement the measures is signed by the customer and Public Service.
9. Public Service issues technical energy audit study rebate.
10. Initial M&V activities are performed, the measures are implemented, follow-up M&V activities are performed, and the customer sends their rebate application (including M&V data and calculations) to Public Service.
11. Public Service verifies the implementation, determines actual savings, and issues the measure implementation rebate based on the M&V results.
12. Annually, the ESCO or a third-party performs M&V and submits data and results to the customer, Public Service, and GEO. Public Service reviews the M&V report to confirm the annual savings and verifies that savings are appropriate to rebate paid. Additional rebates are paid for performance above the rebated conservation; alternatively, the customer refunds rebates if the actual savings are below the originally rebated savings.

D. Marketing Objectives, Goals, & Strategy

Public Service will rely on the Governor's Energy Office and participating Energy Service Companies to market this Program to customers. The Company expects that state and local governments, school districts and higher education institutions will be particularly interested in this Program. Additionally, Public Service will work with pre-qualified ESCOs to identify conservation opportunities with the Standard Offer Program outside of the public sector buildings. To supplement the efforts of the GEO and ESCOs, Public Service plans to offer training seminars to ESCOs, as well as targeted customer groups such as school administrators and government buildings staff. Additional communication formats including newsletters and direct mailing may be used to increase customer awareness.

E. Program-Specific Policies

The customer may perform the technical energy audit using a pre-qualified ESCO, or internally.

Public Service will not rebate for measures identified through the technical energy audit that are outside of the scope of the Company's DSM program offerings. For example, although the audit may identify the installation of a solar photovoltaic system as a worthwhile investment, this type of measure is not rebated through Public Service's DSM programs, and therefore will not be covered under the Standard Offer Program. Standard Offer implementation rebates will not be provided for these measures. These measures may however be eligible for rebates under alternate Public Service programs, such as Solar*Rewards. Public Service will identify these opportunities during the technical energy audit review process, and provide assistance with the appropriate supplemental Public Service rebate application process.

All measures agreed to in the final audit and construction contract/letter of intent will be evaluated together as one bundled project. The benefit-cost analysis and rebate amount will be calculated on the aggregated incremental costs and savings of the bundled project. Prescriptive rebates will not be issued for measures implemented in the Standard Offer Program. Instead, predicted and actual energy and demand reductions (measured through M&V) will be used to determine the rebate amount. For example, installation of a variable frequency drive on a 10 hp motor would not be issued a rebate based on the Motor & Drive Efficiency Program prescriptive dollars per horsepower standard. Rather, predicted and actual savings from the installation of the drive would be measured and calculated as part of the entire package of implemented measures. The amount of the rebate for the bundled project would be calculated based on the methodology described in section H, Rebate Levels.

Measurement and Verification plans will be required for all Standard Offer projects. M&V should continue for a minimum of three years, or for the duration of the performance contract, if used, which ever is longer.

F. Stakeholder Involvement

Public Service met on multiple occasions with the Governor's Energy Office and the Colorado Energy Services Coalition in developing the Standard Offer Program. Going forward, GEO will play a significant role in challenging schools, higher education institutions, state, and local government building participation. Additionally, the ESCO community, customers, and the GEO will provide valuable feedback through discussions with the product portfolio manager on possible program improvements.

G. Rebate Levels

Public Service will offer two main types of rebates in the Standard Offer Program. Study rebates will be given to offset a portion of the cost for the technical energy audit, and implementation rebates will be given based on actual energy and demand reductions to offset a portion of the incremental costs to implement the bundled project. The combination of study and implementation rebates are intended to encourage conservation projects, especially in educational and government buildings where peak demand may not correlate with system wide peak demand, and annual operating hours may vary significantly from project to project.

Study rebates will be provided for preapproved technical energy audits at 50% of the cost up to $0.10 per square foot for standard buildings. For non-standard buildings, Public Service will provide study rebates up to 50% of the technical energy audit cost, up to a limit identified in the pre-approval letter. Study rebates for customers performing their own technical energy audit will be given at $0.10 per square foot.

Implementation rebates apply to new and long-term leased equipment, but not to used equipment. The maximum lifetime and payback for a measure is limited to the lease duration. Rebate levels are based on actual savings up to $250 per kW saved and $0.05 per annual kWh saved. Rebates will be provided to Public Service Company of Colorado retail gas customers for gas conservation projects up to $7.00 per annual dekatherm. All implementation rebates will be limited to 60% of incremental costs. Rebates will not be given for bundled projects with expected paybacks of less than one year. Rebate levels will be adjusted downward so that no bundled project (with rebates included) has a payback less than one year. Rebates will not be given for projects with expected paybacks of more than fifteen years. For rebate calculation purposes, the demand savings shall reflect the reduction in the customer's peak demand (kW) as a result of the energy efficient project. For rebate calculation purposes, energy savings will be the annual kWh saved as a result of the energy efficiency project. For rebate calculation purposed, dekatherms saved will be the annual dekatherms saved as a result of the energy efficiency project.

Implementation rebate levels will be calculated based on the initial M&V results for the bundled project specified in the construction contract/letter of intent. M&V data from each year will be reviewed to determine if the implementation rebate amount was appropriate. Additional rebate will be given if the actual conservation is greater than 110% of the conservation calculated for the implementation rebate. Conversely, if the actual savings are less than 90% of the estimated savings, the customer will be required to return the portion of the rebate commensurate with any rebated savings above the actual measured savings.

H. Evaluation, Measurement & Verification Plan

The Standard Offer Program has a unique M&V process that is detailed in the M&V section of the Indirect Segment of the Plan.

I. Technical Assumptions

Net-to-Gross

The net-to-gross assumptions were developed based on referenced values for the conservation technologies adjusted to account for the existing conservation projects being completed by the ESCO community in Colorado. The weighted average net-to-gross factor (85.5%) was calculated based on the predicted mix of technologies determined for individual electric conservation technologies in the California "Best Practices Benchmarking for Energy Efficiency Programs". The gas net-to-gross value (93%) was assumed using one half of the electric free-rider factor. This is the first exposure for the Colorado market to gas energy conservation measures. Gas measures are typically more difficult to market and install, therefore less measures would be implemented without Public Service incentive programs. The predicted value will be used for calculation of 2009 and 2010 actual results, and the predicted value will be revised for the 2011/2012 Plan based on the actual results from 2009/2010 Plan.

General Assumptions

The forecasted technical assumptions used to estimate savings for this Program were derived from historical Custom Efficiency projects from education and government customers in Colorado. Project-specific assumptions will be presented in the technical energy audit for each project.

BUSINESS SEGMENT	2009	ELECTRIC	GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,318	$1,318	$1,318
Transmission & Distribution Capacity		$269	$269	$269
Marginal Energy		$2,555	$2,555	$2,555
Avoided Emissions (CO2, SOx)		$666	$666	$666
Subtotal		$4,809	$4,809	$4,809
Non-Energy Benefits Adder (10%)				$481
Subtotal		$4,809	$4,809	$5,290
Other Benefits				
Participant Rebates and Incentives	$396			$396
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$4			$3
Subtotal	$401			$399
Reduction in Sales Revenue				
Electric	$3,048		$2,811	
Subtotal	$3,048		$2,811	
Utility Program Costs				
Program Planning & Design		$25	$25	$25
Administration & Program Delivery		$171	$171	$171
Advertising/Promotion/Customer Ed		$52	$52	$52
Participant Rebates and Incentives		$396	$396	$396
Equipment & Installation		$0	$0	$0
Measurement and Verification		$39	$39	$39
Miscellaneous		$0	$0	$0
Subtotal		$683	$683	$683
Participant Costs				
Incremental Capital Costs	$1,128			$1,044
Incremental O&M Costs	$0			$0
Subtotal	$1,128			$1,044
Total Benefits	$3,449	$4,809	$4,809	$5,689
Total Costs	$1,128	$683	$3,495	$1,727
Net Benefit (Cost)	$2,321	$4,125	$1,314	$3,962
Benefit/Cost Ratio	**3.06**	**7.04**	**1.38**	**3.29**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	18 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	82.36%
Gross Load Factor at Customer	E	42.81%
Net-to-Gross (Energy)	F	92.2%
Net-to-Gross (Demand)	G	93.1%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$3,962
MTRC Non-Energy Benefit Adder	K	$481
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.8188 kW
Gross Annual kWh Saved at Customer	(B x E x C)	3,750 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	3,459 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	3,695 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	12.69 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	10.39 kW
Gross Annual kWh Saved at Customer	(B x E x L)	47,572 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	43,877 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	46,872 kWh

Program Summary All Participants		
Total Participants	M	2,483
Total Budget	N	**$21,520,457**
Gross kW Saved at Customer	(M x L)	31,501 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**25,793 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	118,132,336 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	108,957,041 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**116,394,660 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$124,795,596**
TRC Net Benefits without Adder	(M x L x (J - K))	**$109,647,978**

Utility Program Cost per kWh Lifetime	**$0.0102**
Utility Program Cost per kW at Gen	**$834**
Participant Payback with Rebate	**4.3 years**
Participant Payback without Rebate	**6.7 years**

BUSINESS SEGMENT — 2009 GAS GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$90.83	$90.83	$90.83
Variable O&M Savings		$0.46	$0.46	$0.46
Demand Savings		$5.33	$5.33	$5.33
Subtotal		$96.63	$96.63	$96.63
Emissions and Non-Energy Benefits Adder (5%)				$4.83
Subtotal		$96.63	$96.63	$101.46
Other Benefits				
Participant Rebates and Incentives	$5.24			$5.24
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$10.33			$9.61
Subtotal	$15.58			$14.85
Reduction in Sales Revenue				
Gas	$114.22		$108.15	
Subtotal	$114.22		$108.15	
Utility Program Costs				
Program Planning & Design		$0.86	$0.86	$0.86
Administration & Program Delivery		$5.66	$5.66	$5.66
Advertising/Promotion/Customer Ed		$1.82	$1.82	$1.82
Participant Rebates and Incentives		$5.24	$5.24	$5.24
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.87	$0.87	$0.87
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$14.46	$14.46	$14.46
Participant Costs				
Incremental Capital Costs	$30.24			$28.76
Incremental O&M Costs	$0.00			$0.00
Subtotal	$30.24			$28.76
Total Benefits	$129.80	$96.63	$96.63	$116.31
Total Costs	$30.24	$14.46	$122.61	$43.22
Net Benefit (Cost)	$99.56	$82.17	-$25.99	$73.09
Benefit/Cost Ratio	**4.29**	**6.68**	**0.79**	**2.69**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	17.34 years
Net-to-Gross (Weighted on Dth)	B	94.54%
Net-to-Gross (Weighted on Incremental Capital)	C	95.10%
Program Totals:		
Participants	D	264
Average Net Dth/Yr Saved	E	299.6
Total Dth/Yr Saved	F	**79,100**
Utility Costs per Net Dth/Yr	G	$15.29
Net Benefit (Cost) per Gross Dth/Yr	H	$73.09
Non-Energy Benefits Adder per Gross Dth/Yr	I	$4.83
Annual Dth/$M	($1M / G)	**65,394**
Total Utility Budget	(G x F)	**$1,209,587**
Total MTRC Net Benefits with Adder	(F x H)	**$6,115,126**
Total MTRC Net Benefits without Adder	(H - I) x F	**$5,710,913**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$0.88**
Participant Payback with Rebate		**2.0 years**
Participant Payback without Rebate		**2.5 years**

BUSINESS SEGMENT 2010 ELECTRIC GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,360	$1,360	$1,360
Transmission & Distribution Capacity		$272	$272	$272
Marginal Energy		$2,653	$2,653	$2,653
Avoided Emissions (CO_2, SOx)		$780	$780	$780
Subtotal		$5,066	$5,066	$5,066
Non-Energy Benefits Adder (10%)				$507
Subtotal		$5,066	$5,066	$5,572
Other Benefits				
Participant Rebates and Incentives	$410			$410
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$84			$69
Subtotal	$494			$479
Reduction in Sales Revenue				
Electric	$3,166		$2,925	
Subtotal	$3,166		$2,925	
Utility Program Costs				
Program Planning & Design		$20	$20	$20
Administration & Program Delivery		$191	$191	$191
Advertising/Promotion/Customer Ed		$87	$87	$87
Participant Rebates and Incentives		$410	$410	$410
Equipment & Installation		$0	$0	$0
Measurement and Verification		$41	$41	$41
Miscellaneous		$0	$0	$0
Subtotal		$749	$749	$749
Participant Costs				
Incremental Capital Costs	$1,145			$1,058
Incremental O&M Costs	$0			$0
Subtotal	$1,145			$1,058
Total Benefits	$3,660	$5,066	$5,066	$6,051
Total Costs	$1,145	$749	$3,674	$1,807
Net Benefit (Cost)	$2,515	$4,316	$1,392	$4,245
Benefit/Cost Ratio	**3.20**	**6.76**	**1.38**	**3.35**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	18 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	82.05%
Gross Load Factor at Customer	E	44.72%
Net-to-Gross (Energy)	F	92.4%
Net-to-Gross (Demand)	G	93.1%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$4,245
MTRC Non-Energy Benefit Adder	K	$507
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.8159 kW
Gross Annual kWh Saved at Customer	(B x E x C)	3,918 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	3,620 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	3,867 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	14.71 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	12.00 kW
Gross Annual kWh Saved at Customer	(B x E x L)	57,625 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	53,243 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	56,877 kWh

Program Summary All Participants		
Total Participants	M	2,921
Total Budget	N	**$32,191,888**
Gross kW Saved at Customer	(M x L)	42,964 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**35,053 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	168,323,722 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	155,521,797 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**166,138,016 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$182,371,268**
TRC Net Benefits without Adder	(M x L x (J - K))	**$160,606,913**

Utility Program Cost per kWh Lifetime	**$0.0108**
Utility Program Cost per kW at Gen	**$918**
Participant Payback with Rebate	**4.1 years**
Participant Payback without Rebate	**6.4 years**

BUSINESS SEGMENT — 2010 GAS GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$90.92	$90.92	$90.92
Variable O&M Savings		$0.46	$0.46	$0.46
Demand Savings		$5.34	$5.34	$5.34
Subtotal		$96.72	$96.72	$96.72
Emissions and Non-Energy Benefits Adder (5%)				$4.84
Subtotal		$96.72	$96.72	$101.56
Other Benefits				
Participant Rebates and Incentives	$4.86			$4.86
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$17.21			$16.01
Subtotal	$22.07			$20.87
Reduction in Sales Revenue				
Gas	$114.52		$108.47	
Subtotal	$114.52		$108.47	
Utility Program Costs				
Program Planning & Design		$0.97	$0.97	$0.97
Administration & Program Delivery		$4.17	$4.17	$4.17
Advertising/Promotion/Customer Ed		$3.75	$3.75	$3.75
Participant Rebates and Incentives		$4.86	$4.86	$4.86
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.95	$0.95	$0.95
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$14.69	$14.69	$14.69
Participant Costs				
Incremental Capital Costs	$29.83			$28.38
Incremental O&M Costs	$0.00			$0.00
Subtotal	$29.83			$28.38
Total Benefits	$136.59	$96.72	$96.72	$122.43
Total Costs	$29.83	$14.69	$123.16	$43.08
Net Benefit (Cost)	$106.77	$82.03	-$26.44	$79.35
Benefit/Cost Ratio	**4.58**	**6.58**	**0.79**	**2.84**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	17.31 years
Net-to-Gross (Weighted on Dth)	B	94.64%
Net-to-Gross (Weighted on Incremental Capital)	C	95.17%

Program Totals:		
Participants	D	297
Average Net Dth/Yr Saved	E	326.5
Total Dth/Yr Saved	F	**96,956**
Utility Costs per Net Dth/Yr	G	$15.53
Net Benefit (Cost) per Gross Dth/Yr	H	$79.35
Non-Energy Benefits Adder per Gross Dth/Yr	I	$4.84
Annual Dth/$M	($1M / G)	**64,400**
Total Utility Budget	(G x F)	**$1,505,522**
Total MTRC Net Benefits with Adder	(F x H)	**$8,129,177**
Total MTRC Net Benefits without Adder	(H - I) x F	**$7,633,709**

Utility Program Cost per Net Dth Lifetime	(G / A)	**$0.90**
Participant Payback with Rebate		**1.9 years**
Participant Payback without Rebate		**2.5 years**

BOILER EFFICIENCY PROGRAM — 2009 — GAS — GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$97.11	$97.11	$97.11
Variable O&M Savings		$0.49	$0.49	$0.49
Demand Savings		$5.65	$5.65	$5.65
Subtotal		$103.25	$103.25	$103.25
Emissions and Non-Energy Benefits Adder (5%)				$5.16
Subtotal		$103.25	$103.25	$108.41
Other Benefits				
Participant Rebates and Incentives	$6.85			$6.85
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$6.85			$6.85
Reduction in Sales Revenue				
Gas	$119.13		$115.56	
Subtotal	$119.13		$115.56	
Utility Program Costs				
Program Planning & Design		$1.67	$1.67	$1.67
Administration & Program Delivery		$3.92	$3.92	$3.92
Advertising/Promotion/Customer Ed		$1.42	$1.42	$1.42
Participant Rebates and Incentives		$6.85	$6.85	$6.85
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.72	$0.72	$0.72
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$14.58	$14.58	$14.58
Participant Costs				
Incremental Capital Costs	$29.73			$28.48
Incremental O&M Costs	$0.00			$0.00
Subtotal	$29.73			$28.48
Total Benefits	$125.98	$103.25	$103.25	$115.26
Total Costs	$29.73	$14.58	$130.14	$43.06
Net Benefit (Cost)	$96.25	$88.67	-$26.89	$72.20
Benefit/Cost Ratio	**4.24**	**7.08**	**0.79**	**2.68**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	18.57 years
Net-to-Gross (Weighted on Dth)	B	97.00%
Net-to-Gross (Weighted on Incremental Capital)	C	95.80%

Program Totals:		
Participants	D	146
Average Net Dth/Yr Saved	E	216.8
Total Dth/Yr Saved	F	**31,650**
Utility Costs per Net Dth/Yr	G	$15.03
Net Benefit (Cost) per Gross Dth/Yr	H	$72.20
Non-Energy Benefits Adder per Gross Dth/Yr	I	$5.16
Annual Dth/$M	($1M / G)	**66,514**
Total Utility Budget	(G x F)	**$475,834**
Total MTRC Net Benefits with Adder	(F x H)	**$2,355,668**
Total MTRC Net Benefits without Adder	(H - I) x F	**$2,187,224**

Utility Program Cost per Net Dth Lifetime	(G / A)	**$0.81**
Participant Payback with Rebate		**1.9 years**
Participant Payback without Rebate		**2.5 years**

BOILER EFFICIENCY PROGRAM | 2010 GAS GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$97.30	$97.30	$97.30
Variable O&M Savings		$0.49	$0.49	$0.49
Demand Savings		$5.65	$5.65	$5.65
Subtotal		$103.44	$103.44	$103.44
Emissions and Non-Energy Benefits Adder (5%)				$5.17
Subtotal		$103.44	$103.44	$108.61
Other Benefits				
Participant Rebates and Incentives	$6.85			$6.85
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$6.85			$6.85
Reduction in Sales Revenue				
Gas	$119.56		$115.97	
Subtotal	$119.56		$115.97	
Utility Program Costs				
Program Planning & Design		$2.35	$2.35	$2.35
Administration & Program Delivery		$4.13	$4.13	$4.13
Advertising/Promotion/Customer Ed		$2.83	$2.83	$2.83
Participant Rebates and Incentives		$6.85	$6.85	$6.85
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.86	$0.86	$0.86
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$17.02	$17.02	$17.02
Participant Costs				
Incremental Capital Costs	$29.73			$28.48
Incremental O&M Costs	$0.00			$0.00
Subtotal	$29.73			$28.48
Total Benefits	$126.41	$103.44	$103.44	$115.46
Total Costs	$29.73	$17.02	$132.99	$45.50
Net Benefit (Cost)	$96.68	$86.42	-$29.55	$69.96
Benefit/Cost Ratio	**4.25**	**6.08**	**0.78**	**2.54**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	18.57 years
Net-to-Gross (Weighted on Dth)	B	97.00%
Net-to-Gross (Weighted on Incremental Capital)	C	95.80%
Program Totals:		
Participants	D	146
Average Net Dth/Yr Saved	E	216.8
Total Dth/Yr Saved	F	**31,650**
Utility Costs per Net Dth/Yr	G	$17.54
Net Benefit (Cost) per Gross Dth/Yr	H	$69.96
Non-Energy Benefits Adder per Gross Dth/Yr	I	$5.17
Annual Dth/$M	($1M / G)	**57,007**
Total Utility Budget	(G x F)	**$555,188**
Total MTRC Net Benefits with Adder	(F x H)	**$2,282,794**
Total MTRC Net Benefits without Adder	(H - I) x F	**$2,114,042**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$0.94**
Participant Payback with Rebate		**1.9 years**
Participant Payback without Rebate		**2.5 years**

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,390	$1,390	$1,390
Transmission & Distribution Capacity		$283	$283	$283
Marginal Energy		$3,599	$3,599	$3,599
Avoided Emissions (CO2, SOx)		$964	$964	$964
Subtotal		$6,236	$6,236	$6,236
Non-Energy Benefits Adder (10%)				$624
Subtotal		$6,236	$6,236	$6,859
Other Benefits				
Participant Rebates and Incentives	$310			$310
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$310			$310
Reduction in Sales Revenue				
Electric	$3,953		$3,439	
Subtotal	$3,953		$3,439	
Utility Program Costs				
Program Planning & Design		$30	$30	$30
Administration & Program Delivery		$210	$210	$210
Advertising/Promotion/Customer Ed		$32	$32	$32
Participant Rebates and Incentives		$310	$310	$310
Equipment & Installation		$0	$0	$0
Measurement and Verification		$21	$21	$21
Miscellaneous		$0	$0	$0
Subtotal		$604	$604	$604
Participant Costs				
Incremental Capital Costs	$1,348			$1,173
Incremental O&M Costs	$0			$0
Subtotal	$1,348			$1,173
Total Benefits	$4,263	$6,236	$6,236	$7,169
Total Costs	$1,348	$604	$4,043	$1,777
Net Benefit (Cost)	$2,915	$5,632	$2,192	$5,392
Benefit/Cost Ratio	**3.16**	**10.32**	**1.54**	**4.03**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW

Lifetime (Weighted on Generator kWh)	A	18 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	94.88%
Gross Load Factor at Customer	E	67.45%
Net-to-Gross (Energy)	F	87.0%
Net-to-Gross (Demand)	G	87.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$5,392
MTRC Non-Energy Benefit Adder	K	$624
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.8818 kW
Gross Annual kWh Saved at Customer	(B x E x C)	5,909 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	5,141 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	5,492 kWh

Program Summary per Participant

Gross kW Saved at Customer	L	7.24 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	6.38 kW
Gross Annual kWh Saved at Customer	(B x E x L)	42,766 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	37,206 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	39,746 kWh

Program Summary All Participants

Total Participants	M	231
Total Budget	N	**$1,009,956**
Gross kW Saved at Customer	(M x L)	1,672 kW
Net coincident kW Saved at Generator	((G x L) x D / (1 - I)) x M	**1,474 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	9,878,938 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	8,594,676 kWh
Net Annual kWh Saved at Generator	((F x (B x E x L)) / (1 - H)) x M	**9,181,365 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$9,015,691**
TRC Net Benefits without Adder	(M x L x (J - K))	**$7,973,120**

Utility Program Cost per kWh Lifetime	**$0.0062**
Utility Program Cost per kW at Gen	**$685**
Participant Payback with Rebate	**4.7 years**
Participant Payback without Rebate	**6.0 years**

COMPRESSED AIR EFFICIENCY PROGRAM	2010	ELECTRIC	GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,443	$1,443	$1,443
Transmission & Distribution Capacity		$288	$288	$288
Marginal Energy		$3,624	$3,624	$3,624
Avoided Emissions (CO2, SOx)		$1,092	$1,092	$1,092
Subtotal		$6,447	$6,447	$6,447
Non-Energy Benefits Adder (10%)				$645
Subtotal		$6,447	$6,447	$7,091
Other Benefits				
Participant Rebates and Incentives	$308			$308
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$308			$308
Reduction in Sales Revenue				
Electric	$4,002		$3,481	
Subtotal	$4,002		$3,481	
Utility Program Costs				
Program Planning & Design		$29	$29	$29
Administration & Program Delivery		$217	$217	$217
Advertising/Promotion/Customer Ed		$95	$95	$95
Participant Rebates and Incentives		$308	$308	$308
Equipment & Installation		$0	$0	$0
Measurement and Verification		$21	$21	$21
Miscellaneous		$0	$0	$0
Subtotal		$670	$670	$670
Participant Costs				
Incremental Capital Costs	$1,334			$1,160
Incremental O&M Costs	$0			$0
Subtotal	$1,334			$1,160
Total Benefits	$4,309	$6,447	$6,447	$7,399
Total Costs	$1,334	$670	$4,152	$1,831
Net Benefit (Cost)	$2,976	$5,776	$2,295	$5,568
Benefit/Cost Ratio	**3.23**	**9.62**	**1.55**	**4.04**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	18 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	94.90%
Gross Load Factor at Customer	E	67.69%
Net-to-Gross (Energy)	F	87.0%
Net-to-Gross (Demand)	G	87.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$5,568
MTRC Non-Energy Benefit Adder	K	$645
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.8820 kW
Gross Annual kWh Saved at Customer	(B x E x C)	5,930 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	5,159 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	5,511 kWh
Program Summary per Participant		
Gross kW Saved at Customer	L	7.24 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	6.39 kW
Gross Annual kWh Saved at Customer	(B x E x L)	42,957 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	37,373 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	39,924 kWh
Program Summary All Participants		
Total Participants	M	249
Total Budget	N	**$1,208,969**
Gross kW Saved at Customer	(M x L)	1,804 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**1,591 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	10,696,357 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	9,305,830 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**9,941,064 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$10,044,361**
TRC Net Benefits without Adder	(M x L x (J - K))	**$8,881,516**
Utility Program Cost per kWh Lifetime		**$0.0069**
Utility Program Cost per kW at Gen		**$760**
Participant Payback with Rebate		**4.5 years**
Participant Payback without Rebate		**5.9 years**

COOLING EFFICIENCY PROGRAM 2009 ELECTRIC GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,227	$1,227	$1,227
Transmission & Distribution Capacity		$248	$248	$248
Marginal Energy		$1,062	$1,062	$1,062
Avoided Emissions (CO2, SOx)		$291	$291	$291
Subtotal		$2,829	$2,829	$2,829
Non-Energy Benefits Adder (10%)				$283
Subtotal		$2,829	$2,829	$3,112
Other Benefits				
Participant Rebates and Incentives	$446			$446
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$446			$446
Reduction in Sales Revenue				
Electric	$1,545		$1,452	
Subtotal	$1,545		$1,452	
Utility Program Costs				
Program Planning & Design		$19	$19	$19
Administration & Program Delivery		$36	$36	$36
Advertising/Promotion/Customer Ed		$25	$25	$25
Participant Rebates and Incentives		$446	$446	$446
Equipment & Installation		$0	$0	$0
Measurement and Verification		$19	$19	$19
Miscellaneous		$0	$0	$0
Subtotal		$545	$545	$545
Participant Costs				
Incremental Capital Costs	$1,353			$1,268
Incremental O&M Costs	$0			$0
Subtotal	$1,353			$1,268
Total Benefits	$1,991	$2,829	$2,829	$3,558
Total Costs	$1,353	$545	$1,997	$1,813
Net Benefit (Cost)	$638	$2,284	$832	$1,745
Benefit/Cost Ratio	**1.47**	**5.19**	**1.42**	**1.96**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW

Lifetime (Weighted on Generator kWh)	A	20 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	71.99%
Gross Load Factor at Customer	E	16.70%
Net-to-Gross (Energy)	F	94.0%
Net-to-Gross (Demand)	G	94.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$1,745
MTRC Non-Energy Benefit Adder	K	$283
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.7229 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,463 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,375 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,469 kWh

Program Summary per Participant

Gross kW Saved at Customer	L	17.94 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	12.97 kW
Gross Annual kWh Saved at Customer	(B x E x L)	26,252 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	24,677 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	26,361 kWh

Program Summary All Participants

Total Participants	M	234
Total Budget	N	**$2,288,950**
Gross kW Saved at Customer	(M x L)	4,198 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**3,035 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	6,142,990 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	5,774,410 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**6,168,583 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$7,325,899**
TRC Net Benefits without Adder	(M x L x (J - K))	**$6,138,181**

Utility Program Cost per kWh Lifetime	**$0.0187**
Utility Program Cost per kW at Gen	**$754**
Participant Payback with Rebate	**11.6 years**
Participant Payback without Rebate	**17.4 years**

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,249	$1,249	$1,249
Transmission & Distribution Capacity		$248	$248	$248
Marginal Energy		$1,087	$1,087	$1,087
Avoided Emissions (CO2, SOx)		$337	$337	$337
Subtotal		$2,921	$2,921	$2,921
Non-Energy Benefits Adder (10%)				$292
Subtotal		$2,921	$2,921	$3,213
Other Benefits				
Participant Rebates and Incentives	$437			$437
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$437			$437
Reduction in Sales Revenue				
Electric	$1,588		$1,493	
Subtotal	$1,588		$1,493	
Utility Program Costs				
Program Planning & Design		$18	$18	$18
Administration & Program Delivery		$38	$38	$38
Advertising/Promotion/Customer Ed		$48	$48	$48
Participant Rebates and Incentives		$437	$437	$437
Equipment & Installation		$0	$0	$0
Measurement and Verification		$21	$21	$21
Miscellaneous		$0	$0	$0
Subtotal		$562	$562	$562
Participant Costs				
Incremental Capital Costs	$1,309			$1,226
Incremental O&M Costs	$0			$0
Subtotal	$1,309			$1,226
Total Benefits	$2,025	$2,921	$2,921	$3,650
Total Costs	$1,309	$562	$2,054	$1,788
Net Benefit (Cost)	$716	$2,359	$867	$1,862
Benefit/Cost Ratio	**1.55**	**5.20**	**1.42**	**2.04**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	20 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	70.46%
Gross Load Factor at Customer	E	17.19%
Net-to-Gross (Energy)	F	94.0%
Net-to-Gross (Demand)	G	94.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$1,862
MTRC Non-Energy Benefit Adder	K	$292
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.7076 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,506 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,415 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,512 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	18.24 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	12.91 kW
Gross Annual kWh Saved at Customer	(B x E x L)	27,471 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	25,822 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	27,585 kWh

Program Summary All Participants		
Total Participants	M	252
Total Budget	N	**$2,582,748**
Gross kW Saved at Customer	(M x L)	4,597 kW
Net coincident kW Saved at Generator	((G x L) x D / (1 - I)) x M	**3,253 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	6,922,598 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	6,507,242 kWh
Net Annual kWh Saved at Generator	((F x (B x E x L)) / (1 - H)) x M	**6,951,439 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$8,560,392**
TRC Net Benefits without Adder	(M x L x (J - K))	**$7,217,472**

Utility Program Cost per kWh Lifetime	**$0.0187**
Utility Program Cost per kW at Gen	**$794**
Participant Payback with Rebate	**10.9 years**
Participant Payback without Rebate	**16.3 years**

CUSTOM EFFICIENCY PROGRAM — 2009 — ELECTRIC — GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,215	$1,215	$1,215
Transmission & Distribution Capacity		$249	$249	$249
Marginal Energy		$2,881	$2,881	$2,881
Avoided Emissions (CO2, SOx)		$754	$754	$754
Subtotal		$5,099	$5,099	$5,099
Non-Energy Benefits Adder (10%)				$510
Subtotal		$5,099	$5,099	$5,609
Other Benefits				
Participant Rebates and Incentives	$400			$400
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$1,260			$1,096
Subtotal	$1,660			$1,496
Reduction in Sales Revenue				
Electric	$3,334		$2,901	
Subtotal	$3,334		$2,901	
Utility Program Costs				
Program Planning & Design		$178	$178	$178
Administration & Program Delivery		$374	$374	$374
Advertising/Promotion/Customer Ed		$389	$389	$389
Participant Rebates and Incentives		$400	$400	$400
Equipment & Installation		$0	$0	$0
Measurement and Verification		$45	$45	$45
Miscellaneous		$0	$0	$0
Subtotal		$1,386	$1,386	$1,386
Participant Costs				
Incremental Capital Costs	$2,368			$2,060
Incremental O&M Costs	$0			$0
Subtotal	$2,368			$2,060
Total Benefits	$4,994	$5,099	$5,099	$7,105
Total Costs	$2,368	$1,386	$4,286	$3,445
Net Benefit (Cost)	$2,626	$3,714	$813	$3,660
Benefit/Cost Ratio	**2.11**	**3.68**	**1.19**	**2.06**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	18 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	82.63%
Gross Load Factor at Customer	E	51.35%
Net-to-Gross (Energy)	F	87.0%
Net-to-Gross (Demand)	G	87.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$3,660
MTRC Non-Energy Benefit Adder	K	$510
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.7680 kW
Gross Annual kWh Saved at Customer	(B x E x C)	4,498 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	3,913 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	4,180 kWh
Program Summary per Participant		
Gross kW Saved at Customer	L	41.54 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	31.90 kW
Gross Annual kWh Saved at Customer	(B x E x L)	186,850 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	162,560 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	173,656 kWh
Program Summary All Participants		
Total Participants	M	43
Total Budget	N	**$2,474,819**
Gross kW Saved at Customer	(M x L)	1,786 kW
Net coincident kW Saved at Generator	((G x L) x D / (1 - I)) x M	**1,372 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	8,034,561 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	6,990,068 kWh
Net Annual kWh Saved at Generator	((F x (B x E x L)) / (1 - H)) x M	**7,467,223 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$6,537,440**
TRC Net Benefits without Adder	(M x L x (J - K))	**$5,626,583**
Utility Program Cost per kWh Lifetime		**$0.0184**
Utility Program Cost per kW at Gen		**$1,804**
Participant Payback with Rebate		**10.2 years**
Participant Payback without Rebate		**12.4 years**

CUSTOM EFFICIENCY PROGRAM

2009 Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$93.72	$93.72	$93.72
Variable O&M Savings		$0.48	$0.48	$0.48
Demand Savings		$5.52	$5.52	$5.52
Subtotal		$99.73	$99.73	$99.73
Emissions and Non-Energy Benefits Adder (5%)				$4.99
Subtotal		$99.73	$99.73	$104.71
Other Benefits				
Participant Rebates and Incentives	$3.28			$3.28
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$3.28			$3.28
Reduction in Sales Revenue				
Gas	$120.05		$111.65	
Subtotal	$120.05		$111.65	
Utility Program Costs				
Program Planning & Design		$0.10	$0.10	$0.10
Administration & Program Delivery		$8.82	$8.82	$8.82
Advertising/Promotion/Customer Ed		$1.22	$1.22	$1.22
Participant Rebates and Incentives		$3.28	$3.28	$3.28
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.26	$0.26	$0.26
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$13.69	$13.69	$13.69
Participant Costs				
Incremental Capital Costs	$33.23			$30.90
Incremental O&M Costs	$0.00			$0.00
Subtotal	$33.23			$30.90
Total Benefits	$123.33	$99.73	$99.73	$108.00
Total Costs	$33.23	$13.69	$125.34	$44.59
Net Benefit (Cost)	$90.10	$86.04	-$25.61	$63.40
Benefit/Cost Ratio	**3.71**	**7.29**	**0.80**	**2.42**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

2009 GAS GOAL

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	18 years
Net-to-Gross	B	93%

Program Totals:		
Participants	C	14
Average Dth/Yr Saved	D	963.7
Total Dth/Yr Saved	E	**13,492**
Utility Costs per Net Dth/Yr	F	$14.72
Net Benefit (Cost) per Gross Dth/Yr	G	$63.40
Non-Energy Benefits Adder per Gross Dth/Yr	H	$4.99
Annual Dth/$M	($1M / F)	**67,944**
Total Utility Budget	(F x E)	**$198,578**
Total MTRC Net Benefits with Adder	(E x G)	**$855,439**
Total MTRC Net Benefits without Adder	(G - H) x E	**$788,162**

Utility Program Cost per Net Dth Lifetime	(F / A)	**$0.82**
Participant Payback with Rebate		**2.5 years**
Participant Payback without Rebate		**2.8 years**

CUSTOM EFFICIENCY PROGRAM — 2010 — ELECTRIC — GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,264	$1,264	$1,264
Transmission & Distribution Capacity		$254	$254	$254
Marginal Energy		$2,912	$2,912	$2,912
Avoided Emissions (CO2, SOx)		$853	$853	$853
Subtotal		$5,283	$5,283	$5,283
Non-Energy Benefits Adder (10%)				$528
Subtotal		$5,283	$5,283	$5,812
Other Benefits				
Participant Rebates and Incentives	$400			$400
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$1,260			$1,096
Subtotal	$1,660			$1,496
Reduction in Sales Revenue				
Electric	$3,377		$2,938	
Subtotal	$3,377		$2,938	
Utility Program Costs				
Program Planning & Design		$161	$161	$161
Administration & Program Delivery		$392	$392	$392
Advertising/Promotion/Customer Ed		$487	$487	$487
Participant Rebates and Incentives		$400	$400	$400
Equipment & Installation		$0	$0	$0
Measurement and Verification		$45	$45	$45
Miscellaneous		$0	$0	$0
Subtotal		$1,485	$1,485	$1,485
Participant Costs				
Incremental Capital Costs	$2,368			$2,060
Incremental O&M Costs	$0			$0
Subtotal	$2,368			$2,060
Total Benefits	$5,037	$5,283	$5,283	$7,308
Total Costs	$2,368	$1,485	$4,423	$3,545
Net Benefit (Cost)	$2,669	$3,798	$860	$3,763
Benefit/Cost Ratio	**2.13**	**3.56**	**1.19**	**2.06**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	18 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	82.63%
Gross Load Factor at Customer	E	51.35%
Net-to-Gross (Energy)	F	87.0%
Net-to-Gross (Demand)	G	87.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$3,763
MTRC Non-Energy Benefit Adder	K	$528
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.7680 kW
Gross Annual kWh Saved at Customer	(B x E x C)	4,498 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	3,913 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	4,180 kWh
Program Summary per Participant		
Gross kW Saved at Customer	L	41.54 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	31.90 kW
Gross Annual kWh Saved at Customer	(B x E x L)	186,850 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	162,560 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	173,656 kWh
Program Summary All Participants		
Total Participants	M	50
Total Budget	N	**$3,085,144**
Gross kW Saved at Customer	(M x L)	2,077 kW
Net coincident kW Saved at Generator	((G x L) x D / (1 - I)) x M	**1,595 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	9,342,513 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	8,127,986 kWh
Net Annual kWh Saved at Generator	((F x (B x E x L)) / (1 - H)) x M	**8,682,818 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$7,814,845**
TRC Net Benefits without Adder	(M x L x (J - K))	**$6,717,470**
Utility Program Cost per kWh Lifetime		**$0.0197**
Utility Program Cost per kW at Gen		**$1,934**
Participant Payback with Rebate		**10.1 years**
Participant Payback without Rebate		**12.2 years**

CUSTOM EFFICIENCY PROGRAM — 2010 GAS GOAL

2010 Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$93.88	$93.88	$93.88
Variable O&M Savings		$0.48	$0.48	$0.48
Demand Savings		$5.52	$5.52	$5.52
Subtotal		$99.89	$99.89	$99.89
Emissions and Non-Energy Benefits Adder (5%)				$4.99
Subtotal		$99.89	$99.89	$104.88
Other Benefits				
Participant Rebates and Incentives	$3.28			$3.28
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$3.28			$3.28
Reduction in Sales Revenue				
Gas	$120.46		$112.02	
Subtotal	$120.46		$112.02	
Utility Program Costs				
Program Planning & Design		$0.10	$0.10	$0.10
Administration & Program Delivery		$4.16	$4.16	$4.16
Advertising/Promotion/Customer Ed		$4.43	$4.43	$4.43
Participant Rebates and Incentives		$3.28	$3.28	$3.28
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.26	$0.26	$0.26
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$12.24	$12.24	$12.24
Participant Costs				
Incremental Capital Costs	$33.23			$30.90
Incremental O&M Costs	$0.00			$0.00
Subtotal	$33.23			$30.90
Total Benefits	$123.74	$99.89	$99.89	$108.16
Total Costs	$33.23	$12.24	$124.26	$43.14
Net Benefit (Cost)	$90.51	$87.65	-$24.37	$65.02
Benefit/Cost Ratio	**3.72**	**8.16**	**0.80**	**2.51**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	18 years
Net-to-Gross	B	93%

Program Totals:		
Participants	C	14
Average Dth/Yr Saved	D	963.7
Total Dth/Yr Saved	E	**13,492**
Utility Costs per Net Dth/Yr	F	$13.16
Net Benefit (Cost) per Gross Dth/Yr	G	$65.02
Non-Energy Benefits Adder per Gross Dth/Yr	H	$4.99
Annual Dth/$M	($1M / F)	**76,010**
Total Utility Budget	(F x E)	**$177,505**
Total MTRC Net Benefits with Adder	(E x G)	**$877,271**
Total MTRC Net Benefits without Adder	(G - H) x E	**$809,887**

Utility Program Cost per Net Dth Lifetime	(F / A)	**$0.73**
Participant Payback with Rebate		**2.7 years**
Participant Payback without Rebate		**2.9 years**

DATA CENTER EFFICIENCY PROGRAM	2009	ELECTRIC	GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,378	$1,378	$1,378
Transmission & Distribution Capacity		$279	$279	$279
Marginal Energy		$5,695	$5,695	$5,695
Avoided Emissions (CO2, SOx)		$1,671	$1,671	$1,671
Subtotal		$9,024	$9,024	$9,024
Non-Energy Benefits Adder (10%)				$902
Subtotal		$9,024	$9,024	$9,926
Other Benefits				
Participant Rebates and Incentives	$475			$475
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$475			$475
Reduction in Sales Revenue				
Electric	$5,917		$5,325	
Subtotal	$5,917		$5,325	
Utility Program Costs				
Program Planning & Design		$116	$116	$116
Administration & Program Delivery		$32	$32	$32
Advertising/Promotion/Customer Ed		$97	$97	$97
Participant Rebates and Incentives		$475	$475	$475
Equipment & Installation		$0	$0	$0
Measurement and Verification		$36	$36	$36
Miscellaneous		$0	$0	$0
Subtotal		$756	$756	$756
Participant Costs				
Incremental Capital Costs	$824			$741
Incremental O&M Costs	$864			$777
Subtotal	$1,688			$1,519
Total Benefits	$6,391	$9,024	$9,024	$10,401
Total Costs	$1,688	$756	$6,081	$2,275
Net Benefit (Cost)	$4,704	$8,268	$2,943	$8,126
Benefit/Cost Ratio	3.79	11.94	1.48	4.57

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	20 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	84.47%
Gross Load Factor at Customer	E	100.00%
Net-to-Gross (Energy)	F	90.0%
Net-to-Gross (Demand)	G	90.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$8,126
MTRC Non-Energy Benefit Adder	K	$902
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.8121 kW
Gross Annual kWh Saved at Customer	(B x E x C)	8,760 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	7,884 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	8,422 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	70.29 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	57.09 kW
Gross Annual kWh Saved at Customer	(B x E x L)	615,775 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	554,198 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	592,028 kWh

Program Summary All Participants		
Total Participants	M	10
Total Budget	N	**$531,350**
Gross kW Saved at Customer	(M x L)	703 kW
Net coincident kW Saved at Generator	((G x L) x D / (1 - I)) x M	**571 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	6,157,751 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	5,541,975 kWh
Net Annual kWh Saved at Generator	((F x (B x E x L)) / (1 - H)) x M	**5,920,281 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$5,712,051**
TRC Net Benefits without Adder	(M x L x (J - K))	**$5,077,745**

Utility Program Cost per kWh Lifetime	**$0.0045**
Utility Program Cost per kW at Gen	**$931**
Participant Payback with Rebate	**1.3 years**
Participant Payback without Rebate	**2.9 years**

DATA CENTER EFFICIENCY PROGRAM 2010 ELECTRIC GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,433	$1,433	$1,433
Transmission & Distribution Capacity		$285	$285	$285
Marginal Energy		$5,765	$5,765	$5,765
Avoided Emissions (CO2, SOx)		$1,879	$1,879	$1,879
Subtotal		$9,361	$9,361	$9,361
Non-Energy Benefits Adder (10%)				$936
Subtotal		$9,361	$9,361	$10,297
Other Benefits				
Participant Rebates and Incentives	$437			$437
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$437			$437
Reduction in Sales Revenue				
Electric	$5,994		$5,395	
Subtotal	$5,994		$5,395	
Utility Program Costs				
Program Planning & Design		$60	$60	$60
Administration & Program Delivery		$16	$16	$16
Advertising/Promotion/Customer Ed		$181	$181	$181
Participant Rebates and Incentives		$437	$437	$437
Equipment & Installation		$0	$0	$0
Measurement and Verification		$35	$35	$35
Miscellaneous		$0	$0	$0
Subtotal		$730	$730	$730
Participant Costs				
Incremental Capital Costs	$756			$680
Incremental O&M Costs	$863			$777
Subtotal	$1,619			$1,457
Total Benefits	$6,432	$9,361	$9,361	$10,735
Total Costs	$1,619	$730	$6,125	$2,187
Net Benefit (Cost)	$4,812	$8,631	$3,237	$8,548
Benefit/Cost Ratio	**3.97**	**12.83**	**1.53**	**4.91**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	20 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	84.47%
Gross Load Factor at Customer	E	100.00%
Net-to-Gross (Energy)	F	90.0%
Net-to-Gross (Demand)	G	90.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$8,548
MTRC Non-Energy Benefit Adder	K	$936
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.8121 kW
Gross Annual kWh Saved at Customer	(B x E x C)	8,760 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	7,884 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	8,422 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	100.47 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	81.60 kW
Gross Annual kWh Saved at Customer	(B x E x L)	880,153 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	792,138 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	846,211 kWh

Program Summary All Participants		
Total Participants	M	14
Total Budget	N	**$1,026,465**
Gross kW Saved at Customer	(M x L)	1,407 kW
Net coincident kW Saved at Generator	((G x L) x D / (1 - I)) x M	**1,142 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	12,322,143 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	11,089,929 kWh
Net Annual kWh Saved at Generator	((F x (B x E x L)) / (1 - H)) x M	**11,846,949 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$12,023,511**
TRC Net Benefits without Adder	(M x L x (J - K))	**$10,706,737**

Utility Program Cost per kWh Lifetime	**$0.0043**
Utility Program Cost per kW at Gen	**$899**
Participant Payback with Rebate	**1.2 years**
Participant Payback without Rebate	**2.7 years**

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$90	$90	$90
Transmission & Distribution Capacity		$19	$19	$19
Marginal Energy		$3,319	$3,319	$3,319
Avoided Emissions (CO2, SOx)		$795	$795	$795
Subtotal		$4,223	$4,223	$4,223
Non-Energy Benefits Adder (10%)				$422
Subtotal		$4,223	$4,223	$4,646
Other Benefits				
Participant Rebates and Incentives	$609			$609
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$1,924			$1,674
Subtotal	$2,533			$2,283
Reduction in Sales Revenue				
Electric	$4,520		$3,932	
Subtotal	$4,520		$3,932	
Utility Program Costs				
Program Planning & Design		$84	$84	$84
Administration & Program Delivery		$606	$606	$606
Advertising/Promotion/Customer Ed		$98	$98	$98
Participant Rebates and Incentives		$609	$609	$609
Equipment & Installation		$0	$0	$0
Measurement and Verification		$57	$57	$57
Miscellaneous		$0	$0	$0
Subtotal		$1,454	$1,454	$1,454
Participant Costs				
Incremental Capital Costs	$1,772			$1,541
Incremental O&M Costs	$0			$0
Subtotal	$1,772			$1,541
Total Benefits	$7,053	$4,223	$4,223	$6,929
Total Costs	$1,772	$1,454	$5,387	$2,996
Net Benefit (Cost)	$5,281	$2,769	($1,163)	$3,933
Benefit/Cost Ratio	**3.98**	**2.90**	**0.78**	**2.31**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	10 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	9.50%
Gross Load Factor at Customer	E	97.37%
Net-to-Gross (Energy)	F	87.0%
Net-to-Gross (Demand)	G	87.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$3,933
MTRC Non-Energy Benefit Adder	K	$422
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.0883 kW
Gross Annual kWh Saved at Customer	(B x E x C)	8,529 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	7,420 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	7,927 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	18.44 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	1.63 kW
Gross Annual kWh Saved at Customer	(B x E x L)	157,274 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	136,828 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	146,168 kWh

Program Summary All Participants		
Total Participants	M	29
Total Budget	N	**$777,692**
Gross kW Saved at Customer	(M x L)	535 kW
Net coincident kW Saved at Generator	((G x L) x D / (1 - I)) x M	**47 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	4,560,943 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	3,968,020 kWh
Net Annual kWh Saved at Generator	((F x (B x E x L)) / (1 - H)) x M	**4,238,885 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$2,103,151**
TRC Net Benefits without Adder	(M x L x (J - K))	**$1,877,310**

Utility Program Cost per kWh Lifetime	**$0.0183**
Utility Program Cost per kW at Gen	**$16,468**
Participant Payback with Rebate	**2.1 years**
Participant Payback without Rebate	**3.5 years**

ENERGY MANAGEMENT SYSTEMS PROGRAM — 2009 GAS GOAL

2009 Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$48.29	$48.29	$48.29
Variable O&M Savings		$0.26	$0.26	$0.26
Demand Savings		$3.04	$3.04	$3.04
Subtotal		$51.59	$51.59	$51.59
Emissions and Non-Energy Benefits Adder (5%)				$2.58
Subtotal		$51.59	$51.59	$54.17
Other Benefits				
Participant Rebates and Incentives	$6.42			$6.42
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$6.42			$6.42
Reduction in Sales Revenue				
Gas	$62.03		$57.68	
Subtotal	$62.03		$57.68	
Utility Program Costs				
Program Planning & Design		$0.20	$0.20	$0.20
Administration & Program Delivery		$11.35	$11.35	$11.35
Advertising/Promotion/Customer Ed		$1.07	$1.07	$1.07
Participant Rebates and Incentives		$6.42	$6.42	$6.42
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.51	$0.51	$0.51
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$19.55	$19.55	$19.55
Participant Costs				
Incremental Capital Costs	$17.53			$16.30
Incremental O&M Costs	$0.00			$0.00
Subtotal	$17.53			$16.30
Total Benefits	$68.45	$51.59	$51.59	$60.59
Total Costs	$17.53	$19.55	$77.23	$35.85
Net Benefit (Cost)	$50.92	$32.04	-$25.64	$24.74
Benefit/Cost Ratio	**3.90**	**2.64**	**0.67**	**1.69**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	7 years
Net-to-Gross	B	93%

Program Totals:		
Participants	C	14
Average Dth/Yr Saved	D	449.0
Total Dth/Yr Saved	E	**6,286**
Utility Costs per Net Dth/Yr	F	$21.02
Net Benefit (Cost) per Gross Dth/Yr	G	$24.74
Non-Energy Benefits Adder per Gross Dth/Yr	H	$2.58
Annual Dth/$M	($1M / F)	**47,579**
Total Utility Budget	(F x E)	**$132,121**
Total MTRC Net Benefits with Adder	(E x G)	**$155,535**
Total MTRC Net Benefits without Adder	(G - H) x E	**$139,320**

Utility Program Cost per Net Dth Lifetime	(F / A)	**$3.00**
Participant Payback with Rebate		**0.9 years**
Participant Payback without Rebate		**1.5 years**

ENERGY MANAGEMENT SYSTEMS PROGRAM | 2010 | ELECTRIC | GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$93	$93	$93
Transmission & Distribution Capacity		$20	$20	$20
Marginal Energy		$3,267	$3,267	$3,267
Avoided Emissions (CO2, SOx)		$945	$945	$945
Subtotal		$4,325	$4,325	$4,325
Non-Energy Benefits Adder (10%)				$432
Subtotal		$4,325	$4,325	$4,757
Other Benefits				
Participant Rebates and Incentives	$598			$598
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$1,924			$1,674
Subtotal	$2,522			$2,271
Reduction in Sales Revenue				
Electric	$4,571		$3,977	
Subtotal	$4,571		$3,977	
Utility Program Costs				
Program Planning & Design		$71	$71	$71
Administration & Program Delivery		$591	$591	$591
Advertising/Promotion/Customer Ed		$246	$246	$246
Participant Rebates and Incentives		$598	$598	$598
Equipment & Installation		$0	$0	$0
Measurement and Verification		$56	$56	$56
Miscellaneous		$0	$0	$0
Subtotal		$1,561	$1,561	$1,561
Participant Costs				
Incremental Capital Costs	$1,772			$1,541
Incremental O&M Costs	$0			$0
Subtotal	$1,772			$1,541
Total Benefits	$7,093	$4,325	$4,325	$7,029
Total Costs	$1,772	$1,561	$5,538	$3,102
Net Benefit (Cost)	$5,321	$2,764	($1,213)	$3,926
Benefit/Cost Ratio	**4.00**	**2.77**	**0.78**	**2.27**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	10 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	9.50%
Gross Load Factor at Customer	E	97.37%
Net-to-Gross (Energy)	F	87.0%
Net-to-Gross (Demand)	G	87.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$3,926
MTRC Non-Energy Benefit Adder	K	$432
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.0883 kW
Gross Annual kWh Saved at Customer	(B x E x C)	8,529 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	7,420 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	7,927 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	18.44 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	1.63 kW
Gross Annual kWh Saved at Customer	(B x E x L)	157,274 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	136,828 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	146,168 kWh

Program Summary All Participants		
Total Participants	M	38
Total Budget	N	**$1,093,870**
Gross kW Saved at Customer	(M x L)	701 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**62 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	5,976,408 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	5,199,475 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**5,554,401 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$2,751,144**
TRC Net Benefits without Adder	(M x L x (J - K))	**$2,448,110**

Utility Program Cost per kWh Lifetime	**$0.0197**
Utility Program Cost per kW at Gen	**$17,677**
Participant Payback with Rebate	**2.1 years**
Participant Payback without Rebate	**3.5 years**

ENERGY MANAGEMENT SYSTEMS PROGRAM — 2010 GAS GOAL

2010 Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$47.28	$47.28	$47.28
Variable O&M Savings		$0.26	$0.26	$0.26
Demand Savings		$3.04	$3.04	$3.04
Subtotal		$50.58	$50.58	$50.58
Emissions and Non-Energy Benefits Adder (5%)				$2.53
Subtotal		$50.58	$50.58	$53.11
Other Benefits				
Participant Rebates and Incentives	$6.42			$6.42
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$6.42			$6.42
Reduction in Sales Revenue				
Gas	$61.06		$56.79	
Subtotal	$61.06		$56.79	
Utility Program Costs				
Program Planning & Design		$0.20	$0.20	$0.20
Administration & Program Delivery		$11.03	$11.03	$11.03
Advertising/Promotion/Customer Ed		$1.03	$1.03	$1.03
Participant Rebates and Incentives		$6.42	$6.42	$6.42
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.51	$0.51	$0.51
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$19.18	$19.18	$19.18
Participant Costs				
Incremental Capital Costs	$17.53			$16.30
Incremental O&M Costs	$0.00			$0.00
Subtotal	$17.53			$16.30
Total Benefits	$67.48	$50.58	$50.58	$59.53
Total Costs	$17.53	$19.18	$75.97	$35.48
Net Benefit (Cost)	$49.95	$31.40	-$25.39	$24.05
Benefit/Cost Ratio	**3.85**	**2.64**	**0.67**	**1.68**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	7 years
Net-to-Gross	B	93%

Program Totals:		
Participants	C	14
Average Dth/Yr Saved	D	449.0
Total Dth/Yr Saved	E	**6,286**
Utility Costs per Net Dth/Yr	F	$20.62
Net Benefit (Cost) per Gross Dth/Yr	G	$24.05
Non-Energy Benefits Adder per Gross Dth/Yr	H	$2.53
Annual Dth/$M	($1M / F)	**48,486**
Total Utility Budget	(F x E)	**$129,649**
Total MTRC Net Benefits with Adder	(E x G)	**$151,174**
Total MTRC Net Benefits without Adder	(G - H) x E	**$135,276**

Utility Program Cost per Net Dth Lifetime	(F / A)	**$2.95**
Participant Payback with Rebate		**1.0 years**
Participant Payback without Rebate		**1.6 years**

FURNACE EFFICIENCY PROGRAM — 2009 — GAS — GOAL

2009 Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$69.35	$69.35	$69.35
Variable O&M Savings		$0.36	$0.36	$0.36
Demand Savings		$4.17	$4.17	$4.17
Subtotal		$73.88	$73.88	$73.88
Emissions and Non-Energy Benefits Adder (5%)				$3.69
Subtotal		$73.88	$73.88	$77.58
Other Benefits				
Participant Rebates and Incentives	$1.55			$1.55
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$1.55			$1.55
Reduction in Sales Revenue				
Gas	$107.42		$82.72	
Subtotal	$107.42		$82.72	
Utility Program Costs				
Program Planning & Design		$1.88	$1.88	$1.88
Administration & Program Delivery		$2.90	$2.90	$2.90
Advertising/Promotion/Customer Ed		$0.87	$0.87	$0.87
Participant Rebates and Incentives		$1.55	$1.55	$1.55
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.92	$0.92	$0.92
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$8.12	$8.12	$8.12
Participant Costs				
Incremental Capital Costs	$13.62			$10.49
Incremental O&M Costs	$0.00			$0.00
Subtotal	$13.62			$10.49
Total Benefits	$108.98	$73.88	$73.88	$79.13
Total Costs	$13.62	$8.12	$90.84	$18.61
Net Benefit (Cost)	$95.36	$65.76	-$16.96	$60.52
Benefit/Cost Ratio	**8.00**	**9.10**	**0.81**	**4.25**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	15 years
Net-to-Gross	B	77%

Program Totals:		
Participants	C	50
Average Dth/Yr Saved	D	84.1
Total Dth/Yr Saved	E	**4,204**
Utility Costs per Net Dth/Yr	F	$10.55
Net Benefit (Cost) per Gross Dth/Yr	G	$60.52
Non-Energy Benefits Adder per Gross Dth/Yr	H	$3.69
Annual Dth/$M	($1M / F)	**94,803**
Total Utility Budget	(F x E)	**$44,346**
Total MTRC Net Benefits with Adder	(E x G)	**$254,426**
Total MTRC Net Benefits without Adder	(G - H) x E	**$238,896**

Utility Program Cost per Net Dth Lifetime	(F / A)	**$0.70**
Participant Payback with Rebate		**1.0 years**
Participant Payback without Rebate		**1.1 years**

FURNACE EFFICIENCY PROGRAM

2010 GAS GOAL

2010 Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$69.32	$69.32	$69.32
Variable O&M Savings		$0.36	$0.36	$0.36
Demand Savings		$4.17	$4.17	$4.17
Subtotal		$73.85	$73.85	$73.85
Emissions and Non-Energy Benefits Adder (5%)				$3.69
Subtotal		$73.85	$73.85	$77.54
Other Benefits				
Participant Rebates and Incentives	$1.55			$1.55
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$1.55			$1.55
Reduction in Sales Revenue				
Gas	$107.59		$82.85	
Subtotal	$107.59		$82.85	
Utility Program Costs				
Program Planning & Design		$2.87	$2.87	$2.87
Administration & Program Delivery		$2.97	$2.97	$2.97
Advertising/Promotion/Customer Ed		$0.87	$0.87	$0.87
Participant Rebates and Incentives		$1.55	$1.55	$1.55
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.92	$0.92	$0.92
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$9.18	$9.18	$9.18
Participant Costs				
Incremental Capital Costs	$13.62			$10.49
Incremental O&M Costs	$0.00			$0.00
Subtotal	$13.62			$10.49
Total Benefits	$109.14	$73.85	$73.85	$79.09
Total Costs	$13.62	$9.18	$92.03	$19.67
Net Benefit (Cost)	$95.52	$64.67	-$18.18	$59.42
Benefit/Cost Ratio	**8.01**	**8.04**	**0.80**	**4.02**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	15 years
Net-to-Gross	B	77%
Program Totals:		
Participants	C	50
Average Dth/Yr Saved	D	84.1
Total Dth/Yr Saved	E	**4,204**
Utility Costs per Net Dth/Yr	F	$11.93
Net Benefit (Cost) per Gross Dth/Yr	G	$59.42
Non-Energy Benefits Adder per Gross Dth/Yr	H	$3.69
Annual Dth/$M	($1M / F)	**83,850**
Total Utility Budget	(F x E)	**$50,139**
Total MTRC Net Benefits with Adder	(E x G)	**$249,821**
Total MTRC Net Benefits without Adder	(G - H) x E	**$234,298**
Utility Program Cost per Net Dth Lifetime	(F / A)	**$0.80**
Participant Payback with Rebate		**1.1 years**
Participant Payback without Rebate		**1.2 years**

LIGHTING EFFICIENCY PROGRAM 2009 ELECTRIC GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,341	$1,341	$1,341
Transmission & Distribution Capacity		$275	$275	$275
Marginal Energy		$2,498	$2,498	$2,498
Avoided Emissions (CO2, SOx)		$611	$611	$611
Subtotal		$4,724	$4,724	$4,724
Non-Energy Benefits Adder (10%)				$472
Subtotal		$4,724	$4,724	$5,197
Other Benefits				
Participant Rebates and Incentives	$369			$369
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$369			$369
Reduction in Sales Revenue				
Electric	$3,091		$2,968	
Subtotal	$3,091		$2,968	
Utility Program Costs				
Program Planning & Design		$1	$1	$1
Administration & Program Delivery		$69	$69	$69
Advertising/Promotion/Customer Ed		$19	$19	$19
Participant Rebates and Incentives		$369	$369	$369
Equipment & Installation		$0	$0	$0
Measurement and Verification		$22	$22	$22
Miscellaneous		$0	$0	$0
Subtotal		$480	$480	$480
Participant Costs				
Incremental Capital Costs	$1,040			$998
Incremental O&M Costs	$312			$300
Subtotal	$1,352			$1,298
Total Benefits	$3,461	$4,724	$4,724	$5,566
Total Costs	$1,352	$480	$3,448	$1,777
Net Benefit (Cost)	$2,109	$4,245	$1,277	$3,789
Benefit/Cost Ratio	**2.56**	**9.85**	**1.37**	**3.13**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	18 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	84.60%
Gross Load Factor at Customer	E	38.51%
Net-to-Gross (Energy)	F	96.0%
Net-to-Gross (Demand)	G	96.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$3,789
MTRC Non-Energy Benefit Adder	K	$472
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.8676 kW
Gross Annual kWh Saved at Customer	(B x E x C)	3,374 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	3,239 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	3,460 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	14.57 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	12.64 kW
Gross Annual kWh Saved at Customer	(B x E x L)	49,152 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	47,186 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	50,407 kWh

Program Summary All Participants		
Total Participants	M	632
Total Budget	N	**$4,418,019**
Gross kW Saved at Customer	(M x L)	9,208 kW
Net coincident kW Saved at Generator	((G x L) x D / (1 - I)) x M	**7,989 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	31,063,812 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	29,821,259 kWh
Net Annual kWh Saved at Generator	((F x (B x E x L)) / (1 - H)) x M	**31,856,916 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$34,887,178**
TRC Net Benefits without Adder	(M x L x (J - K))	**$30,536,971**

Utility Program Cost per kWh Lifetime	**$0.0079**
Utility Program Cost per kW at Gen	**$553**
Participant Payback with Rebate	**3.9 years**
Participant Payback without Rebate	**6.0 years**

LIGHTING EFFICIENCY PROGRAM 2010 ELECTRIC GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,395	$1,395	$1,395
Transmission & Distribution Capacity		$280	$280	$280
Marginal Energy		$2,586	$2,586	$2,586
Avoided Emissions (CO2, SOx)		$712	$712	$712
Subtotal		$4,973	$4,973	$4,973
Non-Energy Benefits Adder (10%)				$497
Subtotal		$4,973	$4,973	$5,470
Other Benefits				
Participant Rebates and Incentives	$366			$366
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$366			$366
Reduction in Sales Revenue				
Electric	$3,193		$3,065	
Subtotal	$3,193		$3,065	
Utility Program Costs				
Program Planning & Design		$0	$0	$0
Administration & Program Delivery		$71	$71	$71
Advertising/Promotion/Customer Ed		$41	$41	$41
Participant Rebates and Incentives		$366	$366	$366
Equipment & Installation		$0	$0	$0
Measurement and Verification		$24	$24	$24
Miscellaneous		$0	$0	$0
Subtotal		$502	$502	$502
Participant Costs				
Incremental Capital Costs	$1,039			$997
Incremental O&M Costs	$312			$300
Subtotal	$1,351			$1,297
Total Benefits	$3,558	$4,973	$4,973	$5,836
Total Costs	$1,351	$502	$3,567	$1,799
Net Benefit (Cost)	$2,207	$4,471	$1,406	$4,037
Benefit/Cost Ratio	**2.63**	**9.91**	**1.39**	**3.24**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW

Lifetime (Weighted on Generator kWh)	A	18 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	84.60%
Gross Load Factor at Customer	E	39.57%
Net-to-Gross (Energy)	F	96.0%
Net-to-Gross (Demand)	G	96.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$4,037
MTRC Non-Energy Benefit Adder	K	$497
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.8676 kW
Gross Annual kWh Saved at Customer	(B x E x C)	3,466 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	3,328 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	3,555 kWh

Program Summary per Participant

Gross kW Saved at Customer	L	14.89 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	12.92 kW
Gross Annual kWh Saved at Customer	(B x E x L)	51,618 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	49,554 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	52,936 kWh

Program Summary All Participants

Total Participants	M	678
Total Budget	N	**$5,066,713**
Gross kW Saved at Customer	(M x L)	10,096 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**8,759 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	34,997,243 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	33,597,353 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**35,890,773 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$40,758,505**
TRC Net Benefits without Adder	(M x L x (J - K))	**$35,737,728**

Utility Program Cost per kWh Lifetime	**$0.0080**
Utility Program Cost per kW at Gen	**$578**
Participant Payback with Rebate	**3.8 years**
Participant Payback without Rebate	**5.8 years**

MOTOR & DRIVE EFFICIENCY PROGRAM	2009	ELECTRIC	GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,236	$1,236	$1,236
Transmission & Distribution Capacity		$250	$250	$250
Marginal Energy		$3,005	$3,005	$3,005
Avoided Emissions (CO2, SOx)		$813	$813	$813
Subtotal		$5,304	$5,304	$5,304
Non-Energy Benefits Adder (10%)				$530
Subtotal		$5,304	$5,304	$5,834
Other Benefits				
Participant Rebates and Incentives	$412			$412
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$412			$412
Reduction in Sales Revenue				
Electric	$3,575		$3,111	
Subtotal	$3,575		$3,111	
Utility Program Costs				
Program Planning & Design		$2	$2	$2
Administration & Program Delivery		$54	$54	$54
Advertising/Promotion/Customer Ed		$17	$17	$17
Participant Rebates and Incentives		$412	$412	$412
Equipment & Installation		$0	$0	$0
Measurement and Verification		$25	$25	$25
Miscellaneous		$0	$0	$0
Subtotal		$511	$511	$511
Participant Costs				
Incremental Capital Costs	$859			$747
Incremental O&M Costs	$0			$0
Subtotal	$859			$747
Total Benefits	$3,988	$5,304	$5,304	$6,246
Total Costs	$859	$511	$3,621	$1,258
Net Benefit (Cost)	$3,129	$4,793	$1,682	$4,988
Benefit/Cost Ratio	**4.64**	**10.39**	**1.46**	**4.96**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	20 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	78.33%
Gross Load Factor at Customer	E	50.31%
Net-to-Gross (Energy)	F	87.0%
Net-to-Gross (Demand)	G	87.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$4,988
MTRC Non-Energy Benefit Adder	K	$530
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.7280 kW
Gross Annual kWh Saved at Customer	(B x E x C)	4,407 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	3,834 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	4,096 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	4.60 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	3.35 kW
Gross Annual kWh Saved at Customer	(B x E x L)	20,259 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	17,625 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	18,829 kWh

Program Summary All Participants		
Total Participants	M	1,100
Total Budget	N	**$2,582,081**
Gross kW Saved at Customer	(M x L)	5,056 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**3,681 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	22,285,003 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	19,387,952 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**20,711,411 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$25,223,057**
TRC Net Benefits without Adder	(M x L x (J - K))	**$22,541,258**

Utility Program Cost per kWh Lifetime	**$0.0062**
Utility Program Cost per kW at Gen	**$701**
Participant Payback with Rebate	**2.5 years**
Participant Payback without Rebate	**4.8 years**

MOTOR & DRIVE EFFICIENCY PROGRAM 2010 ELECTRIC GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,285	$1,285	$1,285
Transmission & Distribution Capacity		$255	$255	$255
Marginal Energy		$3,033	$3,033	$3,033
Avoided Emissions (CO2, SOx)		$914	$914	$914
Subtotal		$5,487	$5,487	$5,487
Non-Energy Benefits Adder (10%)				$549
Subtotal		$5,487	$5,487	$6,036
Other Benefits				
Participant Rebates and Incentives	$412			$412
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$412			$412
Reduction in Sales Revenue				
Electric	$3,622		$3,151	
Subtotal	$3,622		$3,151	
Utility Program Costs				
Program Planning & Design		$2	$2	$2
Administration & Program Delivery		$55	$55	$55
Advertising/Promotion/Customer Ed		$63	$63	$63
Participant Rebates and Incentives		$412	$412	$412
Equipment & Installation		$0	$0	$0
Measurement and Verification		$27	$27	$27
Miscellaneous		$0	$0	$0
Subtotal		$560	$560	$560
Participant Costs				
Incremental Capital Costs	$859			$747
Incremental O&M Costs	$0			$0
Subtotal	$859			$747
Total Benefits	$4,035	$5,487	$5,487	$6,448
Total Costs	$859	$560	$3,712	$1,308
Net Benefit (Cost)	$3,176	$4,927	$1,775	$5,140
Benefit/Cost Ratio	**4.70**	**9.79**	**1.48**	**4.93**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	20 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	78.33%
Gross Load Factor at Customer	E	50.31%
Net-to-Gross (Energy)	F	87.0%
Net-to-Gross (Demand)	G	87.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$5,140
MTRC Non-Energy Benefit Adder	K	$549
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.7280 kW
Gross Annual kWh Saved at Customer	(B x E x C)	4,407 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	3,834 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	4,096 kWh
Program Summary per Participant		
Gross kW Saved at Customer	L	4.60 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	3.35 kW
Gross Annual kWh Saved at Customer	(B x E x L)	20,259 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	17,625 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	18,829 kWh
Program Summary All Participants		
Total Participants	M	1,100
Total Budget	N	**$2,832,479**
Gross kW Saved at Customer	(M x L)	5,056 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**3,681 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	22,285,003 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	19,387,952 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**20,711,411 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$25,991,510**
TRC Net Benefits without Adder	(M x L x (J - K))	**$23,217,098**
Utility Program Cost per kWh Lifetime		**$0.0068**
Utility Program Cost per kW at Gen		**$769**
Participant Payback with Rebate		**2.5 years**
Participant Payback without Rebate		**4.7 years**

NEW CONSTRUCTION PROGRAM 2009 ELECTRIC GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,641	$1,641	$1,641
Transmission & Distribution Capacity		$332	$332	$332
Marginal Energy		$2,727	$2,727	$2,727
Avoided Emissions (CO2, SOx)		$724	$724	$724
Subtotal		$5,423	$5,423	$5,423
Non-Energy Benefits Adder (10%)				$542
Subtotal		$5,423	$5,423	$5,966
Other Benefits				
Participant Rebates and Incentives	$277			$277
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$277			$277
Reduction in Sales Revenue				
Electric	$2,976		$2,901	
Subtotal	$2,976		$2,901	
Utility Program Costs				
Program Planning & Design		$1	$1	$1
Administration & Program Delivery		$288	$288	$288
Advertising/Promotion/Customer Ed		$30	$30	$30
Participant Rebates and Incentives		$277	$277	$277
Equipment & Installation		$0	$0	$0
Measurement and Verification		$101	$101	$101
Miscellaneous		$0	$0	$0
Subtotal		$697	$697	$697
Participant Costs				
Incremental Capital Costs	$848			$828
Incremental O&M Costs	$0			$0
Subtotal	$848			$828
Total Benefits	$3,253	$5,423	$5,423	$6,243
Total Costs	$848	$697	$3,598	$1,525
Net Benefit (Cost)	$2,406	$4,726	$1,825	$4,718
Benefit/Cost Ratio	**3.84**	**7.78**	**1.51**	**4.09**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	20 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	92.80%
Gross Load Factor at Customer	E	40.00%
Net-to-Gross (Energy)	F	97.5%
Net-to-Gross (Demand)	G	97.5%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$4,718
MTRC Non-Energy Benefit Adder	K	$542
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.9665 kW
Gross Annual kWh Saved at Customer	(B x E x C)	3,504 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	3,415 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	3,649 kWh
Program Summary per Participant		
Gross kW Saved at Customer	L	123.84 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	119.69 kW
Gross Annual kWh Saved at Customer	(B x E x L)	433,910 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	422,955 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	451,827 kWh
Program Summary All Participants		
Total Participants	M	46
Total Budget	N	**$3,971,921**
Gross kW Saved at Customer	(M x L)	5,697 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**5,506 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	19,959,838 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	19,455,927 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**20,784,026 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$26,877,608**
TRC Net Benefits without Adder	(M x L x (J - K))	**$23,788,067**
Utility Program Cost per kWh Lifetime		**$0.0096**
Utility Program Cost per kW at Gen		**$721**
Participant Payback with Rebate		**3.8 years**
Participant Payback without Rebate		**5.7 years**

NEW CONSTRUCTION PROGRAM | 2009 GAS GOAL

2009 Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$105.92	$105.92	$105.92
Variable O&M Savings		$0.53	$0.53	$0.53
Demand Savings		$6.17	$6.17	$6.17
Subtotal		$112.62	$112.62	$112.62
Emissions and Non-Energy Benefits Adder (5%)				$5.63
Subtotal		$112.62	$112.62	$118.25
Other Benefits				
Participant Rebates and Incentives	$4.34			$4.34
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$4.34			$4.34
Reduction in Sales Revenue				
Gas	$127.42		$126.07	
Subtotal	$127.42		$126.07	
Utility Program Costs				
Program Planning & Design		$0.04	$0.04	$0.04
Administration & Program Delivery		$5.30	$5.30	$5.30
Advertising/Promotion/Customer Ed		$3.22	$3.22	$3.22
Participant Rebates and Incentives		$4.34	$4.34	$4.34
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$2.61	$2.61	$2.61
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$15.52	$15.52	$15.52
Participant Costs				
Incremental Capital Costs	$50.66			$50.12
Incremental O&M Costs	$0.00			$0.00
Subtotal	$50.66			$50.12
Total Benefits	$131.77	$112.62	$112.62	$122.59
Total Costs	$50.66	$15.52	$141.59	$65.64
Net Benefit (Cost)	$81.11	$97.10	-$28.97	$56.95
Benefit/Cost Ratio	**2.60**	**7.26**	**0.80**	**1.87**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	20 years
Net-to-Gross	B	99%

Program Totals:		
Participants	C	9
Average Dth/Yr Saved	D	1,305.3
Total Dth/Yr Saved	E	**11,747**
Utility Costs per Net Dth/Yr	F	$15.69
Net Benefit (Cost) per Gross Dth/Yr	G	$56.95
Non-Energy Benefits Adder per Gross Dth/Yr	H	$5.63
Annual Dth/$M	($1M / F)	**63,743**
Total Utility Budget	(F x E)	**$184,291**
Total MTRC Net Benefits with Adder	(E x G)	**$669,010**
Total MTRC Net Benefits without Adder	(G - H) x E	**$602,862**

Utility Program Cost per Net Dth Lifetime	(F / A)	**$0.78**
Participant Payback with Rebate		**3.9 years**
Participant Payback without Rebate		**4.2 years**

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,704	$1,704	$1,704
Transmission & Distribution Capacity		$338	$338	$338
Marginal Energy		$2,749	$2,749	$2,749
Avoided Emissions (CO2, SOx)		$814	$814	$814
Subtotal		$5,605	$5,605	$5,605
Non-Energy Benefits Adder (10%)				$561
Subtotal		$5,605	$5,605	$6,166
Other Benefits				
Participant Rebates and Incentives	$270			$270
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$270			$270
Reduction in Sales Revenue				
Electric	$3,016		$2,938	
Subtotal	$3,016		$2,938	
Utility Program Costs				
Program Planning & Design		$1	$1	$1
Administration & Program Delivery		$216	$216	$216
Advertising/Promotion/Customer Ed		$57	$57	$57
Participant Rebates and Incentives		$270	$270	$270
Equipment & Installation		$0	$0	$0
Measurement and Verification		$94	$94	$94
Miscellaneous		$0	$0	$0
Subtotal		$637	$637	$637
Participant Costs				
Incremental Capital Costs	$843			$823
Incremental O&M Costs	$0			$0
Subtotal	$843			$823
Total Benefits	$3,286	$5,605	$5,605	$6,436
Total Costs	$843	$637	$3,575	$1,461
Net Benefit (Cost)	$2,443	$4,968	$2,030	$4,975
Benefit/Cost Ratio	**3.90**	**8.79**	**1.57**	**4.41**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW

Lifetime (Weighted on Generator kWh)	A	20 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	92.80%
Gross Load Factor at Customer	E	40.02%
Net-to-Gross (Energy)	F	97.4%
Net-to-Gross (Demand)	G	97.4%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$4,975
MTRC Non-Energy Benefit Adder	K	$561
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.9658 kW
Gross Annual kWh Saved at Customer	(B x E x C)	3,506 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	3,415 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	3,648 kWh

Program Summary per Participant

Gross kW Saved at Customer	L	128.25 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	123.87 kW
Gross Annual kWh Saved at Customer	(B x E x L)	449,639 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	437,961 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	467,857 kWh

Program Summary All Participants

Total Participants	M	65
Total Budget	N	**$5,313,990**
Gross kW Saved at Customer	(M x L)	8,336 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**8,051 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	29,226,527 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	28,467,473 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**30,410,718 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$41,472,545**
TRC Net Benefits without Adder	(M x L x (J - K))	**$36,799,975**

Utility Program Cost per kWh Lifetime	**$0.0087**
Utility Program Cost per kW at Gen	**$660**
Participant Payback with Rebate	**3.8 years**
Participant Payback without Rebate	**5.6 years**

NEW CONSTRUCTION PROGRAM

2010 GAS GOAL

2010 Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$106.21	$106.21	$106.21
Variable O&M Savings		$0.53	$0.53	$0.53
Demand Savings		$6.16	$6.16	$6.16
Subtotal		$112.91	$112.91	$112.91
Emissions and Non-Energy Benefits Adder (5%)				$5.65
Subtotal		$112.91	$112.91	$118.56
Other Benefits				
Participant Rebates and Incentives	$4.64			$4.64
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$4.64			$4.64
Reduction in Sales Revenue				
Gas	$128.01		$126.60	
Subtotal	$128.01		$126.60	
Utility Program Costs				
Program Planning & Design		$0.03	$0.03	$0.03
Administration & Program Delivery		$4.18	$4.18	$4.18
Advertising/Promotion/Customer Ed		$8.38	$8.38	$8.38
Participant Rebates and Incentives		$4.64	$4.64	$4.64
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$2.77	$2.77	$2.77
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$20.02	$20.02	$20.02
Participant Costs				
Incremental Capital Costs	$50.21			$49.66
Incremental O&M Costs	$0.00			$0.00
Subtotal	$50.21			$49.66
Total Benefits	$132.65	$112.91	$112.91	$123.20
Total Costs	$50.21	$20.02	$146.62	$69.67
Net Benefit (Cost)	$82.44	$92.90	-$33.71	$53.53
Benefit/Cost Ratio	**2.64**	**5.64**	**0.77**	**1.77**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	20 years
Net-to-Gross	B	99%

Program Totals:		
Participants	C	12
Average Dth/Yr Saved	D	1,292.5
Total Dth/Yr Saved	E	**15,510**
Utility Costs per Net Dth/Yr	F	$20.24
Net Benefit (Cost) per Gross Dth/Yr	G	$53.53
Non-Energy Benefits Adder per Gross Dth/Yr	H	$5.65
Annual Dth/$M	($1M / F)	**49,415**
Total Utility Budget	(F x E)	**$313,864**
Total MTRC Net Benefits with Adder	(E x G)	**$830,184**
Total MTRC Net Benefits without Adder	(G - H) x E	**$742,625**

Utility Program Cost per Net Dth Lifetime	(F / A)	**$1.01**
Participant Payback with Rebate		**4.0 years**
Participant Payback without Rebate		**4.5 years**

PROCESS EFFICIENCY PROGRAM — 2009 — ELECTRIC — GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,260	$1,260	$1,260
Transmission & Distribution Capacity		$257	$257	$257
Marginal Energy		$3,369	$3,369	$3,369
Avoided Emissions (CO2, SOx)		$919	$919	$919
Subtotal		$5,805	$5,805	$5,805
Non-Energy Benefits Adder (10%)				$581
Subtotal		$5,805	$5,805	$6,386
Other Benefits				
Participant Rebates and Incentives	$560			$560
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$2,129			$1,852
Subtotal	$2,690			$2,413
Reduction in Sales Revenue				
Electric	$3,696		$3,216	
Subtotal	$3,696		$3,216	
Utility Program Costs				
Program Planning & Design		$0	$0	$0
Administration & Program Delivery		$3,326	$3,326	$3,326
Advertising/Promotion/Customer Ed		$40	$40	$40
Participant Rebates and Incentives		$560	$560	$560
Equipment & Installation		$0	$0	$0
Measurement and Verification		$207	$207	$207
Miscellaneous		$0	$0	$0
Subtotal		$4,133	$4,133	$4,133
Participant Costs				
Incremental Capital Costs	$2,634			$2,292
Incremental O&M Costs	$0			$0
Subtotal	$2,634			$2,292
Total Benefits	$6,386	$5,805	$5,805	$8,798
Total Costs	$2,634	$4,133	$7,349	$6,425
Net Benefit (Cost)	$3,752	$1,672	($1,543)	$2,374
Benefit/Cost Ratio	**2.42**	**1.40**	**0.79**	**1.37**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	19 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	82.63%
Gross Load Factor at Customer	E	59.63%
Net-to-Gross (Energy)	F	87.0%
Net-to-Gross (Demand)	G	87.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$2,374
MTRC Non-Energy Benefit Adder	K	$581
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.7680 kW
Gross Annual kWh Saved at Customer	(B x E x C)	5,224 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	4,545 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	4,855 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	401.53 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	308.36 kW
Gross Annual kWh Saved at Customer	(B x E x L)	2,097,600 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	1,824,912 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	1,949,484 kWh

Program Summary All Participants		
Total Participants	M	0
Total Budget	N	**$414,850**
Gross kW Saved at Customer	(M x L)	100 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**77 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	524,400 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	456,228 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**487,371 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$238,294**
TRC Net Benefits without Adder	(M x L x (J - K))	**$180,021**

Utility Program Cost per kWh Lifetime	**$0.0438**
Utility Program Cost per kW at Gen	**$5,381**
Participant Payback with Rebate	**10.3 years**
Participant Payback without Rebate	**13.3 years**

PROCESS EFFICIENCY PROGRAM — 2009 GAS GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$98.88	$98.88	$98.88
Variable O&M Savings		$0.50	$0.50	$0.50
Demand Savings		$5.76	$5.76	$5.76
Subtotal		$105.13	$105.13	$105.13
Emissions and Non-Energy Benefits Adder (5%)				$5.26
Subtotal		$105.13	$105.13	$110.39
Other Benefits				
Participant Rebates and Incentives	$2.19			$2.19
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$88.86			$82.64
Subtotal	$91.04			$84.82
Reduction in Sales Revenue				
Gas	$126.55		$117.69	
Subtotal	$126.55		$117.69	
Utility Program Costs				
Program Planning & Design		$0.00	$0.00	$0.00
Administration & Program Delivery		$1.59	$1.59	$1.59
Advertising/Promotion/Customer Ed		$0.06	$0.06	$0.06
Participant Rebates and Incentives		$2.19	$2.19	$2.19
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.20	$0.20	$0.20
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$4.04	$4.04	$4.04
Participant Costs				
Incremental Capital Costs	$24.75			$23.01
Incremental O&M Costs	$0.00			$0.00
Subtotal	$24.75			$23.01
Total Benefits	$217.60	$105.13	$105.13	$195.22
Total Costs	$24.75	$4.04	$121.73	$27.05
Net Benefit (Cost)	$192.85	$101.10	-$16.60	$168.16
Benefit/Cost Ratio	**8.79**	**26.03**	**0.86**	**7.22**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	19.83 years
Net-to-Gross (Weighted on Dth)	B	93.00%
Net-to-Gross (Weighted on Incremental Capital)	C	93.00%
Program Totals:		
Participants	D	6
Average Net Dth/Yr Saved	E	1,508.2
Total Dth/Yr Saved	F	**9,049**
Utility Costs per Net Dth/Yr	G	$4.34
Net Benefit (Cost) per Gross Dth/Yr	H	$168.16
Non-Energy Benefits Adder per Gross Dth/Yr	I	$5.26
Annual Dth/$M	($1M / G)	**230,261**
Total Utility Budget	(G x F)	**$39,300**
Total MTRC Net Benefits with Adder	(F x H)	**$1,636,291**
Total MTRC Net Benefits without Adder	(H - I) x F	**$1,585,141**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$0.22**
Participant Payback with Rebate		**1.4 years**
Participant Payback without Rebate		**2.1 years**

PROCESS EFFICIENCY PROGRAM 2010 ELECTRIC GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,310	$1,310	$1,310
Transmission & Distribution Capacity		$262	$262	$262
Marginal Energy		$3,401	$3,401	$3,401
Avoided Emissions (CO2, SOx)		$1,039	$1,039	$1,039
Subtotal		$6,012	$6,012	$6,012
Non-Energy Benefits Adder (10%)				$601
Subtotal		$6,012	$6,012	$6,613
Other Benefits				
Participant Rebates and Incentives	$560			$560
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$2,129			$1,852
Subtotal	$2,690			$2,413
Reduction in Sales Revenue				
Electric	$3,745		$3,258	
Subtotal	$3,745		$3,258	
Utility Program Costs				
Program Planning & Design		$0	$0	$0
Administration & Program Delivery		$365	$365	$365
Advertising/Promotion/Customer Ed		$6	$6	$6
Participant Rebates and Incentives		$560	$560	$560
Equipment & Installation		$0	$0	$0
Measurement and Verification		$49	$49	$49
Miscellaneous		$0	$0	$0
Subtotal		$980	$980	$980
Participant Costs				
Incremental Capital Costs	$2,634			$2,292
Incremental O&M Costs	$0			$0
Subtotal	$2,634			$2,292
Total Benefits	$6,434	$6,012	$6,012	$9,026
Total Costs	$2,634	$980	$4,238	$3,272
Net Benefit (Cost)	$3,800	$5,031	$1,774	$5,753
Benefit/Cost Ratio	**2.44**	**6.13**	**1.42**	**2.76**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	19 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	82.63%
Gross Load Factor at Customer	E	59.63%
Net-to-Gross (Energy)	F	87.0%
Net-to-Gross (Demand)	G	87.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$5,753
MTRC Non-Energy Benefit Adder	K	$601
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.7680 kW
Gross Annual kWh Saved at Customer	(B x E x C)	5,224 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	4,545 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	4,855 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	401.53 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	308.36 kW
Gross Annual kWh Saved at Customer	(B x E x L)	2,097,600 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	1,824,912 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	1,949,484 kWh

Program Summary All Participants		
Total Participants	M	4
Total Budget	N	**$1,574,800**
Gross kW Saved at Customer	(M x L)	1,606 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**1,233 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	8,390,400 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	7,299,648 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**7,797,936 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$9,240,743**
TRC Net Benefits without Adder	(M x L x (J - K))	**$8,275,165**

Utility Program Cost per kWh Lifetime	**$0.0104**
Utility Program Cost per kW at Gen	**$1,277**
Participant Payback with Rebate	**10.2 years**
Participant Payback without Rebate	**13.1 years**

PROCESS EFFICIENCY PROGRAM — 2010 — GAS — GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$99.17	$99.17	$99.17
Variable O&M Savings		$0.50	$0.50	$0.50
Demand Savings		$5.76	$5.76	$5.76
Subtotal		$105.43	$105.43	$105.43
Emissions and Non-Energy Benefits Adder (5%)				$5.27
Subtotal		$105.43	$105.43	$110.70
Other Benefits				
Participant Rebates and Incentives	$2.19			$2.19
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$90.62			$84.28
Subtotal	$92.81			$86.47
Reduction in Sales Revenue				
Gas	$127.11		$118.21	
Subtotal	$127.11		$118.21	
Utility Program Costs				
Program Planning & Design		$0.00	$0.00	$0.00
Administration & Program Delivery		$0.74	$0.74	$0.74
Advertising/Promotion/Customer Ed		$0.03	$0.03	$0.03
Participant Rebates and Incentives		$2.19	$2.19	$2.19
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.16	$0.16	$0.16
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$3.11	$3.11	$3.11
Participant Costs				
Incremental Capital Costs	$24.75			$23.01
Incremental O&M Costs	$0.00			$0.00
Subtotal	$24.75			$23.01
Total Benefits	$219.92	$105.43	$105.43	$197.17
Total Costs	$24.75	$3.11	$121.33	$26.13
Net Benefit (Cost)	$195.18	$102.31	-$15.90	$171.04
Benefit/Cost Ratio	**8.89**	**33.86**	**0.87**	**7.55**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	19.83 years
Net-to-Gross (Weighted on Dth)	B	93.00%
Net-to-Gross (Weighted on Incremental Capital)	C	93.00%
Program Totals:		
Participants	D	12
Average Net Dth/Yr Saved	E	1,508.2
Total Dth/Yr Saved	F	**18,099**
Utility Costs per Net Dth/Yr	G	$3.35
Net Benefit (Cost) per Gross Dth/Yr	H	$171.04
Non-Energy Benefits Adder per Gross Dth/Yr	I	$5.27
Annual Dth/$M	($1M / G)	**298,656**
Total Utility Budget	(G x F)	**$60,600**
Total MTRC Net Benefits with Adder	(F x H)	**$3,328,553**
Total MTRC Net Benefits without Adder	(H - I) x F	**$3,225,968**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$0.17**
Participant Payback with Rebate		**1.4 years**
Participant Payback without Rebate		**2.1 years**

RECOMMISSIONING PROGRAM	2009	ELECTRIC	GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$407	$407	$407
Transmission & Distribution Capacity		$90	$90	$90
Marginal Energy		$1,866	$1,866	$1,866
Avoided Emissions (CO2, SOx)		$417	$417	$417
Subtotal		$2,780	$2,780	$2,780
Non-Energy Benefits Adder (10%)				$278
Subtotal		$2,780	$2,780	$3,058
Other Benefits				
Participant Rebates and Incentives	$504			$504
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$466			$466
Subtotal	$970			$970
Reduction in Sales Revenue				
Electric	$2,282		$2,282	
Subtotal	$2,282		$2,282	
Utility Program Costs				
Program Planning & Design		$0	$0	$0
Administration & Program Delivery		$193	$193	$193
Advertising/Promotion/Customer Ed		$127	$127	$127
Participant Rebates and Incentives		$504	$504	$504
Equipment & Installation		$0	$0	$0
Measurement and Verification		$41	$41	$41
Miscellaneous		$0	$0	$0
Subtotal		$864	$864	$864
Participant Costs				
Incremental Capital Costs	$1,097			$1,097
Incremental O&M Costs	$0			$0
Subtotal	$1,097			$1,097
Total Benefits	$3,252	$2,780	$2,780	$4,028
Total Costs	$1,097	$864	$3,146	$1,962
Net Benefit (Cost)	$2,155	$1,916	($366)	$2,067
Benefit/Cost Ratio	**2.96**	**3.22**	**0.88**	**2.05**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	7 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	50.96%
Gross Load Factor at Customer	E	64.79%
Net-to-Gross (Energy)	F	100.0%
Net-to-Gross (Demand)	G	100.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$2,067
MTRC Non-Energy Benefit Adder	K	$278
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.5444 kW
Gross Annual kWh Saved at Customer	(B x E x C)	5,676 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	5,676 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	6,063 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	23.25 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	12.66 kW
Gross Annual kWh Saved at Customer	(B x E x L)	131,974 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	131,974 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	140,983 kWh

Program Summary All Participants		
Total Participants	M	28
Total Budget	N	**$562,633**
Gross kW Saved at Customer	(M x L)	651 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**354 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	3,695,270 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	3,695,270 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**3,947,516 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$1,345,626**
TRC Net Benefits without Adder	(M x L x (J - K))	**$1,164,613**

Utility Program Cost per kWh Lifetime	**$0.0204**
Utility Program Cost per kW at Gen	**$1,587**
Participant Payback with Rebate	**1.6 years**
Participant Payback without Rebate	**3.2 years**

RECOMMISSIONING PROGRAM — 2009 — GAS — GOAL

2009 Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$51.92	$51.92	$51.92
Variable O&M Savings		$0.28	$0.28	$0.28
Demand Savings		$3.27	$3.27	$3.27
Subtotal		$55.47	$55.47	$55.47
Emissions and Non-Energy Benefits Adder (5%)				$2.77
Subtotal		$55.47	$55.47	$58.25
Other Benefits				
Participant Rebates and Incentives	$15.09			$15.09
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$15.09			$15.09
Reduction in Sales Revenue				
Gas	$62.03		$62.03	
Subtotal	$62.03		$62.03	
Utility Program Costs				
Program Planning & Design		$0.00	$0.00	$0.00
Administration & Program Delivery		$13.48	$13.48	$13.48
Advertising/Promotion/Customer Ed		$9.70	$9.70	$9.70
Participant Rebates and Incentives		$15.09	$15.09	$15.09
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$1.91	$1.91	$1.91
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$40.19	$40.19	$40.19
Participant Costs				
Incremental Capital Costs	$12.97			$12.97
Incremental O&M Costs	$0.00			$0.00
Subtotal	$12.97			$12.97
Total Benefits	$77.12	$55.47	$55.47	$73.34
Total Costs	$12.97	$40.19	$102.21	$53.16
Net Benefit (Cost)	$64.14	$15.29	-$46.74	$20.18
Benefit/Cost Ratio	**5.94**	**1.38**	**0.54**	**1.38**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	7 years
Net-to-Gross	B	100%

Program Totals:		
Participants	C	8
Average Dth/Yr Saved	D	274.8
Total Dth/Yr Saved	E	**2,199**
Utility Costs per Net Dth/Yr	F	$40.19
Net Benefit (Cost) per Gross Dth/Yr	G	$20.18
Non-Energy Benefits Adder per Gross Dth/Yr	H	$2.77
Annual Dth/$M	($1M / F)	**24,883**
Total Utility Budget	(F x E)	**$88,363**
Total MTRC Net Benefits with Adder	(E x G)	**$44,366**
Total MTRC Net Benefits without Adder	(G - H) x E	**$38,267**

Utility Program Cost per Net Dth Lifetime	(F / A)	**$5.74**
Participant Payback with Rebate		**-0.2 years**
Participant Payback without Rebate		**1.1 years**

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$430	$430	$430
Transmission & Distribution Capacity		$93	$93	$93
Marginal Energy		$1,754	$1,754	$1,754
Avoided Emissions (CO2, SOx)		$511	$511	$511
Subtotal		$2,788	$2,788	$2,788
Non-Energy Benefits Adder (10%)				$279
Subtotal		$2,788	$2,788	$3,066
Other Benefits				
Participant Rebates and Incentives	$524			$524
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$483			$483
Subtotal	$1,006			$1,006
Reduction in Sales Revenue				
Electric	$2,265		$2,265	
Subtotal	$2,265		$2,265	
Utility Program Costs				
Program Planning & Design		$0	$0	$0
Administration & Program Delivery		$197	$197	$197
Advertising/Promotion/Customer Ed		$232	$232	$232
Participant Rebates and Incentives		$524	$524	$524
Equipment & Installation		$0	$0	$0
Measurement and Verification		$48	$48	$48
Miscellaneous		$0	$0	$0
Subtotal		$1,001	$1,001	$1,001
Participant Costs				
Incremental Capital Costs	$1,127			$1,127
Incremental O&M Costs	$0			$0
Subtotal	$1,127			$1,127
Total Benefits	$3,271	$2,788	$2,788	$4,073
Total Costs	$1,127	$1,001	$3,265	$2,128
Net Benefit (Cost)	$2,144	$1,787	($478)	$1,945
Benefit/Cost Ratio	**2.90**	**2.79**	**0.85**	**1.91**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW

Lifetime (Weighted on Generator kWh)	A	7 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	51.43%
Gross Load Factor at Customer	E	63.79%
Net-to-Gross (Energy)	F	100.0%
Net-to-Gross (Demand)	G	100.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$1,945
MTRC Non-Energy Benefit Adder	K	$279
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.5494 kW
Gross Annual kWh Saved at Customer	(B x E x C)	5,588 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	5,588 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	5,970 kWh

Program Summary per Participant

Gross kW Saved at Customer	L	22.58 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	12.41 kW
Gross Annual kWh Saved at Customer	(B x E x L)	126,189 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	126,189 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	134,803 kWh

Program Summary All Participants

Total Participants	M	38
Total Budget	N	**$858,540**
Gross kW Saved at Customer	(M x L)	858 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**471 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	4,795,193 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	4,795,193 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**5,122,522 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$1,668,963**
TRC Net Benefits without Adder	(M x L x (J - K))	**$1,429,763**

Utility Program Cost per kWh Lifetime	**$0.0239**
Utility Program Cost per kW at Gen	**$1,821**
Participant Payback with Rebate	**1.7 years**
Participant Payback without Rebate	**3.3 years**

RECOMMISSIONING PROGRAM — 2010 GAS GOAL

2010 Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$50.84	$50.84	$50.84
Variable O&M Savings		$0.28	$0.28	$0.28
Demand Savings		$3.27	$3.27	$3.27
Subtotal		$54.39	$54.39	$54.39
Emissions and Non-Energy Benefits Adder (5%)				$2.72
Subtotal		$54.39	$54.39	$57.11
Other Benefits				
Participant Rebates and Incentives	$15.09			$15.09
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$15.09			$15.09
Reduction in Sales Revenue				
Gas	$61.06		$61.06	
Subtotal	$61.06		$61.06	
Utility Program Costs				
Program Planning & Design		$0.00	$0.00	$0.00
Administration & Program Delivery		$17.69	$17.69	$17.69
Advertising/Promotion/Customer Ed		$9.73	$9.73	$9.73
Participant Rebates and Incentives		$15.09	$15.09	$15.09
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$3.19	$3.19	$3.19
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$45.70	$45.70	$45.70
Participant Costs				
Incremental Capital Costs	$12.97			$12.97
Incremental O&M Costs	$0.00			$0.00
Subtotal	$12.97			$12.97
Total Benefits	$76.15	$54.39	$54.39	$72.20
Total Costs	$12.97	$45.70	$106.76	$58.67
Net Benefit (Cost)	$63.18	$8.69	-$52.37	$13.53
Benefit/Cost Ratio	**5.87**	**1.19**	**0.51**	**1.23**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	7 years
Net-to-Gross	B	100%

Program Totals:		
Participants	C	8
Average Dth/Yr Saved	D	274.8
Total Dth/Yr Saved	E	**2,199**
Utility Costs per Net Dth/Yr	F	$45.70
Net Benefit (Cost) per Gross Dth/Yr	G	$13.53
Non-Energy Benefits Adder per Gross Dth/Yr	H	$2.72
Annual Dth/$M	($1M / F)	**21,883**
Total Utility Budget	(F x E)	**$100,477**
Total MTRC Net Benefits with Adder	(E x G)	**$29,747**
Total MTRC Net Benefits without Adder	(G - H) x E	**$23,768**

Utility Program Cost per Net Dth Lifetime	(F / A)	**$6.53**
Participant Payback with Rebate		**-0.2 years**
Participant Payback without Rebate		**1.2 years**

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,116	$1,116	$1,116
Transmission & Distribution Capacity		$227	$227	$227
Marginal Energy		$3,314	$3,314	$3,314
Avoided Emissions (CO2, SOx)		$866	$866	$866
Subtotal		$5,523	$5,523	$5,523
Non-Energy Benefits Adder (10%)				$552
Subtotal		$5,523	$5,523	$6,075
Other Benefits				
Participant Rebates and Incentives	$1,793			$1,793
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$1,793			$1,793
Reduction in Sales Revenue				
Electric	$4,387		$3,876	
Subtotal	$4,387		$3,876	
Utility Program Costs				
Program Planning & Design		$680	$680	$680
Administration & Program Delivery		$2,263	$2,263	$2,263
Advertising/Promotion/Customer Ed		$634	$634	$634
Participant Rebates and Incentives		$1,793	$1,793	$1,793
Equipment & Installation		$0	$0	$0
Measurement and Verification		$16	$16	$16
Miscellaneous		$0	$0	$0
Subtotal		$5,386	$5,386	$5,386
Participant Costs				
Incremental Capital Costs	$3,884			$3,790
Incremental O&M Costs	$0			$0
Subtotal	$3,884			$3,790
Total Benefits	$6,180	$5,523	$5,523	$7,868
Total Costs	$3,884	$5,386	$9,263	$9,176
Net Benefit (Cost)	$2,296	$136	($3,740)	($1,308)
Benefit/Cost Ratio	**1.59**	**1.03**	**0.60**	**0.86**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	20 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	69.95%
Gross Load Factor at Customer	E	53.46%
Net-to-Gross (Energy)	F	88.4%
Net-to-Gross (Demand)	G	89.5%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	($1,308)
MTRC Non-Energy Benefit Adder	K	$552
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.6687 kW
Gross Annual kWh Saved at Customer	(B x E x C)	4,683 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	4,138 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	4,421 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	2.35 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	1.57 kW
Gross Annual kWh Saved at Customer	(B x E x L)	10,987 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	9,708 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	10,371 kWh

Program Summary All Participants		
Total Participants	M	51
Total Budget	N	**$644,452**
Gross kW Saved at Customer	(M x L)	120 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**80 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	560,329 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	495,107 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**528,904 kWh**
TRC Net Benefits with Adder	(M x L x J)	**($156,501)**
TRC Net Benefits without Adder	(M x L x (J - K))	**($222,578)**

Utility Program Cost per kWh Lifetime	**$0.0621**
Utility Program Cost per kW at Gen	**$8,055**
Participant Payback with Rebate	9.4 years
Participant Payback without Rebate	17.4 years

SEGMENT EFFICIENCY PROGRAM	2009	GAS	GOAL

2009 Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		#DIV/0!	#DIV/0!	#DIV/0!
Variable O&M Savings		#DIV/0!	#DIV/0!	#DIV/0!
Demand Savings		#DIV/0!	#DIV/0!	#DIV/0!
Subtotal		#DIV/0!	#DIV/0!	#DIV/0!
Emissions and Non-Energy Benefits Adder (5%)				#DIV/0!
Subtotal		#DIV/0!	#DIV/0!	#DIV/0!
Other Benefits				
Participant Rebates and Incentives	#DIV/0!			#DIV/0!
Vendor Incentives				$0.00
Incremental Capital Savings	#DIV/0!			#DIV/0!
Incremental O&M Savings	#DIV/0!			#DIV/0!
Subtotal	#DIV/0!			#DIV/0!
Reduction in Sales Revenue				
Gas	#DIV/0!		#DIV/0!	
Subtotal	#DIV/0!		#DIV/0!	
Utility Program Costs				
Program Planning & Design		#DIV/0!	#DIV/0!	#DIV/0!
Administration & Program Delivery		#DIV/0!	#DIV/0!	#DIV/0!
Advertising/Promotion/Customer Ed		#DIV/0!	#DIV/0!	#DIV/0!
Participant Rebates and Incentives		#DIV/0!	#DIV/0!	#DIV/0!
Equipment & Installation		#DIV/0!	#DIV/0!	#DIV/0!
Measurement & Verification		#DIV/0!	#DIV/0!	#DIV/0!
Miscellaneous		#DIV/0!	#DIV/0!	#DIV/0!
Subtotal		#DIV/0!	#DIV/0!	#DIV/0!
Participant Costs				
Incremental Capital Costs	#DIV/0!			#DIV/0!
Incremental O&M Costs	#DIV/0!			#DIV/0!
Subtotal	#DIV/0!			#DIV/0!
Total Benefits	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total Costs	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Net Benefit (Cost)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Benefit/Cost Ratio	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	0 years
Net-to-Gross	B	0%
Program Totals:		
Participants	C	5
Average Dth/Yr Saved	D	-
Total Dth/Yr Saved	E	-
Utility Costs per Net Dth/Yr	F	#DIV/0!
Net Benefit (Cost) per Gross Dth/Yr	G	#DIV/0!
Non-Energy Benefits Adder per Gross Dth/Yr	H	#DIV/0!
Annual Dth/$M	($1M / F)	**#DIV/0!**
Total Utility Budget	(F x E)	**$25,754**
Total MTRC Net Benefits with Adder	(E x G)	**#DIV/0!**
Total MTRC Net Benefits without Adder	(G - H) x E	**#DIV/0!**
Utility Program Cost per Net Dth Lifetime	(F / A)	**#DIV/0!**
Participant Payback with Rebate		**#DIV/0!**
Participant Payback without Rebate		**#DIV/0!**

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$937	$937	$937
Transmission & Distribution Capacity		$189	$189	$189
Marginal Energy		$2,751	$2,751	$2,751
Avoided Emissions (CO2, SOx)		$792	$792	$792
Subtotal		$4,669	$4,669	$4,669
Non-Energy Benefits Adder (10%)				$467
Subtotal		$4,669	$4,669	$5,136
Other Benefits				
Participant Rebates and Incentives	$486			$486
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$486			$486
Reduction in Sales Revenue				
Electric	$3,595		$3,379	
Subtotal	$3,595		$3,379	
Utility Program Costs				
Program Planning & Design		$39	$39	$39
Administration & Program Delivery		$332	$332	$332
Advertising/Promotion/Customer Ed		$121	$121	$121
Participant Rebates and Incentives		$486	$486	$486
Equipment & Installation		$0	$0	$0
Measurement and Verification		$46	$46	$46
Miscellaneous		$0	$0	$0
Subtotal		$1,023	$1,023	$1,023
Participant Costs				
Incremental Capital Costs	$1,080			$1,025
Incremental O&M Costs	$0			$0
Subtotal	$1,080			$1,025
Total Benefits	$4,081	$4,669	$4,669	$5,622
Total Costs	$1,080	$1,023	$4,402	$2,048
Net Benefit (Cost)	$3,001	$3,646	$267	$3,574
Benefit/Cost Ratio	**3.78**	**4.56**	**1.06**	**2.75**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	14 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	62.98%
Gross Load Factor at Customer	E	55.95%
Net-to-Gross (Energy)	F	94.0%
Net-to-Gross (Demand)	G	93.4%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$3,574
MTRC Non-Energy Benefit Adder	K	$467
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.6282 kW
Gross Annual kWh Saved at Customer	(B x E x C)	4,901 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	4,607 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	4,921 kWh
Program Summary per Participant		
Gross kW Saved at Customer	L	12.44 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	7.82 kW
Gross Annual kWh Saved at Customer	(B x E x L)	60,987 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	57,324 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	61,237 kWh
Program Summary All Participants		
Total Participants	M	175
Total Budget	N	**$2,227,436**
Gross kW Saved at Customer	(M x L)	2,178 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**1,368 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	10,672,676 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	10,031,762 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**10,716,550 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$7,782,616**
TRC Net Benefits without Adder	(M x L x (J - K))	**$6,765,904**
Utility Program Cost per kWh Lifetime		**$0.0152**
Utility Program Cost per kW at Gen		**$1,628**
Participant Payback with Rebate		**2.3 years**
Participant Payback without Rebate		**4.1 years**

SEGMENT EFFICIENCY PROGRAM — 2010 GAS GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$65.92	$65.92	$65.92
Variable O&M Savings		$0.35	$0.35	$0.35
Demand Savings		$4.06	$4.06	$4.06
Subtotal		$70.34	$70.34	$70.34
Emissions and Non-Energy Benefits Adder (5%)				$3.52
Subtotal		$70.34	$70.34	$73.85
Other Benefits				
Participant Rebates and Incentives	$2.21			$2.21
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$2.21			$2.21
Reduction in Sales Revenue				
Gas	$81.75		$78.92	
Subtotal	$81.75		$78.92	
Utility Program Costs				
Program Planning & Design		$0.85	$0.85	$0.85
Administration & Program Delivery		$1.67	$1.67	$1.67
Advertising/Promotion/Customer Ed		$16.79	$16.79	$16.79
Participant Rebates and Incentives		$2.21	$2.21	$2.21
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$1.08	$1.08	$1.08
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$22.59	$22.59	$22.59
Participant Costs				
Incremental Capital Costs	$16.05			$15.51
Incremental O&M Costs	$0.00			$0.00
Subtotal	$16.05			$15.51
Total Benefits	$83.95	$70.34	$70.34	$76.06
Total Costs	$16.05	$22.59	$101.52	$38.10
Net Benefit (Cost)	$67.90	$47.75	-$31.18	$37.96
Benefit/Cost Ratio	**5.23**	**3.11**	**0.69**	**2.00**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	10.67 years
Net-to-Gross (Weighted on Dth)	B	97.43%
Net-to-Gross (Weighted on Incremental Capital)	C	96.60%
Program Totals:		
Participants	D	17
Average Net Dth/Yr Saved	E	213.3
Total Dth/Yr Saved	F	**3,627**
Utility Costs per Net Dth/Yr	G	$23.19
Net Benefit (Cost) per Gross Dth/Yr	H	$37.96
Non-Energy Benefits Adder per Gross Dth/Yr	I	$3.52
Annual Dth/$M	($1M / G)	**43,126**
Total Utility Budget	(G x F)	**$84,100**
Total MTRC Net Benefits with Adder	(F x H)	**$141,312**
Total MTRC Net Benefits without Adder	(H - I) x F	**$128,220**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$2.17**
Participant Payback with Rebate		**1.2 years**
Participant Payback without Rebate		**1.3 years**

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,369	$1,369	$1,369
Transmission & Distribution Capacity		$282	$282	$282
Marginal Energy		$2,729	$2,729	$2,729
Avoided Emissions (CO2, SOx)		$704	$704	$704
Subtotal		$5,085	$5,085	$5,085
Non-Energy Benefits Adder (10%)				$508
Subtotal		$5,085	$5,085	$5,593
Other Benefits				
Participant Rebates and Incentives	$527			$527
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$12			$11
Subtotal	$540			$538
Reduction in Sales Revenue				
Electric	$3,384		$3,066	
Subtotal	$3,384		$3,066	
Utility Program Costs				
Program Planning & Design		$14	$14	$14
Administration & Program Delivery		$92	$92	$92
Advertising/Promotion/Customer Ed		$22	$22	$22
Participant Rebates and Incentives		$527	$527	$527
Equipment & Installation		$0	$0	$0
Measurement and Verification		$0	$0	$0
Miscellaneous		$0	$0	$0
Subtotal		$656	$656	$656
Participant Costs				
Incremental Capital Costs	$794			$719
Incremental O&M Costs	$0			$0
Subtotal	$794			$719
Total Benefits	$3,923	$5,085	$5,085	$6,131
Total Costs	$794	$656	$3,721	$1,375
Net Benefit (Cost)	$3,129	$4,429	$1,363	$4,756
Benefit/Cost Ratio	**4.94**	**7.75**	**1.37**	**4.46**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	17 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	92.98%
Gross Load Factor at Customer	E	48.46%
Net-to-Gross (Energy)	F	90.6%
Net-to-Gross (Demand)	G	90.6%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$4,756
MTRC Non-Energy Benefit Adder	K	$508
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.8999 kW
Gross Annual kWh Saved at Customer	(B x E x C)	4,245 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	3,846 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	4,109 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	106.23 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	95.60 kW
Gross Annual kWh Saved at Customer	(B x E x L)	450,992 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	408,599 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	436,490 kWh

Program Summary All Participants		
Total Participants	M	5
Total Budget	N	**$348,300**
Gross kW Saved at Customer	(M x L)	531 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**478 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	2,254,959 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	2,042,993 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**2,182,451 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$2,526,445**
TRC Net Benefits without Adder	(M x L x (J - K))	**$2,256,371**

Utility Program Cost per kWh Lifetime	**$0.0093**
Utility Program Cost per kW at Gen	**$729**
Participant Payback with Rebate	**1.3 years**
Participant Payback without Rebate	**4.0 years**

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,424	$1,424	$1,424
Transmission & Distribution Capacity		$287	$287	$287
Marginal Energy		$2,740	$2,740	$2,740
Avoided Emissions (CO2, SOx)		$799	$799	$799
Subtotal		$5,251	$5,251	$5,251
Non-Energy Benefits Adder (10%)				$525
Subtotal		$5,251	$5,251	$5,776
Other Benefits				
Participant Rebates and Incentives	$527			$527
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$12			$11
Subtotal	$540			$538
Reduction in Sales Revenue				
Electric	$3,427		$3,105	
Subtotal	$3,427		$3,105	
Utility Program Costs				
Program Planning & Design		$4	$4	$4
Administration & Program Delivery		$81	$81	$81
Advertising/Promotion/Customer Ed		$4	$4	$4
Participant Rebates and Incentives		$527	$527	$527
Equipment & Installation		$0	$0	$0
Measurement and Verification		$0	$0	$0
Miscellaneous		$0	$0	$0
Subtotal		$616	$616	$616
Participant Costs				
Incremental Capital Costs	$794			$719
Incremental O&M Costs	$0			$0
Subtotal	$794			$719
Total Benefits	$3,967	$5,251	$5,251	$6,314
Total Costs	$794	$616	$3,721	$1,335
Net Benefit (Cost)	$3,173	$4,635	$1,530	$4,979
Benefit/Cost Ratio	**5.00**	**8.53**	**1.41**	**4.73**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	17 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	92.98%
Gross Load Factor at Customer	E	48.46%
Net-to-Gross (Energy)	F	90.6%
Net-to-Gross (Demand)	G	90.6%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$4,979
MTRC Non-Energy Benefit Adder	K	$525
Net coincident kW Saved at Generator	(DxCxG)/(1-I)	0.8999 kW
Gross Annual kWh Saved at Customer	(BxExC)	4,245 kWh
Net Annual kWh Saved at Customer	(BxExCxF)	3,846 kWh
Net Annual kWh Saved at Generator	(BxExCxF)/(1-H)	4,109 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	106.23 kW
Net coincident kW Saved at Generator	(GxL)xD/(1-I)	95.60 kW
Gross Annual kWh Saved at Customer	(BxExL)	450,992 kWh
Net Annual kWh Saved at Customer	(Fx(BxExL))	408,599 kWh
Net Annual kWh Saved at Generator	(Fx(BxExL))/(1-I)	436,490 kWh

Program Summary All Participants		
Total Participants	M	10
Total Budget	N	**$654,000**
Gross kW Saved at Customer	(MxL)	1,062 kW
Net coincident kW Saved at Generator	**((GxL)xD/(1-I))xM**	**956 kW**
Gross Annual kWh Saved at Customer	(BxExL)xM	4,509,918 kWh
Net Annual kWh Saved at Customer	(Fx(BxExL))xM	4,085,986 kWh
Net Annual kWh Saved at Generator	**((Fx(BxExL))/(1-H))xM**	**4,364,903 kWh**
TRC Net Benefits with Adder	(MxLxJ)	**$5,289,588**
TRC Net Benefits without Adder	(MxLx(J-K))	**$4,731,794**
Utility Program Cost per kWh Lifetime		**$0.0087**
Utility Program Cost per kW at Gen		**$684**
Participant Payback with Rebate		**1.3 years**
Participant Payback without Rebate		**4.0 years**

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,532	$1,532	$1,532
Transmission & Distribution Capacity		$310	$310	$310
Marginal Energy		$2,642	$2,642	$2,642
Avoided Emissions (CO2, SOx)		$654	$654	$654
Subtotal		$5,138	$5,138	$5,138
Non-Energy Benefits Adder (10%)				$514
Subtotal		$5,138	$5,138	$5,652
Other Benefits				
Participant Rebates and Incentives	$694			$694
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$694			$694
Reduction in Sales Revenue				
Electric	$3,133		$3,133	
Subtotal	$3,133		$3,133	
Utility Program Costs				
Program Planning & Design		$207	$207	$207
Administration & Program Delivery		$1,168	$1,168	$1,168
Advertising/Promotion/Customer Ed		$143	$143	$143
Participant Rebates and Incentives		$694	$694	$694
Equipment & Installation		$0	$0	$0
Measurement and Verification		$42	$42	$42
Miscellaneous		$0	$0	$0
Subtotal		$2,254	$2,254	$2,254
Participant Costs				
Incremental Capital Costs	$1,157			$1,157
Incremental O&M Costs	$0			$0
Subtotal	$1,157			$1,157
Total Benefits	$3,827	$5,138	$5,138	$6,346
Total Costs	$1,157	$2,254	$5,387	$3,411
Net Benefit (Cost)	$2,670	$2,884	($249)	$2,935
Benefit/Cost Ratio	**3.31**	**2.28**	**0.95**	**1.86**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	20 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	84.50%
Gross Load Factor at Customer	E	35.21%
Net-to-Gross (Energy)	F	100.0%
Net-to-Gross (Demand)	G	100.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$2,935
MTRC Non-Energy Benefit Adder	K	$514
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.9027 kW
Gross Annual kWh Saved at Customer	(B x E x C)	3,084 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	3,084 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	3,295 kWh
Program Summary per Participant		
Gross kW Saved at Customer	L	7.00 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	6.32 kW
Gross Annual kWh Saved at Customer	(B x E x L)	21,597 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	21,597 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	23,071 kWh
Program Summary All Participants		
Total Participants	M	50
Total Budget	N	**$789,234**
Gross kW Saved at Customer	(M x L)	350 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**316 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	1,079,828 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	1,079,828 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**1,153,540 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$1,027,795**
TRC Net Benefits without Adder	(M x L x (J - K))	**$847,883**
Utility Program Cost per kWh Lifetime		**$0.0342**
Utility Program Cost per kW at Gen		**$2,497**
Participant Payback with Rebate		**3.0 years**
Participant Payback without Rebate		**7.4 years**

SMALL BUSINESS LIGHTING PROGRAM	2010	ELECTRIC	GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,593	$1,593	$1,593
Transmission & Distribution Capacity		$316	$316	$316
Marginal Energy		$2,668	$2,668	$2,668
Avoided Emissions (CO2, SOx)		$735	$735	$735
Subtotal		$5,312	$5,312	$5,312
Non-Energy Benefits Adder (10%)				$531
Subtotal		$5,312	$5,312	$5,843
Other Benefits				
Participant Rebates and Incentives	$694			$694
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$694			$694
Reduction in Sales Revenue				
Electric	$3,174		$3,174	
Subtotal	$3,174		$3,174	
Utility Program Costs				
Program Planning & Design		$104	$104	$104
Administration & Program Delivery		$1,272	$1,272	$1,272
Advertising/Promotion/Customer Ed		$143	$143	$143
Participant Rebates and Incentives		$694	$694	$694
Equipment & Installation		$0	$0	$0
Measurement and Verification		$42	$42	$42
Miscellaneous		$0	$0	$0
Subtotal		$2,254	$2,254	$2,254
Participant Costs				
Incremental Capital Costs	$1,157			$1,157
Incremental O&M Costs	$0			$0
Subtotal	$1,157			$1,157
Total Benefits	$3,868	$5,312	$5,312	$6,537
Total Costs	$1,157	$2,254	$5,428	$3,411
Net Benefit (Cost)	$2,712	$3,058	($116)	$3,126
Benefit/Cost Ratio	**3.34**	**2.36**	**0.98**	**1.92**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	20 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	84.50%
Gross Load Factor at Customer	E	35.21%
Net-to-Gross (Energy)	F	100.0%
Net-to-Gross (Demand)	G	100.0%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$3,126
MTRC Non-Energy Benefit Adder	K	$531
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.9027 kW
Gross Annual kWh Saved at Customer	(B x E x C)	3,084 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	3,084 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	3,295 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	7.00 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	6.32 kW
Gross Annual kWh Saved at Customer	(B x E x L)	21,597 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	21,597 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	23,071 kWh

Program Summary All Participants		
Total Participants	M	200
Total Budget	N	**$3,156,935**
Gross kW Saved at Customer	(M x L)	1,401 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**1,264 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	4,319,313 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	4,319,313 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**4,614,158 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$4,378,432**
TRC Net Benefits without Adder	(M x L x (J - K))	**$3,634,486**

Utility Program Cost per kWh Lifetime	**$0.0342**
Utility Program Cost per kW at Gen	**$2,497**
Participant Payback with Rebate	**2.9 years**
Participant Payback without Rebate	**7.3 years**

STANDARD OFFER PROGRAM 2009 ELECTRIC GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,266	$1,266	$1,266
Transmission & Distribution Capacity		$264	$264	$264
Marginal Energy		$1,211	$1,211	$1,211
Avoided Emissions (CO_2, SOx)		$301	$301	$301
Subtotal		$3,042	$3,042	$3,042
Non-Energy Benefits Adder (10%)				$304
Subtotal		$3,042	$3,042	$3,346
Other Benefits				
Participant Rebates and Incentives	$598			$598
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$21			$18
Subtotal	$619			$616
Reduction in Sales Revenue				
Electric	$1,812		$1,549	
Subtotal	$1,812		$1,549	
Utility Program Costs				
Program Planning & Design		$22	$22	$22
Administration & Program Delivery		$150	$150	$150
Advertising/Promotion/Customer Ed		$21	$21	$21
Participant Rebates and Incentives		$598	$598	$598
Equipment & Installation		$0	$0	$0
Measurement and Verification		$0	$0	$0
Miscellaneous		$0	$0	$0
Subtotal		$791	$791	$791
Participant Costs				
Incremental Capital Costs	$927			$793
Incremental O&M Costs	$0			$0
Subtotal	$927			$793
Total Benefits	$2,431	$3,042	$3,042	$3,962
Total Costs	$927	$791	$2,340	$1,584
Net Benefit (Cost)	$1,504	$2,251	$702	$2,378
Benefit/Cost Ratio	**2.62**	**3.85**	**1.30**	**2.50**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	15 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	99.65%
Gross Load Factor at Customer	E	24.72%
Net-to-Gross (Energy)	F	85.5%
Net-to-Gross (Demand)	G	85.5%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$2,378
MTRC Non-Energy Benefit Adder	K	$304
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.9102 kW
Gross Annual kWh Saved at Customer	(B x E x C)	2,166 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,852 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,978 kWh
Program Summary per Participant		
Gross kW Saved at Customer	L	37.21 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	33.86 kW
Gross Annual kWh Saved at Customer	(B x E x L)	80,571 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	68,889 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	73,591 kWh
Program Summary All Participants		
Total Participants	M	24
Total Budget	N	**$706,200**
Gross kW Saved at Customer	(M x L)	893 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**813 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	1,933,716 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	1,653,327 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**1,766,186 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$2,123,438**
TRC Net Benefits without Adder	(M x L x (J - K))	**$1,851,818**
Utility Program Cost per kWh Lifetime		**$0.0275**
Utility Program Cost per kW at Gen		**$869**
Participant Payback with Rebate		**2.6 years**
Participant Payback without Rebate		**7.4 years**

STANDARD OFFER PROGRAM 2009 GAS GOAL

2009 Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$63.28	$63.28	$63.28
Variable O&M Savings		$0.34	$0.34	$0.34
Demand Savings		$3.93	$3.93	$3.93
Subtotal		$67.54	$67.54	$67.54
Emissions and Non-Energy Benefits Adder (5%)				$3.38
Subtotal		$67.54	$67.54	$70.92
Other Benefits				
Participant Rebates and Incentives	$17.71			$17.71
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$17.71			$17.71
Reduction in Sales Revenue				
Gas	$81.29		$75.60	
Subtotal	$81.29		$75.60	
Utility Program Costs				
Program Planning & Design		$1.97	$1.97	$1.97
Administration & Program Delivery		$21.65	$21.65	$21.65
Advertising/Promotion/Customer Ed		$0.00	$0.00	$0.00
Participant Rebates and Incentives		$17.71	$17.71	$17.71
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.00	$0.00	$0.00
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$41.33	$41.33	$41.33
Participant Costs				
Incremental Capital Costs	$26.31			$24.46
Incremental O&M Costs	$0.00			$0.00
Subtotal	$26.31			$24.46
Total Benefits	$99.00	$67.54	$67.54	$88.63
Total Costs	$26.31	$41.33	$116.93	$65.79
Net Benefit (Cost)	$72.70	$26.22	-$49.38	$22.84
Benefit/Cost Ratio	**3.76**	**1.63**	**0.58**	**1.35**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	9 years
Net-to-Gross	B	93%

Program Totals:		
Participants	C	12
Average Dth/Yr Saved	D	39.4
Total Dth/Yr Saved	E	**473**
Utility Costs per Net Dth/Yr	F	$44.44
Net Benefit (Cost) per Gross Dth/Yr	G	$22.84
Non-Energy Benefits Adder per Gross Dth/Yr	H	$3.38
Annual Dth/$M	($1M / F)	**22,503**
Total Utility Budget	(F x E)	**$21,000**
Total MTRC Net Benefits with Adder	(E x G)	**$10,795**
Total MTRC Net Benefits without Adder	(G - H) x E	**$9,199**

Utility Program Cost per Net Dth Lifetime	(F / A)	**$4.85**
Participant Payback with Rebate		**0.7 years**
Participant Payback without Rebate		**2.2 years**

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$1,318	$1,318	$1,318
Transmission & Distribution Capacity		$269	$269	$269
Marginal Energy		$1,198	$1,198	$1,198
Avoided Emissions (CO2, SOx)		$346	$346	$346
Subtotal		$3,130	$3,130	$3,130
Non-Energy Benefits Adder (10%)				$313
Subtotal		$3,130	$3,130	$3,443
Other Benefits				
Participant Rebates and Incentives	$683			$683
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$21			$18
Subtotal	$704			$701
Reduction in Sales Revenue				
Electric	$1,835		$1,569	
Subtotal	$1,835		$1,569	
Utility Program Costs				
Program Planning & Design		$3	$3	$3
Administration & Program Delivery		$144	$144	$144
Advertising/Promotion/Customer Ed		$16	$16	$16
Participant Rebates and Incentives		$683	$683	$683
Equipment & Installation		$0	$0	$0
Measurement and Verification		$0	$0	$0
Miscellaneous		$0	$0	$0
Subtotal		$845	$845	$845
Participant Costs				
Incremental Capital Costs	$927			$793
Incremental O&M Costs	$0			$0
Subtotal	$927			$793
Total Benefits	$2,539	$3,130	$3,130	$4,144
Total Costs	$927	$845	$2,415	$1,638
Net Benefit (Cost)	$1,612	$2,285	$716	$2,506
Benefit/Cost Ratio	**2.74**	**3.70**	**1.30**	**2.53**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	15 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	99.65%
Gross Load Factor at Customer	E	24.72%
Net-to-Gross (Energy)	F	85.5%
Net-to-Gross (Demand)	G	85.5%
Transmission Loss Factor (Energy)	H	6.39%
Transmission Loss Factor (Demand)	I	6.39%
MTRC Net Benefit (Cost)	J	$2,506
MTRC Non-Energy Benefit Adder	K	$313
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.9102 kW
Gross Annual kWh Saved at Customer	(B x E x C)	2,166 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,852 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,978 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	37.21 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	33.86 kW
Gross Annual kWh Saved at Customer	(B x E x L)	80,571 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	68,889 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	73,591 kWh

Program Summary All Participants		
Total Participants	M	48
Total Budget	N	**$1,509,800**
Gross kW Saved at Customer	(M x L)	1,786 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**1,625 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	3,867,431 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	3,306,654 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**3,532,372 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$4,475,098**
TRC Net Benefits without Adder	(M x L x (J - K))	**$3,916,076**

Utility Program Cost per kWh Lifetime	**$0.0294**
Utility Program Cost per kW at Gen	**$929**
Participant Payback with Rebate	**1.9 years**
Participant Payback without Rebate	**7.3 years**

STANDARD OFFER PROGRAM — 2010 GAS GOAL

2010 Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$62.84	$62.84	$62.84
Variable O&M Savings		$0.34	$0.34	$0.34
Demand Savings		$3.93	$3.93	$3.93
Subtotal		$67.11	$67.11	$67.11
Emissions and Non-Energy Benefits Adder (5%)				$3.36
Subtotal		$67.11	$67.11	$70.46
Other Benefits				
Participant Rebates and Incentives	$8.86			$8.86
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$8.86			$8.86
Reduction in Sales Revenue				
Gas	$80.98		$75.31	
Subtotal	$80.98		$75.31	
Utility Program Costs				
Program Planning & Design		$0.00	$0.00	$0.00
Administration & Program Delivery		$7.87	$7.87	$7.87
Advertising/Promotion/Customer Ed		$0.00	$0.00	$0.00
Participant Rebates and Incentives		$8.86	$8.86	$8.86
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.00	$0.00	$0.00
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$16.73	$16.73	$16.73
Participant Costs				
Incremental Capital Costs	$26.31			$24.46
Incremental O&M Costs	$0.00			$0.00
Subtotal	$26.31			$24.46
Total Benefits	$89.83	$67.11	$67.11	$79.32
Total Costs	$26.31	$16.73	$92.04	$41.19
Net Benefit (Cost)	$63.53	$50.38	-$24.93	$38.12
Benefit/Cost Ratio	**3.41**	**4.01**	**0.73**	**1.93**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

2010 Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	9 years
Net-to-Gross	B	93%

Program Totals:		
Participants	C	24
Average Dth/Yr Saved	D	78.8
Total Dth/Yr Saved	E	**1,890**
Utility Costs per Net Dth/Yr	F	$17.99
Net Benefit (Cost) per Gross Dth/Yr	G	$38.12
Non-Energy Benefits Adder per Gross Dth/Yr	H	$3.36
Annual Dth/$M	($1M / F)	**55,597**
Total Utility Budget	(F x E)	**$34,000**
Total MTRC Net Benefits with Adder	(E x G)	**$72,067**
Total MTRC Net Benefits without Adder	(G - H) x E	**$65,724**

Utility Program Cost per Net Dth Lifetime	(F / A)	**$1.96**
Participant Payback with Rebate		**1.5 years**
Participant Payback without Rebate		**2.3 years**

➤ Residential Segment

A. Description

Public Service has developed a wide range of program offerings to serve the Residential Segment during the 2009/2010 biennium. This segment consists of over 1.13 million electric and 1.18 million natural gas customers who reflect a diverse population with a variety of lifestyles. Customers traditionally reside in single-family homes, multi-family homes, and apartments/condominium residences. To address this varied set of customers, the Company has developed a unique set of programs targeted to reach the vast majority of the residential market and provide customers with multiple opportunities to participate.

While the Business Segment focuses on customers with large energy savings projects, the Residential Segment is truly a mass-market segment that will touch thousands of customers annually. The programs were developed and will be implemented to allow large numbers of customers to participate and benefit from the programs.

The overall portfolio of programs focuses on educating our customers on energy efficiency and giving them simple ways to participate and encouraging them to make long-term commitments to reduce their energy usage. The Company offers a comprehensive set of programs including prescriptive rebates for heating and cooling equipment, whole house solutions for new or existing homes, and market transformation of ENERGY STAR appliances and televisions through retailers. The segment also contains Saver's Switch, a demand response program available to residential customers.

Programs

A thorough portfolio of residential programs is planned for 2009 and 2010. The full list of residential programs is provided in the table below, along with rankings and other market data. Public Service is keeping the existing Saver's Switch, Home Lighting/Lamp Recycling, and Evaporative Cooling Rebate Programs from 2008 and expanding where possible. The Company is adding one new electric program, four new gas programs, and three new electric/gas combination programs to the Residential Segment in this biennium.

A new addition in 2009 is the market transformation offering, the ENERGY STAR Retailer Incentive Pilot Program. Because this program is new and its methods are unproven, Public Service is introducing it as a pilot program. As such, the Company will launch this program in a controlled way to allow for early adjustments as needed. The ENERGY STAR Retailer Incentive Pilot Program will focus on changing the market for electric household appliances and televisions through coordinated efforts with local retail partners. The Company will hire a third-party implementer experienced with market transformation offerings to coordinate, track, and report the program.

Table 32: Residential Segment Program Rankings

Program Name	Program Ranking[1]	Type of Program	Fuel
Energy Efficient Showerheads	4	Prescriptive	Gas
ENERGY STAR New Homes	11	Custom	Electric/Gas
ENERGY STAR Retailer Incentive	3	Market Transformation	Electric
Evaporative Cooling Rebates	15	Prescriptive	Electric
Heating System Rebates	33	Prescriptive	Gas
Home Lighting & Recycling	1	Prescriptive	Electric
Home Performance with ENERGY STAR	22	Prescriptive	Electric/Gas
Insulation Rebates	27	Prescriptive	Gas
Refrigerator Recycling	14	Prescriptive	Electric
School Education Kits	9	Prescriptive	Electric/Gas
Water Heater Rebate	29	Prescriptive	Gas
Saver's Switch	8	Prescriptive	Electric

When designing and selecting programs to offer in Colorado, Public Service has built upon Xcel Energy's energy efficiency and load management programmatic experience in other states and has refined those programs to specifically meet the needs of customers in Colorado. These programs include: Home Performance with ENERGY STAR, ENERGY STAR New Homes, Heating System Rebates, School Education Kits, Water Heater Rebates, and Energy Efficient Showerheads.

In developing this portfolio of programs, Public Service worked closely with external consultants familiar with residential and low-income programs nationally. This included assessing possible programs, developing technical assumptions specific to efficiency measures and the Colorado climate and energy codes, and performing an initial cost effectiveness test. The Company researched other utility offerings to learn about new programs, understand their challenges, and discover how the existing programs could be improved. For example, Public Service reviewed the Best Practices Benchmarking for Energy Efficiency Programs website and material for ideas to improve programs. The Company also worked with industry consultants and vendors such as E-Source, American Council for an Energy Efficient Economy, and Consortium for Energy Efficiency to learn about activities across the nation. In addition, Public Service spoke with several local energy industry members to shape the new programs and discuss partnership opportunities. This list of key external energy efficiency experts is located below in the Stakeholders section.

The Company assessed several technologies that were not included in this filing but will continue to be investigated for possible addition in future years. The list of technologies came primarily from local energy experts and the DSM Roundtable. The program concepts include:

[1] Rankings are done by determining market segments that could participate in the program, customer classes available, total projected savings, cost per kW/Dth, participation, and participation % of market. The entire portfolio ranking can be found in the introduction of the DSM Plan filing.

whole house cooling fans, solar water heating and passive heating, geothermal/ground source heat pumps and central air conditioner rebate with quality installation.

Public Service is discontinuing the Central Air Conditioner Tune-Up Program at the conclusion of 2008. The program launched in 2007 and did not develop and succeed as expected. The Company partnered with a third-party service provider that specializes in recruiting and training Heating, Ventilation and Air Conditioning contractors and providing the turnkey service so the contractor has the necessary data to verify system performance.

In 2007, the Central Air Conditioner Tune-Up Program had a goal of 1,000 participants, but had actual achievements of 62 participants by year-end. With a small number of participants, but the full program launch costs, the program did not pass the TRC Test at the end of the program year. After having meetings with the Colorado DSM Roundtable and a subcommittee focused on heating and cooling, the Company made several changes in early 2008 that were intended to simplify the process for HVAC contractors and increase the amount of qualified units that would fit in the new program requirements. The new program was launched, with increased marketing activity, in early 2008 with a goal of 2,000 participants. Results through July 2008 show that we have only had 84 participants in the program and the number of customers receiving the tune-up assessment and those choosing to tune-up the unit after the assessment is still below the 50% of total participants, the threshold that would be required to maintain a passing TRC Test ratio.

Due to the performance of the program, in addition to the breadth of new offerings planned for 2009, Public Service decided to close the program at the end of 2008. This will be announced to customers, contractors and other parties in August 2008. The Company will reconsider this program for future DSM Plans if conditions change.

B. Overall Budgets & Goals

The Residential Segment programs have a large reach to customers and provide a wide portfolio of offerings that will allow all customers to participate. Planned achievements of 120.0 GWh and 335,290 Dth over the two-year period account for 31% of the Company's total electric energy savings goal and 47% of the total natural gas goal. The most energy efficiency savings within the Residential Segment will come from Home Lighting & Recycling, Evaporative Cooling Rebates, and ENERGY STAR Retailer Incentive Pilot Programs.

Table 33a: 2009 Residential Segment Budgets & Goals

2009	Electric Participants	Electric Budget	Customer kW	Net Generator kW	Net Generator kWh	Modified TRC Ratio	Gas Participants	Gas Budget	Net Annual DTH Savings	Annual Dth/$M	Total Modified TRC Net Benefits with Adder	Modified TRC Ratio
Residential Segment												
Energy Efficient Showerhead							20,000	$199,514	14,280	71,576	$1,345,979	5.99
ENERGY STAR New Homes	100	$56,000	136	10	117,030	1.74	2,200	$3,002,604	34,658	11,543	$1,157,304	1.25
ENERGY STAR Retailer Incentive	16,469	$2,658,384	3,171	640	2,455,560	1.17						
Evaporative Cooling Rebate	3,800	$1,195,900	6,551	3,803	2,071,569	8.32						
Heating System Rebate							4,500	$789,360	35,868	45,440	$2,086,235	1.85
Home Lighting & Recycling	250,000	$3,127,951	46,250	3,307	46,237,797	6.39						
Home Performance w/ ENERGY STAR	300	$171,949	343	31	374,715	1.94	300	$328,250	9,617	29,299	$207,378	1.23
Insulation Rebate							1,500	$529,900	28,210	53,237	$1,887,085	1.72
Refrigerator Recycling	3,250	$659,703	453	297	2,189,309	2.01						
School Education Kits	6,600	$164,211	673	54	815,800	2.99	6,600	$163,273	14,315	87,674	$854,817	4.16
Water Heating Rebate							1,250	$81,796	1,513	18,502	$29,038	1.16
Energy Efficiency Subtotal	**280,519**	**$8,034,098**	**57,578**	**8,142**	**54,261,780**	**5.11**	**36,350**	**$5,094,697**	**138,462**	**27,178**	**$7,567,835**	**1.67**
Saver's Switch	19,500	$12,286,434	58,500	22,218	45,359	4.21						
Load Management Subtotal	**19,500**	**$12,286,434**	**58,500**	**22,218**	**45,359**	**4.21**						
Residential Segment Total (w/o Low Income)	**300,019**	**$20,320,532**	**116,078**	**30,360**	**54,307,139**	**4.52**	**36,350**	**$5,094,697**	**138,462**	**27,178**	**$7,567,835**	**1.67**

Table 33b: 2010 Residential Segment Budgets & Goals

2010	Electric Participants	Electric Budget	Customer kW	Net Generator kW	Net Generator kWh	Modified TRC Ratio	Gas Participants	Gas Budget	Net Annual DTH Savings	Annual Dth/$M	Total Modified TRC Net Benefits with Adder	Modified TRC Ratio
Residential Segment												
Energy Efficient Showerhead							22,950	$227,224	16,387	72,118	$1,547,842	5.94
ENERGY STAR New Homes	200	$97,550	272	21	234,059	1.90	3,200	$4,345,000	50,411	11,602	$1,738,471	1.26
ENERGY STAR Retailer Incentive	18,116	$2,964,229	3,488	704	2,701,058	1.14						
Evaporative Cooling Rebate	4,000	$1,287,696	6,899	4,005	2,181,848	7.91						
Heating System Rebate							6,500	$1,091,733	51,810	47,456	$3,071,127	1.88
Home Lighting & Recycling	300,000	$3,433,520	55,500	3,969	55,485,357	6.69						
Home Performance w/ ENERGY STAR	1,000	$484,778	1,145	103	1,249,049	2.15	1,000	$1,031,721	32,058	31,072	$752,548	1.25
Insulation Rebate							1,500	$534,755	28,210	52,753	$1,905,707	1.73
Refrigerator Recycling	4,375	$885,382	609	400	2,947,146	2.04						
School Education Kits	7,300	$188,938	745	60	902,324	2.96	7,300	$187,736	15,833	84,336	$921,511	4.01
Water Heating Rebate							1,750	$110,766	2,119	19,129	$43,592	1.17
Energy Efficiency Subtotal	**334,991**	**$9,342,093**	**68,658**	**9,261**	**65,700,842**	**5.00**	**44,200**	**$7,528,935**	**196,828**	**26,143**	**$9,980,798**	**1.60**
Saver's Switch	19,500	$12,286,434	58,500	22,218	45,359	4.03						
Load Management Subtotal	**19,500**	**$12,286,434**	**58,500**	**22,218**	**45,359**	**4.03**						
Residential Segment Total (w/o Low Income)	**354,491**	**$21,628,527**	**127,158**	**31,479**	**65,746,200**	**4.44**	**44,200**	**$7,528,935**	**196,828**	**26,143**	**$9,980,798**	**1.60**

Budgets
DSM budgets are developed using a well-defined process. First, targets from the resource plan are allocated across customer segments, specifically to Business, Residential, Low-Income, and Indirect. Then each program's rebate budget is established at the level required to move the market enough to meet individual program goals. Next, other budget components like advertising and promotion are developed as part of the program planning process. Then, program delivery budgets, including Company labor and external resources, are calculated. Some programs issue competitive bids to secure consultant resources. Finally, the budgets are totaled and reviewed for reasonableness given the historical and projected performance of each program. The resulting goals and budgets from this planning process are shown in each respective program description.

Budgets in 2010 are increasing due to higher participation goals in almost all programs. Program budgets increase accordingly due to increased rebates, promotions, third-party implementer costs and internal labor for every incremental increase in the number of participants. Labor resources are budgeted to increase by approximately two people in 2010 due to program increases. The personnel increase is actually incremental increases across several internal teams such as product marketing, product development, call center personnel, and rebate operations due to increased participation.

Goals
For the 2009/2010 Biennial Plan, goals were established first at the portfolio level through the Public Utilities Commission hearing process. The Company's DSM management team reviewed these goals and completed an initial allocation of the goals to the Business, Residential, and Low-Income Segments.

This allocation was accomplished through a review of historical data, discussions from the DSM Roundtable meetings, meetings with local and national energy industry experts, and the knowledge that residential goals would be significantly higher for 2009 and 2010 than 2008. This is mostly due to the addition of gas energy efficiency programs and the ability to launch new electric and gas combination programs such as ENERGY STAR New Homes and School Education Kits.

Once the overall portfolio goal was allocated to the individual segments, the segment goals were then allocated to each program. This allocation process was based primarily on a review of program performance for existing Public Service programs and longer-term experience with similar programs in Minnesota. Each product team then reviewed the information and informed the segment manager on whether the goals set forth are achievable.

C. Market Analysis

With the current national climate regarding energy policy, there is great energy efficiency opportunity for residential customers in the near future. In addition, due to current building code situation in Colorado, there is an excellent opportunity to impact in both the short-term and the long-term how new homes are constructed through our ENERGY STAR Homes Program. Related to this issue is the quality of existing homes from an energy efficiency perspective. The

Company believes it can make a significant impact in existing homes through the Home Performance with ENERGY STAR Program that focuses on making several efficiency improvements to the house at one time.

The retailer and customer market will continue to expand for compact fluorescent light bulbs (CFLs) in the next several years until the new federal energy standards take effect beginning 2012. There is a great opportunity to rapidly build customer knowledge and use of CFLs through marketing the benefits of the bulbs and offering them at reduced prices through select retailers.

Public Service believes evaporative cooling is an excellent low cost source for cooling in the Colorado climate. Xcel Energy supports the idea of the Department of Energy adding evaporative coolers to the ENERGY STAR Program, which would improve setting standards to clearly identify efficiency levels.

The Company will continue to investigate technologies that were assessed but not included in this filing, mostly due to cost effectiveness. This includes geothermal heat pumps; central air conditioner rebates with quality installation as well as re-evaluating the central air conditioner tune up offering to see if market conditions have improved.

Additionally, the Company maintains a database of "ideas" for new programs. These are ideas that are regularly screened, developed and evaluated in a routine process, including the following ideas for improving home efficiency:

- Condensing storage tank water heaters;
- Heat pump water heaters;
- Radiant cove and radiant floor heating;
- Variable speed fan motor retrofits for furnaces;
- Central air conditioning with quality installation methods;
- Solar tube lighting;
- LED lighting;
- Airtight CFL down lights;
- Improved windows; and
- High Efficiency home electronics and controls.

The marketing, technical and development staffs are continually looking and adding new ideas to the database and discarding some that are not viable in the relevant time period.

D. Marketing/Advertising/Promotion

Trade allies, end-use equipment vendors, energy services companies, and Public Service's call center representatives primarily drive conservation and demand response achievements in the Residential Segment. The Company utilizes newsletters, customer events, direct mail, email communications, and awareness advertising to reach customers. The challenge with customers is that energy efficiency doesn't tend to be on the top their minds. Customers tend to focus on purchase price rather then lifetime costs and are unlikely to replace equipment prior to failure. Customers may also not be aware of energy efficient options available when the need arises to make purchase decisions. Yet, opportunities are growing in marketing to customers because energy costs and climate change have increased this awareness and affinity for energy-saving actions. To support marketing efforts, Public Service employs an integrated approach to marketing communications, where the tactics are designed to work in concert with each other and reinforce key messages over time.

Strategy
Public Service follows the "AIDA" (awareness, interest, desire, action) process for encouraging customers to use the rebate programs. The following are the steps in this process:

1. Create awareness of electric and/or gas prices with respect to their monthly income and living expenses and potential savings from energy efficiency offerings.
2. Create interest by offering more information about program offerings as details become available.
3. Create desire by showing how customers can save short-term with rebates and long-term in the monthly operating costs for their appliances or equipment.
4. Move the customer toward action by providing a wide range of program offerings that may address one or more of their needs.

Key Messages and Target Audience
When communicating with customers, Public Service uses several overarching key messages including:

- Energy efficiency reduces monthly utility bills due to lower operating costs;
- Public Service helps lower energy bills by giving rebates and incentives for installing highly efficient equipment;
- Energy efficiency helps reduce the customer's impact on the environment.

Communications vehicles:

- Program collateral including brochures, applications, and participating vendor lists;
- Newsletters that promote energy efficiency programs and efficiency education;
- Xcel Energy website;
- Direct mail campaigns for specific programs;
- Events including program and technical training for contractors and customer education;
- Speaking opportunities at local trade association events;
- Media relations including free placement in appropriate media, focusing primarily on customer stories and program information and changes; and
- Advertising in newspapers, radio, periodicals and the internet.

E. Segment-Level Policies

There are several general policies that are followed in Public Service's Residential Segment. Individual programs may follow different policies as noted in the program descriptions. The overall segment-level policies include:

- Proof of installation: All programs require documentation of installation through either proof of purchase (i.e. invoices) or a site verification

- Installation date: Rebates are provided for equipment installed within a 12-month period.

F. Stakeholder Involvement

Throughout the product development process, Public Service had discussions with key external parties. The discussions were done in group meetings, one-on-one meetings, phone calls, and brainstorming sessions. The Company talked with several local members to shape the new programs and discuss partnership opportunities. This includes: City/County of Boulder, City of Denver/Denver Greenprint, Governor's Energy Office, All About Saving Heat, Center for Resource Conservation, Colorado Regional Lighting Committee, Colorado Department of Public Health and Environment, Treading Lightly, Smart Energy Living Alliance/E-Star, Energy Efficiency Business Coalition, Denver Water, Resource Action Programs, Rocky Mountain Power, Fort Collins Utilities, Colorado Springs Utilities, and Platte River Power Authority.

In addition to local contacts, Xcel Energy also worked with national organizations in developing the programs. This includes: American Council for an Energy Efficient Economy, Consortium for Energy Efficiency, Department of Energy/ENERGY STAR, Wisconsin Energy Conservation Corporation, E Source, more than 10 evaporative cooling manufacturers, Southwest Energy Efficiency Project, and Wisconsin Energy Conservation Corporation. Several of these local and national organizations will either be involved in one or more programs through an RFP or they will be utilized to provide feedback on the new program to understand what areas could be improved in the future.

G. Evaluation, Measurement & Verification

The specific program measurement and verification plans are included in the M&V section of the Indirect Segment of this Plan.

➢ Energy Efficient Showerhead Program

A. Description

The Energy Efficient Showerhead Program is designed to offer year-round, long-term natural gas savings to Public Service customers. Residential natural gas customers residing in Colorado are eligible to receive a free high-efficiency showerhead (approximately a $5.00 value) to help reduce energy and water use and costs. Currently, Xcel Energy is running similar successful programs in Minnesota and North Dakota.

Direct mailings are sent to customers in the spring and fall offering a free energy efficient showerhead. Customers send back the business reply card if they would like to receive the free unit. The reply card allows the customer to make the active decision whether or not to request the energy efficiency measure. Public Service has contracted with a third-party provider to manage all customer responses and send out the free energy efficient showerhead. The third-party is a residential distributor of energy efficiency-related products in the United States.

According to a study done by SBW Consulting, Inc. in October of 1994 for customers that received and installed a low-flow showerhead:

> The results of the participant satisfaction survey for the efficient showerheads showed a high degree of overall satisfaction. Most (76%) of the respondents were either very satisfied, satisfied or somewhat satisfied with the showerheads. The tenants most frequently found the shower "feel" to be better with the new showerheads. They most frequently saw no change with the new showerhead for spray pattern, amount of water flow, spray adjustment and appearance. An equal number of respondents found the overall performance of the efficient showerhead to be better or about the same as the old showerhead. Twenty percent or less of the tenants found the new showerhead to be less desirable across the six features included in the survey. All or nearly all of the tenants said that their showering habits did not change with the new showerheads."[2]

B. Budgets & Goals

Budgets

The Energy Efficient Showerhead Program budget was developed based upon the desired participation level. Using Xcel Energy's showerhead program in Minnesota as a proxy, the cost of the showerheads, postage, and all necessary marketing efforts were included. Since the third-party will manage all day-to-day activities, minimal internal labor will be allocated to this program.

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[2] Source: http://www.bpa.gov/energy/n/reports/evaluation/residential/faucet_aerator.cfm

Goals
In determining goals for this program, we considered historical performance in other states, program ramp-up and total gas customers within our Public Service territory.

Table 34: Energy Efficient Showerhead Program Budgets and Goals

Energy Efficient Showerhead	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	N/A	$21,256	N/A	$18,079
Admin & Program Delivery	N/A	$35,200	N/A	$40,802
Ad, Promo, & Customer Ed.	N/A	$35,000	N/A	$42,700
Customer Incentives	N/A	$100,000	N/A	$114,750
Equipment & Installation	N/A	N/A	N/A	N/A
M&V	N/A	$8,058	N/A	$10,893
Miscellaneous	N/A	N/A	N/A	N/A
Total	**N/A**	**$199,514**	**N/A**	**$227,224**
Generator kW	N/A	N/A	N/A	N/A
Generator kWh	N/A	N/A	N/A	N/A
Annual Dth	N/A	14,280	N/A	16,387
Annual Dth/$M	N/A	71,576	N/A	72,118
Participants	N/A	20,000	N/A	22,950
Participation as % of Segment	N/A	1.688%	N/A	1.937%
Modified TRC Test Ratio	**N/A**	**5.99**	**N/A**	**6.03**

C. Application Process

Customers are notified of this program through a direct mail piece distributed in the spring and fall months targeting different parts of the service territory in each mailing. The fall and spring were chosen because there is greater demand for water (lawn care, etc). Customers will have a limited amount of time to return the business reply card to the third-party (approximately 45 to 60 days). Once the customer returns the card, they will be shipped one free energy-efficient showerhead.

D. Marketing Objectives, Goals, & Strategy

Customers in Xcel Energy's other service territories respond to the free showerhead offer at a rate of 20 to 25%. In order to reach our program goal for Colorado, the Company plans to send the business reply card to 75,000 customers. Public Service will hold an additional 25,000 cards in case we don't receive sufficient response to the first mailing. The reply card requests the following information:

- Number of showers in household;
- Number of people in household;

- Whether the water heater runs on natural gas; and
- Whether the customer owns or rents their home.

Customer responses will be tracked by the provider and sent to Public Service following the distribution of the showerheads to participants. This information is kept in a tracking system to calculate savings.

E. Program-Specific Policies

In general, each participant is allowed one showerhead per mailing. If the customer lists more then four residents in the home, a second showerhead to the home will be considered. A second showerhead option is listed as well on the business reply card. The third-party provider will note when multiple showerheads are requested and send that in the report to Public Service. Further, if a customer who did not receive the mailing becomes aware of the program and would like a free showerhead, they will receive one if budget allows.

F. Stakeholder Involvement

Public Service is in preliminary discussions with local water municipalities to determine how the gas and water utilities can pool resources to increase the impact of this program from both an energy and water conservation perspective. In particular, Denver Water serves 25% of the state's population and is a leader in water conservation activities. Their aggressive goal to reduce water use 22% by 2016 can be paired with Public Service's energy efficiency goals to produce maximum benefits to both companies. Customers also would benefit from a unified messaging and marketing approach. During the next few months, we plan to work with Denver Water and other water providers to identify and expand these joint opportunities.

G. Evaluation, Measurement & Verification Plan

The M&V process for prescriptive programs is detailed in the M&V section of the Indirect Segment of this Plan. The savings factors that will be verified for the Energy Efficient Showerhead Program are detailed in the Deemed Savings Technical Assumptions section.

H. Rebate Levels

The Energy Efficient Showerhead Program provides free energy efficient equipment rather than a rebate to the customer. It costs Public Service under $5.00 at this time to deliver each showerhead, including the costs of the showerhead, mailing tube, custom labels, business reply postage for returned cards, phone costs, order processing, and postage.

I. Technical Assumptions

The proposed efficiency measure is a low-flow showerhead with a flow rate of 2.0 gallons per minute. The base case uses the Federal Standard assumption of 2.5 gallons per minute, although there are many showerheads currently in service with significantly higher flow rates. Energy savings are captured when reducing the showerhead water flow rate and noting the impacts from reduced heating of the water.

UPDATE: In response to the recent Settlement Agreement, Public Service plans to implement this program with 1.5 GPM showerheads. The impact of these higher efficiency showerheads on technical assumptions, goals, and budgets has not yet been evaluated, but will be included in the May 1, 2009 DSM Plan Amendment. .

➤ ENERGY STAR New Homes Program

A. Description

The ENERGY STAR New Homes Program provides homebuilders with an incentive to build to ENERGY STAR standards. ENERGY STAR homes are built to be a minimum of 15% more energy efficient than standard homes. This program will encourage homebuilders to consider a "whole-house" approach to energy conservation when building new single-family and multi-family homes. This approach combines energy saving construction methods with energy efficient appliances to achieve significantly higher energy savings and provide the customer with lower energy bills, fewer maintenance concerns, higher resale value, and a more comfortable, quiet home.

The ENERGY STAR New Homes Program will provide free ENERGY STAR testing services and a rebate to builders who construct homes that achieve ENERGY STAR certification, and additional rebate dollars if energy efficient electric appliances and lighting are installed. The ENERGY STAR certification threshold in the Denver climate zone is a Home Energy Rating System (HERS) score of 85 or below. The ENERGY STAR criteria for higher elevations is a HERS score of 80 or below. (On the HERS Index, the lower score represents the more efficient home.) Due to differing building codes throughout the state, Public Service has built in flexible options for cities or counties that have more stringent codes than the ENERGY STAR rating. Builders will still be able to participate in those areas but the required efficiency level will have to be better than the traditional 80 HERS or 85 HERS score.

The builder may mix and match efficient technologies or building techniques to obtain a score that meets ENERGY STAR. For example, a builder could install a high efficiency furnace of 96% AFUE combined with less efficient windows, but still meet the threshold. The builder has the flexibility to install any combination of technologies as long as the final result is an ENERGY STAR certified home. To obtain the additional rebate dollars for electric appliances and lighting, the builder must install an ENERGY STAR clothes washer, dishwasher, refrigerator and 20 ENERGY STAR rated fixtures or bulbs.

This program applies to builders of residential single-family, multi-family (duplex, triplex, fourplex) and town homes that receive electric and/or gas service from Public Service. The Company will use a third-party administrator to recruit builders and selected HERS rating companies. The third-party administrator and the HERS Raters will serve as points of contact for the builders, assist with builder training, and track the program. The HERS Rater will model and test the home to determine whether it meets the ENERGY STAR standards. Public Service will conduct an RFP prior to the 2009 program to hire the third-party administrator. The administrator will recruit several HERS rating companies. The HERS rating companies will be contracted and required to go through Company training.

This program builds on Xcel Energy's experience with its similar program in Minnesota, offered since 1996. In that program, Xcel Energy does not offer rebates, but rather provides free services (inspections and testing) and requires builders to install certain energy efficient equipment. In an effort to begin transforming new home construction permanently in Colorado, Public Service will be offering a combination of free services and rebates to build the builder community. We will review this strategy in 2010 in preparation for the Company filing the next biennial.

B. Budgets & Goals

Budgets

The ENERGY STAR New Homes Program budget was developed to include administration and implementation, rebates/incentives, materials, promotional events, advertising and labor costs. The costs for the third-party administrator and HERS Raters were based on past experience with our similar program in Minnesota and by speaking with local energy experts such as GEO. The 2010 budget, developed similar to the 2009, varies because of the increased program goal and larger advertising/promotion/education budget to further build awareness and interest in the second year of the program. Rebate levels will remain the same during the two-year period.

The ENERGY STAR New Homes Program has its measurement and verification built into the program. This program requires a completed HERS rating at the end of construction both to determine if the house passes (in order for the builder to receive a rebate) and if the installed measures will provide the expected energy savings. As a result, the measurement and verification budget for this program appears extremely large compared to the total program cost. These requirements are intended to transform the home construction market over time so that nearly all homes are built to or above ENERGY STAR levels. As the program matures, the need to perform a HERS rating on every new home may diminish as long-standing homebuilders demonstrate that they consistently meet or exceed requirements.

As mentioned earlier, there are multiple ways a homebuilder can build to reach or exceed ENERGY STAR level. The program's custom approach is one reason it can be attractive to builders. Although the energy savings for each home will be unique, Public Service has estimated that the 2009 average annual savings per home will be 1,170 generator kWh and 13.68 Dth. Goals were established using these assumed savings.

Goals

The program goals were determined based on a set of factors. One factor is that the current new home construction market that is in a slowdown due to current economic and mortgage difficulties. Another factor was assessing the local homebuilders and their current engagement in ENERGY STAR homes. The Company consulted with ENERGY STAR to understand past building trends in our service territory including the number of ENERGY STAR homes built in past years. Based on this analysis, Public Service estimated the total number of new homes constructed in our territory will remain relatively flat in 2009 but begin to rebound in 2010. After analyzing these factors, the Company decided to set the program goal so approximately 20% of all new homes would be built to ENERGY STAR levels. This is an aggressive goal for a new program but we believe it is an appropriate goal based on past activity by homebuilders and the GEO.

Table 35: ENERGY STAR New Homes Program Budgets and Goals

ENERGY STAR New Homes	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$2,250	$45,000	$2,300	$48,236
Admin & Program Delivery	$11,500	$534,821	$12,750	$720,995
Ad, Promo, & Customer Ed.	$16,250	$222,783	$30,500	$375,769
Customer Incentives	$11,000	$1,100,000	$22,000	$1,600,000
Equipment & Installation	N/A	N/A	N/A	N/A
M&V	$15,000	$1,100,000	$30,000	$1,600,000
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$56,000**	**$3,002,604**	**$97,550**	**$4,345,000**
Generator kW	10	N/A	21	N/A
Generator kWh	117,030	N/A	234,059	N/A
Annual Dth	N/A	34,658	N/A	50,411
Annual Dth/$M	N/A	11,543	N/A	11,602
Participants	100	2,200	200	3,200
Participation as % of Segment	0.009%	0.186%	0.018%	0.270%
Modified TRC Test Ratio	**1.74**	**1.25**	**1.90**	**1.26**

C. Application Process

Homebuilders are most likely to hear about the program though marketing done by Public Service, the third-party administrator or through a HERS Rater. To initiate the process, the builder expresses interest in building an ENERGY STAR home to a HERS Rater. The Rater will explain the program and rebates, review the home's blueprints and building schedule, and enter the home details into Public Service's tracking software. The Rater will work with the builder to construct the home to or better than ENERGY STAR standards.

When the home is completed, the HERS Rater will perform an air tightness test on the house and then calculate the HERS score and the energy savings on the house. Once the Rater has submitted the test scores to Public Service, the builder will receive a rebate based on the gas and electric savings. There is no rebate application for this program because the HERS report is the data that will be used to determine the rebate for each individual house. The third-party administrator will ensure that all the information entered into the software system is correctly tracked. Houses will be recorded on the Environmental Protection Agency's ENERGY STAR website.

D. Marketing Objectives, Goals, & Strategy

The goal of the ENERGY STAR New Homes Program is to motivate builders to construct qualifying ENERGY STAR homes. The program will be promoted to HERS Raters, builders and developers to build a participating network. The Company will use a competitive bidding process to secure a third-party administrator who will conduct the recruitment and training of the HERS rating companies. The HERS rating companies will conduct and report on the homes efficiency level when construction is complete. The program will be promoted to builders by the participating Raters and third-party administrator using individual sales and recruitment techniques. The program will also be promoted through trade journals targeted to homebuilders and developers.

Public Service will work closely with the Colorado Governor's Energy Office, cities and environmental organizations to build awareness throughout the customer and builder markets. Public Service will build upon the promotion efforts done by the GEO and develop myriad tactics that will motivate builders to participate in the program, including: attending events such as the ENERGY STAR Summit and developing materials and presentations to be used during recruitment sessions and individual builder meetings. Public Service will advertise in local trade magazines and steer builders to local training events. This comprehensive effort will communicate the benefits of ENERGY STAR and teach and motivate builders to differentiate themselves by building ENERGY STAR homes.

E. Program-Specific Policies

In order to participate in this program, homebuilders must be registered as ENERGY STAR partners, licensed, and bonded. The contracted HERS Raters must be Residential Energy Services Network ("RESNET") authorized and use modeling software approved by RESNET. There are two paths to qualify a home to meet ENERGY STAR's guidelines for energy efficiency. Both paths require independent verification by a qualified Home Energy Rater: HERS and Builder Option Package.

A HERS rating is where software is used to model the home's energy use to verify that it meets a target score. In order to pass ENERGY STAR certification, homes will need to meet a minimum HERS rating of 80 in the mountain communities and 85 in the Denver area. Public Service will encourage each house to be modeled and tested using the HERS method. The Builder Option Package (BOP) is a method to achieve ENERGY STAR certification where builders construct the home using a prescribed set of construction specifications that meet program requirements. The EPA has approved BOP specifications at the county and regional levels.

Public Service will accept homes that used the HERS method, an approved Builder Option Package to obtain the ENERGY STAR standard or the "sampling" method as performed by a RESNET certified Rater. Sampling allows an accredited Home Energy Rater to qualify a group of new homes to meet ENERGY STAR guidelines based on pre-analysis of building plans and subsequent random testing and inspections of a sample set of the homes as-built. For builders who have demonstrated an ability to consistently meet the ENERGY STAR guidelines, sampling helps to minimize production interruptions and verification costs, while ensuring that homes meet or exceed the guidelines for qualifying homes as ENERGY STAR. Sampling can be applied when either the performance verification method (HERS Index score) or prescriptive verification method (Builder Option Package) is used.

F. Stakeholder Involvement

Prior to developing the Colorado ENERGY STAR New Homes Program, Xcel Energy participated in the national ENERGY STAR Homes Partner meeting and helped to develop the best practices model along with other program sponsors and the Environmental Protection Agency. Lessons learned from participating factored in the development of the Public Service program. Xcel Energy also met with several utilities in Texas and the southwest to review their program structures and guide the Colorado program design. In addition, Xcel Energy serves on the new home construction committee for the Consortium for Energy Efficiency, regularly meets and works with the EPA and ENERGY STAR, and attends the ENERGY STAR Homes Partner meetings and RESNET conferences.

Public Service has held meetings with the Colorado Governor's Energy Office, Smart Energy Living Alliance, as well as other Colorado such as Platte River Power Authority, Fort Collins Utilities and Colorado Springs Utilities to make the ENERGY STAR New Homes Program successful by offering a consistent message and process.

G. Evaluation, Measurement & Verification Plan

The ENERGY STAR New Homes Program has a unique M&V plan specific to its design elements and is detailed in the M&V section of the Indirect Segment of this Plan.

H. Rebate Levels

Builders may participate in either the gas or electric, or both ENERGY STAR New Homes Program options. The program's gas option includes rebates to the builder based on the level of HERS rating achieved. The Rater will also receive a payment for homes that are entered into the program and tested using the HERS rating system or an approved BOP. The builder will receive a rebate of $200 for meeting the ENERGY STAR certification, plus an additional $10 for each point below ENERGY STAR on the HERS Index. For example, a new home in Denver with a HERS rating of 70 would receive a total rebate of $350 ($200 for meeting the ENERGY STAR threshold plus $150 for achieving 15 points below the minimum ENERGY STAR criteria).

Public Service will offer a separate rebate structure for homes within the City and County of Boulder and other localities with a more stringent code. Within Boulder, the ENERGY STAR New Homes Program will offer the following gas rebates:

Table 36: Boulder Rebate Structure for ENERGY STAR New Homes

Square Footage of Home	Baseline HERS Index	HERS for Rebate Eligibility	Base Rebate Amount	Additional Rebate Amount
3,000 or below	70	60	$200	$10 for each point below the HERS rebate eligibility threshold
3,001 – 5,000	60	51	$200	
5,001 or above	35	30	$200	

For example, a 3,000 square foot home built in the City of Boulder that achieves a HERS score of 55 would receive a total rebate of $250 ($200 for meeting the Rebate Eligibility threshold and $50 for achieving five points below the minimum criteria). The Boulder Rebate Structure will be used for all other cities and counties that have more stringent baselines.

For homes that are either not modeled and do not have a HERS score, that used the Builder Option Package, or that used an approved sampling method to achieve the ENERGY STAR rating, Public Service will pay a rebate of $200 until a suitable method of establishing credible energy savings is determined.

For the ENERGY STAR electric option, the builder will receive a $110 rebate for installing the four required bundled measures: ENERGY STAR clothes washer, dishwasher, refrigerator and 20 ENERGY STAR fixtures or bulbs. This rebate is available to all electric residential new home construction or large remodeling projects.

I. Technical Assumptions

Program savings were determined by the amount of energy savings that can be attributed to design and construction techniques that exceed the applicable energy code. The applicable code is referred to as the Baseline. In the ENERGY STAR rating scheme, a home is modeled as if designed and constructed to the minimum "code". This becomes the theoretical rating of 100.

The baseline building standard is assumed to be the 2006 International Energy Conservation Code (IECC 2006) for all jurisdictions in the state. Due to the inconsistent pattern of code adoption, this is not entirely accurate, but provides a standard baseline for the program analyses. Table 37, below, contains the prescriptive insulation and fenestration requirements for IECC zone 5, which encompasses the Denver area.

Table 37: 2006 IECC Minimum Insulation and Fenestration Requirements by Component[3]

Measure	2006 IECC
Window U-factor	0.35
Window SHGC	0.60
Ceiling Insulation	R-38
Wall Insulation	R-13
Floor Insulation	R-19
Basement Insulation	R-10
Slab Perimeter Insulation	R-10 / 2 ft
Crawlspace Insulation	R-10/R-13
Air Conditioner Efficiency (SEER)	13
Furnace Efficiency (AFUE)	78%
Hot water heater efficiency (Energy Factor -EF)	0.59

[3] Zone 5 data taken from: 2006 IECC Table 402.1.1 Insulation and Fenestration Requirements by Component.

In addition to the above table, IECC 2006 also designates standards for reference and proposed designs. The key components are: [4]

- Proposed glazing area is 18% of conditioned floor area
- Air exchange rate minimum: Specific Leakage Area (SLA) = 0.00036
- Thermostat settings: cooling 78°F and heating 68°F

The baseline home modeled for this analysis had the following characteristics:

- Single-family home;
- Two stories with unfinished conditioned basement;
- Five bedrooms, two bathrooms;
- 2,450 square feet above grade, 1,225 square feet below grade;
- HVAC: Gas Furnace and Central AC;
- Orientation: Square home with each of the four sides facing one of the cardinal directions with the same amount of window space on each orientation;
- 2-foot roof overhangs;
- Roofing material: composite shingles – medium color;
- Doors: wood;
- The duct supply, duct return and air handler are in conditioned space; and
- No shading was assumed.

This program is designed to be consistent with the ENERGY STAR requirements in its ratings and designation of qualifying homes. The ratings are determined by a combination of a computerized analysis (based on DOE 2) by a designated software package – either Energy Gauge or REMRate; passing the ENERGY STAR "Bypass Checklist", and field-testing and inspections (such as a blower door test) to ensure performance with ENERGY STAR standards.

The typical ENERGY STAR home is estimated to have a HERS score of 75. This value was used to calculate the expected energy savings, rebates, and cost-effectiveness of the program. In program operation, the actual scores and projected savings from the HERS ratings analyses will be used to claim savings for the program.

Incremental Costs

For the forecast analysis there were five efficiency measures implemented to the modeled home:

- Increased ceiling insulation from R-38 to R-44;
- Air Exchange Rate reduction from 7.08 Air Changes per Hour (ACH) (50) to 4.6 ACH(50);
- High Efficiency Gas Furnace - 78 AFUE to 92 AFUE; and
- High Efficiency Water Heater – 0.57 Energy Factor to 0.62 Energy Factor for a 50 gallon tank.

[4] For full specifications see IECC 2006 Table 404.5.2 (1): Specifications for the Standard Reference and Proposed Designs

Table 38: Incremental Costs for High Efficiency Measures

Added Efficiency Measure	Incremental Cost	Source
R-38 to R-44 Ceiling Insulation	$206	RS Means 2007 $0.028 per R per square foot
ACH Reduction from 7.08 to 4.6 ACH (50)	$550	Rater estimate - $350 for sealing and $200 for additional mechanical ventilation as required by IECC when the ACH natural is below 0.35
78 AFUE furnace to 92 AFUE	$331	DEER Database $7.631 per kBtu
57 EF Water heater to 62 EF	$55	Market analysis of home improvement stores
Total Incremental Cost	**$1,142**	

Savings

The savings for the forecast were derived from modeling one typical home for Public Service's service area. The analysis used the building energy use simulation tool EnergyGauge USRCPB v2.7.03. The therm and kWh savings are shown in Table 39. This table breaks out the heating, cooling and water heating savings separately to show compliance with meeting the required 15% reduction in these categories.

Table 39: Heating, Cooling, and Water Heating Savings Based on Simulation of an ENERGY STAR Home With HERS Score of 75

Savings	2006 Baseline	HERS Score 75	Savings
Therms	905	661	244
kWh	2039	1886	153

Table 40 below gives a further break down of the savings associated with each individual measure modeled in the prototype ENERGY STAR home. The savings calculations account for the interactive effects related to the addition of more then one measure to a building at a time.

Table 40: ENERGY STAR New Homes Program Savings by Component

Efficiency Measure	Savings (therms)	Savings (kWh)
Ceiling R-38 to R-44	7	21
ACH 7.08 ACH to 4.60 ACH	123	132
Furnace Efficiency 78 to 92 AFUE	96	0
Water Heater Efficiency 57 to 62 EF	19	0

➢ Market Transformation: ENERGY STAR Retailer Incentive Pilot Program

A. Description

The ENERGY STAR Retailer Incentive Pilot Program is designed to increase the sales of energy efficient technologies by working directly with retailers that sell ENERGY STAR equipment. This program is focused on large appliances and electronics, which are estimated to use approximately 18% of total household energy. Public Service will pay rebates directly to retailers for every qualifying unit sold to a Public Service customer. Eligible customers include all residential electric customers. Due to the unique aspects of market transformation programs in terms of participation and measurement processes, this program is being introduced as a pilot. As such, Public Service will launch the ENERGY STAR Retailer Incentive Pilot Program in a controlled way to allow for early adjustments if need be.

Because of the variety and multitude of ENERGY STAR products on the market, the Company will launch the ENERGY STAR Retailer Incentive Pilot Program in phases. The first phase will include some of the largest and most energy-intensive pieces of equipment, including refrigerators, clothes washers, dishwashers, room air conditioners, televisions, and ceiling fans. The following products may be added as future options: freezers, clothes dryers, dehumidifiers, room air cleaners, and computer monitors.

This program represents Public Service's first market transformation program, as contemplated in Colorado Public Utilities Commission Order Number C08-0560. The definition in the Public Service Gas DSM Rulemaking at 4 CCR 723-4-4751(m) is:

> "Market transformation" means a strategy for influencing the adoption of new techniques or technologies by consumers. The objective is to overcome barriers within a market through coordinating tactics such as education, training, and product demonstration and marketing, often conducted in concert with rebates or other financial incentives.

Public Service believes that there are several key components to ensuring this pilot program is truly a market transformation effort. These include:

- Recognition that market transformation is best accomplished at a state, regional and national level. To accomplish this, Public Service plans to partner with the Colorado Governor's Energy Office GEO to assist with marketing the program and with the Consortium for Energy Efficiency (CEE), which is an organization that focuses on market transformation at a national level. In addition, ENERGY STAR staff will provide technical and marketing support. The Company hopes its first market transformation program may serve as a template for other cities and utilities to use.
- Identification of market barriers or program gaps that currently exist and that might result in an opportunity to provide a stimulus to change the market.
- Recognition that true market transformation takes time. Successful market transformation efforts are typically long-term in nature with many measurable impacts

occurring years after program introduction. Sales levels or market share for energy efficient products and energy-saving practices can define these impacts.

- Understanding that it is important to establish measurement and evaluation components upfront to monitor progress and to determine when "course corrections" or program enhancements are needed.

To ensure a higher level of success with this program, Public Service plans to issue an RFP to hire a third-party implementer. This winning bidder will be responsible for recruiting retailers, negotiating contracts and training participating retailers, as well as developing, installing and monitoring point of purchase displays and/or cooperative advertising and tracking sales.

B. Budgets & Goals

Budgets

The ENERGY STAR Retailer Incentive Pilot Program was developed through a collaborative effort between the Public Service marketing team, national retailers and energy industry organizations the product development and product management groups. The team studied the types and quantities of ENERGY STAR equipment sold in the service territory to develop high-level savings goals. This was accomplished by reviewing information available from the Environmental Protection Agency, CEE and data gathered by Public Service staff for other similar program offerings. Once this step was accomplished, the team determined a budget that would potentially meet this goal.

Goals

The team used sales data obtained from potential participating retailers, total residential customer counts, and internal expertise to estimate the number of participating customers for the first and second years of the program.

The program will expand between 2009 and 2010 as the program recruits more retailers into the program, and the number of units receiving rebates increases correspondingly. While there is no scheduled change to rebate levels, Public Service will review rebate levels as the program progresses to evaluate whether the initial levels are appropriate.

Table 41: ENERGY STAR Retailer Incentive Pilot Program Budgets and Goals

ENERGY STAR Retailer Incentive	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$242,382	N/A	$349,750	N/A
Admin & Program Delivery	$103,710	N/A	$152,442	N/A
Ad, Promo, & Customer Ed.	$1,280,994	N/A	$1,372,607	N/A
Customer Incentives	$881,298	N/A	$969,430	N/A
Equipment & Installation	N/A	N/A	N/A	N/A
M&V	$150,000	N/A	$120,000	N/A
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$2,658,384**	**N/A**	**$2,964,229**	**N/A**
Generator kW	640	N/A	704	N/A
Generator kWh	2,455,560	N/A	2,701,058	N/A
MCF	N/A	N/A	N/A	N/A
Dth/$	N/A	N/A	N/A	N/A
Participants	16,469	N/A	18,116	N/A
Participation as % of Segment	1.450%	N/A	1.595%	N/A
Modified TRC Test Ratio	**1.17**	**N/A**	**1.14**	**N/A**

C. Application Process

The ENERGY STAR Retailer Incentive Pilot Program does not require an application for participation. To reach as many customers as possible, Public Service will work with retailers and provide a discounted price on appliances and electronics through up-stream incentives to manufacturers and retailers. The discount will vary depending on the type of equipment and the manufacturer or retailer partner. Rebates will be paid to the participating retailers, rather than directly to the customer. Retailers prefer this method to providing coupons or rebate forms to customers because of the increased time and cost associated with them.

D. Marketing Objectives, Goals, & Strategy

Throughout North America, ENERGY STAR is a well-recognized name, and leveraging the ENERGY STAR label as much as possible in designing the program will increase participation levels. ENERGY STAR currently covers a wide range of products and is developing criteria for other technologies, which are at various stages in the label development process.

This is a retailer-driven program. In the first two years of the program, the primary marketing goal will be to recruit retailers. To reduce costs, Public Service will work with national retailers that have one point of contact. Our third party implementer may issue an RFP to recruit retailers. Participating retailers will also be required to sign a participation agreement.

Public Service is hoping to recruit the large retailers such as:

- Best Buy
- Home Depot
- Lowe's
- Circuit City
- Ultimate Electronics
- Radio Shack

In addition to rebates, Public Service will provide retailers with information about qualifying equipment performance and savings that leverages the ENERGY STAR brand and other information resources and marketing collateral for in-store displays and promotion of qualifying equipment.

Participating retailers will be encouraged to increase their stocks of qualifying products, promote the equipment though in-store displays, and highlight rebated equipment in advertising. Public Service will explore the potential for co-marketing with the retailers, possibly by having promotional booths within the stores and having the Xcel Energy logo on any in-store advertising.

Public Service will use a variety of utility marketing channels to promote the program such as bill inserts, bill messages, the call center, consumer advertising, customer education campaigns, and the Public Service website. The program launch will be coupled with press releases, retailer signage, information displays, and special education events.

E. Program-Specific Policies

Public Service will use retailers that commit to sell and highlight ENERGY STAR certified products. Participating retailers must be an existing ENERGY STAR partner or agree to sign an ENERGY STAR partner agreement. Retail partners must provide historical sales data to help determine a baseline for existing sales. They must also submit weekly sales reports and an initial inventory report one week prior to the start of the promotion showing the on hand inventory for each participating location. This sales data will show the total number of units that each store has sold. The retailer must also agree to display the pre-approved utility signage for the duration of the promotion.

F. Stakeholder Involvement

Public Service consulted with staff from the Southwest Energy Efficiency Project, Colorado GEO, CEE, PG&E, and NYSERDA to assist in the design of the program. To continue this involvement, stakeholders directly involved in Colorado will be engaged in the development process through regular meetings of an advisory board.

G. Rebate Levels

The following table shows proposed measures with their efficiency requirements and rebate levels. Rebates have been determined by reviewing incremental cost and cost-effectiveness criteria of the ENERGY STAR equipment. These rebates are lower than would typically be offered as consumer rebates for a number of reasons. Specifically:

- Retailers can process high numbers of rebates at low cost, reducing processing costs;
- Even a small increase in the profit margin on a product will affect retailer stocking and promotion practices; and
- Rebating directly to retailers avoids the retail markup on the rebate amount.

Table 42: ENERGY STAR Retailer Incentive Pilot Program Rebates

Measure	Minimum Efficiency	Suggested Rebate Levels
Refrigerators	ENERGY STAR	$20
Clothes Washers	MEF 1.6	$50
Dishwashers	ENERGY STAR	$10
Room Air Conditioners	ENERGY STAR	$20
TVs	ENERGY STAR	$20
Ceiling Fans	ENERGY STAR	$10

Rebate levels may change after retailers are selected. Historical sales data will be analyzed and estimated program participants will be determined based on the sales level of each appliance. The rebate budget will be allocated to match the estimated number of participants.

H. Evaluation, Measurement & Verification Plan

Market transformation does not lend itself to evaluation, measurement and verification in the same manner as a traditional resource acquisition program. In part, this is due to the long-term nature of the program and the lack of recognition or a direct connection between Public Service with the ultimate purchaser of the energy efficient equipment. Specific challenges include:

- The program leverages the ENERGY STAR brand, which complicates attribution, since ENERGY STAR program changes and promotion efforts may be changing the baseline over time.
- Because consumer education campaigns will utilize the ENERGY STAR brand, it will be difficult for customers to report the program's influence since in many cases they will not be aware of it.
- Retailers will only supply sales data at a store or zip code level, not at a customer level. While it may be possible to collect some participant data, the submissions of contact information will be voluntary. There is likely to be self-selection bias, limiting the use of participant surveys as a primary evaluation tool.

Given these, Public Service will follow the guidelines for market transformation evaluation as set forth in the California Evaluation Framework.[5] The ENERGY STAR Retailer Incentive Pilot Program has a unique M&V plan that is detailed in the M&V section of the Indirect Segment of this Plan. A comprehensive process and impact evaluation of the ENERGY STAR Retailer Incentive Pilot Program will be conducted in 2011.

I. Technical Assumptions

Public Service estimates the net-to-gross factor for this program based on a review of NYSERDA market transformation efforts for similar technologies. Further, the Company reviewed existing ENERGY STAR sales data to establish a lower boundary for free riders. This review indicated a free rider estimate of 25% (or implied lower bound to the NTG of 75%). Public Service also consulted with a third-party consultant to provide their expertise on this matter and the original NYSERDA estimate was adjusted downward from 88%. The resulting NTG estimate for this program is 80%.

The general assumptions used in the technical analysis include the following:

- **TVs** – The technical assumptions for TVs are derived from data provided by CEE and ENERGY STAR. Public Service is involved with the CEE effort to establish technical criteria for TVs. Currently, a 5% coincidence factor is assumed.
- **Clothes washers** – Savings calculations for clothes washers are based on the ENERGY STAR Clothes Washer Savings Calculator available from the ENERGY STAR website. The analysis is based on a gas water heater home, so savings are generated for gas and electric. The full load hours are assumed to be 392 based on information reported in the ENERGY STAR calculator that 392 clothes washer runs per home annually and assuming about a 1 hour run time from start to finish of the clothes washer. The 11-year measure life source is *Appliance Magazine*, September 2007. Additional savings comes from gas water heating savings of 8.8 therms annually at $1.20 per therm as well as water savings of 5,790 gallons at $0.003 per gallon. The coincidence factor is calculated.
- **Room air conditioners** – Savings calculations for room air conditioners are based on the ENERGY STAR Room AC calculator available from the ENERGY STAR website. The operating hours are the full load hours for Denver (EPA 2002). The incremental cost ($30) and the measure life (9 years) are the assumptions used in the ENERGY STAR Calculator. The coincidence factor is the same as is used in the technical assumptions for Minnesota cooling.
- **Ceiling Fans** – Savings calculations for ceiling fans are based on the ENERGY STAR Ceiling Fan Calculator available from the ENERGY STAR website. A majority of the savings is based on the assumption that the three lighting fixtures in the ENERGY STAR fan will have CFLs in place of incandescent light bulbs. The West North Central hours of operation were applied (4 hours of fan run time daily, and 4 hours of lighting run time daily). While the mountain hours of operation could also be used –(5.6 hours daily of fan, and 3.5 hours daily of lighting operation), these tech sheets do not distinguish between different operating hours of different components of a measure; therefore both

[5] TecMarket Works Framework Team, California Evaluation Framework, June 2004, p. 245-268.

components, the fan and the fan lights, in this case were assumed to have the same number of operation hours. The incremental cost applied is based on information contained in the ENERGY STAR calculator, as well as the measure life. Since almost all the savings associated with the ceiling fan are from the lighting fixtures, the coincidence factor from the lighting is used as calculated.

- **Dishwashers** – Savings calculations for dishwashers are based on the ENERGY STAR Dishwasher Savings Calculator available from the ENERGY STAR website. The analysis is based on a gas water heater home, so savings are generated for gas and electric. The full load hours are assumed to be 215 based on the information contained in the ENERGY STAR calculator that reports 215 dishwasher runs per home annually and assuming about a 1 hour run time from start to finish of the dishwasher. The 11-year measure life source is the Department of Energy. Additional savings comes from gas water heating savings of 12.7 therms annually at $1.20 per therm as well as water savings of 430 gallons annually at $0.003 per gallon. The coincidence factor is calculated.
- **Refrigerators** – Savings calculations for refrigerators are based on the ENERGY STAR Dishwasher Savings Calculator available from the ENERGY STAR website. The operating hours are assumed to be 8,760 based on the information contained in the ENERGY STAR calculator. The 13-year measure life source is the Department of Energy. The coincidence factor is assumed to be 100% since the operation is fully diversified over the year.

➢ Evaporative Cooling Rebate Program

A. Description

The Evaporative Cooling Rebate Program provides a cash rebate to Public Service's electric customers who purchase high-efficiency evaporative cooling equipment for residential use in Colorado. Customers receive checks mailed to their homes; the rebate does not come in the form of a customer account credit.

This program dedicates resources toward increasing energy efficiency in residential homes by encouraging consumers to purchase evaporative coolers rather than central air conditioning. Through this program, participating Public Service customers benefit by reducing the cost of buying energy-efficient units in addition to experiencing energy savings throughout the lifetime if the equipment. This program not only motivates customers to make energy-wise purchases, but also educates customers on their environmental impact.

Qualifying equipment must be new and be a permanently installed direct, indirect or two-stage evaporative cooling unit. Portable coolers or systems with vapor compression backup are not eligible, nor is used or reconditioned equipment. Customers need not be replacing an existing evaporative cooling or air conditioning unit.

The purpose of the Evaporative Cooling Rebate Program is to transform the market over time from central air conditioners for cooling to evaporative cooling. For homes in dry climates, such as Colorado, evaporative cooling provides an experience like an air conditioner, but with significantly less energy.

B. Budgets & Goals

<u>Budgets</u>
The goal in 2009 is to rebate a total of 3,803 evaporative cooling rebates, which is an increase over the 2008 goal of 3,600 units. Proposed savings were estimated on a per unit basis using the projected number of participants. However, participation in this program is weather sensitive. Cooler-than-normal summers result in lower participation as customers may choose to delay purchasing a unit if the weather is mild.

UPDATE: As a result of the recent Settlement Agreement, the 2009 and 2010 budgets for the Evaporative Cooling Rebate Program were increased to $1,480,900 and $1,652,696, respectively. The impact of these budget increases has not yet been evaluated, but will be included in the May 1, 2009 DSM Plan Amendment.

<u>Goals</u>
The 2009 budget was developed using historical Evaporative Cooling Rebate participation. With the addition of the Tier 2 rebate in 2008, additional funds will be needed to cover the additional rebate level. The 2009 budget will be based on projected participation and the funds needed to promote the program. The 2009 program will require additional funds to promote the Tier 2 rebate. These promotional efforts will take place in the summer months when the cooling season

is in full swing. In 2010, there will be a decrease in promotional advertisements, as the program awareness will already be known.

Table 43: Evaporative Cooling Rebate Program Budgets & Goals

Evaporative Cooling Rebate	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$29,368	N/A	$38,520	N/A
Admin & Program Delivery	$37,053	N/A	$37,889	N/A
Ad, Promo, & Customer Ed.	$145,483	N/A	$143,760	N/A
Customer Incentives	$938,000	N/A	$1,018,000	N/A
Equipment & Installation	N/A	N/A	N/A	N/A
M&V	$45,996	N/A	$49,527	N/A
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$1,195,900**	**N/A**	**$1,287,696**	**N/A**
Generator kW	3,803	N/A	4,005	N/A
Generator kWh	2,071,569	N/A	2,181,848	N/A
Annual Dth	N/A	N/A	N/A	N/A
Annual Dth/$M	N/A	N/A	N/A	N/A
Participants	3,800	N/A	4,000	N/A
Participation as % of Segment	0.335%	N/A	0.352%	N/A
Modified TRC Test Ratio	**8.32**	**N/A**	**7.91**	**N/A**

C. Application Process

The Company will make customers aware of the program through a variety of sources including bill inserts, direct mail pieces, the Xcel Energy website, and HVAC contractors. The Xcel Energy website will have program information and eligibility rules. To participate, eligible customers must submit a completed application with a copy of their invoice or receipt. At this time, customers may self-install the units, provided that they supply the paid sales invoice along with the rebate application form. When a customer submits the rebate form with an invoice, it is then sent to the Xcel Energy Rebate Operations team. This team verifies all information required on the form. The customer will then receive a rebate check within four to six weeks of submitting their application if all information is accurate.

D. Marketing Objectives, Goals, & Strategy

The main objective of the Evaporative Cooling Rebate Program is to promote the use of evaporative coolers in place of air conditioning. The program will be promoted through the following strategic marketing efforts:

- Local newspaper advertising – Mid-summer promotions are generally most successful;
- Internet ads that will track number of views "clicks";
- Monthly customer email updates;
- Bill inserts in the spring and mid-summer; and
- Contractor packets to all contractors in the Colorado area.

Public Service has partnered with over 150 dealers and over 60 retailers in the state of Colorado who receive our program literature and help to promote the program. Contractors in Colorado are also an essential part of customer awareness and will receive information on program changes regularly.

In addition, Public Service employs a channel manger to assist with the communication of program details to the dealer and distributor channels. Other activities of the Channel Manager may include: training sessions on program specifics, program related mailings, technical support navigating program tracking systems and overall relationship maintenance.

In the future, we hope to register contractors in the program similar to the way we track contractors in Minnesota. This will help Public Service to understand how the contractors are performing from month-to-month and modify our channel marketing activities.

E. Program-Specific Policies

Customers must purchase qualifying units in order to be eligible for a rebate. Units are qualified for the program based on the manufacturer's specifications. Equipment is added to the list of qualifying units as Public Service is notified of their release.

F. Stakeholder Involvement

When designing the Tier 2 portion of this program, Public Service worked with Frontier Associates to ensure that the equipment was energy efficient and the best cooling option for Colorado customers. Frontier ran technical assumptions on the Tier 1 and Tier 2 options for evaporative cooling finding that the program was beneficial to the customers and to the Company.

In order to determine qualifying equipment, Public Service worked with evaporative cooling manufacturers to verify current and new equipment efficiencies. The following manufacturers were contacted:

- Adobe Air Manufacturer
- Champion Manufacturers
- Cimate Technologies
- Coolerado Corporation
- Essick Manufacturer
- Goettl Manufacturer
- Jenrus Corporation
- Phoenix Manufacturer Incorporated
- Seeley International Manufacturer
- Speakman CRS
- Tradewinds Manufacturer

G. Evaluation, Measurement & Verification Plan

All rebate applications are audited with a two-step process. On the front-end, as rebate applications are received, all critical customer information, equipment eligibility and proper rebates amounts are reviewed, validated, and corrected if inaccurate. The second step takes place prior to the rebate being issued where Rebate Operations audits 100% of the rebates applications to ensure that the information from the form was entered correctly into the tracking database.

The M&V process for prescriptive programs is detailed in the M&V section of the Indirect Segment of this Plan. The savings factors that will be verified for the Evaporative Cooling Rebate Program are detailed in the Deemed Savings Technical Assumptions section.

A comprehensive process and impact evaluation for the Evaporative Cooling Rebate Program is planned for 2010.

H. Rebate Levels

The Evaporative Cooling Rebate Program offers a tiered rebate. Customers may receive up to $500, depending on the equipment purchased:

Tier 1: Qualifying evaporative cooling units have a minimum Industry Standard Rated (ISR) airflow of 2,500 CFM. The rebate amount is the lesser of $200 or the purchase price of the unit. Taxes and ancillary items such as hoses are not covered by the rebate.

Tier 2: Qualifying evaporative cooling units have a minimum Media Saturation Effectiveness of 85% and above. The units must be manufactured with a remote thermostat and a periodic purge water control. Units with periodic purge water control pumps sold separately do not qualify for the rebate.

Rebate applications must be submitted by July 31 the following year after installation to qualify for a rebate. Public Service limits rebates to one per household.

Further, after reviewing the success of vendor incentives in the Minnesota rebate programs, Public Service will review a contractor incentive for higher efficiency units sold to customers (Tier 2 models). The incentive plan will be tested for a short period of time and may consider expanding the incentive based on results.

I. Technical Assumptions

The technical assumptions for the Evaporative Cooling Rebate Program were developed assuming that a standard 13 SEER central air conditioning system was replaced or displaced by either a standard evaporative cooling system or a high efficiency evaporative cooling unit with the same capacity. These units have a measure life of 10 years.

The NTG for the Tier 1 evaporative coolers is 59.7%. This was determined in the 2006 Summit Blue Consulting report. The NTG for the Tier 2 evaporative coolers is assumed to be 100% due to the low market participation. The average of these two numbers (80%) will be used for the Evaporative Cooling Rebate Program.

➢ Heating System Rebate Program

A. Description

The Heating System Rebate Program provides an incentive in the form of a cash rebate to Public Service's natural gas customers who purchase high-efficiency heating equipment for residential use in the Colorado service territory. This program dedicates resources toward increasing energy efficiency in residential homes by encouraging consumers purchase ENERGY STAR furnaces and boilers.

Through this program, participating Public Service customers benefit by reducing the cost of buying energy-efficient units in addition to experiencing energy savings throughout the lifetime of the equipment. This program not only motivates consumers to make energy-wise purchases, but also communicates a consistent, easy to understand message. In making a purchase decision, consumers can identify the ENERGY STAR logo and check with Public Service or a participating Heating, Ventilating and Air Conditioning contractor to ensure all minimum qualifications exist with the chosen appliance to obtain a rebate. The program also creates an umbrella platform so it can be integrated into other Public Service conservation products. This potentially allows Public Service to reach a broader audience by promoting products that include the nationally recognized ENERGY STAR seal of approval.

Xcel Energy currently offers a Heating System Rebate Program to natural gas customers in Minnesota and North Dakota. As proposed with the Colorado program, the Minnesota and North Dakota programs allow customers to choose their own independent residential heating system contractors/installers.

The program is applicable only for the purchase of qualifying new furnaces and boilers installed in new or replacement applications. The two-tier rebate schedule provides for a minimum efficiency of 92% Annual Fuel Utilization Efficiency (AFUE) for furnaces, in line with ENERGY STAR. A 94% AFUE or higher efficiency offers a higher rebate.

To remain consistent with the Minnesota and North Dakota programs, Public Service proposes an 84% AFUE minimum for boilers. While the ENERGY STAR recommended minimum for boilers is 85% AFUE, Public Service prefers the 84% AFUE requirement due to model availability in the market and installation costs. The purchase price and installation cost of the 85% + AFUE Boiler was found to be significantly higher on average than the 84% AFUE. In addition, model availability for the 85% AFUE boiler is lower than the 84% AFUE model.

B. Budgets & Goals

<u>Budgets</u>
Budgets for the Heating System Rebate Program were developed based on the costs per participant estimated from the long-standing Minnesota program. The budget also accounts for costs needed to engage the HVAC contractor base necessary to serve the territory. Engaging the contractor community in the first year is essential to the program's success. The budget includes promotional costs for newsletters and informational letters to the contractor community to build

their awareness so they can assist customers with purchasing energy efficient units and submitting the rebate application to Public Service once installation is complete.
In 2009, Public Service will monitor program awareness among customers and the trade base and determine whether an HVAC contractor incentive is necessary to build the trade network. The 2009 budget contains contingency funding to pay incentives to the HVAC trade. The incentive would be a dollar amount for each rebate application submitted. The contingency will be implemented depending how the program performs in 2009, as well as in 2010.

Any budget variations between 2009 and 2010 are determined by the need to build more awareness about the program in effort to achieve goals, in addition to meeting rebate dollar amounts due to the increased participant goal in 2010. The contingency trade incentive budgets differ between 2009 and 2010, as 2009 provides for trade incentive payouts the second half of the year, while 2010 budget includes trade incentives for the full year.

Goals
The Heating System Rebate Program goals were developed based on historical response to a similar program in Minnesota.

Table 44: Heating System Rebate Program Budgets & Goals

Heating System Rebate	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	N/A	$51,393	N/A	$57,557
Admin & Program Delivery	N/A	$58,807	N/A	$60,808
Ad, Promo, & Customer Ed.	N/A	$153,800	N/A	$181,379
Customer Incentives	N/A	$495,000	N/A	$715,000
Equipment & Installation	N/A	N/A	N/A	N/A
M&V	N/A	$30,360	N/A	$76,989
Miscellaneous	N/A	N/A	N/A	N/A
Total	**N/A**	**$789,360**	**N/A**	**$1,091,733**
Generator kW	N/A	N/A	N/A	N/A
Generator kWh	N/A	N/A	N/A	N/A
Annual Dth	N/A	35,868	N/A	51,810
Annual Dth/$M	N/A	45,440	N/A	47,456
Participants	N/A	4,500	N/A	6,500
Participation as % of Segment	N/A	0.380%	N/A	0.549%
Modified TRC Test Ratio	**N/A**	**1.85**	**N/A**	**1.88**

C. Application Process

The customer will learn about the Heating System Rebate Program primarily through bill inserts, advertising, and the HVAC contractor community. The typical sales cycle begins with a customer hiring an HVAC contractor, from which the heating unit is purchased and installed.

Following installation, the customer or contractor submits, along with an appropriate invoice, a completed Public Service application form obtained through the installer or downloaded from the Xcel Energy web site. Forms are mailed to the utility by either the contractor (typically) or the customer, and can be submitted any time within the deadline parameters outlined on the reverse side of the application form. The rebate application deadline is typically mid-year (July 31) for all of the previous year's installations. Invoices must reflect the same information provided on the application form, specifically the model number, serial number, installation address, and purchase date. Other information gathered on the application form includes customer's Public Service account number, mailing address if different from installation address, customer signature, and contractor signature - if installed by a contractor, and the unit's efficiency level.

Equipment eligibility is determined by using the Gas Appliance Manufacturers Association directory. Xcel Energy Rebate Operations staff reviews each individual form, check to ensure all required information is provided, match the invoice to the application form, and determine the exact amount of the rebate. The Rebate Operations employee then enters the information into an Xcel Energy application database, which notes the rebate status in the customer's Public Service account. In the event of insufficient information, the application form and the invoice are returned to the customer with a letter on company letterhead requesting the additional information. If an application is returned to Public Service a second time and additional information is still needed, the application is then returned to the installer so that he/she can assist the customer. Rebates are mailed within four to six weeks.

D. Marketing Objectives, Goals, & Strategy

The program's objectives are to increase demand for high-efficiency heating equipment among Public Service customers, and through consumer demand assist the overall effort to increase the availability of high-efficiency heating units in the marketplace. The program's goal is to help Public Service customers experience an energy savings with their heating needs and understand the immediate and long-term value of purchasing and installing high-efficiency equipment.

Public Service will use the following marketing communications strategies to make customers aware of the program:

- Print and banner advertising (radio on contingency basis). Advertising is an effective way to reach the broad audience. Banner advertising will be strategically placed on local popular news weather sites, in addition to the local larger print newspaper sites such as the Denver Post. Print advertising media plans will include the larger print papers serving the metropolitan areas, and print papers in smaller cities and other parts of the state.
- Public Service bill inserts are timed according to appropriate seasons for the equipment. Typically, heating season promotion begins as early as July to coincide with the busy summer trade season when heating and cooling equipment is being replaced or installed simultaneously in customer homes. Also, equipment distributors who supply furnaces and boilers to the installers often host promotions in early Fall to jump-start their heating season sales. Bill inserts for high-efficiency heating equipment have proven to be

effective in Spring, when winter has ended and customers have had recent experience with high heating bills.

- The Xcel Energy website has heating pages targeted to both customers and energy partners—installers, contractors and distributors. The pages are updated according to equipment efficiency changes and available promotions. The rebate schedule is always available on these pages, along with links to related pages or to forms and collateral.
- Public Service will have a marketing channel manager who will communicate program details to the dealer and distributor channels, conduct training sessions on program specifics, and provide technical support navigating internal computer applications supporting the program. The channel manager, program manager and marketing assistant participate in appropriate tradeshows related to heating. This participation includes the staffing of a tradeshow table to provide information about the program, and often can include presentation opportunities.
- The program's primary promotions channel is the trade community. Training, meetings, telephone calls, letters and newsletters with quarterly frequency keep the trade informed about the program and help to increase awareness among new contractors. Contractors are encouraged to register as Public Service program participants and obtain contractor ID numbers. This number is a unique identifier and helps with trade promotions internally.

Program performance will be tracked weekly through an internal customer rebate processing system. Performance is reviewed weekly by the program manager and reviewed monthly by marketing management. Marketing strategies may change to meet the dynamic needs of the program depending on its performance throughout the year.

Public Service has incorporated a number of energy efficiency program best practices into its Heating System Rebate Program. Upon launching the program, best practice efforts will include working closely with the HVAC community to ensure program guidelines, eligibility requirements and processes are clearly communicated. As the most important channel to customers, this program relies heavily upon HVAC installers who are on the frontline with customers and are the trusted individual consumers hire to perform expensive service installation projects in their homes.

E. Program-Specific Policies

Eligibility requirements for Colorado participation include having a residential natural gas account with Public Service. The program is applicable only for the purchase of qualifying new furnaces and boilers installed in new or replacement applications. Public Service also accepts self-installed units in addition to HVAC contractor installations, even though it is rare.

F. Stakeholder Involvement

Public Service considers its stakeholders for the Heating System Rebate Program to be the HVAC vendors and contractors, the Governor's Energy Office, local municipalities within the service territory, and environmental organizations. The Company met with GEO, as well as an external consultant, to help design the program. In the future, stakeholders will be invited to share their program suggestions during the Company's semi-annual DSM Roundtable. In addition, Xcel Energy is a member of the Consortium for Energy Efficiency, and monitors CEE's initiatives related to residential HVAC equipment.

G. Evaluation, Measurement & Verification Plan

All rebate applications are audited with a two-step process. On the front-end, as rebates are received, all critical customer information, equipment eligibility and proper rebates amounts are reviewed, validated, and corrected if inaccurate. In the second step, Rebate Operations audits 100% of the rebates applications to ensure that the information from the form was entered correctly into the tracking database. Data is tracked through the Company's internal rebate processing application system. The number of participants is tracked in addition to the energy savings. Errors are reported to rebate operations management and to the product manager.

The M&V process for prescriptive programs is detailed in the M&V section of the Indirect Segment of this Plan. The savings factors that will be verified for the Heating System Rebate Program are detailed in the Deemed Savings Technical Assumptions section.

H. Rebate Levels

The Heating System Rebate Program offers three different rebate levels, depending on the type and efficiency of the equipment purchased. Furnaces above 92% AFUE qualify for a rebate of $80. Furnaces above 94% AFUE and boilers above 84% AFUE receive a rebate of $120. The proposed incentive amounts offer strong encouragement to move to the highest efficiency furnace, offering a $34/Dth increase between a 92% AFUE and a 94% AFUE. The higher rebate is intended to move more customers to the highest efficiency choice.

In general, residential boiler replacement is not cost-effective under the Total Resource Cost Test. However, these measures are included in the Heating System Rebate Program to serve the 11 percent of customers (from the Company's Home Use Study) with residential boiler systems.

I. Technical Assumptions

For the Heating System Rebate Program, the incremental costs are limited to the cost of new equipment (not installation costs). Since the furnace or boiler will be replaced regardless of the efficiency rating of the unit, and assuming no additional required ductwork, installation and equipment rental costs do not apply. The incremental costs for a 92% and 94% AFUE furnace and an 84% AFUE boiler unit are provided in the table below:

Table 45: Incremental Costs for High Efficiency Units

Measure	Material	Labor/ Equipment	Total Incremental Cost	Source
Furnace - 78% to 92% AFUE	$450	$0	$450	DEER database lists $7.631 per kBtu; modeling required a 59 kBtu unit
Furnace - 78% to 94% AFUE	$505	$0	$505	DEER database lists $8.605 per kBtu; modeling required a 59 kBtu unit
Boiler - 80% to 84% AFUE	$440	$0	$440	DEER database lists roughly $8 per kBtu; modeling required a 55 kBtu unit

The savings for this program were obtained by modeling a typical home in Public Service's service territory. The analysis used the building energy use simulation tool EnergyGauge USRCPB v2.7.03. The estimated savings are shown in the table below:

Table 46: Savings Based on Simulation of Typical Existing Home

Measure	Base Heating Consumption (therms)	New Heating Consumption (therms)	Annual Savings (therms)
Furnace - 78% to 92% AFUE	645	547	98
Furnace - 78% to 94% AFUE	645	535	110
Boiler - 80% to 84% AFUE	636	606	30

➢ Home Lighting & Recycling Program

A. Description

The Home Lighting & Recycling Program consists of two offerings for customers: sales of compact fluorescent light bulbs (CFLs) and an environmentally friendly method for customers to dispose of CFLs. Customers may purchase CFLs through the mail-order sales or through local retailers. CFLs are an economical and easy way for customers to save electricity.

Mail Order Sales

The Mail Order Sales channel offers a wide variety of CFLs (listed below), including hard-to-find bulbs, through a third-party vendor at competitive prices. The actual sale and fulfillment of the bulbs is handled through the lighting vendor that manages and owns the entire lighting inventory. Public Service promotes the bulbs through direct mail, newsletters, bill inserts and the Internet and offers an incentive for customers to buy in quantity. Customers can order bulbs via mail, phone, Internet and fax. The customer pays our vendor directly and the bulbs are delivered to the customer's home. The following bulbs are available for mail order:

- Twist: 13, 14, 19, 23, 27, 30, 42-Watt;
- Indoor Reflectors: 14, 15, 16-Watt, outdoor: 19-Watt;
- Globes: 11, 14-Watt;
- Decorative – standard or candelabra: 7-Watt;
- A-Line: 13-Watt;
- 3-Way Twist: 12/20/28-Watt;
- Bug Light: 14-Watt;
- Full Spectrum: 13, 27-Watt;
- Dimmable: 20, 25-Watt; and
- Torchiere fixture or replacement bulbs: 65-Watt.

Retail Discounts

Public Service also promotes CFLs by offering in-store retail discounts. In these promotions the bulb manufacturer, retailer and Public Service combine funds to offer instant rebates enabling customers to purchase a CFL for approximately $0.99. Public Service partners with such retailers as Home Depot, Costco, Ace Hardware and King Soopers to promote the bulbs. The process is very easy -- the customer purchases a bulb as they normally would and receives the discounted price at the register. There is no rebate form to complete.

During the fall retail promotion, Public Service participates in the ENERGY STAR Change A Light, Change the World campaign. This campaign was initiated by the Environmental Protection Agency and encougages utility sponsors nationwide to engage in retail discount promotions during the fall. The campaign leverages a nationwide effort providing economies of scale in promotion costs and offers a consistent message across various sponsors. The bulbs are promoted through print advertising and public relation efforts.

Public Service currently works with two experienced vendors to provide CFLs through the two channels:

- Service Lighting coordinates and administers the mail order sales channel.
- Wisconsin Energy Conservation Corporation (WECC) implements the retail discount promotions by implementing a request for proposal on behalf of Public Service to select the CFL bulb manufacturer and retail partners.

All Public Service electric customers are eligible to participate in the Colorado Home Lighting Program. Mail order sales are currently offered in all of Public Service's service territory. The retail discount channel is offered in Colorado, Minnesota and New Mexico. The preexisting Home Lighting Program has been very successful over the past two years in Colorado. Consumers continue to have a strong interest in saving energy by using CFLs.

The CFL Recycling offer provides an environmentally friendly method for customers to dispose of CFLs. Xcel Energy is viewed as the forerunner in the area CFL Recycling, as it began recycling bulbs in Minnesota in 1992 and currently collects 200,000 units per year. For Colorado, Public Service was instrumental in creating a partnership with Ace Hardware. Ace Hardware will serve as the retail arm for the bulb recycling. Customers can bring spent CFLs to any Ace Hardware store statewide and recycle them free of charge. The retailer stores the bulbs in a covered bin until it is full. Then they ship the bulbs to the recycler in the postage paid bin. Public Service covers the cost of the bulbs recycled through stores in our service area. Public Service worked with the Colorado Department of Public Health & Environment and other Colorado utilities to implement the program statewide.

B. Budgets & Goals

Budgets

The Home Lighting & Recycling Program budget is based primarily on the number of program participants (bulbs sold). Public Service developed the budget by combining the CFL retail discounts, promotion implementation, advertising, labor and promotion costs. The average incentive cost is applied to the bulbs sold, and the implementation, promotion and labor costs are added. In 2010, the participant goal will increase by 200,000 units and the budget increases accordingly.

Goals

The CFL energy savings are developed in a prescriptive or deemed savings manner. They are derived by taking the difference between the average wattage bulb of an incandescent and CFL, and multiplying by the average hours of use. The technical assumptions used in the process are explained in detail under the Technical Assumptions section.

Table 47: Home Lighting & Recycling Program Budgets and Goals

Home Lighting & Recycling	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$57,091	N/A	$58,238	N/A
Admin & Program Delivery	$564,177	N/A	$668,453	N/A
Ad, Promo, & Customer Ed.	$1,006,683	N/A	$946,829	N/A
Customer Incentives	$1,300,000	N/A	$1,560,000	N/A
Equipment & Installation	N/A	N/A	N/A	N/A
M&V	$200,000	N/A	$200,000	N/A
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$3,127,951**	**N/A**	**$3,433,520**	**N/A**
Generator kW	3,307	N/A	3,969	N/A
Generator kWh	46,237,797	N/A	55,485,357	N/A
Annual Dth	N/A	N/A	N/A	N/A
Annual Dth/$M	N/A	N/A	N/A	N/A
Participants	250,000	N/A	300,000	N/A
Participation as % of Segment	22.012%	N/A	26.414%	N/A
Modified TRC Test Ratio	**6.39**	**N/A**	**6.69**	**N/A**

C. Application Process

Customers need not apply to participate in the Home Lighting & Recycling Program. Public Service works with large retail chain stores in order to obtain maximum penetration of the program. The large retailers are not willing to accept coupon or rebate forms because of the increased processing time and costs associated with them. However, they are willing and supportive of discount programs. To reach as many customers as possible, we work with retailers and provide a discounted price on bulbs through upstream incentives to bulb manufacturers and retailers. The discount varies depending on the type of bulb and the manufacturer/retailer partner.

CFL promotions are offered for a limited time period. They are promoted through various media. Customers need to purchase the advertised product during the promotion period at a participating retailer. The customers receive the discounted price at the cash register. Incentives are paid upstream and the discounts are passed on to the customer.

D. Marketing Objectives, Goals, & Strategy

The objective of the Home Lighting Program is to motivate customers to purchase CFLs, persuade them to try using CFLs in different applications throughout their homes, and encourage them to recycle the bulb when it burns out. Public Service will use the mail order sales channel to help customers locate specialty and hard-to-find bulbs. This channel also offers the benefit of home delivery. Although the sales through this channel are minimal (less than 1% of overall projected achievement), Public Service believes that it is important to encourage customers to go beyond purchasing the typical twist CFLs and thus market a variety of models and styles. The Company will market this channel through bill inserts, trade shows and on the Xcel Energy website.

The retail discount channel will drive 99% of the CFL sales; it offers the lowest prices and reaches more customers than the mail order channel, offering more participation and savings potential from our historical experience. Public Service will implement a minimum of two retail promotions and use several different retailers per year to achieve the goal of selling a minimum of one million CFLs. The Company will also look for opportunities to do educational, local and community-focused events. The peak sales period for CFLs is in the fall and winter, promotions will be focused during these peak time periods. Public Service will market this program through bill inserts and advertising.

Public Service will issue a request for proposal (RFP) on a yearly basis to retailers and manufacturers to obtain a good mix of retailers and CFL brands. This will promote optimal pricing and help reduce free-ridership by using a diverse set of retailers, including big box, mass merchandiser, hardware and grocery outlets.

CFL Recycling will be marketed locally through our retail partner, Ace Hardware, through bill inserts, and the Xcel Energy website.

E. Program-Specific Policies

Public Service endeavors to promote ENERGY STAR lighting whenever possible. The Company uses only ENERGY STAR-certified CFLs in both the retail sales and mail order sales channels. Public Service guarantees 100% satisfaction on all CFLs through the mail order sales channel.

For the retail discount sales channel, Public Service selects retailers within the Colorado service territory and assumes that the customers purchasing the CFLs live with the given area. Although there are crossover sales with bordering utilities' territories, the Company assumes that the crossover coming in and out of the territories is equal.

Public Service currently uses Mercury Technologies as the third-party program implementation firm for CFL recycling. Mercury Technologies is known to be the best in industry because they separate the CFL components by hand to ensure that hazardous materials do not end up in the ground soil or water. Mercury Technologies also provides bins made of recycled material and recycles the bins that the bulbs are shipped in. They also provide certificates of proper recycling.

F. Stakeholder Involvement

Xcel Energy collaborates with several organizations to monitor and incorporate best practices into lighting program design. These activities include: serving on the lighting committee for Consortium for Energy Efficiency and as leader for the Lighting Vision Group, participating annually in the national ENERGY STAR Lighting meeting, and interfacing and working with the

American Council for an Energy Efficient Economy (ACEEE), EPA, ENERGY STAR, the Colorado Governor's Energy Office and the Colorado Regional Lighting Committee (CRLC). Public Service has collaborated with the CRLC in the past to coordinate the Change A Light promotion and create consistencies in the campaign throughout the region in 2007 and 2008. In 2007, Public Service offered the largest ENERGY STAR partner event in the country with the ENERGY STAR Bus Tour.

For CFL Recycling, Public Service initiated contact with the Colorado Department of Public Health and Environment, Ace Hardware and Platte River Power Authority to collaborate on a statewide recycling program. The Company has developed promotion materials that will be used throughout the state and has worked with E-Source to develop an article documenting best practices in CFL recycling.[6]

G. Evaluation, Measurement & Verification Plan

The Home Lighting & Recycling Program has a unique M&V process that is detailed in the M&V section of the Indirect Segment of the Plan. A comprehensive process and impact evaluation of the Home Lighting & Recycling Program will be conducted in 2009.

H. Rebate Levels

The upstream markdown incentives are derived through an RFP process with the bulb manufacturer and retailer. The incentives account for 30% to 70% of the incremental cost, depending on the bulb. The savings is ultimately passed on to the customer as an instant rebate for the Retail Discount channel

For the Mail Order Sales channel, there are no rebates. Public Service passes the wholesale price on to the customer and provides a free bulb to customers that spend $35 or more.

H. Technical Assumptions

The technical assumptions for the Home Lighting & Recycling Program center around the hours of operation and penetration rates of the technology within the given area. Public Service assumes customers will replace the lamps that they use more frequently first. Therefore, as the number of lamps replaced in a house increases, the hours of operation per year for each new lamp will decrease over time. Table 48 below details the relationship between the number of lamps replaced and hours of operation. According to ENERGY STAR saturation rates, approximately 6% of the bulbs have been replaced with CFLs in Colorado. This translates into approximately three lamps per house. Public Service has used 1,119 hours of operation per year for its forecast savings calculations.

[6] The article was published in *Energy Pulse* on-line magazine on June 6, 2008.

Table 48: Relationship Between Lamp Location and Hours of Operation[7]

Location of Lamp in Home	Number of Lamps per Space	Annual Operating Hours by Space
Kitchen	5.11	1,210
Outdoor	4.06	1,027
Utility Room	1.81	888
Living Room	5.97	864
Dining Room	1.23	829
Family Room	2.38	772
Garage	4.23	720
Office	1.16	708
Bathroom	6.88	669
Hall	5.12	616
Closet	0.77	513
Other	2.05	435
Bedroom	9.94	406
Total	**50.71**	

For forecasting purposes, Public Service assumes that the measure life for a CFL is inversely related to the annual operating hours, and therefore, should be calculated by dividing the operational life of the lamp by the annual operating hours. On average, the service life of currently available CFLs is approximately 8,000 hours the coincidence factor is 8%, and weighted average incremental cost of $2.73. The average incandescent bulb (65.25 Watt) is replaced with a 19-Watt CFL as the energy efficient option, offering 46.25 Watts of energy savings.

Public Service calculated a net-to-gross ratio of 93%. As a result of the Settlement negotiations, this NTG ratio has been lowered to 83%. The 93% ratio was calculated using data from a recent lighting evaluation implemented by the State of Wisconsin in 2007. Their research provided net-to-gross ratios by type of retailer, showing that home improvement retailers have a net-to-gross of 61% and the grocery retailers 118%. Public Service plans to use a variety of retailers to limit the free riders and increase the net-to-gross ratio. The following table provides examples of expected retailer allocation.

[7] US DOE 2002, US Lighting Market Characterization, Navigant Consulting.

Table 49: Range of Net-to-Gross Values by Retail Type

Mix of Retailer Types	WI Study NTG[8]	Estimated % of CO Retailers	Weighted Average NTG
Hardware	0.98	0.25	24.5%
Mass Merchandisers	0.98	0.3	29.4%
Grocery	1.18	0.2	23.6%
Home Improvement	0.61	0.25	15.25%
Total			**92.75%**

[8] State of Wisconsin - Focus on Energy Public Benefits Evaluation 2007.

➤ Home Performance with ENERGY STAR Program

A. Description

The Home Performance with ENERGY STAR Program is targeted at existing single-family homes that are in need of multiple energy efficiency improvements. By providing these customers with rebate incentives, Public Service is able to incorporate a whole house approach to energy efficiency. In order to participate in the program, all qualified customers must be both natural gas and electric residential customers of Public Service.

The Home Performance Program was developed using principles from the nationally recognized ENERGY STAR "Home Performance with ENERGY STAR" program. The concept of the program is to provide the customer with energy auditing services, direct contractor resources for implementing efficiency measures recommended in the energy audit, and independent verification of the improvements after completion.

This program will complement the new Home Energy Audit Program by requiring an advanced in-home audit as the first step in the process for program participation. After the audit has been completed, the customer may sign up to participate in the Home Performance with ENERGY STAR Program. Customers must implement at least five conservation measure improvements: three mandatory elements and two optional from those recommended by the auditor. The list of measures is provided below in Section H. A list of approved Home Performance contractors will be provided to the customers to obtain bids and contract installations.

Public Service has modeled the Colorado program after Xcel Energy's offering in Minnesota, which carefully evaluated a variety of methodologies across the country on how best to attract, market and motivate customers to implement such a comprehensive program. Programs that were evaluated as part of the product development process for Minnesota's offering include: New York's NYSERDA program, Wisconsin's Focus on Energy program, and Efficiency Vermont's program. In addition, the design team utilized market research from the current Minnesota Home Energy Audit Program. Ultimately, Public Service determined that the Minnesota model proved to be a well-structured offering that utilized other energy efficiency programs and delivery mechanisms. .

In conjunction with the Home Energy Audit Program, Public Service will issue a request for proposals to prospective third-party program implementers. The RFP secures consistent pricing of services for program delivery, specific testing and evaluation requirements tied to qualified program installs and information on provider's licensing and insurance requirements. This RFP is designed to identify qualified Home Performance providers and secure consistent delivery of the program offering.

A separate contract will be available for all interested trade contractors who enroll in and complete the Home Performance Contractor training. This training will be offered prior to the program launch and will take approximately five hours to complete. The primary focus of the training is to provide contractors with information on the program components, how the process works, and the required diagnostic testing that Public Service will require of them as part of the efficient measure installations. Once interested contractors have completed this training, they will be included on the Approved Contractor List. This list will be included in the customer packets and on the Xcel Energy website. All participating contractors must complete the training and sign the contractor agreement before they may provide approved installs for participants in the program.

B. Budgets & Goals

Budgets

The budgets for this program were based on the per participant cost of the current Home Performance with ENERGY STAR Program in Minnesota. Costs for the third party audit provider were estimated based on Minnesota experience and feedback from the local energy industry in Colorado.

Goals

The participant goal was based on a percentage of customers that are likely to sign up for the program as part of the Home Energy Audit Program. With a proposed goal of over 7,000 audits per year during the two-year biennium, Public Service will be able to quickly identify potential participants and market the program directly to them as part of the audit process.

Table 50: Home Performance with ENERGY STAR Program Budgets and Goals

Home Performance w/ ENERGY STAR	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$22,101	$33,047	$27,897	$33,657
Admin & Program Delivery	$48,590	$103,303	$110,396	$202,109
Ad, Promo, & Customer Ed.	$20,830	$33,955	$93,680	$295,020
Customer Incentives	$64,785	$129,715	$215,840	$432,160
Equipment & Installation	N/A	N/A	N/A	N/A
M&V	$15,643	$28,230	$36,965	$68,775
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$171,949**	**$328,250**	**$484,778**	**$1,031,721**
Generator kW	31	N/A	103	N/A
Generator kWh	374,715	N/A	1,249,049	N/A
Annual Dth	N/A	9,617	N/A	32,058
Annual Dth/$M	N/A	29,299	N/A	31,072
Participants	300	300	1,000	1,000
Participation as % of Segment	0.026%	0.025%	0.088%	0.084%
Modified TRC Test Ratio	**1.94**	**1.23**	**2.15**	**1.25**

C. Application Process

Customers interested in participating in the Home Performance with ENERGY STAR Program will begin by contacting Public Service and requesting their Home Energy Audit. The auditor will provide information on the Home Performance Program as part of their in-home audit, tying specific program requirement information and recommendations into the audit. The customer may then sign up for the program the day of the audit or sign the program form and mail it in directly to Public Service for processing and program follow up.

Once a customer has submitted the sign up form and submitted it to Public Service for processing and tracking, the customer has six months to complete the required and optional installs. The customer then completes the required installs along with the selected optional installs and contacts the Home Performance provider to schedule a final inspection. When the inspection is completed the Home Performance provider will submit an electronic rebate form to the processing team along with copies of invoices for all of the completed installs. The rebate is then processed and the check is issued within four to six weeks.

The Home Performance Program information, program forms and approved contractor list will available at Xcel Energy's website as well as through the audit provider. Customers may also contact the customer call center to request program information.

D. Marketing Objectives, Goals, & Strategy

Public Service will implement a variety of marketing strategies to provide program information through the website, print media and local "green" community events. We will also provide incentives to insulation contractors from our approved contractor list, in an effort to identify additional participants that are interested in insulating their home, but may not be aware of this whole house option.

The Home Performance Program will be marketed through the Home Energy Audit Program, the Xcel Energy website, program promotions directly to customers, and approved Home Performance contractors. Public Service will monitor program participation on a monthly basis and implement additional marketing tactics if necessary to achieve the year-end goal.

Public Service will utilize local resources within the service area and work with ENERGY STAR to identify additional existing resources to deliver the program in Colorado. To date, the Company has initiated a dialogue with local energy efficiency agencies such as the Smart Energy Living Alliance (E-Star) and the City of Boulder's Office of Environmental Affairs.

Since this is a new program offering to our Colorado customers, Public Service has budgeted for possible purchase of cooperative advertising opportunities as a contingency plan to address low enrollment. Specifically, the Company would purchase advertising and offer interested contractors the opportunity to partner in the marketing effort. Advertising would be targeted at a variety of local energy efficient-related publications. Given that this program requires a larger investment from residential customers, it may also require a larger promotional budget to attract participants.

In addition, Public Service will attempt to fully utilize the trade partners that have been trained and contracted to deliver this program to customers. We feel this is our most important channel to work with to build awareness and participation in the program. As a result, we are including a financial incentive to this group for educating customers about the Home Performance Program and engaging them to participate. These incentives will provide contractors additional motivation to promote the Home Performance Program offering.

E. Program-Specific Policies

The Home Performance with ENERGY STAR Program requires that customers must have either a Public Service Standard Home Energy Audit without blower door, a Standard Audit with blower door, or an Infrared Audit to qualify for participation. The audit is required prior to starting the improvements.

Public Service will provide the customer with a list or contractors certified in the program. The Company does not guarantee the contractor expertise and does not warrant any of the products or services installed, nor is one contractor promoted over another. Public Service shall have no liability for contractor work or negligence.

To complete the program and be eligible for the rebates, customers must agree to implement five improvements: three mandatory and two optional. The customer will receive rebates for improvements made within six months of the initial audit and verified by the auditor. The Company will not rebate for pre-existing efficient equipment, but will allow it to count towards the required or optional equipment installs.

F. Stakeholder Involvement

Public Service has met with the Cities of Boulder, Fort Collins, Greeley, and Colorado Springs, as well as the Smart Energy Living Alliance, the Center for Resource Conservation, the Platte River Valley Authority and the Governor's Energy Office for program feedback. The Company will continue to meet with these and other stakeholders for feedback to modify and improve the program over time.

G. Evaluation, Measurement & Verification Plan

The Home Performance with ENERGY STAR Program has a unique M&V process that is detailed in the M&V section of the Indirect Segment of the Plan.

Similar to the Home Energy Audit Program, Public Service will implement a Customer Satisfaction Study to research customer experiences in and attitudes about the Home Performance with ENERGY STAR Program. In addition to this study, the Company will interview both audit and contractor staff to identify potential barriers for program delivery and participation. By understanding what potential barriers exist for both our customers and contractors, the Company can make adjustments to the existing program and streamline program delivery.

H. Rebate Levels

The following table provides program participation requirements and rebates that will be offered to qualified customers. Each rebate is prescriptive and energy savings are based on the specific technology assumptions use in the cost-benefit modeling.

Table 51: Required & Optional Measures and Rebates for the Home Performance Program

Measures	Total Rebate
REQUIRED	
Attic Insulation & Bypass Sealing	$150
Air sealing & Weatherstripping	$100
CFLs – Quantity of 20	$40
OPTIONS	
Wall Insulation: Sub-Siding or Cavity	$250
Setback Thermostat	$10
New High Efficiency Furnace	$80
Electrically Efficient Furnace	$100
Tankless Hot Water Heater 82% AFUE	$100
Power Vented Hot Water Heater	$60
Dishwasher	$10
Clothes washer	$50
Refrigerator Replacement	$10
Refrigerator Recycling	$35

In addition, insulation and audit contractors will receive a financial incentive per qualified participant who completes the Home Performance Program upon recommendation from the contractor.

I. Technical Assumptions

The Home Performance with ENERGY STAR Program is based on the Home Performance Program offered by the Department of Energy/Environmental Protection Agency. The program provides a "systems approach" to comprehensive energy improvements. Public Service uses this approach by requiring an upgraded home "shell," including code level attic insulation and a reduction in air infiltration coupled with a combustion safety check if naturally vented combustion appliances (furnace/boiler or water heater) remain in the home after program participation.

Program savings were determined by using a surrogate computer modeled home (modeled with Energy Gauge) with characteristics that approximate the most common home attributes as reported in the 2005 Home Use Survey and the energy consumption characteristics of the metropolitan Denver general housing stock excluding low-income customers. Low-income customers may participate in this program, but also have dedicated program offerings. Savings were determined by modeling the required improvements for the program (attic insulation and air infiltration control) and setting a secondary "baseline", then adding the program "options" to the model. Wall insulation, programmable thermostat impacts, furnace and water heater improvements were modeled with this technique.

Public Service will use a net-to-gross factor of 94% for the Home Performance with ENERGY STAR Program. Because a similar program offered by E-Star Colorado has had very low participation, the Company looked to other bundled home programs around the country and determined that 94% is a reasonable net-to-gross value.

➢ Insulation Rebate Program

A. Description

The Insulation Rebate Program offers Public Service residential gas customers rebate incentives for installing insulation in their existing single-family home or one-to-four unit property. Homes must have a pre-project insulation level of R-20 or below.

Public Service will rebate the following types of qualifying insulation installations:

- Attic insulation and bypass sealing to an R-value of 38 or greater,
- Wall insulation to an R-value of 13, and/or
- Air sealing and weather-stripping.

Customers may use any licensed, bonded and insured insulation contractor to qualify for the rebate.

Our program is similar to the current Insulate Colorado program offered through the GEO and the Insulate and Seal Rebate Program offered through the Center for Resource Conservation (CRC). The purpose of offering this program to our customers is to provide rebate incentives to Public Service customers that may not be familiar with those other programs and to offer a longer-term program given the uncertainty as to whether those programs will continue into 2009 and 2010. The Company has initiated conversations with these groups in an effort to leverage each other's programs and avoid duplication as much as possible. The groups will work together this fall as plans get finalized for 2009 and beyond to determine how we will promote and incent insulation to Colorado customers.

The Department of Energy reports that heating and cooling accounts for 50 to 70% of the energy used in the average home today. They also add that inadequate insulation and air leakage are the leading causes for energy waste in most homes. Recent estimates from the Environmental Protection Agency indicate that homeowners can typically save up to 20% of heating and cooling costs (or up to 10% of total energy costs) by air sealing their homes and adding insulation to attics, floors and over crawl spaces, and accessible basement rim joists.

B. Budgets & Goals

<u>Budgets</u>
Rebate amounts were set to match the Insulate Colorado program and provide a seamless way for either Public Service or the GEO to serve all qualified Colorado residents with very similar program procedures and benefits.

Budgets were based upon the 2006 Minnesota program offering, as well as average insulation costs in the Colorado market.

Costs associated with processing are relatively low since we do not require customers to work with a specific insulation provider and the program is based on a set percentage of the total cost of the insulation install, not just materials. Typically, this program is promoted through Xcel Energy's website and newsletters, communications to local area insulation contractors, and community events and home shows focused on the environment and energy efficiency. For that reason, historically it has required a smaller budget for promotion and marketing purposes.

Goals
The Insulation Rebate Program goals were developed based on historical response to a similar program in Minnesota.

Table 52: Insulation Rebate Program Budgets & Goals

Insulation Rebate	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	N/A	$22,520	N/A	$23,750
Admin & Program Delivery	N/A	$16,900	N/A	$18,025
Ad, Promo, & Customer Ed.	N/A	$25,000	N/A	$27,500
Customer Incentives	N/A	$450,000	N/A	$450,000
Equipment & Installation	N/A	N/A	N/A	N/A
M&V	N/A	$15,480	N/A	$15,480
Miscellaneous	N/A	N/A	N/A	N/A
Total	**N/A**	**$529,900**	**N/A**	**$534,755**
Generator kW	N/A	N/A	N/A	N/A
Generator kWh	N/A	N/A	N/A	N/A
Annual Dth	N/A	28,210	N/A	28,210
Annual Dth/$M	N/A	53,237	N/A	52,753
Participants	N/A	1,500	N/A	1,500
Participation as % of Segment	N/A	0.127%	N/A	0.127%
Modified TRC Test Ratio	**N/A**	**1.72**	**N/A**	**1.73**

C. Application Process

Qualified customers must complete a rebate application, which is available on the Xcel Energy website, by contacting our customer call center or insulation contractor. Customers must provide Public Service with a copy of their dated invoice reflecting the installation along with the rebate application. Qualified installs will be processed and checks issued within four to six weeks. Public Service will issue the rebate directly to the customer, but the rebate form may be submitted through the insulation contractor.

D. Marketing Objectives, Goals, & Strategy

The Insulation Rebate Program will be marketed through a variety of channels such as the Home Energy Audit Program, the Xcel Energy website, direct mailings to local area insulation contractors, and environmentally-focused community events and home shows. Since this rebate program is available to residential natural gas customers from Public Service, we will support this marketing strategy with seasonal direct mail efforts and winter bill inserts to targeted customers. Historically, this strategy has worked well in Minnesota when implemented during the key heating months of December, January and February.

Additionally, the Company will incorporate communications activities to local insulation contractors so they can educate qualified customers on how they can benefit from this rebate. By collaborating on outreach to our customers, the local contractors may be able to drive more customers to commit to insulation installs.

Finally, we will initiate cross marketing efforts with other natural gas rebate programs offered by Public Service. An example of this could be a winter direct mail letter that outlines existing rebate and energy efficiency programs available to natural gas customers of Public Service. This strategy has proved successful in both the Minnesota and North Dakota service territories.

E. Program-Specific Policies

To qualify, all projects must have a pre-installation R-value of 20 or less. Customers must submit a copy of the paid invoice along with their rebate application form within six months of the invoice date to qualify. Qualified insulation contractors must be fully licensed, bonded and insured. Self-installs do not qualify for rebates.

This program is available to Public Service residential natural gas customers in Colorado with existing residential housing. The rebate applies to attic or wall insulation installs and air sealing and weather-stripping. Program excludes new residential construction, new residential additions, garages, sheds and workshops. Customers requesting rebates must contract for insulation services with fully licensed and bonded insulation contractors. To qualify for a rebate, all insulation must be installed to the manufacturer's specifications and meet all state and local codes and federal regulations. Public Service reserves the right to inspect installations before issuing a rebate. Rebates will not be issued if the same purchase has already been rebated through other Public Service rebate programs, such as through the Home Performance with ENERGY STAR Program.

F. Stakeholder Involvement

Public Service has initiated conversations with the GEO and CRC regarding existing efforts related to insulation. The Company worked with the GEO in developing this program since the GEO had an insulation matching grant program with limited funding in 2009. The Company believes that our efforts will be complementary and that the Public Service program will start off strongly due to GEO and CRC activities to educate the customer and contractor marketplace.

G. Evaluation, Measurement & Verification Plan

All rebate applications are audited with a two-step process. On the front-end, as rebate applications are received, all critical customer information, equipment eligibility and proper rebates amounts are reviewed, validated, and corrected if inaccurate. The second step takes place prior to the rebate being issued where Rebate Operations audits 100% of the rebate applications to ensure that the information from the form was entered correctly into the tracking database.

The M&V process for prescriptive measures is detailed in the M&V section of the Indirect Segment of this report. The savings factors that will be verified for the Insulation Rebate Program are detailed in the Deemed Savings Technical Assumptions section.

H. Rebate Levels

The program will provide a rebate equal to 20% of the total cost of the insulation and installation up to a maximum rebate of $300 per customer per natural gas heating meter. Rebates will be offered on a one-time only basis. Public Service will not provide additional rebates through this program for future insulation installs at the same residence unless a new owner implements additional qualified installs.

I. Technical Assumptions

The savings were calculated by computer modeling of a typical residential home in the Denver metro area. The hypothetical modeled home was created with the most common characteristics from our Residential Home Energy Use Study in 2006 and adjusted so its calculated energy consumption was close to the overall average of Public Service's gas heated homes in the metro area. The savings from adding ceiling insulation was determined by changing the characteristic in the model and recalculating the resulting gas consumption and similarly with insulating walls and reducing air infiltration.

Materials for adding ceiling insulation could be fiberglass batts, loose blown fiberglass/rock wool and other similar materials or blown cellulose. Typically, insulators will install a similar material to those already in place. The key factor is that the contractor has installed sufficient materials to meet the final "R value" required (38 in most areas and up to 49 in others).

Table 53: Home Insulation Impacts

	Specifics	Dth/yr-home
Attic Insulation	R 19 to R38/R49*	5.9
Air Sealing	25% Reduction	7.4
Wall Insulation	Empty Cavity to R11	32.3

*IECC 2006 may require R49 in mountain areas.

➢ Refrigerator Recycling Program

A. Description

Public Service's Refrigerator Recycling Program strives to decrease the number of inefficient secondary refrigerators in general use, and by doing so, deliver electric energy savings and peak demand reduction. The program is designed to reduce energy usage by allowing customers to dispose of their operable, inefficient secondary refrigerators in an environmentally safe and compliant manner. Eligible customers include Public Service residential electric customers in our Colorado service territory. Customers with qualifying units will receive an incentive for their participation in this program and will not be directly responsible for any costs associated with pick-up, transportation, disposal and proper recycling of their refrigerator.

Public Service will retain the services of a qualified vendor, utilizing an RFP process, to perform the following:

- Refrigerator collection, transportation and storage;
- Qualifying refrigerator at time of scheduled pick-up;
- Appliance processing and materials recycling;
- Issuing the customer incentive payment;
- All customer service aspects related to above activities;
- Program tracking and reporting; and
- Supporting Measurement & Verification requirements.

The vendor will be required to comply with all local, State and Federal requirements. This includes maintaining all permits and licenses required for any facilities, equipment and personnel used for this program. The adherence to this process will ensure that recycled units will not re-enter the secondary market and be placed back on Public Service's grid.

There are several large, established recycling programs that are using a program model similar to the one proposed here, including: Rocky Mountain Power in Utah, Pacific Power in Washington, and Pacific Gas & Electric (PG&E) in California. Annual harvest rates for these programs range from a very good 2.2% for PG&E, to an excellent 3.5% for both PacifiCorp programs. All of these programs utilize similar recycling services and comparable customer incentives. The primary difference between these programs is variances in marketing responsibilities; the recycling vendor markets some programs, while others, such as our program, are marketed by the utility.

B. Budgets & Goals

<u>Budgets</u>
The Refrigerator Recycling Program budget was developed based on our participation goals. Recycling-related expenditures for the refrigerator itself account for approximately 63% of the overall budget. The projected rebates account for nearly 18% of the budget. Marketing, measurement and verification, and labor expenses were then determined and added as administrative expenses. The total average cost per participant is expected to be around $200. In

2009, the program will be offered to Front Range customers only in order to maximize promotional dollars and to work out any bugs in the program. In 2010, the program will be offered to all Public Service residential customers, which will increase participation numbers and related budget expenses.

Goals

Statistics indicate 20 to 25% of any given residential population will have a "second" refrigerator unit, which in Public Service's service territory is about 249,000 customers or units. Goals for this program were based on impacts realized from similar programs run by other utilities and the potential estimated impacts that could be realized in Colorado during the first two years.

Table 54: Refrigerator Recycling Program Budgets and Goals

Refrigerator Recycling	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$15,824	N/A	$28,779	N/A
Admin & Program Delivery	$415,741	N/A	$575,192	N/A
Ad, Promo, & Customer Ed.	$91,800	N/A	$97,880	N/A
Customer Incentives	$113,750	N/A	$153,125	N/A
Equipment & Installation	N/A	N/A	N/A	N/A
M&V	$22,592	N/A	$30,406	N/A
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$659,707**	**N/A**	**$885,382**	**N/A**
Generator kW	297	N/A	400	N/A
Generator kWh	2,189,309	N/A	2,947,146	N/A
Annual Dth	N/A	N/A	N/A	N/A
Annual Dth/$M	N/A	N/A	N/A	N/A
Participants	3,250	N/A	4,375	N/A
Participation as % of Segment	0.286%	N/A	0.385%	N/A
Modified TRC Test Ratio	**2.17**	**N/A**	**2.21**	**N/A**

C. Application Process

Customers will learn about this program through various marketing channels such as bill inserts, Public Service's Update newsletter, and the Xcel Energy website. We anticipate working with the Governor's Energy Office in order to leverage our respective resources. Marketing messages will direct customers to call our vendor using a toll free phone line. During the call, our vendor will ask qualifying questions in order to minimize costs and maximize customer satisfaction. The vendor will schedule an appointment and will be required to pick-up the refrigerator no later than 10 business days after taking the customer's request. Customers will be called one to two days prior to their scheduled pick-up date in order to confirm their appointment and remind them to turn on their refrigerator and make sure it is empty. Customers will receive their incentive check within four to six weeks after their refrigerator has been picked-up by our vendor.

At program launch or shortly thereafter, Public Service will provide an internet scheduling capability where customers can go on-line 24/7 to qualify and sign-up for this program. Several vendors have this capability now and links from Xcel Energy's website would be provided. Screening questions, similar to those used when customers call the toll free phone line, will be used to qualify customers.

D. Marketing Objectives, Goals, & Strategy

The program will be available to customers year round; however, the marketing strategy will utilize Spring and Fall campaigns to promote the program. In 2009, Refrigerator Recycling will be marketed to customers in the Front Range only. Beginning in 2010, the program will be opened to all residential electric customers in the Public Service Colorado service territory.

This program is new to Public Service in Colorado, but a similar program was offered in Xcel Energy's Minnesota service territory in the early 1990's. In 2009, the goal is to recycle 3,250 units, which is equal to 1.3% of the total secondary refrigerator target market in Colorado. For 2010, the participant goal is 4,375 units or 1.8% of the total target market. Marketing and promotional activities for this program will be Public Service's responsibility.

The target market consists of an estimated 240,000 customers with a second refrigerator, usually located in a garage or basement area. Generally these customers have single-family homes with two or more individuals in the household. Customer interest in this type program is seasonal, usually occurring in the spring, summer and early fall seasons (prior to the Thanksgiving holiday). Program demand often peaks in the summer months, which is associated with customer home improvement projects. Deployment of our promotional tactics will coincide with these seasonal time periods.

Public Service will utilize several marketing channels for this program, including bill inserts, use of our company Update newsletter, and use of the Xcel Energy website. In addition, we will work with GEO to develop marketing materials, such as a leave-behind brochure, which can be handed out when a secondary refrigerator has been identified during an audit. Similar marketing opportunities exist with other Public Service programs such as the Home Performance with ENERGY STAR and some of the Low-Income weatherization programs. Targeted direct mail and telemarketing tactics may also be used. Call Center agents will direct any customers inquiring about this program to contact our vendor using a toll free number or through use of the vendor's website.

E. Program-Specific Policies

All refrigerator units must meet the following requirements in order to participate in this program:

- Must be an operational secondary refrigerator unit. No primary units will be allowed;
- Operational is defined as in working order and used as a secondary unit for at least two months prior to pick up (we are trying to avoid situations where a

customer recently purchased a new refrigerator and is looking for a means to dispose of their old one, with no intention of using it as their secondary unit);

- Refrigerators must be capable of freezing water;
- Refrigerator must be plugged in the night before the pick-up date (customer will receive a call from the vendor, reminding them to do this). This is to ensure full operation (cooling/freezing and the ability to make ice) when inspected at the time of pick up;
- Refrigerators must be no smaller than 10 cubic feet or no larger than 30 cubic feet; and
- There will be a limit of two refrigerators per household.

F. Stakeholder Involvement

Public Service met with GEO during the development process to discuss program design. GEO currently offers a Refrigerator "Replacement" program which differs from the program envisioned here. The GEO program is part of a comprehensive low-income audit program that can include replacement of a qualifying, inefficient "primary" refrigerator with a new ENERGY STAR-rated refrigerator. In some instances, a secondary refrigerator is removed also.

There are opportunities to work with GEO and other non-profit agencies such as the Energy Outreach Colorado when energy audits are being completed for low-income participants. According to GEO, their audit program is being expanded to participants who fall at or below 100% of the area median income (AMI) level, as defined by the U.S. Department of Housing and Urban Development. Public Service and GEO are considering a process where the GEO auditor would take notice of any "secondary" refrigerator units in the home and offer the participant information on Public Service's Refrigerator Recycling Program. GEO and Public Service will also consider using the same recycling vendor to remove the primary and secondary refrigerator at the same time. This could save on collection and transportation expenses and would minimize impacts to participants.

G. Evaluation, Measurement & Verification Plan

The vendor will be required to provide a series of tracking and reporting requirements for this program, including the following:

- Submit weekly reporting documents that include:
  - Model and serial numbers of units collected;
  - Where unit was located in home;
  - Participant information such as name, address and phone (email – optional);
  - Number of appliances collected or rejected, by zip code;
  - If rejected, names of participants and reason for rejection;
  - Number of appliances recycled;
- Submit monthly, copies of any reports generated for the EPA; and
- Maintain accurate records on all shipments of regulated materials.

The M&V process for prescriptive measures is detailed in the M&V section of the Indirect Segment of this report. The savings factors that will be verified for the Refrigerator Recycling Program are detailed in the Deemed Savings Technical Assumptions section.

H. Rebate Levels

Participants will receive a $35 incentive to remove their inefficient secondary refrigerator. The secondary refrigerator will be removed and properly recycled at no cost to the customer. The $35 incentive is on par with many similar programs in the U.S., such as those run by Fort Collins Utilities, PG&E and PacifiCorp, which have proven to be successful programs.

In addition to the $35 incentive, customers will receive the benefit of energy savings, which on average is equal to about $88 annually and a responsible and environmentally friendly way to dispose of a refrigerator with limited remaining life.

I. Technical Assumptions

<u>Energy and Demand Savings</u>
Calculations of energy and demand savings are somewhat unique for this program. The calculation assumes the refrigerator will be permanently removed from the grid. It does not assume net savings by comparing the recycled unit to an energy efficient unit. Forecasted program savings are based on multiple factors including:

- Year refrigerator manufactured;
- Expected total lifetime of refrigerator;
- Weighted average of refrigerator types in overall population by manufacture date;
- Remaining life of refrigerator unit; and
- Annual degradation efficiency factor.

The average savings per unit was derived using the "average kW to peak kW" ratio from Texas Refrigerator Deemed Savings analysis previously conducted by Frontier Associates. Average kW saved was calculated by dividing annual kWh consumption by 8,760 hours.

One of the difficulties involved in the calculation of energy savings for any Refrigerator Recycling Program is the degrading efficiency of older refrigerators over time. To deal with this issue, Frontier established a baseline using the shipment-weighted efficiencies for refrigerators manufactured between 1993 and 2000 and applied an annual degradation factor to estimate their consumption for the first year (2008) and beyond.

These annual energy consumption values are equivalent to Public Service's expected energy savings from removing inefficient secondary refrigerators from the grid. A weighted average was applied to produce average first-year energy savings of 1,025 kWh (see table below). Note these values are gross values and are not adjusted for net-to-gross factors. No savings were claimed beyond the remaining useful life of the refrigerator to be recycled, which is evident in the table below when looking at savings in 2013 and 2014 for refrigerators manufactured between 1993 and 1994.

Table 55: Average Recycled Refrigerator Gross Energy Savings

Year of Ref. Manufacture	2008 savings (kWh)	2009 savings (kWh)	2010 savings (kWh)	2011 savings (kWh)	2012 savings (kWh)	2013 savings (kWh)	2014 savings (kWh)
1993	124.99	129.61	134.41	139.38	72.27	-	-
1994	129.24	134.02	138.98	144.12	149.45	-	-
1995	130.53	135.35	140.36	145.56	150.94	78.26	-
1996	129.76	134.56	139.54	144.70	150.06	155.61	80.68
1997	125.13	129.76	134.56	139.54	144.70	150.06	155.61
1998	120.67	125.13	129.76	134.56	139.54	144.70	150.06
1999	116.36	120.67	125.13	129.76	134.56	139.54	144.70
2000	112.21	116.36	120.67	125.13	129.76	134.56	139.54
Total	**989**	**1,025**	**1,063**	**1,103**	**1,071**	**803**	**671**

Refrigerator annual energy consumption (kWh) is directly related to the age of the appliance. Pratt and Miller (1998)[9] found that annual energy consumption (kWh) increased by a factor of 1.037 for each year it is in use.

The table below was used to establish a reasonable mix of appliances we would expect to see come through this program in the first several years.

Table 56: Percentages for Weighted Averages

Year of Manufacture	% Share
1993	10.98%
1994	11.89%
1995	12.53%
1996	12.92%
1997	12.92%
1998	12.92%
1999	12.92%
2000	12.92%

Net-to-gross assumptions vary widely between similar utility programs. Some programs have assumed a 1.0 factor (no free-riders or spillover equal to free-riders), while others have established factors as low as 0.48. Until recently, net-to-gross assumptions have not played an important role in the planning and tracking process for many of the utilities running similar programs. The numbers of participants, types of units recycled, customer service, etc. have been of greater importance.

The Refrigerator Recycling Program will use a net-to-gross factor of 61%. The basis for using this value comes from two sources: the California Summary Study of 2001 (year studied) Energy Efficiency Programs (California Study), submitted by Global Energy Partners, LLC (2003), and

[9] A document citing this study can be found at:
http://www.energystar.gov/ia/partners/manuf_res/downloads/2007Refrigerator_prg.pdf

an internal evaluation completed by the City of Fort Collins, Colorado for their 2004 program year.

The California Study looked at two programs; the Statewide Summer Initiative, implemented by American Recycling Centers of America (ARCA) for PG&E, San Diego Gas & Electric and Southern California Edison, and Sacramento Municipal Utility District's Residential Refrigerator Recycling program. The California Study analyzed data for program year 2001. The basic conclusion drawn from this study was that the net-to-gross for utility refrigerator recycling programs should fall between 0.6 and 0.8. This conclusion is based on the guidance provided by the California Public Utilities Commission, which suggested a value of 0.8 and a 1996 Xenergy study (customer survey analysis) that suggested factors in the neighborhood of 0.53.

The City of Fort Collins established a net-to-gross factor of 0.61 for this program based on a series of surveys (phone and mail). Using respondent information, Fort Collins Utilities assigned factors to adjust for units that would have been kept, unused, discarded, or transferred (given away, sold to private or second hand dealers, etc.). Additional factors were used to adjust for units that would be replaced by a "new" unit. Because Fort Collins is the closest to our service territory, both in proximity and customer attitudes, Public Service will use the same net-to-gross value for the proposed Refrigerator Recycling Program.

➤ School Education Kits Program

A. Description

The School Education Kits Program offering is a turnkey program that combines a set of classroom activities with projects in the home to install energy efficiency and water conservation products. This program is targeted at sixth grade students in the Colorado service territory. Public Service plans to work with RAP to implement this program. RAP has a history of implementing school programs are part of their LivingWise® Portfolio. RAP will fully implement the School Education Kits Program, including recruiting and training teachers, providing all materials, and tracking participation by the students and teachers.

Along with various classroom materials, each participant receives an Education Activity Kit containing:

- Natural Resources Fact Chart
- Digital Water / Air Thermometer
- FilterTone® Alarm
- High Efficiency Showerhead (2.0 gpm)
- Kitchen Aerator (1.5 gpm)
- Toilet Leak Detector Tablets
- Compact Fluorescent Bulb (14 Watt - 60 Watt Equivalent)
- Compact Fluorescent Bulb (19 Watt - 75 Watt Equivalent)
- Flow Rate Test Bag
- LimeLite® Night Light
- Mini Tape Measure
- Parent Comment Card
- Wristband Postcard

An evaluation of the K-12 schools in Colorado indicates that there are roughly 58,000 sixth grade students. Grade 6 has been chosen due to alignment with Colorado State learning requirements. Specifically, the topics covered in Science Standard 4, Earth Sciences call for discussion of renewable/non-renewable natural resources, solar heat in the environment, and water circulation through the hydrologic cycle.

In Colorado, individual school districts do have the ability to establish their own standards, which supersede state requirements, so there could be some local areas where the program might be moved to the appropriate grade level to accommodate these local preferences. This is a rare occurrence, but a possibility nonetheless. The same content and kit measures would be provided, and the program would remain at that specific grade level in subsequent years.

This program has many advantages including: it enables an educational program to have direct-impact conservation; it helps build awareness of energy conservation to children, and can impact customers at all income levels. Xcel Energy launched a similar program in its New Mexico service territory in 2008.

B. Budgets & Goals

Budgets

The program cost is all-inclusive, made up of not only the kits, but also the curriculum support materials for the teacher, the pre- and post-surveys, and website support. The program budget was developed based on participation goals and an approximate cost per kit. Public Service will conduct an RFP later this year to solidify kit pricing. Labor, administration fees, and postage have been added to the budget as well. This program does not require advertising. Different school districts throughout the state will be selected to participate.

UPDATE: As a result of the recent Settlement Agreement, the 2010 electric and gas budgets for the School Education Kits Program were increased to $573,938 and $575,736, respectively. The impact of these budget increases has not yet been evaluated, but will be included in the May 1, 2009 DSM Plan Amendment.

Goals

Since the Company serves approximately 70% of the Colorado state population, we have assumed that we have approximately 70% of the students - roughly 40,740 sixth grade students. Resource Action Programs data indicates that approximately 80% of teachers offered the program choose to participate.

UPDATE: As a result of the recent Settlement Agreement, the 2010 electric and gas participation goals for the School Education Kits Program were increased to 15,000 students. The impact of these increases has not yet been evaluated, but will be included in the May 1, 2009 DSM Plan Amendment.

Table 57: School Education Kits Program Budgets and Goals

School Education Kits	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$3,154	$2,110	$3,154	N/A
Admin & Program Delivery	$1,651	$1,800	$9,200	$11,200
Ad, Promo, & Customer Ed.	N/A	N/A	N/A	N/A
Customer Incentives	$153,087	$153,087	$169,324	$169,324
Equipment & Installation	N/A	N/A	N/A	N/A
M&V	$6,321	$6,276	$7,260	$7,212
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$164,213**	**$163,273**	**$188,938**	**$187,736**
Generator kW	54	N/A	60	N/A
Generator kWh	815,800	N/A	902,324	N/A
Annual Dth	N/A	14,315	N/A	15,833
Annual Dth/$M	N/A	87,674	N/A	84,336
Participants	6,600	6,600	7,300	7,300
Participation as % of Segment	0.581%	0.557%	0.643%	0.616%
Modified TRC Test Ratio	**2.99**	**4.16**	**2.96**	**4.01**

C. Application Process

The teachers may enroll through various means (i.e., fax, phone, email, mail and website). If teacher response is not sufficient, RAP will redesign the marketing materials and/or offer incentives to the teachers to participate. RAP does not use incentives in every program, but if the enrollment or data collection portions are not at a satisfactory level, incentives are used to get numbers to the level desired by the program sponsor. Examples of incentives may be gift cards to select retailers.

Upon enrollment, the teachers dictate to RAP when in the school year they would like to use the program materials and provide accurate enrollment/participant numbers. RAP sends the teachers the LivingWise® Program materials close to the time when they indicated they would like to use the program. RAP staff will remain in contact with the teachers via fax, phone, email and mail at various times throughout the program to provide support for the teachers and to request the return of the audit forms. Participants are provided with a toll free number to call if they need help. It can take up to three months to receive the results from each elementary school depending on when teachers decide to begin the activity.

Plans include informing all teachers of the program and adding them to a waiting list if they are interested in participating in the future. Because of the number of sixth grade students in the Colorado, we will target a smaller amount of students for the pilot of this program.

D. Marketing Objectives, Goals, & Strategy

Resource Action Programs will manage all aspects of marketing and outreach for the program. They will identify the schools that are within the Public Service territory and determine the approximate number of eligible teachers and students. Then, RAP will send out customized marketing materials to help enroll the classrooms. These materials explain the program, and the fact that it's offered free of charge to their classroom thanks to the sponsoring agency (Public Service). RAP and Public Service will work together to determine the strategic approach for selecting schools.

E. Program-Specific Policies

Only those schools that are selected to participate in the program are able to distribute the LivingWise kits. All kits must come from our selected contractor.

F. Stakeholder Involvement

Resource Action Programs will take full responsibility for marketing and management of the program.

G. Evaluation, Measurement & Verification Plan

The School Education Kits Program has a unique M&V process that is detailed in the M&V section of the Indirect Segment of the Plan. The savings factors that will be verified for the School Education Kits Program are detailed in the Deemed Savings Technical Assumptions section.

H. Rebate Levels

The LivingWise Program is fully funded by Public Service and does not provide rebates to the customer. Students and teachers involved in the program receive a free LivingWise Activity Kit when they sign up a classroom to participate.

I. Technical Assumptions

Forecasted savings were calculated for four measures: two CFLs, the low-flow showerhead and the faucet aerator. For CFLs, savings were calculated based on the 2002 Department of Energy US Lighting Market Characterization. It was assumed both CFLs included in the kit would be put in high lighting usage areas of the home.

For the Showerhead, forecasted savings were determined by replacing one of the home's showerheads with a low-flow model with a flow rate of 2.0 GPM. The base case uses the Federal Standard assumption of 2.5 GPM, although we feel there are many showerheads currently in service with significantly higher flow rates. Energy savings are produced when reducing the showerhead water flow rate and noting the impacts from reduced heating of the water. Technical assumptions included factors for hot water used per year, incoming water temperature and a standard water heating temperature of 130 degrees.

UPDATE: In response to the recent Settlement Agreement, Public Service plans to implement this program with 1.5 GPM showerheads. The impact of these higher efficiency showerheads on technical assumptions, goals, and budgets has not yet been evaluated, but will be included in the May 1, 2009 DSM Plan Amendment.

For the faucet aerator, forecasted savings were determined by the amount of water reduction from the assumed standard faucet aerator. Gas Appliance Manufacturer Association directory data was used to estimate the average recovery efficiency for the typical 40-gallon water heater. This was used in lieu of "Energy Factor," which also includes storage losses, which is not pertinent to aerator savings.

Pubic Service assumes that total household sink water consumption averages 17 gallons per day, based on estimates from the DOE domestic hot water appliance calculator. It was assumed that each home would have three primary sinks, and therefore, the usage was divided by three – assigning 5.6 gallons a day to each sink (since only one aerator is included in the kit, savings must reflect one retrofit). Applying the above calculation method and going from a standard 2.2 GPM flow rate to a 1.5 GPM flow rate, the savings came out to 5.8 therms annually.

➤ Water Heating Rebate Program

A. Description

The Public Service Water Heating Rebate Program is designed to encourage Colorado customers to purchase and install high-efficiency natural gas water heating equipment for residential use. In addition to bringing awareness to these customers about the immediate cash incentive and the long-term operational savings they will experience, the purpose of this program also is to promote market transformation through increasing customer demand for high-efficiency equipment in the marketplace. By purchasing and installing a qualifying water heater, customers can submit an application to receive a cash rebate ranging from $40 to $100, depending on the type of equipment. Customers may choose their own independent residential water heating contractors or installers, or may install the unit themselves. Xcel Energy currently offers this program in Minnesota and North Dakota.

The minimum efficiency levels in the Water Heating Rebate Program have been designed to align with those used by ENERGY STAR, which will go into effect Jan. 1, 2009. This will be the first time that ENERGY STAR has certified natural gas water heater, sending a strong, easily identified message to consumers making a purchasing decision.

Eligibility requirements for participation include having a residential natural gas account with Public Service. The program is applicable only for the purchase of qualifying new standard tank water heaters or tankless water heaters installed in new or replacement applications. The tiered rebate schedule in Colorado allows for a minimum efficiency of 0.62 Energy Factor (EF) for standard tanks. The additional tiers are 0.65 EF, 0.67 EF, and tankless 0.82 EF. While tankless water heaters did not pass the Total Resource Cost Test, they are included as a part of the Water Heating Rebate Program to assist market transformation through customer demand for high-efficiency equipment in the marketplace.

ENERGY STAR's minimum efficiency level will increase from 0.62 EF to 0.67 EF beginning Sept. 1, 2010. Public Service's program in Colorado will maintain the same standards as ENERGY STAR. Public Service recognizes that the 0.67 EF models require power-venting, which can increase equipment and installation costs; however, the higher-efficiency models' premium should decrease with economies of scale in the coming years. When the minimum efficiency changes in 2010, Public Service will develop an appropriate rebate amount based on the incremental cost.

B. Budgets & Goals

<u>Budgets</u>

Budgets for the Colorado Water Heating Rebate Program were developed based on the expected costs per participant in addition to costs needed to engage the HVAC installer base necessary to serve the territory. Specifically, this includes newsletters and direct mail in the form of informational letters to the contractor community to build their awareness so that they can assist the customer base seeking water heating rebates from Public Service. An internal channel manager will also reach out to the trade and develop key relationships to ensure program success.

The overall marketing budget for consumers was determined by the amount of marketing communications necessary to build awareness of the program and to encourage participation. This Program is often cross-marketed with the Heating System Rebate Program as yet another way to save on natural-gas costs in the home.

Goals

The Water Heater Rebate Program goals were established based on historical participation rates in a similar program in Minnesota.

Table 58: Water Heater Rebate Program Budgets and Goals

Water Heater Rebate	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	N/A	$11,850	N/A	$15,200
Admin & Program Delivery	N/A	$1,300	N/A	$3,746
Ad, Promo, & Customer Ed.	N/A	$8,500	N/A	$8,500
Customer Incentives	N/A	$57,000	N/A	$79,060
Equipment & Installation	N/A	N/A	N/A	N/A
M&V	N/A	$3,146	N/A	$4,260
Miscellaneous	N/A	N/A	N/A	N/A
Total	**N/A**	**$81,796**	**N/A**	**$110,766**
Generator kW	N/A	N/A	N/A	N/A
Generator kWh	N/A	N/A	N/A	N/A
Annual Dth	N/A	1,513	N/A	2,119
Annual Dth/$M	N/A	18,502	N/A	19,129
Participants	N/A	1,250	N/A	1,750
Participation as % of Segment	N/A	0.106%	N/A	0.148%
Modified TRC Test Ratio	**N/A**	**1.16**	**N/A**	**1.17**

C. Application Process

The customer will learn about the Water Heating Rebate Program through bill inserts, the Heating, Ventilating and Air Conditioning (HVAC) community and through large retailers that sell water heaters on site. The typical sales cycle includes a consumer hiring an HVAC technician, from whom the water heater is purchased unless it was purchased by the customer at a retail site. Following installation, a completed Public Service application form and appropriate invoice are submitted to the utility. Forms are mailed to the utility by either the contractor (typically) or the customer, and can be submitted any time within the deadline parameters outlined on the reverse side of the application form. Invoices must reflect the same information provided on the application form, specifically model number and purchase date. Other information gathered on the application form includes customer's Public Service account number, mailing address if separate from installation address, customer signature, contractor signature – unless self-installed, and unit's efficiency level.

Equipment eligibility is determined by using the Gas Appliance Manufacturers Association directory. Xcel Energy Rebate Operations team review each individual form, check to ensure all required information is provided, match the invoice to the application form, and determine the exact amount of the rebate. The Rebate Operations employee then enters the information into a Public Service application database, which notes the rebate status in the customer's Public Service account. Status will state whether a check was cut and mailed to the customer, or the explanation of why an application for rebate was denied or returned due to insufficient information. In the event of insufficient information, the application form and the invoice are returned to the customer with a letter on company letterhead requesting the additional information. If an application is returned to Public Service a second time and additional information is still needed, the application is then returned to the installer so they can assist the customer.

Customers can expect to receive a rebate in four to six weeks after submitting the application. The program does not require pre-approval. Customers receive checks mailed to their homes; the rebate does not come in the form of a customer account credit. Rebates for new home construction are negotiated between the builder and resident or new homebuyer to determine who is the recipient of the cash rebate.

D. Marketing Objectives, Goals, & Strategy

The program's objectives are to increase demand for high-efficiency water heating equipment among Public Service customers, and through consumer demand assist the overall effort to increase the availability of high-efficiency water heaters in the marketplace. The program's goal is to help Public Service customers capture energy savings with their water heating needs and understand the immediate and long-term value of purchasing and installing high-efficiency equipment.

Marketing tactics are in place to assist the program meeting its goals, and these include the marketing communications strategies of Public Service bill inserts, Internet pages on the Xcel Energy web site, tradeshows and trade communications (letters and newsletters), HVAC relationship building, and through point-of-purchase materials at larger retailers such as Home Depot and Sears.

Specifically:

- Public Service bill inserts are timed according to appropriate seasons for the equipment. Since water heating is a year-round demand, this provides flexibility with marketing seasonality. To maximize use of bill insert expenses, the Water Heating Rebate Program is cross-marketed in bill inserts along with Heating System Rebates.
- Separate Internet pages for water heating are developed for customers and energy partners—installers, contractors and distributors. The pages are updated according to equipment efficiency changes and available promotions.

- The Public Service channel manager, program manager and marketing assistant participate in appropriate tradeshows related to water heating. This participation includes the staffing of a tradeshow table to provide information about the program, and often can include presentation opportunities. The channel manager also presents program details, objectives and policies to the trade at various contractor meetings.
- The program's primary promotions channel is the trade community. Training, meetings, telephone calls, letters and newsletters with quarterly frequency keep the trade informed about the program and help to increase awareness among new contractors. Contractors are encouraged to register as a Public Service program participant and obtain a contractor ID number.
- Point of purchase materials, namely application forms and program details are made available at larger retailers.

Program performance is tracked weekly through an internal customer rebate processing system. Performance is reviewed weekly by the program manager and reviewed monthly by marketing management. Marketing strategies may change to meet the dynamic needs of the program depending on its performance throughout the year.

Best Practices

As a member and participating utility, Public Service supports the Consortium for Energy Efficiency's March 2008 High Efficiency Residential Gas Water Heating Initiative. The long-term goal of the initiative is to increase the market penetration of high-efficiency water heaters. Public Service's Water Heating Rebate Program will help CEE achieve its goals by promoting high-efficiency equipment to consumers and related trade. Other initiative objectives include increasing the number of high-efficiency models available by increasing the demand by consumers.

As an ENERGY STAR partner, Public Service will follow the Department of Energy's (DOE) program requirements for water heaters. The DOE took into account stakeholder feedback before determining final program requirements.

Upon launching the program, best practice efforts will include working closely with the HVAC community to ensure program guidelines, eligibility requirements and processes are clearly communicated. As the most important channel to customers, this program relies heavily upon HVAC installers who are on the frontline with customers and are the trusted individual consumers hire to perform expensive service installation projects in their homes. Another best practice channel includes retailers that sell high-efficiency water heaters on site. Public Service will provide retailers with program information and the application forms for customers who purchase their water heaters at the stores.

E. Program-Specific Policies

Program-specific policies include a pre-determined date on which applications are due for the previous year's installations. The planned date is July 31 of the following year. The water heating equipment must be purchased and installed within the program's calendar year, and customers and installers must adhere to all program rules that are listed on the reverse side of the rebate application form. An invoice for the equipment is required along with the application form. The forms are three-part forms, allowing the customer and installer to retain their own copies.

High efficiency water heating equipment installed must match GAMA specifications and be certifiable via the online GAMA site before a rebate is provided to the customer. This program requirement is communicated to the customer through the installer, on the Xcel Energy web site, through bill inserts and at many of the larger retailers where customers may be purchasing their own equipment.

Those customers applying for a water heater rebate will be rebated according to the calendar year's rebate schedule. The equipment must meet the minimum efficiency requirement. Customers are allowed to submit for more than one water heater rebate at a time, as some larger homes do require more than one.

F. Stakeholder Involvement

Development of the Program included internal Public Service marketing staff from technical consulting, product development and residential product management. The team also worked with Frontier Associates, a national consulting for utility retailers and distribution companies, in addition to energy efficiency related products. Public Service staff also works with the CEE related to water heating technologies and efficiencies, and follows ENERGY STAR policies on energy efficient products.

Ongoing consumer research studies through Public Service are used to assist program modifications and enhancements. Program-specific studies are conducted every few years, allowing past participants and contractors to provide feedback about their experiences with the program. Public Service met with the Governor's Energy Office staff as part of the development process to discuss the program concept and implementation.

G. Evaluation, Measurement & Verification Plan

All rebate applications are audited with a two-step process. On the front-end, as rebates are received, all critical customer information, equipment eligibility and proper rebates amounts are reviewed, validated, and corrected if inaccurate. The second step takes place prior to the rebate being issued where Rebate Operations audits 100% of the rebates applications to ensure that the information from the form was entered correctly into the tracking database.

The M&V process for prescriptive measures is detailed in the M&V section of the Indirect Segment of this report. The savings factors that will be verified for the Water Heating Rebate Program are detailed in the Deemed Savings Technical Assumptions section.

H. Rebate Levels

Minimum requirements for energy efficiency units through the Water Heating Rebate Program are as follows along with recommended rebate amounts. The minimum efficiency for standard tank units in Colorado will mirror those in Minnesota and North Dakota; however, tankless water heaters in Colorado will follow the new ENERGY STAR guidelines, whereas Minnesota and North Dakota currently rebate at 0.80 EF for tankless to accommodate model availability in those markets. Proportionately, the 0.62 EF rebate amount is a higher jump from baseline than the rebate amounts between the higher tiers based on incremental costs. The reason for this is to gain consumers' attention and steer them away from the baseline of 0.59 EF. Consumers already considering a high-efficiency water heater will be more inclined to choose one of the highest efficiency models.

Table 59: Rebate Schedule for Colorado High-Efficiency Water Heating Equipment

Water Heater Type	Rebate
Standard Tank Water Heater 0.62 EF	$40
Standard Tank Water Heater 0.65 EF	$60
Standard Tank Water Heater 0.67 EF	$80
Tankless Water Heater 0.82 EF	$100

I. Technical Assumptions

The baseline efficiencies for this program are the federal standard efficiencies listed in Table 60 below. This program is limited to replacement of an existing gas-fired unit with a high efficiency gas-fired unit. Electric water heaters are not eligible.

Table 60: Baseline Water Heater Efficiency Requirements

Water Heater Type	Minimum Energy Factor[10]
Gas-fired	0.67 - 0.0019V*
Oil-fired	0.59 - 0.0019V
Electric	0.97 - 0.00132V
Instantaneous Gas	0.62 - 0.0019V
Instantaneous Electric	0.93 - 0.00132V

*Where "V" = Rated Volume

Incremental Costs

This measure is identified as a replacement on burnout; therefore, the only incremental cost incurred is the increased cost of the more efficient technology. Since the water heater will be replaced regardless of the efficiency rating of the unit, the labor and equipment rental costs do not apply. The incremental costs for the various efficiency measures are presented in Table 61 below.

[10] 1990 DOE amendment to federal minimum efficiency requirements

Table 61: Incremental Costs of Efficient Water Heater Options

Measure	Material/Labor	Total Incremental Cost
Standard Tank Water Heater 0.62 EF	$55	$55
Standard Tank Water Heater 0.65 EF	$175	$175
Standard Tank Water Heater 0.67 EF	$230	$230
Tankless Water Heater 0.82 EF	$750	$750

For the 0.65, and 0.67 EF units there will be some additional labor to install the units due to the addition of power ventilation for the 0.65 and 0.67 EF units. The costs in Table 61 above reflect the additional labor fees as well as the material.

Energy Savings

The savings for this program were derived from modeling one typical home for the Public Service Colorado service area. The home characteristics were determined based on an analysis of the existing housing stock in the Denver area. The analysis used the building energy use simulation tool EnergyGauge USRCPB v2.7.03. The savings are shown in Table 62 below.

Table 62: Savings Based on Simulation of Typical Existing Home

Efficiency Level	Base Consumption (Therms)	Change Consumption (Therms)	Annual Savings (Therms)
Standard Tank Water Heater 0.62 EF	200.13	189.35	10.77
Standard Tank Water Heater 0.65 EF	200.13	179.56	20.57
Standard Tank Water Heater 0.67 EF	200.13	173.51	26.62
Tankless Water Heater 0.82 EF	200.13	141.05	59.07

➤ Saver's Switch®

A. Description

Saver's Switch is a demand response program that offers bill credits as an incentive for residential customers to allow Public Service to control operation of their central air conditioners on days when the system is approaching its peak. Beginning in 2009, residential participants will receive a $40 annual reduction on their October bills for participating. This program is generally utilized on hot summer days when Public Service's load is expected to reach near-peak capacity. Saver's Switch helps reduce the impact of escalating demand and price for peak electricity.

When the Program is activated, a control signal is sent to interrupt the air conditioning load during peak periods, typically between the hours of 2 PM to 7 PM on weekdays. The program deploys switches with varying load control strategies. Switches installed prior to 2004 are cycled 15 minutes out of every 30 minutes (a 50% cycling strategy) during the control period. Switches installed since 2004 have utilized an "adaptive algorithm" cycling strategy. This strategy allows the switches to "learn" how a customer's air conditioning is being operated in order to achieve a 50% reduction in load. The newer switches generally provide greater load reduction per unit. Approximately 80% of the 88,000 switches in the field (as of December 31, 2007) use the adaptive algorithm strategy.

Customers may have their air conditioning controlled for up to four hours on a control day. The time period can be either 2 PM to 6 PM or 3 PM to 7 PM. Controlling over two different time periods provides Public Service the flexibility to better manage peak demands on the system.

The switches are manufactured by Cannon Technologies. Hunt Electric handles installation and service calls. In addition to Colorado, Xcel Energy offers the Saver's Switch Program in Minnesota, Wisconsin, North Dakota, and South Dakota, and is currently planning to expand the program to Texas and New Mexico.

B. Budgets & Goals

<u>Budgets</u>

The primary costs in operating the Saver's Switch Program are: the cost of switches, installation, and rebates to participating customers. The number of participants expected for the year drives these costs. In addition, the increased goals in 2009 will likely require increased spending on promotional activities. The 2010 budget mirrors 2009, as the participant goal is held constant.

<u>Goals</u>

The 2009 Saver's Switch goal comes directly from the Fort St. Vrain Decision No. C08-0369 in Docket No. 07A-469E. In that proceeding, the Commission ordered Public Service to expand its demand response efforts to meet a resource need in 2009. The increased goal level will be maintained in 2010.

Table 63: Saver's Switch Program Budgets and Goals

Saver's Switch	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$54,450	N/A	$54,450	N/A
Admin & Program Delivery	$820,821	N/A	$820,821	N/A
Ad, Promo, & Customer Ed.	$1,119,260	N/A	$1,119,260	N/A
Customer Incentives	$5,311,050	N/A	$5,311,050	N/A
Equipment & Installation	$4,806,363	N/A	$4,806,363	N/A
Measurement and Verification	$174,490	N/A	$174,490	N/A
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$12,286,434**	**N/A**	**$12,286,434**	**N/A**
Generator kW	22,218	N/A	22,218	N/A
Generator kWh	45,359	N/A	45,359	N/A
Annual Dth	N/A	N/A	N/A	N/A
Annual Dth/$M	N/A	N/A	N/A	N/A
Participants	19,500	N/A	19,500	N/A
Participation as % of Segment	1.717%	N/A	1.717%	N/A
Modified TRC Test Ratio	**4.21**	**N/A**	**4.03**	**N/A**

C. Application Process

The Saver's Switch Program is promoted to residential customers using a variety of channels including bill inserts, company newsletters, direct mail and telemarketing. Customers may sign up for the program via a mail-in form, phone or the Xcel Energy website. Applications are generally processed and switches installed within 6 to 8 weeks. Due to variations in air conditioner age and where it is located next to the house, the installer will make the final on-site determination as to whether the customer qualifies for the program.

D. Marketing Objectives, Goals, & Strategy

Based on an analysis of customer energy usage during the summer months, Public Service estimates that about 410,000 residential electric customers in Colorado have central air conditioning. Of those, about 88,000 were signed up for the program at the end of 2007. Where possible (i.e. in direct mail and telemarketing), the Company directs its promotional efforts to customers identified as likely to have central air conditioning.

The Saver's Switch Program goals will increase substantially for 2009. In order to meet the higher requirements, Public Service will use the following marketing strategies to promote participation:

- Increased local marketing activities – local advertising, door hanger promotions, etc.;
- Increased direct mail, including e-mail marketing;
- Increasing annual incentives to participants to $40/yr;
- Possibility of offering an up-front incentive to new participants; and
- Partnering with the HVAC community to build partnerships with the goal of reducing customer attrition and increasing penetration in new construction.

E. Program-Specific Policies

The Saver's Switch Program has the following additional requirements:

- The program does not offer customers the choice of opting out of individual control days. The one exception is in the case of medical emergencies where customers can be removed from the program on very short notice.
- When a customer moves into a premise with a pre-existing switch, they are automatically enrolled in the program, but notified that they may opt-out.
- Customers enrolled as of August 1st of each year are eligible for the discount on their October bills.

F. Stakeholder Involvement

Public Service recognizes that the HVAC community and homebuilders are in a position to influence customer attitudes towards the program. The HVAC community may also have lingering misconceptions about Saver's Switch being harmful to customers' air conditioners. In 2009, Public Service is planning to increase its efforts to educate the HVAC/builder community about the benefits of Saver's Switch to customers.

G. Evaluation, Measurement & Verification Plan

The Saver's Switch Program has a unique M&V process that is detailed in the M&V section of the Indirect Segment of the Plan. A Comprehensive process evaluation will be conducted for the Saver's Switch Program in 2009.

H. Rebate Levels

Program participants will receive a flat $40 discount on their October energy bills following participation in the prior summer control season.

I. Technical Assumptions

To calculate the load relief estimates for forecasting and reporting purposes, Public Service used the adaptive algorithm results from the 2005 through 2007 program years. In the impact evaluation report for 2007, produced by Architectural Energy Corporation and RLW Analytics, this value was found to be 1.06 customer kW (or 1.14 generator kW) of load relief per switch under peak conditions.

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$344	$344	$344
Transmission & Distribution Capacity		$74	$74	$74
Marginal Energy		$249	$249	$249
Avoided Emissions (CO2, SOx)		$34	$34	$34
Subtotal		$701	$701	$701
Non-Energy Benefits Adder (10%)				$70
Subtotal		$701	$701	$771
Other Benefits				
Participant Rebates and Incentives	$76			$76
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$14			$11
Subtotal	$90			$87
Reduction in Sales Revenue				
Electric	$241		$194	
Subtotal	$241		$194	
Utility Program Costs				
Program Planning & Design		$4	$4	$4
Administration & Program Delivery		$17	$17	$17
Advertising/Promotion/Customer Ed		$32	$32	$32
Participant Rebates and Incentives		$76	$76	$76
Equipment & Installation		$41	$41	$41
Measurement and Verification		$5	$5	$5
Miscellaneous		$0	$0	$0
Subtotal		$175	$175	$175
Participant Costs				
Incremental Capital Costs	$11			$15
Incremental O&M Costs	$0			$0
Subtotal	$11			$15
Total Benefits	$330	$701	$701	$858
Total Costs	$11	$175	$369	$190
Net Benefit (Cost)	$319	$525	$331	$668
Benefit/Cost Ratio	**30.07**	**4.00**	**1.90**	**4.52**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	7 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	27.15%
Gross Load Factor at Customer	E	6.14%
Net-to-Gross (Energy)	F	80.7%
Net-to-Gross (Demand)	G	89.5%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$668
MTRC Non-Energy Benefit Adder	K	$70
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.2616 kW
Gross Annual kWh Saved at Customer	(B x E x C)	538 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	434 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	468 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	0.39 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.10 kW
Gross Annual kWh Saved at Customer	(B x E x L)	208 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	168 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	181 kWh

Program Summary All Participants		
Total Participants	M	300,019
Total Budget	N	**$20,320,532**
Gross kW Saved at Customer	(M x L)	116,078 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**30,360 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	62,462,356 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	50,429,609 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**54,307,139 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$77,508,232**
TRC Net Benefits without Adder	(M x L x (J - K))	**$69,376,629**

Utility Program Cost per kWh Lifetime	**$0.0507**
Utility Program Cost per kW at Gen	**$669**
Participant Payback with Rebate	**-2.0 years**
Participant Payback without Rebate	**0.3 years**

RESIDENTIAL SEGMENT — 2009 GAS GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$65.76	$65.76	$65.76
Variable O&M Savings		$0.34	$0.34	$0.34
Demand Savings		$3.90	$3.90	$3.90
Subtotal		$70.01	$70.01	$70.01
Emissions and Non-Energy Benefits Adder (5%)				$3.50
Subtotal		$70.01	$70.01	$73.51
Other Benefits				
Participant Rebates and Incentives	$13.44			$13.44
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$21.46			$15.14
Subtotal	$34.90			$28.58
Reduction in Sales Revenue				
Gas	$96.18		$73.16	
Subtotal	$96.18		$73.16	
Utility Program Costs				
Program Planning & Design		$1.01	$1.01	$1.01
Administration & Program Delivery		$4.07	$4.07	$4.07
Advertising/Promotion/Customer Ed		$2.59	$2.59	$2.59
Participant Rebates and Incentives		$13.44	$13.44	$13.44
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$6.44	$6.44	$6.44
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$27.55	$27.55	$27.55
Participant Costs				
Incremental Capital Costs	$43.21			$33.62
Incremental O&M Costs	$0.00			$0.00
Subtotal	$43.21			$33.62
Total Benefits	$131.08	$70.01	$70.01	$102.08
Total Costs	$43.21	$27.55	$100.70	$61.16
Net Benefit (Cost)	$87.87	$42.46	-$30.70	$40.92
Benefit/Cost Ratio	**3.03**	**2.54**	**0.70**	**1.67**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	15.10 years
Net-to-Gross (Weighted on Dth)	B	74.87%
Net-to-Gross (Weighted on Incremental Capital)	C	77.80%

Program Totals:		
Participants	D	36,350
Average Net Dth/Yr Saved	E	3.8
Total Dth/Yr Saved	F	**138,462**
Utility Costs per Net Dth/Yr	G	$36.79
Net Benefit (Cost) per Gross Dth/Yr	H	$40.92
Non-Energy Benefits Adder per Gross Dth/Yr	I	$3.50
Annual Dth/$M	($1M / G)	**27,178**
Total Utility Budget	(G x F)	**$5,094,697**
Total MTRC Net Benefits with Adder	(F x H)	**$7,567,835**
Total MTRC Net Benefits without Adder	(H - I) x F	**$6,920,475**

Utility Program Cost per Net Dth Lifetime	(G / A)	**$2.44**
Participant Payback with Rebate		**2.3 years**
Participant Payback without Rebate		**3.8 years**

RESIDENTIAL SEGMENT	2010	ELECTRIC	GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$315	$315	$315
Transmission & Distribution Capacity		$66	$66	$66
Marginal Energy		$257	$257	$257
Avoided Emissions (CO2, SOx)		$46	$46	$46
Subtotal		$684	$684	$684
Non-Energy Benefits Adder (10%)				$68
Subtotal		$684	$684	$753
Other Benefits				
Participant Rebates and Incentives	$74			$74
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$15			$12
Subtotal	$89			$86
Reduction in Sales Revenue				
Electric	$265		$215	
Subtotal	$265		$215	
Utility Program Costs				
Program Planning & Design		$4	$4	$4
Administration & Program Delivery		$19	$19	$19
Advertising/Promotion/Customer Ed		$30	$30	$30
Participant Rebates and Incentives		$74	$74	$74
Equipment & Installation		$38	$38	$38
Measurement and Verification		$5	$5	$5
Miscellaneous		$0	$0	$0
Subtotal		$170	$170	$170
Participant Costs				
Incremental Capital Costs	$16			$19
Incremental O&M Costs	$0			$0
Subtotal	$16			$19
Total Benefits	$354	$684	$684	$839
Total Costs	$16	$170	$385	$189
Net Benefit (Cost)	$339	$514	$299	$650
Benefit/Cost Ratio	**22.34**	**4.02**	**1.78**	**4.44**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	7 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	25.71%
Gross Load Factor at Customer	E	6.78%
Net-to-Gross (Energy)	F	80.9%
Net-to-Gross (Demand)	G	89.4%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$650
MTRC Non-Energy Benefit Adder	K	$68
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.2476 kW
Gross Annual kWh Saved at Customer	(B x E x C)	594 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	480 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	517 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	0.36 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.09 kW
Gross Annual kWh Saved at Customer	(B x E x L)	213 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	172 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	185 kWh

Program Summary All Participants		
Total Participants	M	354,491
Total Budget	N	**$21,628,527**
Gross kW Saved at Customer	(M x L)	127,158 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**31,479 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	75,477,666 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	61,051,922 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**65,746,200 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$82,631,661**
TRC Net Benefits without Adder	(M x L x (J - K))	**$73,931,788**

Utility Program Cost per kWh Lifetime	**$0.0445**
Utility Program Cost per kW at Gen	**$687**
Participant Payback with Rebate	**-1.7 years**
Participant Payback without Rebate	**0.4 years**

RESIDENTIAL SEGMENT | 2010 | GAS | GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$66.92	$66.92	$66.92
Variable O&M Savings		$0.35	$0.35	$0.35
Demand Savings		$3.96	$3.96	$3.96
Subtotal		$71.23	$71.23	$71.23
Emissions and Non-Energy Benefits Adder (5%)				$3.56
Subtotal		$71.23	$71.23	$74.79
Other Benefits				
Participant Rebates and Incentives	$13.70			$13.70
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$20.06			$13.90
Subtotal	$33.76			$27.60
Reduction in Sales Revenue				
Gas	$97.03		$74.51	
Subtotal	$97.03		$74.51	
Utility Program Costs				
Program Planning & Design		$0.76	$0.76	$0.76
Administration & Program Delivery		$4.07	$4.07	$4.07
Advertising/Promotion/Customer Ed		$3.58	$3.58	$3.58
Participant Rebates and Incentives		$13.70	$13.70	$13.70
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$6.86	$6.86	$6.86
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$28.97	$28.97	$28.97
Participant Costs				
Incremental Capital Costs	$44.64			$35.02
Incremental O&M Costs	$0.00			$0.00
Subtotal	$44.64			$35.02
Total Benefits	$130.79	$71.23	$71.23	$102.39
Total Costs	$44.64	$28.97	$103.48	$63.99
Net Benefit (Cost)	$86.15	$42.26	-$32.25	$38.41
Benefit/Cost Ratio	**2.93**	**2.46**	**0.69**	**1.60**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	15.23 years
Net-to-Gross (Weighted on Dth)	B	75.74%
Net-to-Gross (Weighted on Incremental Capital)	C	78.43%
Program Totals:		
Participants	D	44,200
Average Net Dth/Yr Saved	E	4.5
Total Dth/Yr Saved	F	**196,828**
Utility Costs per Net Dth/Yr	G	$38.25
Net Benefit (Cost) per Gross Dth/Yr	H	$38.41
Non-Energy Benefits Adder per Gross Dth/Yr	I	$3.56
Annual Dth/$M	($1M / G)	**26,143**
Total Utility Budget	(G x F)	**$7,528,935**
Total MTRC Net Benefits with Adder	(F x H)	**$9,980,798**
Total MTRC Net Benefits without Adder	(H - I) x F	**$9,055,288**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$2.51**
Participant Payback with Rebate		**2.4 years**
Participant Payback without Rebate		**3.9 years**

Energy Efficient Showerhead Program

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$47.63	$47.63	$47.63
Variable O&M Savings		$0.26	$0.26	$0.26
Demand Savings		$2.96	$2.96	$2.96
Subtotal		$50.84	$50.84	$50.84
Emissions and Non-Energy Benefits Adder (5%)				$2.54
Subtotal		$50.84	$50.84	$53.38
Other Benefits				
Participant Rebates and Incentives	$4.90			$4.90
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$29.86			$20.90
Subtotal	$34.76			$25.81
Reduction in Sales Revenue				
Gas	$75.88		$53.12	
Subtotal	$75.88		$53.12	
Utility Program Costs				
Program Planning & Design		$1.04	$1.04	$1.04
Administration & Program Delivery		$1.73	$1.73	$1.73
Advertising/Promotion/Customer Ed		$1.72	$1.72	$1.72
Participant Rebates and Incentives		$4.90	$4.90	$4.90
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.39	$0.39	$0.39
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$9.78	$9.78	$9.78
Participant Costs				
Incremental Capital Costs	$4.90			$3.43
Incremental O&M Costs	$0.00			$0.00
Subtotal	$4.90			$3.43
Total Benefits	$110.65	$50.84	$50.84	$79.19
Total Costs	$4.90	$9.78	$62.90	$13.21
Net Benefit (Cost)	$105.74	$41.06	-$12.06	$65.98
Benefit/Cost Ratio	**22.57**	**5.20**	**0.81**	**5.99**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

2009 GAS GOAL

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	10.00 years
Net-to-Gross (Weighted on Dth)	B	70.00%
Net-to-Gross (Weighted on Incremental Capital)	C	70.00%
Program Totals:		
Participants	D	20,000
Average Net Dth/Yr Saved	E	0.7
Total Dth/Yr Saved	F	**14,280**
Utility Costs per Net Dth/Yr	G	$13.97
Net Benefit (Cost) per Gross Dth/Yr	H	$65.98
Non-Energy Benefits Adder per Gross Dth/Yr	I	$2.54
Annual Dth/$M	($1M / G)	**71,576**
Total Utility Budget	(G x F)	**$199,514**
Total MTRC Net Benefits with Adder	(F x H)	**$1,345,979**
Total MTRC Net Benefits without Adder	(H - I) x F	**$1,294,120**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$1.40**
Participant Payback with Rebate		**0.0 years**
Participant Payback without Rebate		**0.4 years**

Energy Efficient Showerhead Program — 2010 GAS GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$47.30	$47.30	$47.30
Variable O&M Savings		$0.26	$0.26	$0.26
Demand Savings		$2.96	$2.96	$2.96
Subtotal		$50.51	$50.51	$50.51
Emissions and Non-Energy Benefits Adder (5%)				$2.53
Subtotal		$50.51	$50.51	$53.04
Other Benefits				
Participant Rebates and Incentives	$4.90			$4.90
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$30.46			$21.32
Subtotal	$35.36			$26.22
Reduction in Sales Revenue				
Gas	$75.47		$52.83	
Subtotal	$75.47		$52.83	
Utility Program Costs				
Program Planning & Design		$0.77	$0.77	$0.77
Administration & Program Delivery		$1.74	$1.74	$1.74
Advertising/Promotion/Customer Ed		$1.82	$1.82	$1.82
Participant Rebates and Incentives		$4.90	$4.90	$4.90
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.47	$0.47	$0.47
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$9.71	$9.71	$9.71
Participant Costs				
Incremental Capital Costs	$4.90			$3.43
Incremental O&M Costs	$0.00			$0.00
Subtotal	$4.90			$3.43
Total Benefits	$110.83	$50.51	$50.51	$79.26
Total Costs	$4.90	$9.71	$62.53	$13.14
Net Benefit (Cost)	$105.92	$40.80	-$12.02	$66.12
Benefit/Cost Ratio	**22.61**	**5.20**	**0.81**	**6.03**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	10.00 years
Net-to-Gross (Weighted on Dth)	B	70.00%
Net-to-Gross (Weighted on Incremental Capital)	C	70.00%
Program Totals:		
Participants	D	22,950
Average Net Dth/Yr Saved	E	0.7
Total Dth/Yr Saved	F	**16,387**
Utility Costs per Net Dth/Yr	G	$13.87
Net Benefit (Cost) per Gross Dth/Yr	H	$66.12
Non-Energy Benefits Adder per Gross Dth/Yr	I	$2.53
Annual Dth/$M	($1M / G)	**72,118**
Total Utility Budget	(G x F)	**$227,224**
Total MTRC Net Benefits with Adder	(F x H)	**$1,547,842**
Total MTRC Net Benefits without Adder	(H - I) x F	**$1,488,721**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$1.39**
Participant Payback with Rebate		**0.0 years**
Participant Payback without Rebate		**0.4 years**

ENERGY STAR NEW HOMES PROGRAM — 2009 — ELECTRIC — GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$80	$80	$80
Transmission & Distribution Capacity		$18	$18	$18
Marginal Energy		$475	$475	$475
Avoided Emissions (CO2, SOx)		$75	$75	$75
Subtotal		$647	$647	$647
Non-Energy Benefits Adder (10%)				$65
Subtotal		$647	$647	$712
Other Benefits				
Participant Rebates and Incentives	$81			$81
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$348			$345
Subtotal	$429			$425
Reduction in Sales Revenue				
Electric	$413		$409	
Subtotal	$413		$409	
Utility Program Costs				
Program Planning & Design		$17	$17	$17
Administration & Program Delivery		$85	$85	$85
Advertising/Promotion/Customer Ed		$120	$120	$120
Participant Rebates and Incentives		$81	$81	$81
Equipment & Installation		$0	$0	$0
Measurement and Verification		$110	$110	$110
Miscellaneous		$0	$0	$0
Subtotal		$412	$412	$412
Participant Costs				
Incremental Capital Costs	$243			$241
Incremental O&M Costs	$0			$0
Subtotal	$243			$241
Total Benefits	$842	$647	$647	$1,138
Total Costs	$243	$412	$820	$653
Net Benefit (Cost)	$598	$235	($173)	$485
Benefit/Cost Ratio	**3.46**	**1.57**	**0.79**	**1.74**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	9 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	7.09%
Gross Load Factor at Customer	E	9.22%
Net-to-Gross (Energy)	F	99.0%
Net-to-Gross (Demand)	G	99.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$485
MTRC Non-Energy Benefit Adder	K	$65
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.0756 kW
Gross Annual kWh Saved at Customer	(B x E x C)	807 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	799 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	861 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	1.36 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.10 kW
Gross Annual kWh Saved at Customer	(B x E x L)	1,098 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	1,087 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	1,170 kWh

Program Summary All Participants		
Total Participants	M	100
Total Budget	N	**$56,000**
Gross kW Saved at Customer	(M x L)	136 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**10 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	109,771 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	108,674 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**117,030 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$65,912**
TRC Net Benefits without Adder	(M x L x (J - K))	**$57,110**

Utility Program Cost per kWh Lifetime	**$0.0539**
Utility Program Cost per kW at Gen	**$5,449**
Participant Payback with Rebate	**2.7 years**
Participant Payback without Rebate	**4.4 years**

ENERGY STAR NEW HOMES PROGRAM — 2009 — GAS — GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$53.81	$53.81	$53.81
Variable O&M Savings		$0.28	$0.28	$0.28
Demand Savings		$3.24	$3.24	$3.24
Subtotal		$57.34	$57.34	$57.34
Emissions and Non-Energy Benefits Adder (5%)				$2.87
Subtotal		$57.34	$57.34	$60.21
Other Benefits				
Participant Rebates and Incentives	$20.41			$20.41
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$41.27			$26.54
Subtotal	$61.68			$46.94
Reduction in Sales Revenue				
Gas	$93.17		$59.91	
Subtotal	$93.17		$59.91	
Utility Program Costs				
Program Planning & Design		$0.83	$0.83	$0.83
Administration & Program Delivery		$9.92	$9.92	$9.92
Advertising/Promotion/Customer Ed		$4.13	$4.13	$4.13
Participant Rebates and Incentives		$20.41	$20.41	$20.41
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$20.41	$20.41	$20.41
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$55.71	$55.71	$55.71
Participant Costs				
Incremental Capital Costs	$46.61			$29.97
Incremental O&M Costs	$0.00			$0.00
Subtotal	$46.61			$29.97
Total Benefits	$154.85	$57.34	$57.34	$107.15
Total Costs	$46.61	$55.71	$115.62	$85.68
Net Benefit (Cost)	$108.24	$1.63	-$58.28	$21.47
Benefit/Cost Ratio	**3.32**	**1.03**	**0.50**	**1.25**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	13.81 years
Net-to-Gross (Weighted on Dth)	B	64.30%
Net-to-Gross (Weighted on Incremental Capital)	C	64.30%
Program Totals:		
Participants	D	2,200
Average Net Dth/Yr Saved	E	15.8
Total Dth/Yr Saved	F	**34,658**
Utility Costs per Net Dth/Yr	G	$86.64
Net Benefit (Cost) per Gross Dth/Yr	H	$21.47
Non-Energy Benefits Adder per Gross Dth/Yr	I	$2.87
Annual Dth/$M	($1M / G)	**11,543**
Total Utility Budget	(G x F)	**$3,002,604**
Total MTRC Net Benefits with Adder	(F x H)	**$1,157,304**
Total MTRC Net Benefits without Adder	(H - I) x F	**$1,002,775**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$6.27**
Participant Payback with Rebate		**1.8 years**
Participant Payback without Rebate		**4.1 years**

ENERGY STAR NEW HOMES PROGRAM 2010 ELECTRIC GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$81	$81	$81
Transmission & Distribution Capacity		$18	$18	$18
Marginal Energy		$461	$461	$461
Avoided Emissions (CO2, SOx)		$90	$90	$90
Subtotal		$650	$650	$650
Non-Energy Benefits Adder (10%)				$65
Subtotal		$650	$650	$715
Other Benefits				
Participant Rebates and Incentives	$81			$81
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$348			$345
Subtotal	$429			$425
Reduction in Sales Revenue				
Electric	$410		$406	
Subtotal	$410		$406	
Utility Program Costs				
Program Planning & Design		$8	$8	$8
Administration & Program Delivery		$47	$47	$47
Advertising/Promotion/Customer Ed		$112	$112	$112
Participant Rebates and Incentives		$81	$81	$81
Equipment & Installation		$0	$0	$0
Measurement and Verification		$110	$110	$110
Miscellaneous		$0	$0	$0
Subtotal		$359	$359	$359
Participant Costs				
Incremental Capital Costs	$243			$241
Incremental O&M Costs	$0			$0
Subtotal	$243			$241
Total Benefits	$839	$650	$650	$1,140
Total Costs	$243	$359	$765	$600
Net Benefit (Cost)	$596	$291	($115)	$541
Benefit/Cost Ratio	**3.45**	**1.81**	**0.85**	**1.90**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	9 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	7.09%
Gross Load Factor at Customer	E	9.22%
Net-to-Gross (Energy)	F	99.0%
Net-to-Gross (Demand)	G	99.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$541
MTRC Non-Energy Benefit Adder	K	$65
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.0756 kW
Gross Annual kWh Saved at Customer	(B x E x C)	807 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	799 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	861 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	1.36 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.10 kW
Gross Annual kWh Saved at Customer	(B x E x L)	1,098 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	1,087 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	1,170 kWh

Program Summary All Participants		
Total Participants	M	200
Total Budget	N	**$97,550**
Gross kW Saved at Customer	(M x L)	272 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**21 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	219,543 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	217,347 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**234,059 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$147,033**
TRC Net Benefits without Adder	(M x L x (J - K))	**$129,360**

Utility Program Cost per kWh Lifetime	**$0.0469**
Utility Program Cost per kW at Gen	**$4,746**
Participant Payback with Rebate	**2.7 years**
Participant Payback without Rebate	**4.4 years**

ENERGY STAR NEW HOMES PROGRAM — 2010 GAS GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$53.71	$53.71	$53.71
Variable O&M Savings		$0.28	$0.28	$0.28
Demand Savings		$3.24	$3.24	$3.24
Subtotal		$57.23	$57.23	$57.23
Emissions and Non-Energy Benefits Adder (5%)				$2.86
Subtotal		$57.23	$57.23	$60.09
Other Benefits				
Participant Rebates and Incentives	$20.41			$20.41
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$42.09			$27.06
Subtotal	$62.50			$47.47
Reduction in Sales Revenue				
Gas	$93.08		$59.85	
Subtotal	$93.08		$59.85	
Utility Program Costs				
Program Planning & Design		$0.62	$0.62	$0.62
Administration & Program Delivery		$9.20	$9.20	$9.20
Advertising/Promotion/Customer Ed		$4.79	$4.79	$4.79
Participant Rebates and Incentives		$20.41	$20.41	$20.41
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$20.41	$20.41	$20.41
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$55.42	$55.42	$55.42
Participant Costs				
Incremental Capital Costs	$46.61			$29.97
Incremental O&M Costs	$0.00			$0.00
Subtotal	$46.61			$29.97
Total Benefits	$155.58	$57.23	$57.23	$107.57
Total Costs	$46.61	$55.42	$115.27	$85.39
Net Benefit (Cost)	$108.97	$1.81	-$58.04	$22.17
Benefit/Cost Ratio	**3.34**	**1.03**	**0.50**	**1.26**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	13.81 years
Net-to-Gross (Weighted on Dth)	B	64.30%
Net-to-Gross (Weighted on Incremental Capital)	C	64.30%

Program Totals:		
Participants	D	3,200
Average Net Dth/Yr Saved	E	15.8
Total Dth/Yr Saved	F	**50,411**
Utility Costs per Net Dth/Yr	G	$86.19
Net Benefit (Cost) per Gross Dth/Yr	H	$22.17
Non-Energy Benefits Adder per Gross Dth/Yr	I	$2.86
Annual Dth/$M	($1M / G)	**11,602**
Total Utility Budget	(G x F)	**$4,345,000**
Total MTRC Net Benefits with Adder	(F x H)	**$1,738,471**
Total MTRC Net Benefits without Adder	(H - I) x F	**$1,514,117**

Utility Program Cost per Net Dth Lifetime	(G / A)	**$6.24**
Participant Payback with Rebate		**1.8 years**
Participant Payback without Rebate		**4.1 years**

ENERGY STAR RETAILER INCENTIVE PROGRAM — 2009 — ELECTRIC — GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$218	$218	$218
Transmission & Distribution Capacity		$48	$48	$48
Marginal Energy		$314	$314	$314
Avoided Emissions (CO2, SOx)		$71	$71	$71
Subtotal		$651	$651	$651
Non-Energy Benefits Adder (10%)				$65
Subtotal		$651	$651	$716
Other Benefits				
Participant Rebates and Incentives	$278			$278
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$499			$399
Subtotal	$777			$677
Reduction in Sales Revenue				
Electric	$460		$368	
Subtotal	$460		$368	
Utility Program Costs				
Program Planning & Design		$76	$76	$76
Administration & Program Delivery		$33	$33	$33
Advertising/Promotion/Customer Ed		$404	$404	$404
Participant Rebates and Incentives		$278	$278	$278
Equipment & Installation		$0	$0	$0
Measurement and Verification		$47	$47	$47
Miscellaneous		$0	$0	$0
Subtotal		$838	$838	$838
Participant Costs				
Incremental Capital Costs	$441			$353
Incremental O&M Costs	$0			$0
Subtotal	$441			$353
Total Benefits	$1,237	$651	$651	$1,393
Total Costs	$441	$838	$1,207	$1,191
Net Benefit (Cost)	$796	($188)	($556)	$202
Benefit/Cost Ratio	**2.80**	**0.78**	**0.54**	**1.17**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	9 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	23.43%
Gross Load Factor at Customer	E	10.26%
Net-to-Gross (Energy)	F	80.0%
Net-to-Gross (Demand)	G	80.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$202
MTRC Non-Energy Benefit Adder	K	$65
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.2018 kW
Gross Annual kWh Saved at Customer	(B x E x C)	899 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	719 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	774 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	0.19 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.04 kW
Gross Annual kWh Saved at Customer	(B x E x L)	173 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	138 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	149 kWh

Program Summary All Participants		
Total Participants	M	16,469
Total Budget	N	**$2,658,384**
Gross kW Saved at Customer	(M x L)	3,171 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**640 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	2,850,291 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	2,280,233 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**2,455,560 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$639,118**
TRC Net Benefits without Adder	(M x L x (J - K))	**$432,769**
Utility Program Cost per kWh Lifetime		**$0.1174**
Utility Program Cost per kW at Gen		**$4,153**
Participant Payback with Rebate		**2.2 years**
Participant Payback without Rebate		**7.8 years**

ENERGY STAR RETAILER INCENTIVE PROGRAM 2010 ELECTRIC GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$212	$212	$212
Transmission & Distribution Capacity		$46	$46	$46
Marginal Energy		$285	$285	$285
Avoided Emissions (CO2, SOx)		$85	$85	$85
Subtotal		$627	$627	$627
Non-Energy Benefits Adder (10%)				$63
Subtotal		$627	$627	$690
Other Benefits				
Participant Rebates and Incentives	$278			$278
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$499			$399
Subtotal	$777			$677
Reduction in Sales Revenue				
Electric	$441		$353	
Subtotal	$441		$353	
Utility Program Costs				
Program Planning & Design		$100	$100	$100
Administration & Program Delivery		$44	$44	$44
Advertising/Promotion/Customer Ed		$394	$394	$394
Participant Rebates and Incentives		$278	$278	$278
Equipment & Installation		$0	$0	$0
Measurement and Verification		$34	$34	$34
Miscellaneous		$0	$0	$0
Subtotal		$850	$850	$850
Participant Costs				
Incremental Capital Costs	$441			$353
Incremental O&M Costs	$0			$0
Subtotal	$441			$353
Total Benefits	$1,218	$627	$627	$1,367
Total Costs	$441	$850	$1,202	$1,203
Net Benefit (Cost)	$776	($223)	($575)	$164
Benefit/Cost Ratio	**2.76**	**0.74**	**0.52**	**1.14**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW

Lifetime (Weighted on Generator kWh)	A	9 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	23.43%
Gross Load Factor at Customer	E	10.26%
Net-to-Gross (Energy)	F	80.0%
Net-to-Gross (Demand)	G	80.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$164
MTRC Non-Energy Benefit Adder	K	$63
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.2018 kW
Gross Annual kWh Saved at Customer	(B x E x C)	899 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	719 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	774 kWh

Program Summary per Participant

Gross kW Saved at Customer	L	0.19 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.04 kW
Gross Annual kWh Saved at Customer	(B x E x L)	173 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	138 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	149 kWh

Program Summary All Participants

Total Participants	M	18,116
Total Budget	N	**$2,964,229**
Gross kW Saved at Customer	(M x L)	3,488 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**704 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	3,135,253 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	2,508,202 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**2,701,058 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$572,106**
TRC Net Benefits without Adder	(M x L x (J - K))	**$353,388**

Utility Program Cost per kWh Lifetime	**$0.1190**
Utility Program Cost per kW at Gen	**$4,210**
Participant Payback with Rebate	**2.3 years**
Participant Payback without Rebate	**8.1 years**

EVAPORATIVE COOLING REBATE PROGRAM 2009 ELECTRIC GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$636	$636	$636
Transmission & Distribution Capacity		$140	$140	$140
Marginal Energy		$179	$179	$179
Avoided Emissions (CO2, SOx)		$32	$32	$32
Subtotal		$986	$986	$986
Non-Energy Benefits Adder (10%)				$99
Subtotal		$986	$986	$1,085
Other Benefits				
Participant Rebates and Incentives	$143			$143
Vendor Incentives				$0
Incremental Capital Savings	$475			$292
Incremental O&M Savings	$1			$0
Subtotal	$619			$435
Reduction in Sales Revenue				
Electric	$284		$170	
Subtotal	$284		$170	
Utility Program Costs				
Program Planning & Design		$4	$4	$4
Administration & Program Delivery		$6	$6	$6
Advertising/Promotion/Customer Ed		$22	$22	$22
Participant Rebates and Incentives		$143	$143	$143
Equipment & Installation		$0	$0	$0
Measurement and Verification		$7	$7	$7
Miscellaneous		$0	$0	$0
Subtotal		$183	$183	$183
Participant Costs				
Incremental Capital Costs	$0			$0
Incremental O&M Costs	$0			$0
Subtotal	$0			$0
Total Benefits	$904	$986	$986	$1,520
Total Costs	$0	$183	$353	$183
Net Benefit (Cost)	$904	$804	$633	$1,337
Benefit/Cost Ratio	**#DIV/0!**	**5.40**	**2.79**	**8.32**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	10 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	90.00%
Gross Load Factor at Customer	E	5.60%
Net-to-Gross (Energy)	F	59.9%
Net-to-Gross (Demand)	G	59.9%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$1,337
MTRC Non-Energy Benefit Adder	K	$99
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.5804 kW
Gross Annual kWh Saved at Customer	(B x E x C)	490 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	294 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	316 kWh
Program Summary per Participant		
Gross kW Saved at Customer	L	1.72 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	1.00 kW
Gross Annual kWh Saved at Customer	(B x E x L)	845 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	506 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	545 kWh
Program Summary All Participants		
Total Participants	M	3,800
Total Budget	N	**$1,195,900**
Gross kW Saved at Customer	(M x L)	6,551 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**3,803 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	3,212,032 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	1,923,659 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**2,071,569 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$8,759,448**
TRC Net Benefits without Adder	(M x L x (J - K))	**$8,113,416**
Utility Program Cost per kWh Lifetime		**$0.0577**
Utility Program Cost per kW at Gen		**$314**
Participant Payback with Rebate		**-5.0 years**
Participant Payback without Rebate		**0.0 years**

EVAPORATIVE COOLING REBATE PROGRAM 2010 ELECTRIC GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$614	$614	$614
Transmission & Distribution Capacity		$132	$132	$132
Marginal Energy		$158	$158	$158
Avoided Emissions (CO2, SOx)		$38	$38	$38
Subtotal		$942	$942	$942
Non-Energy Benefits Adder (10%)				$94
Subtotal		$942	$942	$1,036
Other Benefits				
Participant Rebates and Incentives	$148			$148
Vendor Incentives				$0
Incremental Capital Savings	$477			$292
Incremental O&M Savings	$1			$0
Subtotal	$625			$440
Reduction in Sales Revenue				
Electric	$267		$160	
Subtotal	$267		$160	
Utility Program Costs				
Program Planning & Design		$6	$6	$6
Administration & Program Delivery		$5	$5	$5
Advertising/Promotion/Customer Ed		$21	$21	$21
Participant Rebates and Incentives		$148	$148	$148
Equipment & Installation		$0	$0	$0
Measurement and Verification		$7	$7	$7
Miscellaneous		$0	$0	$0
Subtotal		$187	$187	$187
Participant Costs				
Incremental Capital Costs	$0			$0
Incremental O&M Costs	$0			$0
Subtotal	$0			$0
Total Benefits	$892	$942	$942	$1,476
Total Costs	$0	$187	$346	$187
Net Benefit (Cost)	$892	$755	$596	$1,289
Benefit/Cost Ratio	**#DIV/0!**	**5.05**	**2.72**	**7.91**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	10 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	90.00%
Gross Load Factor at Customer	E	5.60%
Net-to-Gross (Energy)	F	59.9%
Net-to-Gross (Demand)	G	59.9%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$1,289
MTRC Non-Energy Benefit Adder	K	$94
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.5805 kW
Gross Annual kWh Saved at Customer	(B x E x C)	490 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	294 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	316 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	1.72 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	1.00 kW
Gross Annual kWh Saved at Customer	(B x E x L)	846 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	507 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	545 kWh

Program Summary All Participants		
Total Participants	M	4,000
Total Budget	N	**$1,287,696**
Gross kW Saved at Customer	(M x L)	6,899 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**4,005 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	3,382,708 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	2,026,064 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**2,181,848 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$8,893,763**
TRC Net Benefits without Adder	(M x L x (J - K))	**$8,243,918**
Utility Program Cost per kWh Lifetime		**$0.0590**
Utility Program Cost per kW at Gen		**$322**
Participant Payback with Rebate		**-5.5 years**
Participant Payback without Rebate		**0.0 years**

HEATING SYSTEM REBATE PROGRAM

2009 GAS GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$77.60	$77.60	$77.60
Variable O&M Savings		$0.40	$0.40	$0.40
Demand Savings		$4.57	$4.57	$4.57
Subtotal		$82.57	$82.57	$82.57
Emissions and Non-Energy Benefits Adder (5%)				$4.13
Subtotal		$82.57	$82.57	$86.70
Other Benefits				
Participant Rebates and Incentives	$10.63			$10.63
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$10.63			$10.63
Reduction in Sales Revenue				
Gas	$112.05		$86.28	
Subtotal	$112.05		$86.28	
Utility Program Costs				
Program Planning & Design		$1.10	$1.10	$1.10
Administration & Program Delivery		$1.26	$1.26	$1.26
Advertising/Promotion/Customer Ed		$3.30	$3.30	$3.30
Participant Rebates and Incentives		$10.63	$10.63	$10.63
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.65	$0.65	$0.65
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$16.95	$16.95	$16.95
Participant Costs				
Incremental Capital Costs	$46.22			$35.59
Incremental O&M Costs	$0.00			$0.00
Subtotal	$46.22			$35.59
Total Benefits	$122.67	$82.57	$82.57	$97.33
Total Costs	$46.22	$16.95	$103.22	$52.54
Net Benefit (Cost)	$76.45	$65.62	-$20.65	$44.79
Benefit/Cost Ratio	**2.65**	**4.87**	**0.80**	**1.85**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	18.00 years
Net-to-Gross (Weighted on Dth)	B	77.00%
Net-to-Gross (Weighted on Incremental Capital)	C	77.00%

Program Totals:		
Participants	D	4,500
Average Net Dth/Yr Saved	E	8.0
Total Dth/Yr Saved	F	**35,868**
Utility Costs per Net Dth/Yr	G	$22.01
Net Benefit (Cost) per Gross Dth/Yr	H	$44.79
Non-Energy Benefits Adder per Gross Dth/Yr	I	$4.13
Annual Dth/$M	($1M / G)	**45,440**
Total Utility Budget	(G x F)	**$789,360**
Total MTRC Net Benefits with Adder	(F x H)	**$2,086,235**
Total MTRC Net Benefits without Adder	(H - I) x F	**$1,893,921**

Utility Program Cost per Net Dth Lifetime	(G / A)	**$1.22**
Participant Payback with Rebate		**3.1 years**
Participant Payback without Rebate		**4.1 years**

HEATING SYSTEM REBATE PROGRAM 2010 GAS GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$77.73	$77.73	$77.73
Variable O&M Savings		$0.40	$0.40	$0.40
Demand Savings		$4.57	$4.57	$4.57
Subtotal		$82.70	$82.70	$82.70
Emissions and Non-Energy Benefits Adder (5%)				$4.14
Subtotal		$82.70	$82.70	$86.84
Other Benefits				
Participant Rebates and Incentives	$10.63			$10.63
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$10.63			$10.63
Reduction in Sales Revenue				
Gas	$112.30		$86.47	
Subtotal	$112.30		$86.47	
Utility Program Costs				
Program Planning & Design		$0.86	$0.86	$0.86
Administration & Program Delivery		$0.90	$0.90	$0.90
Advertising/Promotion/Customer Ed		$2.70	$2.70	$2.70
Participant Rebates and Incentives		$10.63	$10.63	$10.63
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$1.14	$1.14	$1.14
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$16.23	$16.23	$16.23
Participant Costs				
Incremental Capital Costs	$46.22			$35.59
Incremental O&M Costs	$0.00			$0.00
Subtotal	$46.22			$35.59
Total Benefits	$122.93	$82.70	$82.70	$97.46
Total Costs	$46.22	$16.23	$102.70	$51.82
Net Benefit (Cost)	$76.70	$66.48	-$20.00	$45.64
Benefit/Cost Ratio	**2.66**	**5.10**	**0.81**	**1.88**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	18.00 years
Net-to-Gross (Weighted on Dth)	B	77.00%
Net-to-Gross (Weighted on Incremental Capital)	C	77.00%

Program Totals:		
Participants	D	6,500
Average Net Dth/Yr Saved	E	8.0
Total Dth/Yr Saved	F	**51,810**
Utility Costs per Net Dth/Yr	G	$21.07
Net Benefit (Cost) per Gross Dth/Yr	H	$45.64
Non-Energy Benefits Adder per Gross Dth/Yr	I	$4.14
Annual Dth/$M	($1M / G)	**47,456**
Total Utility Budget	(G x F)	**$1,091,733**
Total MTRC Net Benefits with Adder	(F x H)	**$3,071,127**
Total MTRC Net Benefits without Adder	(H - I) x F	**$2,792,901**

Utility Program Cost per Net Dth Lifetime	(G / A)	**$1.17**
Participant Payback with Rebate		**3.1 years**
Participant Payback without Rebate		**4.1 years**

HOME LIGHTING & RECYCLING PROGRAM — 2009 — ELECTRIC — GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$53	$53	$53
Transmission & Distribution Capacity		$12	$12	$12
Marginal Energy		$517	$517	$517
Avoided Emissions (CO2, SOx)		$69	$69	$69
Subtotal		$651	$651	$651
Non-Energy Benefits Adder (10%)				$65
Subtotal		$651	$651	$717
Other Benefits				
Participant Rebates and Incentives	$28			$28
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$28			$28
Reduction in Sales Revenue				
Electric	$488		$405	
Subtotal	$488		$405	
Utility Program Costs				
Program Planning & Design		$1	$1	$1
Administration & Program Delivery		$12	$12	$12
Advertising/Promotion/Customer Ed		$22	$22	$22
Participant Rebates and Incentives		$28	$28	$28
Equipment & Installation		$0	$0	$0
Measurement and Verification		$4	$4	$4
Miscellaneous		$0	$0	$0
Subtotal		$68	$68	$68
Participant Costs				
Incremental Capital Costs	$59			$49
Incremental O&M Costs	$0			$0
Subtotal	$59			$49
Total Benefits	$516	$651	$651	$745
Total Costs	$59	$68	$473	$117
Net Benefit (Cost)	$457	$584	$179	$628
Benefit/Cost Ratio	**8.75**	**9.63**	**1.38**	**6.39**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	7 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	8.00%
Gross Load Factor at Customer	E	12.77%
Net-to-Gross (Energy)	F	83.0%
Net-to-Gross (Demand)	G	83.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$628
MTRC Non-Energy Benefit Adder	K	$65
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.0715 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,119 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	928 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,000 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	0.19 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.01 kW
Gross Annual kWh Saved at Customer	(B x E x L)	207 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	172 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	185 kWh

Program Summary All Participants		
Total Participants	M	250,000
Total Budget	N	**$3,127,951**
Gross kW Saved at Customer	(M x L)	46,250 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**3,307 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	51,730,625 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	42,936,419 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**46,237,797 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$29,049,128**
TRC Net Benefits without Adder	(M x L x (J - K))	**$26,036,228**

Utility Program Cost per kWh Lifetime	**$0.0095**
Utility Program Cost per kW at Gen	**$946**
Participant Payback with Rebate	**0.5 years**
Participant Payback without Rebate	**0.9 years**

HOME LIGHTING & RECYCLING PROGRAM 2010 ELECTRIC GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$56	$56	$56
Transmission & Distribution Capacity		$12	$12	$12
Marginal Energy		$494	$494	$494
Avoided Emissions (CO2, SOx)		$86	$86	$86
Subtotal		$648	$648	$648
Non-Energy Benefits Adder (10%)				$65
Subtotal		$648	$648	$713
Other Benefits				
Participant Rebates and Incentives	$28			$28
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$28			$28
Reduction in Sales Revenue				
Electric	$492		$408	
Subtotal	$492		$408	
Utility Program Costs				
Program Planning & Design		$1	$1	$1
Administration & Program Delivery		$12	$12	$12
Advertising/Promotion/Customer Ed		$17	$17	$17
Participant Rebates and Incentives		$28	$28	$28
Equipment & Installation		$0	$0	$0
Measurement and Verification		$4	$4	$4
Miscellaneous		$0	$0	$0
Subtotal		$62	$62	$62
Participant Costs				
Incremental Capital Costs	$59			$49
Incremental O&M Costs	$0			$0
Subtotal	$59			$49
Total Benefits	$520	$648	$648	$741
Total Costs	$59	$62	$470	$111
Net Benefit (Cost)	$461	$587	$178	$630
Benefit/Cost Ratio	**8.82**	**10.48**	**1.38**	**6.69**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	7 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	8.00%
Gross Load Factor at Customer	E	12.77%
Net-to-Gross (Energy)	F	83.0%
Net-to-Gross (Demand)	G	83.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$630
MTRC Non-Energy Benefit Adder	K	$65
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.0715 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,119 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	928 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,000 kWh
Program Summary per Participant		
Gross kW Saved at Customer	L	0.19 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.01 kW
Gross Annual kWh Saved at Customer	(B x E x L)	207 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	172 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	185 kWh
Program Summary All Participants		
Total Participants	M	300,000
Total Budget	N	**$3,433,520**
Gross kW Saved at Customer	(M x L)	55,500 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**3,969 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	62,076,750 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	51,523,703 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**55,485,357 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$34,992,723**
TRC Net Benefits without Adder	(M x L x (J - K))	**$31,394,175**
Utility Program Cost per kWh Lifetime		**$0.0087**
Utility Program Cost per kW at Gen		**$865**
Participant Payback with Rebate		**0.4 years**
Participant Payback without Rebate		**0.9 years**

HOME PERFORMANCE W/ ENERGY STAR PROGRAM — 2009 — ELECTRIC — GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$200	$200	$200
Transmission & Distribution Capacity		$43	$43	$43
Marginal Energy		$683	$683	$683
Avoided Emissions (CO2, SOx)		$111	$111	$111
Subtotal		$1,037	$1,037	$1,037
Non-Energy Benefits Adder (10%)				$104
Subtotal		$1,037	$1,037	$1,141
Other Benefits				
Participant Rebates and Incentives	$189			$189
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$52			$49
Subtotal	$240			$237
Reduction in Sales Revenue				
Electric	$596		$560	
Subtotal	$596		$560	
Utility Program Costs				
Program Planning & Design		$64	$64	$64
Administration & Program Delivery		$141	$141	$141
Advertising/Promotion/Customer Ed		$61	$61	$61
Participant Rebates and Incentives		$189	$189	$189
Equipment & Installation		$0	$0	$0
Measurement and Verification		$46	$46	$46
Miscellaneous		$0	$0	$0
Subtotal		$501	$501	$501
Participant Costs				
Incremental Capital Costs	$225			$211
Incremental O&M Costs	$0			$0
Subtotal	$225			$211
Total Benefits	$837	$1,037	$1,037	$1,378
Total Costs	$225	$501	$1,061	$712
Net Benefit (Cost)	$612	$537	($24)	$667
Benefit/Cost Ratio	**3.73**	**2.07**	**0.98**	**1.94**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	10 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	8.91%
Gross Load Factor at Customer	E	12.30%
Net-to-Gross (Energy)	F	94.0%
Net-to-Gross (Demand)	G	94.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$667
MTRC Non-Energy Benefit Adder	K	$104
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.0901 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,078 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,013 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,091 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	1.14 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.10 kW
Gross Annual kWh Saved at Customer	(B x E x L)	1,234 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	1,160 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	1,249 kWh

Program Summary All Participants		
Total Participants	M	300
Total Budget	N	**$171,949**
Gross kW Saved at Customer	(M x L)	343 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**31 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	370,170 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	347,960 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**374,715 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$228,930**
TRC Net Benefits without Adder	(M x L x (J - K))	**$193,304**

Utility Program Cost per kWh Lifetime	**$0.0453**
Utility Program Cost per kW at Gen	**$5,553**
Participant Payback with Rebate	**0.5 years**
Participant Payback without Rebate	**3.7 years**

HOME PERFORMANCE W/ ENERGY STAR PROGRAM 2009 GAS GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$86.19	$86.19	$86.19
Variable O&M Savings		$0.44	$0.44	$0.44
Demand Savings		$4.88	$4.88	$4.88
Subtotal		$91.51	$91.51	$91.51
Emissions and Non-Energy Benefits Adder (5%)				$4.58
Subtotal		$91.51	$91.51	$96.09
Other Benefits				
Participant Rebates and Incentives	$12.68			$12.68
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.14			$0.13
Subtotal	$12.82			$12.81
Reduction in Sales Revenue				
Gas	$101.95		$95.83	
Subtotal	$101.95		$95.83	
Utility Program Costs				
Program Planning & Design		$3.23	$3.23	$3.23
Administration & Program Delivery		$10.10	$10.10	$10.10
Advertising/Promotion/Customer Ed		$3.32	$3.32	$3.32
Participant Rebates and Incentives		$12.68	$12.68	$12.68
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$2.76	$2.76	$2.76
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$32.08	$32.08	$32.08
Participant Costs				
Incremental Capital Costs	$60.15			$56.54
Incremental O&M Costs	$0.00			$0.00
Subtotal	$60.15			$56.54
Total Benefits	$114.76	$91.51	$91.51	$108.90
Total Costs	$60.15	$32.08	$127.91	$88.63
Net Benefit (Cost)	$54.61	$59.43	-$36.40	$20.27
Benefit/Cost Ratio	**1.91**	**2.85**	**0.72**	**1.23**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	16.21 years
Net-to-Gross (Weighted on Dth)	B	94.00%
Net-to-Gross (Weighted on Incremental Capital)	C	94.00%

Program Totals:		
Participants	D	300
Average Net Dth/Yr Saved	E	32.1
Total Dth/Yr Saved	F	**9,617**
Utility Costs per Net Dth/Yr	G	$34.13
Net Benefit (Cost) per Gross Dth/Yr	H	$20.27
Non-Energy Benefits Adder per Gross Dth/Yr	I	$4.58
Annual Dth/$M	($1M / G)	**29,299**
Total Utility Budget	(G x F)	**$328,250**
Total MTRC Net Benefits with Adder	(F x H)	**$207,378**
Total MTRC Net Benefits without Adder	(H - I) x F	**$160,564**

Utility Program Cost per Net Dth Lifetime	(G / A)	**$2.11**
Participant Payback with Rebate		**4.2 years**
Participant Payback without Rebate		**5.3 years**

HOME PERFORMANCE W/ ENERGY STAR PROGRAM 2010 ELECTRIC GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$198	$198	$198
Transmission & Distribution Capacity		$42	$42	$42
Marginal Energy		$655	$655	$655
Avoided Emissions (CO2, SOx)		$132	$132	$132
Subtotal		$1,026	$1,026	$1,026
Non-Energy Benefits Adder (10%)				$103
Subtotal		$1,026	$1,026	$1,129
Other Benefits				
Participant Rebates and Incentives	$189			$189
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$52			$49
Subtotal	$240			$237
Reduction in Sales Revenue				
Electric	$587		$552	
Subtotal	$587		$552	
Utility Program Costs				
Program Planning & Design		$24	$24	$24
Administration & Program Delivery		$96	$96	$96
Advertising/Promotion/Customer Ed		$82	$82	$82
Participant Rebates and Incentives		$189	$189	$189
Equipment & Installation		$0	$0	$0
Measurement and Verification		$32	$32	$32
Miscellaneous		$0	$0	$0
Subtotal		$423	$423	$423
Participant Costs				
Incremental Capital Costs	$225			$211
Incremental O&M Costs	$0			$0
Subtotal	$225			$211
Total Benefits	$827	$1,026	$1,026	$1,366
Total Costs	$225	$423	$975	$634
Net Benefit (Cost)	$603	$603	$51	$732
Benefit/Cost Ratio	**3.69**	**2.42**	**1.05**	**2.15**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	10 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	8.91%
Gross Load Factor at Customer	E	12.30%
Net-to-Gross (Energy)	F	94.0%
Net-to-Gross (Demand)	G	94.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$732
MTRC Non-Energy Benefit Adder	K	$103
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.0901 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,078 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,013 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,091 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	1.14 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.10 kW
Gross Annual kWh Saved at Customer	(B x E x L)	1,234 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	1,160 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	1,249 kWh

Program Summary All Participants		
Total Participants	M	1,000
Total Budget	N	**$484,778**
Gross kW Saved at Customer	(M x L)	1,145 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**103 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	1,233,901 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	1,159,867 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**1,249,049 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$837,841**
TRC Net Benefits without Adder	(M x L x (J - K))	**$720,319**

Utility Program Cost per kWh Lifetime	**$0.0383**
Utility Program Cost per kW at Gen	**$4,697**
Participant Payback with Rebate	**0.5 years**
Participant Payback without Rebate	**3.8 years**

HOME PERFORMANCE W/ ENERGY STAR PROGRAM — 2010 — GAS — GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$86.16	$86.16	$86.16
Variable O&M Savings		$0.44	$0.44	$0.44
Demand Savings		$4.88	$4.88	$4.88
Subtotal		$91.48	$91.48	$91.48
Emissions and Non-Energy Benefits Adder (5%)				$4.57
Subtotal		$91.48	$91.48	$96.06
Other Benefits				
Participant Rebates and Incentives	$12.67			$12.67
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.14			$0.13
Subtotal	$12.81			$12.80
Reduction in Sales Revenue				
Gas	$102.00		$95.88	
Subtotal	$102.00		$95.88	
Utility Program Costs				
Program Planning & Design		$0.99	$0.99	$0.99
Administration & Program Delivery		$5.93	$5.93	$5.93
Advertising/Promotion/Customer Ed		$8.65	$8.65	$8.65
Participant Rebates and Incentives		$12.67	$12.67	$12.67
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$2.02	$2.02	$2.02
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$30.25	$30.25	$30.25
Participant Costs				
Incremental Capital Costs	$60.15			$56.54
Incremental O&M Costs	$0.00			$0.00
Subtotal	$60.15			$56.54
Total Benefits	$114.81	$91.48	$91.48	$108.86
Total Costs	$60.15	$30.25	$126.13	$86.80
Net Benefit (Cost)	$54.66	$61.23	-$34.65	$22.07
Benefit/Cost Ratio	**1.91**	**3.02**	**0.73**	**1.25**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	16.21 years
Net-to-Gross (Weighted on Dth)	B	94.00%
Net-to-Gross (Weighted on Incremental Capital)	C	94.00%
Program Totals:		
Participants	D	1,000
Average Net Dth/Yr Saved	E	32.1
Total Dth/Yr Saved	F	**32,058**
Utility Costs per Net Dth/Yr	G	$32.18
Net Benefit (Cost) per Gross Dth/Yr	H	$22.07
Non-Energy Benefits Adder per Gross Dth/Yr	I	$4.57
Annual Dth/$M	($1M / G)	**31,072**
Total Utility Budget	(G x F)	**$1,031,721**
Total MTRC Net Benefits with Adder	(F x H)	**$752,548**
Total MTRC Net Benefits without Adder	(H - I) x F	**$596,550**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$1.99**
Participant Payback with Rebate		**4.2 years**
Participant Payback without Rebate		**5.3 years**

INSULATION REBATE PROGRAM — 2009 — GAS — GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$95.02	$95.02	$95.02
Variable O&M Savings		$0.48	$0.48	$0.48
Demand Savings		$5.53	$5.53	$5.53
Subtotal		$101.03	$101.03	$101.03
Emissions and Non-Energy Benefits Adder (5%)				$5.05
Subtotal		$101.03	$101.03	$106.08
Other Benefits				
Participant Rebates and Incentives	$14.20			$14.20
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$24.57			$21.86
Subtotal	$38.76			$36.06
Reduction in Sales Revenue				
Gas	$118.61		$105.56	
Subtotal	$118.61		$105.56	
Utility Program Costs				
Program Planning & Design		$0.71	$0.71	$0.71
Administration & Program Delivery		$0.53	$0.53	$0.53
Advertising/Promotion/Customer Ed		$0.79	$0.79	$0.79
Participant Rebates and Incentives		$14.20	$14.20	$14.20
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.49	$0.49	$0.49
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$16.72	$16.72	$16.72
Participant Costs				
Incremental Capital Costs	$74.04			$65.89
Incremental O&M Costs	$0.00			$0.00
Subtotal	$74.04			$65.89
Total Benefits	$157.37	$101.03	$101.03	$142.15
Total Costs	$74.04	$16.72	$122.28	$82.61
Net Benefit (Cost)	$83.34	$84.32	-$21.25	$59.54
Benefit/Cost Ratio	**2.13**	**6.04**	**0.83**	**1.72**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	19.93 years
Net-to-Gross (Weighted on Dth)	B	89.00%
Net-to-Gross (Weighted on Incremental Capital)	C	89.00%

Program Totals:		
Participants	D	1,500
Average Net Dth/Yr Saved	E	18.8
Total Dth/Yr Saved	F	**28,210**
Utility Costs per Net Dth/Yr	G	$18.78
Net Benefit (Cost) per Gross Dth/Yr	H	$59.54
Non-Energy Benefits Adder per Gross Dth/Yr	I	$5.05
Annual Dth/$M	($1M / G)	**53,237**
Total Utility Budget	(G x F)	**$529,900**
Total MTRC Net Benefits with Adder	(F x H)	**$1,887,085**
Total MTRC Net Benefits without Adder	(H - I) x F	**$1,726,964**

Utility Program Cost per Net Dth Lifetime	(G / A)	**$0.94**
Participant Payback with Rebate		**4.8 years**
Participant Payback without Rebate		**6.5 years**

INSULATION REBATE PROGRAM — 2010 — GAS — GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$95.31	$95.31	$95.31
Variable O&M Savings		$0.48	$0.48	$0.48
Demand Savings		$5.53	$5.53	$5.53
Subtotal		$101.32	$101.32	$101.32
Emissions and Non-Energy Benefits Adder (5%)				$5.07
Subtotal		$101.32	$101.32	$106.39
Other Benefits				
Participant Rebates and Incentives	$14.20			$14.20
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$25.05			$22.30
Subtotal	$39.25			$36.50
Reduction in Sales Revenue				
Gas	$119.03		$105.94	
Subtotal	$119.03		$105.94	
Utility Program Costs				
Program Planning & Design		$0.75	$0.75	$0.75
Administration & Program Delivery		$0.57	$0.57	$0.57
Advertising/Promotion/Customer Ed		$0.87	$0.87	$0.87
Participant Rebates and Incentives		$14.20	$14.20	$14.20
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.49	$0.49	$0.49
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$16.87	$16.87	$16.87
Participant Costs				
Incremental Capital Costs	$74.04			$65.89
Incremental O&M Costs	$0.00			$0.00
Subtotal	$74.04			$65.89
Total Benefits	$158.28	$101.32	$101.32	$142.89
Total Costs	$74.04	$16.87	$122.81	$82.76
Net Benefit (Cost)	$84.25	$84.45	-$21.48	$60.12
Benefit/Cost Ratio	**2.14**	**6.01**	**0.83**	**1.73**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	19.93 years
Net-to-Gross (Weighted on Dth)	B	89.00%
Net-to-Gross (Weighted on Incremental Capital)	C	89.00%
Program Totals:		
Participants	D	1,500
Average Net Dth/Yr Saved	E	18.8
Total Dth/Yr Saved	F	**28,210**
Utility Costs per Net Dth/Yr	G	$18.96
Net Benefit (Cost) per Gross Dth/Yr	H	$60.12
Non-Energy Benefits Adder per Gross Dth/Yr	I	$5.07
Annual Dth/$M	($1M / G)	**52,753**
Total Utility Budget	(G x F)	**$534,755**
Total MTRC Net Benefits with Adder	(F x H)	**$1,905,707**
Total MTRC Net Benefits without Adder	(H - I) x F	**$1,745,124**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$0.95**
Participant Payback with Rebate		**4.8 years**
Participant Payback without Rebate		**6.5 years**

REFRIGERATOR RECYCLING PROGRAM 2009 ELECTRIC GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$490	$490	$490
Transmission & Distribution Capacity		$111	$111	$111
Marginal Energy		$1,498	$1,498	$1,498
Avoided Emissions (CO2, SOx)		$332	$332	$332
Subtotal		$2,432	$2,432	$2,432
Non-Energy Benefits Adder (10%)				$243
Subtotal		$2,432	$2,432	$2,675
Other Benefits				
Participant Rebates and Incentives	$251			$251
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$251			$251
Reduction in Sales Revenue				
Electric	$2,792		$1,703	
Subtotal	$2,792		$1,703	
Utility Program Costs				
Program Planning & Design		$35	$35	$35
Administration & Program Delivery		$918	$918	$918
Advertising/Promotion/Customer Ed		$203	$203	$203
Participant Rebates and Incentives		$251	$251	$251
Equipment & Installation		$0	$0	$0
Measurement and Verification		$50	$50	$50
Miscellaneous		$0	$0	$0
Subtotal		$1,457	$1,457	$1,457
Participant Costs				
Incremental Capital Costs	$0			$0
Incremental O&M Costs	$0			$0
Subtotal	$0			$0
Total Benefits	$3,043	$2,432	$2,432	$2,926
Total Costs	$0	$1,457	$3,160	$1,457
Net Benefit (Cost)	$3,043	$974	($729)	$1,469
Benefit/Cost Ratio	**#DIV/0!**	1.67	0.77	2.01

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	7 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	100.00%
Gross Load Factor at Customer	E	84.03%
Net-to-Gross (Energy)	F	61.0%
Net-to-Gross (Demand)	G	61.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$1,469
MTRC Non-Energy Benefit Adder	K	$243
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.6569 kW
Gross Annual kWh Saved at Customer	(B x E x C)	7,361 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	4,490 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	4,836 kWh
Program Summary per Participant		
Gross kW Saved at Customer	L	0.14 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.09 kW
Gross Annual kWh Saved at Customer	(B x E x L)	1,025 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	626 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	674 kWh
Program Summary All Participants		
Total Participants	M	3,250
Total Budget	N	**$659,703**
Gross kW Saved at Customer	(M x L)	453 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**297 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	3,332,774 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	2,032,992 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**2,189,309 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$665,018**
TRC Net Benefits without Adder	(M x L x (J - K))	**$554,930**
Utility Program Cost per kWh Lifetime		**$0.0415**
Utility Program Cost per kW at Gen		**$2,218**
Participant Payback with Rebate		**-0.7 years**
Participant Payback without Rebate		**0.0 years**

REFRIGERATOR RECYCLING PROGRAM 2010 ELECTRIC GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$512	$512	$512
Transmission & Distribution Capacity		$113	$113	$113
Marginal Energy		$1,427	$1,427	$1,427
Avoided Emissions (CO2, SOx)		$414	$414	$414
Subtotal		$2,466	$2,466	$2,466
Non-Energy Benefits Adder (10%)				$247
Subtotal		$2,466	$2,466	$2,713
Other Benefits				
Participant Rebates and Incentives	$251			$251
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$251			$251
Reduction in Sales Revenue				
Electric	$2,815		$1,717	
Subtotal	$2,815		$1,717	
Utility Program Costs				
Program Planning & Design		$47	$47	$47
Administration & Program Delivery		$944	$944	$944
Advertising/Promotion/Customer Ed		$161	$161	$161
Participant Rebates and Incentives		$251	$251	$251
Equipment & Installation		$0	$0	$0
Measurement and Verification		$50	$50	$50
Miscellaneous		$0	$0	$0
Subtotal		$1,453	$1,453	$1,453
Participant Costs				
Incremental Capital Costs	$0			$0
Incremental O&M Costs	$0			$0
Subtotal	$0			$0
Total Benefits	$3,066	$2,466	$2,466	$2,964
Total Costs	$0	$1,453	$3,170	$1,453
Net Benefit (Cost)	$3,066	$1,014	($703)	$1,511
Benefit/Cost Ratio	**#DIV/0!**	**1.70**	**0.78**	**2.04**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	7 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	100.00%
Gross Load Factor at Customer	E	84.03%
Net-to-Gross (Energy)	F	61.0%
Net-to-Gross (Demand)	G	61.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$1,511
MTRC Non-Energy Benefit Adder	K	$247
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.6569 kW
Gross Annual kWh Saved at Customer	(B x E x C)	7,361 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	4,490 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	4,836 kWh
Program Summary per Participant		
Gross kW Saved at Customer	L	0.14 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.09 kW
Gross Annual kWh Saved at Customer	(B x E x L)	1,025 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	626 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	674 kWh
Program Summary All Participants		
Total Participants	M	4,375
Total Budget	N	**$885,382**
Gross kW Saved at Customer	(M x L)	609 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**400 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	4,486,426 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	2,736,720 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**2,947,146 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$921,175**
TRC Net Benefits without Adder	(M x L x (J - K))	**$770,863**
Utility Program Cost per kWh Lifetime		**$0.0413**
Utility Program Cost per kW at Gen		**$2,211**
Participant Payback with Rebate		**-0.6 years**
Participant Payback without Rebate		**0.0 years**

SCHOOL EDUCATION KITS PROGRAM 2009 ELECTRIC GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$81	$81	$81
Transmission & Distribution Capacity		$18	$18	$18
Marginal Energy		$809	$809	$809
Avoided Emissions (CO2, SOx)		$122	$122	$122
Subtotal		$1,030	$1,030	$1,030
Non-Energy Benefits Adder (10%)				$103
Subtotal		$1,030	$1,030	$1,133
Other Benefits				
Participant Rebates and Incentives	$227			$227
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$227			$227
Reduction in Sales Revenue				
Electric	$694		$645	
Subtotal	$694		$645	
Utility Program Costs				
Program Planning & Design		$5	$5	$5
Administration & Program Delivery		$2	$2	$2
Advertising/Promotion/Customer Ed		$0	$0	$0
Participant Rebates and Incentives		$227	$227	$227
Equipment & Installation		$0	$0	$0
Measurement and Verification		$9	$9	$9
Miscellaneous		$0	$0	$0
Subtotal		$244	$244	$244
Participant Costs				
Incremental Capital Costs	$227			$211
Incremental O&M Costs	$0			$0
Subtotal	$227			$211
Total Benefits	$921	$1,030	$1,030	$1,360
Total Costs	$227	$244	$889	$455
Net Benefit (Cost)	$694	$786	$140	$905
Benefit/Cost Ratio	**4.05**	**4.22**	**1.16**	**2.99**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	7 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	8.00%
Gross Load Factor at Customer	E	13.81%
Net-to-Gross (Energy)	F	93.0%
Net-to-Gross (Demand)	G	93.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$905
MTRC Non-Energy Benefit Adder	K	$103
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.0801 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,210 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,125 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,212 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	0.10 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.01 kW
Gross Annual kWh Saved at Customer	(B x E x L)	123 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	115 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	124 kWh

Program Summary All Participants		
Total Participants	M	6,600
Total Budget	N	**$164,211**
Gross kW Saved at Customer	(M x L)	673 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**54 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	814,572 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	757,552 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**815,800 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$608,918**
TRC Net Benefits without Adder	(M x L x (J - K))	**$539,608**

Utility Program Cost per kWh Lifetime	**$0.0304**
Utility Program Cost per kW at Gen	**$3,044**
Participant Payback with Rebate	**0.0 years**
Participant Payback without Rebate	**2.2 years**

SCHOOL EDUCATION KITS PROGRAM — 2009 — GAS — GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$31.53	$31.53	$31.53
Variable O&M Savings		$0.17	$0.17	$0.17
Demand Savings		$1.98	$1.98	$1.98
Subtotal		$33.68	$33.68	$33.68
Emissions and Non-Energy Benefits Adder (5%)				$1.68
Subtotal		$33.68	$33.68	$35.36
Other Benefits				
Participant Rebates and Incentives	$7.49			$7.49
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$17.40			$12.18
Subtotal	$24.89			$19.67
Reduction in Sales Revenue				
Gas	$50.21		$35.15	
Subtotal	$50.21		$35.15	
Utility Program Costs				
Program Planning & Design		$0.10	$0.10	$0.10
Administration & Program Delivery		$0.09	$0.09	$0.09
Advertising/Promotion/Customer Ed		$0.00	$0.00	$0.00
Participant Rebates and Incentives		$7.49	$7.49	$7.49
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.31	$0.31	$0.31
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$7.98	$7.98	$7.98
Participant Costs				
Incremental Capital Costs	$7.49			$5.24
Incremental O&M Costs	$0.00			$0.00
Subtotal	$7.49			$5.24
Total Benefits	$75.10	$33.68	$33.68	$55.03
Total Costs	$7.49	$7.98	$43.13	$13.22
Net Benefit (Cost)	$67.61	$25.69	-$9.46	$41.80
Benefit/Cost Ratio	**10.03**	**4.22**	**0.78**	**4.16**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	5.81 years
Net-to-Gross (Weighted on Dth)	B	70.00%
Net-to-Gross (Weighted on Incremental Capital)	C	70.00%

Program Totals:		
Participants	D	6,600
Average Net Dth/Yr Saved	E	2.2
Total Dth/Yr Saved	F	**14,315**
Utility Costs per Net Dth/Yr	G	$11.41
Net Benefit (Cost) per Gross Dth/Yr	H	$41.80
Non-Energy Benefits Adder per Gross Dth/Yr	I	$1.68
Annual Dth/$M	($1M / G)	**87,674**
Total Utility Budget	(G x F)	**$163,273**
Total MTRC Net Benefits with Adder	(F x H)	**$854,817**
Total MTRC Net Benefits without Adder	(H - I) x F	**$820,384**

Utility Program Cost per Net Dth Lifetime	(G / A)	**$1.96**
Participant Payback with Rebate		**0.0 years**
Participant Payback without Rebate		**0.7 years**

SCHOOL EDUCATION KITS PROGRAM 2010 ELECTRIC GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$85	$85	$85
Transmission & Distribution Capacity		$18	$18	$18
Marginal Energy		$800	$800	$800
Avoided Emissions (CO2, SOx)		$144	$144	$144
Subtotal		$1,047	$1,047	$1,047
Non-Energy Benefits Adder (10%)				$105
Subtotal		$1,047	$1,047	$1,152
Other Benefits				
Participant Rebates and Incentives	$227			$227
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$227			$227
Reduction in Sales Revenue				
Electric	$702		$653	
Subtotal	$702		$653	
Utility Program Costs				
Program Planning & Design		$4	$4	$4
Administration & Program Delivery		$12	$12	$12
Advertising/Promotion/Customer Ed		$0	$0	$0
Participant Rebates and Incentives		$227	$227	$227
Equipment & Installation		$0	$0	$0
Measurement and Verification		$10	$10	$10
Miscellaneous		$0	$0	$0
Subtotal		$254	$254	$254
Participant Costs				
Incremental Capital Costs	$227			$211
Incremental O&M Costs	$0			$0
Subtotal	$227			$211
Total Benefits	$929	$1,047	$1,047	$1,379
Total Costs	$227	$254	$907	$465
Net Benefit (Cost)	$702	$793	$141	$914
Benefit/Cost Ratio	**4.09**	**4.13**	**1.16**	**2.96**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	7 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	8.00%
Gross Load Factor at Customer	E	13.81%
Net-to-Gross (Energy)	F	93.0%
Net-to-Gross (Demand)	G	93.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$914
MTRC Non-Energy Benefit Adder	K	$105
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.0801 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,210 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,125 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,212 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	0.10 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.01 kW
Gross Annual kWh Saved at Customer	(B x E x L)	123 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	115 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	124 kWh

Program Summary All Participants		
Total Participants	M	7,300
Total Budget	N	**$188,938**
Gross kW Saved at Customer	(M x L)	745 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**60 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	900,966 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	837,898 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1-H)) x M**	**902,324 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$680,529**
TRC Net Benefits without Adder	(M x L x (J - K))	**$602,564**

Utility Program Cost per kWh Lifetime	**$0.0317**
Utility Program Cost per kW at Gen	**$3,167**
Participant Payback with Rebate	**0.0 years**
Participant Payback without Rebate	**2.1 years**

SCHOOL EDUCATION KITS PROGRAM — 2010 — GAS — GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$30.59	$30.59	$30.59
Variable O&M Savings		$0.17	$0.17	$0.17
Demand Savings		$1.98	$1.98	$1.98
Subtotal		$32.74	$32.74	$32.74
Emissions and Non-Energy Benefits Adder (5%)				$1.64
Subtotal		$32.74	$32.74	$34.37
Other Benefits				
Participant Rebates and Incentives	$7.49			$7.49
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$17.75			$12.42
Subtotal	$25.23			$19.91
Reduction in Sales Revenue				
Gas	$48.91		$34.24	
Subtotal	$48.91		$34.24	
Utility Program Costs				
Program Planning & Design		$0.00	$0.00	$0.00
Administration & Program Delivery		$0.50	$0.50	$0.50
Advertising/Promotion/Customer Ed		$0.00	$0.00	$0.00
Participant Rebates and Incentives		$7.49	$7.49	$7.49
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.32	$0.32	$0.32
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$8.30	$8.30	$8.30
Participant Costs				
Incremental Capital Costs	$7.49			$5.24
Incremental O&M Costs	$0.00			$0.00
Subtotal	$7.49			$5.24
Total Benefits	$74.14	$32.74	$32.74	$54.28
Total Costs	$7.49	$8.30	$42.54	$13.54
Net Benefit (Cost)	$66.66	$24.44	-$9.80	$40.74
Benefit/Cost Ratio	**9.90**	**3.94**	**0.77**	**4.01**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	5.81 years
Net-to-Gross (Weighted on Dth)	B	70.00%
Net-to-Gross (Weighted on Incremental Capital)	C	70.00%
Program Totals:		
Participants	D	7,300
Average Net Dth/Yr Saved	E	2.2
Total Dth/Yr Saved	F	**15,833**
Utility Costs per Net Dth/Yr	G	$11.86
Net Benefit (Cost) per Gross Dth/Yr	H	$40.74
Non-Energy Benefits Adder per Gross Dth/Yr	I	$1.64
Annual Dth/$M	($1M / G)	**84,336**
Total Utility Budget	(G x F)	**$187,736**
Total MTRC Net Benefits with Adder	(F x H)	**$921,511**
Total MTRC Net Benefits without Adder	(H - I) x F	**$884,488**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$2.04**
Participant Payback with Rebate		**0.0 years**
Participant Payback without Rebate		**0.7 years**

WATER HEATING REBATE PROGRAM — 2009 — GAS — GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$81.60	$81.60	$81.60
Variable O&M Savings		$0.42	$0.42	$0.42
Demand Savings		$4.70	$4.70	$4.70
Subtotal		$86.72	$86.72	$86.72
Emissions and Non-Energy Benefits Adder (5%)				$4.34
Subtotal		$86.72	$86.72	$91.06
Other Benefits				
Participant Rebates and Incentives	$33.90			$33.90
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$33.90			$33.90
Reduction in Sales Revenue				
Gas	$100.91		$90.82	
Subtotal	$100.91		$90.82	
Utility Program Costs				
Program Planning & Design		$7.05	$7.05	$7.05
Administration & Program Delivery		$0.77	$0.77	$0.77
Advertising/Promotion/Customer Ed		$5.05	$5.05	$5.05
Participant Rebates and Incentives		$33.90	$33.90	$33.90
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$1.87	$1.87	$1.87
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$48.64	$48.64	$48.64
Participant Costs				
Incremental Capital Costs	$65.60			$59.04
Incremental O&M Costs	$0.00			$0.00
Subtotal	$65.60			$59.04
Total Benefits	$134.81	$86.72	$86.72	$124.96
Total Costs	$65.60	$48.64	$139.47	$107.69
Net Benefit (Cost)	$69.21	$38.08	-$52.74	$17.27
Benefit/Cost Ratio	**2.05**	**1.78**	**0.62**	**1.16**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	15.18 years
Net-to-Gross (Weighted on Dth)	B	90.00%
Net-to-Gross (Weighted on Incremental Capital)	C	90.00%
Program Totals:		
Participants	D	1,250
Average Net Dth/Yr Saved	E	1.2
Total Dth/Yr Saved	F	**1,513**
Utility Costs per Net Dth/Yr	G	$54.05
Net Benefit (Cost) per Gross Dth/Yr	H	$17.27
Non-Energy Benefits Adder per Gross Dth/Yr	I	$4.34
Annual Dth/$M	($1M / G)	**18,502**
Total Utility Budget	(G x F)	**$81,796**
Total MTRC Net Benefits with Adder	(F x H)	**$29,038**
Total MTRC Net Benefits without Adder	(H - I) x F	**$21,746**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$3.56**
Participant Payback with Rebate		**2.8 years**
Participant Payback without Rebate		**5.8 years**

WATER HEATING REBATE PROGRAM — 2010 — GAS — GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$81.57	$81.57	$81.57
Variable O&M Savings		$0.42	$0.42	$0.42
Demand Savings		$4.70	$4.70	$4.70
Subtotal		$86.70	$86.70	$86.70
Emissions and Non-Energy Benefits Adder (5%)				$4.33
Subtotal		$86.70	$86.70	$91.03
Other Benefits				
Participant Rebates and Incentives	$33.58			$33.58
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$33.58			$33.58
Reduction in Sales Revenue				
Gas	$100.96		$90.87	
Subtotal	$100.96		$90.87	
Utility Program Costs				
Program Planning & Design		$6.46	$6.46	$6.46
Administration & Program Delivery		$1.59	$1.59	$1.59
Advertising/Promotion/Customer Ed		$3.61	$3.61	$3.61
Participant Rebates and Incentives		$33.58	$33.58	$33.58
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$1.81	$1.81	$1.81
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$47.05	$47.05	$47.05
Participant Costs				
Incremental Capital Costs	$65.61			$59.05
Incremental O&M Costs	$0.00			$0.00
Subtotal	$65.61			$59.05
Total Benefits	$134.54	$86.70	$86.70	$124.61
Total Costs	$65.61	$47.05	$137.91	$106.10
Net Benefit (Cost)	$68.93	$39.65	-$51.22	$18.52
Benefit/Cost Ratio	**2.05**	**1.84**	**0.63**	**1.17**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	15.18 years
Net-to-Gross (Weighted on Dth)	B	90.00%
Net-to-Gross (Weighted on Incremental Capital)	C	90.00%
Program Totals:		
Participants	D	1,750
Average Net Dth/Yr Saved	E	1.2
Total Dth/Yr Saved	F	**2,119**
Utility Costs per Net Dth/Yr	G	$52.28
Net Benefit (Cost) per Gross Dth/Yr	H	$18.52
Non-Energy Benefits Adder per Gross Dth/Yr	I	$4.33
Annual Dth/$M	($1M / G)	**19,129**
Total Utility Budget	(G x F)	**$110,766**
Total MTRC Net Benefits with Adder	(F x H)	**$43,592**
Total MTRC Net Benefits without Adder	(H - I) x F	**$33,386**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$3.44**
Participant Payback with Rebate		**2.8 years**
Participant Payback without Rebate		**5.8 years**

SAVER'S SWITCH PROGRAM 2009 ELECTRIC GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$570	$570	$570
Transmission & Distribution Capacity		$121	$121	$121
Marginal Energy		$30	$30	$30
Avoided Emissions (CO2, SOx)		$0	$0	$0
Subtotal		$721	$721	$721
Non-Energy Benefits Adder (10%)				$72
Subtotal		$721	$721	$793
Other Benefits				
Participant Rebates and Incentives	$91			$91
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$91			$91
Reduction in Sales Revenue				
Electric	$1		$1	
Subtotal	$1		$1	
Utility Program Costs				
Program Planning & Design		$1	$1	$1
Administration & Program Delivery		$14	$14	$14
Advertising/Promotion/Customer Ed		$19	$19	$19
Participant Rebates and Incentives		$91	$91	$91
Equipment & Installation		$82	$82	$82
Measurement and Verification		$3	$3	$3
Miscellaneous		$0	$0	$0
Subtotal		$210	$210	$210
Participant Costs				
Incremental Capital Costs	$0			$0
Incremental O&M Costs	$0			$0
Subtotal	$0			$0
Total Benefits	$91	$721	$721	$884
Total Costs	$0	$210	$211	$210
Net Benefit (Cost)	$91	$511	$510	$674
Benefit/Cost Ratio	**#DIV/0!**	**3.43**	**3.42**	**4.21**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	15 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	35.27%
Gross Load Factor at Customer	E	0.01%
Net-to-Gross (Energy)	F	100.0%
Net-to-Gross (Demand)	G	100.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$674
MTRC Non-Energy Benefit Adder	K	$72
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.3798 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	3.00 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	1.14 kW
Gross Annual kWh Saved at Customer	(B x E x L)	2 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	2 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	2 kWh

Program Summary All Participants		
Total Participants	M	19,500
Total Budget	N	**$12,286,434**
Gross kW Saved at Customer	(M x L)	58,500 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**22,218 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	42,120 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	42,120 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**45,359 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$39,422,039**
TRC Net Benefits without Adder	(M x L x (J - K))	**$35,204,091**

Utility Program Cost per kWh Lifetime	**$18.0582**
Utility Program Cost per kW at Gen	**$553**
Participant Payback with Rebate	**-2298.5 years**
Participant Payback without Rebate	**0.0 years**

SAVER'S SWITCH PROGRAM 2010 ELECTRIC GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$550	$550	$550
Transmission & Distribution Capacity		$115	$115	$115
Marginal Energy		$22	$22	$22
Avoided Emissions (CO2, SOx)		$0	$0	$0
Subtotal		$687	$687	$687
Non-Energy Benefits Adder (10%)				$69
Subtotal		$687	$687	$755
Other Benefits				
Participant Rebates and Incentives	$91			$91
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$91			$91
Reduction in Sales Revenue				
Electric	$1		$1	
Subtotal	$1		$1	
Utility Program Costs				
Program Planning & Design		$1	$1	$1
Administration & Program Delivery		$14	$14	$14
Advertising/Promotion/Customer Ed		$19	$19	$19
Participant Rebates and Incentives		$91	$91	$91
Equipment & Installation		$82	$82	$82
Measurement and Verification		$3	$3	$3
Miscellaneous		$0	$0	$0
Subtotal		$210	$210	$210
Participant Costs				
Incremental Capital Costs	$0			$0
Incremental O&M Costs	$0			$0
Subtotal	$0			$0
Total Benefits	$91	$687	$687	$846
Total Costs	$0	$210	$211	$210
Net Benefit (Cost)	$91	$477	$476	$636
Benefit/Cost Ratio	**#DIV/0!**	**3.27**	**3.26**	**4.03**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	15 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	35.27%
Gross Load Factor at Customer	E	0.01%
Net-to-Gross (Energy)	F	100.0%
Net-to-Gross (Demand)	G	100.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$636
MTRC Non-Energy Benefit Adder	K	$69
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.3798 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	3.00 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	1.14 kW
Gross Annual kWh Saved at Customer	(B x E x L)	2 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	2 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	2 kWh

Program Summary All Participants		
Total Participants	M	19,500
Total Budget	N	**$12,286,434**
Gross kW Saved at Customer	(M x L)	58,500 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**22,218 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	42,120 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	42,120 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**45,359 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$37,218,909**
TRC Net Benefits without Adder	(M x L x (J - K))	**$33,201,246**

Utility Program Cost per kWh Lifetime	**$18.0582**
Utility Program Cost per kW at Gen	**$553**
Participant Payback with Rebate	**-2448.4 years**
Participant Payback without Rebate	**0.0 years**

➢ Low-Income Segment

A. Description

The Low-Income Segment includes Public Service's energy efficiency and education programs targeted at income-qualified customers. With this Biennial Plan, Public Service is making a substantial commitment to both low-income gas and electric energy efficiency. The Company recognizes that low-income programs offer a unique opportunity to both substantially improve the efficiency with which customers use energy and to directly improve their quality of life. Energy efficiency programs likely provide other non-energy related benefits to low-income customers in the form of health, safety, comfort, and other improvements. During this biennium, Public Service will be updating the quantification of low-income related non-energy benefits. This issue is further discussed in the Indirect Segment section. Reductions in low-income customers' utility bills can have a disproportionately beneficial effect on household income as compared to non-low-income customers because a larger percentage of a low-income customer's income is spent on energy.

With these factors in mind, Public Service has designed a diverse set of program offerings intended to reach a large percent of the low-income community while leveraging resources already in place to serve this customer group. In particular, to provide services to low-income customers, the Company's programs will actively partner with government and non-profit agencies using their existing infrastructure, access to Federal and State funds, and expertise.

In designing the Low-Income Segment programs, the Company also sought insights from the *Best Practice Benchmarking for Energy Efficiency Programs* study conducted in 2004 by Quantum Consulting, Inc. Specifically, Public Service sought to incorporate the following key practices into its individual programs:

- The most cost effective way to run the program is to pay incentives based on individual measures.
- To ensure program success, educate contractors on all program aspects to find new opportunities - contractors are the primary link between customers and energy savings.

The Company's proposed programs will deliver energy savings and services to more than 20,000 income-qualified customers while producing electric energy savings of 10.7 GWh and 209,603 Dth during the biennium. Electric spending is budgeted at $3,211,768 or 16% of the Residential Segment electric energy efficiency portfolio while gas spending is budgeted at $7,158,696 or 36% of the Residential Segment gas energy efficiency portfolio. Gas energy efficiency budgets for low-income customers are typically higher because there are more cost effective opportunities to encourage installation of gas measures.

The Low-Income Segment consists of the following four programs:

- Easy Savings Energy Kits;
- Multi-Family Weatherizations;
- Non-Profit Weatherizations, and
- Single-Family Weatherizations.

Low-Income Program Rankings
Program Ranking was done for all programs through the same process and the final prioritization was for the entire Public Service portfolio. As a result, the rankings below will not show the entire list, only low-income programs. Criteria used to rank the programs included: market segments, customer classes, natural gas energy savings, electric energy savings, number of participants, participant rate (% of the entire customer class), and Total Resource Cost Test results. There were a total of 36 programs ranked for the entire Public Service portfolio. The Company's definition of Multi-Family market segment consists of apartments, condominiums and townhomes.

Table 64: Low-Income Segment Program Rankings

Low-Income Segment	Program Ranking	Type of Program	Fuel Market Segments Served
Easy Savings Energy Kits	17	Prescriptive	Electric/Gas
Multi-Family Weatherizations	11	Prescriptive	Electric/Gas
Non-Profit Weatherizations	20	Prescriptive	Electric/Gas
Single Family Weatherizations	21	Prescriptive	Electric/Gas

B. Overall Budgets & Goals

Goals for gas programs within the Low-Income Segment are 38% of total Residential gas goals while electric programs within the Segment make up 7% of the total Residential Segment electric goals. The gas goals are a higher percentage of the total Residential goals because there are a larger number of gas-savings opportunities for low-income customers than electric savings opportunities. It also occurs because, in general, Residential customers provide a larger proportion of the overall savings for gas than for electric for the entire Public Service portfolio.

Tables 65a and 65b provide overall budgets and goals for the programs within the Low-Income Segment. The Company developed budgets and goals for the Segment based on historical experience (Multi-Family, Non-Profit and Single-Family) and target participation levels (Easy Savings Energy Kits). Participation rates were established in partnership with GEO, Energy Outreach Colorado (EOC), low-income agencies, and vendors to further refine the goals and budgets.

Table 65a: 2009 Low-Income Segment Budgets and Goals

2009	Electric Participants	Electric Budget	Customer kW	Net Generator kW	Net Generator kWh	Modified TRC Ratio	Gas Participants	Gas Budget	Net Annual DTH Savings	Annual Dth/$M	Total Modified TRC Net Benefits with Adder	Modified TRC Ratio
Low-Income Segment												
Easy Savings Energy Kits	20,000	$591,185	2,040	163	2,472,121	2.39	20,000	$591,599	36,666	61,978	$2,329,354	3.65
Multi-Family Weatherization	518	$106,432	249	28	323,820	2.41	518	$292,290	6,298	21,547	$318,497	1.42
Non-Profit Energy Efficiency	322	$68,991	155	17	201,875	2.28	322	$393,258	4,064	10,333	$165,783	1.23
Single-Family Weatherization	1,958	$749,466	1,593	175	2,135,695	2.54	2,946	$2,086,355	53,551	25,667	$2,058,491	1.36
Energy Efficiency Subtotal	**22,798**	**$1,516,075**	**4,037**	**384**	**5,133,511**	**2.45**	**23,786**	**$3,363,503**	**100,579**	**29,903**	**$4,872,125**	**1.60**
Low-Income Segment Total	**22,798**	**$1,516,075**	**4,037**	**384**	**5,133,511**	**2.45**	**23,786**	**$3,363,503**	**100,579**	**29,903**	**$4,872,125**	**1.60**

Table 65b: 2010 Low-Income Segment Budgets and Goals

2010	Electric Participants	Electric Budget	Customer kW	Net Generator kW	Net Generator kWh	Modified TRC Ratio	Gas Participants	Gas Budget	Net Annual DTH Savings	Annual Dth/$M	Total Modified TRC Net Benefits with Adder	Modified TRC Ratio
Low-Income Segment												
Easy Savings Energy Kits	22,000	$650,410	2,244	180	2,719,334	2.38	22,000	$651,246	40,333	61,932	$2,525,556	3.61
Multi-Family Weatherization	556	$125,458	267	30	347,783	2.19	556	$353,615	6,760	19,116	$346,773	1.41
Non-Profit Energy Efficiency	350	$92,602	168	19	219,700	1.92	350	$494,471	4,417	8,932	$179,552	1.21
Single-Family Weatherization	2,103	$827,223	1,711	188	2,293,929	2.46	3,164	$2,295,861	57,515	25,051	$2,194,696	1.35
Energy Efficiency Subtotal	**25,009**	**$1,695,693**	**4,391**	**417**	**5,580,745**	**2.38**	**26,070**	**$3,795,193**	**109,024**	**28,727**	**$5,246,578**	**1.59**
Low-Income Segment Total	**25,009**	**$1,695,693**	**4,391**	**417**	**5,580,745**	**2.38**	**26,070**	**$3,795,193**	**109,024**	**28,727**	**$5,246,578**	**1.59**

C. Market Analysis

Although the 2005 KEMA DSM Market Potential Assessment did not separately identify the low-income component of the Residential Segment, the study provided useful insight because it distinguished between single-family and multi-family dwellings, allowing for distinctions between these two customer types. However, likely the best information regarding the Low-Income Segment comes from the entities that have historically served that market. As such, the Company relied heavily on information provided by GEO, EOC, and other agencies and non-profit organizations to design its programs.

D. Marketing/Advertising/Promotion

The Low-Income Segment aims to educate low-income customers on the importance of and value provided by energy efficiency. The Company will work with low-income providers, cities/counties and other community organizations to promote all available services. Marketing and promotion activities will occur primarily through partners with collateral material developed by Public Service. This tends to be the most effective way to target the low-income customers, as other targeting methods are limited. Xcel Energy's call center agents are also trained to provide useful information with which to direct potentially eligible customers to participate in the Segment's programs.

E. Segment-Level Policies

Participating customers must purchase retail electricity or gas from Public Service Company of Colorado on a residential tariff or own multi-family buildings whose rental units are a minimum 66% occupied by customers certified as low-income per program guidelines. Specific programs within the Segment may have different eligibility requirements depending on the services offered, funding partners or customers served.

F. Stakeholder Involvement

Public Service received significant input and assistance in developing and designing programs for the Low-Income Segment and will rely heavily on stakeholders to deliver successful programs. Perhaps more than any other Segment, the Low-Income Segment depends on outside expertise in the form of government agencies and non-profits to provide program benefits to customers. In this sense, Public Service is the facilitator that provides financial and energy efficiency resources to complement the services provided by state and local organizations.

The Company will continue to work with the GEO, EOC vendors, outside consultants, Commission Staff, and local weatherization organizations to ensure that its Low-Income Segment programs are delivering promised benefits and producing effective results. These interactions will also guide mid-year performance adjustments that may be necessary to keep programs on track.

G. Evaluation, Measurement and Verification

The specific program measurement and verification plans are included in the M&V section of the Indirect Segment of this Plan.

➢ Easy Savings Energy Kits Program

A. Description

The Easy Savings Energy Kits Program will provide a bundle of home energy efficiency measures in a kit that can be distributed to low-income customers through local low-income agencies. These kits will offer electricity and natural gas savings, as well as customer education to help lower customer bills and improve the comfort and safety of their dwellings.

The Program is currently based on a program model developed by Energy Outreach Colorado using local low-income agencies as the distribution points. Public Service has discussed the program with the Governor's Energy Office, which is currently developing a similar kit program and plans to enroll customers and ship kits to those who qualify. The Company will evaluate both options later this year and may select one or both as a means to distributing kits for 2009 and 2010.

The Easy Savings Energy Kits Program is a turn-key product marketed and managed by Resource Action Programs of Modesto, California. The kits will promote energy savings and consumer information for smart energy use choices. RAP will provide kits to EOC that in turn will be shipped to all the low-income agencies serving customers within Public Service's territory. Customers will be provided with a kit when they apply for federal Low-Income Home Energy Assistance Program ("LIHEAP") funding. LIHEAP's mission is to assist low-income households in meeting their immediate home energy needs, particularly those who pay a high portion of household income for home energy.

The Easy Savings Energy Kits will include the following electric and natural gas efficiency measures:

- Refrigerator/Freezer Thermometer;
- Filter Tone® Alarm;
- High Efficiency Showerhead (2.0 gpm);
- Kitchen Aerator (1.5 gpm);
- Toilet Leak Detector Tablets;
- Compact Fluorescent Bulb (14 Watt - 60 Watt Equivalent);
- Compact Fluorescent Bulb (19 Watt - 75 Watt Equivalent);
- Shower Flow Rate Test Bag;
- Water Temperature Check Card, and
- Air Temperature Ruler.

B. Budgets & Goals

Budgets
The Easy Savings Energy Kits Program budgets for 2009 and 2010 were created with a participation goal in mind. The cost of the kits covers kit contents, education, and distribution. These budgets will cover both the costs of the kits from RAP, as well as the cost of distribution by Energy Outreach Colorado.

Goals
The Company researched the potential amount of kits that could be distributed annually through existing distribution changes to help guide setting the program goal for the next two-year period. Public Service also reviewed the entire Low-income Segment Portfolio for providing a thorough offering to the customer group. Based on this analysis, the Company believes the Easy Savings Energy Kits Program is an excellent opportunity to touch a larger group of the population than the 2,500 customers Public Service helped annually through the Energy $avings Partner programs.

Table 66: Easy Savings Energy Kits Program Budgets and Goals

Easy Savings Energy Kits	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$5,067	$3,813	$3,171	$5,534
Admin & Program Delivery	$152,090	$153,464	$169,529	$167,958
Ad, Promo, & Customer Ed.	N/A	$ 270	$ 282	$ 282
Customer Incentives	$411,300	$411,300	$452,430	$452,430
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	$22,728	$22,752	$25,008	$25,044
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$591,185**	**$591,599**	**$650,411**	**$651,246**
Generator kW	163	N/A	180	N/A
Generator kWh	2,472,121	N/A	2,719,334	N/A
Annual Dth	N/A	36,666	N/A	40,333
Annual Dth/$M	N/A	61,978	N/A	61,932
Participants	20,000	20,000	22,000	22,000
Participation as % of Segment	1.761%	1.688%	1.937%	1.857%
Modified TRC Test Ratio	**2.39**	**3.65**	**2.38**	**3.61**

C. Application Process

There is no need to apply for the Easy Savings Energy Kits Program. Customers who apply for LIHEAP funding and live in Public Service's territory will be provided with a kit. EOC will track customer participation so that customers do not receive a kit every year they come into the agency. This information will also be provided to Public Service on a regular basis.

D. Marketing Objectives, Goals, & Strategy

The overall marketing objective of this program is to increase and expand education among the low-income customers on the importance of energy efficiency and the value of taking action to improve efficiency in their homes. Public Service will work with both the EOC and the GEO to meet demand for kits. (GEO is currently designing a kit program to distribute to LIHEAP customers through a direct mail business reply card.) Using both the EOC distribution and the GEO distribution would allow Public Service to reach more customers annually.

E. Program-Specific Policies

In order to participate, customers must receive LIHEAP funding.

F. Stakeholder Involvement

Public Service worked with an external consultant and Resource Action Programs to determine the best "kit" contents for customers in the Colorado area. The Company will continue to work with RAP and the EOC to streamline program delivery.

H. Rebate Levels

Public Service will fund 100% of the cost of the Easy Savings Energy Kits. Hence, there will be no rebate provided to customers.

G. Evaluation, Measurement & Verification Plan

<u>The Easy Savings Energy Kit Program has a unique M&V plan that is detailed in the M&V section of the Indirect Segment of this Plan. The savings factors that will be verified for the Easy Savings Kit Program are detailed in the Deemed Savings Technical Assumptions section.</u>

I. Technical Assumptions

The Easy Savings Energy Kit contains the same energy efficiency measures Public Service is including in its School Education Kits program.

Energy savings were calculated for three measures: CFLs, low-flow showerheads and faucet aerators.

For CFLs, savings were calculated based on the 2002 U.S. Department of Energy (DOE) Lighting Market Characterization. It was assumed both CFLs included in the kit would be installed in high lighting usage areas of the home. The DOE study assigns 1,210 annual operating hours to the highest use tier of lighting fixtures. A 75W incandescent bulb is replaced by a 19W CFL and a 60W bulb is replaced with a 14W CFL. Annual energy savings are calculated at 68 kWh and 55 kWh respectively. Using an 8% coincidence factor and 8% line loss factor, generator demand savings are calculated at 0.0049 kW and 0.0041 kW.

For showerheads, savings were determined by replacing existing showerheads (based case) with a 2.0 gpm low-flow showerhead. The base case uses the Federal Standard assumption of 2.5 gpm; although the Company feels that there are many showerheads currently in service with significantly higher flow rates. Energy savings are produced when reducing the showerhead water flow rate and noting the impacts from reduced heating of the water. Technical assumptions included factors for hot water used per year, incoming water temperature and a standard water heating temperature of 130 degrees.

UPDATE: In response to the recent Settlement Agreement, Public Service plans to implement this program with 1.5 GPM showerheads. The impact of these higher efficiency showerheads on technical assumptions, goals, and budgets has not yet been evaluated, but will be included in the May 1, 2009 DSM Plan Amendment.

For the faucet aerator, savings were determined by the amount of water reduction from the assumed standard faucet aerator. Gas Appliance Manufacturer Association (GAMA) directory data was used to estimate the average recovery efficiency for the typical 40-gallon water heater. This was used in lieu of "Energy Factor," which also includes storage losses, which is not pertinent to aerator savings.

The Company used DOE's domestic hot water appliance calculator baseline of 17 gallons of water per day for sinks. It was assumed that each home would have 2-3 primary sinks, and the usage was divided by 3 – assigning 5.6 gallons a day to each sink (since only one aerator is included in the kit, savings must reflect one retrofit). Applying the above calculation method and going from a standard 2.2 gpm flow rate to a 1.5 gpm flow rate, the savings came out to 5.8 therms annually.

➢ Multi-Family Weatherization Program

A. Description

The Multi-Family Weatherization Program will offer natural gas and electric efficiency measures to low-income multi-family buildings. This is somewhat similar to the Single-Family program, but differs in that these homes have common areas, greater square footage, and more appliances and potential measures.

The Multi-Family Weatherization components will include, but are not limited to:

Natural Gas Measures

- Ceiling insulation
- Wall insulation
- Storm Windows
- Air Leakage Reduction
- Boiler Efficiency Upgrades

Electric Measures

- Refrigerator Replacements
- Compact Fluorescent Lighting (10 bulbs per unit)

The Multi-Family Weatherization Program will be run in partnership with the Governor's Energy Office and Energy Outreach Colorado. Public Service funds will supplement federal weatherization grants to produce incremental, cost-effective gas and electric savings. The Company and GEO will develop annual contracts with the eight weatherization agencies within the Public Service territory. The EOC works jointly with GEO to identify and qualify multi-family units for the program. Details of measures, rebates, reporting processes, and measurement and verification procedures will be included in the new contracts.

B. Budgets & Goals

Budgets for the Multi-Family Weatherization Program were developed based on the incentives paid to low-income agencies per weatherization. Participation rates were established in partnership with GEO and the low-income agencies using as a guide historical participation in the Colorado Energy $avings Partners low-income program.

Table 67: Multi-Family Weatherization Program Budgets and Goals

Multi-Family Weatherization	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$5,067	$3,812	$3,168	$5,534
Admin & Program Delivery	$9,529	$24,604	$17,060	$24,195
Ad, Promo, & Customer Ed.	N/A	$ 270	$ 282	$ 282
Customer Incentives	$90,324	$258,636	$102,500	$318,636
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	$1,512	$4,968	$2,448	$4,968
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$106,432**	**$292,290**	**$125,458**	**$353,615**
Generator kW	28	N/A	30	N/A
Generator kWh	323,820	N/A	347,783	N/A
Annual Dth	N/A	6,298	N/A	6,760
Annual Dth/$M	N/A	21,547	N/A	19,116
Participants	518	518	556	556
Participation as % of Segment	0.046%	0.044%	0.049%	0.047%
Modified TRC Test Ratio	**2.41**	**1.42**	**2.19**	**1.41**

C. Application Process

To participate in the Multi-Family Weatherization Program, customers apply through the EOC. Applications are reviewed by the EOC and the GEO. Low-income households must comprise at least 66% of the building's total households for the building to be eligible to apply. GEO and the EOC will determine who has the greatest need for weatherization services. In some cases, if the need is very high, the application may be approved for buildings that are 50% low-income.

D. Marketing Objectives, Goals, & Strategy

The overall marketing objective of this program is to increase and expand education among the low-income customers on the importance of energy efficiency. Public Service will also work to educate customers on the value of taking action to improve efficiency in their homes. With the four low-income programs available in this portfolio, Public Service hopes to reach key areas within the Low-Income Segment.

Public Service will work with the low-income providers to encourage promotion of all services available. Information will be posted on the Xcel Energy website directing customers to their local agencies. The Company may also partner with other low-income groups. In Xcel Energy's Minnesota low-income program, the Company partnered with Meals On Wheels, having an informative brochure of low-income services included with each meal delivered to homes in the Xcel Energy service territory. This and other similar tactics will be explored.

E. Program-Specific Policies

In order to participate, customers must be owners of multi-family housing with at least 66% of the rental units occupied by low-income customers whose income is below 80% of the local area median. Customers meeting the federal Department of Energy Weatherization Assistance Program funding guidelines, as determined by the GEO, local government, or their agencies, are automatically deemed income eligible.

F. Stakeholder Involvement

When designing the Low-Income program, Public Service worked with external consultants to define which measures would ensure customer comfort while saving money on energy costs. In addition, Public Service and GEO have contracted with the following low-income weatherization agencies to perform weatherization activities. These contractors are funded through the GEO and other state funding and have agreed to weatherize homes following state regulations and guidelines.

Region 1 – NECALG
Northeastern Colorado Association of Local Governments
231 Main St, Suite 211
Fort Morgan, CO 80701
Counties Served –Logan, Morgan, Phillips, Sedgwick, Washington, Yuma, Cheyenne, Kit Carson, Lincoln and Weld

Region 2 – Pueblo County
Pueblo County Department of Human Services
2631 East 4th
Pueblo, CO 81001
Counties Served – Baca, Bent, Crowley, Custer, Huerfano, Kiowa, Las Animas, Otero, Prowers and Pueblo

Region 3 – ERC
Energy Resource Center
5920 Paonia Court
Colorado Springs, CO 80915
Counties Served – Douglas, El Paso, Elbert, Fremont and Teller

Region 4 – HRWC
Housing Resources of Western Colorado
524 30 Road
Grand Junction, CO 81504
Counties Served – Mesa

Region 5 – NWCCOG
Northwest Colorado Council of Governments
249 Warren Ave.
PO Box 2308
Silverthorne, CO 80498
Counties Served - Chaffee, Clear Creek, Eagle, Garfield, Grand, Jackson, Lake, Moffat, Park, Pitkin, Rio Blanco, Routt and Summit

Region 6 – LPEC
Longs Peak Energy Conservation
2450 Central Ave., Suite J
Boulder, CO 80301
Counties Served – Boulder, Gilpin and Larimer

Region 7 – Arapahoe County
Arapahoe County – Housing and Community Development Services
907 Salida Way
Aurora, CO 80011
Counties Served – Adams, Arapahoe and Broomfield

Region 8 – Sun Power
Sun Power, Inc.
3200 Larimer St.
Denver, CO 80205
Counties Served – Denver and Jefferson

When designing the Low-Income Segment, Public Service reviewed best practices as referenced in a 2004 study performed by Quantum Consulting Inc.[1] This best practices study examined the residential single-family comprehensive weatherization programs of National Grid, Sacramento Municipal Utility District, American Synergy Corporation, Pacific Gas & Electric, NSTAR Electric, and Tacoma Power, with the end goal of improving the overall efficiency of single-family homes. Public Service modeled its Low-Income Segment on a few key points from the best practices study, specifically:

- The most cost effective way to run the program is to pay incentives based on individual measures;
- To ensure program success, educate contractors on all program aspects to find new opportunities- contractors are the primary link between customers and energy savings; and
- Focus on market transformation- market the desire for homeowners to improve the value and comfort of their home.

[1] *Best Practice Benchmarking for Energy Efficiency Programs*, Quantum Consulting, Inc., 2004.

G. Rebate Levels

For the Multi-Family Weatherization Program, Public Service will work with the eight contracted low-income providers to determine rebate amounts for each measure. The Company will fund retrofits up to a cost of $0.40 per kilowatt-hour saved and/or $40 per dekatherm of natural gas saved. Testing, engineering and project management fees may be included in the project costs as up to 20% of total cost.

H. Evaluation, Measurement & Verification Plan

The Multi-Family Weatherization Program has a unique M&V plan that is detailed in the M&V section of the Indirect Segment of this Plan. The savings factors that will be verified for the Multi-Family Weatherization Program are detailed in the Deemed Savings Technical Assumptions section.

I. Technical Assumptions

The energy savings from the Multi-Family Weatherization Program will be identified in engineering audits for each facility conducted prior to selection and implementation of efficiency measures. The audit, performed by a qualified engineer, will identify efficiency measures for consideration, calculate the likely energy savings using specific on-site information and testing results, will estimate the costs for implementation and summarize the information in a report for further consideration. Program savings will include the results from measures actually implemented and the sum of savings for all facilities retrofitted under the program.

The energy savings presented in the table below are indicative of common measures found in multi-family facilities, but the diversity of multi-family facilities makes it very difficult to list all possible opportunities. Theses measures are used to demonstrate cost-effectiveness but not to limit the actual measures that may be identified, analyzed and recommended by the engineer. The applicant may apply for funding from one of the local low-income agencies mentioned above for appropriate efficiency measures for the facility and/or qualified occupants and will be funded within the parameters of the program rules.

Table 68: Baseline Home Measures and Energy Efficient Replacements

Measure	Pre-Condition	Target	Measure Type
Attic Insulation; Single-Family	R-15 or less	R-38	Retrofit
Attic Insulation; Mobile Home	R-8 or less	Maximum cost-effective	Retrofit
Attic Insulation; Multi-Family	R-15 or less	R-38	Retrofit
Wall Insulation	No existing cavity insulation	R-13	Retrofit
Furnace Replacement	78% AFUE	92% AFUE	Replacement
Windows (storms)	Single pane – no storm windows	Install storm windows	Retrofit
Crawlspace Perimeter Insulation	Uninsulated	R-19	Retrofit
Duct Sealing	> 20% duct leakage	25% improvement	Retrofit
Air Leakage	>1850 CFM	25% improvement	Retrofit
Gas Storage Water Heater	Baseline Standard efficiency – 0.59 EF for a 40gal. tank	Minimum of 62% for gas hot water heaters	Replacement
CFLs - 10 installed in most used fixtures	Incandescent; ≥2 hours per day	Lumen-equivalent ENERGY STAR CFL	Retrofit
Refrigerators	Functioning unit manufactured before 2001	New efficient ENERGY STAR	Replacement
Evaporative Cooling	Mechanical	Evaporative	Replacement
Electrically Efficient Furnace	single speed motor	ECM Furnace or e* rated by GAMA	Replacement

Non-Profit Weatherization Program

A. Description

The Non-Profit Weatherization Program will provide funding for energy efficiency retrofit improvements to qualified non-profit organizations within the Company's service territory. The program's focus is on helping organizations that serve low-income individuals, such as shelters, safe houses, and residential treatment centers for those who are on the brink of homelessness. Public Service will work with EOC to support the Non-Profit Weatherization initiative. EOC refers to these funds as NEEP dollars (Non-Profit Energy Efficiency Program).

The NEEP energy savings measures will include, but are not limited to:

Natural Gas Measures
- Ceiling insulation
- Wall insulation
- Storm Windows
- Air Leakage Reduction
- Boiler Upgrades

Electric Measures
- Refrigerator Replacements
- Compact Fluorescent Lighting (10 CFLs per unit)

Qualifying facilities will receive an energy audit, as well as funding for subsequent energy efficiency upgrades. Testing, engineering and project management fees may be included in the project costs as up to 20% of total cost.

B. Budgets & Goals

Budgets
The NEEP budget was based on historical donations for the program. Public Service reviewed previous amounts spent to improve non-profit organizations in Colorado and based funding on overall improvements.

Goals
NEEP goals were derived in conjunction with EOC based on a forecast provided by the EOC that lists audits have begun to determine projects that are expected to be completed in 2009.

Table 69: Non-Profit Energy Efficiency Program Budgets and Goals

Non-Profit Energy Efficiency	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$5,067	$3,816	$3,171	$5,534
Admin & Program Delivery	$6,433	$6,364	$11,068	$5,955
Ad, Promo, & Customer Ed.	N/A	$ 270	$ 282	$ 282
Customer Incentives	$56,591	$367,692	$76,591	$463,692
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	$ 900	$15,120	$1,500	$19,008
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$68,991**	**$393,262**	**$92,603**	**$494,471**
Generator kW	17	N/A	19	N/A
Generator kWh	201,875	N/A	219,700	N/A
Annual Dth	N/A	4,064	N/A	4,417
Annual Dth/$M	N/A	10,333	N/A	8,932
Participants	322	322	350	350
Participation as % of Segment	0.028%	0.027%	0.031%	0.030%
Modified TRC Test Ratio	**2.28**	**1.23**	**1.92**	**1.21**

C. Application Process

Customers can learn about the Non-Profit Weatherization Program in a report that is submitted annually to all Low-Income facilities. The EOC also reaches out to those customers who may not be aware of funding and educate them on the benefits of a weatherization. Customers who are interested in NEEP funding can apply online through the Xcel Energy website or through participating low-income providers. The online application must also be accompanied by a third-party audit and proof that the building is registered with the Secretary of State. A committee made up of industry leaders then determines the applicant's needs and how NEEP can help.

D. Marketing Objectives, Goals, & Strategy

The EOC markets NEEP through various channels, including communications through non-profit association literature, community resource center announcements, and local low-income foundations.

E. Program-Specific Policies

To receive NEEP funding, the eligibility requirements must be met. Customers must receive electricity and/or natural gas from Public Service, operate in a property they own and for which they pay energy bills or have a long-term lease that requires only non-profits to occupy the space with plans to be in current location for at least the next ten years. The property to be upgraded must provide services to vulnerable populations including but not limited to: transitional housing, homeless shelters, affordable housing, domestic violence shelters and day shelters, organizations that provide services (substance abuse, health and mental health services, child care, education and/or emergency services) for special needs populations, including low-income families, the disabled, senior and youth communities.

In order to qualify for NEEP funding, energy efficiency measures must:

- Be recommended by an independent energy auditor based on energy conservation calculations that are available for review;
- Reduce the use of energy (natural gas or electricity or both) provided by Pubic Service to the facility, and
- Have a payback of less than 10 years.

In addition, participating NEEP agencies must be amenable to the following:

- Agree to the installation of an energy use monitoring and reporting system;
- Have a comprehensive energy audit by a qualified entity;
- Set target energy use goals for each facility; (1,048 kWh/yr; 330 Therms/yr)
- Consider installation of all qualifying efficiency measures;
- Engage appropriate contractors and manage the installation and completion of efficiency measures;
- Provide a summary project report at the completion of the installations;
- Provide all insurance and legal protections requested by Public Service, and
- Annually review the energy use of the retrofitted facility and formulate a plan for further improvement using available and appropriate assistance.

Also, we require NEEP organizations to submit the following attachments:

- Organization's year-end audited income statement from the most recently completed fiscal year;
- Copy of organization's determination letter – documentation that indicates the IRS non-profit status of the organization;
- Copy of organization's Certificate of Good Standing from Colorado Secretary of State; and
- Letter from the building owner, which must include:
    - Permission for the NEEP team to conduct an audit and do facility energy upgrades; and
    - Verification of dates for energy upgrades/energy audit, as well as intention for the building to remain in place.

F. Stakeholder Involvement

When designing the Non-Profit Weatherization Program, Public Service worked with external consultants to define which measures would ensure that the customer is comfortable in their home and will save money on their energy costs. The Company and GEO have contracted with the following low-income weatherization agencies to perform weatherization measures. These contractors are funded through the GEO and other state funding and have agreed to weatherize homes following state regulations and guidelines. The EOC uses the same contractors for the Non Profit Weatherization program as the GEO.

Region 1 – NECALG
Northeastern Colorado Association of Local Governments
231 Main St, Suite 211
Fort Morgan, CO 80701
Counties Served –Logan, Morgan, Phillips, Sedgwick, Washington, Yuma, Cheyenne, Kit Carson, Lincoln and Weld

Region 2 – Pueblo County
Pueblo County Department of Human Services
2631 East 4th
Pueblo, CO 81001
Counties Served – Baca, Bent, Crowley, Custer, Huerfano, Kiowa, Las Animas, Otero, Prowers and Pueblo

Region 3 – ERC
Energy Resource Center
5920 Paonia Court
Colorado Springs, CO 80915
Counties Served – Douglas, El Paso, Elbert, Fremont and Teller

Region 4 – HRWC
Housing Resources of Western Colorado
524 30 Rd
Grand Junction, CO 81504
Counties Served – Mesa

Region 5 – NWCCOG
Northwest Colorado Council of Governments
249 Warren Ave
PO Box 2308
Silverthorne, CO 80498
Counties Served - Chaffee, Clear Creek, Eagle, Garfield, Grand, Jackson, Lake, Moffat, Park, Pitkin, Rio Blanco, Routt and Summit

Region 6 – LPEC
Longs Peak Energy Conservation
2450 Central Ave, Suite J
Boulder, CO 80301
Counties Served – Boulder, Gilpin and Larimer

Region 7 – Arapahoe County
Arapahoe County – Housing and Community Development Services
907 Salida Way
Aurora, CO 80011
Counties Served – Adams, Arapahoe and Broomfield

Region 8 – Sun Power
Sun Power, Inc.
3200 Larimer St
Denver, CO 80205
Counties Served – Denver and Jefferson

When designing the Low-Income Segment, Public Service reviewed best practices as referenced in a 2004 study performed by Quantum Consulting Inc.[2] This Best Practices study examined the residential single-family comprehensive weatherization programs of National Grid, Sacramento Municipal Utility District, American Synergy Corporation, Pacific Gas & Electric, and NSTAR Electric, and Tacoma Power, with the end goal of improving the overall efficiency of single-family homes. Public Service modeled its Low-Income Segment on a few key points from the best practices survey, specifically:

- The most cost effective way to run the program is to pay incentives based on individual measures.
- To ensure program success, educate contractors on all program aspects to find new opportunities- contractors are the primary link between customers and energy savings.
- Focus on market transformation- market the desire for homeowners to improve the value and comfort of their home.

H. Rebate Levels

The Non-Profit Energy Efficiency Program does not provide a rebate to customers, but rather provides project funding in the form of grants. The incentive amounts for the NEEP Energy Improvements can be found in the technical assumption section in the appendix of the Plan.

G. Evaluation, Measurement & Verification Plan

The Non-Profit Energy Efficiency Program has a unique M&V plan that is detailed in the M&V section of the Indirect Segment of this Plan. The savings factors that will be verified for the Non-Profit Energy Efficiency Program are detailed in the Deemed Savings Technical Assumptions section.

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[2] Best Practice Benchmarking for Energy Efficiency Programs by Quantum Consulting, Inc., 2004.

I. Technical Assumptions

The energy savings from the Non-Profit Energy Efficiency Program will be determined by engineering audits for each facility conducted prior to selection and implementation of efficiency measures. The audit, performed by a qualified engineer, will identify efficiency measures for consideration, calculate the likely energy savings using specific on-site information and testing results, will estimate the costs for implementation and summarize the information in a report for further consideration. Program savings will include the results from measures actually implemented and the sum of savings for all facilities retrofitted under the program.

➢ Single-Family Weatherization Program

A. Description

The Single-Family Weatherization Program will offer natural gas and electric efficiency measures to low-income single-family households. Depending on need, Public Service may provide any of the following services:

Natural Gas Measures

- Furnace efficiency upgrades;
- Wall insulation;
- Ceiling insulation;

Electric Measures

- Refrigerator replacements;
-
- Compact fluorescent light bulbs (installment of 16 per home).

In addition to these measures, a major focus of this program will be customer education on ways to reduce energy use in the home. Low-income auditors will provide educational materials, historical energy usage information, and bill analysis to these customers during the weatherization process. Public Service will not claim any energy savings associated with the educational component of this program.

The Single-Family Weatherization Program will be run in partnership with the GEO. The Company's funds will supplement federal weatherization grants to produce incremental, cost-effective gas and electric savings. Public Service and the GEO will develop annual contracts with the eight weatherization agencies within the service territory. Details of measures, rebates, reporting processes, and measurement and verification procedures will be included in the new contracts.

B. Budgets & Goals

Budgets

Budgets for the Single-Family Weatherization program were developed based on the incentives paid to low-income agencies per weatherization.

Goals

Participation rates were established in partnership with GEO and the low-income agencies using historical participation in the Colorado Energy $avings Partners low-income program as a guide.

Xcel Energy will only take impact credit from funded work up to amounts in Table 70.

Table 70: Single-Family Weatherization Program Budgets and Goals

Single-Family Weatherization	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$18,579	$13,979	$11,617	$20,291
Admin & Program Delivery	$48,450	$32,635	$18,690	$31,740
Ad, Promo, & Customer Ed.	N/A	$30,990	$1,034	$55,034
Customer Incentives	$666,421	$1,928,507	$778,110	$2,100,500
Equipment & Installation	N/A	N/A	N/A	N/A
Measurement and Verification	$16,020	$80,244	$17,772	$88,296
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$749,470**	**$2,086,355**	**$827,223**	**$2,295,861**
Generator kW	175	N/A	188	N/A
Generator kWh	2,135,695	N/A	2,293,929	N/A
Annual Dth	N/A	53,551	N/A	57,515
Annual Dth/$M	N/A	25,667	N/A	25,051
Participants	1,958	2,946	2,103	3,164
Participation as % of Segment	0.172%	0.249%	0.185%	0.267%
Modified TRC Test Ratio	**2.54**	**1.36**	**2.46**	**1.35**

C. Application Process

Public Service customers will be informed of the Single-Family Weatherization program when they sign up for LIHEAP funding. In order to participate in the program, they must have applied for LIHEAP funding. Once it is determined that the customer meets the income guidelines and receives energy services from Public Service, they will be qualified by their local participating agency to receive weatherization services. Low-income agencies will actively seek out customers that qualify to participate in this program, and customers can inquire about it on their own as well. Information will be provided to new customers as they sign up for LIHEAP funding.

D. Marketing Objectives, Goals, & Strategy

The overall marketing objective of this program is to increase and expand education among the low-income customers on the importance of energy efficiency and the value of taking action to improve efficiency in their homes. Public Service will work with the low-income providers to encourage promotion of all services available. Information will be posted on Xcel Energy's website directing customers to their local agencies. The Company may also partner with other low-income groups. In Xcel Energy's Minnesota low-income program, the Company partnered with Meals On Wheels, having an informative brochure included with each meal delivered to homes in the Company's service territory. This and other similar tactics will be explored.

E. Program-Specific Policies

In order to participate, customers must purchase retail electricity or gas from Public Service on a residential tariff and have a household income below 80% of the area median income. Customers meeting DOE Weatherization Assistance Program funding guidelines, as determined by the GEO, local government, or their agencies, are automatically considered income eligible.

F. Stakeholder Involvement

When designing the Single-Family Weatherization Program, Public Service worked with external consultants to define which measures would ensure that the customer is comfortable in their home and will save money on their energy costs. The Company Service and GEO have contracted with the following low-income weatherization agencies to perform weatherization measures. These contractors are funded through the GEO and other state funding and have agreed to weatherize homes following state regulations and guidelines.

Region 1 – NECALG
Northeastern Colorado Association of Local Governments
Counties Served –Logan, Morgan, Phillips, Sedgwick, Washington, Yuma, Cheyenne, Kit Carson, Lincoln and Weld

Region 2 – Pueblo County
Pueblo County Department of Human Services
Counties Served – Baca, Bent, Crowley, Custer, Huerfano, Kiowa, Las Animas, Otero, Prowers and Pueblo

Region 3 – ERC
Energy Resource Center
5920 Paonia Court
Colorado Springs, CO 80915
Counties Served – Douglas, El Paso, Elbert, Fremont and Teller

Region 4 – HRWC
Housing Resources of Western Colorado
524 30 Rd
Grand Junction, CO 81504
Counties Served – Mesa

Region 5 – NWCCOG
Northwest Colorado Council of Governments
249 Warren Ave
PO Box 2308
Silverthorne, CO 80498
Counties Served - Chaffee, Clear Creek, Eagle, Garfield, Grand, Jackson, Lake, Moffat, Park, Pitkin, Rio Blanco, Routt and Summit

Region 6 – LPEC
Longs Peak Energy Conservation
2450 Central Ave, Suite J
Boulder, CO 80301
Counties Served – Boulder, Gilpin and Larimer

Region 7 – Arapahoe County
Arapahoe County – Housing and Community Development Services
907 Salida Way
Aurora, CO 80011
Counties Served – Adams, Arapahoe and Broomfield

Region 8 – Sun Power
Sun Power, Inc.
3200 Larimer St
Denver, CO 80205
Counties Served – Denver and Jefferson

When designing the Low-Income Segment, Public Service reviewed best practices as referenced in a 2004 study performed by Quantum Consulting Inc.[3] This Best Practices study examined the residential single-family comprehensive weatherization programs of National Grid, Sacramento Municipal Utility District, American Synergy Corporation, Pacific Gas & Electric, and NSTAR Electric, and Tacoma Power, with the end goal of improving the overall efficiency of single-family homes. Public Service modeled its Low-Income Segment on a few key points from the best practices survey, specifically:

- The most cost effective way to run the program is to pay incentives based on individual measures;
- To ensure program success, educate contractors on all program aspects to find new opportunities- contractors are the primary link between customers and energy savings; and
- Focus on market transformation- market the desire for homeowners to improve the value and comfort of their home.

H. Rebate Levels

Public Service will fund a pre-established amount for each low-income single-family weatherization measure. The following table below provides the incremental cost of each measure. The measures that were considered replacement on burnout do not include a labor and equipment rental cost, as the measure would have to be replaced regardless of whether there is an efficiency upgrade or not.

[3] Best Practice Benchmarking for Energy Efficiency Programs by Quantum Consulting, Inc., 2004.

Table 71: Incremental Cost of Efficiency Measures

Efficiency Measure	Incentive to Agency	Expected Participants 2009	Expected Participants 2010
Ceiling Insulation R-11 to R-38	715	1,450	1,550
Wall Insulation R-3 to R-11	670	494	551
Furnace AFUE 78 to 92	623	900	1000
Refrigerator Replacements	631*	600	660
Compact Fluorescent Lighting Package 16 Bulbs**	48	6,590	7,680

*Includes Incentive of $561 and Service Fee of $70 for removal, disposal
** 2009 = 105,440 bulbs
2010 = 122,880 bulbs

G. Evaluation, Measurement & Verification Plan

The Single-Family Weatherization Program has a unique M&V plan that is detailed in the M&V section of the Indirect Segment of this Plan. The savings factors that will be verified for the Single-Family Weatherization Program are detailed in the Deemed Savings Technical Assumptions section.

I. Technical Assumptions

To model the typical low-income home, an external consultant created the baseline home to determine what efficiency measures the home could benefit from. GEO also provided input on most common energy efficiency opportunities.

Table 72 below describes the pre-existing conditions and the target for each of the measures modeled. Each measure is also further categorized as a retrofit or a replace on burnout (replacement). Measures that are identified as replace on burnout are any measures that stop functioning and therefore must be replaced. For example, if a furnace stops working it must be replaced with at least the current efficiency standard. Measures that are considered retrofits are measures that still have some existing functioning level of a measure or technology; for example, the addition of ceiling insulation is considered a retrofit since there is already a low level of existing insulation. Another example of a retrofit is a CFL, since the functioning incandescent light bulbs are being replaced with new lamps.

Table 72: Pre-existing Home Measures and Energy Efficient Replacements

Measure	Pre-Condition	Target	Measure Type
Attic Insulation; Single-Family	R-15 or less	R-38	Retrofit
Wall Insulation	No existing cavity insulation	R-13	Retrofit
Furnace Replacement	78% AFUE	92% AFUE	Replacement
CFLs - 16 installed in most used fixtures	Incandescent; ≥2 hours per day	Lumen-equivalent ENERGY STAR CFL	Retrofit
Refrigerators	Functioning unit manufactured before 2001	New efficient ENERGY STAR	Replacement

LOW-INCOME SEGMENT 2009 ELECTRIC GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$113	$113	$113
Transmission & Distribution Capacity		$25	$25	$25
Marginal Energy		$675	$675	$675
Avoided Emissions (CO2, SOx)		$97	$97	$97
Subtotal		$911	$911	$911
Non-Energy Benefits Adder (20%)				$182
Subtotal		$911	$911	$1,093
Other Benefits				
Participant Rebates and Incentives	$303			$303
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$303			$303
Reduction in Sales Revenue				
Electric	$580		$545	
Subtotal	$580		$545	
Utility Program Costs				
Program Planning & Design		$8	$8	$8
Administration & Program Delivery		$54	$54	$54
Advertising/Promotion/Customer Ed		$0	$0	$0
Participant Rebates and Incentives		$303	$303	$303
Equipment & Installation		$0	$0	$0
Measurement and Verification		$10	$10	$10
Miscellaneous		$0	$0	$0
Subtotal		$376	$376	$376
Participant Costs				
Incremental Capital Costs	$205			$193
Incremental O&M Costs	$0			$0
Subtotal	$205			$193
Total Benefits	$884	$911	$911	$1,396
Total Costs	$205	$376	$920	$569
Net Benefit (Cost)	$678	$535	($10)	$827
Benefit/Cost Ratio	**4.30**	**2.42**	**0.99**	**2.45**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	8 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	9.39%
Gross Load Factor at Customer	E	14.36%
Net-to-Gross (Energy)	F	93.9%
Net-to-Gross (Demand)	G	94.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$827
MTRC Non-Energy Benefit Adder	K	$182
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.0950 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,257 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,181 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,272 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	0.18 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.02 kW
Gross Annual kWh Saved at Customer	(B x E x L)	223 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	209 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	225 kWh

Program Summary All Participants		
Total Participants	M	22,798
Total Budget	N	**$1,516,075**
Gross kW Saved at Customer	(M x L)	4,037 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**384 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	5,076,640 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	4,766,979 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**5,133,511 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$3,339,337**
TRC Net Benefits without Adder	(M x L x (J - K))	**$2,604,140**

Utility Program Cost per kWh Lifetime		**$0.0391**
Utility Program Cost per kW at Gen		**$3,952**
Participant Payback with Rebate		**-1.3 years**
Participant Payback without Rebate		**2.7 years**

LOW-INCOME SEGMENT — 2009 GAS GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$66.31	$66.31	$66.31
Variable O&M Savings		$0.34	$0.34	$0.34
Demand Savings		$3.96	$3.96	$3.96
Subtotal		$70.61	$70.61	$70.61
Emissions and Non-Energy Benefits Adder (5%)				$3.53
Subtotal		$70.61	$70.61	$74.14
Other Benefits				
Participant Rebates and Incentives	$24.78			$24.78
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$13.52			$9.89
Subtotal	$38.30			$34.67
Reduction in Sales Revenue				
Gas	$83.40		$73.76	
Subtotal	$83.40		$73.76	
Utility Program Costs				
Program Planning & Design		$0.21	$0.21	$0.21
Administration & Program Delivery		$1.81	$1.81	$1.81
Advertising/Promotion/Customer Ed		$0.27	$0.27	$0.27
Participant Rebates and Incentives		$24.78	$24.78	$24.78
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$1.03	$1.03	$1.03
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$28.11	$28.11	$28.11
Participant Costs				
Incremental Capital Costs	$43.06			$40.00
Incremental O&M Costs	$0.00			$0.00
Subtotal	$43.06			$40.00
Total Benefits	$121.71	$70.61	$70.61	$108.82
Total Costs	$43.06	$28.11	$101.87	$68.11
Net Benefit (Cost)	$78.65	$42.51	-$31.26	$40.71
Benefit/Cost Ratio	**2.83**	**2.51**	**0.69**	**1.60**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	13.37 years
Net-to-Gross (Weighted on Dth)	B	84.04%
Net-to-Gross (Weighted on Incremental Capital)	C	92.89%
Program Totals:		
Participants	D	23,786
Average Net Dth/Yr Saved	E	4.2
Total Dth/Yr Saved	F	**100,579**
Utility Costs per Net Dth/Yr	G	$33.44
Net Benefit (Cost) per Gross Dth/Yr	H	$40.71
Non-Energy Benefits Adder per Gross Dth/Yr	I	$3.53
Annual Dth/$M	($1M / G)	**29,903**
Total Utility Budget	(G x F)	**$3,363,503**
Total MTRC Net Benefits with Adder	(F x H)	**$4,872,125**
Total MTRC Net Benefits without Adder	(H - I) x F	**$4,449,600**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$2.50**
Participant Payback with Rebate		**1.5 years**
Participant Payback without Rebate		**3.8 years**

LOW-INCOME SEGMENT

2010 GAS GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$65.62	$65.62	$65.62
Variable O&M Savings		$0.34	$0.34	$0.34
Demand Savings		$3.93	$3.93	$3.93
Subtotal		$69.89	$69.89	$69.89
Emissions and Non-Energy Benefits Adder (5%)				$3.49
Subtotal		$69.89	$69.89	$73.39
Other Benefits				
Participant Rebates and Incentives	$25.67			$25.67
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$13.92			$10.18
Subtotal	$39.59			$35.85
Reduction in Sales Revenue				
Gas	$82.61		$73.08	
Subtotal	$82.61		$73.08	
Utility Program Costs				
Program Planning & Design		$0.28	$0.28	$0.28
Administration & Program Delivery		$1.77	$1.77	$1.77
Advertising/Promotion/Customer Ed		$0.43	$0.43	$0.43
Participant Rebates and Incentives		$25.67	$25.67	$25.67
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$1.06	$1.06	$1.06
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$29.21	$29.21	$29.21
Participant Costs				
Incremental Capital Costs	$42.71			$39.65
Incremental O&M Costs	$0.00			$0.00
Subtotal	$42.71			$39.65
Total Benefits	$122.20	$69.89	$69.89	$109.23
Total Costs	$42.71	$29.21	$102.29	$68.86
Net Benefit (Cost)	$79.49	$40.69	-$32.40	$40.37
Benefit/Cost Ratio	**2.86**	**2.39**	**0.68**	**1.59**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	13.31 years
Net-to-Gross (Weighted on Dth)	B	83.90%
Net-to-Gross (Weighted on Incremental Capital)	C	92.85%

Program Totals:		
Participants	D	26,070
Average Net Dth/Yr Saved	E	4.2
Total Dth/Yr Saved	F	**109,024**
Utility Costs per Net Dth/Yr	G	$34.81
Net Benefit (Cost) per Gross Dth/Yr	H	$40.37
Non-Energy Benefits Adder per Gross Dth/Yr	I	$3.49
Annual Dth/$M	($1M / G)	**28,727**
Total Utility Budget	(G x F)	**$3,795,193**
Total MTRC Net Benefits with Adder	(F x H)	**$5,246,578**
Total MTRC Net Benefits without Adder	(H - I) x F	**$4,792,455**

Utility Program Cost per Net Dth Lifetime	(G / A)	**$2.62**
Participant Payback with Rebate		**1.4 years**
Participant Payback without Rebate		**3.8 years**

LOW-INCOME SEGMENT 2010 ELECTRIC GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$114	$114	$114
Transmission & Distribution Capacity		$24	$24	$24
Marginal Energy		$646	$646	$646
Avoided Emissions (CO2, SOx)		$119	$119	$119
Subtotal		$903	$903	$903
Non-Energy Benefits Adder (20%)				$181
Subtotal		$903	$903	$1,084
Other Benefits				
Participant Rebates and Incentives	$295			$295
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$295			$295
Reduction in Sales Revenue				
Electric	$578		$543	
Subtotal	$578		$543	
Utility Program Costs				
Program Planning & Design		$5	$5	$5
Administration & Program Delivery		$49	$49	$49
Advertising/Promotion/Customer Ed		$0	$0	$0
Participant Rebates and Incentives		$321	$321	$321
Equipment & Installation		$0	$0	$0
Measurement and Verification		$11	$11	$11
Miscellaneous		$0	$0	$0
Subtotal		$386	$386	$386
Participant Costs				
Incremental Capital Costs	$205			$193
Incremental O&M Costs	$0			$0
Subtotal	$205			$193
Total Benefits	$873	$903	$903	$1,379
Total Costs	$205	$386	$929	$579
Net Benefit (Cost)	$668	$517	($26)	$799
Benefit/Cost Ratio	**4.25**	**2.34**	**0.97**	**2.38**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	8 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	9.38%
Gross Load Factor at Customer	E	14.35%
Net-to-Gross (Energy)	F	93.9%
Net-to-Gross (Demand)	G	94.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$799
MTRC Non-Energy Benefit Adder	K	$181
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.0949 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,257 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,180 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,271 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	0.18 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.02 kW
Gross Annual kWh Saved at Customer	(B x E x L)	221 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	207 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	223 kWh

Program Summary All Participants		
Total Participants	M	25,009
Total Budget	N	**$1,695,693**
Gross kW Saved at Customer	(M x L)	4,391 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**417 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	5,519,654 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	5,182,280 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**5,580,745 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$3,508,883**
TRC Net Benefits without Adder	(M x L x (J - K))	**$2,715,873**

Utility Program Cost per kWh Lifetime	**$0.0402**
Utility Program Cost per kW at Gen	**$4,071**
Participant Payback with Rebate	**-1.2 years**
Participant Payback without Rebate	**2.7 years**

EASY SAVINGS ENERGY KITS PROGRAM — 2009 — ELECTRIC — GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$59	$59	$59
Transmission & Distribution Capacity		$13	$13	$13
Marginal Energy		$628	$628	$628
Avoided Emissions (CO2, SOx)		$83	$83	$83
Subtotal		$783	$783	$783
Non-Energy Benefits Adder (20%)				$157
Subtotal		$783	$783	$940
Other Benefits				
Participant Rebates and Incentives	$202			$202
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$202			$202
Reduction in Sales Revenue				
Electric	$528		$491	
Subtotal	$528		$491	
Utility Program Costs				
Program Planning & Design		$2	$2	$2
Administration & Program Delivery		$75	$75	$75
Advertising/Promotion/Customer Ed		$0	$0	$0
Participant Rebates and Incentives		$202	$202	$202
Equipment & Installation		$0	$0	$0
Measurement and Verification		$11	$11	$11
Miscellaneous		$0	$0	$0
Subtotal		$290	$290	$290
Participant Costs				
Incremental Capital Costs	$202			$188
Incremental O&M Costs	$0			$0
Subtotal	$202			$188
Total Benefits	$730	$783	$783	$1,141
Total Costs	$202	$290	$781	$477
Net Benefit (Cost)	$528	$493	$2	$664
Benefit/Cost Ratio	**3.62**	**2.70**	**1.00**	**2.39**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	7 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	8.00%
Gross Load Factor at Customer	E	13.81%
Net-to-Gross (Energy)	F	93.0%
Net-to-Gross (Demand)	G	93.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$664
MTRC Non-Energy Benefit Adder	K	$157
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.0801 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,210 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,125 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,212 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	0.10 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.01 kW
Gross Annual kWh Saved at Customer	(B x E x L)	123 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	115 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	124 kWh

Program Summary All Participants		
Total Participants	M	20,000
Total Budget	N	**$591,185**
Gross kW Saved at Customer	(M x L)	2,040 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**163 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	2,468,400 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	2,295,612 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**2,472,121 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$1,354,447**
TRC Net Benefits without Adder	(M x L x (J - K))	**$1,034,974**
Utility Program Cost per kWh Lifetime		**$0.0362**
Utility Program Cost per kW at Gen		**$3,617**
Participant Payback with Rebate		**0.0 years**
Participant Payback without Rebate		**2.5 years**

EASY SAVINGS ENERGY KITS PROGRAM	2009	GAS	GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$31.38	$31.38	$31.38
Variable O&M Savings		$0.17	$0.17	$0.17
Demand Savings		$1.97	$1.97	$1.97
Subtotal		$33.52	$33.52	$33.52
Emissions and Non-Energy Benefits Adder (5%)				$1.68
Subtotal		$33.52	$33.52	$35.20
Other Benefits				
Participant Rebates and Incentives	$7.85			$7.85
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$26.02			$18.21
Subtotal	$33.87			$26.06
Reduction in Sales Revenue				
Gas	$49.98		$34.99	
Subtotal	$49.98		$34.99	
Utility Program Costs				
Program Planning & Design		$0.07	$0.07	$0.07
Administration & Program Delivery		$2.93	$2.93	$2.93
Advertising/Promotion/Customer Ed		$0.01	$0.01	$0.01
Participant Rebates and Incentives		$7.85	$7.85	$7.85
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.43	$0.43	$0.43
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$11.29	$11.29	$11.29
Participant Costs				
Incremental Capital Costs	$7.85			$5.50
Incremental O&M Costs	$0.00			$0.00
Subtotal	$7.85			$5.50
Total Benefits	$83.85	$33.52	$33.52	$61.26
Total Costs	$7.85	$11.29	$46.28	$16.79
Net Benefit (Cost)	$76.00	$22.23	-$12.76	$44.47
Benefit/Cost Ratio	**10.68**	**2.97**	**0.72**	**3.65**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	5.78 years
Net-to-Gross (Weighted on Dth)	B	70.00%
Net-to-Gross (Weighted on Incremental Capital)	C	70.00%

Program Totals:		
Participants	D	20,000
Average Net Dth/Yr Saved	E	1.8
Total Dth/Yr Saved	F	**36,666**
Utility Costs per Net Dth/Yr	G	$16.13
Net Benefit (Cost) per Gross Dth/Yr	H	$44.47
Non-Energy Benefits Adder per Gross Dth/Yr	I	$1.68
Annual Dth/$M	($1M / G)	**61,978**
Total Utility Budget	(G x F)	**$591,599**
Total MTRC Net Benefits with Adder	(F x H)	**$2,329,354**
Total MTRC Net Benefits without Adder	(H - I) x F	**$2,241,560**

Utility Program Cost per Net Dth Lifetime	(G / A)	**$2.79**
Participant Payback with Rebate		**0.0 years**
Participant Payback without Rebate		**0.7 years**

EASY SAVINGS ENERGY KITS PROGRAM — 2010 — ELECTRIC — GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$61	$61	$61
Transmission & Distribution Capacity		$13	$13	$13
Marginal Energy		$600	$600	$600
Avoided Emissions (CO2, SOx)		$104	$104	$104
Subtotal		$779	$779	$779
Non-Energy Benefits Adder (20%)				$156
Subtotal		$779	$779	$934
Other Benefits				
Participant Rebates and Incentives	$202			$202
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$202			$202
Reduction in Sales Revenue				
Electric	$533		$495	
Subtotal	$533		$495	
Utility Program Costs				
Program Planning & Design		$1	$1	$1
Administration & Program Delivery		$76	$76	$76
Advertising/Promotion/Customer Ed		$0	$0	$0
Participant Rebates and Incentives		$202	$202	$202
Equipment & Installation		$0	$0	$0
Measurement and Verification		$11	$11	$11
Miscellaneous		$0	$0	$0
Subtotal		$290	$290	$290
Participant Costs				
Incremental Capital Costs	$202			$188
Incremental O&M Costs	$0			$0
Subtotal	$202			$188
Total Benefits	$734	$779	$779	$1,136
Total Costs	$202	$290	$785	$477
Net Benefit (Cost)	$533	$489	($6)	$659
Benefit/Cost Ratio	**3.64**	**2.69**	**0.99**	**2.38**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	7 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	8.00%
Gross Load Factor at Customer	E	13.81%
Net-to-Gross (Energy)	F	93.0%
Net-to-Gross (Demand)	G	93.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$659
MTRC Non-Energy Benefit Adder	K	$156
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.0801 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,210 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,125 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,212 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	0.10 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.01 kW
Gross Annual kWh Saved at Customer	(B x E x L)	123 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	115 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	124 kWh

Program Summary All Participants		
Total Participants	M	22,000
Total Budget	N	**$650,410**
Gross kW Saved at Customer	(M x L)	2,244 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**180 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	2,715,240 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	2,525,173 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**2,719,334 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$1,478,001**
TRC Net Benefits without Adder	(M x L x (J - K))	**$1,128,544**

Utility Program Cost per kWh Lifetime	**$0.0362**
Utility Program Cost per kW at Gen	**$3,618**
Participant Payback with Rebate	**0.0 years**
Participant Payback without Rebate	**2.5 years**

EASY SAVINGS ENERGY KITS PROGRAM	2010	GAS	GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$30.44	$30.44	$30.44
Variable O&M Savings		$0.17	$0.17	$0.17
Demand Savings		$1.97	$1.97	$1.97
Subtotal		$32.58	$32.58	$32.58
Emissions and Non-Energy Benefits Adder (5%)				$1.63
Subtotal		$32.58	$32.58	$34.21
Other Benefits				
Participant Rebates and Incentives	$7.85			$7.85
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$26.53			$18.57
Subtotal	$34.39			$26.43
Reduction in Sales Revenue				
Gas	$48.67		$34.07	
Subtotal	$48.67		$34.07	
Utility Program Costs				
Program Planning & Design		$0.10	$0.10	$0.10
Administration & Program Delivery		$2.91	$2.91	$2.91
Advertising/Promotion/Customer Ed		$0.00	$0.00	$0.00
Participant Rebates and Incentives		$7.85	$7.85	$7.85
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.43	$0.43	$0.43
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$11.30	$11.30	$11.30
Participant Costs				
Incremental Capital Costs	$7.85			$5.50
Incremental O&M Costs	$0.00			$0.00
Subtotal	$7.85			$5.50
Total Benefits	$83.06	$32.58	$32.58	$60.63
Total Costs	$7.85	$11.30	$45.37	$16.80
Net Benefit (Cost)	$75.21	$21.27	-$12.80	$43.83
Benefit/Cost Ratio	**10.58**	**2.88**	**0.72**	**3.61**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	5.78 years
Net-to-Gross (Weighted on Dth)	B	70.00%
Net-to-Gross (Weighted on Incremental Capital)	C	70.00%

Program Totals:		
Participants	D	22,000
Average Net Dth/Yr Saved	E	1.8
Total Dth/Yr Saved	F	**40,333**
Utility Costs per Net Dth/Yr	G	$16.15
Net Benefit (Cost) per Gross Dth/Yr	H	$43.83
Non-Energy Benefits Adder per Gross Dth/Yr	I	$1.63
Annual Dth/$M	($1M / G)	**61,932**
Total Utility Budget	(G x F)	**$651,246**
Total MTRC Net Benefits with Adder	(F x H)	**$2,525,556**
Total MTRC Net Benefits without Adder	(H - I) x F	**$2,431,703**

Utility Program Cost per Net Dth Lifetime	(G / A)	**$2.79**
Participant Payback with Rebate		**0.0 years**
Participant Payback without Rebate		**0.7 years**

MULTI-FAMILY WEATHERIZATION PROGRAM 2009 ELECTRIC GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$85	$85	$85
Transmission & Distribution Capacity		$19	$19	$19
Marginal Energy		$623	$623	$623
Avoided Emissions (CO_2, SOx)		$89	$89	$89
Subtotal		$817	$817	$817
Non-Energy Benefits Adder (20%)				$163
Subtotal		$817	$817	$981
Other Benefits				
Participant Rebates and Incentives	$363			$363
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$363			$363
Reduction in Sales Revenue				
Electric	$578		$520	
Subtotal	$578		$520	
Utility Program Costs				
Program Planning & Design		$20	$20	$20
Administration & Program Delivery		$38	$38	$38
Advertising/Promotion/Customer Ed		$0	$0	$0
Participant Rebates and Incentives		$363	$363	$363
Equipment & Installation		$0	$0	$0
Measurement and Verification		$6	$6	$6
Miscellaneous		$0	$0	$0
Subtotal		$427	$427	$427
Participant Costs				
Incremental Capital Costs	$145			$130
Incremental O&M Costs	$0			$0
Subtotal	$145			$130
Total Benefits	$941	$817	$817	$1,344
Total Costs	$145	$427	$948	$558
Net Benefit (Cost)	$796	$390	($130)	$786
Benefit/Cost Ratio	**6.50**	**1.91**	**0.86**	**2.41**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	7 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	11.49%
Gross Load Factor at Customer	E	15.32%
Net-to-Gross (Energy)	F	90.0%
Net-to-Gross (Demand)	G	90.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$786
MTRC Non-Energy Benefit Adder	K	$163
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.1113 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,342 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,208 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,300 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	0.48 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.05 kW
Gross Annual kWh Saved at Customer	(B x E x L)	645 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	581 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	625 kWh

Program Summary All Participants		
Total Participants	M	518
Total Budget	N	**$106,432**
Gross kW Saved at Customer	(M x L)	249 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**28 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	334,111 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	300,700 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**323,820 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$195,665**
TRC Net Benefits without Adder	(M x L x (J - K))	**$154,960**

Utility Program Cost per kWh Lifetime	**$0.0453**
Utility Program Cost per kW at Gen	**$3,839**
Participant Payback with Rebate	**-2.7 years**
Participant Payback without Rebate	**1.8 years**

MULTI-FAMILY WEATHERIZATION PROGRAM — 2009 — GAS — GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$86.42	$86.42	$86.42
Variable O&M Savings		$0.44	$0.44	$0.44
Demand Savings		$5.10	$5.10	$5.10
Subtotal		$91.96	$91.96	$91.96
Emissions and Non-Energy Benefits Adder (5%)				$4.60
Subtotal		$91.96	$91.96	$96.56
Other Benefits				
Participant Rebates and Incentives	$36.96			$36.96
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$22.55			$20.29
Subtotal	$59.51			$57.25
Reduction in Sales Revenue				
Gas	$106.76		$96.09	
Subtotal	$106.76		$96.09	
Utility Program Costs				
Program Planning & Design		$0.54	$0.54	$0.54
Administration & Program Delivery		$3.52	$3.52	$3.52
Advertising/Promotion/Customer Ed		$0.04	$0.04	$0.04
Participant Rebates and Incentives		$36.96	$36.96	$36.96
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.71	$0.71	$0.71
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$41.77	$41.77	$41.77
Participant Costs				
Incremental Capital Costs	$73.92			$66.53
Incremental O&M Costs	$0.00			$0.00
Subtotal	$73.92			$66.53
Total Benefits	$166.27	$91.96	$91.96	$153.81
Total Costs	$73.92	$41.77	$137.86	$108.30
Net Benefit (Cost)	$92.35	$50.19	-$45.89	$45.52
Benefit/Cost Ratio	**2.25**	**2.20**	**0.67**	**1.42**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	17.13 years
Net-to-Gross (Weighted on Dth)	B	90.00%
Net-to-Gross (Weighted on Incremental Capital)	C	90.00%
Program Totals:		
Participants	D	518
Average Net Dth/Yr Saved	E	12.2
Total Dth/Yr Saved	F	**6,298**
Utility Costs per Net Dth/Yr	G	$46.41
Net Benefit (Cost) per Gross Dth/Yr	H	$45.52
Non-Energy Benefits Adder per Gross Dth/Yr	I	$4.60
Annual Dth/$M	($1M / G)	**21,547**
Total Utility Budget	(G x F)	**$292,290**
Total MTRC Net Benefits with Adder	(F x H)	**$318,497**
Total MTRC Net Benefits without Adder	(H - I) x F	**$286,321**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$2.71**
Participant Payback with Rebate		**2.9 years**
Participant Payback without Rebate		**6.5 years**

MULTI-FAMILY WEATHERIZATION PROGRAM 2010 ELECTRIC GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$87	$87	$87
Transmission & Distribution Capacity		$19	$19	$19
Marginal Energy		$589	$589	$589
Avoided Emissions (CO_2, SOx)		$111	$111	$111
Subtotal		$807	$807	$807
Non-Energy Benefits Adder (20%)				$161
Subtotal		$807	$807	$968
Other Benefits				
Participant Rebates and Incentives	$346			$346
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$346			$346
Reduction in Sales Revenue				
Electric	$574		$517	
Subtotal	$574		$517	
Utility Program Costs				
Program Planning & Design		$12	$12	$12
Administration & Program Delivery		$64	$64	$64
Advertising/Promotion/Customer Ed		$1	$1	$1
Participant Rebates and Incentives		$383	$383	$383
Equipment & Installation		$0	$0	$0
Measurement and Verification		$9	$9	$9
Miscellaneous		$0	$0	$0
Subtotal		$469	$469	$469
Participant Costs				
Incremental Capital Costs	$145			$130
Incremental O&M Costs	$0			$0
Subtotal	$145			$130
Total Benefits	$920	$807	$807	$1,314
Total Costs	$145	$469	$986	$599
Net Benefit (Cost)	$775	$337	($179)	$714
Benefit/Cost Ratio	**6.35**	**1.72**	**0.82**	**2.19**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	7 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	11.49%
Gross Load Factor at Customer	E	15.32%
Net-to-Gross (Energy)	F	90.0%
Net-to-Gross (Demand)	G	90.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$714
MTRC Non-Energy Benefit Adder	K	$161
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.1113 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,342 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,208 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,300 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	0.48 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.05 kW
Gross Annual kWh Saved at Customer	(B x E x L)	645 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	581 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	626 kWh

Program Summary All Participants		
Total Participants	M	556
Total Budget	N	**$125,458**
Gross kW Saved at Customer	(M x L)	267 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**30 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	358,835 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	322,951 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**347,783 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$190,972**
TRC Net Benefits without Adder	(M x L x (J - K))	**$147,832**

Utility Program Cost per kWh Lifetime	**$0.0498**
Utility Program Cost per kW at Gen	**$4,214**
Participant Payback with Rebate	**-2.5 years**
Participant Payback without Rebate	**1.8 years**

MULTI-FAMILY WEATHERIZATION PROGRAM — 2010 — GAS — GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$86.51	$86.51	$86.51
Variable O&M Savings		$0.44	$0.44	$0.44
Demand Savings		$5.10	$5.10	$5.10
Subtotal		$92.06	$92.06	$92.06
Emissions and Non-Energy Benefits Adder (5%)				$4.60
Subtotal		$92.06	$92.06	$96.66
Other Benefits				
Participant Rebates and Incentives	$42.42			$42.42
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$22.99			$20.69
Subtotal	$65.42			$63.12
Reduction in Sales Revenue				
Gas	$106.95		$96.26	
Subtotal	$106.95		$96.26	
Utility Program Costs				
Program Planning & Design		$0.74	$0.74	$0.74
Administration & Program Delivery		$3.22	$3.22	$3.22
Advertising/Promotion/Customer Ed		$0.04	$0.04	$0.04
Participant Rebates and Incentives		$42.42	$42.42	$42.42
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$0.66	$0.66	$0.66
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$47.08	$47.08	$47.08
Participant Costs				
Incremental Capital Costs	$73.92			$66.53
Incremental O&M Costs	$0.00			$0.00
Subtotal	$73.92			$66.53
Total Benefits	$172.37	$92.06	$92.06	$159.78
Total Costs	$73.92	$47.08	$143.34	$113.61
Net Benefit (Cost)	$98.45	$44.98	-$51.28	$46.17
Benefit/Cost Ratio	**2.33**	**1.96**	**0.64**	**1.41**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	17.13 years
Net-to-Gross (Weighted on Dth)	B	90.00%
Net-to-Gross (Weighted on Incremental Capital)	C	90.00%

Program Totals:		
Participants	D	556
Average Net Dth/Yr Saved	E	12.2
Total Dth/Yr Saved	F	**6,760**
Utility Costs per Net Dth/Yr	G	$52.31
Net Benefit (Cost) per Gross Dth/Yr	H	$46.17
Non-Energy Benefits Adder per Gross Dth/Yr	I	$4.60
Annual Dth/$M	($1M / G)	**19,116**
Total Utility Budget	(G x F)	**$353,615**
Total MTRC Net Benefits with Adder	(F x H)	**$346,773**
Total MTRC Net Benefits without Adder	(H - I) x F	**$312,202**

Utility Program Cost per Net Dth Lifetime	(G / A)	**$3.05**
Participant Payback with Rebate		**2.5 years**
Participant Payback without Rebate		**6.5 years**

NON-PROFIT ENERGY EFFICIENCY PROGRAM — 2009 — ELECTRIC — GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$86	$86	$86
Transmission & Distribution Capacity		$19	$19	$19
Marginal Energy		$624	$624	$624
Avoided Emissions (CO2, SOx)		$90	$90	$90
Subtotal		$819	$819	$819
Non-Energy Benefits Adder (20%)				$164
Subtotal		$819	$819	$983
Other Benefits				
Participant Rebates and Incentives	$365			$365
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$365			$365
Reduction in Sales Revenue				
Electric	$579		$521	
Subtotal	$579		$521	
Utility Program Costs				
Program Planning & Design		$33	$33	$33
Administration & Program Delivery		$42	$42	$42
Advertising/Promotion/Customer Ed		$0	$0	$0
Participant Rebates and Incentives		$365	$365	$365
Equipment & Installation		$0	$0	$0
Measurement and Verification		$6	$6	$6
Miscellaneous		$0	$0	$0
Subtotal		$445	$445	$445
Participant Costs				
Incremental Capital Costs	$163			$146
Incremental O&M Costs	$0			$0
Subtotal	$163			$146
Total Benefits	$945	$819	$819	$1,348
Total Costs	$163	$445	$967	$592
Net Benefit (Cost)	$782	$373	($148)	$756
Benefit/Cost Ratio	**5.81**	**1.84**	**0.85**	**2.28**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	7 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	11.53%
Gross Load Factor at Customer	E	15.35%
Net-to-Gross (Energy)	F	90.0%
Net-to-Gross (Demand)	G	90.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$756
MTRC Non-Energy Benefit Adder	K	$164
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.1118 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,345 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,210 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,303 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	0.48 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.05 kW
Gross Annual kWh Saved at Customer	(B x E x L)	647 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	582 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	627 kWh

Program Summary All Participants		
Total Participants	M	322
Total Budget	N	**$68,991**
Gross kW Saved at Customer	(M x L)	155 kW
Net coincident kW Saved at Generator	((G x L) x D / (1 - I)) x M	**17 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	208,290 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	187,461 kWh
Net Annual kWh Saved at Generator	((F x (B x E x L)) / (1 - H)) x M	**201,875 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$117,107**
TRC Net Benefits without Adder	(M x L x (J - K))	**$91,741**

Utility Program Cost per kWh Lifetime	**$0.0472**
Utility Program Cost per kW at Gen	**$3,985**
Participant Payback with Rebate	**-2.5 years**
Participant Payback without Rebate	**2.0 years**

NON-PROFIT ENERGY EFFICIENCY PROGRAM — 2009 GAS GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$86.14	$86.14	$86.14
Variable O&M Savings		$0.44	$0.44	$0.44
Demand Savings		$5.09	$5.09	$5.09
Subtotal		$91.67	$91.67	$91.67
Emissions and Non-Energy Benefits Adder (5%)				$4.58
Subtotal		$91.67	$91.67	$96.26
Other Benefits				
Participant Rebates and Incentives	$81.44			$81.44
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$21.57			$19.42
Subtotal	$103.01			$100.85
Reduction in Sales Revenue				
Gas	$106.43		$95.78	
Subtotal	$106.43		$95.78	
Utility Program Costs				
Program Planning & Design		$0.84	$0.84	$0.84
Administration & Program Delivery		$1.41	$1.41	$1.41
Advertising/Promotion/Customer Ed		$0.06	$0.06	$0.06
Participant Rebates and Incentives		$81.44	$81.44	$81.44
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$3.35	$3.35	$3.35
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$87.10	$87.10	$87.10
Participant Costs				
Incremental Capital Costs	$81.44			$73.29
Incremental O&M Costs	$0.00			$0.00
Subtotal	$81.44			$73.29
Total Benefits	$209.44	$91.67	$91.67	$197.11
Total Costs	$81.44	$87.10	$182.88	$160.39
Net Benefit (Cost)	$128.00	$4.57	-$91.21	$36.72
Benefit/Cost Ratio	**2.57**	**1.05**	**0.50**	**1.23**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	17.02 years
Net-to-Gross (Weighted on Dth)	B	90.00%
Net-to-Gross (Weighted on Incremental Capital)	C	90.00%
Program Totals:		
Participants	D	322
Average Net Dth/Yr Saved	E	12.6
Total Dth/Yr Saved	F	**4,064**
Utility Costs per Net Dth/Yr	G	$96.78
Net Benefit (Cost) per Gross Dth/Yr	H	$36.72
Non-Energy Benefits Adder per Gross Dth/Yr	I	$4.58
Annual Dth/$M	($1M / G)	**10,333**
Total Utility Budget	(G x F)	**$393,258**
Total MTRC Net Benefits with Adder	(F x H)	**$165,783**
Total MTRC Net Benefits without Adder	(H - I) x F	**$145,087**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$5.69**
Participant Payback with Rebate		**0.0 years**
Participant Payback without Rebate		**7.2 years**

NON-PROFIT ENERGY EFFICIENCY PROGRAM 2010 ELECTRIC GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$87	$87	$87
Transmission & Distribution Capacity		$19	$19	$19
Marginal Energy		$590	$590	$590
Avoided Emissions (CO_2, SOx)		$112	$112	$112
Subtotal		$809	$809	$809
Non-Energy Benefits Adder (20%)				$162
Subtotal		$809	$809	$970
Other Benefits				
Participant Rebates and Incentives	$368			$368
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$368			$368
Reduction in Sales Revenue				
Electric	$576		$518	
Subtotal	$576		$518	
Utility Program Costs				
Program Planning & Design		$19	$19	$19
Administration & Program Delivery		$66	$66	$66
Advertising/Promotion/Customer Ed		$2	$2	$2
Participant Rebates and Incentives		$455	$455	$455
Equipment & Installation		$0	$0	$0
Measurement and Verification		$9	$9	$9
Miscellaneous		$0	$0	$0
Subtotal		$550	$550	$550
Participant Costs				
Incremental Capital Costs	$163			$147
Incremental O&M Costs	$0			$0
Subtotal	$163			$147
Total Benefits	$944	$809	$809	$1,338
Total Costs	$163	$550	$1,068	$697
Net Benefit (Cost)	$781	$259	($260)	$641
Benefit/Cost Ratio	**5.79**	**1.47**	**0.76**	**1.92**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	7 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	11.55%
Gross Load Factor at Customer	E	15.37%
Net-to-Gross (Energy)	F	90.0%
Net-to-Gross (Demand)	G	90.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$641
MTRC Non-Energy Benefit Adder	K	$162
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.1120 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,346 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,212 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,305 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	0.48 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.05 kW
Gross Annual kWh Saved at Customer	(B x E x L)	648 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	583 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	628 kWh

Program Summary All Participants		
Total Participants	M	350
Total Budget	N	**$92,602**
Gross kW Saved at Customer	(M x L)	168 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**19 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	226,681 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	204,013 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**219,700 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$108,003**
TRC Net Benefits without Adder	(M x L x (J - K))	**$80,770**

Utility Program Cost per kWh Lifetime	**$0.0582**
Utility Program Cost per kW at Gen	**$4,911**
Participant Payback with Rebate	**-2.6 years**
Participant Payback without Rebate	**2.1 years**

NON-PROFIT ENERGY EFFICIENCY PROGRAM — 2010 — GAS — GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$86.23	$86.23	$86.23
Variable O&M Savings		$0.44	$0.44	$0.44
Demand Savings		$5.09	$5.09	$5.09
Subtotal		$91.76	$91.76	$91.76
Emissions and Non-Energy Benefits Adder (5%)				$4.59
Subtotal		$91.76	$91.76	$96.35
Other Benefits				
Participant Rebates and Incentives	$94.48			$94.48
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$22.00			$19.80
Subtotal	$116.49			$114.29
Reduction in Sales Revenue				
Gas	$106.61		$95.95	
Subtotal	$106.61		$95.95	
Utility Program Costs				
Program Planning & Design		$1.13	$1.13	$1.13
Administration & Program Delivery		$1.21	$1.21	$1.21
Advertising/Promotion/Customer Ed		$0.06	$0.06	$0.06
Participant Rebates and Incentives		$94.48	$94.48	$94.48
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$3.87	$3.87	$3.87
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$100.76	$100.76	$100.76
Participant Costs				
Incremental Capital Costs	$81.44			$73.29
Incremental O&M Costs	$0.00			$0.00
Subtotal	$81.44			$73.29
Total Benefits	$223.09	$91.76	$91.76	$210.64
Total Costs	$81.44	$100.76	$196.70	$174.05
Net Benefit (Cost)	$141.66	-$9.00	-$104.94	$36.59
Benefit/Cost Ratio	**2.74**	**0.91**	**0.47**	**1.21**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	17.02 years
Net-to-Gross (Weighted on Dth)	B	90.00%
Net-to-Gross (Weighted on Incremental Capital)	C	90.00%

Program Totals:		
Participants	D	350
Average Net Dth/Yr Saved	E	12.6
Total Dth/Yr Saved	F	**4,417**
Utility Costs per Net Dth/Yr	G	$111.95
Net Benefit (Cost) per Gross Dth/Yr	H	$36.59
Non-Energy Benefits Adder per Gross Dth/Yr	I	$4.59
Annual Dth/$M	($1M / G)	**8,932**
Total Utility Budget	(G x F)	**$494,471**
Total MTRC Net Benefits with Adder	(F x H)	**$179,552**
Total MTRC Net Benefits without Adder	(H - I) x F	**$157,035**

Utility Program Cost per Net Dth Lifetime	(G / A)	**$6.58**
Participant Payback with Rebate		**-1.0 years**
Participant Payback without Rebate		**7.2 years**

SINGLE-FAMILY WEATHERIZATION PROGRAM	2009	ELECTRIC	GOAL

2009 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$193	$193	$193
Transmission & Distribution Capacity		$42	$42	$42
Marginal Energy		$751	$751	$751
Avoided Emissions (CO2, SOx)		$117	$117	$117
Subtotal		$1,102	$1,102	$1,102
Non-Energy Benefits Adder (20%)				$220
Subtotal		$1,102	$1,102	$1,323
Other Benefits				
Participant Rebates and Incentives	$418			$418
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$418			$418
Reduction in Sales Revenue				
Electric	$647		$621	
Subtotal	$647		$621	
Utility Program Costs				
Program Planning & Design		$12	$12	$12
Administration & Program Delivery		$30	$30	$30
Advertising/Promotion/Customer Ed		$0	$0	$0
Participant Rebates and Incentives		$418	$418	$418
Equipment & Installation		$0	$0	$0
Measurement and Verification		$10	$10	$10
Miscellaneous		$0	$0	$0
Subtotal		$470	$470	$470
Participant Costs				
Incremental Capital Costs	$224			$215
Incremental O&M Costs	$0			$0
Subtotal	$224			$215
Total Benefits	$1,066	$1,102	$1,102	$1,741
Total Costs	$224	$470	$1,092	$686
Net Benefit (Cost)	$841	$632	$11	$1,056
Benefit/Cost Ratio	**4.75**	**2.34**	**1.01**	**2.54**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	9 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	10.64%
Gross Load Factor at Customer	E	14.80%
Net-to-Gross (Energy)	F	96.0%
Net-to-Gross (Demand)	G	96.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$1,056
MTRC Non-Energy Benefit Adder	K	$220
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.1100 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,297 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,245 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,341 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	0.81 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.09 kW
Gross Annual kWh Saved at Customer	(B x E x L)	1,055 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	1,013 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	1,091 kWh

Program Summary All Participants		
Total Participants	M	1,958
Total Budget	N	**$749,466**
Gross kW Saved at Customer	(M x L)	1,593 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**175 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	2,065,840 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	1,983,206 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**2,135,695 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$1,681,966**
TRC Net Benefits without Adder	(M x L x (J - K))	**$1,330,671**

Utility Program Cost per kWh Lifetime	**$0.0402**
Utility Program Cost per kW at Gen	**$4,278**
Participant Payback with Rebate	**-2.6 years**
Participant Payback without Rebate	**3.0 years**

SINGLE-FAMILY WEATHERIZATION PROGRAM — 2009 — GAS — GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$94.99	$94.99	$94.99
Variable O&M Savings		$0.48	$0.48	$0.48
Demand Savings		$5.59	$5.59	$5.59
Subtotal		$101.06	$101.06	$101.06
Emissions and Non-Energy Benefits Adder (5%)				$5.05
Subtotal		$101.06	$101.06	$106.11
Other Benefits				
Participant Rebates and Incentives	$34.57			$34.57
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$34.57			$34.57
Reduction in Sales Revenue				
Gas	$109.99		$105.59	
Subtotal	$109.99		$105.59	
Utility Program Costs				
Program Planning & Design		$0.25	$0.25	$0.25
Administration & Program Delivery		$0.59	$0.59	$0.59
Advertising/Promotion/Customer Ed		$0.56	$0.56	$0.56
Participant Rebates and Incentives		$34.57	$34.57	$34.57
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$1.44	$1.44	$1.44
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$37.40	$37.40	$37.40
Participant Costs				
Incremental Capital Costs	$69.14			$66.38
Incremental O&M Costs	$0.00			$0.00
Subtotal	$69.14			$66.38
Total Benefits	$144.56	$101.06	$101.06	$140.68
Total Costs	$69.14	$37.40	$142.99	$103.78
Net Benefit (Cost)	$75.42	$63.65	-$41.93	$36.90
Benefit/Cost Ratio	**2.09**	**2.70**	**0.71**	**1.36**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	17.86 years
Net-to-Gross (Weighted on Dth)	B	96.00%
Net-to-Gross (Weighted on Incremental Capital)	C	96.00%
Program Totals:		
Participants	D	2,946
Average Net Dth/Yr Saved	E	18.2
Total Dth/Yr Saved	F	**53,551**
Utility Costs per Net Dth/Yr	G	$38.96
Net Benefit (Cost) per Gross Dth/Yr	H	$36.90
Non-Energy Benefits Adder per Gross Dth/Yr	I	$5.05
Annual Dth/$M	($1M / G)	**25,667**
Total Utility Budget	(G x F)	**$2,086,355**
Total MTRC Net Benefits with Adder	(F x H)	**$2,058,491**
Total MTRC Net Benefits without Adder	(H - I) x F	**$1,776,632**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$2.18**
Participant Payback with Rebate		**3.1 years**
Participant Payback without Rebate		**6.1 years**

SINGLE-FAMILY WEATHERIZATION PROGRAM 2010 ELECTRIC GOAL

2010 Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		$191	$191	$191
Transmission & Distribution Capacity		$40	$40	$40
Marginal Energy		$723	$723	$723
Avoided Emissions (CO_2, SOx)		$141	$141	$141
Subtotal		$1,096	$1,096	$1,096
Non-Energy Benefits Adder (20%)				$219
Subtotal		$1,096	$1,096	$1,315
Other Benefits				
Participant Rebates and Incentives	$402			$402
Vendor Incentives				$0
Incremental Capital Savings	$0			$0
Incremental O&M Savings	$0			$0
Subtotal	$402			$402
Reduction in Sales Revenue				
Electric	$639		$613	
Subtotal	$639		$613	
Utility Program Costs				
Program Planning & Design		$7	$7	$7
Administration & Program Delivery		$11	$11	$11
Advertising/Promotion/Customer Ed		$1	$1	$1
Participant Rebates and Incentives		$455	$455	$455
Equipment & Installation		$0	$0	$0
Measurement and Verification		$10	$10	$10
Miscellaneous		$0	$0	$0
Subtotal		$483	$483	$483
Participant Costs				
Incremental Capital Costs	$224			$215
Incremental O&M Costs	$0			$0
Subtotal	$224			$215
Total Benefits	$1,041	$1,096	$1,096	$1,717
Total Costs	$224	$483	$1,097	$699
Net Benefit (Cost)	$817	$612	($1)	$1,018
Benefit/Cost Ratio	**4.64**	**2.27**	**1.00**	**2.46**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Inputs per Customer kW		
Lifetime (Weighted on Generator kWh)	A	9 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	10.64%
Gross Load Factor at Customer	E	14.80%
Net-to-Gross (Energy)	F	96.0%
Net-to-Gross (Demand)	G	96.0%
Transmission Loss Factor (Energy)	H	7.14%
Transmission Loss Factor (Demand)	I	7.14%
MTRC Net Benefit (Cost)	J	$1,018
MTRC Non-Energy Benefit Adder	K	$219
Net coincident kW Saved at Generator	(D x C x G) / (1 - I)	0.1100 kW
Gross Annual kWh Saved at Customer	(B x E x C)	1,297 kWh
Net Annual kWh Saved at Customer	(B x E x C x F)	1,245 kWh
Net Annual kWh Saved at Generator	(B x E x C x F) / (1 - H)	1,341 kWh

Program Summary per Participant		
Gross kW Saved at Customer	L	0.81 kW
Net coincident kW Saved at Generator	(G x L) x D / (1 - I)	0.09 kW
Gross Annual kWh Saved at Customer	(B x E x L)	1,055 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L))	1,013 kWh
Net Annual kWh Saved at Generator	(F x (B x E x L)) / (1 - I)	1,091 kWh

Program Summary All Participants		
Total Participants	M	2,103
Total Budget	N	**$827,223**
Gross kW Saved at Customer	(M x L)	1,711 kW
Net coincident kW Saved at Generator	**((G x L) x D / (1 - I)) x M**	**188 kW**
Gross Annual kWh Saved at Customer	(B x E x L) x M	2,218,898 kWh
Net Annual kWh Saved at Customer	(F x (B x E x L)) x M	2,130,142 kWh
Net Annual kWh Saved at Generator	**((F x (B x E x L)) / (1 - H)) x M**	**2,293,929 kWh**
TRC Net Benefits with Adder	(M x L x J)	**$1,742,589**
TRC Net Benefits without Adder	(M x L x (J - K))	**$1,367,628**

Utility Program Cost per kWh Lifetime	**$0.0413**
Utility Program Cost per kW at Gen	**$4,397**
Participant Payback with Rebate	**-2.4 years**
Participant Payback without Rebate	**3.1 years**

SINGLE-FAMILY WEATHERIZATION PROGRAM — 2010 — GAS — GOAL

Gas Benefit-Cost Analysis per One Gross Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		$95.14	$95.14	$95.14
Variable O&M Savings		$0.48	$0.48	$0.48
Demand Savings		$5.59	$5.59	$5.59
Subtotal		$101.21	$101.21	$101.21
Emissions and Non-Energy Benefits Adder (5%)				$5.06
Subtotal		$101.21	$101.21	$106.27
Other Benefits				
Participant Rebates and Incentives	$35.06			$35.06
Vendor Incentives				$0.00
Incremental Capital Savings	$0.00			$0.00
Incremental O&M Savings	$0.00			$0.00
Subtotal	$35.06			$35.06
Reduction in Sales Revenue				
Gas	$110.23		$105.82	
Subtotal	$110.23		$105.82	
Utility Program Costs				
Program Planning & Design		$0.34	$0.34	$0.34
Administration & Program Delivery		$0.53	$0.53	$0.53
Advertising/Promotion/Customer Ed		$0.92	$0.92	$0.92
Participant Rebates and Incentives		$35.06	$35.06	$35.06
Equipment & Installation		$0.00	$0.00	$0.00
Measurement & Verification		$1.47	$1.47	$1.47
Miscellaneous		$0.00	$0.00	$0.00
Subtotal		$38.32	$38.32	$38.32
Participant Costs				
Incremental Capital Costs	$69.14			$66.38
Incremental O&M Costs	$0.00			$0.00
Subtotal	$69.14			$66.38
Total Benefits	$145.29	$101.21	$101.21	$141.33
Total Costs	$69.14	$38.32	$144.15	$104.70
Net Benefit (Cost)	$76.15	$62.89	-$42.93	$36.63
Benefit/Cost Ratio	**2.10**	**2.64**	**0.70**	**1.35**

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Input Summary and Totals

Program Assumptions:		
Lifetime (Weighted on Dth)	A	17.86 years
Net-to-Gross (Weighted on Dth)	B	96.00%
Net-to-Gross (Weighted on Incremental Capital)	C	96.00%
Program Totals:		
Participants	D	3,164
Average Net Dth/Yr Saved	E	18.2
Total Dth/Yr Saved	F	**57,515**
Utility Costs per Net Dth/Yr	G	$39.92
Net Benefit (Cost) per Gross Dth/Yr	H	$36.63
Non-Energy Benefits Adder per Gross Dth/Yr	I	$5.06
Annual Dth/$M	($1M / G)	**25,051**
Total Utility Budget	(G x F)	**$2,295,861**
Total MTRC Net Benefits with Adder	(F x H)	**$2,194,696**
Total MTRC Net Benefits without Adder	(H - I) x F	**$1,891,514**
Utility Program Cost per Net Dth Lifetime	(G / A)	**$2.24**
Participant Payback with Rebate		**3.0 years**
Participant Payback without Rebate		**6.1 years**

➢ Indirect Segment

A. Description

The Indirect Segment includes programs that support the overall Plan but do not themselves directly produce energy or demand savings. These programs are not independently evaluated for cost-effectiveness, but their costs are included in the overall portfolio cost-effectiveness evaluations. This segment has two program areas: Education/Market Transformation and Planning and Research. Within the Education/Market Transformation area, the Company will offer four customer-facing programs, including: Business Energy Analysis, Customer Behavioral Change – Business, Customer Behavioral Change – Residential, and Residential Home Energy Audits. Within the Planning and Research area, Public Service will operate four internal programs: DSM Market Research, DSM Planning & Administration, DSM Product Development, and Evaluation, Measurement & Verification.

Public Service believes strongly that programs within the Indirect Segment play critical roles in ensuring that the overall DSM Plan is effectively researched, managed and operated. Programs within the Segment provide valuable information and support for the direct impact programs and offer innovative approaches to effecting changes in the demand-side management marketplace. These innovative approaches, manifested in education and market transformation programs, may not produce readily quantifiable energy and demand savings, but still play a very important role in shifting markets and attitudes to be more energy efficient and demand responsive.

However, because these programs do not directly produce energy and demand savings and, therefore, may reduce the overall cost-effectiveness of the DSM portfolio, there is a natural tendency to limit activity and spending in this area to only the most essential elements. The Company will not limit its Indirect Segment spending to a specific percentage of the overall portfolio, but will remain vigilant about limiting the Segment's size.

B. Overall Budgets & Goals

The Indirect Segment does not have energy and demand savings goals. The Segment's budget consists primarily of labor, educational material, and study costs. Most studies are conducted by outside experts, generally selected through a competitive bid. Table 73a and 73b provide the overall Segment budget, broken out by program.

Table 73a: 2009 Indirect Segment Budgets & Goals

2009	Electric Participants	Electric Budget	Customer kW	Net Generator kW	Net Generator kWh	Modified TRC Ratio	Gas Participants	Gas Budget	Net Annual DTH Savings	Annual Dth/$M	Modified TRC Ratio
Indirect Segment											
Education/Market Transformation											
Business Energy Analysis	400	$697,191					100	$155,262			
Customer Behavioral Change - Business	1,385	$162,968					593	$70,644			
Customer Behavioral Change - Residential	30,000	$882,428					30,000	$920,287			
Residential Home Energy Audit	7,176	$654,672					7,774	$710,484			
Education/Market Transformation Subtotal	**38,961**	**$2,397,259**					**38,467**	**$1,856,677**			
Planning and Research											
DSM Market Research		$1,427,266						$587,266			
DSM Planning & Administration		$293,496						$178,000			
DSM Product Development		$498,560						$129,440			
Evaluation, Measurement & Verification		$739,640						$134,360			
Planning and Research Subtotal		**$2,958,962**						**$1,029,066**			
Indirect Total	**38,961**	**$5,356,221**					**38,467**	**$2,885,743**			

Table 73b: 2010 Indirect Segment Budgets & Goals

2010	Electric Participants	Electric Budget	Customer kW	Net Generator kW	Net Generator kWh	Modified TRC Ratio	Gas Participants	Gas Budget	Net Annual DTH Savings	Annual Dth/$M	Modified TRC Ratio
Indirect Segment											
Education/Market Transformation											
Business Energy Analysis	400	$820,467					100	$156,091			
Customer Behavioral Change - Business	1,385	$171,781					593	$71,275			
Customer Behavioral Change - Residential	34,000	$1,381,488					34,000	$1,418,512			
Residential Home Energy Audit	7,416	$762,937					8,034	$820,356			
Education/Market Transformation Subtotal	**43,201**	**$3,136,672**					**42,727**	**$2,466,233**			
Planning and Research											
DSM Market Research		$247,610						$247,610			
DSM Planning & Administration		$298,896						$180,100			
DSM Product Development		$501,030						$130,400			
Evaluation, Measurement & Verification		$621,830						$202,370			
Planning and Research Subtotal		**$1,669,366**						**$760,480**			
Indirect Total	**43,201**	**$4,806,038**					**42,727**	**$3,226,713**			

C. Market Analysis

The Indirect Segment serves all markets addressed by Public Service's direct impact programs. During the 2009/10 biennium, education/market transformation and market research activities will be focused on establishing baselines and assessing opportunities and potential for DSM within the Company's service territory. These activities will be highlighted by the development of Public Service's first natural gas DSM market potential study, it's second electric DSM market potential study, a quantification of non-energy benefits, a review of techniques for quantifying market transformation and assessing the use of gross versus net goals, and concerted efforts to increase levels of customer awareness about energy efficiency. The assessment of the use of gross versus net goals, in particular, responds to the Commission's suggestion in paragraph 43 of Decision No. C08-0769 (*Order on Applications for Rehearing, Reargument, and Reconsideration*, Docket No. 07A-420E) that Public Service include a proposed approach to net-to-gross in its biennial plan filing.

D. Marketing/Advertising/Promotion

The Indirect Segment's marketing, advertising, and promotion activities are primarily focused on the Education/Market Transformation area. The very nature of these programs suggests that they will use customer contacts in the form of newsletters, bill inserts, community events, energy efficiency workshops, direct mail and email campaigns, communications to new residents, and advertising through radio, television and print to educate customers and transform markets. Promotional costs are also budgeted to create awareness and generate enrollments in the Residential Home Energy Audit and Business Energy Analysis Programs.

E. Segment-Level Policies

Participation in the Residential Home Energy Audit and Business Energy Analysis Programs will be limited to Public Service customers in Colorado. The Company will make every effort to focus its Education and Market Transformation messages and promotions on Public Service customers, yet there will likely be spillover benefits to non-Public Service customers particularly with those activities that convey information to general audiences (like the Company website, partnerships with regional agencies, and community-based events).

F. Stakeholder Involvement

The Indirect Segment relies heavily on input from internal and external stakeholders and also manages the Company's interaction with "official" stakeholder groups such as the DSM Roundtable. Market Research and Education/Market Transformation activities actively engage internal and external stakeholders including employees, customers, trade allies, and vendors to ensure that program objectives are met.

G. Evaluation, Measurement and Verification

The Indirect Segment includes the Evaluation, Measurement and Verification ("EM&V") Program, which describes the evaluation, measurement and verification plan for all of the DSM programs included in this Plan. The DSM Planning & Administration group is responsible for developing the EM&V methodologies, while the DSM Market Research group will oversee the third-parties conducting the research. These efforts are described in more detail within the EM&V and DSM Market Research Program descriptions.

➢ Energy Analysis Program

A. Description

The Energy Analysis Program is an indirect impact program that offers Colorado business customers analysis services to identify energy saving opportunities. The goals of this program are to provide a method for commercial and industrial customers to learn how their business uses energy today and to identify measures that will help them save energy and reduce operating costs in the future. This service focuses on a customer's core energy efficiency opportunities. Energy Analysis is a gateway program and a perfect first step for customers to uncover energy saving opportunities with little capital investment and risk. Public Service representatives have and continue to use this as an initial selling point for energy efficiency programs. Participation is heavily dependent on promotion by internal Public Service representatives as well as the trade allies and outside customer assistance programs.

The Energy Analysis Program offers three different types of assessments: online assessments, on-site analysis and engineering assistance studies, which vary in customer involvement and capital investment. The reports in all three assessments provide detailed information about cost and paybacks, which will assist in creating a business case to make energy efficiency upgrades.

Online energy assessments: An online energy assessment is a free online tool developed and operated by EnerSys, a third-party provider. This online assessment interviews the customer about his or her equipment and operating conditions to uncover areas where energy and cost savings opportunities may exist. Based on industry averages and trends, regional data, and customer knowledge of the facility, the online tool is a starting point for determining energy saving opportunities. This tool requires the customer to invest time, but no money in the analysis, making it virtually risk-free.

- On-site energy assessment: Public Service sends an energy engineer to a customer's facility to conduct an onsite energy assessment, which is a comprehensive audit of the facility and energy use. The customer receives a detailed report including energy saving opportunities with the associated payback, savings, cost and potential rebate information for each opportunity. Three companies were selected through an RFP process to perform the onsite assessments across Public Service's Colorado service territory.
- Engineering assistance studies: Provides the customer guidance when the customer is seeking to replace or upgrade of a major process or system. The customer will hire a provider of his or her choice to analyze the facility and develop recommendations for the most energy efficient options for the equipment. The analysis targets customers who are focused on analyzing their refrigeration, cooling, custom or space and processing heating systems.

B. Budgets & Goals

Budgets

The Energy Analysis budget was developed based on the participation goal and historical data for the program. The three third-party auditors established a pricing schedule based on the size and location of the building. The product team used this information, combined with historical data, to estimate an average assessment cost. The rebate level and participation goals are expected to stay the same for the next two years.

For the Energy Analysis Program, labor, promotions and consulting drive most of the budget. The following was used to identify these specific drivers.

- Consulting: Developed using average auditor pricing and participation goal.
- Labor Charges: Determined by estimating the number of full-time employees needed to manage the program and execute the marketing strategy and rebate process.
- Promotions and Advertising: The estimated promotional budget anticipates several customer and trade communications during the year and a contribution to the general conservation advertising campaign.

Goals

Goals were developed using historical participation in Minnesota as well as the Colorado commercial and industrial customer market.

Table 74: Energy Analysis Program Budgets and Goals

Energy Analysis	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$28,353	$9,048	$29,346	$9,365
Admin & Program Delivery	$622,338	$143,214	$623,621	$143,726
Ad, Promo, & Customer Ed.	$46,500	$3,000	$167,500	$3,000
Customer Incentives	N/A	N/A	N/A	N/A
Equipment & Installation	N/A	N/A	N/A	N/A
M&V	N/A	N/A	N/A	N/A
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$697,191**	**$155,262**	**$820,467**	**$156,091**
Generator kW	N/A	N/A	N/A	N/A
Generator kWh	N/A	N/A	N/A	N/A
Annual Dth	N/A	N/A	N/A	N/A
Annual Dth/$	N/A	N/A	N/A	N/A
Participants	400	100	400	100
Participation as % of Segment	0.250%	0.093%	0.250%	0.093%
Modified TRC Test Ratio	N/A	N/A	N/A	N/A

C. Application Process

Customers may become aware of this program through their Account Manager or the Business Solutions Center, contracted trade allies, external customer assistance programs such as the City of Boulder's Building Performance Program, and/or marketing efforts including mailings, newsletters and the Xcel Energy website. All avenues are essential for increasing program awareness in cooperation with the marketing efforts. If a customer is interested in an online assessment, preapproval is not necessary. Customers will find the free online tool linked to the Xcel Energy website.

Onsite assessments and Engineering Assistance studies require preapproval prior to project completion. Customers may access the onsite assessment preapproval application on the Xcel Energy website and work with their Public Service representative to complete the preapproval process by collecting their billing history information. Once the application is complete with customer and building information an auditor will be assigned to assess the building. The customer will typically receive their final report from the engineer within three months from applying for preapproval. This time allows for internal processing, onsite engineer walkthrough of the facility, creation of the report, and a final review by Public Service internal engineering staff. The preapproval application for Engineering studies can also be found on the Xcel Energy website or provided by the customer's representative. The customer must select an Engineering firm prior to preapproval, because a project proposal including the scope of work must be included with the preapproval application to determine funding levels. Engineering studies typically take three to six months to complete and to be reviewed and approved by Public Service internal engineering staff.

D. Marketing Objectives, Goals, & Strategy

The main goal of the Energy Analysis Program is to raise awareness and knowledge of Public Service's energy efficiency programs. The Company will rely heavily on the trade and related programs, such as City of Boulder's Building Performance Programs and Free Plus, to increase awareness in the Energy Analysis Program and partner in the audit process. Though the target markets will differ by assessment type, both online and onsite, are popular with small business customers. The most participants are expected to be in the following segments: churches, restaurants, manufacturing, office/warehouses, and apartment buildings. Conversely, engineering studies are popular with larger commercial and industrial customers.

Methods used to reach and educate customers:

- Xcel Energy website: Provides a description of the program offering, links program collateral.
- Collateral available: Program brochure, case study, applications, frequently asked questions and study templates so the customer has an idea of the information they will receive by participating.
- Direct mailings: Informational piece to gain awareness and understanding of the program offerings.

- Email campaigns: Brief email available for Public Service representatives to gain interest in the program from their customers.
- Newsletters: Another medium to gain customer awareness and participation in the program.
- Customer seminars: Educate customers about the program offering and benefits.

E. Program-Specific Policies

Indirect impact programs are different from traditional programs because there is no immediate savings associated to the program efforts. Energy Analysis is meant to open the door for customers to participate in Public Service's other energy efficiency program offerings and rebates. Once and onsite assessment or engineering the report is complete the customer will receive a summary of energy conservation opportunities that could be prescriptive, custom or involve recommissioning. When the customer moves forward with implementation they will have to follow the appropriate program guidelines, as Energy Analysis does not take credit for the opportunities found in the report.

F. Stakeholder Involvement

Public Service worked closely with the contracted audit trade allies to develop and streamlined its assessment process. In the future, the program will look to recommendations from the DSM Roundtable to determine if program modifications are needed.

G. Rebate Levels

Customers do not receive a rebate for participation in the Energy Analysis Program, but they do receive study funding assistance for the onsite assessment and the engineering study. Energy Analysis offers two types of study funding based on whether an onsite assessment or engineering study was completed. Participants in an onsite assessment are responsible for paying $200 or $300 per assessment, depending on the building square footage, which is approximately 13% of the actual cost of the audit. Public Service will pay up to 75% of the engineering study cost; funding is based on the potential energy savings of the project and the cost of the study.

H. Evaluation, Measurement & Verification Plan

Public Service will track the number of online assessments, onsite assessments and engineering assistance studies. In the case of online assessments, upon completion of the report of a facility's building usage and energy saving opportunities, the customer receives a follow-up call to assist with any questions about moving forward with the energy efficiency improvements. With onsite assessments and engineering studies, energy saving measures are tracked once the study has been approved by Public Service. Tracking the efficiency opportunities allows Public Service to continue working with the customer to implement the measures in a timely manner.

Because this is a new program for Colorado customers there will not be any comprehensive program evaluations over the next two years. We may choose to do a comprehensive evaluation after the program is completed.

I. Technical Assumptions

For the purposes of the online assessment, the online tool uses an industry average facility based on a regional industry average derived from Energy Information Administration ("EIA") data. Most of the EIA's information about commercial buildings and their energy use comes from the Commercial Buildings Energy Consumption Survey which collects energy-related building characteristics data and energy consumption and expenditures data for commercial buildings in the United States.

➢ Market Transformation: Customer Behavioral Change Program

A. Description

Market transformation strategies attempt to remove barriers to adoption of energy efficiency measures in order to achieve a permanent shift in a market. The definition in the Public Service gas DSM Rulemaking: "'Market Transformation' means a strategy for influencing the adoption of new techniques or technologies by consumers. The objective is to overcome barriers within a market through coordinating tactics such as education, training, product demonstration and marketing, often conducted in concert with rebates or other financial incentives." (4 CCR 723-4-4751(m))

The initial goal of the Customer Behavioral Change Program is to improve public knowledge concerning the benefits of energy efficiency and conservation. The Company views this as the initial phase in a long-term process of creating educated, engaged customers who are ready to act on energy efficiency opportunities. The following key messages will be incorporated into all of the program's marketing efforts: DSM is a resource, DSM is a more cost-effective resource than building new generation resources, and DSM costs incurred today are an investment that defers incurring higher costs for new generation equipment later.

Further, the purpose of the Customer Behavioral Change Program is to induce permanent behavioral changes in the energy usage of residential and business customers through long-term education and proactive customer interactions. A key to the success of market transformation is creating sophisticated buyers who have information that allows them to make more informed and effective decisions. Among the behavioral and attitudinal changes that will affect market transformation are shifts in conventional thinking, heightened awareness, and increased knowledge. Specifically, the Customer Behavioral Change Program will educate customers about how to use energy wisely, how to change energy usage behaviors, and how to buy energy efficient appliances, such as ENERGY STAR-rated appliances. Going beyond the initial education, the true intent of this program is to engage customers about energy conservation and efficiency and compel them to action to reduce their energy usage.

Messages and themes of the Customer Behavioral Change Program will emphasize (1) the partnership between the customer and Public Service; (2) that clear actions that can be taken by the customer; and (3) a results-oriented approach. A key to successful market transformation is being able to provide clear answers when stakeholders ask how they benefit from energy efficiency. The perceived benefits and expected outcomes for market transformation strategies will be clearly defined to receive a high degree of acceptance and support among customers. Specific messages and themes are outlined below in the respective business and residential overview sections.

The Customers Behavioral Change Program will emphasize:

- Introducing energy efficiency and conservation behavior changes into the marketplace;

- Advancing existing energy efficient technologies (ENERGY STAR), services, and behaviors so that they become more widespread; and
- Removing or decreasing the use of inefficient technologies, services, and behaviors.

Recognizing that market transformation is best accomplished at a regional or national level, Public Service will create and leverage strategic partnerships and alliances with governmental, non-governmental, and trade partners to reach target business and residential customers. The following sections describe some of those partnerships for both business and residential behavior change programs.

Successful market transformation efforts are typically long-term in nature and utilize methods to understand customer acceptance and behavioral change. Therefore, the Customer Behavioral Change Program will use two measures to define our progress from year-to-year -- a general participation goal and direct interaction goal. The general participation goal describes the number of customers the Company will reach out to via direct mail, the internet, and radio. This is the general education and awareness portion of the Customer Behavior Change Program. The intent is to build awareness and familiarity amongst our business and residential customers about energy efficiency and conservation. The direct interaction goal describes the number of customers who have received the initial education and are now actively seeking and performing behavioral changes to reduce their energy usage. Direct interactions are defined as occurrences when customers actively engage with Public Service about generic efficiency and conservation topics.

Customer Behavioral Change tactics will include efforts that require customers to contact the Company for more information. This will be tracked primarily through interactions at public events, e.g., community fairs and workshops, as well as requests for further information from direct mail campaigns and internet inquiries. These direct customer activities comprise the primary metric that will be used to evaluate market transformation efforts over longer time periods. The following sections describe the specific intent of the residential and business Customer Behavioral Change Programs. Within each section, the content will first describe the residential and then business portions of the Customer Behavior Change Program.

This program is targeted to all Colorado gas and electric residential customers. Through repeat communications and interactions with customers, Public Service will move from awareness strategies to behavior change strategies to help customers manage their energy usage. Market transformation activities in this program are about going beyond awareness and familiarity and propelling customers to take steps to reduce energy usage. Messages and themes through the residential portion of Customer Behavioral Change Program will specifically (1) reinforce simple, executable steps customers can take to reduce energy usage; (2) encourage purchase of ENERGY STAR-approved appliances; and (3) promote participants to actively encourage others to do the same.

<u>Residential Customer Behavioral Change Overview</u>
Because the residential segment is demographically varied, Public Service employs a variety of resources and channels to communicate conservation and energy efficiency messages. The

strategy deployed will initially encompass awareness messaging and activities. In the initial implementation of the program, primary emphasis will be placed on:

- Community-based events, such as home shows and conservation events;
- Partnerships with local, regional, and state government agencies where possible, as well as non-governmental agencies to reach target residential audience segments;
- Utilizing mass market advertising such as radio, print and television to create awareness in energy efficiency;
- Online messaging through targeted websites;
- Direct mail marketing to address seasonal usage challenges;
- Sponsorship of local Earth Day events;
- Conservation messaging through Public Service's newsletters and bill inserts to residential customers; and
- Publication of reference education materials (in English and Spanish).

Xcel Energy has offered a similar program in its Minnesota service territory for more than a decade. The Minnesota program provides years of experience and best practices that will be applied in the development of the initial offerings in Colorado.

Business Customer Behavioral Change Overview

This program is targeted to all Colorado natural gas and electric business customers, with stronger emphasis on small- to mid-sized customers. As a result of this program, Public Service hopes to create public awareness of energy efficiency and energy conservation while providing business customers with information on what they can do to reduce energy usage. In the initial implementation of the program, primary emphasis will be placed on:

- Energy efficiency and conservation messaging through email and print newsletters;
- Direct mail marketing and collateral to targeted customer segments;
- Focused customer segment events and sponsorships through business and trade associations;
- Customer outreach through energy efficiency workshops; and
- Customer employee behavior change campaign (BC Hydro Power Smart model).

E-Source has identified the BC Hydro Power Smart for Business Program as one of the more notable business behavioral change programs in existence today. That program essentially creates an energy efficiency team comprised of a core group of employees within a company that implement an energy efficiency plan. First, a company is asked to send a select group of employees to a one-day training session. The employees are taught the basics of energy conservation and are asked to create a plan specific to their company. The group is then sent away with posters, stickers, and tip sheets to hand out and place at work. This model has worked particularly well – using a core group to deliver energy efficiency messages throughout the workplace. One of the reasons for this is that the company employees have an understanding of their roles upfront and there is an established group responsible for meeting goals.

B. Budgets & Goals

Budgets

Public Service's budget for this program was determined through estimates of material and labor and past activities in Colorado and other states. The majority of the budget is driven by customer education, conservation promotion and labor. Public Service anticipates that the budget for 2010 will increase in order to expand into television coverage to further broaden and develop energy efficiency messaging to residential customers.

The residential budget for Customer Behavioral Change is higher for natural gas than electric due to the number of opportunities for gas energy efficiency within the home compared to electric opportunities. Customers have more opportunities to reduce their gas usage through energy efficiency – heating, water heating, insulation, and appliances compared to electric – lighting, cooling and appliances. In addition to the opportunities within the house, as prices for fossil fuels, including natural gas, continue to increase, there will be a growing urgency for customers to manage their utility bills by addressing how they use gas within their homes. The business budget is higher for electric because most businesses have more equipment and process loads that use electricity compared to gas.

Goals

The Customer Behavioral Change program is an indirect impact program. Therefore, the program goals are measured in the number of participants, instead of direct energy savings.

Table 75a: Residential Customer Behavioral Change Program Budgets and Goals

Residential Customer Behavioral Change	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$93,053	$127,270	$120,984	$154,213
Admin & Program Delivery	$15,000	$15,000	$15,000	$15,000
Ad, Promo, & Customer Ed.	$774,375	$778,017	$1,245,504	$1,249,299
Customer Incentives	N/A	N/A	N/A	N/A
Equipment & Installation	N/A	N/A	N/A	N/A
M&V	N/A	N/A	N/A	N/A
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$882,428**	**$920,287**	**$1,381,488**	**$1,418,512**
Generator kW	N/A	N/A	N/A	N/A
Generator kWh	N/A	N/A	N/A	N/A
Annual Dth	N/A	N/A	N/A	N/A
Annual Dth/$M	N/A	N/A	N/A	N/A
Participants	30,000	30,000	34,000	34,000
Participation as % of Segment	N/A	N/A	N/A	N/A
Modified TRC Test Ratio	N/A	N/A	N/A	N/A

Table 75b: Business Customer Behavioral Change Program Budgets and Goals

Business Customer Behavioral Change	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$33,074	$12,392-	$41,654	$12,823-
Admin & Program Delivery	$10,294	$5,294-	$10,348	$5,348-
Ad, Promo, & Customer Ed.	$119,600	$52,958-	$119,779	$53,104-
Customer Incentives	N/A	N/A	N/A	N/A
Equipment & Installation	N/A	N/A	N/A	N/A
M&V	N/A	N/A	N/A	N/A
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$162,968**	**$70,644-**	**$171,781**	**$71,275-**
Generator kW	N/A	N/A	N/A	N/A
Generator kWh	N/A	N/A	N/A	N/A
Annual Dth	N/A	N/A	N/A	N/A
Annual Dth/$M	N/A	N/A	N/A	N/A
Participants	1,385	593	1,385	593
Participation as % of Segment	0.865%	0.549%	0.865%	0.549%
Modified TRC Test Ratio	N/A	N/A	N/A	N/A

C. Application Process

No application or approval process is required for this program.

D. Marketing Objectives, Goals, & Strategy

The primary objective of the Customer Behavioral Change Program is to initially heighten residential and business customers' awareness about energy efficiency and conservation and then develop engaged customers who will proactively take steps to reduce energy consumption. The goal of the program is to get customers to conserve and upgrade to high efficiency measures when possible to thereby reduce their energy consumption. Public Service will employ communications and provide behavior-altering strategies that customers can implement in their daily lives to conserve energy (move customers from awareness to action).

The residential portion of the program will target all residential customers in our Colorado service territory. We plan to partner with the Governors' Energy Office, Smart Energy Living Alliance, the Center for Resource Conservation, and local government and non-governmental agencies to drive home the message so the customer isn't just educated, but engaged and therefore ready to act.

The Company anticipates using a variety of communications channels including the internet, print, radio, and events for these communications efforts. Messaging will emphasize specific energy-saving tips residential customers can implement in their daily lives to reduce their energy usage. Seasonal promotions are anticipated to help customers manage their usage during high-bill seasons, e.g., summer and winter.

The messaging will also support various energy conservation and energy management products the Company has available to residential customers. The program campaign will include financial and environmental benefits of energy conservation and will promote ease of implementation to lead the customer to action. The following are some of the proposed activities in support of the Residential Customer Behavioral Change Program.

Table 76a: Residential Customer Behavioral Change Communication Tactics

Residential Customer Communications Tactics	Description
Energy Update Newsletter/Conservation Tips	Energy efficiency messages delivered through newsletter on bimonthly basis.
Bill Inserts	Seasonal inserts supporting multiple topics.
Conservation-focused email	Targeted campaigns to key segments with personalization and promotions to capture customer info and expand energy-saving tips.
Direct Mail-targeted	Campaigns to high-potential customer about conservation/energy tips-complement bill insert schedule.
Possible Community Events	Colorado Home/Garden Show Earth Day Events Denver Arts Festival People's Fair FUEL: The Colorado New Energy Festival Cherry Creek Arts Festival Taste of Colorado Colorado State Fair Oktoberfest Annual Pumpkin Festival Blossoms of Light Parade of Lights National Western Stock Show
Enhanced New Mover Communications	Target customers moving to new residences to educate and engage them in efficiency before they make key decisions regarding their house.
On-hold Messaging	Utilize call center on-hold messaging to communicate to customers re: conservation.
Enhanced Web (home page) Messaging	Enhance existing Web presence to promote conservation and tie to branding campaigns.
Bill Messages	Use to coincide with bill inserts and seasonal messaging.
Speaker's Bureau	Increase community outreach with conservation presentations by energy raters. Energy saving tips and do it yourself.
Youth Engagement	Conservation contests and giveaways targeting youth through schools and events to support life-long habits of efficiency and conservation.
Conservation Advertising-Radio, Print, and Web	Messaging to residential customers about generic efficiency and conservation through optimal channels. Anticipate seasonal schedule.
Gas and Electric Conservation Brochures	Distribute through event channels and with partners to promote conservation education.
ENERGYSMART Library and University	Utilize the existing online energy efficiency database as a tool for customers to learn about opportunities to make changes within their home and lower utility bills.

The business portion of the Customer Behavioral Change Program will focus primarily on creating awareness of energy conservation while providing business customers with information on what they can do to reduce energy use in their buildings. The program hopes to encourage customers to make Public Service their first contact when considering energy efficiency and conservation, and to engage customers to make changes that lower their energy use. It will focus on educating customers and their employees regarding impacts of their energy use and offering choices and information on how to take action to achieve long-term energy and environmental savings. Public Service will consider the following strategies to promote the business Customer Behavioral Change message:

Table 76b: Business Customer Behavioral Change Communication Tactics

Business Customer Communications Tactics	**Description**
Energy Solutions Newsletter	Energy efficiency and conservation messaging delivered through print and e-mail newsletter on a quarterly basis.
Direct Mail – targeted	Marketing campaigns targeted to specific customer segments about energy efficiency and conservation.
Focused customer segment events and sponsorships through business associations	• Government • Education • Hospitality • Nonprofit • Small Business Association • Chambers of Commerce • Building Owners and Managers Association • National Association of Industrial and Office Properties
Segment specific collateral	Online and print versions of segment specific energy conservation collateral.
Energy efficiency workshops	Utilize energy auditors to present energy efficiency workshops to customer groups.
Customer Employee Education Campaign	Engaging customer's employees in energy conservation and changing workplace behavior to enhance efficiency and save costs. Resources and tools to assist organizations in developing creative and effective campaigns.

E. Program-Specific Policies

This program has no specific policies.

F. Stakeholder Involvement

Public Service intends to collaborate on messaging with the Governor's Energy Office and other consumer organizations to deliver consistent energy conservation education to our Colorado business and residential customers. The Company will meet with GEO regularly to discuss our initiatives and where possible, consider coordinating seasonal messaging to maximize the outreach effort. In addition to the GEO, Public Service will also partner with the other governmental organizations, chambers of commerce, and business/industry trade associations.

Further, we will solicit feedback from customers through market research, as well as through the program metrics, to best target and tailor our messages.

G. Rebate Levels

Customers will not receive rebates, as this is an indirect program.

H. Evaluation, Measurement & Verification Plan

A comprehensive process and impact evaluation of the Customer Behavioral Change Program will be conducted in 2010. On an ongoing basis, Public Service will monitor the effectiveness of our Customer Behavioral Change program by tracking participation and response to the various marketing efforts. The method of measurement of participation and response will be dependent on the type of channel used to communicate with customers. For example, the number of unique website visits can measure web-based conservation messaging performance. Conservation promotions in advertising will be measured by customer impressions. Community event participation can be measured by actual "foot traffic" at the booth and attendance at the respective events. Direct marketing efforts can be measured using special promotions and response codes. The following are the proposed channels and metrics that will be used for tracking participation and exposures to consumer education activities:

Table 77: Customer Behavioral Change Program Tracking Metrics

Channel	**Proposed Metric**
Print (Newsletters)	Circulation and average readership
Print (Direct Mail)	Business reply cards, special promotions, or response codes
Radio	Maximum audience exposure
Television (in 2010)	Maximum audience exposure
Events	Event attendance
Web	Unique visits

I. Technical Assumptions

As an indirect program, Customer Behavioral Change does not have technical assumptions.

➢ Residential Home Energy Audit Program

A. Description

The Residential Home Energy Audit Program offers Public Service residential customers four options for energy-use auditing services: the Standard Audit, the Standard Audit with Blower Door Test, the Infrared Audit, which includes a mandatory blower door test and infrared imaging, and the free online Home Analysis tool. The purpose of this program is to improve energy savings by influencing homeowners' and renters' behaviors through conservation education.

The essential elements of in-home Standard Audit are:

- Customer energy bill analysis;
- Client assessment and education;
- Shell assessment;
- Mechanical and electrical equipment review;
- Written energy savings recommendations; and

The customer has the option to add a blower door and/or an infrared test to the Standard Audit for more feedback on the current performance of their residence. Typically, the audit begins with the auditor's review and analysis of the billing history since this is often an indication of what the customer may need to address first. The auditor also takes this opportunity to discuss any concerns or questions that the customer may have regarding their homes energy usage and related comfort.

Once the areas of concern are identified, the auditor initiates the onsite inspection. This process begins with a shell assessment of the exterior of the home, identifying cracks or exterior signs of air leakage or maintenance needs. The auditor then begins the interior evaluation with inspection of the attic or crawl space to determine what insulation has been installed prior to the audit and upgrades the customer should consider, such as additional insulation and sealing bypass areas.

Next, the auditor reviews the home's heating and/or air conditioning systems for efficiency ratings and discusses monthly maintenance tips. The auditor will also show the customer how to implement suggested maintenance options like changing air filters on a regular basis. As the auditor moves through the home, they continue to educate the customer on how they can implement energy efficient measures. The auditor will inspect and provide information on the efficiency of their appliances, as well as on possible replacement options that are ENERGY STAR qualified.

Finally, the Standard audit ends with a review of the top three recommendations to the homeowner and a final review of the customer's questions and concerns. The auditor will leave a copy of the completed report with the customer for reference along with Public Service efficiency program collateral materials and information on relevant rebate programs that may fit their needs. The entire in home audit process takes about two hours to complete.

Blower door testing will be offered as part of the Standard Audit with Blower Door Test, and the Infrared Audit offerings. The blower door test is a diagnostic tool designed to measure the air tightness of a home and identify air leakage locations. A blower door consists of a calibrated fan for measuring the airflow rate and a pressure-sensing device to measure the pressure created by the fan's airflow. The combination of this pressure and fan's airflow measurements are used to determine a home's air tightness. Before the test is performed, customers must go through their home closing and locking all exterior windows. Once the fan is turned on a vacuum effect is created and customers can then check windows and interior bypasses by holding up their hands and feeling the airflow created. Because this test provides such a visual image for customers, they are often motivated to address caulking and weather-stripping issues that they may have overlooked prior to the testing. This tool can also identify potential venting issues around a home's heating system.

The Infrared Audit includes the Standard Audit elements listed above with the addition of infrared imaging and mandatory blower door testing. Benefits of infrared testing include identifying insulation needs, moisture problems, and air leakage paths within walls, attics, windows and doors, as well as providing a quality check for existing insulation. Infrared testing along with the required blower door test gives customers a more detailed list of structural conservation improvements available to them through non-invasive testing, thus increasing their potential savings. As with the Standard Audit program offerings, customers pay for this audit on their Public Service bill.

In addition, a free online audit is available on the Xcel Energy website. Instead of paying for an audit that consists of an auditor providing an in-home analysis of the home, customers can use the online Home Analysis tool free-of-charge. The online audit requests customers to enter information on their home: square footage, type of cooling and heating, age of the home and family size. This audit takes approximately 10 minutes and offers customers suggestions on how to reduce their energy bill such as adding insulation, replacing old inefficient appliances, maintaining their heating systems, replacing old heating systems, as well as purchasing energy efficient products such as showerheads and compact fluorescent lights. Once the online audit is completed, customers are notified of the three in-home audit options if they would like to get more information. Information on Public Service conservation rebate programs is also listed at the end of the online audit.

Public Service plans to utilize the Home Energy Audit Program to support and drive participation in our Home Performance with ENERGY STAR program. A customer who participates in the Home Performance program must begin the process with an advanced home audit to identify areas for improvement. Our intent is to utilize the Home Energy Audit Program to educate participants as to whether or not their house is a good candidate to go through the Home Performance with ENERGY STAR offering.

The Home Energy Audit Program proposed in Colorado matches closely with that of other programs nationally. The Department of Energy's ENERGY STAR website recommends customers employ either an online audit tool similar to our current free Home Analysis tool, or an in-home audit that may include both blower door and infrared testing. Our proposed program offering for Colorado includes all of these options to our residential customers.

Further, studies have indicated that 85% of utilities offer residential customer energy audits.[1] Audit pricing ranges from $25 to $150 for customer co-pay rates. According to this study, in-home audits are still the most commonly offered type of audit, with larger utilities (about 67%) offering online audits as another part of their total program offerings. In addition, Nexus Energy software, the model used in the online Home Analysis offering, was listed as the most common provider of online audits.

B. Budgets & Goals

<u>Budgets</u>

Xcel Energy currently offers similar program offerings in both Minnesota and North Dakota. In developing the Colorado program budget, Public Service began by researching the local Colorado market for potential audit providers and resources. It was found that the cost of delivering audit services through our Colorado market was noticeably higher than in other areas of our service territory. On average, the pricing averaged slightly over 55% higher for similar services offered in our other areas. Our intent is to use a request for proposal bidding process in attempt to negotiate improved pricing that will allow us to conduct more audits. As part of this process, the Company will request bidders provide suggested content for each of the three in-home audits in an effort to provide the best audit services to our customers.

The program budget was developed from the yearly participant goal and speaking with members from the local auditing industry. Given that this program offering is new to Colorado residential customers, Public Service has built additional marketing dollars into the budget to introduce customers to the program.

<u>Goals</u>

The Home Energy Audit Program includes a participant goal, but no energy or demand savings goals since this program does not offer direct savings. Combination gas and electric customers will be counted in both the total gas and electric participant counts for the annual status report. Likewise, electric only and/or gas only customers will be counted as either gas only or electric only. Customers participating in the free online Home Analysis tool on the Xcel Energy website will be counted as participants in the program.

[1] *Utility Trends and Best Practices In Energy Efficiency Study* by Chartwell Inc., February 2008.

Table 78: Residential Home Energy Audit Program Budgets and Goals

Residential Home Energy Audit	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$12,450	$18,758	$25,120	$25,121
Admin & Program Delivery	$697,752	$752,671	$788,365	$850,387
Ad, Promo, & Customer Ed.	$115,800	$125,075	$143,600	$155,175
Customer Incentives	$0	$0	$0	$0
Equipment & Installation	$0	$0	$0	$0
M&V	$10,950	$11,450	$6,000	$6,500
Miscellaneous	-$182,250	-$197,470	-$200,148	-$216,827
Total	**$654,672**	**$710,484**	**$762,937**	**$820,356**
Generator kW	N/A	N/A	N/A	N/A
Generator kWh	N/A	N/A	N/A	N/A
Annual Dth	N/A	N/A	N/A	N/A
Annual Dth/$	N/A	N/A	N/A	N/A
Participants	7,176	7,774	7,416	8,034
Participation as % of Segment	0.632%	0.656%	0.653%	0.678%
Modified TRC Test Ratio	N/A	N/A	N/A	N/A

C. Application Process

The program will be promoted to a customer through seasonal bill inserts, auditor community and the local media. The customer will contact Public Service through the customer call center or by submitting a reply card to a marketing campaign and will request a specific type of audit. The customer is then contacted for scheduling their audit within two weeks of receiving the request. Typically, audits are completed within four to six weeks of the original request date. This timeline is established as part of the program RFP contract. Customers are limited to one audit per three-year period, unless they move to a new address.

Once the completed audit paperwork is submitted to Public Service, the processing team will enter the audit data into our customer database and bill the customer for their audit through our internal billing system. Typically, customers will see the audit charge on their monthly Public Service bill within the first month of billing cycle after the audit is completed. Again, timely entry of audit data and billing is tied to the audit provider's RFP contract.

D. Marketing Objectives, Goals, & Strategy

Completed audits and monthly totals are processed and reported in our customer database on a monthly basis. A quarterly Customer Satisfaction Survey will be put in place to provide M&V around program offering. Typically, the program RFP goes out for bid every two years.

Historically, Xcel Energy's Home Energy Audit Program has proven to be a popular offering in both Minnesota and North Dakota. This program will be marketed primarily through seasonal bill inserts, since increases in monthly energy bills tend to drive program activity. In addition to this tactic, the product team will work with Media Relations to contact local media television and print outlets with information and interviews around this program offering. Again, this tactic can be extremely successful during both winter and summer months when customer utility bills tend to increase. Further, Public Service will market this program through various other methods, including general customer inquiries regarding their energy bill and cross-marketing efforts with other Public Service residential energy efficiency programs. In addition, the Company will identify "green event" opportunities within the community and provide program collateral as part of the overall marketing plan. Finally, Public Service will implement direct mail tactics targeting high usage customers as a contingency plan if the program is not meeting its monthly goals. Program activity will be monitored on a monthly basis to quickly implement the above strategies, if warranted.

To confirm the continuing quality of the program, Public Service will implement a quarterly Customer Satisfaction Study to gauge customer satisfaction with the Home Energy Audit transaction, specifically focusing on the independent contractor's performance on certain roles and responsibilities around the audit experience. This will also be used as a tool to monitor audit performance and to identify any significant changes or trends that may impact the program's success. This market research informs the marketing staff on how the program is delivered, on improvements that may be implemented to provide more information, and gives an indication of potential issues around audit staffing.

E. Program-Specific Policies

In order to qualify for the program, participants must be residential customers living in Public Services' Colorado service territory. Infrared audit customers must be residential customers that receive natural gas from Public Service to qualify for participation. Public Service will offer the Standard audit without blower door and the Standard audit with blower door to qualified customers once every three years.

Qualified auditors should at a minimum be Certified Energy Manager (Association of Energy Engineers) and have five years of audit experience, or comparable training/in-field experience to provide audit services for this program. It is our preference to have auditors that are certified through the Home Energy Rating System (HERS). The decision will be made based on the quality of bids received in the RFP later this year.

F. Stakeholder Involvement

In preparing this filing, Public Service staff contacted local providers such as E-Star (Smart Energy Living Alliance), the City of Boulder Office of Environmental Affairs, the Center for Resource Conservation and independent audit providers such as All About Saving Heat and Lightly Treading to determine what current offerings and resources were available and how the Company might best structure this new offering in Colorado. In addition, the Company worked with external consultants to determine the appropriate program offerings and potential savings calculations.

G. Evaluation, Measurement & Verification Plan

Since this is an indirect program, Public Service will not perform any measurement or verification of energy savings. However, the Company believes it is important to examine the findings of the audit that our contracted auditing vendor(s) provides customers. The quality assurance of the auditors will be conducted by a third-party contractor periodically by reviewing a sample of completed audits and visiting the participants home to determine if the auditor correctly identified all of the energy efficiency opportunities.

H. Rebate Levels

To simplify the process for homeowners, the program will be made available at a reduced price instead of providing customers a rebate/coupon to be used to lower the price. One reason this method was selected was that offering a rebate to customers will require increased processing costs for the program, which will reduce the number of audits able to be completed each year. The Company understands that the actual price for an in-home audit will vary based on location and complexity of the residence, but the purpose of this program is to provide customers with a straight-forward process to improve their knowledge on energy efficiency and options they have within their home. Another key message will be explaining the difference and benefits between the three in-home audits so customers can make an educated decision on which audit will be best for them.

The Home Energy Audit Program will include a customer co-pay of $60 for the Standard Audit without blower door test and a customer co-pay of 40% the total cost for both the Standard Audit with Blower Door Test and Infrared Audit offerings. Public Service has found it valuable to charge customers a co-pay fee for the program services so that they are fully invested in the outcome of the audit. The audit fee for the Standard audit without blower door will be waived for low-income qualified customers. Public Service will not waive the fee for the Standard audit with blower door or the Infrared audit offerings.

Public Service will set the actual price for each of the three in-home offerings once it has completed the selection of auditing services. Public Service will offer the opportunity to bid on the audit contract to all agencies or individuals that indicate an interest in bidding on the contract. The contract will be offered for a period of two years. Typically, the RFP process takes about two months to complete, so it will be initiated at the beginning of the fourth quarter of 2008 to ensure timely program delivery. If the pricing proves to be lower then initial investigations indicate, the Company will pass that savings on to our customers and reduce the co-pay fee.

I. Technical Assumptions

There are no technical assumptions associated with this program.

➢ DSM Market Research

A. Description

Xcel Energy's Market Research group oversees a variety of research efforts that are used to inform the Company's decision-making concerning DSM. These functions are needed to provide overall support for clarifying DSM issues and for thoroughly understanding current and potential customers. Often, similar information is collected over multiple service territories so that comparisons are possible.

In the 2009-2010 biennium, the Market Research group plans to conduct several projects and studies as listed below. Many of these projects are also being conducted to comply with orders in Decision No C08-0560 from Docket No. 07A-420E and the corresponding Paragraph Number is listed for those projects below.

- *Electric & Natural Gas Colorado DSM Potentials Study [2009]* – Market assessment to estimate electric and natural gas DSM potential conducted by a third party selected via RFP; Paragraphs 85 and 87; ($1,500,000)
- *Residential DSM Awareness, Attitude & Usage (AAU) Studies [2009]* – Quantitative research to gauge the energy awareness and energy efficient behaviors of Residential Public Service customers; Paragraph 87; ($50,000).
- *Business DSM Awareness, Attitude & Usage (AAU) Studies [2010]* – Quantitative research to guage the energy awareness and energy efficient behaviors of Business Public Service customers; Paragraph 87; ($50,000).
- *Colorado Home Use Study [2010]* – Quantitative research with Public Service residential customers to gauge appliance saturation; Paragraph 87; ($40,000)
- *Market Transformation/Net-to-Gross Policies and Practices Analysis [2009]* – Assess techniques and practices for quantifying Market Transformation and assessing the effects and national policies related to Net-to-Gross from increased market transformation, education, and energy codes & standards; Paragraph 87; ($40,000)
- *Non-Energy Benefits (NEB) View [2009]* – Investigation to quantify Non-Energy Benefits for the Low Income Segment; Paragraph 139; ($50,000).
- *Conservation Tracker Study [2009 & 2010]* – Quantitative research to gauge the awareness and replay of Xcel Energy conservation communication; ($50,000 per year).
- *Home Energy Audit Customer Satisfaction Tracker [2009 & 2010]* – Gauge satisfaction with the inaugural Home Energy Audit program; ($45,000 per year)

- *Contractor Research [2010]* – Qualitative research with Public Service trade ally partners to gauge DSM Program success and opportunities for improvement; ($20,000)

- *Dun & Bradstreet Business List Purchase [2009 & 2010]* – Quarterly update of firmographic information for existing customer business customers lists to use for understanding, profiling, and targeting marketing efforts; ($45,000 per year).

- *E-Source Membership-Colorado Portion [2009 & 2010]* – Robust repository of secondary and syndicated research resources for national marketing studies, research services, and consulting services; ($75,250 per year).

B. Budgets & Goals

Budgets

The DSM Market Research budget was estimated based on the historical cost of similar studies in other service territories. Projects that cross jurisdictions had costs allocated according to the estimated percent of accounts Public Service represents in Xcel Energy's entire service territory. Internal labor for administering and managing these projects is also included in the Administration & Program Delivery category of the budget. The budgets for each project were split equally between gas and electric for all studies except for the DSM Market Potential Study. For that study, $330,000 was apportioned to gas and $1,170,000 was apportioned to electric. The variance in the Market Research budget between 2009 and 2010 is due to the large cost (estimated at $1.5 M) of the DSM Market Potential Study to be conducted in 2009.

Goals

This is an indirect program and as such, has no estimated energy or demand savings.

Table 79: DSM Market Research Budgets

DSM Market Research	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	N/A	N/A	N/A	N/A
Admin & Program Delivery	$1,427,266	$587,266	$247,610	$247,610
Ad, Promo, & Customer Ed.	N/A	N/A	N/A	N/A
Customer Incentives	N/A	N/A	N/A	N/A
Equipment & Installation	N/A	N/A	N/A	N/A
M&V	N/A	N/A	N/A	N/A
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$1,427,266**	**$587,266**	**$247,610**	**$247,610**
Generator kW	N/A	N/A	N/A	N/A
Generator kWh	N/A	N/A	N/A	N/A
Annual Dth	N/A	N/A	N/A	N/A
Annual Dth/$	N/A	N/A	N/A	N/A
Participants	N/A	N/A	N/A	N/A
Participation as % of Segment	N/A	N/A	N/A	N/A
Modified TRC Test Ratio	N/A	N/A	N/A	N/A

C. Application Process

DSM Market Research is an internal function for the Company. As such, it has no customer application process. However, where appropriate, providers of the larger, more expensive projects will be selected through a competitive bid process. Representatives of the energy efficiency industry will be engaged in this process. Projects will be awarded to vendors who qualify to handle the scope of the project and prove to provide a strong value. The project list will be reviewed at the beginning of each year and may be adjusted to align with current information needs.

D. Marketing Objectives, Goals, & Strategy

As an internal function, the DSM Market Research Program does not have marketing objectives or goals.

E. Program-Specific Policies

This program does not have any specific policies.

F. Stakeholder Involvement

Public Service will rely heavily on the active participation of employees, customers, trade allies, and vendors to successfully execute this research at a high level of integrity, timeliness and cost effectiveness.

G. Evaluation, Measurement & Verification Plan

There is no EM&V planned for this program.

H. Rebate Levels

This program does not provide customer rebates.

I. Technical Assumptions

DSM Market Research does not have technical assumptions associated with it.

➤ DSM Planning & Administration Program

A. Description

DSM Planning & Administration is an indirect program with internal staff that manages all energy efficiency-related compliance filings, including this Biennial Plan, the annual DSM Status Report, and others as needed. This group performs the benefit-cost analyses of all of the energy efficiency and load management programs, provides tracking of the energy and demand savings achievements, and collaborates with the Resource Planning group to develop inputs for the resource plans. The DSM Planning & Administration group also provides management and oversight of all evaluation, measurement, and verification planning and internal policy guidance, hosts the semi-annual DSM Roundtable, and works with outside consultants, when needed, to bring in outside expertise to our program planning. These functions are needed to ensure a cohesive and high-quality DSM portfolio that meets all legal requirements as well as the expectations of Public Service's customers, regulators, and staff.

This program is administrative in nature and is not open to customer participation. However, because this group operates in all of the states where Xcel Energy offers conservation programs, we are able to lend consistency and share best practices across all of the jurisdictions.

B. Budgets & Goals

<u>Budgets</u>
The DSM Planning & Administration budget is made up primarily of labor for both internal and external resources. Public Service anticipates that these costs will be fairly constant within the two years of the biennium.

<u>Goals</u>
As an indirect program, DSM Planning & Administration does not have savings or participation goals.

Table 80: DSM Planning & Administration Program Budgets

DSM Planning & Administration	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	N/A	N/A	N/A	N/A
Admin & Program Delivery	$293,496	$178,000	$298,896	$180,100
Ad, Promo, & Customer Ed.	N/A	N/A	N/A	N/A
Customer Incentives	N/A	N/A	N/A	N/A
Equipment & Installation	N/A	N/A	N/A	N/A
M&V	N/A	N/A	N/A	N/A
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$293,496**	**$178,000**	**$298,896**	**$180,100**
Generator kW	N/A	N/A	N/A	N/A
Generator kWh	N/A	N/A	N/A	N/A
Annual Dth	N/A	N/A	N/A	N/A
Annual Dth/$	N/A	N/A	N/A	N/A
Participants	N/A	N/A	N/A	N/A
Participation as % of Segment	N/A	N/A	N/A	N/A
Modified TRC Test Ratio	N/A	N/A	N/A	N/A

C. Application Process

The DSM Planning & Administration program is not customer-facing, and therefore, has no associated application.

D. Marketing Objectives, Goals, & Strategy

The DSM Planning & Administration program is not customer-facing, and therefore, has no associated marketing objectives or strategy.

E. Program-Specific Policies

This program has no specific policies.

F. Stakeholder Involvement

Public Service considers its stakeholders in the DSM Planning & Administration program to be both the internal groups who run the DSM programs and require DSM data, as well as the external governmental agencies and environmental and customer groups who express interest in the design of and strategy for the Company's future DSM programs. The DSM Planning & Administration group meets with its external stakeholders regularly for the DSM Roundtable, but also meets with parties at other times as requested.

G. Evaluation, Measurement & Verification Plan

The DSM Planning & Administration program is not customer-facing, and therefore, has no participation or savings impacts to be measured or verified.

H. Rebate Levels

There are no customer rebates associated with this program.

I. Technical Assumptions

The DSM Planning & Administration Program does not have technical assumptions.

➢ Product Development

A. Description

Product Development identifies, assesses, and develops new conservation and load management products and services for addition to its DSM portfolio. This work enables Public Service to periodically update its programs with promising new energy saving opportunities for its customers.

The product development process begins with ideas and concepts from customers, regulators, energy professionals, and Public Service staff. Time is spent on further research of the ideas, evaluation and screening, and sometimes testing of particular product ideas as we work through the development process. The product development staff draws on experience from our work in Minnesota as well as our other states. Products under development are evaluated at multiple times during the development process, prioritized, and developed accordingly. The process also addresses potential improvements to existing products in the area of operational efficiency, cost reduction, or customer satisfaction.

Potential products are ranked on several criteria: political requirement, steady state growth potential (GWh or Dth), speed to market, longevity (i.e. how long until the product becomes the standard used by customers), competencies in place to fulfill, length of sales cycle, market barriers (technological, press, market, education), and potential risks (e.g. legal, environmental, regulatory, safety). The highest scoring ideas are developed first with the remaining ideas are tracked in a database. These will be addressed in the future with the next highest scoring ideas being considered.

For this biennial period and beyond, Product Development will be among the major contributors to the increasing conservation goals. We must develop new products and evolve existing products to fulfill the need. Product Development will continue to review promising business and residential energy efficiency technologies in an effort to augment the Company's current mix of rebated products.

B. Budgets & Goals

The product development budgets were created with the understanding that significant effort will be required to attain the energy conservation goals presented by the Commission. For the planning and design component of the 2009 electric budget ($220,560), approximately 32% ($70,560) is proposed for internal labor, while the remaining 68% ($150,000) is proposed for external developmental studies, and projects used to develop and test DSM products. Approximately 37% ($96,000) of the Administration and Program Delivery component ($258,000) is proposed for external labor such as consulting services, while 5% ($12,000) is proposed for employee expenses, and the remaining 58% ($150,000) is proposed for association dues for organizations from which we will acquire information and research. These associations are groups of interested parties which research and evaluate technologies that are applicable across multiple jurisdictions. Our participation will allow the results of their work to be applied to our Colorado programs. The Equipment and Installation component is approximately 4% of the total 2009 electric budget ($20,000), and is proposed for the purchase and installation of energy efficient equipment as part of product research. The percentages of the total budget proposed for each component is similar for the 2009 gas budget, and for both 2010 budgets.

Table 81: DSM Product Development Budgets

DSM Product Development	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	$220,560	$77,440	$223,000	$78,400
Admin & Program Delivery	$258,000	$42,000	$258,000	$42,000
Ad, Promo, & Customer Ed.	N/A	N/A	N/A	N/A
Customer Incentives	N/A	N/A	N/A	N/A
Equipment & Installation	$20,000	$10,000	$20,000	$10,000
M&V	N/A	N/A	N/A	N/A
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$498,560**	**$129,440**	**$501,030**	**$130,400**
Generator kW	N/A	N/A	N/A	N/A
Generator kWh	N/A	N/A	N/A	N/A
Annual Dth	N/A	N/A	N/A	N/A
Dth/$	N/A	N/A	N/A	N/A
Participants	N/A	N/A	N/A	N/A
Participation as % of Segment	N/A	N/A	N/A	N/A
Modified TRC Test Ratio	N/A	N/A	N/A	N/A

UPDATE: As a result of the recent Settlement Agreement, the 2009 and 2010 electric and gas budgets for the DSM Product Development Program were increased. The new budgets for 2009 are $673,560 (electric) and $204,440 (gas). The new budgets for 2010 are $676.030 (electric) and $205,400 (gas). These budget increases have not yet been separated into the budget categories listed above, but will be included in the May 1, 2009 DSM Plan Amendment.

C. Application Process

This program is non-customer-facing and therefore, has no application process.

D. Marketing Objectives, Goals, & Strategy

This is a non-customer-facing program and does not have marketing objectives or goals.

E. Program-Specific Policies

This program has no specific policies.

F. Stakeholder Involvement

Many stakeholders are involved in the product development process. Ideas come from customers, regulators, company employees, trade organizations, equipment manufacturers, vendors, service providers, and programs we run in other states. These ideas are screened within the product development process, and those ideas that have significant conservation potential are further developed. The product development team draws on our experience with existing conservation programs, as well as solicits information from published standards, trade groups, industry experts, and customers to further develop high potential ideas.

Once developed and filed, new programs must be rolled out to customers. Implementing new products is a joint effort between product developers, product portfolio managers, and many other individuals including marketing assistants, customer account managers, engineers , and rebate specialists. The goal of the new product implementation is to transform the product design in to an efficient, sustainable, robust program that can serve the targeted customers. To do this, operational procedures, budgets, marketing communication materials, and employee training materials are developed. Employee expertise, administrative systems, delivery channels, and vendor/customer relationships are leveraged from existing products and applied to the new program. Throughout the implementation process, and the normal program lifecycle, feedback is collected by the product development team to revise the program as needed, and include in future programs.

G. Evaluation, Measurement & Verification Plan

Product Development will not be subject to evaluation, measurement and verification.

H. Rebate Levels

Product Development is non-customer-facing and as such does not pay rebates.

I. Technical Assumptions

This program does not have technical assumptions associated with it.

➢ Evaluation, Measurement & Verification Plan

A. Description

The Evaluation, Measurement & Verification ("EM&V") Plan for Public Service was developed to evaluate, measure, and verify all direct savings gas and electric programs. All programs will be evaluated on an ongoing basis during each year to ensure that the reported savings areas accurate as possible. Additionally, select programs will be evaluated on a post-performance year basis through comprehensive program evaluations in order to ensure that the savings, technical assumptions, and net-to-gross ratios that are reported by Public Service are accurate and that the program is operating as effectively as possible. The robustness of the proposal is balanced with the costs of the Plan, being mindful of the objectives of ensuring accurate savings while keeping expenditures prudent and maintaining the cost effectiveness of programs. The Company will report any modifications to this M&V plan in its written quarterly updates. All new programs will include a detailed M&V process consistent with this plan.

The Company's evaluation, measurement and verification approach has three components, separated into performance year and post-performance year activities. The components are listed below and detailed in the following sections. Performance year activities are ongoing during the reporting year while programs are being implemented and include rebate application validation and ongoing measurement and verification. Post-performance year activities take place in the years following the performance year and include continuing ongoing measurement and verification (if necessary), as well as comprehensive program evaluations. Comprehensive program evaluations will be staggered over at least the next eight years.

Performance Year Measurement and Verification (M&V)
M&V is conducted on an ongoing basis on measures implemented throughout the program performance year. These ongoing M&V activities ensure that rebate application forms contain complete and correct information, the specified equipment is installed, and the claimed gross energy savings are accurate. These performance year activities include:

1. Rebate Application Validation

This validation procedure applies to all electric and gas residential and business programs offered in Colorado. The procedure is comprised of the following two steps, both performed by Rebate Operations.

Step 1: Front-End Validation
Rebate Operations reviews all prescriptive business and residential program rebate applications and vendor invoices, including those for indirect impact programs. They check the customer information, equipment eligibility and proper rebate amounts. If information is missing or incorrect, the application is sent back to the account representative or customer. For custom programs, the program staff reviews the project documentation to verify customer information, equipment eligibility, and proper rebate amounts, and then delivers final numbers to Rebate Operations.

Step 2: Daily Audit
Rebate Operations audits all business and residential applications to verify that the information was correctly entered. This is the final review prior to issuing the rebate. If errors or issues are found, they are corrected. The daily audit report is re-run after the problems are corrected and filed for permanent storage.

2. Ongoing Measurement and Verification of Savings
Public Service's ongoing M&V procedures are aligned with utility industry best practices for measuring program results. The Company requires that its contractors follow standard protocols, such as the International Performance Measurement and Verification Protocol ("IPMVP") and the California Evaluation Framework. The following links to some of the common reference materials describe these protocols in more detail:

California Evaluation Framework:

http://www.calmac.org/publications/California_Evaluation_Framework_June_2004.pdf

National Action Plan:

http://www.epa.gov/cleanenergy/documents/evaluation_guide.pdf

The IPMVP can be found in the Products & Services section of the Efficiency Valuation Organization's website at http://www.evo-world.org.

For direct impact prescriptive programs, Public Service contracts with third-party verification contractors and program implementers to randomly select samples of business and residential rebates for verification inspections. For some programs, such as ENERGY STAR New Homes, Home Performance with ENERGY STAR, and New Construction, the third-party implementer verifies all of the installations to ensure that reported gross savings are accurate. Custom projects are either verified through engineering reviews of savings or through pre- and post-metering depending on the size of the savings. Table 82 summarizes each program's EM&V plan.

Table 82: 2009/2010 DSM Biennial Plan Measurement Verification Plans By Program

Segment & Program Name	*Component Name*	*Type of Program*	M&V Plan	Comprehensive Program Evaluation Plans
Business Electric:				
Compressed Air Efficiency		Direct/Custom	Projects <1 GWh savings: Company engineers or outside engineering firm calculate savings for pre-approval, calculations reviewed by higher levels of engineering staff depending on size. Random samples of projects sent to outside engineering firm for verification if PSCo engineers complete analysis. Acct Mgr or Business Solutions Center verifies project installation and collects equipment invoices. Project >=1 GWh savings: Pre & Post Metering verifies savings. (Projects of all sizes may be metered depending on certainty assessment of savings.)	
		Direct/Prescriptive	Prescriptive rebates available for Variable Frequency Drive Compressors that are less than 50 hp and have no air loss drain valves. Verification Contractor selects random sample & performs field inspections of deemed savings factors--E.g. size of compressor and number of drains.	
Cooling Efficiency	Cooling Efficiency Custom	Direct/Custom	Projects <1 GWh savings: Company engineers or outside engineering firm calculate savings for pre-approval, calculations reviewed by higher levels of engineering staff depending on size. Random samples of projects sent to outside engineering firm for verification if PSCo engineers complete analysis. Acct Mgr or Business Solutions Center verifies project installation and collects equipment invoices. Project >=1 GWh savings: Pre & Post Metering verifies savings. (Projects of all sizes may be metered depending on certainty assessment of savings.)	Process/Impact Study in 2009
	Cooling Efficiency Prescriptive	Direct/Prescriptive	Verification Contractor selects random sample & performs field inspections of deemed savings factors; E.g. equipment type, size, efficiency, climate zone and building type. For VAV's, number of boxes and fans, climate zone and building type will be verified using a sample of total boxes and fans.	Process/Impact Study in 2009
Custom Efficiency		Direct/Custom	Projects <1 GWh savings: Company engineers or outside engineering firm calculate savings for pre-approval, calculations reviewed by higher levels of engineering staff depending on size. Random samples of projects sent to outside engineering firm for verification if PSCo engineers complete analysis. Acct Mgr or Business Solutions Center verifies project installation and collects equipment invoices. Project >=1 GWh savings: Pre & Post Metering verifies savings. (Projects of all sizes may be metered depending on certainty assessment of savings.)	

Table 82: 2009/2010 DSM Biennial Plan Measurement Verification Plans By Program

Segment & Program Name	Component Name	Type of Program	M&V Plan	Comprehensive Program Evaluation Plans
Data Center Efficiency		Direct/Custom	Projects <1 GWh savings: Company engineers or outside engineering firm calculate savings for pre-approval, calculations reviewed by higher levels of engineering staff depending on size. Random samples of projects sent to outside engineering firm for verification if PSCo engineers complete analysis. Acct Mgr or Business Solutions Center verifies project installation and collects equipment invoices. Project >=1 GWh savings: Pre & Post Metering verifies savings. (Projects of all sizes may be metered depending on certainty assessment of savings.)	
Energy Management Systems		Direct/Custom	Projects <1 GWh savings: Company engineers or outside engineering firm calculate savings for pre-approval, calculations reviewed by higher levels of engineering staff depending on size. Random samples of projects sent to outside engineering firm for verification if PSCo engineers complete analysis. Acct Mgr or Business Solutions Center verifies project installation and collects equipment invoices. Project >=1 GWh savings: Pre & Post Metering verifies savings. (Projects of all sizes may be metered depending on certainty assessment of savings.)	
Lighting Efficiency	Lighting Efficiency Custom	Direct/Custom	Projects <1 GWh savings: Company engineers or outside engineering firm calculate savings for pre-approval, calculations reviewed by higher levels of engineering staff depending on size. Random samples of projects sent to outside engineering firm for verification if PSCo engineers complete analysis. Acct Mgr or Business Solutions Center verifies project installation and collects equipment invoices. Project >=1 GWh savings: Pre & Post Metering verifies savings. (Projects of all sizes may be metered depending on certainty assessment of savings.)	A Process/Impact Study was conducted in 2008.
	Lighting Efficiency Prescriptive	Direct/Prescriptive	Verification Contractor selects random sample & performs field inspections of deemed savings factors-- E.g. number of fixtures, equipment type, building type, existence of air conditioning. Information gathered for a sample of lamps/fixtures and extrapolated to total population.	A Process/Impact Study was conducted in 2008.

Table 82: 2009/2010 DSM Biennial Plan Measurement Verification Plans By Program

Segment & Program Name	Component Name	Type of Program	M&V Plan	Comprehensive Program Evaluation Plans
Motor & Drive Efficiency	Motor Efficiency Custom	Direct/Custom	Projects <1 GWh savings: Company engineers or outside engineering firm calculate savings for pre-approval, calculations reviewed by higher levels of engineering staff depending on size. Random samples of projects sent to outside engineering firm for verification if PSCo engineers complete analysis. Acct Mgr or Business Solutions Center verifies project installation and collects equipment invoices. Project >=1 GWh savings: Pre & Post Metering verifies savings. (Projects of all sizes may be metered depending on certainty assessment of savings.)	Process/Impact Study in 2010
	Motor Efficiency Prescriptive	Direct/Prescriptive	Verification Contractor selects random sample & performs field inspections of deemed savings factors--E.g. horsepower, efficiency, type, speed, application, building type, use of motor. For VFDs, size, speed, type, application and use of motor drive, building type. If more than 10 motors, information will be gathered for a sample.	Process/Impact Study in 2010
New Construction	Energy Efficient Buildings	Direct/Prescriptive	Consultant visits site and verifies that specified measures were installed. Projects with individual measure savings >= 1 GWh savings: Four weeks of data logging verifies savings.	
	Energy Design Assistance	Direct/Custom	Consultant visits site and verifies that specified measures were installed. Equipment and systems are monitored for a two week timeframe, as appropriate, to evaluate performance variables against modeling assumptions. Projects with individual measure savings >= 1 GWh savings: Four weeks of data logging verifies savings. All projects verified with actual results not within 10% of the energy savings identified in the original model will have an as-built model completed for rebate calculations.	Process/Impact Study in 2009
Process Efficiency	Process Efficiency - Prescriptive	Direct/Prescriptive	Verification Contractor selects random sample & performs field inspections of deemed savings factors specified for applicable end use program	
	Process Efficiency - Custom	Direct/Custom	Projects <1 GWh savings: Company engineers or outside engineering firm calculate savings for pre-approval, calculations reviewed by higher levels of engineering staff depending on size. Random samples of projects sent to outside engineering firm for verification if PSCo engineers complete analysis. Acct Mgr or Business Solutions Center verifies project installation and collects equipment invoices. Project >=1 GWh savings: Pre & Post Metering verifies savings. (Projects of all sizes may be metered depending on certainty assessment of savings.)	

Table 82: 2009/2010 DSM Biennial Plan Measurement Verification Plans By Program

Segment & Program Name	Component Name	Type of Program	M&V Plan	Comprehensive Program Evaluation Plans
Recommissioning	Recommissioning Studies	Indirect	N/A	Process/Impact Study in 2010
	Recommissioning Study Credit	Direct/Custom	Customer hires an engineering firm to conduct study of building and to determine energy savings for each measure. Internal engineers review and verify that savings calculations are accurate for 100% of projects. For measures over 1 GWh of savings, pre and post metering is required to verify savings. For projects very difficult to meter, a combination of metering and calculation may be used.	Process/Impact Study in 2010
	Recommissioning over 1 year projects	Direct/Custom	Customer hires an engineering firm to conduct study of building and to determine energy savings for each measure. Internal engineers review and verify that savings calculations are accurate for 100% of projects. For measures over 1 GWh of savings, pre and post metering is required to verify savings. For projects very difficult to meter, a combination of metering and calculation may be used.	Process/Impact Study in 2010
Segment Efficiency	Segment Efficiency - Prescriptive Lighting	Direct/Prescriptive	Same as Prescriptive Lighting	
	Segment Efficiency - Prescriptive Motors/Drives	Direct/Prescriptive	Same as Prescriptive Motors	Process/Impact Study in 2010
	Segment Efficiency - Prescriptive Cooling	Direct/Prescriptive	Same as Prescriptive Cooling	
	Segment Efficiency - Custom Lighting	Direct/Custom	Same as Custom Programs	
	Segment Efficiency - Custom	Direct/Custom	Same as Custom Programs	Process/Impact Study in 2010
	Segment Efficiency - Custom Cooling	Direct/Custom	Same as Custom Programs	
	Segment Efficiency - EMS	Direct/Custom	Same as Custom Programs	
	Segment Efficiency - Custom Custom	Direct/Custom	Same as Custom Programs	
	Segment Efficiency - Recommissioning	Direct/Prescriptive	Same as Custom Recommissioning	Process/Impact Study in 2010
Self-Directed Custom Efficiency		Direct/Custom	Customer will calculate savings and Company will verify calculations. Customer will develop and implement M&V plan specific to project. Company will review M&V plan and results. Additionally, a random sample of all pre-approved projects will be selected by the Company and sent to an outside engineering firm for metering and verification.	Process/Impact Study in 2011

Table 82: 2009/2010 DSM Biennial Plan Measurement Verification Plans By Program

Segment & Program Name	Component Name	Type of Program	M&V Plan	Comprehensive Program Evaluation Plans
Small Business Lighting		Direct/Prescriptive	Verification Contractor selects random sample & performs field inspections of deemed savings factors-- E.g. number of fixtures, equipment type, building type, existence of air conditioning. Information gathered for a sample of lamps/fixtures.	
Standard Offer		Direct/Custom	Customer or customers agent (such as ESCO) will calculate savings and Company will verify calculations. Customer or customers agent (such as ESCO) will develop and implement M&V plan specific to project and will submit it as a part of the project description in the initial audit phase of the program. Company will review M&V plan and results. Additionally, a random sample of all pre-approved projects will be selected by the Company and sent to an outside engineering firm for metering and verification.	
Business Gas:				
Boiler Efficiency	Boiler Efficiency Custom	Direct/Custom	Projects <20,000 Dth savings: Company engineers or outside engineering firm calculate savings for pre-approval, calculations reviewed by higher levels of engineering staff depending on size. Random samples of projects sent to outside engineering firm for verification if PSCo engineer completes analysis. Acct Mgr or Business Solutions Center verifies project installation, collects equipment invoices. Project >=20,000 Dth savings: Pre & Post Metering verifies savings. (Projects of all sizes may be metered depending on certainty assessment of savings.)	Process/Impact Study in 2011
	Boiler Efficiency Prescriptive	Direct/Prescriptive	Verification Contractor selects random sample & performs field inspections of deemed savings factors. For boilers- size, efficiency. For steam traps- high or low pressure. For all other- size, implemented measure.	Process/Impact Study in 2011
Custom Efficiency		Direct/Custom	Projects <20,000 Dth savings: Company engineers or outside engineering firm calculate savings for pre-approval, calculations reviewed by higher levels of engineering staff depending on size. Random samples of projects sent to outside engineering firm for verification if PSCo engineer completes analysis. Acct Mgr or Business Solutions Center verifies project installation, collects equipment invoices. Project >=20,000 Dth savings: Pre & Post Metering verifies savings. (Projects of all sizes may be metered depending on certainty assessment of savings.)	

Table 82: 2009/2010 DSM Biennial Plan Measurement Verification Plans By Program

Segment & Program Name	Component Name	Type of Program	M&V Plan	Comprehensive Program Evaluation Plans
Energy Management Systems		Direct/Custom	Projects <20,000 Dth savings: Company engineers or outside engineering firm calculate savings for pre-approval, calculations reviewed by higher levels of engineering staff depending on size. Random samples of projects sent to outside engineering firm for verification if PSCo engineer completes analysis. Acct Mgr or Business Solutions Center verifies project installation, collects equipment invoices. Project >=20,000 Dth savings: Pre & Post Metering verifies savings. (Projects of all sizes may be metered depending on certainty assessment of savings.)	
Furnace Efficiency		Direct/Prescriptive	Verification Contractor selects random sample & performs field inspections of deemed savings factors; E.g. efficiency of unit and size.	
New Construction	Energy Design Assistance	Direct/Custom	Consultant visits site and verifies that specified measures were installed. Equipment and systems are monitored for a two week timeframe, as appropriate, to evaluate performance variables against modeling assumptions. Projects with individual measure savings >= 20,000 Dth savings: Four weeks of data logging verifies savings. All projects verified with actual results not within 10% of the energy savings identified in the original model, will have an as-built model completed for rebate calculations.	Process/Impact Study in 2009
	Energy Efficiency Buildings	Direct/Prescriptive	Consultant visits site and verifies that specified measures were installed. Projects with individual measure savings >= 20,000 Dth savings: Four weeks of data logging verifies savings.	
Process Efficiency	Process Efficiency - Custom	Direct/Custom	Projects <20,000 Dth savings: Company engineers or outside engineering firm calculate savings for pre-approval, calculations reviewed by higher levels of engineering staff depending on size. Random samples of projects sent to outside engineering firm for verification if PSCo engineer completes analysis. Acct Mgr or Business Solutions Center verifies project installation, collects equipment invoices. Project >=20,000 Dth savings: Pre & Post Metering verifies savings. (Projects of all sizes may be metered depending on certainty assessment of savings.)	
	Process Efficiency - Prescriptive	Direct/Prescriptive	Verification Contractor selects random sample & performs field inspections of deemed savings factors specified for applicable end use program	

Table 82: 2009/2010 DSM Biennial Plan Measurement Verification Plans By Program

Segment & Program Name	Component Name	Type of Program	M&V Plan	Comprehensive Program Evaluation Plans
Recommissioning	Recommissioning Studies	Indirect	N/A	Process/Impact Study in 2010
	Recommissioning Study credit	Direct/Custom	Customer hires an engineering firm to conduct study of building and to determine energy savings for each measure. Internal engineers reviews and verifies that savings calculations are accurate for 100% of projects. For measures over 20,000 Dth of savings, pre and post metering is required to verify savings. For projects very difficult to meter, a combination of metering and calculation may be used.	Process/Impact Study in 2010
	Recommissioning over 1 year projects	Direct/Custom	Customer hires an engineering firm to conduct study of building and to determine energy savings for each measure. Internal engineers reviews and verifies that savings calculations are accurate for 100% of projects. For measures over 20,000 Dth of savings, pre and post metering is required to verify savings. For projects very difficult to meter, a combination of metering and calculation may be used.	Process/Impact Study in 2010
Segment Efficiency	Segment Efficiency - Prescriptive Boilers	Direct/Prescriptive	Same as Prescriptive Boilers	
	Segment Efficiency - Recommissioning	Direct/Custom	Sames as Custom Recommissioning	Process/Impact Study in 2010
Standard Offer		Direct/Custom	Customer or customer's agent (such as ESCO) will calculate savings and Company will verify calculations. Customer or customers agent (such as ESCO) will develop and implement M&V plan specific to project and will submit it as a part of the project description in the initial audit phase of the program. Company will review M&V plan and results. Additionally, a random sample of all pre-approved projects will be selected by the Company and sent to an outside engineering firm for metering and verification.	
Residential Electric:				
ENERGY STAR New Homes		Direct/Prescriptive	Third-party program implementer performs walk through and HERS rating (blower door) at end of construction prior to rebating for program - 100% site verification. Home size information, measures installed, and HERS rating are verified.	
ENERGY STAR Retailer Incentive		Market Transformation Pilot Direct/Prescriptive	Evaluation contractor will determine pre-promotion or baseline sales and ENERGY STAR penetration for each product category. The contractor will evaluate the post-promotion sales to determine the shift in penetration of ENERGY STAR equipment within each product category.	Process/Impact Study in 2011
Evaporative Cooling Rebate Program		Direct/Prescriptive	Verification Contractor selects random sample & performs field inspections of deemed savings factors; E.g. type of unit (tier 1 or 2), and type of unit if previously installed.	Process/Impact Study in 2010

Table 82: 2009/2010 DSM Biennial Plan Measurement Verification Plans By Program

Segment & Program Name	Component Name	Type of Program	M&V Plan	Comprehensive Program Evaluation Plans
Home Lighting & Recycling		Direct/Prescriptive	Verification contractor audits program tracking databases.	Process/Impact Study in 2009
Home Performance with ENERGY STAR		Direct/Prescriptive	Third-party program implementer (auditor) performs walk through after the homeowner has performed all of their planned energy efficiency improvements. 100% of all homes will be inspected through this method. The program has this permanently built into the program as a requirement to ensure all stated improvements have been made prior to issuing the rebate.	
Refrigerator Recycling		Direct/Prescriptive	Verfication contractor conducts phone surveys of random sample of participants to verify removal of refrigerator and that refrigerator was operable at time of removal.	
Saver's Switch		Direct/ Demand Response	Xcel Energy's load research group manages third-party contractors to conduct sampling of enrolled sites. A data logger is installed on-site to monitor the air conditioner's energy use and how that use changes on a control day. Third party evaluator analyzes results to determine load relief achieved during a control day.	Process Study in 2009
School Education Kit		Direct/Prescriptive	Third-party program implementer conducts phone/mail surveys to teachers/students to confirm what was installed at students home.	
Low-Income Segment	Single Family Weatherization	Direct/Prescriptive	Contracted weatherization agency visits home, identifies savings opportunities and then installs measures. Weatherization agency provides documentation of completed measures to third party program implementer, who submits information to PSCo.	
	Multi-Family Weatherization	Direct/Custom	Consultant visits home and completes energy audit. PSCo engineer reviews audit report and approves or denies report. Consultant visits site to verify that approved measures were installed and submits final savings in verification report.	
	Non-Profit Weatherization	Direct/Custom	Consultant visits building and completes energy audit. PSCo engineer reviews audit report and approves or denies report. Consultant visits site to verify that approved measures were installed and submits final savings in verification report.	
	Easy Savings Energy Kits	Direct/Prescriptive	Third-party program implementer conducts phone or mail surveys to confirm what was installed at recipient's home.	

Table 82: 2009/2010 DSM Biennial Plan Measurement Verification Plans By Program

Segment & Program Name	Component Name	Type of Program	M&V Plan	Comprehensive Program Evaluation Plans
Residential Gas:				
Energy Efficient Showerhead		Direct/Prescriptive	Verification Contractor selects random sample & performs phone survey of deemed savings factors--E.g. Showerhead was received and installed.	
ENERGY STAR New Homes		Direct/Prescriptive	Third-party program implementer performs walk through and HERS rating (blower door) at end of construction prior to rebating for program - 100% site verification. Home size information, measures installed, and HERS rating are verified	
Heating System Rebate		Direct/Prescriptive	Verification Contractor selects random sample & performs field inspections of deemed savings factors; E.g. efficiency of unit.	
Home Performance with ENERGY STAR		Direct/Prescriptive	Third-party program implementer (auditor) performs walk through after the homeowner has performed all of their planned energy efficiency improvements. 100% of all homes will be inspected through this method. The program has this permanently built into the program as a requirement to ensure all stated improvements have been made prior to issuing the rebate. PSCO will also implement a market research survey with customers to gauge satisfaction with the program, auditors and installation contractors that were used.	
Insulation Rebate		Direct/Prescriptive	Verification Contractor selects random sample & conducts phone survey to confirm rebated measure was installed.	
School Education Kit		Direct/Prescriptive	Third-party program implementer conducts phone/mail surveys to teachers/students to confirm what was installed at student's home.	
Water Heating Rebate		Direct/Prescriptive	Verification Contractor selects random sample & performs field inspections of deemed savings factors--E.g. type of unit installed.	
Low-Income Segment				
Single-Family Weatherization		Direct/Prescriptive	Contracted weatherization agency visits home, identifies savings opportunities and then installs measures. Weatherization agency provides documentation of completed measures to third party program implementer, who submits information to PSCo.	
Multi-Family Weatherization		Direct/Custom	Consultant visits home and completes energy audit. PSCo engineer reviews audit report and approves or denies report. Consultant visits site to verify that approved measures were installed and submits final savings in verification report.	
Non-Profit Energy Efficiency		Direct/Custom	Consultant visits building and completes energy audit. PSCo engineer reviews audit report and approves or denies report. Consultant visits site to verify that approved measures were installed and submits final savings in verification report.	

Table 82: 2009/2010 DSM Biennial Plan Measurement Verification Plans By Program

Segment & Program Name	Component Name	Type of Program	M&V Plan	Comprehensive Program Evaluation Plans
Easy Savings Energy Kits		Direct/Prescriptive	Third-party program implementer conducts phone or mail surveys to confirm what was installed at recipient's home.	
Education/Market Transformation Segment				
Business Energy Analysis		Indirect	Since this is an indirect impact program, we will not perform M&V of savings.	
Customer Behavioral Change Programs-Residential & Business		Indirect/Market Transformation	Direct savings are not credited to this program; therefore, on-going M&V will not be conducted.	An evaluation contractor will be hired to measure and report on program progress. This includes an assessment of the extent to which education and market transformation efforts are achieving the desired results.
Residential Home Energy Audit		Indirect	Since this is an indirect impact program, we will not perform M&V of savings. However, a third-party contractor will periodically review a sample of completed audits to determine if the auditor correctly identified all of the energy efficiency opportunities.	

The following two sections describe the general M&V methods that will be used for prescriptive and custom programs.

Prescriptive Programs:

Prescriptive programs use technical assumptions based on stipulated or deemed technical assumptions that are assigned to measures in order to calculate gross energy and demand savings. The verification activities for prescriptive programs will follow a Deemed Savings approach, where the primary goal is to conduct field inspections for a sample of projects to determine that the measures are properly installed and have the potential to generate savings. This approach corresponds to the basic rigor method outlined in the IPMVP—Option A: Retrofit Isolation: Key Parameter Measurement. Onsite verification activities will confirm energy efficiency measure installation and will allow the inspector to gather enough information to recalculate the energy savings as reported by Xcel Energy for each selected project. Inspection parameters gathered onsite will vary based on the program and sector.

Key parameters (also referred to as savings factors or checkpoints in this document) include the following:

- Installed equipment matches equipment listed on rebate application. For example, as applicable, the contractor will check:
    - Manufacturer
    - Model number
    - Efficiency rating
    - Equipment size, capacity or output
    - Application of measure (e.g. motors that run fans versus pumps versus other mechanical systems)
    - Participant segment (e.g. restaurant versus college versus office building)
    - Quantity (e.g. number of light bulbs)
- Any comments concerning the operation of the fixtures or deviations from the customer application.

For most of the programs, the contractor selects a statistically valid number of projects to verify through field inspections or phone surveys. The sample size is designed to achieve accuracy levels of between 10% and 20% given a confidence level of 90% around the "realization rate" and is weighted to select larger projects. The number of randomly selected participants in the sample may increase or decrease during the year in order to ensure that the realization rate accuracy approximates the precision goals for the program. Sampling bias caused by poor response rates and deliberate exclusion of sample projects will be reduced through a quality control process. Rebate forms notify all customers that their respective premises and measures are subject to verification inspections.

The "realization rate" is a calculated value that compares the verified savings to the reported savings. The realization rate for a project is the ratio of the verified savings to the savings reported on the rebate application. The realization rate for the program as a whole is the ratio of the program's total verified savings to the total rebate reported savings. The program realization rate is applied to gross savings to determine gross program impacts. T he net-to-gross factor is then applied to the verified gross savings to yield net program impacts.

The general M&V process for the following prescriptive programs or prescriptive components of programs is outlined below.

Business Programs
- Compressed Air Efficiency
- Cooling Efficiency
- Lighting Efficiency
- Motor & Drive Efficiency
- Process Efficiency
- Segment Efficiency
- Small Business Lighting Efficiency
- Furnace Efficiency
- Boiler Efficiency

Residential Programs
- Evaporative Cooling Rebate
- Refrigerator Recycling
- Energy Efficient Showerheads
- Heating System Rebate
- Insulation Rebate
- Water Heater Rebate

General Prescriptive Project Process
1. Customer submits rebate application and required documentation to Public Service after measure is installed.
2. Rebate Operations reviews all business and residential program rebate applications and vendor invoices. They check the customer information, equipment eligibility and proper rebate amounts. If information is missing or incorrect, the application is sent back to the account representative or customer to make changes.
3. If project qualifies for rebate, Rebate Operations enters rebate application form data into Siebel or ReCap (rebate tracking database) and authorizes rebate payment. Prior to authorizing rebates, all applications are verified in a daily audit.
4. Public Service sends the verification contractor (VC) a list of all of the projects completed in that period on an agreed to schedule.
5. The VC selects a statistically valid sample of projects to inspect. The sample size is designed to achieve 90% confidence with 10-20% precision.
6. VC contacts customer to schedule the inspection or complete the phone survey.
7. VC visits site and verifies the savings factors or checkpoints for that measure.
8. VC inputs the verified savings factors into the calculator spreadsheets to calculate the project's verified energy savings.
9. VC calculates the project's realization rate, which is calculated by dividing the recalculated or verified savings are divided by the reported or rebated savings. At 1 or 100%, the verified and rebated savings are equal.
10. VC calculates the program's realization rate, which is the average realization rate of all projects in the program sample.
11. The program's realization rate is applied to the rebate application savings captured in Siebel or ReCap to determine gross verified savings.
12. Net-to-gross factors will be applied to the gross verified savings to determine net savings.

Program Exceptions
Programs with special design elements are verified using different processes. The M&V process for these programs is described below.

ENERGY STAR New Homes

The ENERGY STAR New Homes Program is designed to encourage homebuilders to consider a "whole-house" approach to energy conservation when building new single-family and multi-family homes. The program is implemented by a third-party contractor in partnership with HERS raters. Each project is verified by a HERS rater prior to issuing a rebate to the builder.

1. Builder contacts HERS rater to express interest in building an ENERGY STAR home.
2. HERS rater works with builder to construct the home to meet or exceed ENERGY STAR standards. The HERS Rater will visit the home during construction to inspect the building method used and the equipment installed.
3. When the home is completed, the HERS Rater will perform an air tightness test on the house and then calculate the HERS score and the energy savings on the house. The HERS Rater models the home by entering the individual characteristics into REMRATE, a software program approved by RESNET. The software will generate the energy savings of the home. When the rating of the home is completed, the electronic model for the house is submitted to a HERS Provider. RESNET requires that each house be submitted to a HERS Provider for quality assurance. The HERS Provider may be employed by the rating company but must be separately designated as a Provider. The Provider shall not be the same person that rated the home. The HERS Provider will review the file for errors. RESNET requires that HERS Providers do quality assurance on 10% of each Rater's building files and fully replicate 1% of the home ratings annually.
4. Once the Rater has submitted the test scores to Public Service, the builder will receive a rebate based on the gas and electric savings. There is no rebate application for this program because the HERS report is the data that will be used to determine the rebate for each individual house. The third-party implementer will ensure that all the information entered into the software system is correctly tracked. Houses will be recorded on the Environmental Protection Agency's ENERGY STAR website.
5. Public Service will track the home address, meter number, characteristics (home style, square footage, heating and cooling equipment installed), builder name and address, HERS score on modeled homes, blower door test score, gas and electric energy saved, date tested and rebate amount paid.

ENERGY STAR Retailer Incentive

The ENERGY STAR Retailer Incentive Program provides upstream incentives and advertising dollars to retailers for increasing their sales of ENERGY STAR units. The program performance is measured by an independent contractor using a pre- and post-promotion evaluation.

1. Retailer signs a memorandum of understanding that details the requirements of the Xcel Energy participation agreement.
2. Retailer submits historical sales data for stores within the Xcel Energy service area to the Xcel Energy third-party contractor.
3. Contractor determines the total sales and ENERGY STAR penetration within each product category.
4. Xcel Energy and retailer promote the ENERGY STAR units for a given time period.

5. After the promotion is complete, the retailer submits sales data for the same stores for the given time period to the contractor. Retailer also submits sales data for a pre-determined control group of stores.
6. Contractor evaluates the sales data and determines shift in penetration to ENERGY STAR units.
7. Xcel Energy pays retailer based on the sales "lift" or the change in ENERGY STAR penetration.

Home Lighting & Recycling

The Home Lighting & Recycling Program is designed to increase the sale and use of compact fluorescent light bulbs in our Colorado service territory. Public Service partners with manufacturers and retailers to reduce the retail price of qualifying bulbs and promote them to the retailers' customers. One of the retailers, Ace Hardware, has agreed to require customers to complete an instant rebate coupon to purchase the bulbs at the discounted price. The information captured from the coupons will include customer contact information, number of bulbs purchased per customer, and model of bulbs purchased.

1. Participating retailers will provide weekly or monthly sales reports listing the model types and number of bulbs sold.
2. A third-party vendor will enter the information, including the coupon information from Ace Hardware, into a tracking database created by Xcel Energy. The vendor will submit monthly reports containing total number of bulbs sold, average wattage of bulbs sold, number of bulbs purchased per customer, weighed average operating hours, and kW and kWh savings.
3. To determine the demand savings, each bulb model will be assigned to one of five groups based on the CFL bulb wattage. A deemed value will be used for the wattage of the incandescent bulb being replaced for each group of bulbs as seen in the table below. The actual wattage of each CFL bulb model will be subtracted from the wattage of the incandescent equivalent to calculate the wattage (kW) saved for each model of bulb.

Table 83: Deemed Incandescent and CFL-Equivalent Wattages

CFL Wattage Range	Replaced Incandescent Bulb Wattage
9 - 12	40
13 - 16	60
17 - 23	75
24 - 30	100
31 - 52	150

4. The energy savings will be calculated for each bulb based on the demand saved multiplied by hours of operation for all of the bulbs based on the table shown below. The position in the table will be determined by compiling coupon data (number of bulbs purchased) from individual Ace Hardware customers. The Ace Hardware coupons are the only source of data for the number of bulbs purchased per customer. Customers purchasing more than 12 bulbs will be excluded from the Operating Hours calculation.

The Operating Hours will be calculated from the chart below using the actual number of bulbs purchased per customer. The chart assumes that each customer already has three CFL bulbs installed in their house, which will remain a fixed assumption.

Table 84: Average Operating Hours of Each Additional CFL Added to a Home

# of Purchased Bulbs	Average Operating Hours of Newly Installed Bulbs
1	1210
2	1210
3	1149
4	1119
5	1100
6	1088
7	1059
8	1038
9	1019
10	1003
11	991
12	980

5. The database will compute a distribution of the number of bulbs purchased per customer and a weighted average operating hours per bulb from the coupon distribution. This report should be completed by early to mid-summer and will be used (after audit and verification) to determine the operating hours for all bulbs for the calendar year. An example of the computation of the weighted average operating hours follows.

Table 85: Example of Calculation of Operating Hours from Sample Distribution

Bulbs	Average Operating Hours/Bulb	Distribution of Sample Customers Purchasing Bulbs	Number of Bulbs	Distribution of Operating Hours Per Bulbs Sold	Average Operating Hours to Use for each bulb sold
1	1210	60	60	72,600	
2	1210	300	600	726,000	
3	1149	400	1200	1,378,800	
4	1119	800	3200	3,580,800	
5	1100	600	3000	3,300,000	
6	1088	450	2700	2,937,600	
7	1059	200	1400	1,482,600	
8	1038	800	6400	6,643,200	
9	1019	2	18	18,342	
10	1003	3	30	30,090	
11	991	1	11	10,901	
12	980	1	12	11,760	
			18,631	**20,192,693**	**1,084**

6. The third-party Verification Contractor will audit the database by examining and comparing against the Retailer sales reports. The Verification Contractor will adjust Watts/Bulb if errors are found and provide the final verified total kW for all bulbs by year-end.
7. The Verification Contractor will also audit the number of bulbs purchased per customer against a sample of the customer coupons. They may remove outliers and correct errors in the final calculations of number of bulbs/customer that will be used to establish the operating hours per bulb. The Verification Contractor may call a sample of customers to confirm purchases if necessary. The Verification Contractor will provide the final operating hours by September to use for calculating the year-end gross energy savings.

Home Performance with ENERGY STAR

The Home Performance with ENERGY STAR Program is designed to take a whole house approach to improving the energy efficiency of existing single-family homes. Each project is subject to onsite verification prior to issuing a rebate.

1. Customer contacts Public Service to request a home energy audit.
2. Customer submits program application form.
3. Within one year of enrollment in the program, the customer installs the required measures and the selected optional measures and contacts the Home Performance provider to schedule a final verification inspection.

4. When the inspection is completed, the Home Performance provider will submit an electronic rebate form to the processing team along with copies of invoices for all of the completed installs. The rebate is then processed and the check is issued within four to six weeks.

Low-Income Easy Savings Energy Kits
The Easy Savings Energy Kits Program provides a bundle of home energy efficiency measures and educational items in a kit that can be distributed to low-income customers through local low-income agencies. The third-party program implementers issue the kits and complete follow-up surveys to a sample of the participants to confirm that the equipment was installed.

Low-Income Single-Family Weatherization
The Single-Family Weatherization Program offers standard payments to the program implementer for the installation of specific, predetermined energy efficiency measures. Savings from the measures are based on deemed savings values and include measures such as wall and ceiling insulation, furnace replacements, refrigerator replacements and compact fluorescent lighting. Verification is built into the program design, as the contracted weatherization agency actually installs the measures. The specific program process, including verification, is outlined below.

1. Income-qualified customer signs up for weatherization services through program implementer.
2. Program implementer arranges for a weatherization crew from a contracted agency to visit the customer's home to identify savings opportunities.
3. The crew returns to the home within 14 days to implement the identified measures.
4. The contractor submits documentation of the measures that were installed to the implementer.
5. The implementer submits this documentation to Public Service along with a request for payment for the installed measures.
6. Public Services issues payment for the installed measures.

Low-Income Multi-Family Weatherization
The Multi-Family Weatherization Program offers payments to the program implementer for the installation of energy efficiency measures. This program differs from the Single-Family Weatherization Program in that deemed savings are not used to determine savings. Instead, an auditor visits the facility, analyzes the savings opportunities and calculates savings. Verification is built into the program design, as the contracted weatherization agency actually installs the measures. The specific program process, including verification, is outlined below.

1. Income-qualified customer signs up for weatherization services through program implementer.
2. Program implementer arranges for the contracted consultant to visit the home and identify savings opportunities.
3. Consultant produces an audit report outlining savings opportunities and potential savings.
4. Public Service engineer reviews project and has 10 days to approve or deny the report.

5. Program implementer arranges for the weatherization crew to install measures approved by Public Service.
6. Program implementer arranges for the contracted consultant to visit the home to verify measure installation and calculate final savings.
7. Contracted consultant submits completed audit report with final savings to the implementer.
8. The implementer submits this documentation to Public Service along with a request for payment for the installed measures.
9. Public Services issues payment for the installed measures.

Low-Income Non-Profit Energy Efficiency

The Non-Profit Energy Efficiency Program provides funding for energy efficiency retrofit improvements to qualified non-profit organizations within the Company's service territory. Verification is built into the program design, as the contracted weatherization agency actually installs the measures. The specific program process, including verification, is outlined below.

1. Income-qualified customer signs up for weatherization services through program implementer.
2. Program implementer arranges for the contracted consultant to visit the building and identify savings opportunities.
3. Consultant produces an audit report outlining savings opportunities and potential savings.
4. Public Service engineer reviews project and has 10 days to approve or deny the report.
5. Program implementer arranges for the weatherization crew to install measures approved by Public Service.
6. Program implementer arranges for the contracted consultant to visit the building to verify measure installation and calculate final savings.
7. Contracted consultant submits completed audit report with final savings to the implementer.
8. The implementer submits this documentation to Public Service along with a request for payment for the installed measures.
9. Public Services issues payment for the installed measures.

Saver's Switch

Saver's Switch is a demand response program that offers bill credits as an incentive for residential customers to allow Public Service to control operation of their central air conditioners on days when the system is approaching its peak. Public Service's load research organization leads an annual research project to evaluate the load relief achieved from installed Saver's Switch units. The team contracts the data gathering and most of the analysis to a third-party consultant that specializes in load research projects. A sample of each type of switch is included in the annual research project. This is done with a data logger installed onsite to monitor the air conditioner's energy use and how that use changes on a control day. The results are used to document the extent of load relief achieved during a control day.

School Education Kits

School Education Kits is a turnkey program designed to provide households with information and equipment to realize immediate energy savings. The third-party program implementers issue the kits and complete follow-up surveys to a sample of the participants to confirm that the equipment was installed.

Custom Programs:
Custom programs use technical assumptions that are specific to the actual measure characteristics in order to calculate the energy and demand savings. For all Custom projects, an internal engineer (or an outside firm) determines in the preapproval stage the demand and energy savings using technical assumptions specific to each measure. Senior and managing engineers will audit the preapproval calculations for all projects, as outlined in Step 4 of the General Customer Project Process.). In addition, a random sample of all preapproved projects completed by Public Service associate engineers will be sent to an outside engineering firm for review, as shown in Step 5. After installation of the project measures, an account manager verifies the installation of equipment, removal of old equipment, and collects the invoices. The rebate is not paid until the savings are verified.

All projects with measure savings greater than or equal to one GWh or 20,000 Dth require enhanced rigor measurement and verification methods. Enhanced rigor can involve end use or whole facility metering or engineering and building simulation models, which correspond to IPMVP options B, C, or D. These projects require a detailed M&V plan, outlining the scope and methods of the M&V activities at the specific facility. The methods, such as pre- and post-metering, will be aligned with the appropriate IPMVP options. Length of time that metering takes place will vary depending upon the load variability, with a minimum of two weeks of metering pre- and post-installation. If metering is too costly or physically impossible, engineering modeling or building simulation modeling may be substituted. Metering may also be used to verify savings of smaller projects depending on the engineer's assessment of the uncertainty around the savings.

The general Custom project approval process is described below and applies to the following programs:

- Boiler Efficiency
- Compressed Air Efficiency
- Cooling Efficiency
- Custom Efficiency
- Data Center Efficiency
- Energy Management Systems
- Lighting Efficiency
- Motor and Drive Efficiency
- Process Efficiency
- Segment Efficiency

General Custom Project Process

Project Identification

1. Project identification and scoping.
2. Customer submits preapproval application to Public Service.

Preapproval

3. Public Service engineer (or outside engineering firm) reviews the application and calculates the energy and demand savings based on the technical assumptions specific to that measure and the resulting rebate.
4. Public Service engineers review the calculations, regardless of whether internal or external engineers completed Step 3.
    a. For projects <0.5 GWh or <10,000 Dth, a senior engineer must review and approve.

    b. For projects 0.5-1 GWh or 10,000 to 20,000 Dth, a senior engineer and managing engineer must review and approve.
    c. For projects >1 GWh or >20,000 Dth, a senior engineer, managing engineer and the engineering team manager must review and approve.
5. Public Service selects a random sample of the projects and sends to an outside engineering firm (if Public Service associate engineer performed Step 3) to review the calculations.
    a. For projects <0.5 GWh or <10,000 Dth, 10% of projects are sampled
    b. For projects 0.5-1 GWh or 10,000-20,000 Dth, 25% of projects are sampled
    c. For projects >1 GWh or 20,000 Dth, 100% of projects are sampled after pre- and post-monitoring data is collected.
6. If the outside engineering firm disagrees with the Public Service engineer's analysis, they discuss the project and reach consensus on the calculations.
7. Public Service sends out preapproval or rejection letter stating the preapproved demand and energy savings and rebate amount.

Monitoring

8. If monitoring will be needed, a Public Service engineer or outside engineering party drafts an M&V plan. The plan is finalized by the Public Service engineer and sent out for customer signature.
9. If the customer does not have the appropriate meter structure, an outside engineering firm will install metering equipment and collect the pre-data as set forth in the monitoring agreement.
10. After the designated pre-monitoring period, the customer completes the project installation and contacts account manager.
11. Outside engineering firm collects post-installation monitoring data and sends pre and post data to Public Service.

Site Verification

12. For managed accounts, the customer's account manager confirms project installation, which may include visiting the site and reviewing invoices and other project documentation. The project documentation is then submitted to Public Service DSM staff.
13. Currently, nearly all customers completing custom projects have an account manager. For non-managed customers completing custom projects, the Business Solutions Center and Public Service DSM staff will review project documentation, including checking the customer information, equipment eligibility and proper rebate amounts.

Approval & Rebate Payment

14. For non-monitored projects, the invoices are reviewed and if the installed measure specifications match the proposed measure specifications, then the preapproved rebate is awarded. If the costs increased by + or - 10% or the scope changed, the project is reevaluated (return to Step 3).
15. For monitored projects, Public Service engineer (or outside engineering firm) determines actual savings based on monitoring results.
16. For monitored projects, if Public Service engineer performs Step 3, 100% of projects will be sent to outside engineering firm for review.
17. If the outside engineering firm disagrees with the Public Service engineer's analysis, they discuss the project and reach consensus on the calculations.

18. Rebate is issued to the customer based on final savings.
19. Project savings are reported in the year that the rebate is awarded.

Program Exceptions
Programs with special design elements are verified using different processes. The M&V process for these programs is described below.

New Construction- Energy Design Assistance & Energy Efficient Building
The Energy Design Assistance component of the New Construction Program provides design assistance in support of integrated design process by providing computer modeling of the planned design, funding to offset the cost of design time associated with the increased energy analysis, financial incentives to improve the cost effectiveness of a package of energy-efficient measures, and field verification to ensure that the strategies are installed per the design intent. Public Service contracts with a third-party program implementer ("consultant") to complete the energy modeling and measurement and verification. The rebate is not paid until the savings are verified.

1. Application submittal.
2. Introductory meeting with design team.
3. Consultant completes energy modeling to identify conservation packages.
4. Construction documents are reviewed for measures identified through the energy model. The design team and customer are notified whether or not these measures were found within these documents.
5. Consultants provide Public Service with a verification plan per project.
6. Consultant visits site and verifies that specified measures were installed. Equipment and systems are monitored for a two week timeframe, as appropriate, to evaluate performance variables against modeling assumptions.
7. For projects with individual measures that have savings greater than or equal to 1.0 GWh or 20,000 Dth per year, data logging is required for a time period of four weeks.
8. The actual results are compared to the estimated savings to determine the final rebate.
9. If the actual results are not within 10% of the energy savings identified within the original model, the consultant completes an as-built model to determine final energy savings.
10. Rebate is issued to customer based on final savings.

The Energy Efficient Building component of the New Construction Program provides an opportunity for customers to review their new construction, major renovation or additions measures before the building is built. Since each building is unique and includes various conservation opportunities, each building will receive:

1. Review of construction documents compared to application submitted.
2. Consultant visits site and verifies that specified measures were installed.
3. For projects with individual measures that have savings greater than or equal to 1.0 GWh or 20,000 Dth per year, data logging is required for a time period of four weeks.
4. Final results are determined based on data logging and verification.
5. Rebates are issued to customer based on final savings.

Recommissioning
The Recommissioning Program identifies existing functional systems that can be "tuned up" to run as efficiently as possible through low- or no-cost improvements. The rebate is not paid until the savings are verified. Metering Recommissioning projects may be very difficult. In these cases, a combination of metering and calculations may be used.

<u>Study Preapproval</u>

1. Customer hires an engineering firm to conduct a study of the building to identify savings opportunities and determine energy savings for each measure.
2. Customer submits application and proposal from recommissioning provider to Public Service for study preapproval.
3. After preapproval, recommissioning provider can begin study.

<u>Study Approval</u>

4. Completed study is submitted to Public Service for review.
5. Public Service engineer reviews all savings calculations and identifies if any measures will require monitoring (measure savings > 1 GWh or 20,000 Dth).
6. If monitoring is needed, Public Service will send out general monitoring letter alerting customer that one or more measures will require monitoring.
7. Public Service follows up (generally within 7 business days) with a detailed M&V plan that the customer must sign.
8. If study is approved, the provider will present study to customer and Public Service issues study rebate.
9. If study is not approved, Public Service will follow up with provider to reconcile issues.

<u>Implementation</u>

10. Customer selects measures.
11. If measure requires monitoring, customer must contact Public Service. Public Service will notify verification contractor that monitoring is needed. Pre-monitoring must be completed prior to measure installation in accordance with the M&V plan.
12. Customer implements selected measures. If monitoring is required, customer contacts account manager, who contacts the Public Service engineer. Public Service will notify the verification contractor that the customer is ready for post-monitoring.
13. For measure savings > 1 GWh or 20,000 Dth, post-monitoring is conducted in accordance with the M&V plan.
14. Post-monitoring data is submitted to Public Service engineer for analysis and determination of final savings and rebate amount.

<u>Approval & Rebate Payment</u>

15. Account manager collects invoices and signed form identifying which measures were installed.
16. The invoices are reviewed and if the invoice details match what was submitted on the rebate form, then the preapproved rebate is awarded. If there are discrepancies, the account manager works with the customer to provide additional detail and reconcile differences.
17. Rebate is issued to the customer based on final savings.

Self-Directed Custom Efficiency

The Self-Direct Program will provide large commercial and industrial electricity customers in Colorado the opportunity to self-fund energy conservation projects at their facilities. Customers who engineer, implement, and commission qualifying projects will receive rebates to offset their costs to implement efficient projects.

1. Public Service prequalifies customers who are eligible for participation in the Self-Direct Program.
2. Once prequalified, a customer identifies the opportunity, then develops and submits a project application. The customer will be required to develop an evaluation, measurement, and verification plan and submit it with the application. Specific components of the plan will be determined by the customer, and agreed upon by Public Service. At a minimum, the plan should employ sound engineering judgment and follow standard industry practices such as the International Performance Measurement & Verification Protocol.
3. Public Service provides confirmation of application receipt, reviews the application, and asks for additional information if necessary. Public Service notifies the customer of approval or denial of the application, expected rebate, and mutually agreed on M&V plan. The Customer can request a meeting to discuss Public Service's decisions related to the application.
4. If the customer chooses to implement the measures, they sign a letter, which includes an M&V plan, stating that they intend to implement the preapproved measures. After the customer signs their letter of intent, they must conduct any pre-installation monitoring required in the M&V plan, and submit the data to the Company. The Company must approve this data before the customer may implement the efficiency measures. The customer then implements the measures and performs follow-up monitoring as described in the M&V plan.
5. The customer then submits a project completion report. Public Service will review the report, request any additional data, and calculate the final rebate. The rebate will be paid by check upon completion of project and Public Service's approval of project completion report.
6. A random sample of all preapproved projects will be selected by the Company and sent to an outside engineering firm for metering and verification.

Standard Offer

The Standard Offer Program is intended to serve customers with limited financial and human resources who have conservation potential. The program will offer funding for customers to receive a technical energy audit and provide rebates to help offset the cost of implementation. The audit is typically performed by an Energy Service Company (ESCO), but also may be performed by the customer. It will provide the customer with a final report detailing the energy conservation opportunities, financial analysis, and potential funding mechanisms.

1. The customer signs an intent document with Public Service rebate clause included. For public sector projects (schools, government buildings), the intent document is a Memorandum of Understanding between the customer and GEO. For private sector clients, it is a letter of intent signed by Public Service and the customer.

2. GEO, ESCO (if selected), or Public Service representative performs a walkthrough of the customer's building(s). The walk through identifies potential projects, and evaluates the approximate conservation potential for each building.
3. The customer selects an ESCO to perform the technical energy audit or decides to perform the audit internally.
4. The ESCO or customer applies to Public Service for pre-approval for the technical energy audit rebate.
5. If the customer is using an ESCO to perform the technical energy audit, a contract to perform the audit is signed by the ESCO and the customer.
6. The draft technical energy audit, including identified energy conservation measures is submitted to Public Service, reviewed by all applicable parties, and discussed to determine which measures will be implemented.
7. The technical energy audit is revised to reflect measures to be implemented, finalized, and submitted to Public Service. Public Service determines the project implementation rebate.
8. If the customer is using an ESCO to implement the measures, a construction contract is executed between the ESCO and the customer. If the customer is not using an ESCO to implement the measures, a letter of intent to implement the measures is signed by the customer and Public Service.
9. Public Service issues technical energy audit study rebate.
10. Initial M&V activities are performed, the measures are implemented, follow-up M&V activities are performed, and the customer sends their rebate application (including M&V data and calculations) to Public Service.
11. Public Service verifies the implementation, determines actual savings from normalized data, and issues the measure implementation rebate based on the M&V results.
12. Annually, the ESCO or a third-party performs M&V and submits data and results to the customer, Public Service, and GEO. Public Service reviews the M&V report to confirm the annual savings and verifies that savings are appropriate to rebate paid. Additional rebates are paid for performance above the rebated conservation; alternatively, the customer refunds rebates if the actual savings are below the originally rebated savings.

Post-Performance Year Program Evaluation, Measurement and Verification
Post-performance year evaluation, measurement and verification refers to efforts in the years following the program year to verify savings and update technical assumptions.

Comprehensive Program Process/Impact Evaluations
In addition to the ongoing measurement and verification described in the plan, Public Service will hire independent third-party consultants to complete comprehensive program evaluations of three or four specific programs each year. The comprehensive program evaluations of particular programs will be staggered over a number of years. The principal purposes of comprehensive program evaluations are to assess customer satisfaction with the DSM program being evaluated, and to assess changes that should be made to technical assumptions, net-to-gross (NTG) ratios

and program processes based on the evaluator's own research as well as a thorough review of industry-wide and the Company's current processes, technical assumptions and NTG ratios. If, as a result of a comprehensive program evaluation that is completed prior to December 31,2009, the evaluator recommends changes to any technical assumptions, NTG ratios, or program processes, the Company shall implement such changes for purposes of its DSM activities undertaken during 2010. The Settling Parties understand that such changes shall not affect the calculation of achieved savings and net economic benefits for 2009.

Factors that are taken into consideration in determining the priority and schedule of program evaluations include, but are not limited to: program tenure in Colorado, amount of savings relative to total goals and per participant, program budgets compared to total, uncertainty and/or risk associated with savings or technical assumptions, availability of other studies regarding the particular measures, etc. Discussions with portfolio managers, product developers, and technical consultants are used to finalize the priority and schedule of evaluations. The Company will also consult with interested parties at the scheduled roundtable meetings regarding suggested changes to the programs that are proposed to be included as part of the comprehensive evaluation performed during 2010 and 2011.

The list below shows the programs that are scheduled for comprehensive process and impact evaluations to be completed in 2009, 2010, and 2011. In addition, a comprehensive evaluation of the Business Lighting Efficiency Program is being completed in 2008. This schedule will be reviewed at the beginning of each year and may be adjusted based on costs, scope and need.

2009 Comprehensive Process and Impact Evaluations

- Residential Home Lighting & Recycling (Electric)
- Residential Saver's Switch (Electric)
- Business Energy Design Assistance (Gas & Electric)
- Business Cooling Efficiency (Electric)

2010 Comprehensive Process and Impact Evaluations

- Residential Evaporative Cooling Rebate (Electric)
- Business Motor & Drive Efficiency (Electric)
- Business Recommissioning (Gas & Electric)
- Residential & Business Customer Behavioral Change (Gas & Electric)

2011 Comprehensive Process and Impact Evaluations

- Business Boiler Efficiency (Gas)
- Business Self-Directed Custom Efficiency
- Residential ENERGY STAR Retailer Incentive

* Since the Saver's Switch Program conducts annual comprehensive impact evaluations that determine net savings, the comprehensive study planned for 2009 will be a process evaluation only.

B. Budgets & Goals

EM&V is budgeted in the following ways:

1) Rebate validation: Internal labor is charged to the individual program's Administration and Program Delivery costs.
2) Ongoing M&V: Most outside contractor costs will be charged to the individual program's M&V costs and are not included in the general budget below. Budgets for these activities were forecasted at between 3 to 5% of the respective program total budgets. These budgets are included in the program write-ups, but are not included in the budget below. Ongoing M&V costs that are budgeted below in the "M&V" category are general charges from the third party contractors for database development, data tracking, and reporting.
3) Comprehensive Program Evaluation studies: Outside Consultant costs are budgeted in the "M&V" category of the budget below. These costs were budgeted based on proposals from current M&V contractors and past study costs. Internal Xcel Energy labor that is used to oversee and administer the ongoing M&V programs and the comprehensive program evaluations is charged to the M&V budget below under the "Admin & Program Delivery" category.

Table 86: Evaluation, Measurement and Verification Program Budgets

Evaluation, Measurement and Verification	2009 Electric Goal	2009 Gas Goal	2010 Electric Goal	2010 Gas Goal
Budget				
Planning & Design	N/A	N/A	N/A	N/A
Admin & Program Delivery	$120,140	$18,860	$124,630	$19,570
Ad, Promo, & Customer Ed.	N/A	N/A	N/A	N/A
Customer Incentives	N/A	N/A	N/A	N/A
Equipment & Installation	N/A	N/A	N/A	N/A
M&V	$619,500	$115,500	$497,200	$182,800
Miscellaneous	N/A	N/A	N/A	N/A
Total	**$739,640**	**$134,360**	**$621,830**	**$202,370**
Generator kW	N/A	N/A	N/A	N/A
Generator kWh	N/A	N/A	N/A	N/A
Annual Dth	N/A	N/A	N/A	N/A
Annual Dth/$	N/A	N/A	N/A	N/A
Participants	N/A	N/A	N/A	N/A
Participation as % of Segment	N/A	N/A	N/A	N/A
Modified TRC Test Ratio	N/A	N/A	N/A	N/A

C. Application Process

There is no application process associated with this program.

D. Marketing Objectives, Goals, & Strategy

Evaluation, Measurement & Verification does not have marketing objectives or goals.

E. Program-Specific Policies

This program does not have specific policies.

F. Stakeholder Involvement

There are no stakeholders associated with this program.

G. Evaluation, Measurement & Verification Plan

This program serves as the EM&V plan for Public Service's entire DSM portfolio.

H. Rebate Levels

The Evaluation, Measurement & Verification does not pay rebates.

I. Technical Assumptions

This program does not have technical assumptions.

➢ Technical Assumptions

The following section contains the forecasted technical assumptions for each type of measure in each program proposed in this Plan. These assumptions are used to estimate the energy consumption impacts and other measure-specific factors in order to calculate the benefit-cost analyses. The forecasted impacts are derived by applying the anticipated participation for each DSM measure to the detailed technical assumptions for that measure, which are contained within electronic files that will be provided as part of the overall application. The impacts from each of the measures are aggregated and inputted into the benefit-cost model for the program level analysis.

The following table describes each column in these forecasted technical assumptions:

Column Label	**Column Description**
Type of Measure	Program name and individual measures
High Efficiency Product Description / Rating	High efficiency product description
Efficient Product Consumption (electric) Dth/yr H.E. Consumption (gas)	Annual consumption of high efficiency product in either watts (electric) or Dth/yr (gas)
Baseline Product Description / Rating	Baseline product description
Baseline Product Consumption (electric) Dth/yr Baseline consumption (gas)	Annual consumption of baseline product in either watts (electric) Dth/yr (gas)
Life of Product (years)	High efficiency product lifetime
Hours of Operation per Year	Annual hours of operation of product
Rebate Amount	Average dollar amount of rebate given to participants
Average Baseline Product Cost	Average cost to acquire baseline product
Incremental Cost of Efficient Product	Additional cost over baseline cost to acquire high efficiency product
Rebate as a % of Incremental Cost	Percent of incremental cost that is equal to the rebate amount
Incremental Cost Payback Period w/o Rebate	Payback period expressed in years after a participant acquires the high efficiency product with the cost not reduced by the rebate amount
Incremental Cost Payback Period w/ Rebate	Payback period expressed in years after a participant acquires the high efficiency product with the cost reduced by the rebate amount
Annual Customer kWh/Dth Savings	Annual kWh or Dth savings customer realizes after implementing high efficiency product
Customer kW Savings	Annual kW savings customer realizes after implementing high efficiency product
Generator Peak kW Savings	Annual kW savings utility realizes on annual peak day after customer implements high efficiency product
Total O&M Savings	Amount customer saves in operation and maintenance expenses after implementing high efficiency product
Coincidence Factor	Percent of consumption of high efficiency product on annual peak day
Participants 2009	Total participants in program in 2009
Units 2009	Total # of each measure implemented by participants in program in 2009
Participants 2010	Total participants in program in 2010
Units 2010	Total # of each measure implemented by participants in program in 2010
NTG	Net-to-gross percentage

➢ Technical Assumptions

The following section contains the forecasted technical assumptions for each type of measure in each program proposed in this Plan. These assumptions are used to estimate the energy consumption impacts and other measure-specific factors in order to calculate the benefit-cost analyses. The forecasted impacts are derived by applying the anticipated participation for each DSM measure to the detailed technical assumptions for that measure, which are contained within electronic files that will be provided as part of the overall application. The impacts from each of the measures are aggregated and inputted into the benefit-cost model for the program level analysis.

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Baseline Product Description / Rating	Baseline product description
Baseline Product Consumption (electric) Dth/yr Baseline consumption (gas)	Annual consumption of baseline product in either watts (electric) Dth/yr (gas)
Life of Product (years)	High efficiency product lifetime
Hours of Operation per Year	Annual hours of operation of product
Rebate Amount	Average dollar amount of rebate given to participants
Average Baseline Product Cost	Average cost to acquire baseline product
Incremental Cost of Efficient Product	Additional cost over baseline cost to acquire high efficiency product
Rebate as a % of Incremental Cost	Percent of incremental cost that is equal to the rebate amount
Incremental Cost Payback Period w/o Rebate	Payback period expressed in years after a participant acquires the high efficiency product with the cost not reduced by the rebate amount
Incremental Cost Payback Period w/ Rebate	Payback period expressed in years after a participant acquires the high efficiency product with the cost reduced by the rebate amount
Annual Customer kWh/Dth Savings	Annual kWh or Dth savings customer realizes after implementing high efficiency product
Customer kW Savings	Annual kW savings customer realizes after implementing high efficiency product
Generator Peak kW Savings	Annual kW savings utility realizes on annual peak day after customer implements high efficiency product
Total O&M Savings	Amount customer saves in operation and maintenance expenses after implementing high efficiency product
Coincidence Factor	Percent of consumption of high efficiency product on annual peak day
Participants 2009	Total participants in program in 2009
Units 2009	Total # of each measure implemented by participants in program in 2009
Participants 2010	Total participants in program in 2010
Units 2010	Total # of each measure implemented by participants in program in 2010
NTG	Net-to-gross percentage

Forecasted Electric Technical Assumptions

Type of Measure	High Efficiency Product Description / Rating	Efficient Product Consumption	Baseline Product Description / Rating	Baseline Product Consumption	Life of Product (years)	Hours of Operation per Year	Rebate Amount	Average Baseline Product Cost	Incremental Cost of Efficient Product	Rebate as a % of Incremental Cost	Incremental Cost Payback Period w/o Rebate	Incremental Cost Payback Period w/ Rebate	Annual Customer kWh Savings	Customer kW Savings	Generator Peak kW Savings	Total O&M Savings	Coincidence Factor	Participants 2009	Units 2009	Participants 2010	Units 2010	NTG
										Self Calculating Fields												
BUSINESS SEGMENT																						
Self-Direct		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
Self-Direct	New Equipment	100,216	Old or less efficient systems or equipment	206,449	17	4,245	$56,084	$6,329	$84,341	66%	3.0	1.0	450,992	106.23	105.52	$123.57	93%	5	5	10	10	91%
Process Efficiency		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
Process Efficiency	New Equipment	1,160,000	Old or less efficient systems or equipment	1,561,531	19	5,224	$224,858	$308,896	$1,057,789	21%	9.0	7.1	2,097,600	401.53	354.43	$74,361.67	83%	0.25	0.25	4	4	87%
Standard Offer		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
Standard Offer	New Equipment	42,242	Old or less efficient systems or equipment	116,653	15	2,166	$26,660	$42,155	$43,413	61%	2.9	1.1	161,143	74.41	79.21	$164.28	100%	12	12	24	24	86%
TEA (Study)	0	0	0	0	15	0	$12,800	$0	$25,600	50%			0	0.00	0.00			12	12	24	24	86%
Compressed Air Efficiency		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
Average Study -Efficiency	Leaks & Waste Found and Repaired	135,771	Existing System in with Leaks & Waste that have not been repaired	146,395	5	7,824	$5,516	$0	$7,227	76%	1.8	0.4	83,125	10.62	9.94	$0.00	88%	18	18	20	20	87%
Average Custom Project	New Equipment	97,619	Old or less efficient systems or equipment	146,395	20	5,882	$9,577	$15,657	$56,457	17%	3.7	3.1	286,925	48.78	50.92	$0.00	98%	24	24	26	26	87%
VFD compressors <50HP - NEW	VFD Compressor	12,489	Modulation or load no-load with less than 300 gal of storage	18,692	20	3,774	$4,283	$0	$18,939	23%	12.2	9.5	23,410	6.20	5.88	$0.00	89%	37	37	38	38	87%
No Air Loss Drain Valves	No-Air Loss Drains	0	Electronic Solenoid/Timed Drains	530	20	7,824	$200	$125	$448	45%	2.3	1.3	4,147	0.53	0.50	$0.00	88%	152	152	165	165	87%
Cooling Efficiency		**Watts**		**Watts**					**$10,392**	**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
Rooftop Units less than 5.4 tons	RTU size 3 tons, 15.4 SEER, 13.1 EER	2,748	RTU size 3 tons, 9.7 SEER, 8.2 EER	4,390	20	873	$366	$4,500	$600	61%	2.3	0.9	1,434	1.64	1.58	$0.00	90%	5	5	5	5	94%
Rooftop Units 5.5-11.3 tons	RTU size 8.9 tons, 13.6 SEER, 11.6 EER	9,207	RTU size 8.9 tons, 12.1 SEER, 10.3 EER	10,369	20	875	$659	$13,500	$2,500	26%	13.3	9.8	1,017	1.16	1.12	$0.00	90%	40	55	40	55	94%
Rooftop Units11.4-19.9 tons	RTU size 14.7 tons, 11.4 SEER, 9.7 EER	15,339	RTU size 14.7 tons, 13.5 SEER, 11.5 EER	18,186	20	883	$1,147	$22,500	$3,750	31%	8.1	5.6	2,513	2.85	2.74	$0.00	90%	28	40	28	40	94%
Rooftop Units 20-63.3 tons	RTU size 31 tons, 14 SEER, 11.9 EER	31,261	RTU size 31 tons, 11.2 SEER, 9.5 EER	39,158	20	878	$4,154	$45,000	$7,500	55%	5.9	2.6	6,936	7.90	7.59	$0.00	90%	25	50	30	50	94%
Rooftop Units greater than 63.3 tons	RTU size 125.1 tons, 11.3 SEER, 9.6 EER	156,375	RTU size 125.1 tons, 10.8 SEER, 9.2 EER	163,174	20	945	$7,506	$187,500	$31,250	24%	28.1	21.3	6,422	6.80	6.54	$0.00	90%	24	50	26	45	94%
Variable Air Volume Conversion	Variable volume air handling system - VAV Boxes	2,241	Constant Volume Air Handling System	2,636	20	1,036	$100	$0	$290	34%	4.4	2.9	410	0.40	0.38	$0.00	90%	10	250	10	250	94%
Split Systems less than 5.4 tons	Split System size 2.9 tons, 15.5 SEER, 13.2 EER	2,636	Split System size 2.9 tons, 11.4 SEER, 9.7 EER	3,588	20	886	$203	$5,100	$600	34%	3.9	2.6	843	0.95	0.91	$0.00	90%	10	10	10	10	94%
Condensing Units > 5.4 tons	Condensing Units size 24.6 tons, 13.2 SEER, 11.2 EER	26,357	Condensing Units 24.6 tons, 11.2 SEER, 10.1 EER	29,228	20	1,453	$812	$25,000	$2,500	32%	4.9	3.3	4,170	2.87	2.76	$0.00	90%	20	40	20	40	94%
Water-source Heat Pumps	Condensing Units size 2.9 tons, 16.1 SEER, 14.5 EER	2,400	Condensing Units 2.9 tons, 13.3 SEER, 12 EER	2,900	20	912	$389	$4,500	$750	52%	9.2	4.4	456	0.50	0.48	$0.00	90%	6	6	10	10	94%
PTAC	Condensing Units size 0.7 tons, 13.9 SEER, 11.8 EER	712	Condensing Units 0.7 tons, 11.2 SEER, 9.1 EER	923	20	720	$57	$1,125	$188	31%	5.7	3.9	152	0.21	0.20	$0.00	90%	5	40	5	40	94%

Forecasted Electric Technical Assumptions

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										Self Calculating Fields												
scroll/screw chiller < 150 tons	Chiller size 77.1 tons, 0.61 full load kW/ton, 0.55 IPLV	47,031	Chiller size 77.1 tons, 0.79 full load kW/ton, 0.68 IPLV	60,917	20	708	$1,696	$75,000	$12,500	14%	5.7	5.0	9,827	13.89	13.35	$0.00	90%	1	1	1	1	94%
scroll/screw chiller 150 to 300 tons	Chiller size 225 tons, 0.61 full load kW/ton, 0.55 IPLV	137,250	Chiller size 225 tons, 0.72 full load kW/ton, 0.63 IPLV	161,448	20	735	$4,275	$96,000	$16,000	27%	4.2	3.1	17,786	24.20	23.26	$0.00	90%	1	1	1	1	94%
Centrifugal Chillers < 150 tons	Chiller size 125 tons, 0.60 full load kW/ton, 0.58 IPLV	75,000	Chiller size 125 tons, 0.70 full load kW/ton, 0.67 IPLV	87,899	20	871	$3,375	$75,000	$12,500	27%	6.0	4.4	11,241	12.90	12.40	$0.00	90%	1	2	1	2	94%
Centrifugal Chillers 150-300 tons	Chiller size 200 tons, 0.55 full load kW/ton, 0.51 IPLV	109,361	Chiller size 200 tons, 0.63 full load kW/ton, 0.60 IPLV	126,702	20	964	$6,192	$120,000	$20,000	31%	7.0	4.8	16,720	17.34	16.67	$0.00	90%	2	5	2	2	94%
Cooling Studies	Customer has Study	0	No Study	0	0	0	$2,001	$0	$2,668	75%			0	0.00		$0.00	0%	7	7	7	7	
Centrifugal Chillers > 300 tons	Chiller size 896.8 tons, 0.50 full load kW/ton, 0.47 IPLV	444,728	Chiller size 896.8 tons, 0.58 full load kW/ton, 0.55 IPLV	516,905	20	964	$28,006	$540,000	$90,000	31%	7.6	5.2	69,610	72.18	69.39	$0.00	90%	15	22	18	26	94%
Air-Cooled Chillers - avg. capacity 250 tons	Air-cooled chiller average capacity 250 tons, 1.15 kW/ton	277,972	Air-cooled chiller average capacity 250 tons, 1.26 kW/ton	298,743	20	955	$4,174	$250,000	$8,608	48%	2.5	1.3	19,843	20.77	19.97	$0.00	90%	13	13	13	13	94%
Custom Cooling																						
Custom Cooling	Varies by project	177,155	varies by project	241,815	20	2,998	$25,864	$133,759	$62,429	41%	4.3	2.5	193,872	64.66	11.67	$0.00	17%	21	16	25	19	94%
Custom Efficiency		Watts		Watts						%	Years	Years	kWh	kW	kW							
Custom Efficiency	New Equipment	67,033	Old or less efficient systems or equipment	108,573	18	4,498	$16,616	$19,091	$98,357	17%	8.7	7.2	186,850	41.54	36.67	$4,754.75	83%	43	43	50	50	87%
Energy Management Systems		Watts		Watts						%	Years	Years	kWh	kW	kW							
Average Project	Install new or Add to Existing EMS	2,829,501	No or very old EMS system	2,847,940	10	8,529	$7,376	$7,286	$32,666	23%	4.5	3.5	157,274	18.44	1.87	$4,769.90	10%	29	29	38	38	87%
Lighting Efficiency		Watts		Watts						%	Years	Years	kWh	kW	kW							
T8 Ballasts, 4 ft. or less, 1 and 2 lamp	T8 1 and 2 Lamp systems	58	T12 1 and 2 Lamp systems, incandescents	77	18	3,141	$10	$0	$42	24%	9.8	7.5	59	0.02	0.02	($0.48)	85%	21	15165	23	16682	96%
T8 Ballasts, 4 ft. or less, 3 and 4 lamp	T8 Lighting Systems	127	T12 3 and 4 Lamp systems	167	18	3,141	$18	$0	$53	34%	5.8	3.8	126	0.04	0.04	($1.02)	85%	38	13143	42	14457	96%
T8 Ballasts, Length > 4 ft. and <= 8 ft., 1 lamp	T8 1 and 2 Lamp systems	75	T12 1 and 2 Lamp systems	97	18	3,141	$10	$0	$56	18%	11.1	9.2	69	0.02	0.02	($0.56)	85%	4	2123	4	2335	96%
T8 Ballasts, Length > 4 ft. and <= 8 ft., 2 lamp	T8 Lighting Systems	141	T12 1 and 2 Lamp systems, incandescents	159	18	3,141	$18	$0	$56	32%	13.5	9.2	57	0.02	0.02	($0.46)	85%	1	506	1	556	96%
T8 to T8 Delamping	T8 with less lamps	75	T8 with more lamps	120	18	3,141	$12	$0	$55	22%	5.3	4.1	143	0.05	0.04	($1.15)	85%	10	3033	11	3336	96%
Super T8 1 and 2 Lamp	Super T8 Lighting Systems	61	T12 1 and 2 Lamp systems, incandescents	110	18	3,141	$13	$0	$36	36%	3.2	2.0	154	0.05	0.04	($1.25)	85%	29	8214	31	8594	96%
Super T8 3 and 4 Lamp	Super T8 Lighting Systems	139	T12 4' Fluorescent, 4-F40T12ES 34W, 2-Mag EE	221	18	3,141	$22	$0	$64	35%	3.4	2.2	259	0.08	0.07	($2.09)	85%	27	4550	29	4903	96%
T5 Ballasts 1 and 2 Lamp	T5 Lighting Systems	110	Fluorescent, (2) 48", ES lamp, MAG ballast	141	18	3,141	$13	$0	$29	44%	4.1	2.3	97	0.03	0.03	($0.79)	85%	5	1921	5	2113	96%
T5 Ballasts 3 and 4 Lamp	T5 Lighting Systems	76	Fluorescent, (2) 48", ES lamp, MAG ballast	122	18	3,141	$16	$0	$37	43%	3.5	2.0	147	0.05	0.04	($1.19)	85%	1	0	1	0	96%

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Compact Fluorescent Lamps (CFL), less than 19W	Screw-in Compact Fluorescent	17	Incandescent	57	5	3,141	$3	$0	$7	44%	0.7	0.4	125	0.04	0.04	($1.01)	85%	5	1517	5	1668	96%
CFL, 19 to 32 W	Modular or Hardwired Compact Fluorescent	32	Incandescent	114	18	3,141	$10	$0	$20	50%	1.1	0.5	258	0.08	0.07	($2.08)	85%	5	758	5	834	96%
CFL, 33 to 56W	Hardwired or Modular CFL	62	Incandescent	230	18	3,141	$30	$0	$100	30%	2.6	1.8	527	0.17	0.15	($4.27)	85%	5	379	6	417	96%
Industrial Multi-CFL	Hardwired or Modular Multi-CFL	99	Mercury Vapor, High Pressure Sodium, Metal Halide	313	18	3,141	$45	$0	$98	46%	2.0	1.1	675	0.21	0.19	($5.46)	85%	2	76	2	83	96%
HID, 151 to 250W	Metal Halide	291	Mercury Vapor, High Pressure Sodium	423	18	3,141	$30	$0	$161	19%	5.3	4.3	412	0.13	0.12	($3.33)	85%	1	35	1	39	96%
HID, 251 to 1000W	Metal Halide	590	Mercury Vapor, High Pressure Sodium	1,397	18	3,141	$45	$0	$253	18%	1.4	1.1	2,534	0.81	0.73	($20.51)	85%	4	56	4	61	96%
Pulse-Start Metal Halide, <= 175W	Pulse Start Metal Halide	231	Metal Halide	323	18	3,141	$25	$0	$161	16%	7.6	6.4	288	0.09	0.08	($2.33)	85%	1	35	1	39	96%
Pulse-Start Metal Halide, 176W-319W	Pulse Start Metal Halide	258	Metal Halide	376	18	3,141	$50	$0	$185	27%	6.8	4.9	373	0.12	0.11	($3.02)	85%	1	101	1	111	96%
Pulse-Start Metal Halide, 320W-749W	Pulse Start Metal Halide	488	Metal Halide	590	18	3,141	$45	$0	$283	16%	12.0	10.1	320	0.10	0.09	($2.59)	85%	1	126	2	139	96%
Pulse-Start Metal Halide, 750W+	Pulse Start Metal Halide	1,053	Metal Halide	1,393	18	3,141	$140	$0	$381	37%	4.9	3.1	1,068	0.34	0.31	($8.64)	85%	2	76	3	83	96%
High Efficiency Ballasts	Energy Efficient Ballast	83	Standard Efficiency Ballast	87	18	3,141	$2	$17	$2	68%	2.4	0.7	13	0.00	0.00	($0.10)	85%	2	5965	2	6561	96%
Parking Garages	Fluorescent	97	150W Metal Halide or 175W Metal Halide	179	18	8,760	$50	$0	$182	27%	5.5	4.0	720	0.08	0.07	$0.00	85%	1	30	1	33	96%
High Bay Fluorescents replacing 150, 175, 250 Watt HID	High Bay Fluorescent <= 200 watts	158	HID: 150, 175, 250W Lamp	364	18	3,141	$85	$0	$204	42%	4.3	2.5	648	0.21	0.19	($5.24)	85%	38	2528	39	2629	96%
High Bay Fluorescents replacing 320, 350, 400 Watt HID	High Bay Fluorescents <= 300 Watts	328	HID: 320, 350, 400W Lamp	592	18	3,141	$110	$0	$265	42%	4.3	2.5	831	0.26	0.24	($6.72)	85%	115	6066	118	6213	96%
High Bay Fluorescents replacing 750 Watt HID	High Bay Fluorescents <= 610 Watts	613	HID: 750W Lamp	1,099	18	3,141	$200	$0	$402	50%	3.6	1.8	1,528	0.49	0.44	($12.36)	85%	41	1183	41	1163	96%
High Bay Fluorescents replacing 1000 Watt HID	High Bay Fluorescents <= 900 Watts	878	HID: 1000W Lamp	1,397	18	3,141	$210	$0	$520	40%	4.3	2.6	1,631	0.52	0.47	($13.19)	85%	24	627	25	657	96%
Wall mount occupancy sensor	Lighting System with Occupancy Sensor	192	Lighting System without Occupancy Sensor	275	18	3,141	$30	$0	$55	55%	2.9	1.3	259	0.08	0.07	($2.09)	85%	8	1256	9	1381	96%
Ceiling mount occupancy sensor	Lighting System with Occupancy Sensor	192	Lighting System without Occupancy Sensor	275	18	3,141	$50	$0	$125	40%	6.6	3.9	259	0.08	0.07	($2.09)	85%	8	1213	8	1335	96%
Photocell	Lighting System with Photocell	220	Lighting System without Photocell	275	18	3,141	$30	$0	$65	46%	5.1	2.8	173	0.05	0.05	($1.40)	85%	2	506	3	556	96%
Exit sign retrofit and replacement	LED	2	Incandescent	45	18	3,141	$15	$0	$80	19%	8.1	6.6	135	0.04	0.04	($1.09)	85%	5	1517	6	1668	96%
Low Wattage T8 4' lamps	T8 25W and 28W Lamps	28	T8 32W Lamps	35	8	3,141	$1	$2	$2	50%	1.2	0.6	22	0.01	0.01	($0.18)	85%	10	18198	11	20018	96%

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Integrated 25W Ceramic Metal Halide	Ceramic Metal Halide	32	Incandescent	97	7	3,141	$25	$0	$57	44%	3.8	2.1	203	0.06	0.06	($1.64)	85%	3	506	3	556	96%
Ceramic Metal Halide <=150W	Ceramic Metal Halide	41	Incandescent	166	18	3,141	$55	$0	$202	27%	7.0	5.1	393	0.13	0.11	($3.18)	85%	1	76	1	83	96%
Ceramic Metal Halide 151-250W	Ceramic Metal Halide	217	Incandescent	647	18	3,141	$60	$0	$222	27%	2.2	1.6	1,348	0.43	0.39	($10.91)	85%	2	51	2	56	96%
Ceramic Metal Halide 251W-	Ceramic Metal Halide	505	Metal Halide	590	18	3,141	$75	$0	$295	25%	15.2	11.3	265	0.08	0.08	($2.14)	85%	1	25	1	28	96%
T12 to T8 with delamping, 1 and 2 Lamp	T8 1 and 2 Lamp systems	63	T12 2, 3, and 4 Lamp systems	143	18	3,141	$14	$0	$43	33%	2.3	1.6	249	0.08	0.07	($2.02)	85%	21	3539	23	3892	96%
T12 to T8 with delamping, 3 Lamp	T8 3 Lamp Systems	110	T12 4 Lamp systems	186	18	3,141	$22	$0	$53	41%	3.0	1.8	240	0.08	0.07	($1.94)	85%	14	2528	16	2780	96%
Super T8 1 and 2 Lamp	Super T8	47	T8 1 and 2 Lamp systems	59	18	3,141	$4	$10	$20	20%	7.1	5.6	39	0.01	0.01	($0.31)	85%	2	1314	2	1446	96%
Super T8 3 and 4 Lamp	Super T8	113	T8 1 and 2 Lamp systems, incandescents	136	18	3,141	$5	$24	$21	21%	4.2	3.3	69	0.02	0.02	($0.56)	85%	2	1213	3	1335	96%
T5 Ballasts 1 and 2 Lamp	T8 1 and 2 Lamp systems	88	T8 2 and 4 Lamp systems	103	18	3,141	$4	$46	$9	45%	2.6	1.4	47	0.02	0.01	($0.38)	85%	2	1517	2	1668	96%
T5 Ballasts 3 and 4 Lamp	T5 3 and 4 Lamp	78	T8 Systems	145	18	3,141	$3	$56	$48	5%	3.1	2.9	211	0.07	0.06	($1.71)	85%	1	0	1	0	96%
CFL <=18W	Screw-in CFL	17	Incandescent	57	5	3,141	$2	$2	$4	35%	0.5	0.3	125	0.04	0.04	($1.01)	85%	3	758	3	834	96%
CFL19-32W	Modular or Hardwired CFL	32	Incandescent	114	18	3,141	$5	$36	$40	13%	2.1	1.9	258	0.08	0.07	($12.38)	85%	18	3033	20	3336	96%
CFL, 33 W-56W	Modular or Hardwired CFL	62	Incandescent	252	18	3,141	$8	$47	$46	17%	1.1	0.9	598	0.19	0.17	($4.84)	85%	39	2856	43	3142	96%
Pulse-Start Metal Halide, 176W-319W	Pulse Start Metal Halide	274	High Pressure Sodium, Metal Halide	376	18	3,141	$8	$191	$30	27%	1.3	0.9	323	0.10	0.09	($2.61)	85%	1	126	2	139	96%
Pulse-Start Metal Halide, 320W-749W	Pulse Start Metal Halide	508	High Pressure Sodium, Mercury Vapor, Metal Halide	590	18	3,141	$12	$253	$30	40%	1.6	1.0	258	0.08	0.07	($2.09)	85%	1	131	1	145	96%
Pulse-Start Metal Halide, 750W+	750W Pulse Start Metal Halide	1,053	1000W Metal Halide	1,393	18	3,141	$18	$351	$70	26%	0.9	0.7	1,068	0.34	0.31	($8.64)	85%	1	5	1	6	96%
High Bay Fluorescents <= 300 Watts	High Bay Fluorescents <= 300 Watts	350	Metal Halide	592	18	3,141	$12	$223	$110	11%	2.0	1.8	762	0.24	0.22	($6.16)	85%	27	1517	29	1668	96%
High Bay Fluorescents <= 610 Watts	High Bay Fluorescents <= 610 Watts	536	Metal Halide	1,099	18	3,141	$40	$291	$133	30%	1.0	0.7	1,769	0.56	0.51	($14.31)	85%	35	859	39	945	96%
High Bay Fluorescents <= 900 Watts	High Bay Fluorescents <= 900 Watts	666	Metal Halide	1,397	18	3,141	$50	$355	$186	27%	1.1	0.8	2,295	0.73	0.66	($18.56)	85%	4	76	5	83	96%
Energy Efficient Ballasts	Energy Efficient Ballast	95	Standard Electronic Ballast	99	18	3,141	$1	$17	$2	57%	2.4	1.0	12	0.00	0.00	($0.10)	85%	1	3539	2	3892	96%
Low Wattage T8	Low Wattage T8 Lamps	28	Standard T8 32 watt lamps	35	8	3,141	$1	$2	$2	50%	1.2	0.6	22	0.01	0.01	($0.18)	85%	3	5055	3	5561	96%
Integrated 25W Ceramic Metal Halide	Ceramic Metal Halide	25	Incandescent	97	7	3,141	$12	$12	$45	27%	2.7	2.0	226	0.07	0.07	($1.83)	85%	1	126	1	139	96%
Ceramic Metal Halide <=150W	Ceramic Metal Halide <= 150 Watts	66	Incandescent	235	18	3,141	$25	$59	$145	17%	3.7	3.1	529	0.17	0.15	$8.00	85%	1	76	1	83	96%
Ceramic Metal Halide 151-250W	Ceramic Metal Halide 151 to 250 Watts	300	Metal Halide	483	18	3,141	$15	$192	$98	15%	2.3	2.0	575	0.18	0.17	($4.65)	85%	1	51	1	56	96%
Ceramic Metal Halide 251W-	Ceramic Metal Halide	505	Metal Halide	590	18	3,141	$20	$253	$42	48%	2.1	1.1	265	0.08	0.08	($2.14)	85%	1	25	1	28	96%
Custom Lighting	High Efficiency Lighting	28,513	Existing Lower Efficiency Lighting	52,670	17	3,528	$17,049	$0	$76,420	22%	13.1	10.1	85,237	24.16	21.83	($613.83)	85%	24	24	24	24	96%
Lighting Redesign Implementation	Improved Light Levels	109,526	Excessive Light Levels or	222,643	18	6,511	$45,247	$0	$156,150	29%	4.1	2.9	736,506	113.12	102.23	($2,874.31)	85%	5	5	8	8	96%
Lighting Redesign Study	0	0	0	0	0	0	$3,750	$0	$7,500	50%			0	0.00	0.00	$0.00	0%	0	15	0	15	96%

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Type of Measure	High Efficiency Product Description / Rating	Efficient Product Consumption	Baseline Product Description / Rating	Baseline Product Consumption	Life of Product (years)	Hours of Operation per Year	Rebate Amount	Average Baseline Product Cost	Incremental Cost of Efficient Product	Rebate as a % of Incremental Cost	Incremental Cost Payback Period w/o Rebate	Incremental Cost Payback Period w/ Rebate	Annual Customer kWh Savings	Customer kW Savings	Generator Peak kW Savings	Total O&M Savings	Coincidence Factor	Participants 2009	Units 2009	Participants 2010	Units 2010	NTG
										Self Calculating Fields												
Motor & Drive Efficiency		**Watts**		**Watts**			**per unit**			**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
Plan A - New Motors (1-200HP)	NEMA Premium Efficient Motors	13,744	EPACT Efficient Motors	13,961	20	3,454	$87	$0	$173	50%	3.3	1.7	749	0.22	0.18	$0.00	78%	175	175	175	175	87%
Plan B - Replacement Motors (1-200HP)	NEMA Premium Efficient Motors	17,816	Earlier than or EPACT Efficient Motors	18,720	20	3,718	$914	$0	$1,722	53%	7.7	3.6	3,364	0.90	0.75	$0.00	78%	325	325	325	325	87%
ASD's (1-200HP)	Equipment coupled with a ASD/VFD	18,492	Equipment without an ASD/VFD	27,601	20	4,399	$3,367	$0	$7,117	47%	2.9	1.5	40,068	9.11	7.59	$0.00	78%	500	500	500	500	87%
NEMA Premium 201 to 250 hp	NEMA Premium motors	145,400	EPACT Efficient Motors	147,237	20	5,200	$625	$0	$3,040	21%	5.6	4.5	9,550	1.84	1.66	$0.00	84%	3	3	3	3	87%
NEMA Premium >250 to 500 hp	NEMA Premium motors	232,640	EPACT Efficient Motors	234,395	20	5,200	$1,000	$0	$3,870	26%	7.5	5.6	9,122	1.75	1.58	$0.00	84%	3	3	3	3	87%
Super NEMA Premium 1-5 hp (Tier 2)	>1% Higher than NEMA Premium motors	1,581	EPACT Efficient Motors	1,644	20	2,745	$25	$0	$71	35%	5.1	3.3	173	0.06	0.06	$0.00	84%	55	55	55	55	87%
Super NEMA Premium >5-20 hp (Tier 2)	>1% Higher than NEMA Premium motors	7,879	EPACT Efficient Motors	8,137	20	3,391	$105	$0	$124	85%	2.0	0.3	873	0.26	0.23	$0.00	84%	36	36	36	36	87%
Super NEMA Premium >20-500 hp (Tier 2)	>1% Higher than NEMA Premium motors	112,647	EPACT Efficient Motors	115,057	20	5,329	$1,164	$0	$2,858	41%	4.0	2.4	12,842	2.41	2.17	$0.00	84%	1	1	1	1	87%
Custom Motors (>501HP) / ASD's (>201HP)	New Equipment	287,525	Old or less efficient systems or equipment	359,753	20	6,347	$13,085	$11,250	$82,073	16%	3.5	2.9	458,424	72.23	68.18	$0.00	88%	2	2	2	2	87%
Motor - Studies	-						$0												0		0	
Recommissioning		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
Recommissioning - Implementation	Optimized Building Systems	695,005	Existing Building System - Not Tuned or Optimized	746,765	7	5,313	$3,419	$0	$27,244	13%	1.8	1.6	274,981	51.76	29.26	$4,905.96	53%	11	11	15	15	100%
Recommissioning - Studies	0	0	0	0	0	0	$16,582	$0	$22,109	75%			0	0.00	0.00			17	17	23	23	100%
Refrigeration Recommissioning	Optimized Refrigeration Systems	229,252	Existing Refrigeration Systems - Not Tuned or Optimized	245,593	7	8,206	$3,352	$0	$10,000	34%	1.6	1.1	134,096	16.34	6.52	$0.00	37%	0	5	0	5	100%

Forecasted Electric Technical Assumptions																						
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											Self Calculating Fields											
Small Business Lighting		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
Small Buisness Lighting Program - Total	More efficient lighting	42,997	Less efficient lighting	50,000	20	3,084	$4,860	$0	$8,100	60%	5.1	2.0	21,597	7.00	6.32		85%	50	50	200	200	100%
New Construction		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
EDA: Basic Track	More efficient building over code	308,115	Building built at code	446,544	20	3,488	$41,529	$0	$121,534	34%	3.6	2.4	482,853	138.43	137.23		93%	37	37	44	44	98%
EDA: Enhanced Modeling Track	More efficient building over code	477,579	Building built at code	692,143	20	3,488	$64,369	$0	$188,378	34%	3.8	2.4	748,422	214.56	212.71		93%	0	0	6	6	98%
Energy Efficient Buidlings	More efficient building over code	142,138	Building built at code	205,997	20	3,644	$19,158	$0	$36,797	52%	2.3	1.1	232,698	83.86	63.31		93%	9	9	15	15	93%
SEGMENT EFFICIENCY		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
CRE Prescriptive Lighting	New Equipment	45,704	Old or less efficient equipment	53,770	18	3,084	$3,226	$0	$8,204	39%	4.4	2.7	24,874	8.07	7.30		85%	3	3	33	33	96%
CRE Prescriptive Motors/Drives	New Equipment/Install ASDs/VFDs	92,241	Old or less efficient equipment or equipment w/o ASDs/VFDs	110,264	20	5,246	$5,407	$0	$14,321	38%	2.7	1.7	94,558	18.02	12.75		66%	5	5	40	40	87%
CRE Prescriptive Cooling	New higher efficiency	117,734	Old or less efficient	123,064	20	2,424	$1,599	$0	$17,461	9%	15.7	14.3	12,919	5.33	3.73		66%	1	1	10	10	94%
CRE Custom Lighting	New equipment	1,596,000	Old or less efficient equipment	1,680,000	18	3,084	$33,600	$0	$33,530	100%	1.7	0.0	259,056	84.00	76.05		85%	0	0	3	3	96%
CRE Custom Motors/Drives	New equipment/Install ASDs/VFDs	1,157,797	Old or less efficient equipment or equipment w/o ASDs/VFDs	1,218,733	20	5,246	$24,375	$0	$44,267	55%	2.5	1.1	319,698	60.94	43.11		66%	0	0	1	1	87%
CRE Custom Cooling	New Higher Efficiency Equipment	1,171,445	Old or less efficient equipment	1,233,100	20	2,424	$24,662	$0	$51,042	48%	4.0	2.0	149,446	61.66	43.19		66%	0	0	1	1	94%
CRE Custom EMS	Install EMS	306,714	No EMS	322,857	10	8,345	$6,457	$0	$39,314	16%	6.3	5.2	134,712	16.14	0.27		2%	0	0	1	1	87%
CRE Custom Custom	New higher efficiency	284,050	Old or less efficient	299,000	18	4,889	$5,980	$0	$42,111	14%	9.9	8.5	73,091	14.95	12.31		77%	0	0	1	1	87%
CRE Recommissioning - TOTAL	Optimized Building Systens	295,921	Existing Building Systems - Not Tuned or Optimized	332,495	7	6,133	$14,630	$0	$22,436	65%	1.9	0.7	224,311	36.57	17.48		45%	0	0	20	20	100%
CRE Studies-TOTAL	0	0	0	0	0	0		$0					0	0.00	0.00		0%	0	0	0	0	100%
Preliminary Report	0	0	0	0	0	0	$3,378	$0	$6,755	50%			0	0.00	0.00		0%	40	40	60	60	100%
Investigative Study	0	0	0	0	0	0	$20,217	$0	$40,434	50%			0	0.00	0.00		0%	2	2	5	5	100%

Forecasted Electric Technical Assumptions

Type of Measure	High Efficiency Product Description / Rating	Efficient Product Consumption	Baseline Product Description / Rating	Baseline Product Consumption	Life of Product (years)	Hours of Operation per Year	Rebate Amount	Average Baseline Product Cost	Incremental Cost of Efficient Product	Rebate as a % of Incremental Cost	Incremental Cost Payback Period w/o Rebate	Incremental Cost Payback Period w/ Rebate	Annual Customer kWh Savings	Customer kW Savings	Generator Peak kW Savings	Total O&M Savings	Coincidence Factor	Participants 2009	Units 2009	Participants 2010	Units 2010	NTG
										Self Calculating Fields												
Data Center		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
Data Center Efficiency - Existing																						
Localized Data Center - avg 1,000 sq ft with 250 servers	High Efficiency HVAC and Server Equipment, Server Virtualization		Standard Installation Practices														84%					90%
Study	0	0	0	0	0	0	$7,500	$0	$15,000	50%			0	0.00	0.00	$0.00	84%	2	2	2	2	90%
Implementation	0	3,500	Do nothing	62,773	20	8,760	$23,709	$0	$81,161	29%	3.4	2.4	519,234	59.27	53.49	($13,000.00)	84%	1	1	3	3	90%
Mid-tier Data Center - avg 5,000 sq ft with 1250 servers	High Efficiency HVAC and Server Equipment, Server Virtualization		Standard Installation Practices														84%					90%
Study	0	0	0	0	0	0	$10,000	$0	$20,000	50%			0	0.00	0.00	$0.00	84%	2	2	2	2	90%
Implementation	0	21,291	Do nothing	313,867	20	8,760	$117,030	$0	$160,806	73%	1.4	0.4	2,562,962	292.58	264.01	($13,000.00)	84%	1	1	3	3	90%
Enterprise-class Data Center - avg 10,000sq ft with 2500 servers	High Efficiency HVAC and Server Equipment, Server Virtualization		Standard Installation Practices														84%					90%
Study	0	0	0	0	0	0	$15,000	$0	$30,000	50%			0	0.00	0.00	$0.00	84%	0	0	0	0	90%
Implementation	0	42,582	Do nothing	627,733	20	8,760	$234,060	$0	$261,612	89%	1.1	0.1	5,125,924	585.15	528.02	($13,000.00)	84%	0	0	0	0	90%
Data Center Efficiency - New																						**90%**
Localized Data Center - avg 1,000 sq ft with 250 servers	High Efficiency HVAC and Server Equipment, Server Virtualization		Standard Installation Practices														84%					90%
Study	0	0	0	0	0	0	$7,500	$0	$15,000	50%			0	0.00	0.00	$0.00	84%	1	1	1	1	90%
Implementation	0	4,258	Do nothing	62,773	20	8,760	$23,406	$0	$78,677	30%	3.4	2.4	512,592	58.52	52.80	($13,000.00)	84%	1	1	1	1	90%
Mid-tier Data Center - avg 5,000 sq ft with 1250 servers	High Efficiency HVAC and Server Equipment, Server Virtualization		Standard Installation Practices														84%					90%
Study	0	0	0	0	0	0	$10,000	$0	$20,000	50%			0	0.00	0.00	$0.00	84%	1	1	1	1	90%
Implementation	0	21,291	Do nothing	313,867	20	8,760	$117,030	$0	$153,386	76%	1.3	0.3	2,562,962	292.58	264.01	($13,000.00)	84%	1	1	1	1	90%
Enterprise-class Data Center - avg 10,000sq ft with 2500 servers	High Efficiency HVAC and Server Equipment, Server Virtualization		Standard Installation Practices														84%					90%
Study	0	0	0	0	0	0	$15,000	$0	$30,000	50%			0	0.00	0.00	$0.00	84%	0	0	0	0	90%
Implementation	0	42,582	Do nothing	627,733	20	8,760	$234,060	$0	$246,771	95%	1.1	0.1	5,125,924	585.15	528.02	($13,000.00)	84%	0	0	0	0	90%
RESIDENTIAL SEGMENT																						
Saver's Switch		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
Average Customer New AC - Smart Switch - 2009-10	Utility Load Control for control period	0	No Control, No Switch	3,000	15	1	$0	$0	$0		0.0	0.0	2	3.00	1.14	$0.00	35%	19500	19500	19500	19500	100%
School Education Kit		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
Living Wise Kit-CFLs	High efficiency CFL lighting (2 bulbs; 1-14W; 1-19W)	33	baseline is incandescent bulbs(2 bulbs; 1-60W; 1-75W)	135	7	1,210	$23	$0	$23	100%	2.4	0.0	123	0.10	0.01	$0.00	8%	6600	6600	7300	7300	93%

Forecasted Electric Technical Assumptions

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										Self Calculating Fields												
Evaporative Cooling Rebate		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
Evaporative Replacing																						
Evaporative Replacing Refrigerated Air	Standard Evaporative Cooler	1,029	Refrigerated Air	2,769	10	490	$200	$1,288	-$868	-23%	-13.0	-15.9	853	1.74	1.69	$0.00	90%	3700	3700	3900	3900	60%
High Efficiency Evaporative Replacing Refrigerated Air	High Efficiency Evaporative Cooler	787	Refrigerated Air	2,769	10	490	$500	$1,268	$532	94%	7.0	0.4	972	1.98	1.92	$0.00	90%	50	50	50	50	60%
Higher Efficiency Evap Replacing Std. Evap																						
Higher Efficiency Evap Replacing Std. Evap	High Efficiency Evaporative Cooler	787	Standard Evaporative Cooler	1,029	10	490	$500	$400	$1,400	36%	150.3	96.6	119	0.24	0.23	$14.79	90%	50	50	50	50	60%
Home Lighting & Recycling		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
Residential Home Lighting	Average bulb of a 4 bulb pack per customer CFL	19	Average bulb of a 4 bulb pack per customer Non-CFL	65	7	1,119	$0	$1	$3	0%	0.7	0.7	52	0.05	0.00	$0.00	8%	250000	1000000	300000	1200000	83%
Home Performance with ENERGY STAR		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
CFLs (Quantity of 20)--Required	High Efficiency CFL (20 bulbs)	380	Incandescent bulbs (20)	1,305	9	901	$40	$0	$63	64%	1.0	0.3	833	0.93	0.08	$0.00	8%	135	300	449	1000	94%
Refrigerator Recycling	removal of second refrigerator	0	existing unit vintage from 7-18 years old	134	7	7,361	$35	$0	$0		0.0	-0.5	989	0.13	0.14	$0.00	100%	23	52	78	174	94%
Energy Star Refrigerator	Energy Star Refrigerator	60	standard refrigerator	71	13	8,760	$10	$1,070	$30	33%	4.1	2.7	93	0.01	0.01	$0.00	100%	23	52	78	174	94%
ECM Furnace Fan Efficiency	ECM Furnace Fan (variable speed motor)	150	typical permanent split capacitor motor	400	18	2,484	$100	$0	$400	25%	8.2	6.2	621	0.25	0.00	$0.00	0%	41	90	135	301	94%
Dishwasher	0.65 Energy Factor Energy Star Recommended	870	0.46 Energy Factor - Federal Minimum Standard	1,229	11	215	$10	$545	$30	33%	5.0	3.3	77	0.36	0.01	$15.26	2%	37	83	125	278	94%
Clothes Washer	Energy Star Clothes washer	143	standard clothes washer	209	11	200	$50	$300	$200	25%	193.6	145.2	13	0.07	0.00	$10.56	2%	41	90	135	301	94%
ENERGY STAR New Homes		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
CFLs-Quantity of 20 (Required)	High efficiency 20 CFL bulbs	380	baseline is 20 incandescent bulbs	1,305	8	975	$40	$0	$71	56%	1.0	0.4	901	0.93	0.08	$0.00	8%	25	100	50	200	99%
Energy Star Clothes Washer	Energy Star Clothes washer	143	standard clothes washer	209	11	392	$50	$300	$200	25%	98.8	74.1	26	0.07	0.00	$42.14	4%	25	100	50	200	99%
Energy Star Dishwasher	0.65 Energy Factor energy star recommended	870	0.46 Energy Factor - Federal Minimum Standard	1,229	11	215	$10	$545	$30	33%	5.0	3.3	77	0.36	0.01	$17.21	2%	25	100	50	200	99%
Energy Star Refrigerator	Energy Star Refrigerator	60	standard refrigerator	71	13	8,760	$10	$1,070	$30	33%	4.1	2.7	93	0.01	0.01	$0.00	100%	25	100	50	200	99%
Refrigerator		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
Refrigerator Recycling - second refrigerator	removal of second refrigerator	0	existing unit vintage from 7-18 years old	139	7	7,361	$35	$0	$0		0.0	-0.4	1,025	0.14	0.15	$0.00	100%	3250	3250	4375	4375	61%

Forecasted Electric Technical Assumptions

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										Self Calculating Fields												
ENERGY STAR Retailer Incentive		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
Energy Star TV	Energy Star rated TV	173	baseline TV	194	6	2,397	$20	$700	$0		0.0	-4.9	52	0.02	0.00	$0.00	5%	6771	16469	7448	18116	80%
Energy Star Clothes Washer	Energy Star Clothes washer	143	standard clothes washer	209	11	392	$50	$300	$200	25%	98.8	74.1	26	0.07	0.00	$42.14	4%	1354	3294	1490	3623	80%
Energy Star Dishwasher	0.65 Energy Factor energy star recommended	870	0.46 Energy Factor - Federal Minimum Standard	1,229	11	215	$10	$545	$0		0.0	-1.7	77	0.36	0.01	$17.21	2%	1422	3458	1564	3804	80%
Energy Star Ceiling fan	Energy Star Ceiling Fan	91	standard ceiling fan	215	10	1,460	$22	$190	$86	25%	6.1	4.6	180	0.12	0.01	$0.00	8%	1723	4192	1896	4611	80%
Energy Star Room AC	Energy Star 10,000 Btu/hr 10.8 EER room units	926	standard 10,000 Btu/hr 9.8 EER room unit	1,020	9	628	$20	$270	$30	67%	6.4	2.1	59	0.09	0.08	$0.00	75%	3476	8454	3823	9299	80%
Energy Star Refrigerator	Energy Star Refrigerator	60	standard refrigerator	71	13	8,760	$10	$1,070	$30	33%	4.1	2.7	93	0.01	0.01	$0.00	100%	1723	4192	1896	4611	80%
LOW INCOME SEGMENT																						
Easy Savings Energy Kit		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
Energy Savings Kit-CFLs	High efficieny CFL lighting (2 bulbs; 1 14W; 1 19W)	33	baseline is incandescent bulbs(2 bulbs; 1-60W; 1-75W)	135	7	1,210	$21	$0	$21	100%	2.1	0.0	123	0.10	0.01	$0.00	8%	20000	20000	22000	22000	93%
Single-Family Weatherization		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
Refrigerator Replacements	2008 Energy Star standard refrigerator	55	existing unit vintage from 7-18 years old	134	7	7,361	$561	$420	$141	399%	3.1	-9.2	584	0.08	0.09	$0.00	100%	441	675	474	725	96%
ECM Furnace Fan Efficiency	ECM Furnanace fan (variable speed motor)	150	typical permanent split capacitor motor	400	18	2,202	$400	$0	$400	100%	9.3	0.0	551	0.25	0.00	$0.00	0%	237	363	255	390	96%
Compact Fluorescent Lighting Package 16 lamps	High efficiency CFL lighting 16 bulbs	304	baseline is 16 incandescent bulbs	1,044	8	1,016	$60	$0	$60	100%	1.0	0.0	752	0.74	0.06	$0.00	8%	1280	1956	1374	2103	96%
Multi-Family Weatherization		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
Refrigerator Replacements	2008 Energy Star standard refrigerator	55	existing unit vintage from 7-18 years old	134	7	7,361	$561	$420	$141	399%	3.1	-9.2	584	0.08	0.09	$0.00	100%	97	119	104	128	90%
Compact Fluorescent Lighting Package -10	High efficieny CFL lighting	190	baseline is incandescent bulbs	653	7	1,105	$37	$0	$37	100%	0.9	0.0	511	0.46	0.04	$0.00	8%	421	518	452	556	90%
Non-Profit Energy Efficiency Initiative		**Watts**		**Watts**						**%**	**Years**	**Years**	**kWh**	**kW**	**kW**							
Refrigerator Replacements	2008 Energy Star standard refrigerator	55	existing unit vintage from 7-18 years old	134	7	7,361	$561	$420	$141	399%	3.1	-9.2	584	0.08	0.09	$0.00	100%	61	75	66	82	90%
Compact Fluorescent Lighting Package 10 lamps	High efficieny CFL lighting	190	baseline is incandescent bulbs	653	7	1,105	$46	$0	$46	100%	1.1	0.0	511	0.46	0.04	$0.00	8%	261	322	284	350	90%

Forecasted Electric Technical Assumptions Reference Sources	
BUSINESS SEGMENT	
Self-Direct	
Average Self-Direct Project	The average came from Custom Efficiency projects completed during 2006-2008. Customers and equipment providers or engineers provide data for the pre-approval application. Some projects involve pre- and post-project monitoring and verification. All applications must be pre-approved, prior to equipment purchase. Some customers purchase high efficient new equipment instead of standard equipment others buy new equipment and remove old, so Average Baseline Product Costs is a weighted average of both cases and Incremental is the added cost to achieve the higher efficiency.
Standard Offer	
Average Standard Offer Project - Electric	The average electric project came from CO Custom Efficiency projects completed during 2006-2008. Customers and equipment providers or engineers provide data for the pre-approval application. Some projects involve pre- and post-project monitoring and verification. All applications must be pre-approved, prior to equipment purchase. Some customers purchase high efficient new equipment instead of standard equipment others buy new equipment and remove old, so Average Baseline Product Costs is a weighted average of both cases and Incremental is the added cost to achieve the higher efficiency.
TEA (Study)	Cost based on savings per square footage basis from Colorado Energy Service Coalition
Compressed Air Efficiency	
Average Study	The average came from all studies that were turned in during 2006 & 2007 in MN. These study were performed by compressed air providers that determined the leaks and waste at each customers site and provided Xcel with their projected kW and kWh savings using standard "Compressed Air Challenge" assumptions. These studies are reimbursed at a rate of 75% (if leaks are fixed) for 100 and larger HP systems up to $15,000 and 100% for 50-99 hp systems up to $2,500. These studies are meant to find things that the customer would not find on their own that have a 1 year payback or less. Customer would not have purchased a study so Average Baseline Product Costs would be $0, so all cost is Incremental.
Average Custom Project	The average came from all applications turned in during 2007 for CO projects. Customer provided data from study or from compressed air provider estimating the expected savings estimates for each application. Each application used typical estimates for each type system using standard assumptions used by the "Compressed Air Challenge" or from vendor's equipment models . A Study is required to determine the customer system requirement to determine the optimal customer requirements. Customer must have a study to receive a $200/kW rebate, if not customer can get only $50/kW. Almost all customers have Air Studies that participate in this program. Some customers purchase high efficient new equipment instead of standard equipment others buy new equipment and remove old, so Average Baseline Product Costs is a weighted average of both cases and Incremental is the added cost to achieve the higher efficiency.
VFD Compressors less than 50HP	The estimated HP purchase from 2007 CO data was 25hp for VFD compressors. The average of % savings based upon <50HP compressor applied for in CO 2007 Compressor system must be under 50hp to qualify and must be proposing to stay under 50hp
No Air Loss Drain Valves	Assuming replacing a Timed drain or solenoid drain set at 8.5 min closed and 12.5 seconds open. Compressed air system must be the following control type for the trim compressor: Load/no-Load with at least 5 gal/CFM of storage (180 CFM compressor would need to have 5*180=900 gallons of storage or more) Variable Speed Drive compressor; Variable Displacement/Capacity compressor; Centrifugal compressors in their efficient trim range without any blowoff to atm.

Forecasted Electric Technical Assumptions Reference Sources	
Cooling Efficiency	
General Note on calculating energy savings when given SEER	To convert a Seasonal Energy Efficiency Ratio (SEER) to an Energy Efficiency Ratio (EER), multiply SEER by 0.85. The conversion factor of 0.85 a generally accepted factor for converting from SEER to EER. Once EER is obtained, convert EER to kW/ton using the following equation: kW/ton = 12/EER. To convert kW/ton to kW, multiply by tons. Cost data predominately based upon information in the Minnesota Deemed Savings data, supplemented by information from local vendors. Equivalent Full Load Hours (EFLH) for specific market segments based upon relative operating hours in the Minnesota Deemed Savings data. Climate specific values were determined from TMY data for Denver and Grand Junction. Weighted average of market and climate were determined for each measure to estimate the typical participant's EFLH. Weighted average of market used for market-specific coincidence factors supplied by the Minnesota Deemed Savings data. Coincidence factor of 90% taken from the Minnesota Deemed Savings data, sourced from NYSERDA.
Rooftop Units less than 5.4 tons	Average size and typical efficient product efficiency determined from historic participation. Baseline from ASHRAE Standard 90.1-2001.
Rooftop Units 5.5-11.3 tons	Average size and typical efficient product efficiency determined from historic participation. Baseline from ASHRAE Standard 90.1-2001.
Rooftop Units11.4-19.9 tons	Average size and typical efficient product efficiency determined from historic participation. Baseline from ASHRAE Standard 90.1-2001.
Rooftop Units 20-63.3 tons	Average size and typical efficient product efficiency determined from historic participation. Baseline from ASHRAE Standard 90.1-2001.
Rooftop Units greater than 63.3 tons	Average size and typical efficient product efficiency determined from historic participation. Baseline from ASHRAE Standard 90.1-2001.
Variable Air Volume Conversion	Based upon a formulation using EFLH for Chillers and Rooftop units. Savings at the cooling unit and fan included.
Split Systems less than 5.4 tons	Average size and typical efficient product efficiency determined from historic participation. Baseline from ASHRAE Standard 90.1-2001.
Condensing Units > 5.4 tons	Average size and typical efficient product efficiency determined from historic participation. Baseline from ASHRAE Standard 90.1-2001.
Water-source Heat Pumps	Average size determined from historic participation. Baseline from ASHRAE Standard 90.1-2001. SEER determined from EER/0.90 because of less temperature variation on the condenser side.
PTAC	Average size and typical efficient product efficiency determined from historic participation. Baseline from ASHRAE Standard 90.1-2001.
scroll/screw chiller < 150 tons	Average size and typical efficient product efficiency determined from historic participation in Minnesota, adjusted for Colorado design temperature. Baseline from ASHRAE Standard 90.1-2001.
scroll/screw chiller 150 to 300 tons	Average size assumed to be midpoint of the range. Typical efficient product efficiency determined from historic participation in Minnesota. Baseline from ASHRAE Standard 90.1-2001.
Centrifugal Chillers < 150 tons	Average size and typical efficient product efficiency determined from historic participation. Baseline from ASHRAE Standard 90.1-2004.
Centrifugal Chillers 150- 300 tons	Average size and typical efficient product efficiency determined from historic participation. Baseline from ASHRAE Standard 90.1-2004.
Cooling Studies	These studies are reimbursed at a rate of 75%.
Centrifugal Chillers > 300 tons	Average size and typical efficient product efficiency determined from historic participation. Baseline from ASHRAE Standard 90.1-2004.
Air-Cooled Chillers - avg. capacity 250 tons	Average size and typical efficient product efficiency determined from historic participation. Baseline from ASHRAE Standard 90.1-2001.
Custom Cooling	Average savings, rebates, and costs derived from past participation

Forecasted Electric Technical Assumptions Reference Sources	
Custom Efficiency	
Average Custom Project	The average came from Custom Efficiency projects completed during 2004 & 2005. Customers and equipment providers or engineers provide data for the pre-approval application. Some projects involve pre- and post-project monitoring and verification. All applications must be pre-approved, prior to equipment purchase. Some customers purchase high efficient new equipment instead of standard equipment others buy new equipment and remove old, so Average Baseline Product Costs is a weighted average of both cases and Incremental is the added cost to achieve the higher efficiency.
Energy Management Systems	
Average Project	The average came from all projects that were turned in during 2005. These projects utilized a Third Party vendor to gather the end use and hour data. This vendor asked the customer how many hours their end use (lighting. ventilation, and AC) were used and what the size of the equipment was that the EMS would control, then asks how many hours their EMS system will allow these end use to be on. The vendor uses conservative estimates for efficiency for equipment in their model. Electric end use for this program used 8,197 hours because of the Implied Rule and should not be connected to gas. There is a small amount of Real kW for Cooling savings. This type of project could receive a rebate for Gas savings also, but this table only reflects the Electric part of the project. Also Payback in this table does not reflect savings from any energy or non-energy O&M. Payback will not match the official Costbens or Bencost Worksheets. Customer adds an EMS system so Average Baseline Product Costs would be $0, so all cost is Incremental
Lighting	
Lighting Retrofit	-
Lighting Efficiency	Commissioned Information from the Lighting Research Center establishes wattages for the different fixture types. The Consortium for Energy Efficiency (CEE) also provided information on newer technologies. Rebate forms detail what equipment customers are
Lighting Retrofit	In general, measures are for one-for-one fixture changeouts. Cooling benefits and heating penalty based upon information in the MN Deemed Savings data (33% kW credit for cooling, 11% kWh credit for cooling, 0.000887 DKt penalty per lighting kWh savings @ $10/DKt). Lifetimes based upon Deemed Savings and research from the Lighting Research Center.
T8 Ballasts, 4 ft. or less, 1 and 2 lamp	Based on a weighted average of 4 ft 1 and 2 Lamp electronic ballast T8 systems from past participation. Systems replaced a mix of T12 systems, both electronic and magnetic ballasts, as well as incandescent from 70-150W and is based on MN Deemed Savings Data
T8 Ballasts, 4 ft. or less, 3 and 4 lamp	Based on a weighted average of 4 ft 3 and 4 Lamp electronic ballast T8 systems from past participation. Systems replaced a mix of T12 systems, with either electronic or magnetic ballasts and is based on MN Deemed Savings Data.
T8 Ballasts, Length > 4 ft. and <= 8 ft., 1 lamp	Based on a weighted average of 8 ft 1 and 2 Lamp 8 electronic ballast T8 systems from past participation. Systems replaced a mix of T12 systems, with either electronic or magnetic ballasts and is based on MN Deemed Savings Data.
T8 Ballasts, Length > 4 ft. and <= 8 ft., 2 lamp	Based on a weighted average of 8 ft 1 and 2 Lamp 8 electronic ballast T8 systems from past participation. Systems replaced a mix of systems, with either electronic or magnetic ballasts and is based on MN Deemed Savings Data.
T8 to T8 Delamping	Based on retrofit of Existing T8 systems from either 3 or 4 lamps to 2 or 3 lamps.
Super T8 1 and 2 Lamp	Based on a weighted average of 4 ft 1 and 2 Super T8 Lamp electronic ballast T8 systems. Systems assumed to be replaced were a mix of T8 and T12 systems, with either electronic or magnetic ballasts and is based on MN Deemed Savings.
Super T8 3 and 4 Lamp	Based on a weighted average of 4 ft 3 and 4 Super T8 Lamp electronic ballast T8 systems. Systems assumed to be replaced were a mix of T8 andT12 systems, with either electronic or magnetic ballasts and is based on MN Deemed Savings.

Forecasted Electric Technical Assumptions Reference Sources	
T5 Ballasts 1 and 2 Lamp	Based on a weighted average of 1 and 2 Lamp electronic ballast T5 systems from past participation. Systems replaced a mix of T12 systems, both electronic and magnetic ballasts, as well as 150W incandescent and is based on MN Deemed Savings.
T5 Ballasts 3 and 4 Lamp	Based on a weighted average of 3 and 4 Lamp electronic ballast T5 systems from past participation. Systems replaced a mix of T12 systems, both electronic and magnetic ballasts, as well as 150W incandescent and is based on MN Deemed Savings.
Compact Fluorescent Lamps (CFL), less than 19W	Based on a weighted average of 7W and 15W, CFL from past participation. Systems replaced a mix of 15W through 65W incandescent and is based on MN Deemed Savings Data for screw-in CFL
CFL, 19 to 32 W	Based on a 26W, CFL from past participation. Systems replaced a mix of 75W and 100W incandescent and Metal Halide and is based on MN Deemed Savings Data.
CFL, 33 to 56W	Based on a weighted average of 36W and 55W CFLs from participation. Systems replaced a mix of 150W through 400W incandescent and is based on MN Deemed Savings
Industrial Multi-CFL	Based on a 64W to 84W Industrial CFL. Systems replaced 100W Metal Halide, Mercury Vapor and incandescent and is based on MN Deemed Saving Data.
HID, 151 to 250W	Based on a weighted average of 175W Metal Halides. Systems replaced a mix of 400W Mercury Vapor and 250W High Pressure Sodium. The wattages refer to the lamp wattage. Fixture wattage will be greater. This measure consisted of a weighted average
HID, 251 to 1000W	Based on a 400W Metal Halide. Systems replaced 1000W Mercury Vapor and is based on MN Deemed Savings Data
Pulse-Start Metal Halide, <= 175W	Based on a weighted average of 175W and 250W Metal Halide and MN Deemed Savings Data.
Pulse-Start Metal Halide, 176W-319W	Based on a weighted average of 250W.Pulse Start Metal Halides. Systems replaced a mix of 400W Metal Halide and 400W Mercury Vapor and is based on MN Deemed Savings Data
Pulse-Start Metal Halide, 320W-749W	Based on a weighted average of 320W and 360W.Pulse Start Metal Halides. Systems replaced 400W Metal Halide; 400W Mercury Vapor; 400W High Pressure Sodium and is based on MN Deemed Savings Data
Pulse-Start Metal Halide, 750W+	Based on a 750W Pulse Start Metal Halides. Systems replaced 1000W Metal Halide and is based on MN Deemed Savings Data.
High Efficiency Ballasts	Based on high efficiency ballasts using approx. 4% less energy
Parking Garages	Based on replacing 150W or 175W Metal Halide with T8 Systems
High Bay Fluorescents replacing 250 Watt Metal Halide	Based on replacing Metal Halide 150W to 250W and MN Deemed Savings
High Bay Fluorescents replacing 400 Watt Metal Halide	Based on replacing Metal Halide less than or equal to 400W and MN Deemed Savings
High Bay Fluorescents replacing 750 Watt Metal Halide	Based on replacing Metal Halide less than or equal to 750W and MN Deemed Savings
High Bay Fluorescents replacing 1000 Watt Metal Halide	Based on replacing Metal Halide less than or equal to 1000W and MN Deemed Savings
Wall mount occupancy sensor	Based on a weighted average connected load of 300W to the sensor and savings estimated to be 30%. Based upon MN Deemed Savings Data.
Ceiling mount occupancy sensor	Based on a weighted average connected load of 300W to the sensor and savings estimated to be 30%. Based upon MN Deemed Savings Data.
Photocell	Based on a weighted average connected load of 300W to the sensor and savings estimated to be 20%. Based upon MN Deemed Savings Data.
Exit sign retrofit and replacement	Based on a 2W LED Exit Sign. Systems replaced 30W and 40W Incandescent Exit Signs and MN Deemed Savings Data
Low Wattage T8 4' lamps	Based on a weighted average of 25W and 28W T8 with electronic ballast. Based upon MN Deemed Savings Data.

Forecasted Electric Technical Assumptions Reference Sources	
Integrated 25W Ceramic Metal Halide	Based on MN Deemed Savings and replacing a 75W incandescent and MN Deemed Savings Data
Ceramic Metal Halide <=150W	Based on a weighted average of 20W to 39W Ceramic Metal Halide. Systems replaced 100W to 150W Incandescent. Based upon MN Deemed Savings Data.
Ceramic Metal Halide 151-250W	Based on a weighted average of 150W, 175W and 200W Ceramic Metal Halide. Systems replaced 500W incandescent and based upon MN Deemed Savings
Ceramic Metal Halide 251W-	Based on a weighted average of 320W, 350W, and 400W Ceramic Metal Halide. Systems replaced 400W Metal Halide and 1000W Mercury Vapor
T12 to T8 with delamping, 1 and 2 Lamp	Based on T8 retrofit of existing T12 fluorescent 4, 3, or 2 Lamp fixture with either 1 or 2 lamp T8
T12 to T8 with delamping, 3 Lamp	Based on T8 retrofit of existing T12 fluorescent 4 and 3 lamp fixture with 3 lamp T8
Lighting New Construction	In general, measures are for one-for-one fixture comparisons. Cooling benefits and heating penalty based upon information in the MN Deemed Savings data (11% kW credit for cooling, 22% kWh credit for cooling, 0.000887 DKt penalty per lighting kWh savings @ $10/DKt)
Super T8 1 and 2 Lamp	Based on a weighted average of 4 ft 1 and 2 Super T8 Lamp electronic ballast T8 systems. Systems assumed to be installed instead of 32W T8 systems
Super T8 3 and 4 Lamp	Based on a weighted average of 4 ft 3 and 4 Super T8 Lamp electronic ballast T8 systems. Systems assumed to be installed instead of 32W T8 systems
Lighting - T5 Ballasts 1 and 2 Lamp	Based on a weighted average of T5 1 and 2 lamp systems replacing T12 systems and MN Deemed Savings.
Lighting - T5 Ballasts 3 and 4 Lamp	0
Lighting - CFL <=18W	Based on a weighted average of 7W and 15W, CFL from past participation. Systems installed instead of a mix of 40W and 60W incandescent and MN Deemed Savings Data
Lighting - CFL19-32W	Based on a weighted average of 20W, 23W and 26W CFL from past participation. Systems replaced a mix of 75W and 100W incandescent and MN Deemed Savings Data
CFL, 33 W-56W	Based on a weighted average of 36W and 55w CFLs from participation. Systems installed instead of a mix of 150W and 200W incandescent
Pulse-Start Metal Halide, 176W-319W	Based on a weighted average of 250W.Pulse Start Metal Halides. Systems installed instead of 400W Metal Halide and 400W Mercury Vapor. Retrofit data used to establish baseline technologies.
Pulse-Start Metal Halide, 320W-749W	Based on a weighted average of 320W and 350W.Pulse Start Metal Halides. Systems replaced 400W and 1000W Metal Halide; 400W and 1000W Mercury Vapor; and 400W High Pressure Sodium. Retrofit data used to establish baseline technologies.
Pulse-Start Metal Halide, 750W+	Based on a 750W Pulse Start Metal Halides. Systems installed instead of 1000W Metal Halide. Retrofit data used to establish baseline technologies.
High Bay Fluorescents <= 300 Watts	Based on replacing Metal Halide less than 400W and MN Deemed Savings
High Bay Fluorescents <= 610 Watts	Based on replacing Metal Halide less than 750W and MN Deemed Savings
High Bay Fluorescents <= 900 Watts	Based on replacing Metal Halide less than 1000W and MN Deemed Savings
Energy Efficient Ballasts	Replacing normal ballast factor ballast (.88) with High efficiency ballast
Low Wattage T8	Based on MN Deemed Savings. Lamps installed instead of 32W T8.
Integrated 25W Ceramic Metal Halide	Based on MN Deemed Savings and replacing a 75W incandescent
Ceramic Metal Halide <=150W	Based on a weighted average of 39W, 70W, 100W and 150W Ceramic Metal Halide. Systems installed instead of 100W, 250W, 300W and 500W Incandescent and MN Deemed Savings Data.

Forecasted Electric Technical Assumptions Reference Sources	
Ceramic Metal Halide 151-250W	Based on a weighted average of 175W and 250W Ceramic Metal Halide. Systems installed instead of250W and 400W Mercury Vapor and MN Deemed Savings Data
Ceramic Metal Halide 251W-	Based on a weighted average of 320W, 350W, and 400W Ceramic Metal Halide. Systems installed instead of 400W Metal Halide and 1000W Mercury Vapor and MN Deemed Savings Data
Motor Efficiency	
Plan A - New Motors	The technical assumptions for the Plan A & Plan B motors were derived from data obtained from the National Electrical Manufacturers Association (NEMA), US Department of Energy MotorMaster+ software, Eff. Vermont , and historical program participation data for 2007. The NEMA Premium™ program standards are utilized for the high efficiency baseline for both programs. Plan A uses EPACT standards as the low efficiency baseline. Plan B uses historical efficiency data for motors manufactured 15-20 years ago as the low efficiency baseline. Average motor size submitted for Plan A rebate during 2007 was 17 HP. The average kW/HP was 0.01294 across the 2007 sample. Average cost estimated to be $10 per HP for an efficient motor upgrade from baseline to NEMA premium efficient model The Colorado Motor Program Evaluation is currently measuring actual marketplace kW and kWh installed impact and free ridership, per the deemed savings in hours, application and specific motor efficiencies if available.
Plan B - Replacement Motors	The technical assumptions for the Plan A & Plan B motors were derived from data obtained from the National Electrical Manufacturers Association (NEMA), US Department of Energy MotorMaster+ software, Eff. Vermont , and historical program participation data for 2007. The NEMA Premium™ program standards are utilized for the high efficiency baseline for both programs. Plan A uses EPACT standards as the low efficiency baseline. Plan B uses historical efficiency data for motors manufactured 15-20 years ago as the low efficiency baseline. Average motor size submitted for rebate during 2007 was 22 HP. The average kW/HP was 0.414 across the 2007 sample. Average cost estimated to be $78 per HP for an efficient motor for retrofit/Replacement The Colorado Motor Program Evaluation is currently measuring actual marketplace kW and kWh installed impact and free ridership, per the deemed savings in hours, application and specific motor efficiencies if available.
ASD's	The technical assumptions for the Adjustable Speed Drives is derived from data obtained from historical applications for ASD's in CO for 2007 and Minnesota 2007. Each application was custom analyzed for energy savings based on type of application, motor size, and profile of operational hours. The formulas for calculating energy savings were utilized to calculate the individual energy savings on a per-project basis. These individual analyses were stratified to eliminate applications that would not qualify for incentive, and develop the technical results for applications that would qualify for incentive. Only Fans and Pumps qualify for ASD rebates through this program. Average motor size submitted for rebate during 2007 in CO was 34 HP. Average energy savings from VFD's determined by evaluating each individual VFD application for 2009/2010, motor size, operating hours, installation type. The average energy savings was determined to be 0.263 kW/hp. Average cost estimated to be $209 per HP for a VFD. Used Grainger and outside vendors to estimate this total based upon participant levels and actual costs. The percentage of VSD Applications in the field that would obtain to Fans and Pumps is approximately 18-25% based upon US Industrial Electric Motor Systems Market Opp. Assessment pg.17 The Colorado Motor Program Evaluation is currently measuring actual marketplace kW and kWh installed impact and free ridership, per the deemed savings in hours, application and specific motor efficiencies if available.

Forecasted Electric Technical Assumptions Reference Sources	
NEMA 201-500 hp	Hours of operation from MN Industrial Deemed Motor Hours Load factor of 0.75 Particpation assumed to be 50% increase in number of NEMA sales in this hp range Rebate: $4/hp Incremental cost info from local MN vendors
Tier 2 motors	Hours of operation from MN Industrial Deemed Motor Hours Load factor of 0.75 Assume 1.0% higher efficiency than NEMA Premium Assume cost is 10% higher than NEMA premium
Custom Motors	The technical assumptions for Custom Motors were derived from data obtained from historical completed project data for Custom Efficiency projects in (CO & MN) 2006 & 2007. A study conducted in 2003 NSP Custom Solutions for Business Program Impact and Process Evaluation concluded ... "Analyzed in aggregate, the on-site assessments were just over 3% higher for energy savings. When the analysis was completed for demand savings the on-site estimates were 1% higher than the tracking savings. This indicates that project implementation was doing a very good job of estimating the savings potential from an engineering perspective.
Recommissioning	
Recommissioning	~The average reductions (kW reduction = 10%; kWh reduction =12%), costs, and rebates are based on identified potential in studies completed in Colorado since 2006. Measure life taken to be 7 years. ~The low coincidence factor reflects the fact that some implementation measures have only energy savings and no demand component. Savings are put on an "equivalent kW" basis to have all measures on a common metric. As such, high Efficient Product is not necessarily representative of new peak demand, but shows the "equivalent kW" upon which a rebate may be expressed. Regardless, the annual energy savings is not affected by this restatement. ~Since many measures have very quick or even instantaneous rebates, the average rebate, derived from the study data, is less than the $400/kW or $0.08/kWh potential rebate. ~Rebates and capital costs include for implementation only pertain to the completion of identified measures. Rebate and costs for studies are shown on the "Study" component. Baseline cost is $0 since the customer would have done nothing without the study. ~Optimized Building Performance determined as the difference between the Baseline and the Estimated Savings per implementer. ~Since participation includes both those who implement in a given calendar year as well as all those customers who had studies performed in that calendar year, the actual number o ~Number of study participants is estimated to be 150% of implementing participants. ~For purposes of the electric component of this program, the electric-related components were looked at exclusively. Any Xcel Energy gas-related costs or savings were looked at o ~Energy O&M Savings based on natural gas savings of participants who are not Xcel Energy natural gas customers. Approximately 32% of participants have Xcel Energy as their na
Refrigeration Recommissioning	Savings potential based upon pilot program data from 13 Minnesota stores. Average store size scaled to 2/3 because of typically smaller Colorado stores Assumes 85% coincidence factor of all savings across all customers Correlations were developed from MN pilot program data to relate energy and demand savings to case loads Rebate based upon $0.025 per estimated kWh, with a maximum of 50% of cost. Actual credit taken wil be determined from post-implementation report.
Small Business Lighting	
Small Business Lighting	Net-to-gross = 100% for CO and NM as the small business segment has not historically done energy effficiency projects on their own kW savings, rebate amoutns taken from an average of Years 1 and 2 actuals from One-Stop Efficiency Shop in MN; audit cost estimated from Years 1 and 2 costs for MN program Assumed typical customer is 200kW of demand with 25% of demand due to lighting load according to Esource

Forecasted Electric Technical Assumptions Reference Sources	
New Construction	
EDA: Basic Track	Net-to-gross = 98% for CO as defined for existing EDA program; program requirements well above code, so feel free-ridership will be negligible. Assumptions from EDA-Custom Consulting verified results for MN and CO programs from 2007 projects Average hours of operation calculated from actual verified projects kWh/kW; Rebate amount is $300/kW saved
EDA: Enhanced Modeling Track	Net-to-gross = 98% for CO as defined for existing EDA program; program requirements well above code, so feel free-ridership will be negligible. Assumptions from EDA-Custom Consulting verified results for CO programs from 2007/2008 projects Average hours of operation calculated from actual verified projects kWh/kW; Rebate amount is $300/kW saved CO - assumed Enhanced Modeling will see 55% increase in energy savings and incremental cost from Basic as was seen for CO Custom Consulting
Energy Efficieny Buildings	Net-to-gross = 93% for CO as determined from weighted average of program components; program requirements well above code, so feel free-ridership will be negligible. Assumptions from EDA-Plan Review results for MN program from 2006-2007; due to stricter CO codes, savings will be 70% of MN projects Incremental cost based on $/sq ft implementation for Custom Consulting and average building size from Plan Review projects Average hours of operation calculated from project estimates kWh/kW;
Segment Efficiency	
Commercial Real Estate - TOTAL	Net-to-Gross = 76% as determined by a weighted average of the NTG of the program components This new program is built upon the premise that existing program offerings will be offered as a part of a study-driven package. Implementation rebates will mimic those of the existing programs, with the possibility of receiving up to 30% extra if a customer meets participation requirements. Estimated energy savings are based on those of the already existent programs; before and after scenarios based upon those savings being applied to the prototypical building participating in the study. The program rollup includes the rebates and costs associated with performing the studies which will identify the measures as well as the implementation-related costs and rebates. Hours of operation based on those used for the MN program.
CRE Prescriptive	Lighting, Motors, Drives assumptions from actual project implementation in MN
CRE Custom	Inputs based on actual participants in the CO Custom Efficiency program
CRE EMS	Inputs based upon actual participants in the CO EMS Program in 2006/2007; Rebate based on MN program average payout of $319.17/kW
CRE Recommissioning	Inputs based upon those for actual participants for the CO Recommisioning Program. Baseline consumption based upon DSManager load information for stereotypical building size of 205,000 ft2. Rebates and costs only reflect those associated with implementation.
CRE Studies	Study Costs are split with the Electric Program on the basis of 96.50% Electric, 3.50% Gas; Preliminary Report avg cost: $7,500; Investigative Study avg cost: $41,900
Data Center Efficiency	
Data Center Efficiency	Net-to-Gross = 90% as we have seen some projects come through the Custom Efficiency program and reports have determined that 10% of the market is currently doing virtualization of servers study rebate at 50% of cost not to exceed $15,000 implementation rebate at $300/kW saved virtualization at ratio of 15:1 for retrofit lighting assume no change in number of fixtures

Forecasted Electric Technical Assumptions Reference Sources	
RESIDENTIAL SEGMENT	
Saver's Switch	
Notes:	Only Smart Switches Installed
School Education Kit	
Living Wise Kit-CFLs	The CFL analysis assumed replacing one 75W and one 60W incandescent light bulb with 19W and 14W CFL bulbs, respectively. The savings are calculated based on the assumption of the number of hours each bulb would be used. It was assumed that these bulbs would be placed in the high traffic areas of the home. Thus 1210 hours of use annually were assumed in line with the 2002 DOE study (see kit-CFL calc tab) that distributes the hours of operation with each bulb in accordance with where it is installed. For this kit, the customers are instructed to place the bulbs in the most frequently used areas of their home. The life is estimated by dividing the nominal life of 8,000 hours by the average annual hours for the bulbs. The incremental cost assigned to this measure is more then the typical incremental cost of a CFL, the incremental cost here is the weighted cost of the full kit that the customer will be receiving. The full kit costs $46.39, however, only three pieces of the kit could have savings associated with them, so the cost is distributed to each of the 3 components based on their individual savings.
Home Performance with ENERGY STAR	
CFLs (Quantity of 20)--Required	The savings and annual hours of operation for compact fluorescent lamps are based on data and calculations derived from the 2002 US Lighting Market Characterization performed for the Department of Energy in 2002. The incremental cost came from MEEA/ES Change A Lite campaign. The life is based on the distribution of hours per bulb as each is added to a home per the 2002 DOE study, the amount of hours decrease from the most at 1210 hours of use annually. Each home is assumed to already have 3.2 existing CFLs in high use areas of their home (Data provided by ESource), therefore the 20 bulbs analyzed starting from bulb 4 (See CFL Table). Coincidence is from CA CFL Metering Study Final Report
Dishwasher	Savings calculation for the dishwasher were based on the Energy Star Dishwasher Savings Calculator: http://www.energystar.gov/index.cfm?c=dishwash.pr_dishwashers. This looked at a gas water heater home, so savings are generated for gas and electric. The full load hours are assumed to be 215 based on the Energy Star calculator reporting 215 dishwasher runs per home annually assuming about a 1 hour run time from start to finish of the dishwasher. The 11 year measure life source: Department of Energy. Additional savings comes from gas water heating savings of 12.7 therms annually at $1.20 per therm. Coincidence factor source: calculated.
Clothes Washer	Savings calculation for the clotherswasher were based on the Energy Star Clotherswasher Savings Calculator: http://www.energystar.gov/index.cfm?c=clotheswash.pr_clothes_washers. This looked at a gas water heater home, so savings are generated for gas and electric. The full load hours are assumed to be 392 based on the Energy Star calculator reporting 392 clothes washer runs per home annually assuming about a 1 hour run time from start to finish of the clothes washer. The 11 year measure life source: Appliance Magazine, September 2007. Additional savings comes from gas water heating savings of 8.8 therms annually at $1.20 per therm. Coincidence factor source: calculated
ECM Furnace Fan Efficiency	The assumption underlying the installation of an electronically commutated motor (ECM) for forced air furnaces is that they will be installed only at the same time the furnace is replaced. The determinants of furnace replacement are replacement on burnouot. The source of information is Scott Pigg et. al. in Home Energy Magazine, Nov/Dec 2003. The savings derive from the calculations that the fan will run 2,423 hours annually in both the heating and air circulation modes. It replaces a 400-watt motor with 150 watts. Its life is expected to match a new gas furnace, 18 years. The incremental cost is estimated to be $400. As the fan operates in heating season, it delivers no summer energy savings or peak kW savings.
Energy Star Refrigerator	Savings calculation for the refrigerator were based on the Energy Star Refrigerator Savings Calculator: http://www.energystar.gov/index.cfm?c=refrig.pr_refrigerators. The full load hours are assumed to be 8760 based on the Energy Star calculator. The 13 year measure life source: Department of Energy. Coincidence factor source: 100% since load is fully diversified.
Refrigerator Recycling	The "connected load" value for the refrigerator program is the calculated electricity consumption of the base and change case refrigerator at the time of Xcel's system peak (in Watts). As a result, the coincidence factor is calculated at 100%. The "hours of operation" value was calculated such that the product of the "connected load" and "hours of operation" would equal the independently calculated "Annual Customer kWh Savings" value [Hours of operation = (Annual kWh Savings) / (Connected Load * 1000)]. Energy consumption and savings values were calculated using shipment-weighted average efficiencies of units manufactured from 1993-2000 with appropriate degradation factors applied to calculate baseline energy consumption. These values came from http://enduse.lbl.gov/Projects/RED.html. Demand savings values were calculated using an Average kW/Peak kW ratio from Deemed Refrigerator Savings for Texas developed by Frontier Associates. The "measure life" value for the refrigerator program is NOT the expected useful life of the Energy Star refrigerator. Rather, it is the average number of years that Xcel can expect to realize energy savings from the Refrigerator recycling. This is the weighted average of the expected remaining life of the the range of refrigerators replaced. The Rebate amount is the $35 incentive paid to the customer. $102 for the recycling and transportation of the removed unit, and $24 for the CFC disposal are treated as administrati

Forecasted Electric Technical Assumptions Reference Sources	
Evaporative Cooling	
Evaporative Replacing Refrigerated Air	Energy savings for replacing refrigerated air conditioning with an evaporative cooler uses a 3-ton AC unit rated at the federal standard of SEER 13 as the baseline. Its connected load is calulated at 3.22 kW: kW = (Btuh/EER) / 1,000, where EER = (-0.02 * SEER ^2) + (1.12 * SEER). The source for the EER formula is Building America, Research Benchmark Definitions, p. 9. http://www.eere.energy .gov/buildings/building_america/pdfs/37529.pdf. The AC's annual energy use was simulated in ESPRE and combines the fan motor condenser. Energy for the evaporative cooler used the following calculation: Motor HP * .746 (conversion constant) / Motor Efficiency * Load Factor * Effective Full Load Hours. The motor is rated at 3/4 HP per manufacturers' information sheets. The source for 70 percent motor efficiency is http://www.eere.energy.gov/buildings/appliance_standards/commercial/pdfs/small_motors_tsd.pdf. The hours of operation for the baseline 13 SEER refrigerated air system are based on a home with a 3 ton air conditioning load modeled with ESPRE. The coincidence factors are calculated according to the following formula: (coincidence factor = peak kW / Connected Load kW). See "Refrigerated Air Calculations" and "Evaporative Cooling Calculations" for further explanation. See "Incremental Cost Calculations" for incremental cost d
High Efficiency Evaporative Replacing Refrigerated Air	Energy savings for replacing refrigerated air conditioning with a high-efficiency evaporative cooler uses the same baseline 3-ton AC unit rated at the federal standard of SEER 13 as the baseline as described above. The formula for calculating the energy used by the high-efficiency evaporative cooler is the same but uses a different load factor and motor efficiency. It was calculated as the dividend of the 90 percent load factor of the baseline evaporative cooler divided by the ratio of the saturation rates -- effectiveness ratings -- of the baseline cooler to the lowest rating of the high-efficiency model: .9 / (.65 / .85). Again, the model for the calculations is in the Summit Blue study of evaporative cooling completed for Xcel Energy in Colorado. Hours of operation, coincidence factors, and incremental costs are calculated as described above.
Higher Efficiency Evap Replacing Std. Evap	Energy savings for upgrading from a standard evaporative cooler to a high-efficiency model derive from the difference in the units' load factors and motor efficiencies. Using the same formula for kWh for both units, Motor HP * .746 (conversion constant) / Motor Efficiency * Load Factor * Effective Full Load Hours, the lower load factor of the more efficient equipment yields saving. Hours of operation, coincident factors, and incremental costs are calculated as described above.
Home Lighting & Recycling	
Home Lighting	All information is provided in comments to individual cells.
ENERGY STAR New Homes	
CFLs-Quantity of 20 (Required)	The savings and annual hours of operation for compact fluorescent lamps are based on data and calculations derived from the 2002 US Lighting Market Characterization performed for the Department of Energy in 2002 (see lighting Calc sheets). The incremental cost came from MEEA/ES Change A Lite program information. The life is estimated by dividing the nominal life of 8,000 hours by the estimated annual hours of use.
Energy Star Clothes Washer	Savings calculation for the clotheswasher were based on the Energy Star clothes washer Savings Calculator: http://www.energystar.gov/index.cfm?c=clotheswash.pr_clothes_washers. This looked at a gas water heater home, so savings are generated for gas and electric. The full load hours are assumed to be 392 based on the Energy Star calculator reporting 392 clothes washer runs per home annually assuming about a 1 hour run time from start to finish of the clothes washer. The 11 year measure life source: Appliance Magazine, September 2007. Additional savings comes from gas water heating savings of 8.8 therms annually at $1.20 per therm as well as water savings of 5790 gallons at $0.003 per gallon. Coincidence factor source: Calculated
Energy Star Dishwasher	Savings calculation for the dishwasher were based on the Energy Star Dishwasher Savings Calculator: http://www.energystar.gov/index.cfm?c=dishwash.pr_dishwashers. This looked at a gas water heater home, so savings are generated for gas and electric. The full load hours are assumed to be 215 based on the Energy Star calculator reporting 215 dishwasher runs per home annually assuming about a 1 hour run time from start to finish of the dishwasher. The 11 year measure life source: Department of Energy. Additional savings comes from gas water heating savings of 12.7 therms annually at $1.20 per therm as well as water savings of 430 gallons annually at $0.003 per gallon. Coincidence factor source: calculated.
Energy Star Refrigerator	Savings calculation for the refrigerator were based on the Energy Star Refrigerator Savings Calculator: http://www.energystar.gov/index.cfm?c=refrig.pr_refrigerators. The full load hours are assumed to be 8760 based on the Energy Star calculator. The 13 year measure life source: Department of Energy. Coincidence factor: 100% since load is fully diversified.
Refrigerator Recycling	
Refrigerator Replacements	The "connected load" value for the refrigerator program is the calculated electricity consumption of the base and change case refrigerator at the time of Xcel's system peak (in Watts). As a result, the coincidence factor is calculated at 100%. The "hours of operation" value was calculated such that the product of the "connected load" and "hours of operation" would equal the independently calculated "Annual Customer kWh Savings" value [Hours of operation = (Annual kWh Savings) / (Connected Load * 1000)]. Energy consumption and savings values were calculated using shipment-weighted average efficiencies of units manufactured from 1993-2000 with appropriate degradation factors applied to calculate baseline energy consumption. These values came from http://enduse.lbl.gov/Projects/RED.html. Demand savings values were calculated using an Average kW/Peak kW ratio from Deemed Refrigerator Savings for Texas developed by Frontier Associates. The "measure life" value for the refrigerator program is NOT the expected useful life of the Energy Star refrigerator. Rather, it is the average number of years that Xcel can expect to realize energy savings from the Refrigerator recycling. This is the weighted average of the expected remaining life of the the range of refrigerators replaced.

Forecasted Electric Technical Assumptions Reference Sources	
ENERGY STAR Retailer Incentive	
TV	The technical assumptions for the TV, were derived from data provided by Consortium For Energy Efficiency (CEE) and ENERGY STAR. The CEE Assumptions and Summary are attached. - All calculations for the Energy Star TV were provided by Xcel Energy. Currently a 5% coincidence is assumed.
Energy Star Clothes Washer	Savings calculation for the clotheswasher were based on the Energy Star clothes washer Savings Calculator: http://www.energystar.gov/index.cfm?c=clotheswash.pr_clothes_washers. This looked at a gas water heater home, so savings are generated for gas and electric. The full load hours are assumed to be 392 based on the Energy Star calculator reporting 392 clothes washer runs per home annually assuming about a 1 hour run time from start to finish of the clothes washer. The 11 year measure life source: Appliance Magazine, September 2007. Additional savings comes from gas water heating savings of 8.8 therms annually at $1.20 per therm as well as water savings of 5790 gallons at $0.003 per gallon. Coincidence factor is calculated.
Room AC	Savings calculations for the room AC are based on the Energy Star room AC calculator: http://www.energystar.gov/index.cfm?c=roomac.pr_room_ac. The operating hours are the full load hours for Denver (EPA 2002). The incremental cost ($30) as well as the measure life (9 years) are the assumptions used in the Energy Star Calculator. The coincidence factor is the Xcel Minnesota Air conditioning factor.
Ceiling Fan	Savings calculations for the ceiling fan were based on the Energy Star Ceiling Fan Calculator: http://www.energystar.gov/index.cfm?c=ceiling_fans.pr_ceiling_fans. Majority of the savings is based on the assumption that the 3 lighting fixtures in the Energy Star Fan will have CFLs in place of incandescent light bulbs. The West North Central hours of operation were applied - 4 hours of fan run time daily, and 4 hours of lighting run time daily. While the mountain hours of operation might have been more appropriate - 5.6 hours daily of fan, and 3.5 hours daily of lighting operation, these tech sheets do not distinguish between different operating hours of different components of a measure, therefore both components, the fan and the fan lights, in this case were assumed to have the same amount of operation hours. The incremental cost applied is from the Energy Star calculator, as well as the measure life. Coincidence factor from CFL Metering Study Final Report 2005.
Energy Star Dishwasher	Savings calculation for the dishwasher were based on the Energy Star Dishwasher Savings Calculator: http://www.energystar.gov/index.cfm?c=dishwash.pr_dishwashers. This looked at a gas water heater home, so savings are generated for gas and electric. The full load hours are assumed to be 215 based on the Energy Star calculator reporting 215 dishwasher runs per home annually assuming about a 1 hour run time from start to finish of the dishwasher. The 11 year measure life source: Department of Energy. Additional savings comes from gas water heating savings of 12.7 therms annually at $1.20 per therm as well as water savings of 430 gallons annually at $0.003 per gallon. Coincidence factor is calculated.
Energy Star Refrigerator	Savings calculation for the refrigerator were based on the Energy Star Refrigerator Savings Calculator: http://www.energystar.gov/index.cfm?c=refrig.pr_refrigerators. The operating hours are assumed to be 8760 based on the Energy Star calculator. The 13 year measure life source: Department of Energy. Coincidence factor is 100% since the load is fully diversified over the year. This program is a market transformation program. In this case all rebate dollars go to Energy Star Appliance retailers to buy down the cost of the appliances, there is no direct rebate to the customer, other than the reduced price of the appliance.
LOW INCOME SEGMENT	
Easy Savings Energy Kit	
Energy Savings Kit-CFLs	The CFL analysis assumed replacing one 75W and one 60W incandescent light bulb with 19W and 14W CFL bulbs, respectively. The savings are calculated based on the assumption of the number of hours each bulb would be used. It was assumed that these bulbs would be placed in the high traffic areas of the home. Thus 1210 hours of use annually were assumed in line with the 2002 DOE study that distributes the hours of operation with each bulb in accordance with where it is installed. For this kit, the customers are instructed to place the bulbs in the most frequently used areas of their home. The lifetime is based on 8000 hours of life per ENERGY STAR divided by the average annual hours of use. The incremental cost assigned to this measure is more than the typical incremental cost of a CFL, the incremental cost here is the weighted cost of the full kit that the customer will be receiving. The full kit costs $46.39, however, only three pieces of the kit could have savings associated with them, so the cost is distributed to each of the 3 components based on their individual savings.

Forecasted Electric Technical Assumptions Reference Sources	
Single-Family Weatherization	
Refrigerator Replacements	The "connected load" value for the refrigerator program is the calculated electricity consumption of the base and change case refrigerator at the time of Xcel's system peak (in Watts). As a result, the coincidence factor is calculated at 100%. The "hours of operation" value was calculated such that the product of the "connected load" and "hours of operation" would equal the independently calculated "Annual Customer kWh Savings" value [Hours of operation = (Annual kWh Savings) / (Connected Load * 1000)]. The Incremental Cost was calculated as the weighted average of the difference in cost of installing an Energy Star refrigerator in 2008 with installing a refrigerator meeting the Federal Standard at the expected time of baseline refrigerator burnout [Incremental Cost = Cost of EStar 2008 Refrigerator – PV(Cost of Federal Standard Refrigerator in future year of burnout)]. Separate Incremental Costs were calculated for refrigerators manufactured each year from 1993 to 2000. The average Incremental Cost was obtained by weighting each year's Incremental Cost according to the probability that it would still be in service (as there are more refrigerators in the market manufactured in 2000 than 1993). These weight Energy consumption and savings values were calculated using shipment-weighted average efficiencies of units manufactured from 1993-2000 with appropriate degradation factors a Demand savings values were calculated using an Average kW/Peak kW ratio from Deemed Refrigerator Savings for Texas developed by Frontier Associates. The "measure life" value for the refrigerator program is NOT the expected useful life of the Energy Star refrigerator. Rather, it is the average number of years that Xcel can expect to
ECM Furnace Fan Efficiency	The assumption underlying the installation of an electronically commutated motor (ECM) for forced air furnaces is that they will be installed only at the same time the furnace is replaced. The determinants of furnace replacement are replacement on burnouot. The source of information is Scott Pigg et. al. in Home Energy Magazine, Nov/Dec 2003. The savings derive from the calculations that the fan will run 2,423 hours annually in both the heating and air circulation modes. It replaces a 400-watt motor with 150 watts. Its life is expected to match a new gas furnace, 18 years. The incremental cost is estimated to be $400. As the fan operates in heating season, it delivers no summer energy savings or peak kW savings.
Compact Fluorescent Lighting Package	The savings and annual hours of operation for compact fluorescent lamps are based on data and calculations derived from the 2002 US Lighting Market Characterization performed for the Department of Energy in 2002. The incremental cost came from Home Depot's stock lists. The life is estimated by dividing the nominal life of 8,000 hours by the annual hours of operation. The hours of operation are derived from the 2002 Lighting Market Characterization study done by the DOE (see calc sheet).
Multi-Family Weatherization	
General Approach	The energy savings from the MF program will be determined by engineering audits for each facility conducted prior to selection and implementation of ECMs. The audit will be performed and signed by a Registered Engineer. The audit will identify ECOs for consideration, calculate the likely energy savings using specific on-site information and testing results, will estimate the costs for implementation and summarize the information in a report for further consideration. Program savings will include the results from ECMs actually implemented and the sum of savings for all facilities retrofitted under the program.
General Approach	The energy savings presented by the set of electric and gas ECMs above and on the Gas Tech Sheet are indicative of common ECMs found in multi-family facilities but the diversity of multi-family facilities makes it very difficult to identify all the appropriate opportunities. The set of ECMs presented here are used to demonstrate cost-effectiveness but not to limit the actual ECMs identified, analyzed and recommended by the Engineer. The applicant may apply for funding for appropriate ECMs for the facility and/or qualified occupants and will be funded within the parameters of the program rules.
Refrigerator Replacements	The "connected load" value for the refrigerator program is the calculated electricity consumption of the base and change case refrigerator at the time of Xcel's system peak (in Watts). As a result, the coincidence factor is calculated at 100%. The "hours of operation" value was calculated such that the product of the "connected load" and "hours of operation" would equal the independently calculated "Annual Customer kWh Savings" value [Hours of operation = (Annual kWh Savings) / (Connected Load * 1000)]. The Incremental Cost was calculated as the weighted average of the difference in cost of installing an Energy Star refrigerator in 2008 with installing a refrigerator meeting the Federal Standard at the expected time of baseline refrigerator burnout [Incremental Cost = Cost of EStar 2008 Refrigerator – PV(Cost of Federal Standard Refrigerator in future year of burnout)]. Separate Incremental Costs were calculated for refrigerators manufactured each year from 1993 to 2000. The average Incremental Cost was obtained by weighting each year's Incremental Cost according to the probability that it would still be in service (as there are more refrigerators in the market manufactured in 2000 than 1993). These weight Energy consumption and savings values were calculated using shipment-weighted average efficiencies of units manufactured from 1993-2000 with appropriate degradation factors a Demand savings values were calculated using an Average kW/Peak kW ratio from Deemed Refrigerator Savings for Texas developed by Frontier Associates. The "measure life" value for the refrigerator program is NOT the expected useful life of the Energy Star refrigerator. Rather, it is the average number of years that Xcel can expect to
Compact Fluorescent Lighting Package	The savings and annual hours of operation for compact fluorescent lamps are based on data and calculations derived from the 2002 US Lighting Market Characterization performed for the Department of Energy in 2002. The incremental cost came from MEEA/ES Change A Light Program. The life is estimated based on the distribution of hours per bulb as each is added to a home per the 2002 DOE study, the amount of hours decrease from the most at 1210 hours of use annually. The hours of operation are derived from the 2002 Lighting Market Characterization study done by the DOE (see calc sheet). Installers are instructed to install the units in the most used locations in the home.

Forecasted Electric Technical Assumptions Reference Sources

Non-Profit Energy Efficiency Initiative

General Approach	The energy savings from the MF program will be determined by engineering audits for each facility conducted prior to selection and implementation of ECMs. The audit will be performed and signed by a Registered Engineer. The audit will identify ECOs for consideration, calculate the likely energy savings using specific on-site information and testing results, will estimate the costs for implementation and summarize the information in a report for further consideration. Program savings will include the results from ECMs actually implemented and the sum of savings for all facilities retrofitted under the program.
General Approach	The energy savings presented by the set of electric and gas ECMs above and on the Gas Tech Sheet are indicative of common ECMs found in multi-family facilities but the diversity of multi-family facilities makes it very difficult to identify all the appropriate opportunities. The set of ECMs presented here are used to demonstrate cost-effectiveness but not to limit the actual ECMs identified, analyzed and recommended by the Engineer. The applicant may apply for funding for appropriate ECMs for the facility and/or qualified occupants and will be funded within the parameters of the program rules.
Refrigerator Replacements	The "connected load" value for the refrigerator program is the calculated electricity consumption of the base and change case refrigerator at the time of Xcel's system peak (in Watts). As a result, the coincidence factor is calculated at 100%. The "hours of operation" value was calculated such that the product of the "connected load" and "hours of operation" would equal the independently calculated "Annual Customer kWh Savings" value [Hours of operation = (Annual kWh Savings) / (Connected Load * 1000)]. The Incremental Cost was calculated as the weighted average of the difference in cost of installing an Energy Star refrigerator in 2008 with installing a refrigerator meeting the Federal Standard at the expected time of baseline refrigerator burnout [Incremental Cost = Cost of EStar 2008 Refrigerator – PV(Cost of Federal Standard Refrigerator in future year of burnout)]. Separate Incremental Costs were calculated for refrigerators manufactured each year from 1993 to 2000. The average Incremental Cost was obtained by weighting each year's Incremental Cost according to the probability that it would still be in service (as there are more refrigerators in the market manufactured in 2000 than 1993). These weight Energy consumption and savings values were calculated using shipment-weighted average efficiencies of units manufactured from 1993-2000 with appropriate degradation factors a Demand savings values were calculated using an Average kW/Peak kW ratio from Deemed Refrigerator Savings for Texas developed by Frontier Associates. The "measure life" value for the refrigerator program is NOT the expected useful life of the Energy Star refrigerator. Rather, it is the average number of years that Xcel can expect to
Compact Fluorescent Lighting Package	The savings and annual hours of operation for compact fluorescent lamps are based on data and calculations derived from the 2002 US Lighting Market Characterization performed for the Department of Energy in 2002. The incremental cost came from MEEA/ES Change A Lite program data. The life is estimated based 8,000 hrs bulb life divided by the annual average hours of use. The hours of operation are derived from the 2002 Lighting Market Characterization study done by the DOE.

Forecasted Natural Gas Technical Assumptions

Type of Measure	High Efficiency Product Description / Rating	Dkt/yr H.E. consumption	Baseline Product Description / Rating	Dkt/yr Baseline consumption	Life of Product (years)	Average Hours of Operation per yr	Average Rebate Amount	Average Baseline Product Cost	Average Incremental Cost of Efficient Product	Rebate as a % of Incremental Cost	Incremtal Cost Payback Period w/o Rebate	Incremtal Cost Payback Period w Rebate	Average Annual Customer Dkt Savings	2009 Participants	2009 Units	2010 Participants	2010 Units	NTG
										Self Calculating Fields								
BUSINESS SEGMENT																		
Standard Offer		Dkt/yr		Dkt/yr						%	Years	Years	Dkt/yr					
Standard Offer - TOTAL	New Equipment	27,050	Old or less efficient systems or equipment	27,093	9	0	$371	$0	$1,114	33%	2.6	1.8	42	12	24	24	48	93%
Process Efficiency		Dkt/yr		Dkt/yr						%	Years	Years	Dkt/yr					
Reverse Osmosis treatment	Existing system	2,993	RO system	7,522	20	8,400	$9,056	$0	$113,000	8%	2.5	2.3	4,528	2	2	4	4	93%
Steam Traps	New Steam Traps	2,416	Existing Boiler, malfunctioning steam traps	2,481	7	0	$50	$0	$200	25%	0.3	0.2	65	2	2	4	4	93%
Boiler Efficiency	New Boiler	2,117	Existing Boiler	2,389	20	0	$1,532	$7,848	$7,197	21%	2.6	2.1	272	2	2	4	4	93%
New Construction		Dkt/yr		Dkt/yr														
Energy Design Assistance - TOTAL	More efficient building over code	3,199	Building built at code	4,637	20	0	$2,875	$0	$74,084	4%	5.2	5.0	1,437	4	4	5	5	99%
EDA: Basic Track	More efficient building over code	3,199	Building built at code	4,637	20	0	$2,875	$0	$74,084	4%	5.2	5.0	1,437	4	4	4	4	99%
EDA: Enhanced Modeling Track	More efficient building over code	4,959	Building built at code	6,955	20	0	$2,875	$0	$102,881	3%	5.2	5.0	1,996	0	0	1	1	99%
Energy Efficient Buildings	More efficient building over code	614	Building built at code	988	20	0	$1,066	$0	$8,839	12%	2.4	2.1	374	1	1	2	2	97%
Segment Efficiency		Dkt/yr		Dkt/yr						%	Years	Years	Dkt/yr					
CRE Prescriptive - TOTAL	Higher efficiency equipment	2,117	Old or less efficient equipment	2,389	20	1,880	$1,532	$0	$7,197	21%	2.6	2.1	272	0	0	1	1	97%
CRE Boilers	Existing Boiler Efficiency	2,117	Boiler of lower efficiency	2,389	20	1,880	$1,532	$7,848	$7,197	21%	2.6	2.1	272	0	0	1	1	97%
CRE Custom - TOTAL	Improved equipment or process	0	Old or less efficient equipment											0	0	2	2	
CRE EMS	Install EMS	3,254	No EMS	3,648	10	1,000	$769	$0	$16,920	5%	4.3	4.1	394	0	0	1	1	93%
CRE Custom Custom	Improved equipment or process	16,301	Old or less efficient equipment	17,159	18	0	$1,434	$0	$4,498	32%	0.5	0.4	858	0	0	1	1	93%
CRE Recommissioning - TOTAL	Optimized Building Systems	58,041	Existing Building Systems - Not Tuned or Optimized	60,240	7	0	$4,398	$0	$28,527	15%	1.3	1.1	2,199	0	0	1	1	100%
Preliminary Report							**$131**		**$263**					**5**	**5**	**10**	**10**	**88%**
Investigative Study							**$733**		**$1,467**					**0**	**0**	**0**	**0**	**88%**
Boiler Efficiency		Dkt/yr		Dkt/yr						%	Years	Years	Dkt/yr					
New Boiler																		
Hot Water Boiler - Non-condensing 175 MBtuh	85% Efficient	310	80% Efficient	329	20	0	$70	$3,000	$500	14%	2.6	2.2	19	10	10	10	10	97%
Hot Water Boiler - Non-condensing 500 MBtuh	85% Efficient	885	80% Efficient	940	20	0	$200	$5,000	$4,000	5%	7.2	6.9	55	5	5	5	5	97%
Hot Water Boiler - Non-condensing 1MMBtuh	85% Efficient Boiler	1,770	80% Efficient Boiler	1,880	20	0	$400	$7,300	$4,400	9%	4.0	3.6	111	10	10	10	10	97%
Hot Water Boiler - Non-condensing 2 MMBtuh	85% Efficient Boiler	3,540	80% Efficient Boiler	3,761	20	0	$800	$12,000	$5,000	16%	2.3	1.9	221	5	5	5	5	97%
Hot Water Boiler - Non-condensing 4 MMBtuh	85% Efficient Boiler	7,079	80% Efficient Boiler	7,522	20	0	$1,600	$24,000	$10,000	16%	2.3	1.9	442	1	1	1	1	97%
Hot Water Boiler - Non-condensing 6 MMBtuh	85% Efficient Boiler	10,619	80% Efficient Boiler	11,283	20	0	$2,400	$36,000	$15,000	16%	2.3	1.9	664	1	1	1	1	97%
Hot Water Boiler - Non-condensing 8, MMBtuh	85% Efficient Boiler	14,159	80% Efficient Boiler	15,044	20	0	$3,200	$48,000	$20,000	16%	2.3	1.9	885	1	1	1	1	97%

Forecasted Natural Gas Technical Assumptions

Type of Measure	High Efficiency Product Description / Rating	Dkt/yr H.E. consumption	Baselilne Product Description / Rating	Dkt/yr Baseline consumption	Life of Product (years)	Average Hours of Operation per yr	Average Rebate Amount	Average Baseline Product Cost	Average Incremental Cost of Efficient Product	Rebate as a % of Incremental Cost	Incremtal Cost Payback Period w/o Rebate	Incremtal Cost Payback Period w Rebate	Average Annual Customer Dkt Savings	2009 Participants	2009 Units	2010 Participants	2010 Units	NTG
										Self Calculating Fields								
Hot Water Boiler - Condensing 175 MBtuh	92% Efficient Boiler	274	80% Efficient Boiler	329	20	0	$350	$3,000	$1,600	22%	2.9	2.3	55	18	18	18	18	97%
Hot Water Boiler - Condensing 500 MBtuh	92% Efficient Boiler	782	80% Efficient Boiler	940	20	0	$1,000	$5,000	$6,200	16%	3.9	3.3	158	20	20	20	20	97%
Hot Water Boiler - Condensing 1 MMBtuh	92% Efficient Boiler	1,564	80% Efficient Boiler	1,880	20	0	$2,000	$7,300	$7,700	26%	2.4	1.8	317	20	20	20	20	97%
Hot Water Boiler - Condensing 2 MMBtuh	92% Efficient Boiler	3,128	80% Efficient Boiler	3,761	20	0	$4,000	$12,000	$14,500	28%	2.3	1.7	633	10	10	10	10	97%
Hot Water Boiler - Condensing 4 MMBtuh	92% Efficient Boiler	6,255	80% Efficient Boiler	7,522	20	0	$8,000	$24,000	$29,000	28%	2.3	1.7	1,267	1	1	1	1	97%
Hot Water Boiler - Condensing 6 MMBtuh	92% Efficient Boiler	9,383	80% Efficient Boiler	11,283	20	0	$12,000	$36,000	$43,500	28%	2.3	1.7	1,900	1	1	1	1	97%
Hot Water Boiler - Condensing 8 MMButh	92% Efficient Boiler	12,511	80% Efficient Boiler	15,044	20	0	$16,000	$48,000	$58,000	28%	2.3	1.7	2,533	1	1	1	1	97%
Custom Boiler - High Pressure Steam assumed 1-HP steam boiler at 80% eff, 20 MMButh	83% Efficient Boiler	36,250	80% Efficient Boiler	37,609	20	0	$1,691	$0	$34,436	5%	2.5	2.4	1,359	1	1	1	1	97%
Boiler Tune up																		
C&I Gas Boiler - Tune-Up assumed a 1-HW boiler at 80% eff, 175 MBtuh	Boiler Tune-up - 2% additive improvement in efficiency; Boiler now at 80% efficiency	329	Existing boiler at 78% efficiency	338	2	0	$250	$0	$1,000	25%	11.9	8.9	8	13	26	13	26	97%
C&I Gas Boiler - Tune-Up assumed a 1-HW boiler at 80% eff, 500 MBtuh	Boiler Tune-up - 2% additive improvement in efficiency; Boiler now at 80% efficiency	940	Existing boiler at 78% efficiency	964	2	0	$250	$0	$1,000	25%	4.1	3.1	24	15	30	15	30	97%
C&I Gas Boiler - Tune-Up assumed a 1-HW boiler at 80% eff, 1 MMButh	Boiler Tune-up - 2% additive improvement in efficiency; Boiler now at 80% efficiency	1,880	Existing boiler at 78% efficiency	1,929	2	0	$250	$0	$1,000	25%	2.1	1.6	48	6	12	6	12	97%
C&I Gas Boiler - Tune-Up assumed a 1-HW boiler at 80% eff, 2 MMBtuh	Boiler Tune-up - 2% additive improvement in efficiency; Boiler now at 80% efficiency	3,761	Existing boiler at 78% efficiency	3,857	2	0	$250	$0	$1,000	25%	1.0	0.8	96	5	10	5	10	97%

Forecasted Natural Gas Technical Assumptions

Type of Measure	High Efficiency Product Description / Rating	Dkt/yr H.E. consumption	Baseline Product Description / Rating	Dkt/yr Baseline consumption	Life of Product (years)	Average Hours of Operation per yr	Average Rebate Amount	Average Baseline Product Cost	Average Incremental Cost of Efficient Product	Rebate as a % of Incremental Cost	Incremtal Cost Payback Period w/o Rebate	Incremtal Cost Payback Period w Rebate	Average Annual Customer Dkt Savings	2009 Participants	2009 Units	2010 Participants	2010 Units	NTG
										Self Calculating Fields								
Outdoor Air Reset																		
C&I Gas Boiler - Outdoor Air Reset assumed a 1-HW boiler at 80% eff, 175 Mbtuh	83% Efficient Boiler	317	80% Efficient existing boiler	329	20	0	$250	$0	$1,000	25%	8.4	6.3	12	0	5	0	5	97%
C&I Gas Boiler - Outdoor Air Reset assumed a 1-HW boiler at 80% eff, 500 Mbtuh	83% Efficient Boiler	906	80% Efficient existing boiler	940	20	0	$250	$0	$1,000	25%	2.9	2.2	34	0	10	0	10	97%
C&I Gas Boiler - Outdoor Air Reset assumed a 1-HW boiler at 80% eff, 1 MMButh	83% Efficient Boiler	1,812	80% Efficient existing boiler	1,880	20	0	$250	$0	$1,000	25%	1.5	1.1	68	0	5	0	5	97%
C&I Gas Boiler - Outdoor Air Reset assumed a 1-HW boiler at 80% eff, 2 MMBtuh	83% Efficient Boiler	3,625	80% Efficient existing boiler	3,761	20	0	$250	$0	$1,000	25%	0.7	0.6	136	0	1	0	1	97%
Stack Dampers																		
C&I Gas Boiler - Stack Dampers assumed a 1-HW boiler at 80% eff, 175 Mbtuh	81% Efficient Boiler	325	80% Efficient existing boiler	329	20	0	$125	$0	$500	25%	12.3	9.2	4	0	5	0	5	97%
C&I Gas Boiler - Stack Dampers assumed a 1-HW boiler at 80% eff, 500 Mbtuh	81% Efficient Boiler	929	80% Efficient existing boiler	940	20	0	$125	$0	$500	25%	4.3	3.2	12	0	1	0	1	97%
C&I Gas Boiler - Stack Dampers assumed a 1-HW boiler at 80% eff, 1 MMButh	81% Efficient Boiler	1,857	80% Efficient existing boiler	1,880	20	0	$250	$0	$1,000	25%	4.3	3.2	23	0	1	0	1	97%
C&I Gas Boiler - Stack Dampers assumed a 1-HW boiler at 80% eff, 2 MMBtuh	81% Efficient Boiler	3,714	80% Efficient existing boiler	3,761	20	0	$250	$0	$1,000	25%	2.2	1.6	46	0	1	0	1	97%
Modulating Burner Controls																		
C&I Gas Boiler - Modulating Burner Controls, >=5 to 1 turn down assumed a 1-HW boiler at 80% eff, 175	83% Efficient Boiler	317	80% Efficient existing boiler	329	20	0	$952	$0	$3,808	25%	32.0	24.0	12	0	3	0	3	97%
C&I Gas Boiler - Modulating Burner Controls, >=5 to 1 turn down assumed a 1-HW boiler at 80% eff, 500	83% Efficient Boiler	906	80% Efficient existing boiler	940	20	0	$952	$0	$3,808	25%	11.2	8.4	34	0	2	0	2	97%
C&I Gas Boiler - Modulating Burner Controls, >=5 to 1 turn down assumed a 1-HW boiler at 80% eff, 1	83% Efficient Boiler	1,812	80% Efficient existing boiler	1,880	20	0	$2,106	$0	$8,422	25%	12.4	9.3	68	0	1	0	1	97%
C&I Gas Boiler - Modulating Burner Controls, >=5 to 1 turn down assumed a 1-HW boiler at 80% eff, 2	83% Efficient Boiler	3,625	80% Efficient existing boiler	3,761	20	0	$2,106	$0	$8,422	25%	6.2	4.6	136	0	1	0	1	97%

Forecasted Natural Gas Technical Assumptions

Type of Measure	High Efficiency Product Description / Rating	Dkt/yr H.E. consumption	Baseline Product Description / Rating	Dkt/yr Baseline consumption	Life of Product (years)	Average Hours of Operation per yr	Average Rebate Amount	Average Baseline Product Cost	Average Incremental Cost of Efficient Product	Rebate as a % of Incremental Cost	Incremtal Cost Payback Period w/o Rebate	Incremtal Cost Payback Period w Rebate	Average Annual Customer Dkt Savings	2009 Participants	2009 Units	2010 Participants	2010 Units	NTG
											Self Calculating Fields							
O2 Trim Control																		
C&I Gas Boiler - O2 Trim Control assumed a 1-HW boiler at 80% eff, 175 Mbtuh	82% Efficient Boiler	321	80% Efficient existing boiler	329	20	0	$3,875	$0	$15,500	25%	193.1	144.8	8	0	1	0	1	97%
C&I Gas Boiler - O2 Trim Control assumed a 1-HW boiler at 80% eff, 500 Mbtuh	82% Efficient Boiler	917	80% Efficient existing boiler	940	20	0	$3,875	$0	$15,500	25%	67.6	50.7	23	0	1	0	1	97%
C&I Gas Boiler - O2 Trim Control assumed a 1-HW boiler at 80% eff, 1	82% Efficient Boiler	1,835	80% Efficient existing boiler	1,880	20	0	$3,875	$0	$15,500	25%	33.8	25.3	46	0	1	0	1	97%
C&I Gas Boiler - O2 Trim Control assumed a 1-HW boiler at 80% eff, 2	82% Efficient Boiler	3,669	80% Efficient existing boiler	3,761	20	0	$3,875	$0	$15,500	25%	16.9	12.7	92	0	1	0	1	97%
Steam Traps																		
C&I Gas Boiler - Steam Traps - Low Pressure - average of 10 and 15 PSI	New Steam Traps	2,441	Existing Boiler, malfunctioning steam traps	2,481	10	0	$50	$0	$200	25%	0.5	0.4	40	0	1	0	1	97%
C&I Gas Boiler - Steam Traps - High Pressure - average of 50 PSI and 65 PSI	New Steam Traps	2,392	Existing Boiler, malfunctioning steam traps	2,481	4	0	$50	$0	$200	25%	0.2	0.2	89	0	1	0	1	97%
Boiler Efficiency Studies							**$3,000**		**$6,000**					**2**	**2**	**2**	**2**	
Furnace Efficiency		**Dkt/yr**		**Dkt/yr**						**%**	**Years**	**Years**	**Dkt/yr**					
Furmaces (avg size-90,000 Btu/h)	93% Efficient Furnace	197	80% Efficient Furnace	258	15	2,864	$94	$668	$826	11%	1.4	1.2	61	50	90	50	90	77%
Custom Efficiency		**Dkt/yr**		**Dkt/yr**						**%**	**Years**	**Years**	**Dkt/yr**					
Average Project	Varies by project	19,689	Varies by project	20,725	18	0	$7,254	$0	$34,436	21%	3.3	2.6	1,036	14	14	14	14	93%
Energy Management Systems		**Dkt/yr**		**Dkt/yr**						**%**	**Years**	**Years**	**Dkt/yr**					
Average Project	Adding EMS system to Existing building	9,173	No or very old EMS system	9,656	7	0	$3,380	$0	$8,463	40%	1.8	1.1	483	14	14	14	14	93%
Recommissioning		**Dkt/yr**		**Dkt/yr**						**%**	**Years**	**Years**	**Dkt/yr**					
Recommissioning - Studies	-				7		$0	$0	$0				0	7	7	7	7	100%
Recommissioning - Implementation	Optimized Building Systems	58,041	Existing Building System - Not Tuned or Optimized	60,240	7		$15,391	$0	$28,527	54%	1.3	0.6	2,199	1	1	1	1	100%
RESIDENTIAL SEGMENT																		
Energy Efficient Showerhead		**Dkt/yr**		**Dkt/yr**						**%**	**Years**	**Years**	**Dkt/yr**					
Energy Efficient Showerhead	2.0 GPM	4	2.5 GPM federal minimum efficiency	5	10	42	$5	$0	$5	100%	0.4	0.0	1	20000	20000	22950	22950	70%

Forecasted Natural Gas Technical Assumptions

Type of Measure	High Efficiency Product Description / Rating	Dkt/yr H.E. consumption	Baseline Product Description / Rating	Dkt/yr Baseline consumption	Life of Product (years)	Average Hours of Operation per yr	Average Rebate Amount	Average Baseline Product Cost	Average Incremental Cost of Efficient Product	Rebate as a % of Incremental Cost	Incremtal Cost Payback Period w/o Rebate	Incremtal Cost Payback Period w Rebate	Average Annual Customer Dkt Savings	2009 Participants	2009 Units	2010 Participants	2010 Units	NTG
										Self Calculating Fields								
School Education Kit		**Dkt/yr**		**Dkt/yr**						**%**	**Years**	**Years**	**Dkt/yr**					
Living Wise Kit-Shower heads	Low Flow Shower head - 2.0 GPM	4	Federal Minimum Standard flow rate 2.5 GPM	6	6	55	$12	$0	$12	100%	0.4	0.0	3	3300	6600	3650	7300	70%
Living Wise Kit-Faucet Aerators	1.5 GPM flow rate aerator	1	Federal Minimum Standard flow rate 2.2 GPM	1	5	16	$12	$0	$12	100%	1.7	0.0	1	3300	6600	3650	7300	70%
Water Heating Rebate										**%**	**Years**	**Years**	**Dkt/yr**					
0.62 EF Hot Water Heater	0.62 EF Hot Water Heater Energy Star Standard	19	for 40 gallon tank .59 EF is IECC code	20	15	463	$40	$640	$55	73%	4.3	1.2	1	963	963	1348	1348	90%
0.65 EF Hot Water Heater	0.65 EF Hot Water Heater	18	for 40 gallon tank .59 EF is IECC code	20	15	463	$60	$640	$175	34%	7.1	4.7	2	252	252	353	353	90%
0.67 EF Hot Water Heater	0.67 EF Hot Water Heater Energy Star Standard in 2010	17	for 40 gallon tank .59 EF is IECC code	20	15	463	$80	$640	$230	35%	7.2	4.7	3	25	25	35	35	90%
0.82 EF Tankless Hot Water Heater	0.82 EF Tankless Hot Water Heater Energy Star Standard	14	for 40 gallon tank .59 EF is IECC code	20	20	463	$100	$640	$750	13%	10.6	9.2	6	10	10	14	14	90%
Heating System Rebate		**Dkt/yr**		**Dkt/yr**						**%**	**Years**	**Years**	**Dkt/yr**					
Furnace AFUE 78 to 92	92 AFUE ENERGY STAR	55	78 AFUE is Federal Standard baseline efficiency for gas furnaces	64	18	2,126	$80	$770	$450	18%	3.8	3.1	10	2115	2115	3055	3055	77%
Furnace AFUE 78 to 94	94 AFUE ENERGY STAR	54	78 AFUE is Federal Standard baseline efficiency for gas furnaces	64	18	2,126	$120	$770	$505	24%	3.8	2.9	11	2340	2340	3380	3380	77%
New 84% boiler	84 AFUE High Efficiency Unit	61	80 AFUE is federal baseline efficiency for boilers	64	18	2,126	$120	$2,520	$440	27%	12.2	8.9	3	45	45	65	65	77%
Insulation Rebate		**Dkt/yr**		**Dkt/yr**						**%**	**Years**	**Years**	**Dkt/yr**					
Attic insulation & bypass sealing (R-19 to R-40)	R-40 Insulation or higher	79	average home estimated to have R-19 existing based on study	85	20	2,126	$118	$0	$588	20%	8.3	6.6	6	1008	1500	1008	1500	89%
Air sealing & weather-stripping	25% reduction in air changes per hour - 0.45 ACH	71	EnergyGauge Default 0.60 ACH	79	10	2,126	$54	$0	$272	20%	3.1	2.5	7	22	32	22	32	89%
Wall insulation; sub-siding or cavity	R-11 insulation	85	Baseline assumes R-0 in wall cavities as existing level	117	20	2,126	$300	$0	$2,080	14%	5.4	4.6	32	470	700	470	700	89%

Forecasted Natural Gas Technical Assumptions

Type of Measure	High Efficiency Product Description / Rating	Dkt/yr H.E. consumption	Baseline Product Description / Rating	Dkt/yr Baseline consumption	Life of Product (years)	Average Hours of Operation per yr	Average Rebate Amount	Average Baseline Product Cost	Average Incremental Cost of Efficient Product	Rebate as a % of Incremental Cost	Incremtal Cost Payback Period w/o Rebate	Incremtal Cost Payback Period w Rebate	Average Annual Customer Dkt Savings	2009 Participants	2009 Units	2010 Participants	2010 Units	NTG
										Self Calculating Fields								
Home Performance with ENERGY STAR		**Dkt/yr**		**Dkt/yr**						**%**	**Years**	**Years**	**Dkt/yr**					
Attic insulation & bypass sealing (Required)	Addition of attic insulation to R-40	79	R-19 average baseline existing level of insulation based on market study	85	20	2,126	$150	$0	$588	26%	8.3	6.2	6	76	300	253	1000	94%
Air sealing & weather-stripping (Required)	25% reduction in ACH - 0.60 to 0.45 ACH	71	Default ACH for an existing Home in EnergyGauge has 0.60 ACH	79	10	2,126	$100	$0	$272	37%	3.1	1.9	7	76	300	253	1000	94%
Wall insulation; sub-siding or cavity	R-11 insulation in wall cavity (assuming retrofit wall is 2x4 construction R-13 is max that could fit, given existing wall with interior discrepancies, R-11 is assumed actual level)	71	For this measure the baseline must have no existing wall cavity insulation	104	20	2,126	$250	$0	$2,150	12%	5.5	4.9	32	31	122	103	405	94%
Setback thermostat	Energy Star Programable thermostat (assume 1 degree set back during heating, and 1 degree increase during cooling)	68	standard programable thermostat - not energy star	71	5	2,808	$10	$0	$50	20%	1.2	0.9	4	65	257	217	857	94%
New HE furnace 92 AFUE	Energy Star recommend 92 AFUE	63	78 AFUE is Federal Standard baseline efficiency for gas furnaces	71	18	2,126	$80	$770	$390	21%	4.2	3.3	8	23	90	76	301	94%
New HE furnace 94 AFUE	94 AFUE	62	78 AFUE is Federal Standard baseline efficiency for gas furnaces	71	18	2,126	$120	$770	$440	27%	4.2	3.0	9	13	52	44	174	94%
Tankless hot water heater 82%	0.82 EF Tankless Hot Water Heater Energy Star Standard	65	for 40 gallon tank .59 EF is IECC code	71	20	95	$100	$640	$750	13%	10.6	9.2	6	6	24	21	81	94%
Power vented hot water heater	0.65 EF Hot Water Heater	69	for 40 gallon tank .59 EF is IECC code	71	15	463	$60	$640	$175	34%	6.9	4.6	2	10	38	32	127	94%

Forecasted Natural Gas Technical Assumptions

Type of Measure	High Efficiency Product Description / Rating	Dkt/yr H.E. consumption	Baseline Product Description / Rating	Dkt/yr Baseline consumption	Life of Product (years)	Average Hours of Operation per yr	Average Rebate Amount	Average Baseline Product Cost	Average Incremental Cost of Efficient Product	Rebate as a % of Incremental Cost	Incremtal Cost Payback Period w/o Rebate	Incremtal Cost Payback Period w Rebate	Average Annual Customer Dkt Savings	2009 Participants	2009 Units	2010 Participants	2010 Units	NTG
											Self Calculating Fields							
ENERGY STAR New Homes		**Dkt/yr**		**Dkt/yr**						**%**	**Years**	**Years**	**Dkt/yr**					
Furnace AFUE 78 to 92	Energy Star recommend 92 AFUE	81	78 AFUE is Federal Standard baseline efficiency for gas furnaces	91	18	2,126	$196	$770	$331	59%	2.9	1.2	10	550	2200	800	3200	64%
Ceiling Insulation R-38 to R-44	R-44 Ceiling Insulation	90	R-38 Ceiling Insulation is minimum required by IECC 2006	91	20	2,126	$14	$0	$206	7%	24.5	22.8	1	550	2200	800	3200	64%
ACH Reduction	4.6 ACH	78	7.08 ACH defualt ACH as specified by IECC 2006	91	10	2,126	$251	$0	$550	46%	3.7	2.0	12	550	2200	800	3200	64%
Water Heater	Energy Star recommended 0.62 Energy factor	89	0.57 Energy Factor as dictated by DOE code and IECC 2006	91	15	370	$39	$675	$55	71%	2.4	0.7	2	550	2200	800	3200	64%
LOW-INCOME SEGMENT																		
Single-Family Weatherization		**Dkt/yr**		**Dkt/yr**						**%**	**Years**	**Years**	**Dkt/yr**					
Ceiling R-11 to R-38	DOE recommend level of insulation for CO Climate Zones R-38	82	estimated existing level	90	20	2,126	$715	$0	$715	100%	7.5	0.0	8	712	1958	764	2103	96%
Wall R-3 to R-11	Assuming 2x4 construction, up to R-13 insulation can fit in wall cavity	80	estimated existing level	99	20	2,126	$670	$0	$670	100%	3.0	0.0	19	304	837	327	899	96%
Furnace AFUE 78 to 92	Energy Star recommend 92 AFUE	79	70 AFUE is measured existing level for retrofit, 78 is min. code standard for replacement	90	18	2,126	$623	$660	$623	100%	4.7	0.0	11	264	726	283	780	96%
Single pane window plus storm	Addition of storm windows	79	estimated existing level	90	20	2,126	$1,225	$0	$1,225	100%	9.4	0.0	11	118	326	127	350	96%
Crawl space wall R-0 to 19	Addition of R-19 batts to crawlspace walls	88	estimated existing level	90	20	2,126	$175	$0	$175	100%	5.8	0.0	3	346	951	371	1021	96%
ACH leakage 0.8 to 0.6	25% reduction in leakage	87	estimated existing level	90	10	2,126	$272	$0	$272	100%	6.7	0.0	3	1071	2946	1150	3164	96%
Duct leaks from 25% to 18.75%	25% reduction in leakage	88	estimated existing level	90	15	2,126	$325	$0	$325	100%	11.3	0.0	2	77	211	82	227	96%
Water heater EF to .62	Energy Star standard is currently 62 (it is set to move to 0.67 by 2010)	89	for 40 gallon tank .59 EF is IECC code	90	15	463	$55	$640	$55	100%	4.6	0.0	1	55	150	59	161	96%

Forecasted Natural Gas Technical Assumptions

Type of Measure	High Efficiency Product Description / Rating	Dkt/yr H.E. consumption	Baseline Product Description / Rating	Dkt/yr Baseline consumption	Life of Product (years)	Average Hours of Operation per yr	Average Rebate Amount	Average Baseline Product Cost	Average Incremental Cost of Efficient Product	Rebate as a % of Incremental Cost	Incremtal Cost Payback Period w/o Rebate	Incremtal Cost Payback Period w Rebate	Average Annual Customer Dkt Savings	2009 Participants	2009 Units	2010 Participants	2010 Units	NTG
										Self Calculating Fields								
Easy Savings Energy Kit		**Dkt/yr**		**Dkt/yr**						**%**	**Years**	**Years**	**Dkt/yr**					
Energy Savings Kit - Low Flow Shower head	Low Flow Shower head - 2.0 GPM	6	Federal Minimum Standard flow rate 2.5 GPM	8	6	84	$10	$0	$10	100%	0.4	0.0	2	10000	20000	11000	22000	70%
Energy Savings Kit-Faucet Aerators	1.5 GPM flow rate aerator	1	Federal Minimum Standard flow rate 2.2 GPM	1	5	16	$10	$0	$10	100%	1.5	0.0	1	10000	20000	11000	22000	70%
Multi-Family Weatherization		**Dkt/yr**		**Dkt/yr**						**%**	**Years**	**Years**	**Dkt/yr**					
Ceiling R-11 to R-38 (AC w/Gas heat) - Not Modeled used Arkansas Deemed Savings, most northern weather zone	Upgrade ceiling insulation levels to DOE recommended levels for Weather Zone	82	R11	90	20	2,126	$715	$0	$715	100%	7.5	0.0	8	95	173	102	186	90%
Wall R-3 to R-11	Upgrade wall insulation levels to DOE recommended levels for Weather Zone	80	R3 Empty cavity	99	20	2,126	$560	$0	$560	100%	2.5	0.0	19	81	147	87	158	90%
Boiler Efficiency Burner Modifications	Install excess air trim control to produce between 2 and 5% efficiency improvement.	79	Boiler with 50% to 100% excess air	90	15	2,126	$2,751	$0	$2,751	100%	20.7	0.0	11	25	45	27	48	90%
Single pane window plus storm	Add storm window to single paned glass	79	Sngl pane	90	20	2,126	$816	$0	$816	100%	6.2	0.0	11	31	57	34	61	90%
ACH leakage 0.8 to 0.6	Reduce air infiltration .6 ACH	87	.8 ACH	90	10	2,126	$272	$0	$272	100%	6.7	0.0	3	285	518	306	556	90%
Non-Profit Energy Efficiency Initiative		**Dkt/yr**		**Dkt/yr**						**%**	**Years**	**Years**	**Dkt/yr**					
Ceiling R-11 to R-38 (AC w/Gas heat) - Not Modeled used Arkansas Deemed Savings, most northern weather zone	Upgrade ceiling insulation levels to DOE recommended levels for Weather Zone	82	R 11	90	20	2,126	$715	$0	$715	100%	7.5	0.0	8	57	107	62	116	90%
Wall R-3 to R-11	Fill wall cavity with insulation	80	R 3 empty cavity	99	20	2,126	$560	$0	$560	100%	2.5	0.0	19	48	90	53	98	90%
Boiler Efficiency Burner Modifications	Install excess air trim control to produce between 2 and 5% efficiency improvement.	79	Boiler with 50% to 100% excess air	90	15	2,126	$2,751	$0	$2,751	100%	20.7	0.0	11	24	45	26	49	90%
Single pane window plus storm	Add storm window to single paned glass	79	single pane	90	20	2,126	$816	$0	$816	100%	6.2	0.0	11	19	36	21	39	90%
Reduce air infiltration	ACH leakage 0.8 to 0.6	87	ACH = .8	90	10	2,126	$272	$0	$272	100%	6.7	0.0	3	173	322	188	350	90%

Forecasted Natural Gas Technical Assumptions Reference Sources

BUSINESS SEGMENT	
Standard Offer	
Average Standard Offer Project - Gas	The average gas project came from MN Commercial Real Estate projects completed during 2005-2007. Customers and equipment providers or engineers provide data for the pre-approval application. Some projects involve pre- and post-project monitoring and verification. All applications must be pre-approved, prior to equipment purchase. Some customers purchase high efficient new equipment instead of standard equipment others buy new equipment and remove old, so Average Baseline Product Costs is a weighted average of both cases and Incremental is the added cost to achieve the higher efficiency.
BUSINESS NEW CONSTRUCTION - NEW PRODUCTS	
EDA: Basic Track	Assumptions from EDA-Custom Consulting results for MN and CO programs from 2006-2007 Avg incremental cost based on MN average of $51.54 /MCF of energy saved per year.
EDA: Enhanced Modeling Track	Assumptions from EDA-Custom Consulting results for MN and CO programs from 2006-2007 Avg incremental cost based on MN average of $51.54 /MCF of energy saved per year. Assume 55% additional savings from using Enhanced Modeling over Basic based on actuals from MN program
Prescriptive Rebates	Assumptions from EDA-Plan Review results for MN program from 2006-2007
Segment Efficiency	
Commercial Real Estate - TOTAL	This new program is built upon the premise that existing program offerings will be offered as a part of a study-driven package. Implementation rebates will mimic those of the existing programs, with the possibility of receiving up to 30% extra if a customer meets participation requirements. Estimated energy savings are based on those of the already existent programs; before and after scenarios based upon those savings being applied to the prototypical building participating in the study. The program rollup includes the rebates and costs associated with performing the studies which will identify the measures as well as the implementation-related costs and rebates. Hours of operation based on those used for the MN program.
CRE Prescriptive	
CRE Boilers	Inputs based upon the CO Boiler Efficiency Program. Baseline MCF: 2,389, Energy Eff MCF: 2,117
CRE EMS	Inputs based upon the CO EMS Program. Baseline MCF: 3,648, Energy Eff MCF: 3,254
CRE Custom	Inputs based upon MN Custom Efficiency Gas Program.
CRE Recommissioning	Inputs based upon those for the CO Recommisioning Program. Baseline consumption based upon DSManager load information for stereotypical building size of 205,000 ft2. Rebates and costs only reflect those associated with implementation.
CRE Studies	Study Costs are split with the Electric Program on the basis of 96.50% Electric, 3.50% Gas
Boiler Efficiency	
Boilers and Auxiliary Equipment (Tune-ups, Outdoor Air Reset, Stack Dampers, Modulating Burners, O2 Trim Control)	NTG estimated at 73%, and based on NTG from Business Cooling Program

Forecasted Natural Gas Technical Assumptions Reference Sources

	For 175,000 Btu/h hot water boilers: 20% of capacity used for space heating, 80% of capacity used for hot water. For other hot water boilers: 50% of capacity used for space heating, 50% of capacity used for hot water
	Boilers assumed to be oversized; max input capacity at 65% of nameplate
	*Condensing boiler efficiencies at part loads were taken from AERCO International Inc Thermal Efficiency curve for condensing boilers.
	Though the BTU input and output are affected by altitude, the efficiency stays the same,so the elevation effect is not considered.
	Rebates based on $400/MMBtu/h for non-condensing and $2,000/MMBtu/h for condensing
	For auxiliary equipment rebates, the estimated rebate amounts are based on a maximum payout of 25% of incremental costs
	For custom project - incremental cost estimated from MN Triennial
Steam Traps	Energy savings for steam traps were analyzed based on average steam pressures of : Low Pressure Steam - Average of 10 PSI and 15 PSI; High Pressure Steam - Average of 50 PSI and 60 PSI. Yearly operation of 6,000 hours. Average leaks from holes having sizes of 0.025 sq. in., 0.05 sq. in., 0.075 sq. in., 50% of steam loss to atmosphere, 50% steam loss to condensate. Leakage data from Energy Management Handbook, Wayne Turner. Energy Savings - Low Pressure Steam: 5 lb/hr x 6,000 hours = 30,000 lb/hr. 30,000 lb/hr x 1164 BTU/lb (at about 249.8 F and 15 psi) x 50% loss to atmosphere = 17.46 MMBTU. 30,000 lb/hr x (1164-200) BTU/lb x 50% loss = 14.46 MMBTU loss to condensate. Total MMBTU = 31.92, MCF savings at 80% efficiency = 39.9. High Pressure Steam: 11 lb/hr x 6,000 hr/yr = 66,000 lb/yr. 66,000 lb/hr x 1181 BTU/lb (at 307.3 F and 60 psi) x 50% loss to atmosphere = 38.97 MMBTU. 66,000 x (1181-200)BTU/lb x 50% loss to condensate = 32.37 MMBTU. Total MMBTU = 71.34. MCF savings at 80% efficiency = 89.18 MCF
Custom Efficiency	
CUSTOM EFFICIENCY	NTG = 73%, based on NTG evaluated by Summit Blue for electric Custom program
	This is an average of MN Gas Custom Efficiency projects from 2006-2008.
Energy Management Systems	
ENERGY MANAGEMENT SYSTEMS	NTG = 73%, based on NTG evaluated by Summit Blue for Custom Efficiency program
	The averages came from CO projects in 2006.
	This type of project could receive a rebate for Electric savings also, but this table only reflects the Gas part of the project. Also Payback in this table does not reflect savings from any energy or non-energy O&M. Payback will not match the official Costbens or Bencost Worksheets.
	Customer adds an EMS system so Average Baseline Product Costs would be $0, so all cost is Incremental. All cost data from actual projects. All rebates are at $2/MCF
Furnace Efficiency	
FURNACE EFFICIENCY	NTG estimated at 73%, and based on NTG for residential heating programs as small business and residential customers tend to respond the same to energy efficiency programs.
	Average of 90,000 BTU/hr and 93% efficiency for high-efficiency option in line with average from actual MN program 2007 rebates; Average incremental cost based on California DEER database of $9.71 per 1,000 Btu/h
	93% efficiency is an average of the 92 & 94 AUE efficiency available
	Annual operating hours based on 2005 ASHRAE Handbook Fundamentals Chapter 32, page 22 Table 7 Sample Annual Bin Data for Denver, CO
	Assume furnace is oversized by 15%; equivalent full-load operating hours = 2,864

Forecasted Natural Gas Technical Assumptions Reference Sources

	Space heating comes on at 62.5 deg F; % furnace load between 62.5 deg F and -2.5 deg F is linear with outside air temperature
Recommissioning	
RECOMMISSIONING	NTG = 83%, based on NTG evaluated by Summit Blue for electric Recommissioning program
	Averages from CO Projects from 2006-2007 used for assumptions. Since participation includes both those who implement in a given calendar year as well as all those customers who had studies performed in that calendar year, the actual number of participants is necessarily higher than the number of implementing participants. Since Study funding is provided as a Rebate, those costs, on the customer and utility side, needed to be considered as well. Rebates that might pertain to both fuels are evaluated on the basis of total costs and then rebate expenses are split between the electric and gas sides. In all cases, all savings are considered, rebates are restricted to 50% of implementation cost and rebates will not push the payback to less than 1 year.
RESIDENTIAL SEGMENT	
Showerheads	
Showerheads	Energy savings for the low flow shower head were based on an engineering calculation (see shower head calculation tab). Water savings were calculated to be 1,257 gallons annually. Baseline assumed current federal minimum standard 2.5 gpm changing to a 2.0 gpm shower head. The calculation of savings is per single shower head change assuming 1 shower per day in a home with a 40 gallon gas water heater. The non-energy savings are the savings associated with the 1,257 gallons of water savings estimated at $3.00 per 1000 gallons of water.
School Education Kit	
Living Wise Kit-Shower heads	The savings were calculated based on the retrofit of one shower head (see Kit-Shower head calcs tab). Savings were based on 1,657 gallons of water savings annually. Base case was a 2.5 gpm shower head replaced by a 2.0 gpm shower head. Savings also assume 1.32 showers a day based on Handbook of Water Use and Conservation (as provided by Denver Water Conservation) that 2.64 people live in a home, and assuming one shower each per day. Measure life is 6 years per California Measurement Advisory Committee (CALMAC) ProtocolsAdditional savings are calculated for water savings - $0.003 per gallon saved.
Living Wise Kit-Faucet Aerators	The savings were calculated based on the retrofit of one aerator (see Kit-Faucet Aerator calcs tab). Savings were based on 657 gallons of water savings annually. Base case was a 2.2 gpm (typical standard) aerator replaced by a 1.5 gpm shower aerator (as included in the kit). Additional savings are calculated for water savings - $0.003 per gallon saved. The measure life is 5 years per California Measurement Advisory Committee (CALMAC) Protocols.
Water Heating Rebate	
0.62 EF Hot Water Heater	Savings for the water heater are based on the assumption that federal standards are the baseline piece of equipment. Baseline is an Efficiency Factor (EF) 59 percent for a 40 gallon unit. The replacement model has an EF rating of 62 percent (in compliance with current Energy Star Standard). All savings were derived from EnergyGauge Modeling of Typical Residential Home in Denver. The tank's life is estimated at 15 years by the California Measurement Advisory Committee (CALMAC) Protocols, Appendix F, and the incremental cost is taken from market analysis of "big box" vendors. The average baseline cost is from RS MEANS Repair and Remodeling Cost Data 2007 for a 40 gallon gas water heater.
0.65 EF Hot Water Heater	Savings for the water heater are based on the assumption that federal standards are the baseline piece of equipment. Baseline is an Efficiency Factor (EF) 59 percent for a 40 gallon unit. The replacement model has an EF rating of 65 percent. All savings were derived from EnergyGauge Modeling of Typical Residential Home in Denver. The tank's life is estimated at 15 years by the California Measurement Advisory Committee (CALMAC) Protocols, Appendix F, and the incremental cost is taken from market analysis of "big box" vendors. The average baseline cost is from RS MEANS Repair and Remodeling Cost Data 2007 for a 40 gallon gas water heater.
0.67 EF Hot Water Heater	Savings for the water heater are based on the assumption that federal standards are the baseline piece of equipment. Baseline is an Efficiency Factor (EF) 59 percent for a 40 gallon unit. The replacement model has an EF rating of 67 percent (in compliance with what Energy Star Standards will move to in 2010). All savings were derived from EnergyGauge Modeling of Typical Residential Home in Denver. The tank's life is estimated at 15 years by the California Measurement Advisory Committee (CALMAC) Protocols, Appendix F, and the incremental cost is taken from market analysis of "big box" vendors. The average baseline cost is from RS MEANS Repair and Remodeling Cost Data 2007 for a 40 gallon gas water heater.
0.82 EF Hot Water Heater	Savings for the water heater are based on the assumption that federal standards are the baseline piece of equipment. Baseline is a storage tank with an Efficiency Factor (EF) 59 percent for a 40 gallon unit. The replacement model has an EF rating of 82 percent (in compliance with current Energy Star Standards for tankless hot water heaters). All savings were derived from EnergyGauge Modeling of Typical Residential Home in Denver. The tank's life is estimated at 15 years by the California Measurement Advisory Committee (CALMAC) Protocols, Appendix F, and the incremental cost is taken from market analysis of "big box" vendors. The average baseline cost is from RS MEANS Repair and Remodeling Cost Data 2007 for a 40 gallon gas water heater.
Heating System Rebate	

Forecasted Natural Gas Technical Assumptions Reference Sources

Furnace AFUE 78 to 92	Energy savings for the gas furnace were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics). The baseline furnace has an Annual Fuel Utilization Efficiency (AFUE)of 78, which is the federal minimum efficiency standard. The incremental cost of the high-efficiency furnace rated at an AFUE of 92 is $450(based on the California Energy Commission's Database for Energy Efficient Resources (DEER). http://www.energy.ca.gov/deer) and does not include labor or equipment rental fees as this measure is considered a replace on burnout. The average baseline product cost is based on the cost for a 60-75 MBH output gas furnace from RS MEANS Repair and Remodeling Cost Data 2007. The measure life of the furance source is: Draft Technical Support Document: Energy Conservation Standards for Residential Furnaces and Boilers, Efficiency Standards for Consumer Products: Residential Central Air Conditioners And Heat Pumps, Prepared for US DOE, September 2006
Furnace AFUE 78 to 94	Energy savings for the gas furnace were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics). The baseline furnace has an Annual Fuel Utilization Efficiency (AFUE)of 78, which is the federal minimum efficiency standard. The incremental cost of the high-efficiency furnace rated at an AFUE of 94 is $505 (based on the California Energy Commission's Database for Energy Efficient Resources (DEER). http://www.energy.ca.gov/deer) and does not include labor or equipment rental fees as this measure is considered a replace on burnout. The average baseline product cost is based on the cost for a 60-75 MBH output gas furnace from RS MEANS Repair and Remodeling Cost Data 2007. The measure life of the furance source is: Draft Technical Support Document: Energy Conservation Standards for Residential Furnaces and Boilers, Efficiency Standards for Consumer Products: Residential Central Air Conditioners And Heat Pumps, Prepared for US DOE, September 2006
New 84% boiler	Energy savings for the boiler were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics). The baseline boiler has an Annual Fuel Utilization Efficiency (AFUE)of 80, which is the federal minimum efficiency standard. The incremental cost of the high-efficiency boiler rated at an AFUE of 84 is $440 (based on the California Energy Commission's Database for Energy Efficient Resources (DEER). http://www.energy.ca.gov/deer) and does not include labor or equipment rental fees as this measure is considered a replace on burnout. The average baseline product cost is based boiler costs reported in RS MEANS Repair and Remodeling Cost Data 2007. The measure life of the furance source is: Draft Technical Support Document: Energy Conservation Standards for Residential Furnaces and Boilers, Efficiency Standards for Consumer Products: Residential Central Air Conditioners And Heat Pumps, Prepared for US DOE, September 2006
Insulation Rebate	
Attic insulation & bypass sealing	Energy savings for the attic insulation and bypass sealing were calculated form EnergyGauge modeling. The baseline home was designed based on the typical characteristics of the average home in the Denver area - 2 story, 3 bed 2 bath , 2000 square feet, R-19 ceiling, R-11 wall, gas fired furnace heating, central air conditioning etc (see below for more specfic info) The baseline home had an existing level of insulation in the attic of R-19, the change case had an elevated insulation level of R-40. The incremental cost of the insulation came from RSMeans Repair and Remodeling 2007 at a cost of $0.028 per squarefoot per increase in R-value. The measure life is 20 years as sourced from based on California Measurement Advisory Committee (CALMAC) Protocols, Appendix F (www.calmac.org/events/APX_F.pdf) with adjustments per Xcel's request.
Air sealing & weather-stripping	ACH = Air Changes per Hour; savings come from reducing the air infiltration through leaks, weatherstripping, holes etc. Air infiltration is measured as ACH. Energy savings for the air sealing and weather stripping improvements were calculated from EnergyGauge modeling. The baseline home was designed based on the typical characteristics of the average home in the Denver area - 2 story, 3 bed 2 bath , 2000 square feet, R-19 ceiling, R-11 wall, gas fired furnace heating, central air conditioning etc. (see below for more specfic info) The baseline home had an existing ACH natural of 0.60 and the change case had a 25% reduction to 0.45 ACH natural. The incremental cost was based on the Nation Energy Audit Tool (NEAT) and Frontier estimates. The measure life for the air sealing measure is 10 years based on California Measurement Advisory Committee (CALMAC) Protocols, Appendix F (www.calmac.org/events/APX_F.pdf).
Wall insulation; sub-siding or cavity	Energy savings for wall insulation were calculated form EnergyGauge modeling. The baseline home was designed based on the typical characteristics of the average home in the Denver area - 2 story, 3 bed 2 bath , 2000 square feet, R-19 ceiling, gas fired furnace heating, central air conditioning etc (see below for more specfic info) The baseline home had an existing level of insulation in the walls of R-0 for only this modeling case, to participate in the wall insulation measure, the home must have no existing wall cavity insulation to be eligable, the change case had an elevated insulation level of R-11. The incremental cost of the insulation came from RSMeans Repair and Remodeling 2007 at a cost of $0.028 per squarefoot per increase in R value. The measure life is 20 years as sourced from based on California Measurement Advisory Committee (CALMAC) Protocols, Appendix F (www.calmac.org/events/APX_F.pdf) with adjustments per Xcel's request.
Home Performance with ENERGY STAR	
Attic insulation & bypass sealing (Required)	Energy savings for the attic insulation and bypass sealing were calculated form EnergyGauge modeling. The baseline home was designed based on the typical characteristics of the average home in the Denver area - 2 story, 3 bed 2 bath , 2000 square feet, R-19 ceiling, R-11 wall, gas fired furnace heating, central air conditioning... (see home characteristics tab for more specfic info) The baseline home had an existing level of insulation in the attic of R-19, the change case had an elevated insulation level of R-40. The incremental cost of the insulation came from RSMeans Repair and Remodeling 2007 at a cost of $0.028 per squarefoot per increase in R-value. The measure life is 20 years as sourced from based on California Measurement Advisory Committee (CALMAC) Protocols, Appendix F (www.calmac.org/events/APX_F.pdf) with adjustments per Xcel's request.

Forecasted Natural Gas Technical Assumptions Reference Sources

Air sealing & weather-stripping (Required)	Energy savings for the air sealing and weather stripping were calculated from EnergyGauge modeling. The baseline home was designed based on the typical characteristics of the average home in the Denver area - 2 story, 3 bed 2 bath , 2000 square feet, R-19 ceiling, R-11 wall, gas fired furnace heating, central air conditioning... (see home characteristics tab for more specfic info) The baseline home had an existing ACH natural of 0.60 and the change case had a 25% reduction to 0.45 ACH natural. The incremental cost was based on the Nation Energy Audit Tool (NEAT) and Frontier estimates. The measure life for the air sealing measure is 10 years based on California Measurement Advisory Committee (CALMAC) Protocols, Appendix F (www.calmac.org/events/APX_F.pdf).
Wall insulation; sub-siding or cavity	Energy savings for wall insulation were calculated form EnergyGauge modeling. The baseline home was designed based on the typical characteristics of the average home in the Denver area - 2 story, 3 bed 2 bath , 2000 square feet, R-19 ceiling, gas fired furnace heating, central air conditioning... (see home characteristics tab for more specfic info) The baseline home had an existing level of insulation in the walls of R-0 for only this modeling case, to participate in the wall insulation measure, the home must have no existing wall cavity insulation to be eligable, the change case had an elevated insulation level of R-11. The incremental cost of the insulation came from RSMeans Repair and Remodeling 2007 at a cost of $0.028 per squarefoot per increase in R-value. The measure life is 20 years as sourced from based on California Measurement Advisory Committee (CALMAC) Protocols, Appendix F (www.calmac.org/events/APX_F.pdf) with adjustments per Xcel's request. The wall insulation measure savings account for the interactive effects of adding the mandatory ceiling insulation and air infilitration measures first.
Setback thermostat	Energy savings for the thermostat setback were calculated form EnergyGauge modeling. The baseline home was designed based on the typical characteristics of the average home in the Denver area - 2 story, 3 bed 2 bath , 2000 square feet, R-19 ceiling, R-11 wall, gas fired furnace heating, central air conditioning... (see home characteristics tab for more specfic info) The baseline home had a cooling thermostat setting of 78 degrees F, and a heating thermostat setting of 65 degrees F. The change case assumed a 1 degree set back during heating to 64 degrees F, and a 1 degree increase during cooling to 79 degrees F. The incremental cost of the insulation came from as estimate from Xcel of $50 for an Energy Star programmable thermostat over a regular programable thermostat. The measure life is estimated to be 5 years.
New HE furnace AFUE 92	Energy savings for the gas furnace were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area. he baseline home was designed based on the typical characteristics of the average home in the Denver area - 2 story, 3 bed 2 bath , 2000 square feet, R-19 ceiling, R-11 wall, gas fired furnace heating, central air conditioning... (see home characteristics tab for more specfic info) The baseline furnace has an Annual Fuel Utilization Efficiency (AFUE)of 78, which is the federal minimum efficiency standard. The incremental cost of the high-efficiency furnace rated at an AFUE of 92 is $450(based on the California Energy Commission's Database for Energy Efficient Resources (DEER). http://www.energy.ca.gov/deer) and does not include labor or equipment rental fees as this measure is considered a replace on burnout. The average baseline product cost is based on the cost for a 60-75 MBH output gas furnace from RS MEANS Repair and Remodeling Cost Data 2007. The high efficiency furnace measure savings account for the interactive effects of adding the mandatory ceiling insulation and air infilitration measures first.
New HE furnace AFUE 94	Energy savings for the gas furnace were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics). The baseline furnace has an Annual Fuel Utilization Efficiency (AFUE)of 78, which is the federal minimum efficiency standard. The incremental cost of the high-efficiency furnace rated at an AFUE of 94 is $505 (based on the California Energy Commission's Database for Energy Efficient Resources (DEER). http://www.energy.ca.gov/deer) and does not include labor or equipment rental fees as this measure is considered a replace on burnout. The average baseline product cost is based on the cost for a 60-75 MBH output gas furnace from RS MEANS Repair and Remodeling Cost Data 2007. The measure life of the furance source is: Draft Technical Support Document: Energy Conservation Standards for Residential Furnaces and Boilers, Efficiency Standards for Consumer Products: Residential Central Air Conditioners And Heat Pumps, Prepared for US DOE, September 2006
Tankless hot water heater 82%	Savings for the water heater are based on the assumption that federal standards are the baseline piece of equipment. Baseline is a storage tank with an Efficiency Factor (EF) 59 percent for a 40 gallon unit C. The replacement model has an EF rating of 82 percent (in compliance with current Energy Star Standards for tankless hot water heaters). All savings were derived from EnergyGauge Modeling of Typical Residential Home in Denver. The tank's life is estimated at 15 years by the California Measurement Advisory Committee (CALMAC) Protocols, Appendix F, and the incremental cost is taken from market analysis of "big box" vendors. The average baseline cost is from RS MEANS Repair and Remodeling Cost Data 2007 for a 40 gallon gas water heater.
Power vented hot water heater	Savings for the water heater are based on the assumption that federal standards are the baseline piece of equipment. Baseline is an Efficiency Factor (EF) 59 percent for a 40 gallon unit . The replacement model has an EF rating of 65 percent. All savings were derived from EnergyGauge Modeling of Typical Residential Home in Denver. The tank's life is estimated at 15 years by the California Measurement Advisory Committee (CALMAC) Protocols, Appendix F, and the incremental cost is taken from market analysis of "big box" vendors. The average baseline cost is from RS MEANS Repair and Remodeling Cost Data 2007 for a 40 gallon gas water heater.
ENERGY STAR New Homes	

Forecasted Natural Gas Technical Assumptions Reference Sources

Furnace AFUE 78 to 92	Energy savings for the gas furnace were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics). The baseline furnace has an Annual Fuel Utilization Efficiency (AFUE)of 78, which is the federal minimum efficiency standard. The incremental cost of the high-efficiency furnace rated at an AFUE of 92 is $331(based on the California Energy Commission's Database for Energy Efficient Resources (DEER). http://www.energy.ca.gov/deer) and does not include labor or equipment rental fees as this measure is considered a replace on burnout. The average baseline product cost is based on the cost for a 45-60 MBH output gas furnace from RS MEANS Repair and Remodeling Cost Data 2007. The measure life of the furance source is: Draft Technical Support Document: Energy Conservation Standards for Residential Furnaces and Boilers, Efficiency Standards for Consumer Products: Residential Central Air Conditioners And Heat Pumps, Prepared for US DOE, September 2006. The savings for this measure account for the interactive effects related to adding more then one measure at the same time to a home -which is the case for Energy Star New Homes. The savings dictated the w
Ceiling Insulation R-38 to R-44	Energy savings for the R-44 Ceiling insulation were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics). The baseline was the IECC 2006 code minimum of R-38. The incremental cost is based on RS MEANS 2007 of $0.028 per R per square foot including material and labor (some additional labor is required since more insulation is being installed). The measure life for the insulation is sourced at: based on California Measurement Advisory Committee (CALMAC) Protocols, Appendix F (www.calmac.org/events/APX_F.pdf) with adjustments per Xcel's request. The savings for this measure account for the interactive effects related to adding more then one measure at the same time to a home -which is the case for Energy Star New Homes. The savings dictated the weighted percentage of administrative dollars and rebate dollars.
ACH Reduction	ACH = Air Changes per Hour; reducing natural and induced infiltration of air saves energy. Energy savings for the ACH reduction were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics). The baseline was the IECC 2006 default of 0.00036 SLA (equivelent to 7.08 ACH). The incremental cost is estimated to be $200 for the addition of a mechanical ventilation required when ach(50) is below 0.35 (0.25 in this case), and an additional $350 for materials and labor involved with the additional sealing of the home. The measure life for is based on California Measurement Advisory Committee (CALMAC) Protocols, Appendix F (www.calmac.org/events/APX_F.pdf) . The savings for this measure account for the interactive effects related to adding more then one measure at the same time to a home - which is the case for Energy Star New Homes. The savings dictated the weighted percentage of administrative dollars and rebate dollars.
Water heater	Savings for the water heater are based on the assumption that federal standards are the baseline piece of equipment. Baseline is an Efficiency Factor (EF) 57 percent for a 50 gallon unit. The replacement model has an EF rating of 62 percent (in compliance with Energy Star Standard). All savings were derived from EnergyGauge Modeling of Typical Energy Star New Home in Denver (see characteristics below. The tank's life is estimated at 15 years by the California Measurement Advisory Committee (CALMAC) Protocols, Appendix F, and the incremental cost is taken from market analysis of "big box" vendors. The average baseline cost is from RS MEANS Repair and Remodeling Cost Data 2007 for a 50 gallon gas water heater. The savings for this measure account for the interactive effects related to adding more then one measure at the same time to a home - which is the case for Energy Star New Homes. The savings dictated the weighted percentage of administrative dollars and rebate dollars.
LOW INCOME SEGMENT	
Single-Family Weatherization	
Ceiling R-11 to R-38	The energy savings for all thermal envelope measures were calculated in the simulation model REM/Rate, using data from the Colorado Governor's Energy Office (GEO) to create the baseline house. It is a one-story, 961-square foot dwelling sitting on an uninsulated crawlspace, with nominal R-11 insulation in the ceiling, walls with R-3 insulation, and single pane windows. The savings for the ceiling insulation come from reducing heat loss by the addition of R-27 blown-in insulation (totals to R-38). The source for the life of all thermal envelope measures is the California Measurement Advisory Committee (CALMAC) Protocols, Appendix F (www.calmac.org/events/APX_F.pdf). For ceiling insulation the life is 20 years. The incremental cost of the insulation upgrade is $715; $415 for material and $300 for labor. The measure is treated as a retrofit. The source for material costs is RS Means, Repair and Remodeling Cost Data, 2007, at 28 cents per SqFt per R-value. The hours of operation were caculated to be the heating load hours per Manual J calculation - HLH = (heating degree days *24)/(65 - winter design temperature).
Wall R-3 to R-11	The energy savings for all thermal envelope measures were calculated in the simulation model REM/Rate, using data from the Colorado Governor's Energy Office to create the baseline house. It is a one-story, 961-square foot dwelling sitting on an uninsulated crawlspace, with nominal R-11 insulation in the ceiling, walls with R-0 cavity insulation (for the wall insulation measure the existing home must have no existing wall cavity insulation to participate), and single pane windows. The savings for the wall insulation come from reducing heat loss by blowing R-8 insulation into wall cavities..The source for the life of all thermal envelope measures is the California Measurement Advisory Committee (CALMAC) Protocols, Appendix F (www.calmac.org/events/APX_F.pdf). For ceiling insulation the life is 20 years. The incremental cost of the insulation upgrade is $715; $415 for material and $300 for labor. The measure is treated as a retrofit. The source for material costs is RS Means, Repair and Remodeling Cost Data, 2007, at 28 cents per SqFt per R-value and additional $365 for labor to install the retrofit. The hours of operation were caculated to be the heating load hours per Manual J calculation - HLH = (heating degree days *24)/(65 - winter design temperature).
Furnace AFUE 70/78 to 92	Energy savings for the gas furnace were calculated in REM/Rate using a baseline, replacement furnace rate at an Annual Fuel Utilization Efficiency (AFUE)of 78, which is the minimum efficiency standard. Underlying the replacement of a furnace is a replace on burnout. The incremental cost of the high-efficiency furnace rated at an AFUE of 92 is $623, based on the California Energy Commission's Database for Energy Efficient Resources (DEER). http://www.energy.ca.gov/deer. The average baseline product cost is based on the cost for a 75-100 MBH output gas furnace from RS MEANS Repair and Remodeling Cost Data 2007. The hours of operation were caculated to be the heating load hours per Manual J calculation - HLH = (heating degree days *24)/(65 - winter design temperature).

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Single pane window plus storm	As with the other thermal envelope measures, savings for the addition of storm windows were calculated in the simulation model REM/Rate, using data from the Colorado GEO. It is a one-story, 961-square foot dwelling sitting on an uninsulated crawlspace, with nominal R-11 insulation in the ceiling, walls with no insulation, and single pane windows. The source for the life of all thermal envelope measures is the California Measurement Advisory Committee (CALMAC) Protocols, Appendix F (www.calmac.org/events/APX_F.pdf). The expected life of storm windows is 20 years. The incremental cost of adding storm windows is $1,225 including the $850 cost of windows and $375 for labor. The measure is treated as a retrofit. The source for material costs is RS Means, Repair and Remodeling Cost Data, 2007, at $8.50 per SqFt. The hours of operation were caculated to be the heating load hours per Manual J calculation - HLH = (heating degree days *24)/(65 - winter design temperature).
Crawl space wall R-0 to 19	The energy savings for insulating the crawlspace are based on Energy Gauge modeling of adding R19 insulated skirting to the interior of the baseline home's crawlspace. The average lifetime of this measure is 25 years, based on the California Measurement Advisory Committee (CALMAC) Protocols, Appendix F (www.calmac.org/events/APX_F.pdf). The incremental cost is $175 comprising $110 for material and $65 for labor. Treated as a retrofit, crawlspace insulating data came from RS Means, Repair and Remodeling Cost Data, 2007, at $.075 (75 cents) per SqFt. The hours of operation were caculated to be the heating load hours per Manual J calculation - HLH = (heating degree days *24)/(65 - winter design temperature).
ACH leakage 0.8 to 0.6	ACH = Air Changes per Hour measured as equivalent air volume of the home changes each hour (or 0.8 ACH = 0.8 air exchanges per hour) savings comes from reducing the natural and induced air infiltration to the home. Energy savings by reducing air infiltration in the baseline dwelling derive from simulating in REM/Rate Modeling the reduction of air infiltration by 25 percent, based on historical data from GEO. The target is to reduce Air Changes per Hour (ACH) from .80 to .60. The life of the material is 10 years, based on the California Measurement Advisory Committee (CALMAC) Protocols, Appendix F (www.calmac.org/events/APX_F.pdf). The incremental cost of $272 includes both $47 for material and $225 for labor, based on data from the National Energy Audit Tool (NEAT) and Frontier Associates' experience. The hours of operation were caculated to be the heating load hours per Manual J calculation - HLH = (heating degree days *24)/(65 - winter design temperature).
Duct leaks from 25% to 18.75%	Energy savings from sealing ducts come from reducing the losses from heating ducts into unconditioned space by 25 percent, as modeled in REM/Rate. Sealing materials' life of 15 years is based on California Measurement Advisory Committee (CALMAC) Protocols, Appendix F (www.calmac.org/events/APX_F.pdf). The incremental cost is $325, $50 for material and $275 for labor, as found in the DEER database. The hours of operation were caculated to be the heating load hours per Manual J calculation - HLH = (heating degree days *24)/(65 - winter design temperature).
Water heater EF .59 to .62	Savings for the water heater were generated using REM/Rate simulation software. The federal minimum efficiency was the baseline- an Efficiency Factor (EF) 59 percent for a 40 gallon unit (as was the size generated by the model to meet the needs of the home). The replacement model has an EF rating of 62 percent (in compliance with current Energy Star Standard). The tank's life is estimated at 15 years by the California Measurement Advisory Committee (CALMAC) Protocols, Appendix F, and the incremental cost is taken from market analysis of "big box" vendors. The average baseline cost is from RS MEANS Repair and Remodeling Cost Data 2007 for a 40 gallon gas water heater. Hours of operation are based on the assumption of 40 gallon tank = annual consumption divided by 0.4 (40 gallon tank will have roughly 40 kbtu input).
Eligibility	Poverty guidelines for eligible families are at 185 percent of federal guidelines for the 48 contiguous states and the District of Columbia. Source is the Federal Register, Vol. 73, No. 15, January 23, 2008, pp. 3971–3972
Easy Savings Energy Kit	
Energy Savings Kit-Shower heads	The savings were calculated based on the retrofit of one shower head (see Kit-Shower head calcs tab). Savings were based on 2,511 gallons of water savings annually. Base case was a 2.5 gpm shower head replaced by a 2.0 gpm shower head. Savings also assume 2 showers a day even though there is only 1 shower head in the kit. Because this is a low income dwelling it was assumed that there would only be full bathroom in the home, therefore all showers would be taken in the retrofited shower. Measure life is 6 years per California Measurement Advisory Committee (CALMAC) ProtocolsAdditional savings are calculated for water savings - $0.003 per gallon saved.
Energy Savings Kit-Faucet Aerators	The savings were calculated based on the retrofit of one aerator (see Kit-Faucet Aerator calcs tab). Savings were based on 657 gallons of water savings annually. Base case was a 2.2 gpm (typical standard) aerator replaced by a 1.5 gpm shower aerator (as included in the kit). Additional savings are calculated for water savings - $0.003 per gallon saved. The measure life is 5 years per California Measurement Advisory Committee (CALMAC) Protocols.
Multi-Family Weatherization	
General Approach	The energy savings from the MF program will be determined by engineering audits for each facility conducted prior to selection and implementation of ECMs. The audit will be performed and signed by a Registered Engineer. The audit will identify ECOs for consideration, calculate the likely energy savings using specific on-site information and testing results, will estimate the costs for implementation and summarize the information in a report for further consideration. Program savings will include the results from ECMs actually implemented and the sum of savings for all facilities retrofitted under the program.
General Approach	The energy savings presented by the set of electric and gas ECMs above and on the Gas Tech Sheet are indicative of common ECMs found in multi-family facilities but the diversity of multi-family facilities makes it very difficult to identify all the appropriate opportunities. The set of ECMs presented here are used to demonstrate cost-effectiveness but not to limit the actual ECMs identified, analyzed and recommended by the Engineer. The applicant may apply for funding for appropriate ECMs for the facility and/or qualified occupants and will be funded within the parameters of the program rules.

Forecasted Natural Gas Technical Assumptions Reference Sources	
Ceiling R-11 to R-38 (AC w/Gas heat) - Not Modeled - used Arkansas Deemed Savings, most northern weather zone	Ceiling R-11 to R-38 (AC w/Gas Heat) Deemed savings were used to produce the savings for the ceiling measure. The closest weather zone for which deemed savings are available is for Arkansas's Zone 9. The Arkansas deemed saving tables were developed using building simulation modeling based on the EnergyGauge model. Therm, kW, and kWh values per square foot were applied to the estimated area for program participants. Since participating buildings are multi-story, only the top floor units (approximately one-half of units treated) were candidates for ceiling insulation. Savings factors for electric air conditioned/gas heating spaces were adopted for all envelope measures. Measure life is based on California Measurement Advisory Committee (CALMAC). Incremental costs were calculated using RS MEANS RR 2007 @ 0.028 per sq ft per R.
Wall R-3 to R-11	Wall R-3 to R-11 Deemed savings were used to produce the savings for the wall measure. The closest weather zone for which deemed savings are available is for Arkansas's Zone 9. The Arkansas deemed saving tables were developed using building simulation modeling based on the EnergyGauge model. Therm, kW, and kWh values per square foot of wall area were applied to the assumed treated area for program participants. The treated area was assumed net of common walls found in multifamily settings. Measure life is based on California Measurement Advisory Committee (CALMAC). Incremental cost is from RSMEANS RR 2007 @ 0.028 per sq ft per R and $365 for additional labor involved for retrofit.
Boiler Efficiency Burner Modifications	Boiler Efficiency Burner Modifications: Excess air trim control produces between 2 and 5% efficiency improvement. Estimated savings are based on reduced gas consumption for a boiler excess air improvement as described in the Boiler Efficiency Handbook, published by the Boiler Efficiency Institute: Pg 3-3, Item 3.2 in "Boiler Efficiency Improvement," Boiler Efficiency Institute, Dyer, F., and G. Maples, Auburn University, 1988. Per-unit base consumption for the boiler was derived from modeling used to produce savings estimates for single-family furnace efficiency projects. Measure life is based on Frontier experience. Incremental costs are based information from http://www.energysolutionscenter.org/boilerburner/Eff_Improve/Efficiency/Oxygen_Control.asp.
Single pane window plus storm	Single pane window plus storm storm window: Deemed savings for window treatment is based on the difference in baseline consumption per square foot of single vs. double-pane/glass with storm window according to Arkansas deemed savings values. Window area was assumed at 10% of floor area. Measure life is based on California Measurement Advisory Committee (CALMAC). Incremental Costs are from RSMEANS RR 2007 @8.50 per square foot.
Non-Profit Energy Efficiency Initiative	
General Approach	The energy savings from the MF program will be determined by engineering audits for each facility conducted prior to selection and implementation of ECMs. The audit will be performed and signed by a Registered Engineer. The audit will identify ECOs for consideration, calculate the likely energy savings using specific on-site information and testing results, will estimate the costs for implementation and summarize the information in a report for further consideration. Program savings will include the results from ECMs actually implemented and the sum of savings for all facilities retrofitted under the program.
General Approach	The energy savings presented by the set of electric and gas ECMs above and on the Gas Tech Sheet are indicative of common ECMs found in multi-family facilities but the diversity of multi-family facilities makes it very difficult to identify all the appropriate opportunities. The set of ECMs presented here are used to demonstrate cost-effectiveness but not to limit the actual ECMs identified, analyzed and recommended by the Engineer. The applicant may apply for funding for appropriate ECMs for the facility and/or qualified occupants and will be funded within the parameters of the program rules.
Ceiling R-11 to R-38 (AC w/Gas heat) - Not Modeled - used Arkansas Deemed Savings, most northern weather zone	Ceiling R-11 to R-38 (AC w/Gas Heat) Deemed savings were used to produce the savings for the ceiling measure. The closest weather zone for which deemed savings are available is for Arkansas's Zone 9. The Arkansas deemed saving tables were developed using building simulation modeling based on the EnergyGauge model. Therm, kW, and kWh values per square foot were applied to the estimated area for program participants. Since participating buildings are multi-story, only the top floor units (approximately one-half of units treated) were candidates for ceiling insulation. Savings factors for electric air conditioned/gas heating spaces were adopted for all envelope measures. Measure life is based on California Measurement Advisory Committee (CALMAC). Incremental costs were calculated using RS MEANS RR 2007 @ 0.028 per sq ft per R.
Wall R-3 to R-11	Wall R-3 to R-11 Deemed savings were used to produce the savings for the wall measure. The closest weather zone for which deemed savings are available is for Arkansas's Zone 9. The Arkansas deemed saving tables were developed using building simulation modeling based on the EnergyGauge model. Therm, kW, and kWh values per square foot of wall area were applied to the assumed treated area for program participants. The treated area was assumed net of common walls found in multifamily settings. Measure life is based on California Measurement Advisory Committee (CALMAC). Incremental cost is from RSMEANS RR 2007 @ 0.028 per sq ft per R and $365 for additional labor involved for retrofit.
Boiler Efficiency Burner Modifications	Boiler Efficiency Burner Modifications: Excess air trim control produces between 2 and 5% efficiency improvement. Estimated savings are based on reduced gas consumption for a boiler excess air improvement as described in the Boiler Efficiency Handbook, published by the Boiler Efficiency Institute: Pg 3-3, Item 3.2 in "Boiler Efficiency Improvement," Boiler Efficiency Institute, Dyer, F., and G. Maples, Auburn University, 1988. Per-unit base consumption for the boiler was derived from modeling used to produce savings estimates for single-family furnace efficiency projects. Measure life is based on Frontier experience. Incremental costs are based information from http://www.energysolutionscenter.org/boilerburner/Eff_Improve/Efficiency/Oxygen_Control.asp.
Single pane window plus storm	Single pane window plus storm storm window: Deemed savings for window treatment is based on the difference in baseline consumption per square foot of single vs. double-pane/glass with storm window according to Arkansas deemed savings values. Window area was assumed at 10% of floor area. Measure life is based on California Measurement Advisory Committee (CALMAC). Incremental Costs are from RSMEANS RR 2007 @8.50 per square foot.

Forecasted Natural Gas Technical Assumptions Reference Sources	
ACH leakage 0.8 to 0.6	ACH = Air Changes per Hour. Savings come from reducing the natural and induced infiltration of air. ACH leakage 0.8 to 0.6 Reduce air infiltration savings are based on Arkansas deemed savings values for Weather Zone 9. The deemed savings are based on reduction in CFMs measured at 50 Pascal house pressure. A conversion factor of 17 is used to equate air changes per hour (natural) to CFM50, or CFM50+17 = ACH-Natural. Once CFM50 values equating to 0.8 and 0.6 ACH were known, Arkansas deemed savings values for reduced air infiltration were applied. Measure life is based on California Measurement Advisory Committee (CALMAC). Incremental Costs are based on NEAT/Frontier experience.

This spreadsheet contains technical assumptions for the 2009/2010 Demand-Side Management Biennial Plan

The tabs in this file have been divided into three types:
All tabs with **Deemed** in the name describe how we will calculate actual conservation and net benefit.
All tabs with **Forecast** in the name detail how we came up with our estimates for program participation and performance for the filing period.
All tabs with **Ref** in the name are external references that support our assumptions.

Within each of the Deemed tabs, certain cells have been highlighted using the following convention:
Green - Energy savings calculation equation

Light Yellow - Assumed values that are inputs to energy savings equations

Light Blue - Assumed values that are not inputs to the energy savings equations (incremental cost, measure life, etc.) but are included in benefit cost tests.

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Boiler Efficiency Program

Prescriptive rebates will be offered for new Hot Water Boilers (Condensing and non-condensing), replacement of currently operating hot water boilers, steam traps. (commercial only), and various boiler improvements.

Algorithms:

New Boiler Savings (Gross Dth)	= (BTUH - (BTUH x EFFb/EFFh)) x Hrs / 1,000,000
Boiler Tune Up savings (Gross Dth)	= ((BTUH x EFFh/EFFb) - BTUH) x Hrs / 1,000,000
Outdoor Air Reset savings (Gross Dth)	= ((BTUH x EFFh/EFFb) - BTUH) x Hrs / 1,000,000
Stack Dampers savings (Gross Dth)	= ((BTUH x EFFh/EFFb) - BTUH) x Hrs / 1,000,000
Modulating Burner Controls savings (Gross Dth)	= (BTUH x EFFh/EFFb - BTUH) x Hrs / 1,000,000
O2 Trim Control savings (Gross Dth)	= (BTUH x EFFh/EFFb - BTUH) x Hrs / 1,000,000
Steam Traps savings (Gross Dth)	= Leak_Rate x Leak_Hours x BTU_per_Pound / EFFb
Net Dth	= Gross Dth x NTG

Variables:

BTUH	= Rated boiler Input BTUH nameplate data provided by customer on rebate form.
Hrs	= Sum of annual space heating and domestic hot water operational hours per year of the boiler. 1004 hours will be used for space heating and 876 hours will be used for domestic hot water. Forecast Ref Boiler Op Hours work sheet which includes an oversizing factor of 54%.
EFFb	=Efficiency of Baseline boiler. Refer Table 2 below
EFFh	= Efficiency for higher efficiency boiler. Refer Table 2 below.
Leak_Hours	= Annual hours boiler lines are pressurized = 6000 hours (Refer Forecast Boiler Ancil Equip Calcs)
Leak_Rate	=Leakage rate, pounds of steam per hour. High Pressure = 11, Low Pressure = 5 (Refer Forecast Boiler Ancil Equip Calcs)
BTU_Per_Pound	= 1164 BTU per pound for lost to atmosphere, 964 BTU per pound lost to condensate. Assume 50/50 mix = 1064 BTU per pound. (Refer Forecast Boiler Ancil Equip Calcs)

Measure Life	= Length of time the boiler equipment will be operational = 20 years. Low pressure Steam Trap measure life = 10 years. High pressure Steam Traps = 4 years Boiler Tuneup = 2 years.
Baseline Cost	= Cost of the baseline technology. Cost for an existing boiler is $0. Baseline cost for new application is assumed to be the cost of 80% efficient unit based on customer provided size. Refer Table 1 below.
High Efficiency Cost	= Incremental costs given based on customer provided size and efficiency. Refer Table 1 below.
NTG	Net-to-gross = 97% . Reference 5.

Provided by Customer:	**Verified during M&V:**
For boilers:	
Boiler size (BTUH)	Yes
Boiler Efficiency (85% or 92%)	Yes
For steam traps:	
High or low pressure	Yes
Incremental cost	No
For all but boilers and steam traps:	
Boiler size (BTUH)	Yes
Implemented measure	Yes
Incremental cost	No

Assumptions:

- Each boiler is replaced with the same size on a 1 for 1 basis.
- Only commercial boilers can receive prescriptive rebates, industrial boilers must go through Custom Efficiency.
- Climate zone assumed to be Denver for all boilers
- Prescriptive rebates are only given for boilers put into service, rebates are not given for backup boilers. Even though we do not rebate backup boilers, our assumed hours have been conservatively reduced to 65% of the predicted hours to account for boiler redundancy.
- Steam boiler has condensate return.
- Thermal Efficiency indicates the heat exchangers effectiveness to transfer heat from the combustion process to the water in the boiler, exclusive radiation and convection losses

- Assumed savings for boiler tune-up = 2% for non condensing boiler. This is an average value of the two years, 4% initial to no savings at the end of the two years. Life of product is 2 years. DOE states up to 5%.
- Assumed savings for outdoor air reset on non condensing boilers = 3%. Life of product is 20 years. The Natural Gas consortium states up to 5% savings
- Assumed savings for installing Stack dampers on non condensing boilers = 1%. Life of product is 20 years. Canada energy council, up to 4%
- Assumed savings for modulating burner controls on non condensing boilers = 3%. Life of product is 20 years. The Natural Gas consortium states up to 4% savings
- Assumed savings for O2 trim controls on non condensing boilers = 2%. Life of product is 20 years. The Natural Gas consortium states of 2 to 4% savings

Table 1, Excerpt from Hot water boiler costs, Full table on Deemed Incremental Costs tab

	Non-condensing		Condensing	Incremental	Incremental
	80% eff.	85% eff.	92% eff.	Cost for 80% to 85% eff	Cost for 80% to 92% eff
175,000 Btuh	$3,000	$3,500	$4,600	$500	$1,600
500,000 Btuh	$5,000	$9,000	$11,200	$4,000	$6,200

Table 2, Boiler Efficiencies

	Baseline Boiler Efficiency (EFFb)	Efficient Boiler Efficiency (EFFh)
New Boilers (Non-Condensing)	80.00%	86.00%
New Boilers (Condensing)	80.00%	96.20%
Boiler Tune Up	78.00%	80.00%
Outdoor Air Reset	80.00%	83.00%
Stack Dampers	80.00%	81.00%
Modulating Burner Controls	80.00%	83.00%
O2 Trim Control	80.00%	82.00%
Steam Traps	80.00%	N/A

References:

1. The baseline efficiency for the boiler is based on 2006 IECC, minimum of 80%, ASHRAE 90.1, and Federal Energy Management Program (FEMP).
2. Bin Temp & CO Bin Hrs are taken from ASHRAE, to determine operating hours. Value is 1880 hours for both space heating and domestic water production.
3. Did not account for altitude, since boiler equipment is manufactured for use in Colorado.
4. Leakage data from Energy Management Handbook, by Wayne Turner
5. Net-to-Gross factor for Boiler Efficiency was calculated using 1/2 of the free-rider factor for Cooling Efficiency.

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Compressed Air Efficiency

Custom and prescriptive rebates will be offered under the compressed air program. Prescriptive rebates are available for Variable Frequency Drive Compressors that are less than 50 hp, and no air loss drain valves. Other measures may receive rebates through the Custom Efficiency program. Each custom efficiency project will be analyzed individually by Xcel Energy. Engineering variables required for the analysis will be obtained from the customer or vendor. Analysis will be based on standard engineering methodologies.

Algorithms:

VFD Comp Electrical Demand Savings (Customer kW)	= HP x Service Factor x 0.746 x (%_Load_b / Motor_Effb - %_Load_h / Motor_Effh)
VFD Comp Electrical Energy Savings (Customer kWh)	= Demand Savings (Customer kW) x VFD_Hours
No Loss Air Drains Electrical Energy Savings (Customer kWh)	= Number_of_Drains x kW_per_Drain x Drain_Hours
No Loss Air Drains Electrical Demand Savings (Customer kW)	= Number_of_Drains x kW_per_Drain

Electrical Energy Savings (Gross Generator kWh)	= Customer kWh / (1-TDLF)
Electrical Demand Savings (Gross Generator kW)	= Customer kW x CF / (1-TDLF)
Electrical Energy Savings (Net Generator kWh)	= Gross Generator kWh x NTG
Electrical Demand Savings (Net Generator kW)	= Gross Generator kW x NTG

Variables:

HP	= HP of new Compressor provided by the customer
Service_Factor	= Service factor of the motor, we will use 1.1 (Reference 1)
0.746	= Standard conversion from HP to kW.
%_Load_b	= Average percent loading for baseline compressor = 0.8952 as calculated on %BHP to %Flow tab
%_Load_h	= Average percent loading for VFD compressor = 0.61 as calculated on %BHP to %Flow tab
Motor_Eff_b	= Efficiency of existing compressor motor as determine in Table 1 using customer provided HP
Motor_Eff_h	= Efficiency of new compressor motor as determine in Table 1 using customer provided HP
VFD_Hours	= Operating hours of compressors from Table 1.
Drain_Hours	= Operating hours of compressed air systems. We will use 6920 hours which is an average of completed CO and MN custom compressed air project hours.
Number_of_Drains	= Number of drains replaced will be provided by the customer
kW_per_Drain	= kW savings per drain, we will use 0.53 kW per calculations on Forecast NLAD tab.
TDLF	Transmission-Distribution Loss Factor = 6.39%, the percentage loss of electricity as it flows from the power plant to the customer, calculated using factors from Enhanced DSM Filing SRD-2
CF_VFD	= Coincidence Factor - Probability that the measure peak demand reduction will occur at the same time as the grid peak demand, we will use 88.8% for small VFD compressors based on historic small VFD compressor projects in MN and CO.
CF_NLAD	= Coincidence Factor - Probability that the measure peak demand reduction will occur at the same time as the grid peak demand, we will use 88% for No Loss Air Drains based on historic custom compressed air projects in MN and CO.

NTG	Net-to-gross = We will use 87% for Compressed Air projects (Reference 2)
Incremental operation and maintenance cost	= 0 - conservative approach, taking no credit for improved mean time between failure.
Incremental Cost of Efficient Equipment	= Incremental cost of efficient measures from Table 2. Compared to the do-nothing option.

Provided by Customer:	**Verified during M&V:**
Size of Compressor	Yes
Number of Drains	Yes

Assumptions:

VFD Compressors<50 hp

Compressed air system in which VFD compressor is installed must have a capacity < 50hp.

Existing compressor was a non-reciprocating load/no load type with a minimum of 1 gallon of storage per cfm capacity, or modulation with or without unload.

No Loss Air Drains

Compressor must be one of the following:

Load/no-Load with at least 5 gal/CFM of storage (180 CFM compressor would need to have 5*180=900 gallons of storage or more)

Variable Speed Drive compressor

Variable Displacement/Capacity compressor

Centrifugal compressors in their efficient trim range without any blowoff to atm.

Table 1. Motor Efficiencies from NEMA

Compressor HP	Motor Description	Existing Compressor Motor Efficiency	New Compressor Motor Efficiency	Operating Hours
10	10 HP 1800 RPM ODP	89.5%	91.7%	3391
15	15 HP 1800 RPM ODP	91.0%	93.0%	3391
20	20 HP 1800 RPM ODP	91.0%	93.0%	3391
25	25 HP 1800 RPM ODP	91.7%	93.6%	4067
30	30 HP 1800 RPM ODP	92.4%	94.1%	4067
40	40 HP 1800 RPM ODP	93.0%	94.1%	4067

Existing Compressor Motor Efficiency values are from EPAC motors

New Compressor Motor Efficiency values are from NEMA Premium motors

Operating hours from completed MN and CO custom projects 2007-2008

Table 2. Incremental Costs for Efficient Measures

10 HP VFD Compressor	$10,841
15 HP VFD Compressor	$14,018
20 HP VFD Compressor	$16,879
25 HP VFD Compressor	$19,561
30 HP VFD Compressor	$24,357
40 HP VFD Compressor	$27,429
No Loss Air Drain	$448

Compressor prices are the average price from three retailers plus $1500 for installation as calculated on VFD info tab
NLAD price is average of nine retailers prices as calculated on Forecast NLAD tab

Changes from 2008

The 2008 Custom C&I, Custom SB, and Compressed Air Efficiency programs have been combined in the 2009 Custom Efficiency Program
Prescriptive rebates have been added for VFD compressors < 50hp and No Loss Air Drains

References

(1) Service factor (1.1) from Compressed Air & Gas Institute (CAGI) standards comparing Nameplate HP to actual BHP @ 100% Full rated pressure and flow
(2) National Energy Efficiency Best Practices Report (http://www.eebestpractices.com)

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Cooling Efficiency

Prescriptive rebates will be offered for new cooling equipment. Rebates for most measures are dependent on size and on meeting a minimum efficiency. Additional rebates are available for better efficiencies than the minimum qualifying efficiencies.

Custom rebates are available for cooling-related improvements that are not covered by the aforementioned prescriptive rebates. These would include such applications as heat recovery.

Algorithms:

Conversions

Energy Efficiency Ratio	= Seasonal Energy Efficiency Ratio x 0.85
kW/ton	= 12 / Energy Efficiency Ratio
For Rooftop Units, Water Source Heat Pumps, Split Systems, Condensing Units	
Cooling Electrical Energy Savings (Customer kWh)	= Size x EFLH x (12/SEER_Standard - 12/SEER_Eff)
Cooling Electrical Demand Savings (Customer kW)	= Size x (12/EER_Standard - 12/EER_Eff)
For Chillers	
Cooling Electrical Energy Savings (Customer kWh)	= Size x EFLH x (IPLV_Standard - IPLV_Eff)
Cooling Electrical Demand Savings (Customer kW)	= Size x (FLV_Standard - FLV_Eff)
For Variable Air Volume (VAV) Boxes	
Cooling Electrical Energy Savings (Customer kWh)	= #_of_fans x Savings x EFLH x [(cfm_per_fan / cfm_per_ton) x FLV + bhp_per_fan x 0.746 x Load_Factor)]
Cooling Electrical Demand Savings (Customer kW)	= #_of_fans x Savings x [(cfm_per_fan / cfm_per_ton) x FLV + bhp_per_fan x 0.746 x Load_Factor)]

Electrical Energy Savings (Gross Generator kWh)	= Customer kWh / (1-TDLF)
Electrical Demand Savings (Gross Generator kW)	= Customer kW x CF / (1-TDLF)
Electrical Energy Savings (Net Generator kWh)	= Gross Generator kWh x NTG
Electrical Demand Savings (Net Generator kW)	= Gross Generator kW x NTG

Variables:

Size	= The equipment capacity in tons, provided by customer
EFLH	= Equivalent Full Load Hours. The equivalent number of hours that the equipment would be running at full load over the course of the year. Values are shown in Table 2 for different building types and locations, to be provided by the customer.
SEER_Standard	= Seasonal Energy Efficiency Ratio in Btu/Wh of standard equipment, based upon the minimum acceptable efficiency defined by International Energy Conservation Code, 2006. Value determined from table 1 based on customer provided equipment type and size.
SEER_Eff	= Seasonal Energy Efficiency Ratio in Btu/Wh of High Efficiency equipment that the customer will install, provided by customer
EER_Standard	= EER of standard equipment, based upon the minimum acceptable efficiency defined by the International Energy Conservation Code, 2006, for a specific type of equipment and size. Tbale 1.
EER_Eff	= EER of High Efficiency that the customer will install, provided by customer.

FLV_Standard	= Full load cooling efficiency in kW/ton of standard equipment, based upon the minimum acceptable efficiency defined by International Energy Conservation Code, 2006 for chiller type and size (type and size provided by customer). Table 1
FLV_Eff	= Full Load Value cooling efficiency in kW/ton, representing the efficiency at design conditions, provided by customer
IPLV_Standard	= Integrated Part Load Value (representing the average efficiency over a range of loaded states) cooling efficiency in kW/ton of standard equipment, based upon the minimum acceptable efficiency defined by International Energy Conservation Code, 2006 for chiller type and size (type and size provided by customer). Table 1
IPLV_Eff	= Integrated Part Load Value (representing the average efficiency over a range of loaded states) cooling efficiency in kW/ton of High Efficiency equipment, provided by customer.
CF	= Coincidence Factor, the probability that peak demand of the motor will coincide with peak utility system demand. 0.90 will be used for prescriptive rebates (Reference 1).
Measure Life	Measure life is taken at 20 years for all cooling equipment. (Reference 2)
#_of_fans	= Number of fans provided by customer
cfm_per_ton	= Cubic feet per minute of airflow, typical amount of supply air per ton of cooling, 400 is a standard value used in the Colorado industry (Reference 5)
FLV	= Full Load Value of Chiller, taken to be 0.6 kW/ton for VAV (Reference 5)
Savings	= Savings factor associated with Variable Air Volume conversion, taken to be 15% (Reference 5)
Load Factor	= Average fraction of full load operation, taken to be 80% (Reference 5)
bhp_per_fan	= Brake horsepower per fan, taken to be 1 bhp (Reference 5)
TDLF	Transmission-Distribution Loss Factor = 6.39%, the percentage loss of electricity as it flows from the power plant to the customer, calculated using factors from Enhanced DSM Filing SRD-2
NTG	Net-to-gross = We will use 94% for cooling projects (Reference 6)
Incremental operation and maintenance cost	= 0 - conservative approach, taking no credit for improved mean time between failure.

Provided by Customer:	**Verified during M&V:**
For all but VAV:	
Cooling equipment type	Yes
Cooling equipment size (tons)	Yes
Cooling equipment efficiency (SEER, EER, IPLV, kW/ton - dependent on the technology)	Yes
Climate zone	Yes
Building type	Yes
For VAV:	
# of Variable Air Volume Boxes	Yes
# of fans	Yes
Climate zone	Yes
Building type	Yes

Assumptions:

- Each piece of cooling equipment is going in instead of a machine of the same size that only met minimum International Energy Conservation Code, 2006 requirements.
- Prescriptive rebates are not given for backup cooling equipment.
- Some equipment is rated in only EER or SEER. To convert a Seasonal Energy Efficiency Ratio (SEER) to an Energy Efficiency Ratio (EER), multiply SEER by 0.85. The conversion factor of 0.85 a generally accepted factor for converting from SEER to EER. Once EER is obtained, convert EER to kW/ton using the following equation: kW/ton = 12/EER. To convert kW/ton to kW, multiply by tons.
- VAV = Variable Air Volume

Table 1. Excerpt from Deemed Baseline Efficienc tab

Equipment	Equipment Classification	FLV (kW/ton)	IPLV (kW/ton)	Incremental Cost
Centrifugal Chiller (150-300 tons)	Standard Efficiency	0.63	0.60	-
Centrifugal Chiller (150-300 tons)	High Efficiency			$20,000

Table 2. Equivalent Full Load Hours by Building Type - Market segment hours scaled from Minnesota OES data (Reference 3) with Office value calculated for Denver and Grand Junction Typical Meteorological Year data. Distributions developed from CBECS data (Reference 4)

Building Type	**Front Range EFLH**	**Western Slope EFLH**
Education - Community College	725	844
Education - Secondary School	456	531
Education - University	981	1,142
Health/Medical - Clinic	833	969
Health/Medical - Hospital	1,616	1,880
Lodging	1,356	1,578
Office	1,102	1,283
Retail	975	1,135

EFLH*- Zone 1 (Front Range/Denver) and Zone 2 (Western State as represented by Grand Junction)

Changes from 2008

Baseline efficiencies updated. Cost information updated from various sources. Methodology now look at market segment rather than a single Equivalent Full Load Hours value for all participants and measures.

References

1. NYSERDA (New York State Energy Research and Development Authority); NY Energy $mart Programs Deemed Savings Database - Source for coincidence factor
2. ASHRAE, 2007, Applications Handbook, Ch. 36, table 4, Comparison of Service Life Estimates
3. Arkansas Deemed Savings Quick Start Program Draft Report Commercial Measures Final Report - source of equivalent full load hour methodology for segments
4. CBECS (Commercial Buildings Energy Consumption Survey), 2003 - Total Floor space of Cooled Buildings by Principal Building Activity - source of market segment distributions
5. Derived by Eugene Scales and Associates
6. NTG factor from National Energy Efficiency Best Practices Report (http://www.eebestpractices.com)

Building Type	Zone 1 EFLH-MOES	Ratio vs. Office EFLH
Education - Community College	560	66%
Education - Secondary School	352	41%
Education - University	758	89%
Health/Medical - Clinic	643	76%
Health/Medical - Hospital	1,248	147%
Lodging	1,047	123%
Office	851	100%
Retail	753	88%

weighting Factors for Zones ----->	10%	90%
Building Type	**Western Slope**	**Front Range**
Education - Community College	844	725
Education - Secondary School	531	456
Education - University	1,142	981
Health/Medical - Clinic	969	833
Health/Medical - Hospital	1,880	1,616
Lodging	1,578	1,356
Office	1283	1,102
Retail	1,135	975

Equipment	Equipment Classification	SEER	EER	FLV (kW/ton)	IPLV (kW/ton)	Incremental Cost, $
Rooftop Units less than 5.4 tons	Standard Efficiency	10.0	8.5			
	High Efficiency					600
Rooftop Units 5.5-11.3 tons	Standard Efficiency	11.9	8.9			
	High Efficiency					2,500
Rooftop Units11.4-19.9 tons	Standard Efficiency	11.2	9.5			
	High Efficiency					3,750
Rooftop Units 20-63.3 tons	Standard Efficiency	9.5	9.3			
	High Efficiency					7,500
Rooftop Units greater than 63.3 tons	Standard Efficiency	9.2	9.0			
	High Efficiency					31,250
Variable Air Volume Conversion	Standard Efficiency		10.0	0.60		
	High Efficiency					290
Split Systems less than 5.4 tons	Standard Efficiency	10.0	9.7			
	High Efficiency					600
Condensing Units > 5.4 tons	Standard Efficiency	11.2	10.1			
	High Efficiency					2,500
Water-source Heat Pumps	Standard Efficiency	12.4	11.2			
	High Efficiency					750
PTAC	Standard Efficiency	11.2	9.1			
	High Efficiency					188
scroll/screw chiller < 150 tons	Standard Efficiency			0.79	0.78	
	High Efficiency					12,500
scroll/screw chiller 150 to 300 tons	Standard Efficiency			0.72	0.71	
	High Efficiency					16,000
Centrifugal Chillers < 150 tons	Standard Efficiency			0.70	0.70	
	High Efficiency					12,500
Centrifugal Chillers 150- 300 tons	Standard Efficiency			0.63	0.63	
	High Efficiency					20,000
Centrifugal Chillers > 300 tons	Standard Efficiency			0.58	0.58	
	High Efficiency					90,000
Air-Cooled Chillers - avg. capacity 250 tons	Standard Efficiency			1.41	1.41	
	High Efficiency					8,608

CUSTOM SAVINGS TECHNICAL ASSUMPTIONS

Program: Custom Efficiency

Customer may apply for rebate under the Custom Efficiency Program for gas or electric projects not listed under prescriptive rebate programs. Each Custom Efficiency project will be analyzed individually by Xcel Energy. Technical variables required for the analysis will be obtained from the customer or vendor. Analysis will be based on standard engineering methodologies.

Calculations:

Electrical energy savings and electrical demand savings will be calculated based on the project specific details. Each project will undergo an engineering review in accordance with standard engineering practices. The review will be in accordance with the calculation methodologies detailed in the prescriptive programs where applicable.

A net-to-gross factor of 87% will be used for electric custom projects, referenced National Energy Efficiency Best Practices Report (http://www.eebestpractices.com) A net-to-gross factor of 93% will be used for custom gas projects which assumes 1/2 of the free rider rate for electric becasue gas programs are new offerings in Colorado.
A transmission distribution loss factor of 6.39% will be used for Custom Efficiency projects. This is calculated using factors from the 2007/2008 DSM Biennial Plan; no significant system changes have been noted since then.

Product Life will be evaluated for each project, lives for end use technologies will be in accordance with prescriptive programs where applicable

Operation and Maintenance Savings will be evaluated for each project.

Changes from 2008

Rebate levels and minimum payback criteria were updated from 2008.

DATA CENTER SAVINGS TECHNICAL ASSUMPTIONS

Program: Data Center Efficiency

This is a custom program. Customer may apply for rebate under the Data Center Efficiency Program for projects not listed under prescriptive rebate programs. Each Data Center efficiency project will be analyzed individually by Xcel Energy. Technical variables required for the analysis will be obtained from the customer or vendor. Analysis will be based on standard engineering methodologies.

Calculations:

Electrical energy savings and electrical demand savings will be calculated based on the project-specific details. Each project will undergo an engineering review in accordance with standard engineering practices. Where prescriptive elements exist, the review will be in accordance with the calculation methodologies detailed in the prescriptive programs.

A net-to-gross factor of 90% will be used for Data Center projects, reference National Energy Efficiency Best Practices Report (http://www.eebestpractices.com)

A transmission distribution loss factor of 6.39% will be used for Data Center projects. Reference the Enhanced DSM filing, SRD-2; no significant system changes have been noted since then.

Assumptions:

Operation and Maintenance Savings will be calculated for each specific project based on project details.

study rebate at 50% of cost not to exceed $15,000

for retrofit lighting assume no change in number of fixtures

virtualization at ratio of 15:1

Changes from 2008

This is a new program for 2009.

Energy Management System/Controls (EMS) SAVINGS TECHNICAL ASSUMPTIONS

Program: EMS Efficiency

This is a custom program including both gas and electric measures. Customer may apply for rebate under the EMS Program. Each EMS project will be analyzed individually by Xcel Energy. Technical variables required for the analysis will be obtained from the customer or vendor. Analysis will be based on good engineering practices and standards.

Calculations:

Electrical and gas energy savings and electrical demand savings will be calculated based on the project-specific details. Each project will undergo an engineering review in accordance with standard engineering practices. Where prescriptive elements exist, the review will be in accordance with the calculation methodologies detailed in the prescriptive programs.

Assumptions:

A net-to-gross factor of 87% will be used for electric measures and a net-to-gross factor of 93% will ne used for gas EMS projects, reference National Energy Efficiency Best Practices Report (http://www.eebestpractices.com). Gas measures will assume one half of the free rider factor of electric because gas measures are new to Colorado.
A transmission distribution loss factor of 6.39% will be used for EMS projects. Reference the Enhanced DSM filing, SRD-2; no significant system changes have been noted since then.

for retrofit lighting assume no change in number of fixtures

Operation and Maintenance Savings will be calculated for each specific project based on project details.
Life of product is 10 years.

Changes from 2008

Gas measures have been added to the program for 2009.
Measure life for the program have been changed form 7 to 10 years.

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Furnace Efficiency

Prescriptive rebates will be offered for new Condensing Furnaces and replacement of current furnaces.

Algorithms:

Furnace Savings (Gross Dth)	= Alt X (BTUH - (BTUH x EFFb/EFFh)) x Hrs / 1,000,000
Net Dth	= Gross Dth x NTG

Variables:

Hrs	= Annual operational hours per year of the furnace = 2864, based on the BIN data for Denver from ASHRAE. Reference 1.
EFFb	=Required Efficiency of Baseline furnace (AFUE), as defined in the 2006 IECC. It is 78%.
EFFh	= Required efficiency for higher efficiency furnace (AFUE). The customer provides the rated nameplate efficiency, either 92% or 94%.
BTUH	= British thermal unit per hour - Rated furnace BTUH nameplate data provided by customer on rebate
1,000,000	=Conversion from BTU to dekatherms = 1,000,000
Alt	=Altitude correction factor for Denver which is 0.80. This factor represents the reduced capacity of a furnace at increased altitude. Standard reduction is approximately 4% per thousand feet, therefore we will use 20% for Colorado furnaces.
Measure Life	= Length of time the furnace equipment will be operational = 15 years (Reference 4)
Baseline Cost	= Cost of the baseline technology. For Retrofit, the cost is $0 since the baseline is to continue to operate the existing system. For New Construction, the cost is that of the lower efficiency option. Costs assumed to be $9.71 per 1000BTU/h capacity (reference 2)
High Efficiency Cost	= Installed cost of high efficiency unit assumed to be $42.48 per 1000BTUH (Reference 2)
NTG	Net-to-gross = 77% (Reference 3)

Provided by Customer:	Verified during M&V:
New furnace size (BTUH)	Yes
New furnace efficiency	Yes

Assumptions:
- Each furnace is replaced with the same size on a 1 for 1 basis.
- Prescriptive rebates are only given for furnaces put into service, rebates are not given for backup furnaces.
- Service life of typical furnace is 20 years (per FEMP), 15 years used in the calculations. Reference 5
- Furnaces must have a minimum efficiency of 92% AFUE for a rebate, and 94% AFUE or higher efficiency will receive a larger rebate.
- The baseline efficiency for the furnace is based on 2006 IECC, minimum of 78%.
- Efficiency of all furnaces is Annual Fuel Utilization Efficiency ("AFUE")

Changes from 2008:
There was no prescriptive program in 2008

References:
1. Bin Temp & CO Bin Hrs are taken from ASHRAE, to determine operating hours in Denver area. See table 1, used 2864 hours.
2. The average baseline and high efficiency costs are based on the California DEER database.
3. Net-to-Gross factor from Summit Blue 2006 Midwest Residential market Assessments DSM Potential Study
4. Measure life from the Federal Energy Management Program (FEMP).

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Lighting Efficiency

Prescriptive rebates will be offered for replacement lighting equipment. New Construction rebates will be offered for new facilities or spaces overhauled for a new purpose.
Custom rebates are available for lighting-related improvements that are not prescriptive.

Algorithms:

Electrical Demand Savings (Customer kW)	= (kW_Base - kW_EE) x HVAC_cooling_kWsavings_factor
Electrical Energy Savings (Customer kWh/yr)	= (kW_Base - kW_EE) x Hrs x HVAC_cooling_kWhsavings_factor
Natural Gas Savings (Dth)	= (kW_Base - kW_EE) x Hrs x HVAC_heating_penalty_factor
Lighting Controls -Electrical Energy Savings (Customer kWh/yr)	=(kW connected) x (1-PAF) x Hrs x HVAC_cooling_kWhsavings_factor
Lighting Controls -Electrical Demand Savings (Customer kW)	=(kW connected) x (1-PAF) x HVAC_cooling_kWsavings_factor
Lighting Controls -Natural Gas Savings (Dth)	=(kW connected) x (1-PAF) x Hrs x HVAC_heating_penalty_factor
Electrical Energy Savings (Gross Generator kWh)	= Customer kWh / (1-TDLF)
Electrical Demand Savings (Gross Generator kW)	= Customer kW x CF / (1-TDLF)
Electrical Energy Savings (Net Generator kWh)	= Gross Generator kWh x NTG
Electrical Demand Savings (Net Generator kW)	= Gross Generator kW x NTG

Variables:

Hrs	= Annual Operating Hours. Hours to be obtained from Table 2. The type of facility is to be supplied by the customer.
kW_Base	= Baseline fixture wattage (kW per fixture) determined from stipulated fixture wattages from Standard Fixture information. Fixture type provided by customer. Table 3 is an example of a Standard Fixture information table.
kW_EE	= High Efficiency fixture wattage (kW per fixture) determined from stipulated fixture wattages from Standard Fixture information. Fixture type provided by customer. Table 3 is an example of a Standard Fixture information table.
HVAC_cooling_kWhsavings_factor	= Cooling system energy savings factor resulting from efficient lighting from Table 1. Reduction in lighting energy results in a reduction in cooling energy, if the customer has air conditioning. Existence of air conditioning to be provided by customer.

HVAC_cooling_kWsavings_factor	= Cooling system demand savings factor resulting from efficient lighting from Table 1. Reduction in lighting demand results in a reduction in cooling demand, if the customer has air conditioning. Existence of air conditioning to be provided by customer.
HVAC_heating_kWsavings_factor	= Heating system penalty factor resulting from efficient lighting. Reduction in lighting demand results in an increase in heating usage, if the customer has air conditioning. A value of -0.00088738 Dth/kWh given by (Reference 4).
CF	= Coincidence Factor, the probability that peak demand of the lights will coincide with peak utility system demand. CF will be determined based on customer provided building type in table 2.
Measure Life	= Length of time the lighting equipment will be operational, see Table 6 for Measure Lifetimes
Baseline Cost	operate the existing system. For New Construction, the cost is that of the lower efficiency option. Costs given by (Reference 5) and vendors.
High Efficiency Cost	= Cost of the High Efficiency technology. Costs given in Deemed Fixture Table (Reference 4)
kW connected	Total connected fixture load, determined as the sum of stipulated fixture wattages from Deemed Fixture Table.
PAF	Stipulated power adjustment factor based on control type from Table 4.
TDLF	Transmission Distribution Loss Factor = 6.39%, the percentage loss of electricity as it flows from the power plant to the customer, calculated using factors from Enhanced DSM Filing SRD-2
NTG	Net-to-gross = 96% (Reference 5)
Incremental operation and maintenance cost	= Other annual savings or costs associated with the electrical savings. For Lighting, this consists of additional natural gas for heating. Methodology given by (Reference 4).

Provided by Customer:	Verified during M&V:
Number of Fixtures	Yes
Lighting equipment type	Yes
Building type	Yes
Existence of air conditioning	Yes

Assumptions:

- Each replacement lighting fixture is going in on a one-for-one basis for existing fixtures. New construction fixtures are put in on a one-for-one basis instead of lower efficiency options.
- In the Technical Assumptions, one will note that the Operating Hours does not appear, but rather a modified version. The methodology defines kW Savings on the basis of difference in kW with the HVAC Cooling demand factor. The Annual Energy Savings takes into account any heating that has to be added.

Table 1: HVAC Interactive Factors (Reference 2)

HVAC system	HVAC_cooling_kWhsavings_factor	HVAC_cooling_kW savings_factor
Heating only	1.00	1.00
Heating and cooling	1.11	1.33

Table 2: Coincident Peak Demand Factors and Annual Operating Hours by Building Type (Reference 1 and 3)

Building Type	CF	Annual Operating Hours
Office	78%	3435
Restaurant	94%	4156
Retail	94%	3068
Grocery/Supermarket	94%	4612
Warehouse	96%	2388
Elemen./Second. School	73%	2080
College	71%	5010
Health	84%	3392
Hospital	84%	4532
Hotel/Motel	51%	2697
Manufacturing	96%	5913
Other/Misc.	96%	2278
24-Hour Facility	94%	8234
Safety or Code Required	96%	8760

Table 3: Example of T8 Lighting-Reference 6 - Full table in Deemed Fixture Table tab

Technology	kW
1 Lamp T12	0.039
1 Lamp T8	0.031

Table 4: Stipulated Power Adjustment Factors (Reference 1 and 7) - Full table in Deemed Fixture Table tab

Control Type	PAF
no controls	1.00
Occupancy Sensor - Wall Mount	0.70
Occupancy Sensor - Ceiling Mount	0.70

Daylighting - Continuous Dimming	0.57
Daylighting - Multiple Step Dimming	0.65
Daylighting - On/Off	0.73

Table 5: Total Connected Fixture Wattages (Reference 7) - Full table in Deemed Fixture Table tab

Connected Fixtures	kW_connected
1 2-lamp T8 32W EL Ballast Fixture	0.058
2 2-lamp T8 32W EL Ballast Fixtures	0.116
3 2-lamp T8 32W EL Ballast Fixtures	0.174
4 2-lamp T8 32W EL Ballast Fixtures	0.232
1 4-lamp T8 32W EL Ballast Fixture	0.112
2 4-lamp T8 32W EL Ballast Fixtures	0.224
3 4-lamp T8 32W EL Ballast Fixtures	0.336
4 4-lamp T8 32W EL Ballast Fixtures	0.448

Table 6: Measure Lifetimes in Years (Reference 4)

Measure	Lifetime in Years
CFL less than 19W	5
Low Wattage T8 Lamps	8
Integrated 25W Ceramic Metal Halide	7
T8 Lighting Systems	18
T5 Lighting Systems	18
Lighting Controls	18

Changes from 2008

Baseline efficiencies updated. High efficiency values updated. More measures added to program. Cost information updated from various sources. Methodology now looks at market segment rather than a single operating hours value for all participants.

References

1. Arkansas Deemed Savings Quick Start Program Draft Report Commercial Measures Final Report, Nexant. CF and hours

2. HVAC Interactive Factors developed based on the Rundquist Simplified HVAC Interaction Factor method for Minnesota, presented on page 28 of the 11/93 issue of the ASHRAE Journal - "Calculating lighting and HVAC interactions".
3. Technical Reference User Manual No. 2004-31, Efficiency Vermont, 12/31/04. CF and Hours
4. Deemed Savings Database, Minnesota Office of Energy Security, 2008. CF, Hours, kW, Costs, Measure life
5. Net-to-Gross factor from National Energy Efficiency Best Practices Study(http://www.eebestpractices.com)
6. Lighting Efficiency input wattage guide, Xcel Energy, July, 2008, kW
7. CL&P and UI program Savings Documentation modified for 3022 Daylight Hours in Denver CO

Post-retrofit Fixture	kW_EE	pre-retrofit fixture	kW_Base	Full Cost	Incremental Cost
(1) F32T8 48" 32W Lamp with a high efficiency, low ballast factor electronic ballast	0.025	(1) F40T12 48" 34W lamps, energy saving magnetic ballast	0.043	$41.45	
(2) F32T8 48" 32W Lamp with a high efficiency, low ballast factor electronic ballast	0.048	(2) F40T12 48" 34W lamps, energy saving magnetic ballast	0.072	$43.45	
(3) F32T8 48" 32W Lamp with a high efficiency, low ballast factor electronic ballast	0.072	(3) F40T12 48" 34W lamps, energy saving magnetic ballast	0.106	$53.45	
(4) F32T8 48" 32W Lamps with a high efficiency, low ballast factor electronic ballast	0.096	(4) F40T12 48" 34W lamps, energy saving magnetic ballast	0.144	$56.45	
(1) F32T8 48" 32W Lamp with a high efficiency, high ballast factor electronic ballast	0.037	(2) F40T12 48" 34W lamps, energy saving magnetic ballast	0.072	$32.78	
(2) F32T8 48" 32W Lamp with a high efficiency, normal ballast factor electronic ballast	0.055	(3) F40T12 48" 34W lamps, energy saving magnetic ballast	0.106	$37.49	
(2) F32T8 48" 32W Lamps with a high efficiency, high ballast factor electronic ballast	0.073	(4) F40T12 48" 34W lamps, energy saving magnetic ballast	0.144	$37.49	
(3) F32T8 48" 32W Lamps with a high efficiency, normal ballast factor electronic ballast	0.083	(4) F40T12 48" 34W lamps, energy saving magnetic ballast	0.144	$44.33	
(2) F32T8 48" 32W Lamps with a high efficiency, low ballast factor electronic ballast	0.048	(1) F96T12ES 8' 60W lamp, energy savings magnetic ballast	0.075	$47.49	
(4) F32T8 48" 32W Lamps with a high efficiency, low ballast factor electronic ballast	0.096	(2) F96T12ES 8' 60W lamps, energy savings magnetic ballast	0.123	$60.11	
(4) F32T8 48" 32W Lamps with a high efficiency, normal ballast factor electronic ballast	0.108	(2) F96T12ES 8' 60W lamps, energy savings magnetic ballast	0.123	$60.11	
(4) F32T8 48" 32W Lamps with a high efficiency, high ballast factor electronic ballast	0.141	(4) F96T12ES 8' 60W lamps, energy savings magnetic ballast	0.246	$86.52	
(1) F32T8 48" 32W Lamp with a high efficiency, low ballast factor electronic ballast	0.025	(2) F40T12 48" 34W lamps, energy saving magnetic ballast	0.072	$32.78	
(2) F32T8 48" 32W Lamp with a high efficiency, low ballast factor electronic ballast	0.048	(3) F40T12 48" 34W lamps, energy saving magnetic ballast	0.106	$37.49	
(2) F32T8 48" 32W Lamp with a high efficiency, low ballast factor electronic ballast	0.048	(4) F40T12 48" 34W lamps, energy saving magnetic ballast	0.144	$37.49	
(2) F32T8 48" 32W Lamp with a high efficiency, low ballast factor electronic ballast	0.048	(1) F96T12ES 8' 60W lamp, energy savings magnetic ballast	0.075	$37.49	
(1) F28T5 lamp with ~1.0 ballast factor electronic ballast	0.032	(1) F40T12 48" 34W lamps, energy saving magnetic ballast	0.043	$46.50	
(2) F28T5 lamps with ~1.0 ballast factor electronic ballast	0.063	(2) F40T12 48" 34W lamps, energy saving magnetic ballast	0.072	$49.00	
(3) F28T5 lamps with ~1.0 ballast factor electronic ballast	0.095	(3) F40T12 48" 34W lamps, energy saving magnetic ballast	0.106	$67.50	
(4) F28T5 lamps with ~1.0 ballast factor electronic ballast	0.126	(4) F40T12 48" 34W lamps, energy saving magnetic ballast	0.144	$70.00	
Fluorescent, (1) 96", T-8 lamp, electronic ballast	0.058	Fluorescent, (1) 96", T-12 lamp, magnetic ballast	0.075	$93.45	$20.00
(1) F54T5/HO 45.8" lamps with a ~1.0 ballast factor electronic ballast	0.062	Incandescent, (1) 150W lamp	0.150	$27.00	$26.75
(1) F54T5/HO 45.8" lamps with a ~1.0 ballast factor electronic ballast	0.062	(2) F40T12 48" 34W lamps, energy saving magnetic ballast	0.072	$27.00	$27.00
(1) F54T5/HO 45.8" lamps with a ~1.0 ballast factor electronic ballast	0.062	(3) F40T12 48" 34W lamps, energy saving magnetic ballast	0.106	$48.00	$48.00
(2) F54T5/HO 45.8" lamps with a ~1.0 ballast factor electronic ballast	0.117	(4) F40T12 48" 34W lamps, energy saving magnetic ballast	0.144	$32.00	$32.00
Fluorescent, (2) 96", T-8 lamp, low power factor electronic ballast	0.094	Fluorescent, (2) 96", T-12 lamp, magnetic ballast	0.123	$103.45	$20.00
(2) F54T5/HO 45.8" lamps with a ~1.0 ballast factor electronic ballast, high bay	0.117	Metal Halide, (1) 150W lamp	0.190	$192.88	$110.00
(2) F54T5/HO 45.8" lamps with a ~1.0 ballast factor electronic ballast, high bay	0.117	Metal Halide, (1) 175W lamp	0.215	$192.88	$110.00
(3) F54T5/HO 45.8" lamps with a ~1.0 ballast factor electronic ballast, high bay	0.179	Metal Halide, (1) 250W lamp	0.295	$222.17	$110.00
(4) F54T5/HO 45.8" lamps with a ~1.0 ballast factor electronic ballast, high bay	0.234	Metal Halide, (1) 400W lamp	0.458	$293.31	$110.00
(6) F54T5/HO 45.8" lamps with a ~1.0 ballast factor electronic ballast, high bay	0.358	Metal Halide, (1) 400W lamp	0.458	$293.31	$110.00
(8) F54T5/HO 45.8" lamps with a ~1.0 ballast factor electronic ballast, high bay	0.468	Metal Halide, (1) 750W lamp	0.850	$372.31	$110.00
(10) F54T5/HO 45.8" lamps with a ~1.0 ballast factor electronic ballast, high bay	0.585	Metal Halide, (1) 1000W lamp	1.080	$407.31	$110.00
(3) F32T8 48" 32W Lamps with a high efficiency, high ballast factor electronic ballast, high bay	0.093	Metal Halide, (1) 150W lamp	0.190	$140.00	$42.50
(3) F32T8 48" 32W Lamps with a high efficiency, high ballast factor electronic ballast, high bay	0.093	Metal Halide, (1) 175W lamp	0.215	$140.00	$42.50
(4) F32T8 48" 32W Lamps with a high efficiency, very high ballast factor electronic ballasts, high bay	0.154	Metal Halide, (1) 250W lamp	0.295	$153.00	$63.75
(6) F32T8 48" 32W Lamps with a high efficiency, high ballast factor electronic ballasts, high bay	0.186	Metal Halide, (1) 400W lamp	0.458	$260.00	$85.00
(8) F32T8 48" 32W Lamps with a high efficiency, normal ballast factor electronic ballasts, high bay	0.224	Metal Halide, (1) 400W lamp	0.458	$265.00	$90.00
(12) F32T8 48" 32W Lamps with a high efficiency, normal ballast factor electronic ballasts,, high bay	0.336	Metal Halide, (1) 750W lamp	0.850	$397.50	$127.50
(16) F32T8 48" 32W Lamps with a high efficiency, normal ballast factor electronic ballasts, high bay	0.448	Metal Halide, (1) 1000W lamp	1.080	$530.00	$170.00
(18) F32T8 48" 32W Lamps with a high efficiency, normal ballast factor electronic ballasts, high bay	0.68	Metal Halide, (1) 1000W lamp	1.080	$534.00	$174.00
(20) F32T8 48" 32W Lamps with a high efficiency, normal ballast factor electronic ballasts, high bay	0.755	Metal Halide, (1) 1000W lamp	1.080	$538.00	$178.00
(3) Fluorescent, 48" T-8 lamps, VHLO Ballasts	0.279	Metal Halide, (1) 400W lamp	0.458	$163.00	$7.00
(6) Fluorescent, 48" T-8 lamps, VHLO Ballasts	0.555	Metal Halide, (1) 750W lamp	0.850	$242.00	$28.00
(8) Fluorescent, 48" T-8 lamps, VHLO Ballasts	0.793	Metal Halide, (1) 1000W lamp	1.080	$334.00	$26.00
Screw-In CFL, 1-CF 9W, magnetic ballast	0.011	Incandescent, 1-A 15W, no ballast	0.015	$6.79	$4.31
Screw-In CFL, 1-CF 9W, magnetic ballast	0.011	Incandescent, 1-A 25W, no ballast	0.025	$6.79	$4.31
Screw-In CFL, 1-CF 9W, magnetic ballast	0.011	Incandescent, 1-A 40W, no ballast	0.040	$6.79	$4.31
Screw-In CFL, 1-CF 9W, magnetic ballast	0.011	Incandescent, 3-A 15W, no ballast	0.045	$6.79	$4.31
Screw-In CFL, 1-CF 15W, magnetic ballast	0.017	Incandescent, 1-A 60W, no ballast	0.060	$6.79	$4.31
Screw-In CFL, 1-CF 15W, magnetic ballast	0.017	Incandescent, 1-PAR 65W, no ballast	0.065	$6.79	$4.31

Screw-In CFL, 1-CF 11W, magnetic ballast	0.013	Incandescent, 1-A 50W, no ballast	0.050	$6.79	$4.31
Screw-In CFL, 1-CF 11W, magnetic ballast	0.013	Incandescent, 2-A 25W, no ballast	0.050	$6.79	$4.31
Hard-Wired CFL, 2-PL 42W, 1 electronic ballast	0.093	Metal Halide, 100W, magnetic ballast	0.129	$83.42	$40.00
Hard-Wired CFL, 2-PL 32W, 1 electronic ballast	0.068	Mercury Vapor, 100W, magnetic ballast	0.125	$92.87	$50.00
Hard-Wired CFL, 2-PL 26W, 1 electronic ballast	0.052	Metal Halide, 70W, magnetic ballast	0.090	$79.37	$40.00
Hard-Wired CFL, 2-PL 23W, 2 magnetic ballasts	0.048	Incandescent, 1-A 150W, no ballast	0.150	$112.24	$50.00
Hard-Wired CFL, 2-PL 23W, 2 magnetic ballasts	0.048	Incandescent, 2-A 75W, no ballast	0.150	$112.24	$50.00
Hard-Wired CFL, 2-PL 23W, 2 magnetic ballasts	0.048	Incandescent, 3-A 50W, no ballast	0.150	$112.24	$50.00
Hard-Wired CFL, 2-PL 23W, 2 magnetic ballasts	0.048	Incandescent, 3-A 60W, no ballast	0.180	$112.24	$50.00
Hard-Wired CFL, 2-2D 38W, 1 electronic ballast	0.074	Incandescent, 2-A 150W, no ballast	0.300	$102.62	$50.00
Hard-Wired CFL, 2-2D 38W, 1 electronic ballast	0.074	Incandescent, 3-A 100W, no ballast	0.300	$102.62	$50.00
Hard-Wired CFL, 2-2D 38W, 1 electronic ballast	0.074	Incandescent, 2-PAR 150W, no ballast	0.300	$102.62	$50.00
Hard-Wired CFL, 2-2D 38W, 1 electronic ballast	0.074	Incandescent, 1-PS30 300W, no ballast	0.300	$102.62	$50.00
Hard-Wired CFL, 2-2D 28W, 1 electronic ballast	0.056	Incandescent, 2-A 100W, no ballast	0.200	$102.62	$50.00
Hard-Wired CFL, 2-2D 28W, 1 electronic ballast	0.056	Incandescent, 3-A 75W, no ballast	0.225	$102.62	$50.00
Hard-Wired CFL, 2-2D 28W, 1 electronic ballast	0.056	Incandescent, 4-A 40W, no ballast	0.160	$102.62	$50.00
Hard-Wired CFL, 2-2D 28W, 1 electronic ballast	0.056	Incandescent, 4-A 60W, no ballast	0.240	$102.62	$50.00
Hard-Wired CFL, 2-2D 28W, 1 electronic ballast	0.056	Incandescent, 4-A 75W, no ballast	0.300	$102.62	$50.00
Hard-Wired CFL, 2-2D 28W, 1 electronic ballast	0.056	Incandescent, 4-A 100W, no ballast	0.400	$102.62	$50.00
Hard-Wired CFL, 2-2D 28W, 1 electronic ballast	0.056	Incandescent, 1-PS30 200W, no ballast	0.200	$102.62	$50.00
Hard-Wired CFL, 1-PL 32W, magnetic ballast	0.033	Incandescent, 2-A 60W, no ballast	0.120	$76.35	$40.00
Hard-Wired CFL, 1-PL 32W, magnetic ballast	0.033	Incandescent, 3-A 40W, no ballast	0.120	$76.35	$40.00
Hard-Wired CFL, 1-PL 32W, magnetic ballast	0.033	Incandescent, 1-R 120W, no ballast	0.120	$76.35	$40.00
Hard-Wired CFL, 1-PL 32W, 1 electronic ballast	0.036	Metal Halide, 50W, magnetic ballast	0.062	$76.35	$40.00
Hard-Wired CFL, 1-PL 26W, magnetic ballast	0.027	Incandescent, 1-A 100W, no ballast	0.100	$74.60	$40.00
Hard-Wired CFL, 1-PL 26W, magnetic ballast	0.027	Incandescent, 2-A 50W, no ballast	0.100	$74.60	$40.00
Hard-Wired CFL, 1-PL 26W, magnetic ballast	0.027	Incandescent, 1-R 100W, no ballast	0.100	$74.60	$40.00
Hard-Wired CFL, 1-PL 26W, magnetic ballast	0.027	Incandescent, 1-PAR 100W, no ballast	0.100	$74.60	$40.00
Hard-Wired CFL, 1-PL 23W, magnetic ballast	0.024	Incandescent, 2-A 40W, no ballast	0.080	$76.17	$40.00
Hard-Wired CFL, 1-PL 23W, magnetic ballast	0.024	Incandescent, 1-R 90W, no ballast	0.090	$76.17	$40.00
Hard-Wired CFL, 1-PL 23W, magnetic ballast	0.024	Incandescent, 1-PAR 85W, no ballast	0.085	$76.17	$40.00
Hard-Wired CFL, 1-PL 20W, magnetic ballast	0.022	Incandescent, 1-A 75W, no ballast	0.075	$76.17	$40.00
Hard-Wired CFL, 1-PL 20W, magnetic ballast	0.022	Incandescent, 1-R 75W, no ballast	0.075	$76.17	$40.00
Hard-Wired CFL, 1-PL 20W, magnetic ballast	0.022	Incandescent, 1-PAR 75W, no ballast	0.075	$76.17	$40.00
250W Metal Halide, magnetic ballast	0.291	Mercury Vapor, 400W, magnetic ballast	0.454		$161
175W Metal Halide, magnetic ballast	0.209	High Pressure Sodium, 250W, magnetic ballast	0.295		$161
400W Metal Halide, magnetic ballast	0.456	Mercury Vapor, 1000W, magnetic ballast	1.080		$ 253.00
150W Pulse Start Metal Halide, energy saving magnetic ballast	0.167	175W Metal Halide, magnetic ballast	0.209	$161	$30
175W Pulse Start Metal Halide, energy saving magnetic ballast	0.191	250W Metal Halide, magnetic ballast	0.291	$161	$30
200W Pulse Start Metal Halide, magnetic ballast	0.232	250W Metal Halide, magnetic ballast	0.291	$280	$30
320W Pulse Start Metal Halide, magnetic ballast	0.367	400W Metal Halide,, magnetic ballast	0.456	$283	$30
360W Pulse Start Metal Halide, magnetic ballast	0.418	400W Metal Halide, magnetic ballast	0.456	$283	$30
750W Pulse Start Metal Halide, magnetic ballast	0.814	1000W Metal Halide, magnetic ballast	1.077	$381	$30
2W LED Exit Sign	0.002	30W Incandescent Exit Sign	0.03		$80.00
0.25W LEC Exit Sign	0.00025	40W Incandescent Exit Sign	0.04		$80.00
F32T8 25W Lamp on a standard efficiency, normal ballast factor ballast	0.0213	F32T8 32W Lamp on a standard efficiency, normal ballast factor ballast	0.0272	$4.00	$2.00
F32T8 28W Lamp on standard efficiency, normal ballast factor ballast	0.0238	F32T8 32W Lamp on a standard efficiency, normal ballast factor ballast	0.0272	$4.00	$2.00
Ceramic Metal Halide, 1-SE 20W, electronic ballast	0.025	Incandescent, 1-R 75W	0.075	$192	$57
Ceramic Metal Halide, 1-SE 20W, electronic ballast	0.025	Incandescent, 1-R 100W	0.100	$192	$137
Ceramic Metal Halide, 1-SE 20W, electronic ballast	0.025	Incandescent, 1-R 120W	0.120	$192	$136
Ceramic Metal Halide, 1-PAR 39W, electronic ballast	0.045	Incandescent, 1-R 150W	0.150	$222	$166
Ceramic Metal Halide, 1-SE 20W, electronic ballast	0.025	Incandescent, 1-PAR 100W	0.100	$192	$132
Ceramic Metal Halide, 1-PAR 39W, electronic ballast	0.045	Incandescent, 1-PAR 150W	0.150	$222	$161
Ceramic Metal Halide, 1-SE 20W, electronic ballast	0.025	Incandescent, 1-PAR 150W	0.150	$192	$132
Ceramic Metal Halide, 1-SE 150W, electronic ballast	0.168	Incandescent, 1-PS40 500W	0.500	$222	$152

Ceramic Metal Halide, 1-SE 175W, electronic ballast	0.189	250W Metal Halide, magnetic ballast	0.291	$131	$159
Ceramic Metal Halide, 1-SE 250W, electronic ballast	0.275	400W Metal Halide, magnetic ballast	0.456	$253	$37
Ceramic Metal Halide, 320W, electronic ballast	0.349	400W Metal Halide, magnetic ballast	0.456	$253	$292
Ceramic Metal Halide, 350W, electronic ballast	0.38	400W Metal Halide, magnetic ballast	0.456	$253	$292
Ceramic Metal Halide, 400W, electronic ballast	0.435	400W Metal Halide, magnetic ballast	0.456	$253	$298
No Lighting controls	1.00	no controls			$0.00
Occupancy Sensor - Wall Mount	0.70	Occupancy Sensor - Wall Mount			$55.00
Occupancy Sensor - Ceiling Mount	0.70	Occupancy Sensor - Ceiling Mount			$125.00
Daylighting - Continuous Dimming	0.70	Daylighting - Continuous Dimming			$65.00
Daylighting - Multiple Step Dimming	0.80	Daylighting - Multiple Step Dimming			$65.00
Daylighting - On/Off	0.90	Daylighting - On/Off			$65.00
High Efficiency Low Ballast Factor Electronic Ballasts	kW EE	Standard Electronic Ballasts	kW Base		
1 Lamp T8 32W Fixture	0.025	1 Lamp T8 32W Fixture	0.031		$55.00
2 Lamp T8 32W Fixture	0.048	2 Lamp T8 32W Fixture	0.058		$55.00
3 Lamp T8 32W Fixture	0.072	3 Lamp T8 32W Fixture	0.085		$55.00
4 Lamp T8 32W Fixture	0.096	4 Lamp T8 32W Fixture	0.112		$55.00

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Motor Efficiency

Prescriptive rebates will be offered for new motors (Plan A) up to 500 hp and replacement of currently operating motors (Plan B) up to 500 hp, and installation of new variable frequency drives (VFD) up to 200 hp.

Algorithms:

Motor Electrical Energy Savings (Customer kWh)	= HP x LF_Motors x Conversion x (1/Standard_Eff - 1/ High_Eff) x Hrs
Motor Electrical Demand Savings (Customer kW)	= HP x LF_Motors x Conversion x (1/Standard_Eff - 1/ High_Eff)
VFD Drive Electrical Energy Savings (Customer kWh)	= HP x LF_Drives x Conversion x (1/Standard_Eff) x Hrs x %_Savings_Drives
VFD Drive Electrical Demand Savings (Customer kW)	= HP x LF_Drives x Conversion x (1/Standard_Eff) x %_Savings_Drives
Electrical Energy Savings (Gross Generator kWh)	= Customer kWh / (1-TDLF)
Electrical Demand Savings (Gross Generator kW)	= Customer kW x CF / (1-TDLF)
Electrical Energy Savings (Net Generator kWh)	= Gross Generator kWh x NTG
Electrical Demand Savings (Net Generator kW)	= Gross Generator kW x NTG

Variables:

Hrs	= Annual operational hours per year of the motor. Deemed values are used for hours based on the type and use of the motor. The customer provides the following information on the rebate form (HP, Industrial/non industrial, building type, and pump/fan/other)
LF_Motors	= Motor load factor as percentage (0 - 100). The assumed value of 75% will be used for prescriptive motors. See Reference 3
LF_Drives	= Drive load factor as percentage (0 - 100). The assumed value of 75% will be used for prescriptive pumping drives and 65% will be used for prescriptive fan drives. (Reference 5)
HP	= Rated motor horsepower provided by customer on rebate form.
High_Eff	= Efficiency of high efficiency replacement motor as percentage (0-100). The customer will provide the model and serial number of the motor along with actual nameplate efficiency from the new motor. If the actual efficiency is not provided by the custom
Standard_Eff (Plan A motors and drives)	= Efficiency of standard replacement motor as percentage (0 - 100) we will use 'EPAct Efficiency' as specified in Table 1 based on customer provided motor size, speed, and type.
Standard_Eff (Plan B motors)	= Efficiency of existing motor (0 - 100). We will use efficiency of 'Existing Efficiency Motors', from Table 1.
%_Savings_Drives	= Average savings achieved by installing a variable frequency drive on a fan or pumping motor. 33% will be used for prescriptive drive rebates. (Reference 5)
Conversion	= Standard conversion from horsepower to kW. 1 HP = .746 kW

Coincidence Factor	= Probability that peak demand of the motor will coincide with peak utility system demand. 0.78 will be used for prescriptive rebates, see Reference 2.
Measure Life	= Length of time the motor/drive will be operational = 20 years, (Reference 3)
Baseline and incremental cost assumptions	= The customer will provide the model and serial number of the motor from that the size, type and rpm of the motor/drive will determine the deemed baseline cost or incremental cost from Table 1. (Reference 1, 3 and 6)
TDLF	A transmission distribution loss factor of 6.39% will be used. This is calculated using factors from Enhanced DSM Filing - SRD-2
NTG	Net-to-Gross factors - We will use 87% as the NTG for all motors programs (Reference 7)
Incremental operation and maintenance costs or savings	= 0 value assumed for this program

Provided by Customer:	**Verified during M&V:**
For Motors:	
New motor model and serial number (HP, efficiency, type, and speed can then be looked up in a database)	Yes
Application of motor (Industrial/non Industrial)	Yes
Building type where motor is installed for non industrial motors	Yes
Use of motor (pump, fan, other) for non industrial motors	Yes
Equipment is installed	Yes
For Variable Frequency Drives (VFD):	
Size, speed, type and use of motor drive is connected to	Yes
Application of motor (Industrial/non Industrial)	Yes
Building type where motor is installed for non industrial motors	Yes
Use of motor (pump, fan, other) for non industrial motors	Yes
Equipment is installed	Yes

Assumptions:
- Each motor is replaced with the same size on a 1 for 1 basis. Motors replaced with different sizes can participate in the Custom Efficiency program.
- Prescriptive rebates are only given for motors put into service, rebates are not given for backup motors.
- Prescriptive rebates are only given to variable frequency drives installed on pump or fan applications.
- Rebates do not apply to rewound or repaired motors.

Table 1. Excerpt from Deemed Plan A Tables: Motor Efficiency and Incremental Cost of Premium Efficiency Motor (Reference 1,2,3) Full table in "Deemed Plan A Tables" tab

Motor Tag	Standard or Premium Efficiency	HP	Speed (rpm)	Type (Open Drip Proof or Totally Enclosed Fan Cooled)	Efficiency	Incremental Cost
Premium Efficiency Motor 1 HP 1200 RPM ODP	Premium Efficiency Motor	1	1200	ODP	82.5%	$52
Existing Efficiency Motor 2 HP 1800 RPM ODP	Existing Efficiency Motor	2	1800	ODP	78.5%	-
Premium Efficiency Motor 25 HP 3600 RPM ODP	Premium Efficiency Motor	25	3600	ODP	91.7%	$ 1,030
Existing Efficiency Motor 5 HP 1800 RPM TEFC	Existing Efficiency Motor	5	1800	TEFC	83.2%	-

Table 2. Excerpt from Deemed Plan B Tables: Motor Efficiency and Incremental Cost of Premium Efficiency Motor (Reference 1,2,3) Full table in "Deemed Plan B Tables" tab

Motor Tag	Standard or Premium Efficiency	HP	Speed (rpm)	Type (Open Drip Proof or Totally Enclosed Fan Cooled)	Efficiency	Incremental Cost
Existing Efficiency Motor 1 HP 1200 RPM ODP	Existing Efficiency Motor	1	1200	ODP	76.3%	-
Premium Efficiency Motor 3 HP 1200 RPM ODP	Premium Efficiency Motor	3	1200	ODP	88.5%	$ 434.20
Existing Efficiency Motor 15 HP 1800 RPM TEFC	Existing Efficiency Motor	15	1800	TEFC	87.2%	-
Premium Efficiency Motor 75 HP 3600 RPM TEFC	Premium Efficiency Motor	75	3600	TEFC	93.6%	$ 4,305.60

Table 3: Excerpt of Operating Hours by Motor Size, Industrial Applications (Reference 4) Full table in "Deemed Plan A Tables" tab

HP	All SIC (Industrial)
1	2,745
25	4,067
100	5,329

Table 4: Excerpt of Operating Hours by Application, Non-industrial (Reference 3) Full table in "Deemed Plan A Tables" tab

Building Type	Operating Hours
Office HVAC Pump	2,000
Retail Ventilation Fan	3,261
Hospitals Other Application	4,500

Table 5. Excerpt from Deemed ASD Tables tab showing incremental costs for ASDs (Reference 8)

HP	Average Installed price ($)
1	684
2	737
2	815
3	921
5	1,172

Table 6. Excerpt from Deemed Enhanced Cost Table tab showing incremental costs for Enhanced NEMA Premium Motors (Reference 9)

HP	Plan A Incremental Cost	Plan B Incremental Cost
1	$69	$402
1.5	$75	$442
2	$72	$472

Changes from 2008:

Prescriptive rebates will be offered for Plan A motors from 201-500 hp in addition to previously offered rebates for 1-200 hp.
Prescriptive rebates for Plan B motors have been added for 2009
Prescriptive rebates for Enhanced NEMA Premium motors have been added for 2009

References:

1. CEE (Consortium for Energy Efficiency) Premium Efficiency Motors Initiative - Source for premium motor efficiencies, EPAct Standard Motor Efficiencies and baseline/incremental costs
2. NYSERDA (New York State Energy Research and Development Authority), Energy $mart Programs Deemed Savings Database - Source for Coincidence Factor
3. Efficiency Vermont's Technical Reference User Manual, 2004 - Source for operating hours for non-industrial motors (p.15) and source for measure life, Source for load factor (75%) and baseline/incremental costs
4. United States Industrial Electric Motor Systems Market Opportunities Assessment, EERE, US DOE, Dec 2002 - Source for operating hours for industrial motors and source for load factor (Table 1-18 and 1-19)
5. Office of Industrial Electric Motor Systems Market Opportunities Assessment : Department of Energy (assessment of 265 Industrial facilities in 1997) - Source for VSD opportunity in the US market along with Load Factors for Fans and Pumps along with average savings.
6. NWPCC (Northwest Power Conservation Council) RTF's (Regional Technical Forum) Archived Measures - Source for full motor cost
7. Net-to-gross factor from Energy Efficiency Best Practices (http://www.eebestpractices.com)
8. Average cost for ASD information from Grainger (6/25/08) online
9. Assumed costs for Enhanced NEMA Premium motors are 10% higher than costs for NEMA Premium motors from Motor Master

Table 1. Excerpt from Deemed Plan A Tables: Motor Efficiency and Incremental Cost of Premium Efficiency Motor (Reference 1,2,3) Full table in "Deemed Plan A Tables" tab

Motor Tag	Standard or Premium Efficiency	HP	Speed (rpm)	Type (Open Drip Proof or Totally Enclosed Fan Cooled)	Efficiency	Incremental Cost
Premium Efficiency Motor 1 HP 1200 RPM ODP	Premium Efficiency Motor	1	1200	ODP	82.5%	$52
Existing Efficiency Motor 2 HP 1800 RPM ODP	Existing Efficiency Motor	2	1800	ODP	78.5%	-
Premium Efficiency Motor 25 HP 3600 RPM ODP	Premium Efficiency Motor	25	3600	ODP	91.7%	$ 1,030
Existing Efficiency Motor 5 HP 1800 RPM TEFC	Existing Efficiency Motor	5	1800	TEFC	83.2%	-

Table 2. Excerpt from Deemed Plan B Tables: Motor Efficiency and Incremental Cost of Premium Efficiency Motor (Reference 1,2,3) Full table in "Deemed Plan B Tables" tab

Motor Tag	Standard or Premium Efficiency	HP	Speed (rpm)	Type (Open Drip Proof or Totally Enclosed Fan Cooled)	Efficiency	Incremental Cost
Existing Efficiency Motor 1 HP 1200 RPM ODP	Existing Efficiency Motor	1	1200	ODP	76.3%	-
Premium Efficiency Motor 3 HP 1200 RPM ODP	Premium Efficiency Motor	3	1200	ODP	88.5%	$ 434.20
Existing Efficiency Motor 15 HP 1800 RPM TEFC	Existing Efficiency Motor	15	1800	TEFC	87.2%	-
Premium Efficiency Motor 75 HP 3600 RPM TEFC	Premium Efficiency Motor	75	3600	TEFC	93.6%	$ 4,305.60

Table 3: Excerpt of Operating Hours by Motor Size, Industrial Applications (Reference 4) Full table in "Deemed Plan A Tables" tab

HP	All SIC (Industrial)
1	2,745
25	4,067
100	5,329

Table 4: Excerpt of Operating Hours by Application, Non-industrial (Reference 3) Full table in "Deemed Plan A Tables" tab

Building Type	Operating Hours
Office HVAC Pump	2,000
Retail Ventilation Fan	3,261
Hospitals Other Application	4,500

Stipulated Values

Load Factor	0.75
Conversion	= .746 (1 HP = .746 kW)
Coincidence Factor	0.78

Table 1: Motor Efficiency and Incremental Cost of Premium Efficiency Motor (1), (2), (3)

Motor Tag	Standard or Premium Effici	HP	Speed	Type	Efficiency	Efficiency	Incremental Cost (NWPCC RTF)
Standard Efficiency Motor 1 HP 1200 RPM ODP	Standard Efficiency Motor	1	1200	ODP	80	80.0%	-
Standard Efficiency Motor 1.5 HP 1200 RPM ODP	Standard Efficiency Motor	1.5	1200	ODP	84	84.0%	-
Standard Efficiency Motor 2 HP 1200 RPM ODP	Standard Efficiency Motor	2	1200	ODP	85.5	85.5%	-
Standard Efficiency Motor 3 HP 1200 RPM ODP	Standard Efficiency Motor	3	1200	ODP	86.5	86.5%	-
Standard Efficiency Motor 5 HP 1200 RPM ODP	Standard Efficiency Motor	5	1200	ODP	87.5	87.5%	-
Standard Efficiency Motor 7.5 HP 1200 RPM ODP	Standard Efficiency Motor	7.5	1200	ODP	88.5	88.5%	-
Standard Efficiency Motor 10 HP 1200 RPM ODP	Standard Efficiency Motor	10	1200	ODP	90.2	90.2%	-
Standard Efficiency Motor 15 HP 1200 RPM ODP	Standard Efficiency Motor	15	1200	ODP	90.2	90.2%	-
Standard Efficiency Motor 20 HP 1200 RPM ODP	Standard Efficiency Motor	20	1200	ODP	91	91.0%	-
Standard Efficiency Motor 25 HP 1200 RPM ODP	Standard Efficiency Motor	25	1200	ODP	91.7	91.7%	-
Standard Efficiency Motor 30 HP 1200 RPM ODP	Standard Efficiency Motor	30	1200	ODP	92.4	92.4%	-
Standard Efficiency Motor 40 HP 1200 RPM ODP	Standard Efficiency Motor	40	1200	ODP	93	93.0%	-
Standard Efficiency Motor 50 HP 1200 RPM ODP	Standard Efficiency Motor	50	1200	ODP	93	93.0%	-
Standard Efficiency Motor 60 HP 1200 RPM ODP	Standard Efficiency Motor	60	1200	ODP	93.6	93.6%	-
Standard Efficiency Motor 75 HP 1200 RPM ODP	Standard Efficiency Motor	75	1200	ODP	93.6	93.6%	-
Standard Efficiency Motor 100 HP 1200 RPM ODP	Standard Efficiency Motor	100	1200	ODP	94.1	94.1%	-
Standard Efficiency Motor 125 HP 1200 RPM ODP	Standard Efficiency Motor	125	1200	ODP	94.1	94.1%	-
Standard Efficiency Motor 150 HP 1200 RPM ODP	Standard Efficiency Motor	150	1200	ODP	94.5	94.5%	-
Standard Efficiency Motor 200 HP 1200 RPM ODP	Standard Efficiency Motor	200	1200	ODP	94.5	94.5%	-
Standard Efficiency Motor 1 HP 1800 RPM ODP	Standard Efficiency Motor	1	1800	ODP	82.5	82.5%	-
Standard Efficiency Motor 1.5 HP 1800 RPM ODP	Standard Efficiency Motor	1.5	1800	ODP	84	84.0%	-
Standard Efficiency Motor 2 HP 1800 RPM ODP	Standard Efficiency Motor	2	1800	ODP	84	84.0%	-
Standard Efficiency Motor 3 HP 1800 RPM ODP	Standard Efficiency Motor	3	1800	ODP	86.5	86.5%	-
Standard Efficiency Motor 5 HP 1800 RPM ODP	Standard Efficiency Motor	5	1800	ODP	87.5	87.5%	-
Standard Efficiency Motor 7.5 HP 1800 RPM ODP	Standard Efficiency Motor	7.5	1800	ODP	88.5	88.5%	-
Standard Efficiency Motor 10 HP 1800 RPM ODP	Standard Efficiency Motor	10	1800	ODP	89.5	89.5%	-
Standard Efficiency Motor 15 HP 1800 RPM ODP	Standard Efficiency Motor	15	1800	ODP	91	91.0%	-
Standard Efficiency Motor 20 HP 1800 RPM ODP	Standard Efficiency Motor	20	1800	ODP	91	91.0%	-
Standard Efficiency Motor 25 HP 1800 RPM ODP	Standard Efficiency Motor	25	1800	ODP	91.7	91.7%	-
Standard Efficiency Motor 30 HP 1800 RPM ODP	Standard Efficiency Motor	30	1800	ODP	92.4	92.4%	-
Standard Efficiency Motor 40 HP 1800 RPM ODP	Standard Efficiency Motor	40	1800	ODP	93	93.0%	-
Standard Efficiency Motor 50 HP 1800 RPM ODP	Standard Efficiency Motor	50	1800	ODP	93	93.0%	-
Standard Efficiency Motor 60 HP 1800 RPM ODP	Standard Efficiency Motor	60	1800	ODP	93.6	93.6%	-
Standard Efficiency Motor 75 HP 1800 RPM ODP	Standard Efficiency Motor	75	1800	ODP	94.1	94.1%	-
Standard Efficiency Motor 100 HP 1800 RPM ODP	Standard Efficiency Motor	100	1800	ODP	94.1	94.1%	-
Standard Efficiency Motor 125 HP 1800 RPM ODP	Standard Efficiency Motor	125	1800	ODP	94.5	94.5%	-
Standard Efficiency Motor 150 HP 1800 RPM ODP	Standard Efficiency Motor	150	1800	ODP	95	95.0%	-
Standard Efficiency Motor 200 HP 1800 RPM ODP	Standard Efficiency Motor	200	1800	ODP	95	95.0%	-
Standard Efficiency Motor 1 HP 3600 RPM ODP	Standard Efficiency Motor	1	3600	ODP	N/A	N/A	-
Standard Efficiency Motor 1.5 HP 3600 RPM ODP	Standard Efficiency Motor	1.5	3600	ODP	82.5	82.5%	-
Standard Efficiency Motor 2 HP 3600 RPM ODP	Standard Efficiency Motor	2	3600	ODP	84	84.0%	-
Standard Efficiency Motor 3 HP 3600 RPM ODP	Standard Efficiency Motor	3	3600	ODP	84	84.0%	-

Standard Efficiency Motor 5 HP 3600 RPM ODP	Standard Efficiency Motor	5	3600	ODP	85.5	85.5%	-
Standard Efficiency Motor 7.5 HP 3600 RPM ODP	Standard Efficiency Motor	7.5	3600	ODP	87.5	87.5%	-
Standard Efficiency Motor 10 HP 3600 RPM ODP	Standard Efficiency Motor	10	3600	ODP	88.5	88.5%	-
Standard Efficiency Motor 15 HP 3600 RPM ODP	Standard Efficiency Motor	15	3600	ODP	89.5	89.5%	-
Standard Efficiency Motor 20 HP 3600 RPM ODP	Standard Efficiency Motor	20	3600	ODP	90.2	90.2%	-
Standard Efficiency Motor 25 HP 3600 RPM ODP	Standard Efficiency Motor	25	3600	ODP	91	91.0%	-
Standard Efficiency Motor 30 HP 3600 RPM ODP	Standard Efficiency Motor	30	3600	ODP	91	91.0%	-
Standard Efficiency Motor 40 HP 3600 RPM ODP	Standard Efficiency Motor	40	3600	ODP	91.7	91.7%	-
Standard Efficiency Motor 50 HP 3600 RPM ODP	Standard Efficiency Motor	50	3600	ODP	92.4	92.4%	-
Standard Efficiency Motor 60 HP 3600 RPM ODP	Standard Efficiency Motor	60	3600	ODP	93	93.0%	-
Standard Efficiency Motor 75 HP 3600 RPM ODP	Standard Efficiency Motor	75	3600	ODP	93	93.0%	-
Standard Efficiency Motor 100 HP 3600 RPM ODP	Standard Efficiency Motor	100	3600	ODP	93	93.0%	-
Standard Efficiency Motor 125 HP 3600 RPM ODP	Standard Efficiency Motor	125	3600	ODP	93.6	93.6%	-
Standard Efficiency Motor 150 HP 3600 RPM ODP	Standard Efficiency Motor	150	3600	ODP	93.6	93.6%	-
Standard Efficiency Motor 200 HP 3600 RPM ODP	Standard Efficiency Motor	200	3600	ODP	94.5	94.5%	-
Standard Efficiency Motor 1 HP 1200 RPM TEFC	Standard Efficiency Motor	1	1200	TEFC	80	80.0%	-
Standard Efficiency Motor 1.5 HP 1200 RPM TEFC	Standard Efficiency Motor	1.5	1200	TEFC	85.5	85.5%	-
Standard Efficiency Motor 2 HP 1200 RPM TEFC	Standard Efficiency Motor	2	1200	TEFC	86.5	86.5%	-
Standard Efficiency Motor 3 HP 1200 RPM TEFC	Standard Efficiency Motor	3	1200	TEFC	87.5	87.5%	-
Standard Efficiency Motor 5 HP 1200 RPM TEFC	Standard Efficiency Motor	5	1200	TEFC	87.5	87.5%	-
Standard Efficiency Motor 7.5 HP 1200 RPM TEFC	Standard Efficiency Motor	7.5	1200	TEFC	89.5	89.5%	-
Standard Efficiency Motor 10 HP 1200 RPM TEFC	Standard Efficiency Motor	10	1200	TEFC	89.5	89.5%	-
Standard Efficiency Motor 15 HP 1200 RPM TEFC	Standard Efficiency Motor	15	1200	TEFC	90.2	90.2%	-
Standard Efficiency Motor 20 HP 1200 RPM TEFC	Standard Efficiency Motor	20	1200	TEFC	90.2	90.2%	-
Standard Efficiency Motor 25 HP 1200 RPM TEFC	Standard Efficiency Motor	25	1200	TEFC	91.7	91.7%	-
Standard Efficiency Motor 30 HP 1200 RPM TEFC	Standard Efficiency Motor	30	1200	TEFC	91.7	91.7%	-
Standard Efficiency Motor 40 HP 1200 RPM TEFC	Standard Efficiency Motor	40	1200	TEFC	93	93.0%	-
Standard Efficiency Motor 50 HP 1200 RPM TEFC	Standard Efficiency Motor	50	1200	TEFC	93	93.0%	-
Standard Efficiency Motor 60 HP 1200 RPM TEFC	Standard Efficiency Motor	60	1200	TEFC	93.6	93.6%	-
Standard Efficiency Motor 75 HP 1200 RPM TEFC	Standard Efficiency Motor	75	1200	TEFC	93.6	93.6%	-
Standard Efficiency Motor 100 HP 1200 RPM TEFC	Standard Efficiency Motor	100	1200	TEFC	94.1	94.1%	-
Standard Efficiency Motor 125 HP 1200 RPM TEFC	Standard Efficiency Motor	125	1200	TEFC	94.1	94.1%	-
Standard Efficiency Motor 150 HP 1200 RPM TEFC	Standard Efficiency Motor	150	1200	TEFC	95	95.0%	-
Standard Efficiency Motor 200 HP 1200 RPM TEFC	Standard Efficiency Motor	200	1200	TEFC	95	95.0%	-
Standard Efficiency Motor 1 HP 1800 RPM TEFC	Standard Efficiency Motor	1	1800	TEFC	82.5	82.5%	-
Standard Efficiency Motor 1.5 HP 1800 RPM TEFC	Standard Efficiency Motor	1.5	1800	TEFC	84	84.0%	-
Standard Efficiency Motor 2 HP 1800 RPM TEFC	Standard Efficiency Motor	2	1800	TEFC	84	84.0%	-
Standard Efficiency Motor 3 HP 1800 RPM TEFC	Standard Efficiency Motor	3	1800	TEFC	87.5	87.5%	-
Standard Efficiency Motor 5 HP 1800 RPM TEFC	Standard Efficiency Motor	5	1800	TEFC	87.5	87.5%	-
Standard Efficiency Motor 7.5 HP 1800 RPM TEFC	Standard Efficiency Motor	7.5	1800	TEFC	89.5	89.5%	-
Standard Efficiency Motor 10 HP 1800 RPM TEFC	Standard Efficiency Motor	10	1800	TEFC	89.5	89.5%	-
Standard Efficiency Motor 15 HP 1800 RPM TEFC	Standard Efficiency Motor	15	1800	TEFC	91	91.0%	-
Standard Efficiency Motor 20 HP 1800 RPM TEFC	Standard Efficiency Motor	20	1800	TEFC	91	91.0%	-
Standard Efficiency Motor 25 HP 1800 RPM TEFC	Standard Efficiency Motor	25	1800	TEFC	92.4	92.4%	-
Standard Efficiency Motor 30 HP 1800 RPM TEFC	Standard Efficiency Motor	30	1800	TEFC	92.4	92.4%	-
Standard Efficiency Motor 40 HP 1800 RPM TEFC	Standard Efficiency Motor	40	1800	TEFC	93	93.0%	-
Standard Efficiency Motor 50 HP 1800 RPM TEFC	Standard Efficiency Motor	50	1800	TEFC	93	93.0%	-
Standard Efficiency Motor 60 HP 1800 RPM TEFC	Standard Efficiency Motor	60	1800	TEFC	93.6	93.6%	-
Standard Efficiency Motor 75 HP 1800 RPM TEFC	Standard Efficiency Motor	75	1800	TEFC	94.1	94.1%	-
Standard Efficiency Motor 100 HP 1800 RPM TEFC	Standard Efficiency Motor	100	1800	TEFC	94.5	94.5%	-
Standard Efficiency Motor 125 HP 1800 RPM TEFC	Standard Efficiency Motor	125	1800	TEFC	94.5	94.5%	-

Standard Efficiency Motor 150 HP 1800 RPM TEFC	Standard Efficiency Motor	150	1800	TEFC	95	95.0%	-
Standard Efficiency Motor 200 HP 1800 RPM TEFC	Standard Efficiency Motor	200	1800	TEFC	95	95.0%	-
Standard Efficiency Motor 1 HP 3600 RPM TEFC	Standard Efficiency Motor	1	3600	TEFC	75.5	75.5%	-
Standard Efficiency Motor 1.5 HP 3600 RPM TEFC	Standard Efficiency Motor	1.5	3600	TEFC	82.5	82.5%	-
Standard Efficiency Motor 2 HP 3600 RPM TEFC	Standard Efficiency Motor	2	3600	TEFC	84	84.0%	-
Standard Efficiency Motor 3 HP 3600 RPM TEFC	Standard Efficiency Motor	3	3600	TEFC	85.5	85.5%	-
Standard Efficiency Motor 5 HP 3600 RPM TEFC	Standard Efficiency Motor	5	3600	TEFC	87.5	87.5%	-
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Standard Efficiency Motor 15 HP 3600 RPM TEFC	Standard Efficiency Motor	15	3600	TEFC	90.2	90.2%	-
Standard Efficiency Motor 20 HP 3600 RPM TEFC	Standard Efficiency Motor	20	3600	TEFC	90.2	90.2%	-
Standard Efficiency Motor 25 HP 3600 RPM TEFC	Standard Efficiency Motor	25	3600	TEFC	91	91.0%	-
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Standard Efficiency Motor 150 HP 3600 RPM TEFC	Standard Efficiency Motor	150	3600	TEFC	94.5	94.5%	-
Standard Efficiency Motor 200 HP 3600 RPM TEFC	Standard Efficiency Motor	200	3600	TEFC	95	95.0%	-
Premium Efficiency Motor 1 HP 1200 RPM ODP	Premium Efficiency Motor	1	1200	ODP	82.5	82.5%	$52
Premium Efficiency Motor 1.5 HP 1200 RPM ODP	Premium Efficiency Motor	1.5	1200	ODP	86.5	86.5%	$60
Premium Efficiency Motor 2 HP 1200 RPM ODP	Premium Efficiency Motor	2	1200	ODP	87.5	87.5%	$61
Premium Efficiency Motor 3 HP 1200 RPM ODP	Premium Efficiency Motor	3	1200	ODP	88.5	88.5%	$54
Premium Efficiency Motor 5 HP 1200 RPM ODP	Premium Efficiency Motor	5	1200	ODP	89.5	89.5%	$63
Premium Efficiency Motor 7.5 HP 1200 RPM ODP	Premium Efficiency Motor	7.5	1200	ODP	90.2	90.2%	$123
Premium Efficiency Motor 10 HP 1200 RPM ODP	Premium Efficiency Motor	10	1200	ODP	91.7	91.7%	$116
Premium Efficiency Motor 15 HP 1200 RPM ODP	Premium Efficiency Motor	15	1200	ODP	91.7	91.7%	$115
Premium Efficiency Motor 20 HP 1200 RPM ODP	Premium Efficiency Motor	20	1200	ODP	92.4	92.4%	$115
Premium Efficiency Motor 25 HP 1200 RPM ODP	Premium Efficiency Motor	25	1200	ODP	93	93.0%	$201
Premium Efficiency Motor 30 HP 1200 RPM ODP	Premium Efficiency Motor	30	1200	ODP	93.6	93.6%	$231
Premium Efficiency Motor 40 HP 1200 RPM ODP	Premium Efficiency Motor	40	1200	ODP	94.1	94.1%	$249
Premium Efficiency Motor 50 HP 1200 RPM ODP	Premium Efficiency Motor	50	1200	ODP	94.1	94.1%	$273
Premium Efficiency Motor 60 HP 1200 RPM ODP	Premium Efficiency Motor	60	1200	ODP	94.5	94.5%	$431
Premium Efficiency Motor 75 HP 1200 RPM ODP	Premium Efficiency Motor	75	1200	ODP	94.5	94.5%	$554
Premium Efficiency Motor 100 HP 1200 RPM ODP	Premium Efficiency Motor	100	1200	ODP	95	95.0%	$658
Premium Efficiency Motor 125 HP 1200 RPM ODP	Premium Efficiency Motor	125	1200	ODP	95	95.0%	$841
Premium Efficiency Motor 150 HP 1200 RPM ODP	Premium Efficiency Motor	150	1200	ODP	95.4	95.4%	$908
Premium Efficiency Motor 200 HP 1200 RPM ODP	Premium Efficiency Motor	200	1200	ODP	95.4	95.4%	$964
Premium Efficiency Motor 1 HP 1800 RPM ODP	Premium Efficiency Motor	1	1800	ODP	85.5	85.5%	$52
Premium Efficiency Motor 1.5 HP 1800 RPM ODP	Premium Efficiency Motor	1.5	1800	ODP	86.5	86.5%	$60
Premium Efficiency Motor 2 HP 1800 RPM ODP	Premium Efficiency Motor	2	1800	ODP	86.5	86.5%	$61
Premium Efficiency Motor 3 HP 1800 RPM ODP	Premium Efficiency Motor	3	1800	ODP	89.5	89.5%	$54
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Premium Efficiency Motor 25 HP 1800 RPM ODP	Premium Efficiency Motor	25	1800	ODP	93.6	93.6%	$201
Premium Efficiency Motor 30 HP 1800 RPM ODP	Premium Efficiency Motor	30	1800	ODP	94.1	94.1%	$231

Premium Efficiency Motor 40 HP 1800 RPM ODP	Premium Efficiency Motor	40	1800	ODP	94.1	94.1%	$249
Premium Efficiency Motor 50 HP 1800 RPM ODP	Premium Efficiency Motor	50	1800	ODP	94.5	94.5%	$273
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Premium Efficiency Motor 150 HP 1800 RPM ODP	Premium Efficiency Motor	150	1800	ODP	95.8	95.8%	$908
Premium Efficiency Motor 200 HP 1800 RPM ODP	Premium Efficiency Motor	200	1800	ODP	95.8	95.8%	$964
Premium Efficiency Motor 1 HP 3600 RPM ODP	Premium Efficiency Motor	1	3600	ODP	77	77.0%	$52
Premium Efficiency Motor 1.5 HP 3600 RPM ODP	Premium Efficiency Motor	1.5	3600	ODP	84	84.0%	$60
Premium Efficiency Motor 2 HP 3600 RPM ODP	Premium Efficiency Motor	2	3600	ODP	85.5	85.5%	$61
Premium Efficiency Motor 3 HP 3600 RPM ODP	Premium Efficiency Motor	3	3600	ODP	85.5	85.5%	$54
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Premium Efficiency Motor 15 HP 3600 RPM ODP	Premium Efficiency Motor	15	3600	ODP	90.2	90.2%	$115
Premium Efficiency Motor 20 HP 3600 RPM ODP	Premium Efficiency Motor	20	3600	ODP	91	91.0%	$115
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Premium Efficiency Motor 50 HP 3600 RPM ODP	Premium Efficiency Motor	50	3600	ODP	93	93.0%	$273
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Premium Efficiency Motor 125 HP 3600 RPM ODP	Premium Efficiency Motor	125	3600	ODP	94.1	94.1%	$841
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Premium Efficiency Motor 1.5 HP 1200 RPM TEFC	Premium Efficiency Motor	1.5	1200	TEFC	87.5	87.5%	$60
Premium Efficiency Motor 2 HP 1200 RPM TEFC	Premium Efficiency Motor	2	1200	TEFC	88.5	88.5%	$61
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Premium Efficiency Motor 75 HP 1200 RPM TEFC	Premium Efficiency Motor	75	1200	TEFC	94.5	94.5%	$554
Premium Efficiency Motor 100 HP 1200 RPM TEFC	Premium Efficiency Motor	100	1200	TEFC	95	95.0%	$658
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Premium Efficiency Motor 150 HP 1200 RPM TEFC	Premium Efficiency Motor	150	1200	TEFC	95.8	95.8%	$908
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Premium Efficiency Motor 1 HP 1800 RPM TEFC	Premium Efficiency Motor	1	1800	TEFC	85.5	85.5%	$52
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Premium Efficiency Motor 1 HP 3600 RPM TEFC	Premium Efficiency Motor	1	3600	TEFC	77	77.0%	$52
Premium Efficiency Motor 1.5 HP 3600 RPM TEFC	Premium Efficiency Motor	1.5	3600	TEFC	84	84.0%	$60
Premium Efficiency Motor 2 HP 3600 RPM TEFC	Premium Efficiency Motor	2	3600	TEFC	85.5	85.5%	$61
Premium Efficiency Motor 3 HP 3600 RPM TEFC	Premium Efficiency Motor	3	3600	TEFC	86.5	86.5%	$54
Premium Efficiency Motor 5 HP 3600 RPM TEFC	Premium Efficiency Motor	5	3600	TEFC	88.5	88.5%	$63
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Premium Efficiency Motor 10 HP 3600 RPM TEFC	Premium Efficiency Motor	10	3600	TEFC	90.2	90.2%	$116
Premium Efficiency Motor 15 HP 3600 RPM TEFC	Premium Efficiency Motor	15	3600	TEFC	91	91.0%	$115
Premium Efficiency Motor 20 HP 3600 RPM TEFC	Premium Efficiency Motor	20	3600	TEFC	91	91.0%	$115
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Premium Efficiency Motor 50 HP 3600 RPM TEFC	Premium Efficiency Motor	50	3600	TEFC	93	93.0%	$273
Premium Efficiency Motor 60 HP 3600 RPM TEFC	Premium Efficiency Motor	60	3600	TEFC	93.6	93.6%	$431
Premium Efficiency Motor 75 HP 3600 RPM TEFC	Premium Efficiency Motor	75	3600	TEFC	93.6	93.6%	$554
Premium Efficiency Motor 100 HP 3600 RPM TEFC	Premium Efficiency Motor	100	3600	TEFC	94.1	94.1%	$658
Premium Efficiency Motor 125 HP 3600 RPM TEFC	Premium Efficiency Motor	125	3600	TEFC	95	95.0%	$841
Premium Efficiency Motor 150 HP 3600 RPM TEFC	Premium Efficiency Motor	150	3600	TEFC	95	95.0%	$908
Premium Efficiency Motor 200 HP 3600 RPM TEFC	Premium Efficiency Motor	200	3600	TEFC	95.4	95.4%	$964

Measure Life

Measure Life =	20 years (2), (3)	20

Table 2: Operating Hours by Motor Size, Industrial Applications (4)

HP	All SIC (Industrial)
1	2,745
1.5	2,745
2	2,745
3	2,745
5	2,745
7.5	3,391
10	3,391
15	3,391
20	3,391
25	4,067

30	4,067
40	4,067
50	4,067
60	5,329
75	5,329
100	5,329
125	5,200
150	5,200
200	5,200

Table 3: Operating Hours by Application, Non-industrial (3)

Building Type	Operating Hours
Office HVAC Pump	2,000
Retail HVAC Pump	2,000
Hospitals HVAC Pump	2,754
Elem/Sec Schools HVAC Pump	2,190
Restaurant HVAC Pump	2,000
Warehouse HVAC Pump	2,241
Hotels/Motels HVAC Pump	4,231
Grocery HVAC Pump	2,080
Health HVAC Pump	2,559
College/Univ HVAC Pump	3,641
Office Ventilation Fan	6,192
Retail Ventilation Fan	3,261
Hospitals Ventilation Fan	8,374
Elem/Sec Schools Ventilation Fan	3,699
Restaurant Ventilation Fan	4,155
Warehouse Ventilation Fan	6,389
Hotels/Motels Ventilation Fan	3,719
Grocery Ventilation Fan	6,389
Health Ventilation Fan	2,000
College/Univ Ventilation Fan	3,631
Office Other Application	4500
Retail Other Application	4500
Hospitals Other Application	4500
Elem/Sec Schools Other Application	4500
Restaurant Other Application	4500
Warehouse Other Application	4500
Hotels/Motels Other Application	4500
Grocery Other Application	4500
Health Other Application	4500
College/Univ Other Application	4500

References

1 CEE (Consortium for Energy Efficiency) Premium Efficiency Motors Iniative - Source for premium motor efficiencies and EPAct Standard Motor Efficiencies
2 NYSERDA (New York State Energy Research and Development Authority), Energy $mart Programs Deemed Savings Database
3 Efficiency Vermont's Technical Reference User Manual, 2004 - Source for operating hours for non-industrial motors (p.15) and source for measure life and source for load factor (75%)
4 United States Industrial Electric Motor Systems Market Opportunities Assessment, EERE, US DOE, Dec 2002 - Source for operating hours for industrial motors and source for load factor (Table 1-18 and 1-19)

Stipulated Values

Load Factor	0.75
Conversion	= .746 (1 HP = .746 kW)
Coincidence Factor	0.78

Table 1: Motor Efficiency and Full Cost of Premium Efficiency Motor (2), (5), (1)

Motor Tag	Existing or Premium Efficiency	HP	Speed	Type	Efficiency	% Eff	Full Cost
Existing Efficiency Motor 1 HP 1200 RPM ODP	Existing Efficiency Motor	1	1200	ODP	76.3	76.3%	-
Existing Efficiency Motor 1.5 HP 1200 RPM ODP	Existing Efficiency Motor	1.5	1200	ODP	77.4	77.4%	-
Existing Efficiency Motor 2 HP 1200 RPM ODP	Existing Efficiency Motor	2	1200	ODP	78.5	78.5%	-
Existing Efficiency Motor 3 HP 1200 RPM ODP	Existing Efficiency Motor	3	1200	ODP	80.6	80.6%	-
Existing Efficiency Motor 5 HP 1200 RPM ODP	Existing Efficiency Motor	5	1200	ODP	83.2	83.2%	-
Existing Efficiency Motor 7.5 HP 1200 RPM ODP	Existing Efficiency Motor	7.5	1200	ODP	85.3	85.3%	-
Existing Efficiency Motor 10 HP 1200 RPM ODP	Existing Efficiency Motor	10	1200	ODP	86.3	86.3%	-
Existing Efficiency Motor 15 HP 1200 RPM ODP	Existing Efficiency Motor	15	1200	ODP	87.2	87.2%	-
Existing Efficiency Motor 20 HP 1200 RPM ODP	Existing Efficiency Motor	20	1200	ODP	88.1	88.1%	-
Existing Efficiency Motor 25 HP 1200 RPM ODP	Existing Efficiency Motor	25	1200	ODP	88.9	88.9%	-
Existing Efficiency Motor 30 HP 1200 RPM ODP	Existing Efficiency Motor	30	1200	ODP	89.4	89.4%	-
Existing Efficiency Motor 40 HP 1200 RPM ODP	Existing Efficiency Motor	40	1200	ODP	89.7	89.7%	-
Existing Efficiency Motor 50 HP 1200 RPM ODP	Existing Efficiency Motor	50	1200	ODP	89.9	89.9%	-
Existing Efficiency Motor 60 HP 1200 RPM ODP	Existing Efficiency Motor	60	1200	ODP	90.4	90.4%	-
Existing Efficiency Motor 75 HP 1200 RPM ODP	Existing Efficiency Motor	75	1200	ODP	90.9	90.9%	-
Existing Efficiency Motor 100 HP 1200 RPM ODP	Existing Efficiency Motor	100	1200	ODP	90.9	90.9%	-
Existing Efficiency Motor 125 HP 1200 RPM ODP	Existing Efficiency Motor	125	1200	ODP	91.3	91.3%	-
Existing Efficiency Motor 150 HP 1200 RPM ODP	Existing Efficiency Motor	150	1200	ODP	91.7	91.7%	-
Existing Efficiency Motor 200 HP 1200 RPM ODP	Existing Efficiency Motor	200	1200	ODP	92.5	92.5%	-
Existing Efficiency Motor 1 HP 1800 RPM ODP	Existing Efficiency Motor	1	1800	ODP	76.3	76.3%	-
Existing Efficiency Motor 1.5 HP 1800 RPM ODP	Existing Efficiency Motor	1.5	1800	ODP	77.4	77.4%	-
Existing Efficiency Motor 2 HP 1800 RPM ODP	Existing Efficiency Motor	2	1800	ODP	78.5	78.5%	-
Existing Efficiency Motor 3 HP 1800 RPM ODP	Existing Efficiency Motor	3	1800	ODP	80.6	80.6%	-
Existing Efficiency Motor 5 HP 1800 RPM ODP	Existing Efficiency Motor	5	1800	ODP	83.2	83.2%	-
Existing Efficiency Motor 7.5 HP 1800 RPM ODP	Existing Efficiency Motor	7.5	1800	ODP	85.3	85.3%	-
Existing Efficiency Motor 10 HP 1800 RPM ODP	Existing Efficiency Motor	10	1800	ODP	86.3	86.3%	-
Existing Efficiency Motor 15 HP 1800 RPM ODP	Existing Efficiency Motor	15	1800	ODP	87.2	87.2%	-
Existing Efficiency Motor 20 HP 1800 RPM ODP	Existing Efficiency Motor	20	1800	ODP	88.1	88.1%	-
Existing Efficiency Motor 25 HP 1800 RPM ODP	Existing Efficiency Motor	25	1800	ODP	88.9	88.9%	-
Existing Efficiency Motor 30 HP 1800 RPM ODP	Existing Efficiency Motor	30	1800	ODP	89.4	89.4%	-
Existing Efficiency Motor 40 HP 1800 RPM ODP	Existing Efficiency Motor	40	1800	ODP	89.7	89.7%	-
Existing Efficiency Motor 50 HP 1800 RPM ODP	Existing Efficiency Motor	50	1800	ODP	89.9	89.9%	-
Existing Efficiency Motor 60 HP 1800 RPM ODP	Existing Efficiency Motor	60	1800	ODP	90.4	90.4%	-
Existing Efficiency Motor 75 HP 1800 RPM ODP	Existing Efficiency Motor	75	1800	ODP	90.9	90.9%	-
Existing Efficiency Motor 100 HP 1800 RPM ODP	Existing Efficiency Motor	100	1800	ODP	90.9	90.9%	-
Existing Efficiency Motor 125 HP 1800 RPM ODP	Existing Efficiency Motor	125	1800	ODP	91.3	91.3%	-
Existing Efficiency Motor 150 HP 1800 RPM ODP	Existing Efficiency Motor	150	1800	ODP	91.7	91.7%	-
Existing Efficiency Motor 200 HP 1800 RPM ODP	Existing Efficiency Motor	200	1800	ODP	92.5	92.5%	-
Existing Efficiency Motor 1 HP 3600 RPM ODP	Existing Efficiency Motor	1	3600	ODP	76.3	76.3%	-
Existing Efficiency Motor 1.5 HP 3600 RPM ODP	Existing Efficiency Motor	1.5	3600	ODP	77.4	77.4%	-
Existing Efficiency Motor 2 HP 3600 RPM ODP	Existing Efficiency Motor	2	3600	ODP	78.5	78.5%	-
Existing Efficiency Motor 3 HP 3600 RPM ODP	Existing Efficiency Motor	3	3600	ODP	80.6	80.6%	-
Existing Efficiency Motor 5 HP 3600 RPM ODP	Existing Efficiency Motor	5	3600	ODP	83.2	83.2%	-
Existing Efficiency Motor 7.5 HP 3600 RPM ODP	Existing Efficiency Motor	7.5	3600	ODP	85.3	85.3%	-

Existing Efficiency Motor 10 HP 3600 RPM ODP	Existing Efficiency Motor		10	3600	ODP	86.3	86.3%	-	
Existing Efficiency Motor 15 HP 3600 RPM ODP	Existing Efficiency Motor		15	3600	ODP	87.2	87.2%	-	
Existing Efficiency Motor 20 HP 3600 RPM ODP	Existing Efficiency Motor		20	3600	ODP	88.1	88.1%	-	
Existing Efficiency Motor 25 HP 3600 RPM ODP	Existing Efficiency Motor		25	3600	ODP	88.9	88.9%	-	
Existing Efficiency Motor 30 HP 3600 RPM ODP	Existing Efficiency Motor		30	3600	ODP	89.4	89.4%	-	
Existing Efficiency Motor 40 HP 3600 RPM ODP	Existing Efficiency Motor		40	3600	ODP	89.7	89.7%	-	
Existing Efficiency Motor 50 HP 3600 RPM ODP	Existing Efficiency Motor		50	3600	ODP	89.9	89.9%	-	
Existing Efficiency Motor 60 HP 3600 RPM ODP	Existing Efficiency Motor		60	3600	ODP	90.4	90.4%	-	
Existing Efficiency Motor 75 HP 3600 RPM ODP	Existing Efficiency Motor		75	3600	ODP	90.9	90.9%	-	
Existing Efficiency Motor 100 HP 3600 RPM ODP	Existing Efficiency Motor		100	3600	ODP	90.9	90.9%	-	
Existing Efficiency Motor 125 HP 3600 RPM ODP	Existing Efficiency Motor		125	3600	ODP	91.3	91.3%	-	
Existing Efficiency Motor 150 HP 3600 RPM ODP	Existing Efficiency Motor		150	3600	ODP	91.7	91.7%	-	
Existing Efficiency Motor 200 HP 3600 RPM ODP	Existing Efficiency Motor		200	3600	ODP	92.5	92.5%	-	
Existing Efficiency Motor 1 HP 1200 RPM TEFC	Existing Efficiency Motor		1	1200	TEFC	76.3	76.3%	-	
Existing Efficiency Motor 1.5 HP 1200 RPM TEFC	Existing Efficiency Motor		1.5	1200	TEFC	77.4	77.4%	-	
Existing Efficiency Motor 2 HP 1200 RPM TEFC	Existing Efficiency Motor		2	1200	TEFC	78.5	78.5%	-	
Existing Efficiency Motor 3 HP 1200 RPM TEFC	Existing Efficiency Motor		3	1200	TEFC	80.6	80.6%	-	
Existing Efficiency Motor 5 HP 1200 RPM TEFC	Existing Efficiency Motor		5	1200	TEFC	83.2	83.2%	-	
Existing Efficiency Motor 7.5 HP 1200 RPM TEFC	Existing Efficiency Motor		7.5	1200	TEFC	85.3	85.3%	-	
Existing Efficiency Motor 10 HP 1200 RPM TEFC	Existing Efficiency Motor		10	1200	TEFC	86.3	86.3%	-	
Existing Efficiency Motor 15 HP 1200 RPM TEFC	Existing Efficiency Motor		15	1200	TEFC	87.2	87.2%	-	
Existing Efficiency Motor 20 HP 1200 RPM TEFC	Existing Efficiency Motor		20	1200	TEFC	88.1	88.1%	-	
Existing Efficiency Motor 25 HP 1200 RPM TEFC	Existing Efficiency Motor		25	1200	TEFC	88.9	88.9%	-	
Existing Efficiency Motor 30 HP 1200 RPM TEFC	Existing Efficiency Motor		30	1200	TEFC	89.4	89.4%	-	
Existing Efficiency Motor 40 HP 1200 RPM TEFC	Existing Efficiency Motor		40	1200	TEFC	89.7	89.7%	-	
Existing Efficiency Motor 50 HP 1200 RPM TEFC	Existing Efficiency Motor		50	1200	TEFC	89.9	89.9%	-	
Existing Efficiency Motor 60 HP 1200 RPM TEFC	Existing Efficiency Motor		60	1200	TEFC	90.4	90.4%	-	
Existing Efficiency Motor 75 HP 1200 RPM TEFC	Existing Efficiency Motor		75	1200	TEFC	90.9	90.9%	-	
Existing Efficiency Motor 100 HP 1200 RPM TEFC	Existing Efficiency Motor		100	1200	TEFC	90.9	90.9%	-	
Existing Efficiency Motor 125 HP 1200 RPM TEFC	Existing Efficiency Motor		125	1200	TEFC	91.3	91.3%	-	
Existing Efficiency Motor 150 HP 1200 RPM TEFC	Existing Efficiency Motor		150	1200	TEFC	91.7	91.7%	-	
Existing Efficiency Motor 200 HP 1200 RPM TEFC	Existing Efficiency Motor		200	1200	TEFC	92.5	92.5%	-	
Existing Efficiency Motor 1 HP 1800 RPM TEFC	Existing Efficiency Motor		1	1800	TEFC	76.3	76.3%	-	
Existing Efficiency Motor 1.5 HP 1800 RPM TEFC	Existing Efficiency Motor		1.5	1800	TEFC	77.4	77.4%	-	
Existing Efficiency Motor 2 HP 1800 RPM TEFC	Existing Efficiency Motor		2	1800	TEFC	78.5	78.5%	-	
Existing Efficiency Motor 3 HP 1800 RPM TEFC	Existing Efficiency Motor		3	1800	TEFC	80.6	80.6%	-	
Existing Efficiency Motor 5 HP 1800 RPM TEFC	Existing Efficiency Motor		5	1800	TEFC	83.2	83.2%	-	
Existing Efficiency Motor 7.5 HP 1800 RPM TEFC	Existing Efficiency Motor		7.5	1800	TEFC	85.3	85.3%	-	
Existing Efficiency Motor 10 HP 1800 RPM TEFC	Existing Efficiency Motor		10	1800	TEFC	86.3	86.3%	-	
Existing Efficiency Motor 15 HP 1800 RPM TEFC	Existing Efficiency Motor		15	1800	TEFC	87.2	87.2%	-	
Existing Efficiency Motor 20 HP 1800 RPM TEFC	Existing Efficiency Motor		20	1800	TEFC	88.1	88.1%	-	
Existing Efficiency Motor 25 HP 1800 RPM TEFC	Existing Efficiency Motor		25	1800	TEFC	88.9	88.9%	-	
Existing Efficiency Motor 30 HP 1800 RPM TEFC	Existing Efficiency Motor		30	1800	TEFC	89.4	89.4%	-	
Existing Efficiency Motor 40 HP 1800 RPM TEFC	Existing Efficiency Motor		40	1800	TEFC	89.7	89.7%	-	
Existing Efficiency Motor 50 HP 1800 RPM TEFC	Existing Efficiency Motor		50	1800	TEFC	89.9	89.9%	-	
Existing Efficiency Motor 60 HP 1800 RPM TEFC	Existing Efficiency Motor		60	1800	TEFC	90.4	90.4%	-	
Existing Efficiency Motor 75 HP 1800 RPM TEFC	Existing Efficiency Motor		75	1800	TEFC	90.9	90.9%	-	
Existing Efficiency Motor 100 HP 1800 RPM TEFC	Existing Efficiency Motor		100	1800	TEFC	90.9	90.9%	-	
Existing Efficiency Motor 125 HP 1800 RPM TEFC	Existing Efficiency Motor		125	1800	TEFC	91.3	91.3%	-	
Existing Efficiency Motor 150 HP 1800 RPM TEFC	Existing Efficiency Motor		150	1800	TEFC	91.7	91.7%	-	
Existing Efficiency Motor 200 HP 1800 RPM TEFC	Existing Efficiency Motor		200	1800	TEFC	92.5	92.5%	-	

Existing Efficiency Motor 1 HP 3600 RPM TEFC	Existing Efficiency Motor		1	3600	TEFC	76.3	76.3%	-	
Existing Efficiency Motor 1.5 HP 3600 RPM TEFC	Existing Efficiency Motor		1.5	3600	TEFC	77.4	77.4%	-	
Existing Efficiency Motor 2 HP 3600 RPM TEFC	Existing Efficiency Motor		2	3600	TEFC	78.5	78.5%	-	
Existing Efficiency Motor 3 HP 3600 RPM TEFC	Existing Efficiency Motor		3	3600	TEFC	80.6	80.6%	-	
Existing Efficiency Motor 5 HP 3600 RPM TEFC	Existing Efficiency Motor		5	3600	TEFC	83.2	83.2%	-	
Existing Efficiency Motor 7.5 HP 3600 RPM TEFC	Existing Efficiency Motor		7.5	3600	TEFC	85.3	85.3%	-	
Existing Efficiency Motor 10 HP 3600 RPM TEFC	Existing Efficiency Motor		10	3600	TEFC	86.3	86.3%	-	
Existing Efficiency Motor 15 HP 3600 RPM TEFC	Existing Efficiency Motor		15	3600	TEFC	87.2	87.2%	-	
Existing Efficiency Motor 20 HP 3600 RPM TEFC	Existing Efficiency Motor		20	3600	TEFC	88.1	88.1%	-	
Existing Efficiency Motor 25 HP 3600 RPM TEFC	Existing Efficiency Motor		25	3600	TEFC	88.9	88.9%	-	
Existing Efficiency Motor 30 HP 3600 RPM TEFC	Existing Efficiency Motor		30	3600	TEFC	89.4	89.4%	-	
Existing Efficiency Motor 40 HP 3600 RPM TEFC	Existing Efficiency Motor		40	3600	TEFC	89.7	89.7%	-	
Existing Efficiency Motor 50 HP 3600 RPM TEFC	Existing Efficiency Motor		50	3600	TEFC	89.9	89.9%	-	
Existing Efficiency Motor 60 HP 3600 RPM TEFC	Existing Efficiency Motor		60	3600	TEFC	90.4	90.4%	-	
Existing Efficiency Motor 75 HP 3600 RPM TEFC	Existing Efficiency Motor		75	3600	TEFC	90.9	90.9%	-	
Existing Efficiency Motor 100 HP 3600 RPM TEFC	Existing Efficiency Motor		100	3600	TEFC	90.9	90.9%	-	
Existing Efficiency Motor 125 HP 3600 RPM TEFC	Existing Efficiency Motor		125	3600	TEFC	91.3	91.3%	-	
Existing Efficiency Motor 150 HP 3600 RPM TEFC	Existing Efficiency Motor		150	3600	TEFC	91.7	91.7%	-	
Existing Efficiency Motor 200 HP 3600 RPM TEFC	Existing Efficiency Motor		200	3600	TEFC	92.5	92.5%	-	
Premium Efficiency Motor 1 HP 1200 RPM ODP	Premium Efficiency Motor		1	1200	ODP	82.5	82.5%	$	271.00
Premium Efficiency Motor 1.5 HP 1200 RPM ODP	Premium Efficiency Motor		1.5	1200	ODP	86.5	86.5%	$	300.05
Premium Efficiency Motor 2 HP 1200 RPM ODP	Premium Efficiency Motor		2	1200	ODP	87.5	87.5%	$	327.80
Premium Efficiency Motor 3 HP 1200 RPM ODP	Premium Efficiency Motor		3	1200	ODP	88.5	88.5%	$	434.20
Premium Efficiency Motor 5 HP 1200 RPM ODP	Premium Efficiency Motor		5	1200	ODP	89.5	89.5%	$	546.45
Premium Efficiency Motor 7.5 HP 1200 RPM ODP	Premium Efficiency Motor		7.5	1200	ODP	90.2	90.2%	$	682.75
Premium Efficiency Motor 10 HP 1200 RPM ODP	Premium Efficiency Motor		10	1200	ODP	91.7	91.7%	$	803.45
Premium Efficiency Motor 15 HP 1200 RPM ODP	Premium Efficiency Motor		15	1200	ODP	91.7	91.7%	$	1,041.80
Premium Efficiency Motor 20 HP 1200 RPM ODP	Premium Efficiency Motor		20	1200	ODP	92.4	92.4%	$	1,250.90
Premium Efficiency Motor 25 HP 1200 RPM ODP	Premium Efficiency Motor		25	1200	ODP	93	93.0%	$	1,532.15
Premium Efficiency Motor 30 HP 1200 RPM ODP	Premium Efficiency Motor		30	1200	ODP	93.6	93.6%	$	1,660.00
Premium Efficiency Motor 40 HP 1200 RPM ODP	Premium Efficiency Motor		40	1200	ODP	94.1	94.1%	$	2,409.25
Premium Efficiency Motor 50 HP 1200 RPM ODP	Premium Efficiency Motor		50	1200	ODP	94.1	94.1%	$	2,794.30
Premium Efficiency Motor 60 HP 1200 RPM ODP	Premium Efficiency Motor		60	1200	ODP	94.5	94.5%	$	3,338.60
Premium Efficiency Motor 75 HP 1200 RPM ODP	Premium Efficiency Motor		75	1200	ODP	94.5	94.5%	$	3,923.40
Premium Efficiency Motor 100 HP 1200 RPM ODP	Premium Efficiency Motor		100	1200	ODP	95	95.0%	$	4,700.60
Premium Efficiency Motor 125 HP 1200 RPM ODP	Premium Efficiency Motor		125	1200	ODP	95	95.0%	$	5,410.20
Premium Efficiency Motor 150 HP 1200 RPM ODP	Premium Efficiency Motor		150	1200	ODP	95.4	95.4%	$	6,108.55
Premium Efficiency Motor 200 HP 1200 RPM ODP	Premium Efficiency Motor		200	1200	ODP	95.4	95.4%	$	8,231.25
Premium Efficiency Motor 1 HP 1800 RPM ODP	Premium Efficiency Motor		1	1800	ODP	85.5	85.5%	$	243.70
Premium Efficiency Motor 1.5 HP 1800 RPM ODP	Premium Efficiency Motor		1.5	1800	ODP	86.5	86.5%	$	248.05
Premium Efficiency Motor 2 HP 1800 RPM ODP	Premium Efficiency Motor		2	1800	ODP	86.5	86.5%	$	279.05
Premium Efficiency Motor 3 HP 1800 RPM ODP	Premium Efficiency Motor		3	1800	ODP	89.5	89.5%	$	293.15
Premium Efficiency Motor 5 HP 1800 RPM ODP	Premium Efficiency Motor		5	1800	ODP	89.5	89.5%	$	337.15
Premium Efficiency Motor 7.5 HP 1800 RPM ODP	Premium Efficiency Motor		7.5	1800	ODP	91	91.0%	$	466.95
Premium Efficiency Motor 10 HP 1800 RPM ODP	Premium Efficiency Motor		10	1800	ODP	91.7	91.7%	$	533.70
Premium Efficiency Motor 15 HP 1800 RPM ODP	Premium Efficiency Motor		15	1800	ODP	93	93.0%	$	701.20
Premium Efficiency Motor 20 HP 1800 RPM ODP	Premium Efficiency Motor		20	1800	ODP	93	93.0%	$	881.05
Premium Efficiency Motor 25 HP 1800 RPM ODP	Premium Efficiency Motor		25	1800	ODP	93.6	93.6%	$	1,027.10
Premium Efficiency Motor 30 HP 1800 RPM ODP	Premium Efficiency Motor		30	1800	ODP	94.1	94.1%	$	1,151.70
Premium Efficiency Motor 40 HP 1800 RPM ODP	Premium Efficiency Motor		40	1800	ODP	94.1	94.1%	$	1,464.15
Premium Efficiency Motor 50 HP 1800 RPM ODP	Premium Efficiency Motor		50	1800	ODP	94.5	94.5%	$	2,033.15

Premium Efficiency Motor 60 HP 1800 RPM ODP	Premium Efficiency Motor	60	1800	ODP	95	95.0%	$	2,017.15
Premium Efficiency Motor 75 HP 1800 RPM ODP	Premium Efficiency Motor	75	1800	ODP	95	95.0%	$	2,360.15
Premium Efficiency Motor 100 HP 1800 RPM ODP	Premium Efficiency Motor	100	1800	ODP	95.4	95.4%	$	3,106.80
Premium Efficiency Motor 125 HP 1800 RPM ODP	Premium Efficiency Motor	125	1800	ODP	95.4	95.4%	$	3,566.15
Premium Efficiency Motor 150 HP 1800 RPM ODP	Premium Efficiency Motor	150	1800	ODP	95.8	95.8%	$	5,135.50
Premium Efficiency Motor 200 HP 1800 RPM ODP	Premium Efficiency Motor	200	1800	ODP	95.8	95.8%	$	6,129.15
Premium Efficiency Motor 1 HP 3600 RPM ODP	Premium Efficiency Motor	1	3600	ODP	77	77.0%	$	50.00
Premium Efficiency Motor 1.5 HP 3600 RPM ODP	Premium Efficiency Motor	1.5	3600	ODP	84	84.0%	$	240.90
Premium Efficiency Motor 2 HP 3600 RPM ODP	Premium Efficiency Motor	2	3600	ODP	85.5	85.5%	$	273.85
Premium Efficiency Motor 3 HP 3600 RPM ODP	Premium Efficiency Motor	3	3600	ODP	85.5	85.5%	$	295.10
Premium Efficiency Motor 5 HP 3600 RPM ODP	Premium Efficiency Motor	5	3600	ODP	86.5	86.5%	$	344.30
Premium Efficiency Motor 7.5 HP 3600 RPM ODP	Premium Efficiency Motor	7.5	3600	ODP	88.5	88.5%	$	453.30
Premium Efficiency Motor 10 HP 3600 RPM ODP	Premium Efficiency Motor	10	3600	ODP	89.5	89.5%	$	544.75
Premium Efficiency Motor 15 HP 3600 RPM ODP	Premium Efficiency Motor	15	3600	ODP	90.2	90.2%	$	695.35
Premium Efficiency Motor 20 HP 3600 RPM ODP	Premium Efficiency Motor	20	3600	ODP	91	91.0%	$	831.65
Premium Efficiency Motor 25 HP 3600 RPM ODP	Premium Efficiency Motor	25	3600	ODP	91.7	91.7%	$	1,030.35
Premium Efficiency Motor 30 HP 3600 RPM ODP	Premium Efficiency Motor	30	3600	ODP	91.7	91.7%	$	1,142.60
Premium Efficiency Motor 40 HP 3600 RPM ODP	Premium Efficiency Motor	40	3600	ODP	92.4	92.4%	$	1,475.85
Premium Efficiency Motor 50 HP 3600 RPM ODP	Premium Efficiency Motor	50	3600	ODP	93	93.0%	$	1,741.95
Premium Efficiency Motor 60 HP 3600 RPM ODP	Premium Efficiency Motor	60	3600	ODP	93.6	93.6%	$	2,105.55
Premium Efficiency Motor 75 HP 3600 RPM ODP	Premium Efficiency Motor	75	3600	ODP	93.6	93.6%	$	2,616.90
Premium Efficiency Motor 100 HP 3600 RPM ODP	Premium Efficiency Motor	100	3600	ODP	93.6	93.6%	$	3,310.90
Premium Efficiency Motor 125 HP 3600 RPM ODP	Premium Efficiency Motor	125	3600	ODP	94.1	94.1%	$	4,186.25
Premium Efficiency Motor 150 HP 3600 RPM ODP	Premium Efficiency Motor	150	3600	ODP	94.1	94.1%	$	5,256.40
Premium Efficiency Motor 200 HP 3600 RPM ODP	Premium Efficiency Motor	200	3600	ODP	95	95.0%	$	7,455.80
Premium Efficiency Motor 1 HP 1200 RPM TEFC	Premium Efficiency Motor	1	1200	TEFC	82.5	82.5%	$	373.70
Premium Efficiency Motor 1.5 HP 1200 RPM TEFC	Premium Efficiency Motor	1.5	1200	TEFC	87.5	87.5%	$	435.25
Premium Efficiency Motor 2 HP 1200 RPM TEFC	Premium Efficiency Motor	2	1200	TEFC	88.5	88.5%	$	408.40
Premium Efficiency Motor 3 HP 1200 RPM TEFC	Premium Efficiency Motor	3	1200	TEFC	89.5	89.5%	$	593.45
Premium Efficiency Motor 5 HP 1200 RPM TEFC	Premium Efficiency Motor	5	1200	TEFC	89.5	89.5%	$	736.90
Premium Efficiency Motor 7.5 HP 1200 RPM TEFC	Premium Efficiency Motor	7.5	1200	TEFC	91	91.0%	$	860.20
Premium Efficiency Motor 10 HP 1200 RPM TEFC	Premium Efficiency Motor	10	1200	TEFC	91	91.0%	$	1,129.75
Premium Efficiency Motor 15 HP 1200 RPM TEFC	Premium Efficiency Motor	15	1200	TEFC	91.7	91.7%	$	1,566.35
Premium Efficiency Motor 20 HP 1200 RPM TEFC	Premium Efficiency Motor	20	1200	TEFC	91.7	91.7%	$	1,803.40
Premium Efficiency Motor 25 HP 1200 RPM TEFC	Premium Efficiency Motor	25	1200	TEFC	93	93.0%	$	2,158.75
Premium Efficiency Motor 30 HP 1200 RPM TEFC	Premium Efficiency Motor	30	1200	TEFC	93	93.0%	$	2,356.80
Premium Efficiency Motor 40 HP 1200 RPM TEFC	Premium Efficiency Motor	40	1200	TEFC	94.1	94.1%	$	3,316.00
Premium Efficiency Motor 50 HP 1200 RPM TEFC	Premium Efficiency Motor	50	1200	TEFC	94.1	94.1%	$	3,651.00
Premium Efficiency Motor 60 HP 1200 RPM TEFC	Premium Efficiency Motor	60	1200	TEFC	94.5	94.5%	$	4,203.75
Premium Efficiency Motor 75 HP 1200 RPM TEFC	Premium Efficiency Motor	75	1200	TEFC	94.5	94.5%	$	5,024.50
Premium Efficiency Motor 100 HP 1200 RPM TEFC	Premium Efficiency Motor	100	1200	TEFC	95	95.0%	$	7,197.25
Premium Efficiency Motor 125 HP 1200 RPM TEFC	Premium Efficiency Motor	125	1200	TEFC	95	95.0%	$	8,244.20
Premium Efficiency Motor 150 HP 1200 RPM TEFC	Premium Efficiency Motor	150	1200	TEFC	95.8	95.8%	$	9,028.35
Premium Efficiency Motor 200 HP 1200 RPM TEFC	Premium Efficiency Motor	200	1200	TEFC	95.8	95.8%	$	11,508.55
Premium Efficiency Motor 1 HP 1800 RPM TEFC	Premium Efficiency Motor	1	1800	TEFC	85.5	85.5%	$	271.65
Premium Efficiency Motor 1.5 HP 1800 RPM TEFC	Premium Efficiency Motor	1.5	1800	TEFC	86.5	86.5%	$	342.95
Premium Efficiency Motor 2 HP 1800 RPM TEFC	Premium Efficiency Motor	2	1800	TEFC	86.5	86.5%	$	364.20
Premium Efficiency Motor 3 HP 1800 RPM TEFC	Premium Efficiency Motor	3	1800	TEFC	89.5	89.5%	$	390.00
Premium Efficiency Motor 5 HP 1800 RPM TEFC	Premium Efficiency Motor	5	1800	TEFC	89.5	89.5%	$	452.85
Premium Efficiency Motor 7.5 HP 1800 RPM TEFC	Premium Efficiency Motor	7.5	1800	TEFC	91.7	91.7%	$	621.65
Premium Efficiency Motor 10 HP 1800 RPM TEFC	Premium Efficiency Motor	10	1800	TEFC	91.7	91.7%	$	699.45

Premium Efficiency Motor 15 HP 1800 RPM TEFC	Premium Efficiency Motor	15	1800	TEFC	92.4	92.4%	$ 928.05
Premium Efficiency Motor 20 HP 1800 RPM TEFC	Premium Efficiency Motor	20	1800	TEFC	93	93.0%	$ 1,011.70
Premium Efficiency Motor 25 HP 1800 RPM TEFC	Premium Efficiency Motor	25	1800	TEFC	93.6	93.6%	$ 1,398.90
Premium Efficiency Motor 30 HP 1800 RPM TEFC	Premium Efficiency Motor	30	1800	TEFC	93.6	93.6%	$ 1,576.80
Premium Efficiency Motor 40 HP 1800 RPM TEFC	Premium Efficiency Motor	40	1800	TEFC	94.1	94.1%	$ 2,176.55
Premium Efficiency Motor 50 HP 1800 RPM TEFC	Premium Efficiency Motor	50	1800	TEFC	94.5	94.5%	$ 2,477.75
Premium Efficiency Motor 60 HP 1800 RPM TEFC	Premium Efficiency Motor	60	1800	TEFC	95	95.0%	$ 3,366.55
Premium Efficiency Motor 75 HP 1800 RPM TEFC	Premium Efficiency Motor	75	1800	TEFC	95.4	95.4%	$ 3,843.45
Premium Efficiency Motor 100 HP 1800 RPM TEFC	Premium Efficiency Motor	100	1800	TEFC	95.4	95.4%	$ 4,687.60
Premium Efficiency Motor 125 HP 1800 RPM TEFC	Premium Efficiency Motor	125	1800	TEFC	95.4	95.4%	$ 6,874.00
Premium Efficiency Motor 150 HP 1800 RPM TEFC	Premium Efficiency Motor	150	1800	TEFC	95.8	95.8%	$ 7,723.15
Premium Efficiency Motor 200 HP 1800 RPM TEFC	Premium Efficiency Motor	200	1800	TEFC	96.2	96.2%	$ 9,316.10
Premium Efficiency Motor 1 HP 3600 RPM TEFC	Premium Efficiency Motor	1	3600	TEFC	77	77.0%	$ 252.15
Premium Efficiency Motor 1.5 HP 3600 RPM TEFC	Premium Efficiency Motor	1.5	3600	TEFC	84	84.0%	$ 301.35
Premium Efficiency Motor 2 HP 3600 RPM TEFC	Premium Efficiency Motor	2	3600	TEFC	85.5	85.5%	$ 345.35
Premium Efficiency Motor 3 HP 3600 RPM TEFC	Premium Efficiency Motor	3	3600	TEFC	86.5	86.5%	$ 400.40
Premium Efficiency Motor 5 HP 3600 RPM TEFC	Premium Efficiency Motor	5	3600	TEFC	88.5	88.5%	$ 502.90
Premium Efficiency Motor 7.5 HP 3600 RPM TEFC	Premium Efficiency Motor	7.5	3600	TEFC	89.5	89.5%	$ 643.10
Premium Efficiency Motor 10 HP 3600 RPM TEFC	Premium Efficiency Motor	10	3600	TEFC	90.2	90.2%	$ 683.85
Premium Efficiency Motor 15 HP 3600 RPM TEFC	Premium Efficiency Motor	15	3600	TEFC	91	91.0%	$ 914.40
Premium Efficiency Motor 20 HP 3600 RPM TEFC	Premium Efficiency Motor	20	3600	TEFC	91	91.0%	$ 1,143.00
Premium Efficiency Motor 25 HP 3600 RPM TEFC	Premium Efficiency Motor	25	3600	TEFC	91.7	91.7%	$ 1,336.50
Premium Efficiency Motor 30 HP 3600 RPM TEFC	Premium Efficiency Motor	30	3600	TEFC	91.7	91.7%	$ 1,598.25
Premium Efficiency Motor 40 HP 3600 RPM TEFC	Premium Efficiency Motor	40	3600	TEFC	92.4	92.4%	$ 2,117.40
Premium Efficiency Motor 50 HP 3600 RPM TEFC	Premium Efficiency Motor	50	3600	TEFC	93	93.0%	$ 2,553.15
Premium Efficiency Motor 60 HP 3600 RPM TEFC	Premium Efficiency Motor	60	3600	TEFC	93.6	93.6%	$ 3,550.50
Premium Efficiency Motor 75 HP 3600 RPM TEFC	Premium Efficiency Motor	75	3600	TEFC	93.6	93.6%	$ 4,305.60
Premium Efficiency Motor 100 HP 3600 RPM TEFC	Premium Efficiency Motor	100	3600	TEFC	94.1	94.1%	$ 5,183.55
Premium Efficiency Motor 125 HP 3600 RPM TEFC	Premium Efficiency Motor	125	3600	TEFC	95	95.0%	$ 7,033.25
Premium Efficiency Motor 150 HP 3600 RPM TEFC	Premium Efficiency Motor	150	3600	TEFC	95	95.0%	$ 8,509.65
Premium Efficiency Motor 200 HP 3600 RPM TEFC	Premium Efficiency Motor	200	3600	TEFC	95.4	95.4%	$ 10,825.40

Measure Life

Measure Life = 20 Years (3), (5)	20

Table 2: Operating Hours by Motor Size, Industrial Applications (4)

HP	All SIC (Industrial)
1	2,745
1.5	2,745
2	2,745
3	2,745
5	2,745
7.5	3,391
10	3,391
15	3,391
20	3,391
25	4,067
30	4,067
40	4,067
50	4,067
60	5,329

75	5,329
100	5,329
125	5,200
150	5,200
200	5,200

Table 3: Operating Hours by Application, Non-industrial (5)

Building Type	Operating Hours
Office HVAC Pump	2,000
Retail HVAC Pump	2,000
Hospitals HVAC Pump	2,754
Elem/Sec Schools HVAC Pump	2,190
Restaurant HVAC Pump	2,000
Warehouse HVAC Pump	2,241
Hotels/Motels HVAC Pump	4,231
Grocery HVAC Pump	2,080
Health HVAC Pump	2,559
College/Univ HVAC Pump	3,641
Office Ventilation Fan	6,192
Retail Ventilation Fan	3,261
Hospitals Ventilation Fan	8,374
Elem/Sec Schools Ventilation Fan	3,699
Restaurant Ventilation Fan	4,155
Warehouse Ventilation Fan	6,389
Hotels/Motels Ventilation Fan	3,719
Grocery Ventilation Fan	6,389
Health Ventilation Fan	2,000
College/Univ Ventilation Fan	3,631
Office Other Application	4500
Retail Other Application	4500
Hospitals Other Application	4500
Elem/Sec Schools Other Application	4500
Restaurant Other Application	4500
Warehouse Other Application	4500
Hotels/Motels Other Application	4500
Grocery Other Application	4500
Health Other Application	4500
College/Univ Other Application	4500

References

1 NWPCC (Northwest Power Conservation Council) RTF's (Regional Technical Forum) Archived Measures - Source for full motor cost

2 CEE (Consortium for Energy Efficiency) Premium Efficiency Motors Iniative - Source for premium motor efficiencies

3 NYSERDA (New York State Energy Research and Development Authority); NY Energy $mart Programs Deemed Savings Database - Source for coincidence factor, measure life, and motor load factor

4 United States Industrial Electric Motor Systems Market Opportunities Assessment, EERE, US DOE, Dec 2002 - Source for operating hours for industrial motors and source for motor load factor data (Tables 1-18 and 1-19)

5 Efficiency Vermont's Technical Reference User Manual, 2004 - Source for operating hours for commercial motors (p.15) and source for measure life and source for existing motor efficiencies and source for motor load factor default value

VFD Costs

	TELEMECANIQUE	DAYTON		Emerson			
Source =	Grainger (6/25/08) online						
Brand =	TELEMECANIQUE	DAYTON		Emerson			
Brand =		Fuji					
By Pass =	without Bypass	without Bypass		without Bypass			
Voltage/Phase =	460V - 3Phase	460V - 3Phase		460V - 3Phase			

Average costs including install will be used for 2009 and 2010 incremental costs.

HP	$	$		$	Average Purchase Price ($)	Average Installed price ($)	HP
1	$413	$584	estimated	$371	$456	$684	1
2	$450	$637	estimated	$387	$491	$737	2
2	$487	$689		$454	$543	$815	2
3	$563	$746		$533	$614	$921	3
5	$675	$1,022		$646	$781	$1,172	5
7.5	$843	$1,297		$992	$1,044	$1,566	7.5
10	$1,032	$1,685		$1,307	$1,341	$2,012	10
15	$1,359	$2,125		$1,572	$1,685	$2,528	15
20	$1,687	$2,849		$2,264	$2,267	$3,400	20
25	$2,746	$3,490		$2,490	$2,909	$4,363	25
30	$2,990	$3,683		$2,682	$3,118	$4,678	30
40	$3,678	$5,328	Fuji	$3,369	$4,125	$6,187	40
50	$4,326	$6,131	Fuji	$4,163	$4,873	$7,310	50
60	$5,432	$7,663	Fuji	$5,003	$6,033	$9,049	60
75	$5,836	$8,964	Fuji	$6,256	$7,019	$10,528	75
100	$6,663	$11,267	Fuji	$7,903	$8,611	$12,917	100
125	$7,324	$14,157	Fuji	$9,467	$10,316	$15,474	125
150	$8,272	$15,004	estimated	$11,016	$11,431	$17,146	150
200	$9,504	$16,742	estimated	$14,362	$13,536	$20,304	200

Installation assued as 50% of purchase price

Average % savings [1]	33%
Measure Life (years)	20

Pumping Load Factor	75%
Fan Load Factor	65%

Coin. Factor	78%

1. From Office of Industrial Electric Motor Systems Market Opportunities Assessment : Department of Energy (assessment of 265 Industrial facilities in 1997)

hp	Plan A Incremental Cost	Plan B Incremental Cost
1	$69	$402
1.5	$75	$442
2	$72	$472
3	$74	$518
5	$66	$590
7.5	$142	$767
10	$129	$889
15	$108	$1,475
20	$114	$1,798
25	$218	$2,320
30	$267	$2,750
40	$320	$3,655
50	$455	$4,032
60	$599	$5,987
75	$500	$6,958
100	$754	$8,923
125	$589	$11,851
150	$691	$13,298
200	$636	$16,953
250	$3,344	$21,468
300	$4,007	$29,636
350	$7,011	$35,792
400	$6,393	$39,233
450	$8,415	$40,915
500	$11,521	$43,173

Costs were determined for 1800 RPM TEFC motors, but will be used for all RPM and Types of Enhanced NEMA Premium motors as 1800 RPM TEFC is the
Incremental costs for Plan A represents the cost differential between standard motor and efficient motor
Incremental costs for Plan B motors represent the full purchase and installation costs for the new motor

NEW CONSTRUCTION SAVINGS TECHNICAL ASSUMPTIONS

Program: New Construction

This is a custom program including electric and gas measures. There are three choices of tracks customers may choose to follow. This program is unique in that Xcel relies heavily on expert consultant in the design process; however, we will perform independent project review in accordance with standard engineering methods. Customer may apply for rebate under the New Construction Program.

Calculations:

Electrical and gas energy savings and electrical demand savings will be calculated based on the project-specific details. Each project will undergo an engineering review in accordance with standard engineering practices. Prescriptive items within the project will be handled through their respective deemed programs.

Assumptions:

Net-to-gross = Electric 98% for the EDA tracks and 93% for the Energy Efficient Buildings track. Gas EDA NTG is 99% and Gas Energy Efficient Building track is 97%. Program requirements are well above code, so feel free-ridership will be negligible. Gas free ridership will be lower than electric because gas programs are new to Colorado.

Transmission-Distribution Loss Factor = 6.39%, the percentage loss of electricity as it flows from the power plant to the customer, calculated using factors from Enhanced DSM Filing SRD-2

Electric Rebate amount is $300/kW saved

Assume 55% additional savings from using Enhanced Modeling track over Basic based on actuals from MN program

Operation and Maintenance Savings will be calculated for each specific project based on project details.

Life of product is 20 years for gas and electric measures.

Changes from 2008

This is a new program for 2009.

TECHNICAL ASSUMPTIONS

Program: Process Efficiency

The Process Efficiency Business Program targets energy intensive processes at large industrial facilities Customers who implement identified upgrades may receive rebates for large process changes that are not completed through Custom Efficiency or the prescriptive programs.

Calculations:

Electrical energy savings,electrical demand savings and gas savings will be calculated based on the methodologies presented in each of the end use programs.

A net-to-gross factor of 86.6% will be used for electric Process Efficency projects.
A net-to-gross factor of 93.9 % will be used for gas Process Efficency projects. This represents one half of the free rider factor for electric projeects because gas programs are new to Colorado.
A transmission distribution loss factor of 6.39% will be used for Process Efficiency projects. This was calculated using factors from Enhanced DSM filing-SRD-2

Changes from 2008
The Process Efficiency Program is new for 2009.

Electric Net to Gross= 0.866
Gas Net to Gross = 0.933
ElectricNTG Factor based on Frontier from the Energy Efficiency Best Practices CA website, custom projects
Gas Net to gross is determined by assuming one half of the electric free rider factorfree rider factor 1/2 of electric (1-

RECOMMISSIONING SAVINGS TECHNICAL ASSUMPTIONS

Program: Recommissioning

Recommissioning is a special program that involves a Study phase and an Implementation phase. The customer may apply for rebate under the Recommissioning Program. Each Recommissioning project will be analyzed individually by Xcel Energy. A qualified engineering vendor will perform the study and provide a report and technical calculations to Xcel Energy for review. Analysis will be based on standard engineering methodologies. Customer may also submit for implementation a proposed "Fast Track" project without going through the Recommissioning Study phase, as long as they have performed a study. Recommissioning projects do not have to demonstrate a TRC factor greater than one on a project by project basis. In that regard the program is similar to deemed programs. In most other respects it is more of a custom program.

Calculations:

Electric and Gas energy savings and electrical demand savings will be calculated by a study vendor based on the project specific details. Each project will undergo an engineering review by Xcel Energy in accordance with standard engineering practices.

A net-to-gross factor of 100% will be used for Recommissioning projects, based on the following justification: Without having completed a recommissioning study through our program, the customer would not have known about the opportunities. If they would have known about them, they would have done them on their own due to the likelihood they are no/low cost items with very quick paybacks.
A transmission distribution loss factor of 6.39% will be used for recommissioning projects. Reference the Enhanced DSM filing, SRD-2; no significant system changes have been noted since then.
Persistence of the Recommissioning product (product life) is set at 7 years, reference "Recommissioning Persistence - Task 1 Benchmarking Deliverable 040607.pdf"

Changes from 2008

1. A gas rebate is being proposed for the first time.

SEGMENT EFFICIENCY TECHNICAL ASSUMPTIONS

Program: Segment Efficiency

This is a custom program that involves an energy and financial analysis of existing facilities. Customer may apply for rebate under the Segment Efficiency Program. Each project will be analyzed individually by Xcel Energy. Technical variables required for the analysis will be obtained from the customer or vendor. Analysis will be based on standard engineering methods. Prescriptive rebates may be given for measures identified during the analysis that qualify under prescriptive end use programs.

Calculations:

Electrical and gas energy savings and electrical demand savings will be calculated based on the project-specific details. Each project will undergo an engineering review in accordance with standard engineering practices. Where prescriptive elements exist, the calculations will be in accordance with the calculation methodologies detailed in the prescriptive programs.

Changes from 2008

This is a new program for 2009.

Assumptions

A transmission distribution loss factor of 6.39% will be used for custom projects. This is calculated using factors from Enhanced DSM Filing - SRD-2

We will conservatively use NTG for each end use technology as stated in their respective technical assumptions. Actual NTG should be closer to 100% because these customers have historically not participated in the programs.

TECHNICAL ASSUMPTIONS

Program: Self-Direct

The Self-Direct Program will provide large commercial and industrial customers in Colorado to self-fund electric energy conservation projects at their facilities. Customers who engineer, implement, and commission qualifying projects will receive rebates to offset their costs to implement efficient projects.

Calculations:
Electrical energy savings and electrical demand savings will be calculated based on the actual savings from a project.

A net-to-gross factor of 90.6% will be used for Self-Direct projects. The NTG assumption (90.6%) was developed based on the weighted average of the net-to-gross factors determined for individual electric conservation technologies by Energy Efficient Best Practices California. The weighting for technologies was based on the Custom Efficiency projects completed by large Colorado customers from 2006 to 2008.

A transmission distribution loss factor of 6.39% will be used for Electrical projects. This was calculated using factors from Enhanced DSM filing-SRD-2

Measure life and operation and maintenance savings will be calculated for each project.

Changes from 2008
The Self-Direct Program is new for 2009.

	% of saving	NTG Factor	weighted
Cooling	0.063766944	0.937	6%
EMS	0.026063631	0.87	2%
Lighting	0.389723422	0.96	37%
Custom	0.264643412	0.86	23%
Compressed Air	0.255802591	0.867	22%
	Total NTG		90.6%

NTG Factor based on the Energy Efficiency Best Practices CA website
% of Savings based on large CO completed Custom Efficiency projects

TECHNICAL ASSUMPTIONS

Program: Small Business Lighting

The Small Business Lighting Program provides free lighting efficiency audits to small and mid sized businesses. Customers who implement identified lighting upgrades may receive rebates through the Lighting Efficiency or Custom Efficiency programs.

Calculations:

Electrical energy savings and electrical demand savings will be calculated based on the methodologies and assumptions presented in the Lighting Efficiency and Custom Efficiency programs.

A net-to-gross factor of 100% will be used for small business lighting projects.

A transmission distribution loss factor of 6.39% will be used for small business lighting projects. This was calculated using factors from Enhanced DSM filing-SRD-2

Changes from 2008
The Small Business Lighting Program is new for 2009.

STANDARD OFFER SAVINGS TECHNICAL ASSUMPTIONS

Program: Standard Offer

Standard Offer utilizes an ESCO, pre-qualified by the Governor's Energy Office, or a Customer-chosen vendor to perform a pre-formatted investment grade audit from which comes a bundled set of measures that the customer, by agreement, must implement. The customer may apply for a rebate under the Standard Offer Program or the implementation funding can come from the ESCO. Analysis will be based on standard engineering methodologies. Prescriptive rebates will not be offered in this program.

Calculations:

Electric and Gas energy savings and electrical demand savings will be calculated by an ESCO or a Customer-chosen vendor based on facility-specific details. Each project will undergo an engineering review by Xcel Energy in accordance with standard engineering practices. M&V plans will be required for all Standard Offer projects and must last a minimum of three years.

A net-to-gross factor of 81.3% will be used for electric projects in 2009. A net-to-gross factor of 87.6% will be used for electric projects in 2010. A net-to-gross factor of 93% will be used for gas projects in both years.
A transmission distribution loss factor of 6.39% will be used for Standard Offer projects. Reference the Enhanced DSM filing, SRD-2; no significant system changes have been noted since then.

Measure life and operation and maintenance savings for Standard Offer projects will be calculated for each project as part of the Technical Energy Audit

Changes from 2008

1. Standard Offer program is being offered for the first time.

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Energy Efficient Showerheads

Residential natural gas customers are eligible to receive a free high-efficiency showerhead to help reduce energy and water use.

Algorithms:

Showerhead Natural Gas Savings (Gross Dth)	= (GPY_Saved x Delta_T x 8.33) / HGE x SPD
Net Dth	= Gross Dth x NTG

Variables:

GPY_Saved	= Gallons per year of hot water saved with high-efficiency showerhead (for one shower per day) assuming 65% of water flow is hot water. Showerhead = 1660 gallons per year per shower (Reference 2)
Delta_T	= Change in temperature of water from incoming water temperature to water heater temperature setting. Delta_T is 74 degrees F. (Reference 1)
HGE	= Heat generation efficiency based on steady-state water heater efficiency. Used value of 0.76. (Reference 1)
SPD	= Number of showers per day = 1.32 based on 2.64 people per home and 2 bathrooms. (Reference 3)
8.33	Conversion from gallons to pounds of water
Incremental Costs	=costs provided by vendor; = $5 per showerhead
NTG	= Net-to-Gross Factor - We will use 70% for showerheads. (Reference 4)
O&M savings	= Water savings are assumed to be 1258 gallons per year @ $0.003/gallon = $3.77 per shower head
Measure Life	= 10 years

Provided by administrator:	Verified during M&V:
Showerhead received by customer	Yes
Showerhead installed by customer	Yes

Assumptions:
- 2.5 gpm replaced with 2.0 gpm, resulting in 1,660 gallons of annual water savings per shower. (reference 2)
- 1.32 showers per day at 6.9 minutes per shower (reference 2,3)

Changes From 2008:
This is a new program for 2009

References

1. Department of Energy Domestic Hot Water Appliance Calculator
2. Japanese study: "The effects of variation in body temperature on the preferred water temperature and flow rate during showering"
   Authors: Tadakatsu Ohnaka, Yutaka Tochihara, Yumiko Watanabe. Affiliations: a) Department of Physiological Hygiene, The Institute of Public Health, Minato-ku, Tokyo, Japan; b) Faculty of Home Economics, Jissen Women's University, Hino, Tokyo, Japan.
3. Handbook of Water Use and Conservation, Denver Water Conservation
4. Net-to-Gross factor is an assumed installation rate for showerheads based on Xcel MN study and aggressive CO follow-up

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: ENERGY STAR New Homes Rebates

Residential natural gas and electric customers receive a cash rebate for implementing ENERGY STAR energy efficiencies.

Algorithms:

Required measures savings (Customer kW)	= (Baseline_HERS - Measured_HERS) x kW_per_HERS
Required measures savings (Customer kWh)	= (Baseline_HERS - Measured_HERS) x kWh_per_HERS
Required measures savings (Gross Dth)	= (Baseline_HERS - Measured_HERS) x Dth_per_HERS
20 CFLs Electric Energy Savings (kWh) and Electric Demand Savings (kW)	Energy and demand savings and annual hours of operation for compact fluorescent lamps are based on data and calculations derived from the 2002 US Lighting Market Characterization performed for the Department of Energy in 2002. Energy savings are 940 kWh and demand savings are 0.93 kW.
Clothes washer natural gas savings (Dth) and electric energy savings (kWh)	Energy savings for the clotherswasher were based on the Energy Star Clotherswasher Savings Calculator: http://www.energystar.gov/index.cfm?c=clotheswash.pr_clothes_washers. This assumed a gas water heater home, so savings are generated for gas and electric. Savings is 0.88 Dth and 26 Kwh.
Dishwasher natural gas savings (Dth) and electric energy savings (kWh)	Energy savings for the dishwasher were based on the Energy Star Dishwasher Savings Calculator: http://www.energystar.gov/index.cfm?c=dishwash.pr_dishwashers. This assumed a gas water heater home, so savings are generated for gas and electric. Savings is 1.27 Dth and 77 kWh.
Refrigerator electric energy savings (kWh)	Energy savings for the refrigerator were based on the Energy Star Refrigerator Savings Calculator: http://www.energystar.gov/index.cfm?c=refrig.pr_refrigerators. Savings is 93 kWh.
Net Dth	= Gross Dth x NTG
Electrical Energy Savings (Gross Generator kWh)	= Customer kWh / (1-TDLF)
Electrical Demand Savings (Gross Generator kW)	= Customer kW x CF / (1-TDLF)
Electrical Energy Savings (Net Generator kWh)	= Gross Generator kWh x NTG
Electrical Demand Savings (Net Generator kW)	= Gross Generator kW x NTG

Variables:

Baseline_HERS	= Home Energy Rating System baseline for home location from Table 1.
As_Built_HERS	= Home Energy Rating System for constructed home, calculated for each home.
kW_per_HERS	= 0.0024 kW, based on average total running time of furnace and air conditioner of 2,548 hours
kWh_per_HERS	= 6.1 kWh per HERS point, based on simulated ENERGY STAR home with HERS score of 75
Dth_per_HERS	= 0.98 Dth per HERS point, based on simulated ENERGY STAR home with HERS score of 75
TDLF	Transmission Distribution Loss Factor = 7.14%, the percentage loss of electricity as it flows from the power plant to the customer, calculated using factors from Enhanced DSM Filing SRD-2
CF	Coincidence Factor = the probability that peak demand of the lights will coincide with peak utility system demand from Table 2
NTG	Net-to-Gross Factor = We will use 94% based on reference 5.
O&M savings	Operation and Maintenance savings = We will assume no O&M savings.

Table 1. Baseline HERS Values

Location	Square Footage of Home	Baseline HERS	HERS for Rebate Eligibility
City of Boulder	3,000 and below	70	60
City of Boulder	3,001 - 5,000	60	51
City of Boulder	5,001 or above	35	30
Mountain Communities	All	100	80
Other Areas	All	100	85

Table 2. Measure Life and Cost

Type of measure:	Measure life:	Incremental cost:	Coincidence factor:
Ceiling insulation	20 years (Reference 1)	$206 (Reference 6)	N/A
HE furnace AFUE 92%	18 years (Reference 12)	$331 (Reference 13)	N/A
ACH reduction	10 years (Reference 1)	$550 (Reference 7)	N/A
Water heater 57 to 62 EF	15 years (Reference 1)	$55 (Reference 13)	N/A
CFLs	8.2 years (Reference 9)	$71 (Reference 10)	8% (Reference 13)
Clothes washer	11 years (Reference 16)	$200 (Reference 14)	4.47% (Reference 14)
Dishwasher	11 years (Reference 15)	$30 (Reference 14)	2.45% (Reference 14)
Refrigerator replacement	13 years (Reference 14)	$30 (Reference 14)	100%

Provided by Customer:	Verified during M&V:
Home size info and type of equipment	Yes
HERS score	Yes
Blower door test	Yes

Assumptions:

The baseline home had an existing level of insulation in the attic of R-38 and the change case had an elevated insulation level of R-44.
The baseline home had an existing ACH of 7.08 and the change case was 4.6 ACH.
The baseline furnace had an AFUE of 78%, which is the federal minimum efficiency standard.
The baseline water heater is a 40 gallon capacity with an 57 EF.

Changes From 2008:
This is a new program for 2009

Building Characteristics for Standard Home Used for Modeling:
Single family home
Two stories with unfinished conditioned basement
Five bedrooms, two bathroom
2450 square feet above grade, 1225 square feet below grade
Basement
HVAC: Gas Furnace and Central AC
Orientation: Square home with each of the four sides facing one of the cardinal directions with the same amount of window space on each orientation
2 foot roof overhangs
Roofing material: composite shingles – medium color
Doors: wood
The duct supply, duct return and air handler are in conditioned space
No shading was assumed

References:

1. California Measurement Advisory Committee (CALMAC) Protocols, Appendix F (www.calmac.org/events/APX_F.pdf).
2. 2006 Residential Energy Use Colorado Service Area - Xcel: Bruce Neilson
3. American Housing Survey for Denver - US Census Bureau
4. Xcel Energy CO DSM Potential 2006 - prepared by Kema
5. National Energy Efficiency Best Practices Study - Residential Single-Family Comprehensive Weatherization Best Practices Report from December 2004.
6. RS Means Repair and Remodeling 2007 at a cost of $0.028 per square foot per increase in R-value.
7. National Energy Audit Tool (NEAT) and Frontier estimates.
8. EEBP web site - Tacoma Residential Weatherization program.
9. US Lighting Market Characterization Study performed for the Department of Energy in 2002
10. MEEA/ES Change A Light campaign info
11. Xcel Energy estimate
12. Draft Technical Support Document: Energy Conservation Standards for Residential Furnaces and Boilers, Efficiency Standards for Consumer Products Prepared for US DOE, September 2006
13. California Energy Commission's Database for Energy Efficient Resources (DEER)
14. www.energystar.gov
15. DOE 2007
16. Appliance Magazine, September 2007

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: ENERGY STAR Retailer Incentive Pilot Program

This is a pilot program designed to increase the sales of energy efficient technologies by providing rebates directly to retailers that sell ENERGY STAR appliances and electronics such as refrigerators, clothes washers, dishwashers, room air conditioners, televisions and ceiling fans.

Algorithms:

Energy Star Refrigerator electric energy and demand savings (kWh and kW)	Energy savings for the refrigerator were based on the Energy Star Refrigerator Savings Calculator: http://www.energystar.gov/index.cfm?c=refrig.pr_refrigerators. Savings is 93 kWh and 0.011 kW.
Energy Star clothes washer natural gas savings (Gross Dth) and electric energy and demand savings (kWh and kW)	Energy savings for the clotherswasher were based on the Energy Star Clotherswasher Savings Calculator: http://www.energystar.gov/index.cfm?c=clotheswash.pr_clothes_washers. This assumed a gas water heater home, so savings are generated for gas and electric. Savings is 0.88 Dth, 26 kWh and 0.66 kW.
Energy Start dishwasher natural gas savings (Gross Dth) and electric energy and demand savings (kWh and kW)	Energy savings for the dishwasher were based on the Energy Star Dishwasher Savings Calculator: http://www.energystar.gov/index.cfm?c=dishwash.pr_dishwashers. This assumed a gas water heater home, so savings are generated for gas and electric. Savings is 1.27 Dth, 77 kWh and 0.36 kW.
Energy Star room air conditioner electric energy and demand savings (kWh and kW)	Energy savings for the room air conditioner (AC) were based on the Energy Star Room AC Savings Calculator: http://www.energystar.gov/index.cfm?c=roomac.pr_room_ac. Savings is 59 kWh and 0.094 kW.
Energy Star television electric energy and demand savings (kWh and kW)	Energy savings for the television were based on the Energy Star Television Savings Calculator: http://www.energystar.gov/index.cfm?c=dishwash.pr_dishwashers. Savings is 52 kWh and 0.022 kW.
Energy Star ceiling fan energy and demand savings (kWh and kW)	Energy savings for the ceiling fan were based on the Energy Star Television Savings Calculator: http://www.energystar.gov/index.cfm?c=refrig.pr_refrigerators. Savings is 180 kWh and 0.12 kW.
Net Dth	= Gross Dth x NTG
Electrical Energy Savings (Gross Generator kWh)	= Customer kWh / (1-TDLF)
Electrical Demand Savings (Gross Generator kW)	= Customer kW x CF / (1-TDLF)
Electrical Energy Savings (Net Generator kWh)	= Gross Generator kWh x NTG
Electrical Demand Savings (Net Generator kW)	= Gross Generator kW x NTG

Variables:

NTG	Net-to-Gross Factor = We will use 80% based on reference 1.
CF	Coincidence Factor = Probability that peak demand of the bulb will coincide with peak utility system demand.
TDLF	Transmission Distribution Loss Factor = 7.14%, the percentage loss of electricity as it flows from the power plant to the customer, calculated using factors from Enhanced DSM Filing SRD-2
O&M savings	Operation and Maintenance savings = We will assume no O&M savings.

Type of Measure:	Measure Life:	Incremental Cost:	Coincidence Factor:
Energy Star Refrigerator	13 years (Reference 2)	$30 (Reference 2)	100% (fully diversified load)
Energy Star Clothes Washer	11 years (Reference 7)	$200 (Reference 2)	4.47% (calculated)
Energy Star Dishwasher	11 years (Reference 4)	$0 (Reference 2)	2.45% (calculated)
Energy Star Room AC	9 years (Reference 2)	$30 (Reference 2)	75% (Reference 5)
Energy Star Television	6.2 years (Reference 3)	$0 (Reference 2)	5% (assumed value)
Energy Star Ceiling fan	10 years (Reference 2)	86 (Reference 2)	8% (Reference 6)

Changes from 2008:
This program is new for 2009

References:

1. NYSERDA market transformation efforts
2. Energy Star Calculator DOE 2004
3. Consortium for Energy Efficiency
4. Appliance Magazine, September 2007
5. MN Cooling Coincidence Factor
6. CA CFL Metering Study Final Report 2005
7. DOE 2007

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Evaporative Cooling

Prescriptive rebates will be offered for the purchase and installation of evaporative coolers. Two tiers of rebates are offered based on the Evaporative Efficacy of the unit and the type of media. The rebates and analyses are based on a nominal 3 ton cooling load. Tier 1 units are standard efficiency evaporative coolers. Tier 2 units are high efficiency evaporative coolers (see assumptions for details). Credit will be calculated based on the number and type of units installed, and the type of the existing unit.

Algorithms:

Refrigerated air to Tier 1 savings:

Energy Savings (Customer kWh)	= Ref_air_energy - (MotorHP x Motor_kW_Constant/Tier1Motor_eff x LF_evap x EFLH) = 1840 kWh
Demand Savings (Customer kW)	= Ref_air_demand - (MotorHP x LF_evap x Motor_kW_Constant/Tier1Motor_eff) = 2.2 kw

Refrigerated air to Tier 2 savings:

Energy Savings (Customer kWh)	= Ref_air_energy - (MotorHP x Motor_kW_Constant/Tier2Motor_eff x LF_evap_efficient x EFLH) = 2095 kWh
Demand Savings (Customer kW)	= Ref_air_demand - (MotorHP x LF_evap_efficient x Motor_kW_Constant/Tier2Motor_eff) = 2.43 kW

Tier 1 to Tier 2 savings:

Energy Savings (Customer kWh)	= (MotorHP x Motor_kW_Constant/Tier1Motor_eff x LF_evap x EFLH) - (MotorHP x Motor_kW_Constant/Tier2Motor_eff x LF_evap_efficient x EFLH) = 362 kWh
Demand Savings (Customer kW)	= (MotorHP x LF_evap x Motor_kW_Constant/Tier1Motor_eff) - (MotorHP x LF_evap_efficient x Motor_kW_Constant/Tier2Motor_eff) = 0.24 kW

Electrical Energy Savings (Gross Generator kWh)	= Customer kWh / (1-TLF)
Electrical Demand Savings (Gross Generator kW)	= Customer kW x CF / (1-TLF)
Electrical Energy Savings (Net Generator kWh)	= Gross Generator kWh x NTG
Electrical Demand Savings (Net Generator kW)	= Gross Generator kW x NTG

Variables:

Ref_air_energy	= modeled hourly energy use of home with 3 ton 13 SEER standard AC unit in Denver using ESPRE. We will use 1,358 kWh. (Reference 1)
Ref_air_demand	= Btuh/EER x 1000. We will use 3.22 kW (Reference 2)
Tier1Motor_eff	Standard evaporative cooling motor efficiency. We will use 0.7. (Reference 3)
Tier2Motor_eff	High efficacy evaporative cooling motor efficiency. We will use 0.7. (Reference 3)
LF_evap	Load factor for standard evaporative cooler of 0.90. (Reference 5)
LF_evap_efficient	Load factor for high efficiency evaporative cooler of 0.69. (Reference 5)

MotorHP	Motor Horsepower - We will use 1.0725 to represent the motor size for an evaporative cooler which corresponds to the cooling output of a 3 ton AC unit. (Reference 5)
Motor_kW_Constant	kW conversion / HP = 0.746
EFLH	Effective full load hours (700 hours) (Reference 5)
CF	= Coincidence Factor, the probability that peak demand of the coolers will coincide with peak utility system demand. 0.90 will be used for prescriptive rebates (Reference 5)
TDLF	Transmission Distribution Loss Factor = 7.14%, the percentage loss of electricity as it flows from the power plant to the customer, calculated using factors from Enhanced DSM Filing SRD-2
NTG	Net-to-Gross Factor = We will use 60% for standard AC to standard evaporative cooling, and 100% for remaining projects based on Xcel Energy program experience.
Incremental Costs	= Incremental cost of efficient technology over baseline technology. Costs will be provided by customer if available, if not, assumed costs will be used. AC unit = $1268(Reference 6), Std Evap Cooler = $400(Reference 6), HE Evap Cooler = $2200(Reference 8)
O&M savings	= Operation and Maintenance savings related to water use are listed in Table 1.
Measure Life	= 10 years (Reference 4)

Provided by Customer:	Verified during M&V:
Type of unit installed (Tier 1 or Tier 2)	Yes
If Tier 2, type of unit previously installed (AC or None)	Yes

Assumptions:

Table 1. Operation and Mainrtenance Savings (Reference 9)

Base System	New System	O&M Savings
Refrigerated Air	Standard Evap Cooling (Tier 1)	$ (19.85)
Refrigerated Air	Hight Efficient Evap Cooling (Tier 2)	$ (5.06)
Standard Evap Cooling (Tier 1)	Hight Efficient Evap Cooling (Tier 2)	$ 14.79

Qualifying equipment must be new and be a permanently installed direct, indirect or two-stage evaporative cooling unit. Portable coolers or systems with vapor compression backup are not eligible, nor is used or reconditioned equipment.
Tier 1: Qualifying evaporative cooling units must have a minimum Industry Standard Rated airflow of 2,500 CFM
Tier 2: Qualifying evaporative cooling units must have a minimum Media Saturation Effectiveness of 85% and above. The units must be installed with a remote thermostat and a periodic purge water control.

References:

1. ESPRE 2.1 engineering model: Simplified energy analysis methods for residential buildings
2. Building America, Research Benchmark Definitions, Pg 9, http://www.eere.energy.gov/buildings/building_america/pdfs/37529.pdf
3. Average motor efficiency for 0.75 hp motor from NEMA, http://www.eere.energy.gov/buildings/appliance_standards/commercial/pdfs/small_motors_tsd.pdf
4. Kinney, Larry. New Evaporative Cooling Systems: An Emerging Solution for Homes in Hot Dry Climates with Modest Cooling Loads. SWEEP
5. Summit Blue/Nexant Study - Motor HP, load factor, EFLH
6. An average of the price for a 13 SEER Goodman (http://www.acfactoryoutlet.com/home.asp?p=listgoodman.asp&cat=73&sort=1&ah=1) and the price as noted in the DOE's AC calculator spreadsheet (www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/Calc_CAC.xls) is assumed.
7. http://www.google.com/products?q=home+depot+evaporative+cooler+cost&ie=UTF-8&oe=utf-8&rls=org.mozilla:en-US:official&client=firefox-a&um=1&sa=X&oi=product_result_group&resnum=1&ct=title
8. http://www.toolbase.org/TechInventory/techDetails.aspx?ContentDetailID=750: "A two-stage evaporative cooler with a cooling capacity equivalent to a three-ton conventional system retails for about $1,800." The California Energy Commission states that installation costs are equivalent to refrigerated air systems, so only equipment cost is included in this analysis (http://www.consumerenergycenter.org/home/heating_cooling/evaporative.html: "Installation costs of swamp coolers are comparable to air conditioning units").
9. O&M Savings based on manufacturers water use data and an assumed $3/thousand gallons cost for water

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Heating System Rebates

Residential natural gas customers receive a cash rebate for purchasing high-efficiency heating equipment.

Algorithms:

Furnace from AFUE 78% to 92% (Tier 1): Natural gas savings (Gross Dth)	Energy savings for the gas furnace were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics) = 9.8 Dth
Furnace from AFUE 78% to 94% (Tier 2): Natural gas savings (Gross Dth)	Energy savings for the gas furnace were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics) = 11 Dth
84% boiler natural gas savings (Gross Dth)	Energy savings for the gas boiler were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics) = 3.0 Dth
Net Dth	= Gross Dth x NTG

Variables:

NTG	Net-to-Gross Factor = We will use 77% (Reference 6)
Measure life	= 18 years (Reference 5)

Incremental cost:

High-efficiency furnace rated at an AFUE of 92 is $450. (Reference 1)
High-efficiency furnace rated at an AFUE of 94 is $505. (Reference 1)
High-efficiency boiler rated at an AFUE of 84 is $440. (Reference 1)

Provided by Customer:
Efficiency of new unit (Furnace 92%, 94% - Boiler 84%)

Verified during M&V:
Yes

Changes From 2008:
This is a new program for 2009

Building Characteristics for Prototype Home Used for Modeling:

Single Family
Two story (Reference 3)
3 bedroom 2 bathroom (Reference 3)
2000 square feet (Reference 3)
Basement foundation (Reference 3)
HVAC:
- heating - gas furnace 78 AFUE (55.9 kBtu unit required) - 85% of homes have gas heating, and 78% of which are forced air furnaces (Reference 2)
- cooling - 59% have Central Air Conditioning model required a 2.5 ton unit to meet the cooling load (Reference 2)
- air handler is in the basement and supply ducts and return ducts are assumed to be in majority interior space

Windows:
- 61% of homes have double pane windows (Reference 2)
- double pane low-E are standard (Reference 4)
- Model assumes 15% of wall area glazing
- applied a u-factor of 0.53 (average between clear glass double pane and low-E)

Insulation Levels:

Existing Ceiling Insulation: R-19 (Reference 4)
Existing Wall Insulation: R-11 (Reference 4)

Basement Assumptions

Assumed basement walls to have R-11 insulation
Basement is considered finished space but not conditioned
The air handler is located in the basement
Some homes will have smaller sections of the basement conditioned – maybe a bonus room etc, however this cannot be easily modeled in EnergyGauge

Appliances (Reference 2)

85% have dishwashers
74% electric ranges
88% and 89% have clothes washer and dryer (electric)
85% water heating is gas - model used a 40 gallon storage tank
68% of homes have ceiling fans

Average Customer Energy Consumption: (Reference 2)

kWh annually: 9,000 roughly for a 2,000 square foot home
Therms annually: 835

References:

1. California Energy Commission's Database for Energy Efficient Resources (DEER) http//www.energy.ca.gov/deer
(Does not include labor of equipment rental fees as this measure is considered a replace on burnout)
2. 2006 Residential Energy Use Colorado Service Area - Xcel: Bruce Neilson
3. American Housing Survey for Denver - US Census Bureau
4. Xcel Energy CO DSM Potential 2006 - prepared by Kema
5. Draft Technical Support Document: Energy Conservation Standards for Residential Furnaces and Boilers, Efficiency Standards for Consumer Products: Residential Central Air Conditioners And Heat Pumps, Prepared for US DOE, September 2006
6. Summit Blue 2006 Midwest Residential Market Assessment and DSM Potential Study.
7. Baseline costs from RS MEANS Repair and Remodeling Cost Data 2007

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Home Lighting & Recycling

Home Lighting Program encourages the purchase of compact fluorescent lamps (CFLs) and recycling of all fluorescent lamps.

Algorithms:

Electrical Energy Savings (Customer kWh)	=Number_of_Bulbs x (kW_Savings_per_Bulb) x Hours
Electrical Demand Savings (Customer kW)	=Number_of_Bulbs x (kW_Savings_per_Bulb)
Electrical Energy Savings (Gross Generator kWh)	= Customer kWh / (1-TDLF)
Electrical Demand Savings (Gross Generator kW)	= Customer kW x CF / (1-TDLF)
Electrical Energy Savings (Net Generator kWh)	= Gross Generator kWh x NTG
Electrical Demand Savings (Net Generator kW)	= Gross Generator kW x NTG

Variables:

Number_of_Bulbs	= Number of bulbs sold
kW_Savings_per_Bulb	= kW savings per replaced bulb. We will subtract the manufacturer provided wattage for each CFL from the wattage of the incadescent bulb it replaces. The incadescent wattages will be determined based on the CFL wattage as seen in Table 1.
Hours	= Hours of operation per year for the bulb. Hours of operation will be determined by assuming that there are three existing CFLs in each home. A sample of customers will be used to determine the distribution of bulbs purchased per customer. This distribution of bulbs/purchase will be used to determine the average hours of newly installed bulbs per Table 3.
CF	= Probability that peak demand of the bulb will coincide with peak utility system demand. 0.08 will be used for all CFLs based on Reference 1.
Measure Life	= Measure life for the average CFL sold will be 7 years; (8000 hr life/1,119 hr/yr).
TDLF	Transmission Distribution Loss Factor = 7.14%, the percentage loss of electricity as it flows from the power plant to the customer, calculated using factors from Enhanced DSM Filing SRD-2

Incremental Cost of Bulbs	= From Table 4 (Ref 3)
Net-to-Gross Factor	= We will use 83% for residential home lighting. Per Settlement NTG = 83% = 93% - 10% Installation Rate assumption.
O&M savings	= Operation and Maintenance savings are assumed to be zero.

Provided by Program Vendor:
Number and type of bulbs purchased

Verified during M&V:
Yes

Assumptions:
Average house in CO already has 3 CFLs installed

Table 1 - Existing lighting wattage for residential lights (Reference 1,5)

CFL Wattage Range	Replaced Incandescent Bulb Wattage
9 - 12	40
13 - 16	60
17 - 23	75
24 - 30	100
31 - 52	150

Table 2 - Hours of operation by space (Reference 2)

	Number of Lamps per Space	Annual Operating Hours per Space	Total Installed Lamps
Kitchen	5.11	1210	5.11
Outdoor	4.06	1027	9.17
Utility Room	1.81	888	10.98
Living Room	5.97	864	16.95
Dining Room	1.23	829	18.18
Family Room	2.38	772	20.56
Garage	4.23	720	24.79
Office	1.16	708	25.95
Bathroom	6.88	669	32.83
Hall	5.12	616	37.95
closet	0.77	513	38.72
Other	2.05	435	40.77
Bedroom	9.94	406	50.71

Purchased lamps are installed in most frequently used locations in declining order; e.g. first 5 in Kitchen, next 4 in Outdoor locations etc.

Table 3 - Average hours for newly installed bulbs

Total Number of Bulbs in the House	Newly Purchased Bulbs	Per Bulb Hours	Total Hours for Newly Installed Bulbs	Average Hours of Newly
1	-	1210	NA	NA
2	-	1210	NA	NA
3	-	1210	NA	NA
4	1	1210	1210	1210
5	2	1210	2420	1210
6	3	1027	3447	1149
7	4	1027	4474	1119
8	5	1027	5501	1100
9	6	1027	6528	1088
10	7	888	7416	1059
11	8	888	8304	1038
12	9	864	9168	1019
13	10	864	10032	1003
14	11	864	10896	991
15	12	864	11760	980

Table 4 - Average Cost Table		
Gross Retail	$3.23	per bulb
Baseline	$0.50	
Incremental	$2.73	
Rebate	$1.30	
Net Retail	$1.43	

Changes from 2008:
Home lighting is adding a bulb recycling service for 2009.

References:
1. CFL METERING STUDY FINAL REPORT, Prepared for: Pacific Gas & Electric Company, San Diego Gas & Electric Company, Southern California Edison Company, 2005 - Composite wattages and coincidence factor
2. US DOE, US Lighting Market Characterization, Navigant Consulting, 2002. Annual operating hours
3. Cost Data Source: 2006 MEEA Change A Light Change the World Program for 15W and 26W lamps. These costs are an upper boundary as lamp prices are significantly lower for more common 13W lamps (vast majority of residential lamps), and all lamp prices decrease.
4. Deemed Savings Database, Minnesota Office of Energy Security, 2008. CF, Hours, kW, Costs

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Home Performance with ENERGY STAR Rebates

Residential natural gas and electric customers receive a cash rebate for implementing multiple energy efficiency improvements.

Algorithms:

REQUIRED: Attic insulation and bypass sealing natural gas savings (Gross Dth) and electric energy and demand savings (kWh and kW)	Energy savings for the attic insulation and bypass sealing were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics.) Savings is 5.9 Dth, 180 kWh and 0.13 kW.
REQUIRED: Air sealing and weather-stripping natural gas savings (Gross Dth) and electric energy and demand savings (kWh and kW)	Energy savings for the air sealing and weather stripping were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics.) Air infiltration is measured as Air Changes per Hour (ACH); savings come from reducing the air infiltration through leaks, weatherstripping, holes etc. Savings is 7.4 Dth, 64 kWh and 0.03 kW.
REQUIRED: 20 CFLs electric energy savings and demand savings (kWh and kW)	Energy and demand savings and annual hours of operation for compact fluorescent lamps are based on data and calculations derived from the 2002 US Lighting Market Characterization performed for the Department of Energy in 2002. Savings is 833 kWh and 0.925 kW.
Wall insulation natural gas savings (Gross Dth) and electric energy and demand savings (kWh and kW)	Energy savings for the wall insulation were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics.) Savings is 32.3 Dth/yr, 630 kWh and 0.31 kW.
Setback thermostat natural gas savings (Gross Dth) and electric energy and demand savings (kWh and kW)	Energy savings for the thermostat setback were calculated in EnergyGauge modeling using a baseline model home calibrated to typical home size and characteristics for the Denver area (see below for characteristics.) Savings is 3.6 Dth, 175 kWh and 0.07 kW.
New HE Furnace AFUE 92% natural gas savings (Gross Dth)	Energy savings for the gas furnace were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics) = 7.8 Dth
New HE Furnace AFUE 94% natural gas savings (Gross Dth)	Energy savings for the gas furnace were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics) = 8.8 Dth
Tankless water heater 82% natural gas savings (Gross Dth)	Energy savings for the gas water heater were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics) = 5.9 Dth
Power vented water heater natural gas savings (Gross Dth)	Energy savings for the gas water heater were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics) = 2.1 Dth
Dishwasher natural gas savings (Gross Dth) and electric energy and demand savings (kWh and kW)	Energy savings for the dishwasher were based on the Energy Star Dishwasher Savings Calculator: http://www.energystar.gov/index.cfm?c=dishwash.pr_dishwashers. This assumed a gas water heater home, so savings are generated for gas and electric. Savings is 1.27 Dth, 77 kWh and 0.36 kW.

Clothes washer natural gas savings (Gross Dth) and electric energy and demand savings (kWh and kW)	Energy savings for the clotherswasher were based on the Energy Star Clotherswasher Savings Calculator: http://www.energystar.gov/index.cfm?c=clotheswash.pr_clothes_washers. This assumed a gas water heater home, so savings are generated for gas and electric. Savings is 0.88 Dth, 26 Kwh and 0.66 kW.
Refrigerator replacement electric energy and demand savings (kWh and kW)	Energy savings for the refrigerator were based on the Energy Star Refrigerator Savings Calculator: http://www.energystar.gov/index.cfm?c=refrig.pr_refrigerators. Savings is 93.41 kWh and 0.011 kW.
Refrigerator recycling electric energy and demand savings (kWh and kW)	Energy savings for the refrigerator are based on shipment-weighted average efficiencies of units manufactured from 1993-2000 with appropriate degradation factors applied to calculate baseline energy consumption (http://enduse.lbl.gov/Projects/RED.html) Demand savings are based on using an Average kW/Peak kW ratio from Deemed Refrigerator Savings for Texas developed by Frontier Associates. Reference 8. Savings is 988.9 kWh and 0.13 kW.
Net Dth	= Gross Dth x NTG
Electrical Energy Savings (Gross Generator kWh)	= Customer kWh / (1-TDLF)
Electrical Demand Savings (Gross Generator kW)	= Customer kW x CF / (1-TDLF)
Electrical Energy Savings (Net Generator kWh)	= Gross Generator kWh x NTG
Electrical Demand Savings (Net Generator kW)	= Gross Generator kW x NTG

Variables:

NTG	Net-to-Gross Factor = We will use 94% based on reference 5.
CF	Coincidence Factor = Probability that peak demand of the bulb will coincide with peak utility system demand. As seen in Table 1 based on Reference 1.
O&M savings	Operation and Maintenance savings = We will assume no O&M savings.
TDLF	Transmission Distribution Loss Factor = 7.14%, the percentage loss of electricity as it flows from the power plant to the customer, calculated using factors from Enhanced DSM Filing SRD-2

Table 1. (Reference 1)

Type of measure:	**Measure life:**	**Incremental cost:**	**Coincidence Factor**
Attic insulation and bypass sealing	20 years (Reference 1)	$588 (Reference 6)	NA
Air sealing and weather-stripping	10 years (Reference 1)	$272 (Reference 7)	NA
CFLs	8.8 years (Reference 9)	$63 (Reference 10)	8%
Wall insulation	20 years (Reference 1)	$2,150 (Reference 6)	NA
Setback thermostat	5 years (Reference 11)	$50 (Reference 11)	NA
HE furnace AFUE 92%	18 years (Reference 12)	$390 (Reference 13)	NA
HE furnace AFUE 94%	19 years (Reference 12)	$440 (Reference 13)	NA
Tankless water heater 82%	20 years (Reference 1)	$750 (Reference 13)	NA
Power vented water heater	15 years (Reference 1)	$175 (Reference 13)	NA
Dishwasher	11 years (Reference 15)	$30 (Reference 14)	2%
Clothes washer	11 years (Reference 16)	$200 (Reference 14)	2%
Refrigerator replacement	13 years (Reference 14)	$30 (Reference 14)	100%
Refrigerator recycling	7.3 years (Reference 14)	$0 (Reference 11)	100%

Provided by Customer:
Type of Measures Implemented

Verified during M&V:
Yes

Assumptions:
The baseline home had an existing level of insulation in the attic of R-19 and the change case had an elevated insulation level of R-40.
The baseline home had an existing ACH natural of 0.60 and the change case had a 25% reduction to 0.45 ACH natural.
The baseline home had an existing level of insulation in the walls of R-0 and the change case had an elevated insulation level of R-11.
The baseline water heater is a 40 gallon capacity with an Efficiency Factor (EF) of 59%.

Changes From 2008:
This is a new program for 2009

Building Characteristics for Prototype Home Used for Modeling:

- Single Family
- Two story (Reference 3)
- 3 bedroom 2 bathroom (Reference 3)
- 2000 square feet (Reference 3)
- Basement foundation (Reference 3)
- HVAC:
  - heating - gas furnace 78 AFUE (55.9 kBtu unit required) - 85% of homes have gas heating, and 78% of which are forced air furnaces (Reference 2)
  - cooling - 59% have Central Air Conditioning model required a 2.5 ton unit to meet the cooling load (Reference 2)
  - air handler is in the basement and supply ducts and return ducts are assumed to be in majority interior space
- Windows:
  - 61% of homes have double pane windows (Reference 2)
  - double pane low-E are standard (Reference 4)
  - Model assumes 15% of wall area glazing
  - applied a u-factor of 0.53 (average between clear glass double pane and low-E)

Insulation Levels:

- Existing Ceiling Insulation: R-19 (Reference 4)
- Existing Wall Insulation: R-11 (Reference 4)

Basement Assumptions

- Assumed basement walls to have R-11 insulation
- Basement is considered finished space but not conditioned
- The air handler is located in the basement
- Some homes will have smaller sections of the basement conditioned – maybe a bonus room etc, however this cannot be easily modeled in EnergyGauge

Appliances (Reference 2)
85% have dishwashers
74% electric ranges
88% and 89% have clothes washer and dryer (electric)
85% water heating is gas - model used a 40 gallon storage tank
68% of homes have ceiling fans

Average Customer Energy Consumption: (Reference 2)
kWh annually: 9,000 roughly for a 2,000 square foot home
Therms annually: 835

References:

1. California Measurement Advisory Committee (CALMAC) Protocols, Appendix F (www.calmac.org/events/APX_F.pdf).
2. 2006 Residential Energy Use Colorado Service Area - Xcel: Bruce Neilson
3. American Housing Survey for Denver - US Census Bureau
4. Xcel Energy CO DSM Potential 2006 - prepared by Kema
5. National Energy Efficiency Best Practices Study - Residential Single-Family Comprehensive Weatherization Best Practices Report from December 2004.
6. RS Means Repair and Remodeling 2007 at a cost of $0.028 per square foot per increase in R-value.
7. National Energy Audit Tool (NEAT) and Frontier estimates.
8. EEBP web site - Tacoma Residential Weatherization program.
9. US Lighting Market Characterization Study performed for the Department of Energy in 2002
10. MEEA/ES Change A Light campaign info
11. Xcel Energy estimate
12. Draft Technical Support Document: Energy Conservation Standards for Residential Furnaces and Boilers, Efficiency Standards for Consumer Products Prepared for US DOE, September 2006
13. California Energy Commission's Database for Energy Efficient Resources (DEER)
14. www.energystar.gov
15. DOE 2007
16. Appliance Magazine, September 2007

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Insulation Rebates

Residential natural gas customers receive a cash rebate for installing insulation in their existing single-family home or one-to-four unit property.

Algorithms:

Attic insulation and bypass sealing natural gas savings (Gross Dth)	Energy savings for the attic insulation and bypass sealing were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics.) Savings is 5.9 Dth/yr.
Air sealing and weather-stripping natural gas savings (Gross Dth)	Energy savings for the air sealing and weather stripping were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics.) Air infiltration is measured as Air Changes per Hour (ACH); savings come from reducing the air infiltration through leaks, weatherstripping, holes etc. Savings is 7.4 Dth/yr.
Wall insulation natural gas savings (Gross Dth)	Energy savings for the wall insulation were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics.) Savings is 32.3 Dth/yr.
Net Dth	= Gross Dth x NTG

Variables:

NTG	Net-to-Gross Factor = We will use 89% based on reference 5.
O&M savings	= Operation and Maintenance savings are assumed to be zero for the insulation rebates.

Type of insulation:	Measure life:	Incremental cost:	
Attic insulation and bypass sealing	20 years (Reference 1)	$588.00	(Reference 6)
Air sealing and weather-stripping	10 years (Reference 1)	$272.00	(Reference 7)
Wall insulation	20 years (Reference 1)	$2,080.00	(Reference 6)

Provided by Customer:	Verified during M&V:
Attic insulation and bypass sealing was completed	Yes
Air sealing and weather stripping was completed	Yes
Wall insulation was completed	Yes

Assumptions:

The baseline home had an existing level of insulation in the attic of R-19 and the change case had an elevated insulation level of R-40.
The baseline home had an existing ACH natural of 0.60 and the change case had a 25% reduction to 0.45 ACH natural.
The baseline home had an existing level of insulation in the walls of R-0 and the change case had an elevated insulation level of R-11.

Changes From 2008:

This is a new program for 2009

Building Characteristics for Prototype Home Used for Modeling:

Single Family
Two story (Reference 3)
3 bedroom 2 bathroom (Reference 3)
2000 square feet (Reference 3)
Basement foundation (Reference 3)
HVAC:
- heating - gas furnace 78 AFUE (55.9 kBtu unit required) - 85% of homes have gas heating, and 78% of which are forced air furnaces (Reference 2)
- cooling - 59% have Central Air Conditioning model required a 2.5 ton unit to meet the cooling load (Reference 2)
- air handler is in the basement and supply ducts and return ducts are assumed to be in majority interior space

Windows:
- 61% of homes have double pane windows (Reference 2)
- double pane low-E are standard (Reference 4)
- Model assumes 15% of wall area glazing
- applied a u-factor of 0.53 (average between clear glass double pane and low-E)

Insulation Levels:

Existing Ceiling Insulation: R-19 (Reference 4)
Existing Wall Insulation: R-11 (Reference 4)

Basement Assumptions

Assumed basement walls to have R-11 insulation
Basement is considered finished space but not conditioned
The air handler is located in the basement
Some homes will have smaller sections of the basement conditioned – maybe a bonus room etc, however this cannot be easily modeled in EnergyGauge

Appliances (Reference 2)

85% have dishwashers
74% electric ranges
88% and 89% have clothes washer and dryer (electric)
85% water heating is gas - model used a 40 gallon storage tank
68% of homes have ceiling fans

Average Customer Energy Consumption: (Reference 2)

kWh annually: 9,000 roughly for a 2,000 square foot home
Therms annually: 835

References:

1. California Measurement Advisory Committee (CALMAC) Protocols, Appendix F (www.calmac.org/events/APX_F.pdf).
2. 2006 Residential Energy Use Colorado Service Area - Xcel: Bruce Neilson
3. American Housing Survey for Denver - US Census Bureau
4. Xcel Energy CO DSM Potential 2006 - prepared by Kema
5. National Energy Efficiency Best Practices Study - Residential Single-Family Comprehensive Weatherization Best Practices Report from December 2004.
6. RS Means Repair and Remodeling 2007 at a cost of $0.028 per square foot per increase in R-value.
7. National Energy Audit Tool (NEAT) and Frontier estimates.

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Refrigerator Recycling

Rebates will be offered for pickup of a secondary working refrigerator that will be demanufactured and re-cycled.

Algorithms:

Refrigerator Electrical Energy Savings (Customer kWh)	= [Baseline Product Consumption - Efficient Product consumption] = 1,025* kWh/refrigerator recycled
Refrigerator Electrical Demand Savings (Customer kW)	= Refrigerator Electrical Energy Savings / 8760 x Average_to_Peak_kW_Factor = 0.139 kW
Electrical Energy Savings (Gross Generator kWh)	= Customer kWh / (1-TDLF) = 1,104 kWh*
Electrical Demand Savings (Gross Generator kW)	= Customer kW x CF / (1-TDLF) = 0.150 kW
Electrical Energy Savings (Net Generator kWh)	= Gross Generator kWh x NTG = 673 kWh*
Electrical Demand Savings (Net Generator kW)	= Gross Generator kW x NTG = 0.091 kW

*** 2009 values**

Variables:

Baseline Product Consumption	= Baseline Product Consumption is the average current year consumption for refrigerators manufactured 1993-2000 = 1025 kWh in 2009 and 1063 kWh in 2010 as calculated in Table 1.
Efficient Product Consumption	= Efficient Product Consumption is 0 when unit has been demanufacturered.
Average_to_Peak_kW_Factor	= Ratio of average electrical demand to peak electrical demand for a refrigerator from 1993 to 2000. We will use a value of 1.19 from reference 1.
8760	= Total number of hours in one year
Measure Life	= Measure life is assumed to be the remaining service life of the existing refrigerators that are removed under this program. = 7.3 years based on weighted average calculated in Table 1.
Incremental Costs	= Actual cost to implement program from vendor
TDLF	Transmission Distribution Loss Factor = 7.14%, the percentage loss of electricity as it flows from the power plant to the customer, calculated using factors from Enhanced DSM Filing - SRD-2
NTG	= Net to gross will be 61% for refrigerator recycling (Reference 3)

O&M savings	= Operation and Maintenance savings are assumed to be zero for refrigerator recycling.
CF	= Coincidence Factor = 1 by definition because we use average to peak kW

Provided by recycling vendor/homeowner:	**Verified during M&V:**
Confirm refrigerator was removed	Yes
Confirm refrigerator was working prior to removal	Yes

Assumptions:

Rebates are available only for working secondary units released by owners.

Changes From 2008:

New program for 2009

Table 1. (Reference 1 and 2)

		Baseline kWh		
Year of Manufacture	% Share	2009	2010	Remaining Life
1993	11.0%	1,180	1,224	4.5
1994	11.9%	1,128	1,169	5.0
1995	12.5%	1,080	1,120	5.5
1996	12.9%	1,042	1,080	6.5
1997	12.9%	1,004	1,042	7.5
1998	12.9%	969	1,004	8.5
1999	12.9%	934	969	9.5
2000	12.9%	901	934	10.5
Weighted Average		**1025**	**1063**	**7.3**

References

1. Baseline kWh and Average to peak kW ratio from Energy Data Sourcebook for the U.S. Residential Sector. Berkeley, CA: Lawrence Berkeley National Laboratory. LBNL-40297
2. Remaining Life and % share from US DOE, Technical support document: Energy efficiency standards for consumer products: Refrigerators, refrigerator-freezers, and freezers including draft environmental assessment, regulatory impact analysis, 1995 Jul
3. Net-to-Gross factor from Fort Collins Utility report

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: School Education Kits

A package of energy efficiency and water conservation classroom activities combined with projects for home that is targeted at sixth grade students in the Colorado service territory. The program is known as LivingWise and each participant receives a "LivingWise Activity Kit" containing a high-efficiency showerhead, a kitchen sink aerator, and two compact fluorescent bulbs, in addition to other educational items such as a thermometer, filter alarm, leak detection tablet, night light and tape measure.

Algorithms:

CFL Electric Energy Savings (Customer kWh)	= Number_of_Bulbs x (kW_EE - kW_Base) x Hrs
CFL Electric Demand Savings (Customer kW)	= Number_of_Bulbs x (kW_EE - kW_Base)
Showerhead Gas Savings (Gross Dth)	= (GPY_Saved x Delta_T x 8.33) / HGE x SPD
Aerator Gas Savings (Gross Dth)	= (GPY_Saved x Delta_T x 8.33) / HGE
Net Dth	= Gross Dth x NTG
Electrical Energy Savings (Gross Generator kWh)	= Customer kWh / (1-TDLF)
Electrical Demand Savings (Gross Generator kW)	= Customer kW x CF / (1-TDLF)
Electrical Energy Savings (Net Generator kWh)	= Gross Generator kWh x NTG
Electrical Demand Savings (Net Generator kW)	= Gross Generator kW x NTG

Variables:

Number_of_Bulbs	= Number of bulbs provided in each kit = 2.
Hrs	= Annual operational hours per year of the fixture. We will use 1210 hours which represents the average operating hours for the first 5 CFLs installed in a house. (Reference 1)
CF	= Coincidence Factor, the probability that peak demand of the lights will coincide with peak utility system demand. 0.08 will be used for prescriptive rebates (Reference 1)
kW_EE	= Fixture wattage (kW per fixture) for the two CFLs provided in the kit. We will use 0.019 kW which is the average for the two bulbs per kit.
kW_Base	= Fixture wattage (kW per fixture) for the two incandescent bulbs that the CFLS will replace. We will use 0.06526 kw which is the average of the two bulbs per kit.
GPY_Saved	= Gallons per year of hot water saved with high-efficiency showerhead (for one shower per day) or aerator assuming 65% of water flow is hot water. Showerhead = 1660 gallons per year per shower, Aerator = 657 gallons.
Delta_T	= Change in temperature of water from incoming water temperature to water heater temperature setting. Delta_T is 74 degrees F. (Reference 4)
HGE	= Heat generation efficiency based on steady-state water heater efficiency. Used value of 0.76. (Reference 2)
SPD	= Number of showers per day = 1.32 based on 2.64 people per home and 2 bathrooms. (Reference 4)
Incremental Costs	Costs per Table 2; Measure Cost
TDLF	Transmission Distribution Loss Factor = 7.14%, the percentage loss of electricity as it flows from the power plant to the customer, calculated using factors from Enhanced DSM Filing SRD-2
Net-to-Gross Factor	= We will use 70% for the gas measures in the school education kits per Dave Munk of RAP, and we will use 93% for the CFL measure.
Measure Life	Measure lives are shown in Table 1.
O&M savings	= Operation and Maintenance savings are assumed to be zero for the school education kits.

Provided by Customer: | **Verified during M&V:**

Provided by Customer:	Verified during M&V:
Kit was received	Yes
Measures have been installed	Yes

Assumptions:

Showerheads:
- 2.5 gpm replaced with 2.0 gpm, resulting in 1,660 gallons of annual water savings per shower. (reference 2,2)
- 1.32 showers per day at 6.9 minutes per shower (reference 2,3)

Faucet aerators:
- 2.2 gpm replaced with 1.8 gpm in bathroom, resulting in 657 gallons of annual water savings. (reference 2,3)
- 17 gal/day used by 3 primary sinks (33% per sink) (reference 4)

Table 1. Measure Life

Measure	Measure Life	Source
LW Kit-Shower heads	6	Reference 5
LW Kit-Faucet Aerators	5	Reference 5
LW Kit-CFLs	6.61	8000 hour CFL lamp divided by average hr/yr (1210 hr/yr)

Table 2 Measure Cost

	Measure Cost	Source:
LW Kit-Shower heads	$12	Vendor quote per kit allocated to
LW Kit-Faucet Aerators	$12	number of items providing savings.
LW Kit-CFLs	$23	

Changes From 2008:

This is a new program for 2009

References

1. Composite Wattages, Operating Hours and Coincidence from CFL METERING STUDY FINAL REPORT, Prepared for: Pacific Gas & Electric Company, San Diego Gas & Electric Company, Southern California Edison Company, 2005
2. Department of Energy Domestic Hot Water Appliance Calculator
3. Japanese study: "The effects of variation in body temperature on the preferred water temperature and flow rate during showering" Authors: Tadakatsu Ohnaka, Yutaka Tochihara, Yumiko Watanabe. Affiliations: a) Department of Physiological Hygiene, The Institute of Public Health, Minato-ku, Tokyo, Japan; b) Faculty of Home Economics, Jissen Women's University, Hino, Tokyo, Japan.
4. Handbook of Water Use and Conservation, Denver Water Conservation
5. California Measurement Advisory Committee (CALMAC) Protocols, Appendix F (www.calmac.org/events/APX_F.pdf).

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Water Heating Rebates

Residential natural gas customers receive a cash rebate for purchasing high-efficiency natural gas water heating equipment.

Algorithms:

Standard tank water heater 0.62 EF Natural gas savings (Gross Dth)	Energy savings for the gas water heater are based on federal minimum efficiency requirements for a baseline water heater. The replacement model has an Efficiency Factor (EF) rating of 62%, which is the current Energy Star Standard. All savings were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics.) Savings is 1.08 Dth/yr
Standard tank water heater 0.65 EF Natural gas savings (Gross Dth)	Energy savings for the gas water heater are based on federal minimum efficiency requirements for a baseline water heater. The replacement model has an EF rating of 65%. All savings were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics.) Savings is 2.06 Dth/yr.
Standard tank water heater 0.67 EF Natural gas savings (Gross Dth)	Energy savings for the gas water heater are based on federal minimum efficiency requirements for a baseline water heater. The replacement model has an EF rating of 67%. All savings were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics.) Savings is 2.66 Dth/yr.
Tankless water heater 0.82 EF Natural gas savings (Gross Dth)	Energy savings for the gas water heater are based on federal minimum efficiency requirements for a baseline water heater. The replacement model has an EF rating of 82%, which is the current Energy Star Standard. All savings were calculated in EnergyGauge using a baseline home model calibrated to typical home size and characteristics for the Denver area (see below for characteristics.) Savings is 5.91 Dth/yr.
Net Dth	= Gross Dth x NTG

Variables:

NTG	Net-to-Gross Factor = We will use 90% based on letter from Davis Energy Group to DOE dated 10/23/07.
Measure life	= 15 years for standard tank water heater and 20 years for tankless water heater. (Reference 5)

Unit Type	Incremental Cost:	
Standard tank water heater 0.62 EF	$55.00	(Reference 1)
Standard tank water heater 0.65 EF	$175.00	(Reference 1)
Standard tank water heater 0.67 EF	$230.00	(Reference 1)
Standard tank water heater 0.82 EF	$750.00	(Reference 1)

Provided by Customer:
Type of unit installed

Verified during M&V:
Yes

Assumptions:
The baseline water heater is 40 gallon capacity with an Efficiency Factor (EF) of 59%.
The average baseline product cost is based on the cost from RS MEANS Repair and Remodeling Cost Data 2007

Changes From 2008:
This is a new program for 2009

Building Characteristics for Prototype Home Used for Modeling:

Single Family
Two story (Reference 3)
3 bedroom 2 bathroom (Reference 3)
2000 square feet (Reference 3)
Basement foundation (Reference 3)
HVAC:
- heating - gas furnace 78 AFUE (55.9 kBtu unit required) - 85% of homes have gas heating, and 78% of which are forced air furnaces (Reference 2)
- cooling - 59% have Central Air Conditioning model required a 2.5 ton unit to meet the cooling load (Reference 2)
- air handler is in the basement and supply ducts and return ducts are assumed to be in majority interior space

Windows:
- 61% of homes have double pane windows (Reference 2)
- double pane low-E are standard (Reference 4)
- Model assumes 15% of wall area glazing
- applied a u-factor of 0.53 (average between clear glass double pane and low-E)

Insulation Levels:
Existing Ceiling Insulation: R-19 (Reference 4)
Existing Wall Insulation: R-11 (Reference 4)

Basement Assumptions
Assumed basement walls to have R-11 insulation
Basement is considered finished space but not conditioned
The air handler is located in the basement
Some homes will have smaller sections of the basement conditioned – maybe a bonus room etc, however this cannot be easily modeled in EnergyGauge

Appliances (Reference 2)
85% have dishwashers
74% electric ranges
88% and 89% have clothes washer and dryer (electric)
85% water heating is gas - model used a 40 gallon storage tank
68% of homes have ceiling fans

Average Customer Energy Consumption: (Reference 2)
kWh annually: 9,000 roughly for a 2,000 square foot home
Therms annually: 835

References:

1. California Energy Commission's Database for Energy Efficient Resources (DEER) http//www.energy.ca.gov/deer
(Does not include labor of equipment rental fees as this measure is considered a replace on burnout)
2. 2006 Residential Energy Use Colorado Service Area - Xcel: Bruce Neilson
3. American Housing Survey for Denver - US Census Bureau
4. Xcel Energy CO DSM Potential 2006 - prepared by Kema
5. California Measurement Advisory Committee (CALMAC) Protocols, Appendix F.

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Residential Saver's Switch New A/C

Prescriptive rebates will be offered to customers who install a Saver's Switch on their AC system.

Calculations:

Saver's Switch Electrical Energy Savings (Customer kWh)	= Average kW per Unit x Full Load Hours of Operation
Saver's Switch Electrical Demand Savings (Customer kW)	= Average kW per Unit
Electrical Energy Savings (Gross Generator kWh)	= Customer kWh / (1-TDLF)
Electrical Demand Savings (Gross Generator kW)	= Customer kW x CF / (1-TDLF)
Electrical Energy Savings (Net Generator kWh)	= Gross Generator kWh x NTG
Electrical Demand Savings (Net Generator kW)	= Gross Generator kW x NTG

Variables:

Average kW per Unit	= Average kW per A/C Unit = 3.000 kW/unit (Reference 1)
Full Load Hours of Operation	= Equivalent Full Load Hours of Operation that a Switch achieves energy savings by controlling an a/c unit during a typical year. Value includes equivalent hours during control discounted by the equivalent full load hours of payback period after the control, during which usage is increased. = 0.72 hours (Reference 1)
CF	Coincidence Factor = Percentage of the kW savings that occur during the annual hour of system peak. = 35.27% (Reference 1)
Measure Life	= Length of time the switch will be operational = 15 years from reference 1
TDLF	Transmission Distribution Loss Factor = 7.14% based on the Enhanced DSM filing, SRD-2
NTG	= Net-to-Gross factor for Saver's switches will be 100% as customers would not have the ability to install a switch without the program.

Provided by Customer:
Number of units with switch installed.

Verified during M&V:
Yes

Assumptions:
Customer kW value is the connected amps volt kW, and probably will not occur on even the hottest day due to AC over sizing. Oversizing is taken into account in the Coincidence Factor

Changes from 2008
Customer incentive revised from 2008

References
1. 2007 Xcel Energy Colorado Residential Saver's Switch Impact Evaluation.

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Easy Savings Energy Kit

A package of home energy efficiency measures in a kit that can be distributed to low-income customers through low-income agencies. Each participant receives a kit containing a high-efficiency showerhead, a kitchen sink aerator, and two compact fluorescent bulbs, in addition to other items such as a thermometer, filter alarm, leak detection tablet, night light and tape measure.

Algorithms:

CFL Electric Energy Savings (Customer kWh)	= (kW base-kW eff)x Hr use = Savings; ={(60 - 14)/1000 + (75-19)/1000} x 1,210 hr = 123 kWh/yr per kit
CFL Electric Demand Savings (Customer kW)	= (kW_EE - kW_Base) = (60-14)/1000 + (75-19)/1000 = 0.102 kW per kit
Showerhead Energy Savings (Gross Dth)	= (GPY_Saved x Delta_T x 8.33) / HGE x SPD/100000; = 1.33 Dkt/yr per kit
Aerator Energy Savings (Gross Dth)	= ((GPY_Saved x Delta_T x 8.33) / HGE)/1000000 = 0.343 Dkt/yr per kit
Electrical Energy Savings (Gross Generator kWh)	= Customer kWh / (1-TDLF)
Electrical Demand Savings (Gross Generator kW)	= Customer kW x CF / (1-TDLF)
Electrical Energy Savings (Net Generator kWh)	= Gross Generator kWh x NTG
Electrical Demand Savings (Net Generator kW)	= Gross Generator kW x NTG
Net Dth	= Gross Dth x NTG

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Variables:

Number_of_Bulbs	= Number of bulbs provided in each kit = 2.
Hrs	= Annual operational hours per year of the fixture. We will use 1210 hours which represents the average operating hours for the first 5 CFLs installed in a house. (Reference 1)
CF	= Coincidence Factor, the probability that peak demand of the lights will coincide with peak utility system demand. 0.08 will be used for prescriptive rebates (Ref 2)
kW_EE	= Bulb wattage per supplied CFLs; = 14W and 19 W. These are in the two bulb kit.
kW_Base	= Bulb wattage replaced by supplied CFLs; = 60 W and 75W.
GPY_Saved	= Gallons per year of hot water saved with high-efficiency showerhead (for one shower per day) or aerator assuming 65% of water flow is hot water. Showerhead = 1635 gallons per year per shower, Aerator = 423 gallons.
Delta_T	= Change in temperature of water from incoming water temperature to water heater temperature setting. Delta_T is 74 degrees F. (Reference 5)
HGE	= Heat generation efficiency based on steady-state water heater efficiency. Used value of 0.76 . (Reference 3)
SPD	= Number of showers per day = 1.32 based on 2.64 people per home and 2 bathrooms. (Reference 5)
Incremental Costs	= Incremental costs of measure as seen in Table 1.
Transmission Distribution Loss Factor (TDLF)	Transmission Distribution Loss Factor = 7.14%, the percentage loss of electricity as it flows from the power plant to the customer, calculated using factors from Enhanced DSM Filing - SRD-2
Net-to-Gross Factor (NTG)	= We will use 100% for school education kits as these kits would not be available without the program.
O&M savings	= Operation and Maintenance savings are assumed to be zero for the easy savings energy kits.

Table 1. (Reference 1,6)

Measure	Measure Life	Incremental Cost
CFLs	6.61 years (Reference 1)	$20.57
Shower heads	6 years (Reference 6)	$10.28
Faucet aerators	5 years (Reference 6)	$10.28

Provided by Customer:
Number of kits distributed

Verified during M&V:
Yes

Changes From 2008:
This is a new program for 2009

References

1. US DOE US Lighting Market Characterization Study 2002
2. Composite Wattages, Operating Hours and Coincidence from CFL METERING STUDY FINAL REPORT, Prepared for: Pacific Gas & Electric Company, San Diego Gas & Electric Company, Southern California Edison Company, 2005
3. Department of Energy Domestic Hot Water Appliance Calculator
4. Japanese study: "The effects of variation in body temperature on the preferred water temperature and flow rate during showering"
   Authors: Tadakatsu Ohnaka, Yutaka Tochihara, Yumiko Watanabe. Affiliations: a) Department of Physiological Hygiene, The Institute of Public Health, Minato-ku, Tokyo, Japan; b) Faculty of Home Economics, Jissen Women's University, Hino, Tokyo, Japan.
5. Handbook of Water Use and Conservation, Denver Water Conservation
6. CALMAC; California Measurement Advisory Committee.

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DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Low Income Multi-Family Weatherization

Low Income service agency may apply for a grant to improve the natural gas and electric efficiency measures of low income multi-family housing units and common spaces/systems.

Algorithms:

Savings will be determined by results of an engineering audit of potential energy savings for the facility and living units. Calculations may include standard energy calculations or hourly energy modeling with recognized software packages. Savings for CFL lighting, refrigerator upgrades or evaporative coolers installed in living units will be deemed per other programs for low income participants or prescriptive programs.

We will use 100% for the Net-to-Gross factor for the Low Income Multi-Family Weatherization program.

We will use 7.14%, the percentage loss of electricity as it flows from the power plant to the customer, calculated using factors from rate case no. 07-00319-UT

References:
References for each custom efficiency projects will be documented.

Changes from 2008:
This program is new for 2009

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Low Income Non-Profit Weatherization

Low Income service agency may apply for a grant to improve the natural gas and electric efficiency measures of low income non-proft housing units and common spaces/systems.

Algorithms:

Savings will be determined by results of an engineering audit of potential energy savings for the facility and living units. Calculations may include standard energy calculations or hourly energy modeling with recognized software packages. Savings for CFL lighting, refrigerator upgrades or evaporative coolers installed in living units will be deemed per other programs for low income participants or prescriptive programs.

We will use 100% for the Net-to-Gross factor for the Low Income Non-Profit Weatherization program.

We will use 7.14%, the percentage loss of electricity as it flows from the power plant to the customer, calculated using factors from rate case no. 07-00319-UT

References:
References for each custom efficiency projects will be documented.

Changes from 2008:
This program is new for 2009

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Low Income Single Family Weatherization Rebates

Residential low-income natural gas and electric customers can energy efficiency measures performed at no cost to them.

Algorithms:

Ceiling insulation from R-11 to R-38 natural gas savings (Gross Dth)	Energy savings for the ceiling insulation were calculated in REM/Rate using a baseline home model calibrated to home size and characteristics for the Denver area (see below for characteristics.) Savings is 7.9 Dth.
Wall insulation from R-3 to R-11 natural gas savings (Gross Dth)	Energy savings for the wall insulation were calculated in REM/Rate using a baseline home model calibrated to home size and characteristics for the Denver area (see below for characteristics.) Savings is 18.7 Dth.
New HE Furnace AFUE 92% natural gas savings (Gross Dth)	Energy savings for the gas furnace were calculated in REM/Rate using a baseline home model calibrated to home size and characteristics for the Denver area (see below for characteristics.) Savings is 11.1 Dth.
Refrigerator replacement electric energy savings (Customer kWh) and demand savings (Customer KW)	Energy savings for the refrigerator were based on the Energy Star Refrigerator Savings Calculator: http://www.energystar.gov/index.cfm?c=refrig.pr_refrigerators. Savings is 584 kWh and 0.08 kW.
16 CFLs electric energy savings (Customer kWh) and electric demand savings (Customer kW)	Energy and demand savings and annual hours of operation for compact fluorescent lamps are based on data and calculations derived from the 2002 US Lighting Market Characterization performed for the Department of Energy in 2002. Energy savings are 784 kWh and demand savings are 0.77 kW.
Net Dth	= Gross Dth x NTG
Electrical Energy Savings (Gross Generator k	= Customer kWh / (1-TDLF)
Electrical Demand Savings (Gross Generator	= Customer kW x CF / (1-TDLF)
Electrical Energy Savings (Net Generator kWh	= Gross Generator kWh x NTG
Electrical Demand Savings (Net Generator kV	= Gross Generator kW x NTG

Variables:

NTG	Net-to-Gross Factor = We will use 96% based on reference 5.
O&M savings	Operation and Maintenance savings = We will assume no O&M savings.
TDLF	Transmission Distribution Loss Factor = 7.14%, the percentage loss of electricity as it flows from the power plant to the customer, calculated using factors from Enhanced DSM Filing SRD-2

Type of measure:	Measure life:	Incremental cost:	Coincidence Factor:
Ceiling insulation	20 years (Reference 1)	$715 (Reference 6)	NA
Wall insulation	20 years (Reference 1)	$670 (Reference 6)	NA
HE furnace AFUE 92%	18 years (Reference 12)	$623 (Reference 13)	NA
Refrigerator replacement	7.3 years (Reference 14)	$631 (Reference 3)	100% (by definition per calc)
CFLs	7.9 years (Reference 9)	$60 (Reference 10)	8% (Reference 9)

Provided by Customer:
Type of measures implemented

Verified during M&V:
Yes

Changes From 2008:
This is a new program for 2009

Assumptions:

Building Characteristics for Baseline Home Used for Modeling:

Single Family
One story (Reference 3)
2 bedroom 1 bathroom (Reference 3)
961 square feet (Reference 3)
Crawlspace foundation (Reference 3)
HVAC:
- heating - gas furnace 78 AFUE (Reference 3)
- no cooling - 25% have evaporative coolers (Reference 3)
- air handler is in the crawlspace and supply ducts and return ducts are assumed to be in majority interior space

Windows:
- SHGC = 0.75
- U-factor = 1.27

Insulation Levels:

Existing Ceiling Insulation: R-11 (Reference 4)
Existing Wall Insulation: R-3 (Reference 4)

Crawlspace Assumptions

Assumed crawlspace walls do not have insulation
The air handler is located in the crawlspace
ACH = 0.8 and duct leakage is 25%

Appliances (Reference 2)

85% have dishwashers
74% electric ranges
88% and 89% have clothes washer and dryer (electric)
85% water heating is gas - model used a 40 gallon storage tank
68% of homes have ceiling fans

References:

1. California Measurement Advisory Committee (CALMAC) Protocols, Appendix F (www.calmac.org/events/APX_F.pdf).
2. 2006 Residential Energy Use Colorado Service Area - Xcel: Bruce Neilson
3. Colorado Governor's Energy Office (GEO)
4. Xcel Energy CO DSM Potential 2006 - prepared by Kema
5. National Energy Efficiency Best Practices Study - Residential Single-Family Comprehensive Weatherization Best Practices Report from December
6. RS Means Repair and Remodeling 2007 at a cost of $0.028 per square foot per increase in R-value.
7. National Energy Audit Tool (NEAT) and Frontier estimates.
8. EEBP web site - Tacoma Residential Weatherization program.
9. US Lighting Market Characterization Study performed for the Department of Energy in 2002
10. MEEA/ES Change A Light campaign info
11. Xcel Energy estimate
12. Draft Technical Support Document: Energy Conservation Standards for Residential Furnaces and Boilers, Efficiency Standards for Consumer Prepared for US DOE, September 2006
13. California Energy Commission's Database for Energy Efficient Resources (DEER)
14. www.energystar.gov
15. DOE 2007
16. Appliance Magazine, September 2007

➢ Appendix A – List of Acronyms

Acronym	Meaning
AFUE	Annual Fuel Utilization Efficiency
AIDA	Awareness, Interest, Desire, Action
ASD	Adjustable Speed Drive
ASHRAE	American Society of Heating Refrigeration & Air Conditioning Engineers
BOMA	Building Owners and Managers Association
CEE (Minnesota)	Center for Energy and the Environment
CEE (Boston)	Consortium for Energy Efficiency
CFM	Cubic Feet Per Minute
CPUC	Colorado Public Utilities Commission
CRLC	Colorado Regional Lighting Committee
DOE	Department of Energy
DSM	Demand-Side Management
EER	Energy Efficiency Ratio
EF	Energy Factor
EIA	Energy Information Administration
EMS	Energy Management System
EM&V	Evaluation, Measurement & Verification
EOC	Energy Outreach Colorado
EPA	Environmental Protection Agency
ESCO	Energy Services Company
E$P	Energy $avings Partners (Low-Income Program)
GAMA	Gas Appliance Manufacturer's Association
GEO	Governor's Energy Office
GPM	Gallons per Minute
HERS	Home Energy Rating System
HVAC	Heating, Ventilation, and Air Conditioning
IPMVP	International Performance Measurement and Verification Protocol
LIHEAP	Low-Income Home Energy Assistance Program
M&V	Measurement and Verification
NAIOP	National Association of Industrial and Office Properties
NEEP	Non-Profit Energy Efficiency Initiative
NEMA	National Electrical Manufacturers Association
O&M	Operations and Maintenance
RAP	Resource Action Programs
RESNET	Residential Energy Services Network
SCFM	Standard cubic feet per minute
SEER	Seasonal Energy Efficiency Ratio
VFD	Variable Frequency Drive

➢ Appendix B -- Budget Categories

The following chart indicates how projected DSM expenditures are divided between the budget categories.

Budget Category	Components
Program Planning & Design	• Labor for product development and program managers. • Expenditures related to product development, program planning and design.
Administration & Program Delivery	• Labor for program managers, sales representatives, call center, rebate processing, technical consulting, and other program fulfillment activities associated with delivering a program directly to the customer. • Labor for installation contractors, vendors, technical consultants, fulfillment contractors and alternative providers that Public Service contracts with to provide DSM services. • Project fulfillment, implementation and program support activities associated with delivering a program directly to the customer.
Advertising, Promotions, & Customer Education	• Labor for communication staff and others. • TV, radio, newspaper and print media; direct promotion and sales support materials; postage, promotional events; contracted outbound telephone sales. • Customer education through seminars, pamphlets, videos, and computer games.
Incentives	• Customer rebates, finance interest subsidies, subsidies for engineering studies, trade incentives, and incentives given in the form of subsidized products or equipment.
Equipment & Installation	• The costs to purchase energy efficient equipment and to install efficient equipment at the customer site.
Measurement & Verification	• Labor for market research and load research. • Labor for product development staff, product development external consultants, product development research activities. • Customer surveys, program evaluation expenses.
Miscellaneous	• Revenues - Program-related income that offsets the overall expense (e.g. income from audits, customer portion of cost sharing). All revenues are credited back to the individual programs.

ELECTRIC BENEFIT-COST ANALYSIS KEY

Electric Benefit-Cost Analysis per Customer kW

	Participant Test ($/kW)	Utility Test ($/kW)	Rate Impact Test ($/kW)	Modified Total Resource Test ($/kW)
System Benefits (Avoided Costs)				
Generation Capacity		A1	A1	A1
Transmission & Distribution Capacity		A2	A2	A2
Marginal Energy		A3	A3	A3
Avoided Emissions (CO2, SOx)		A4	A4	A4
Subtotal		A	A	A5
Non-Energy Benefits Adder (x%)				A6
Subtotal		A	A	AA
Other Benefits				
Participant Rebates and Incentives	B1			B1
Vendor Incentives				B2
Incremental Capital Savings	B3			B4
Incremental O&M Savings	B5			B6
Subtotal	B			BB
Reduction in Sales Revenue				
Electric	C1		C2	
Subtotal	C		CC	
Utility Program Costs				
Program Planning & Design		D1	D1	D1
Administration & Program Delivery		D2	D2	D2
Advertising/Promotion/Customer Ed		D3	D3	D3
Participant Rebates and Incentives		D4	D4	D4
Equipment & Installation		D5	D5	D5
Measurement and Verification		D6	D6	D6
Miscellaneous		D7	D7	D7
Subtotal		D	D	D
Participant Costs				
Incremental Capital Costs	E1			E2
Incremental O&M Costs	E3			E4
Subtotal	E			EE
Total Benefits	F1	F2	F3	F4
Total Costs	G1	G2	G3	G4
Net Benefit (Cost)	H1	H2	H3	H4
Benefit/Cost Ratio	I1	I2	I3	I4

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Explanation of Inputs

A1	Generation Avoided (Net)
A2	Transmission and Distribution Avoided (Net)
A3	Marginal Energy Reduced (Net)
A4	Emissions Avoided (Net)

Explanation of Inputs (Cont.)

A5	A1 + A2 + A3 + A4	Total System Benefits
A6	NEB * A5	Non-Energy Benefits Adder (10% Bus. and Res. - 20% Low Income)
A	A1 + A2 + A3 + A4	Total System Benefits
AA	A5 + A6	Total System Benefits with NEB Adder
B1		Rebates and Incentives Received by Participants (Gross)
B2		Incentive Received by Vendors (Gross)
B3		Incremental Capital Savings (Gross)
B4		Incremental Capital Savings (Net)
B5		Incremental O&M Savings (Gross, Escalated by 1.99% with 7.88% Discount)
B6		Incremental O&M Savings (Net, Escalated by 1.99% with 7.88% Discount)
B	B1 + B3 + B5	Total Other Benefits
BB	B1 + B2 + B4 + B6	Total Other Benefits (Modified TRC Test)
C1		Lost Electric revenues from program (Gross)
C2		Lost Electric revenues from program (Net)
C	C1	Total Lost Electric revenues from program (Gross)
CC	C2	Total Lost Electric revenues from program (Net)
D1		Program Planning and Design Costs (Gross)
D2		Administration & Program Delivery Costs (Gross)
D3		Advertising/Promotion/Customer Ed Costs (Gross)
D4		Participant (Rebates & Incentives) Costs (Gross)
D5		Equipment & Installation Costs (Gross)
D6		Measurement and Verification Costs (Gross)
D7		Miscellaneous Costs (Gross)
D	D1 + D2 + D3 + D4 + D5 + D6 + D7	Total Utility Program Costs (Gross)
E1		Incremental Capital Costs (Gross)
E2		Incremental Capital Costs (Net)
E3		Incremental O&M Costs (Gross, Escalated by 1.99% with 7.88% Discount)
E4		Incremental O&M Costs (Net, Escalated by 1.99% with 7.88% Discount)
E	E1 + E3	Total Participant Costs (Gross)
EE	E2 + E4	Total Participant Costs (Net)
F1	B + C	Total Benefits in Participant Test
F2	A	Total Benefits in Utility Test
F3	A	Total Benefits in Rate Impact Test
F4	AA + BB	Total Benefits in Modified TRC Test
G1	E	Total Costs in Participant Test
G2	D	Total Costs in Utility Test
G3	CC + D	Total Costs in Rate Impact Test
G4	D + EE	Total Costs in Modified TRC Test
H1	F1 - G1	Net Benefits (Costs) in Participant Test
H2	F2 - G2	Net Benefits (Costs) in Utility Test
H3	F3 - G3	Net Benefits (Costs) in Rate Impact Test
H4	F4 - G4	Net Benefits (Costs) in Modified TRC Test
I1	F1 / G1	Participant Test Ratio
I2	F2 / G2	Utility Test Ratio
I3	F3 / G3	Rate Impact Test Ratio
I4	F4 / G4	Modified Total Resource Cost Test Ratio

GAS BENEFIT-COST ANALYSIS KEY

Gas Benefit-Cost Analysis per One Dth/Yr

	Participant Test ($/Dth-yr)	Utility Test ($/Dth-yr)	Rate Impact Test ($/Dth-yr)	Modified Total Resource Test ($/Dth-yr)
System Benefits (Avoided Costs)				
Commodity Cost Reduction		A1	A1	A1
Variable O&M Savings		A2	A2	A2
Demand Savings		A3	A3	A3
Subtotal		A	A	A4
Emissions and Non-Energy Benefits (5% Adder)				A5
Subtotal		A	A	AA
Other Benefits				
Participant Rebates and Incentives	B1			B1
Vendor Incentives				B2
Incremental Capital Savings	B3			B4
Incremental O&M Savings	B5			B6
Subtotal	B			BB
Reduction in Sales Revenue				
Gas	C1		C2	
Subtotal	C		CC	
Utility Program Costs				
Program Planning & Design		D1	D1	D1
Administration & Program Delivery		D2	D2	D2
Advertising/Promotion/Customer Ed		D3	D3	D3
Participant Rebates and Incentives		D4	D4	D4
Equipment & Installation		D5	D5	D5
Measurement and Verification		D6	D6	D6
Miscellaneous		D7	D7	D7
Subtotal		D	D	D
Participant Costs				
Incremental Capital Costs	E1			E2
Incremental O&M Costs	E3			E4
Subtotal	E			EE
Total Benefits	F1	F2	F3	F4
Total Costs	G1	G2	G3	G4
Net Benefit (Cost)	H1	H2	H3	H4
Benefit/Cost Ratio	I1	I2	I3	I4

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

Explanation of Inputs

A1		Reduced Commodity (Net)
A2		Variable O&M Savings (Net)
A3		Reduced System Capacity (Net)
A4	A1 + A2 + A3	Total System Benefits (Net)
A5	(A1 + A2 + A3 + A4) * 5%	Emissions and Non-Energy Benefits Adder (5%)

Explanation of Inputs (cont.)

A	A1 + A2 + A3	Total System Benefits
AA	A4 + A5	Total System Benefits with NEB Adder
B1		Participant Rebates or Incentives (Gross)
B2		Vendor Incentives (Gross)
B3		Incremental Capital Savings (Gross)
B4		Incremental Capital Savings (Net)
B5		Incremental O&M Savings (Gross, Escalated by 1.99% with 7.72% Discount)
B6		Incremental O&M Savings (Net, Escalated by 1.99% with 7.72% Discount)
B	B1 + B3 + B5	Total Other Benefits
BB	B1 + B2 + B4 + B6	Total Other Benefits (Modified TRC Test)
C1		Lost Gas revenues from program (Gross)
C2		Lost Gas revenues from program (Net)
C		Total Lost Gas revenues from program (Gross)
CC		Total Lost Gas revenues from program (Net)
D1		Program Planning and Design Costs (Gross)
D2		Administration & Program Delivery Costs (Gross)
D3		Advertising/Promotion/Customer Ed Costs (Gross)
D4		Participant (Rebates & Incentives) Costs (Gross)
D5		Equipment & Installation Costs (Gross)
D6		Measurement and Verification Costs (Gross)
D7		Miscellaneous Costs (Gross)
D	D1 + D2 + D3 + D4 + D5 + D6 + D7	Total Utility Program Costs (Gross)
E1		Incremental Capital Costs (Gross)
E2		Incremental Capital Costs (Net)
E3		Incremental O&M Costs (Gross, Escalated by 1.99% with 7.72% Discount)
E4		Incremental O&M Costs (Net, Escalated by 1.99% with 7.72% Discount)
E	E1 + E3	Total Participant Costs (Gross)
EE	E2 + E4	Total Participant Costs (Net)
F1	B + C	Total Benefits in Participant Test
F2	A	Total Benefits in Utility Test
F3	A	Total Benefits in Rate Impact Test
F4	AA + BB	Total Benefits in Modified TRC Test
G1	E	Total Costs in Participant Test
G2	D	Total Costs in Utility Test
G3	CC + D	Total Costs in Rate Impact Test
G4	D + EE	Total Costs in Modified TRC Test
H1	F1 - G1	Net Benefits (Costs) in Participant Test
H2	F2 - G2	Net Benefits (Costs) in Utility Test
H3	F3 - G3	Net Benefits (Costs) in Rate Impact Test
H4	F4 - G4	Net Benefits (Costs) in Modified TRC Test
I1	F1 / G1	Participant Test Ratio
I2	F2 / G2	Utility Test Ratio
I3	F3 / G3	Rate Impact Test Ratio
I4	F4 / G4	Modified Total Resource Cost Test Ratio

➢ Appendix E -- Avoided Cost Assumptions

The following sections summarize the avoided cost assumptions Public Service has made in order to perform the cost-effectiveness tests for electric and gas programs, and for which the Company is asking for approval of for use in the status reports and incentives calculations for 2009 and 2010 achievements.

Electric Programs
In order to determine the cost-effectiveness of its electric energy efficiency and load management programs, Public Service must first calculate the avoided generation, transmission, distribution, and marginal energy costs these programs avoid. Below are tables showing the avoided cost assumptions used in this plan.

1. Estimated Annual Avoided Generation Capacity Costs (Source: Public Service Resource Planning)

Year	$/kW-yr	Year	$/kW-yr
2009	$124.74	2024	$223.59
2010	$131.30	2025	$231.41
2011	$138.21	2026	$239.51
2012	$145.49	2027	$247.89
2013	$153.14	2028	$256.57
2014	$158.50	2029	$265.55
2015	$164.05	2030	$274.84
2016	$169.79	2031	$284.46
2017	$175.74	2032	$294.42
2018	$181.89	2033	$304.73
2019	$188.25	2034	$315.39
2020	$194.84	2035	$326.43
2021	$201.66	2036	$337.85
2022	$208.72	2037	$349.68
2023	$216.03	2038	$361.92

2. Estimated Annual Avoided Transmission and Distribution Capacity Costs (Source: Public Service Resource Planning)

Year	$/kW-yr
2009	$30.60
2010-2038	Escalated at 1.99% annually

3. Estimated Annual Avoided Marginal Energy Costs (Source: Public Service Resource Planning and Quantitative Risk Services)

Year	Annual Average per kWh	Annual Maximum per kWh
2009	$0.067	$0.161
2010	$0.053	$0.128
2011	$0.057	$0.127
2012	$0.055	$0.124
2013	$0.058	$0.125
2014	$0.057	$0.122
2015	$0.057	$0.124
2016	$0.056	$0.124
2017	$0.063	$0.150
2018	$0.065	$0.138
2019	$0.070	$0.155
2020	$0.074	$0.150
2021	$0.078	$0.167
2022	$0.083	$0.156
2023	$0.088	$0.153
2024	$0.094	$0.160
2025	$0.098	$0.160
2026	$0.102	$0.177
2027	$0.109	$0.173
2028	$0.114	$0.179
2029-2038	Escalated at 4.67% annually based on the average escalation from 2014-2028	

4. Estimated Annual Avoided Emissions Costs (includes CO_2, SOx) (Source: Public Service Resource Planning)

Year	$/MWh	Year	$/MWh
2009	$0.11	2024	$33.97
2010	$14.67	2025	$33.64
2011	$14.83	2026	$34.95
2012	$16.44	2027	$37.98
2013	$15.92	2028	$41.23
2014	$16.74	2029	$41.71
2015	$17.97	2030	$42.85
2016	$19.66	2031	$44.27
2017	$20.48	2032	$44.59
2018	$22.40	2033	$44.04
2019	$23.72	2034	$46.72
2020	$25.16	2035	$51.37
2021	$26.82	2036	$54.35
2022	$30.55	2037	$51.96
2023	$33.65	2038	$52.08

Gas Programs

In order to determine the cost-effectiveness of its gas programs, Public Service must calculate the avoided commodity cost of gas, avoided capacity costs and any avoided variable O&M costs associated with the gas energy efficiency savings. Below are tables showing the avoided cost assumptions used in this Plan.

1. Estimated Commodity Cost of Gas (Source: Public Service Gas Resource Planning)

Year	$/Dth	Year	$/Dth
2009	$10.28	2024	$11.55
2010	$9.53	2025	$11.70
2011	$8.83	2026	$11.92
2012	$8.66	2027	$12.26
2013	$8.76	2028	$12.58
2014	$8.69	2029	$12.90
2015	$9.00	2030	$13.11
2016	$9.34	2031	$13.41
2017	$9.82	2032	$13.71
2018	$10.06	2033	$14.02
2019	$10.44	2034	$14.34
2020	$10.70	2035	$14.67
2021	$10.47	2036	$15.00
2022	$10.81	2037	$15.34
2023	$11.16	2038	$15.69

2. Estimated Avoided Variable O&M Costs (Source: Public Service Pricing and Planning)

Year	$/Dth
2009-2038	$0.05

4. Estimated Annual Avoided Reservation Costs (used to estimate capacity savings – Peak Day Dth savings estimated as 1% of annual Dth savings) (Source: Public Service Gas Resource Planning)

Year	$/Peak-Day Dth
2009-2038	$57.70