➢ Heating Efficiency

A. Description

Public Service's Heating Efficiency product provides rebates for business customers who purchase high efficiency natural gas or dual-fuel commercial equipment for space heating, water heating or process heating loads less than 30 percent. Available rebates are designed to promote the installation of high-efficiency equipment that improves combustion and seasonal efficiency above standard levels for both natural gas and electricity. While this product is only available for Public Service's retail natural gas and electric business customers, those who choose to switch from a third-party natural gas provider can also be eligible for natural gas measures. This product is not available for *Gas Transport Only* customers. The product has several components which include: hot water boiler systems, furnaces, water heaters, boiler auxiliary equipment improvements, pipe insulation, boiler tune-ups and other unique (custom) heating systems. The product's electric component provides a rebate for Electronically Commutated Fan Motors (ECMs) for commercial furnaces—either as a retrofit or new furnace option. The Company is also adding a new prescriptive measure, Unit Heaters. This measure will allow for both natural gas and electricity savings, offer low install costs, and is able to heat large volume areas without requiring extensive duct systems. The details for each product measure are described below.

1. Hot Water Boiler Systems

Public Service rebates hot water boilers that exceed the minimum efficiency levels established by 2015 International Energy Conservation Code (IECC) standards. IECC requires a minimum efficiency of 82% on 2,500 MBTUH or larger units and requires a minimum efficiency of 80% on hot water boilers less than 2,500 MTUH. Rebates are eligible for the installation of a new condensing boiler where either no previous boiler existed or the current boiler is no longer functional, for two possible scenarios:

- Plan A-1 – Boilers equal to or above 85% efficiency; or
- Plan A-2 – Boilers equal to or above 92% efficiency.

2. Furnaces

Furnaces must have a minimum efficiency of 92% Annual Fuel Utilization Efficiency (AFUE), which aligns with ENERGY STAR® guidelines. Furnaces of 94% AFUE or higher receive a larger rebate. ECMs for furnace fans allow the motor to adjust its speed to ensure the optimal airflow at all times using significantly less electricity to deliver air in both the heating and cooling seasons.

3. Water Heater Systems

Public Service rebates commercial water heating systems that exceed the minimum efficiency levels established by the 2015 IECC standards. These can be either tankless or storage systems, greater than 150 MBTUH and more than 92% efficiency.

4. Boiler Auxiliary Equipment Improvements

The performance of a boiler system can be enhanced with controls and system efficiency improvements. Boiler auxiliary equipment rebates are based on the incremental cost of efficient equipment and are calculated based on a percentage of the project cost (i.e. how much it costs to perform that portion of the project, not the entire project cost). Rebates for tune-ups are available on the same boiler every two years. The following will be rebated:

a) Boiler Tune-Ups

Must include the following activities in order to qualify:

- Measurement of combustion efficiency using an electronic flue gas analyzer at steady state conditions
  - Test results of the electronic flue gas analyzer must be included with the application
- Adjustment of air flow and reduction of excessive stack temperatures
- Adjustment of burner and gas input, manual or motorized draft control
- Cleaning of burners, combustion chamber and heat exchanger surface, when weather or operating schedule permits
- Cleaning and inspecting the burner nozzles
- Checking for proper venting
- Completing visual inspection of system piping and insulation
- Checking safety controls
- Checking adequacy of combustion air intake

b) Boiler Efficiency Retrofits

- Modular burner controls (addition of controls to existing equipment)
- 5:1 turndown ratio or greater
- Outdoor air reset controls
- Stack dampers
- Steam trap replacement/parts

c) Pipe Insulation

- ~~Insulation rebates are for boiler or water heater pipes and are based on the pipe's diameter, R-value of the insulation, and the linear feet of insulation.~~
- Pipe insulation rebates are for boiler or water heater pipes and are based on the pipe's diameter and the linear feet of insulation.
- Rebates are available for adding insulation to existing bare pipe or replacing damaged existing insulation; however, insulating new pipes is not eligible.

<u>5. Unit Heaters</u>

Electricity savings for the non-condensing power vent unit heater and condensing unit heaters are for the fan that is associated with a unit heater; infrared unit heaters do not have a fan. Rebates are for customers who install:

- A non-condensing power vent unit heater with a minimum efficiency of 83%
- A condensing unit heater with a minimum efficiency of 90%

- Infrared heater with a minimum efficiency of 80%

6. Custom Boilers

Equipment installations performed outside of the prescriptive scope may be eligible for rebates available through the Custom Efficiency product. All projects require preapproval prior to purchase and installation and must conform to all Custom Efficiency product guidelines. More Custom Efficiency rebates and guideline information can be found on the Company's website.[1]

These projects require individual evaluation to determine how much energy will be saved and to ensure cost-effectiveness. Projects that typically fall under the custom category include, but are not limited to:

- Large boiler systems (greater than 10 million BTUH)
- Carwash boilers
- Pool boilers
- Boiler control systems
- Process loads

B. Targets, Participants & Budgets

Targets and Participants

Project pipeline and market potential were evaluated to determine participation and energy savings targets. Participation increased rapidly through the first few years of the product's natural gas energy efficiency offerings, but due to low natural gas prices, pipeline momentum has slowed in recent years. ECMs for furnace fans have been introduced as an option for electric energy savings. To increase participation in the product, the Company will review potential new prescriptive measures identified through Custom Efficiency, as technology improves and markets change.

Budgets

For the Heating Efficiency product, rebates are the largest expense, with promotional costs and labor also being factors. The following summarizes the budget drivers:

- *Rebates* – calculated using average rebate cost per Dth, kW, and kWh.
- *Promotions* – important to build awareness and provide education on the benefits of high efficiency heating systems.
- *Labor* – determined by estimating the number of full-time employees needed to manage the product and execute the marketing strategy and rebate process.

C. Application Process

[1] http://www.xcelenergy.com/Energy_Solutions/Business_Solutions

Rebate applications are available on the Xcel Energy website.[2] Hard copies are also available via Account Managers, the Trade Relations Manager, and trade allies. Participants in the product may submit their application through their Account Manager or the Business Solutions Center (BSC). Customers must apply for rebates within 12 months of equipment purchase and start-up. Participants are required to complete an application, and provide manufacturer equipment specifications and an invoice, as proof of purchase.

The following equipment information must be included on the application when applying for a boiler rebate:

- Plan selection (A-1 or A-2),
- use (space heat and/or domestic water heat or both),
- status (new or existing),
- manufacturer and model number,
- process load percentage,
- efficiency,
- size (MMBTUH), and
- quantity.

Information required for other equipment may include:

- r-value,
- fluid temperature,
- pipe location (inside/outside) linear feet,
- pipe diameter,
- cost, and
- serial number.

Preapproval is not required before the customer buys or installs equipment for prescriptive measures, but will be required for custom projects in accordance with the Custom Efficiency product policies.

D. Marketing Objectives & Strategies

The objective of the Heating Efficiency product is to provide education and incentives that motivate customers to purchase high efficient heating equipment and run their existing heating systems at optimum efficiency. Boiler systems are typically installed in mid- to large-sized facilities, while furnaces tend to be in smaller buildings. The product marketing strategy supports identification of and targeted messaging to these different facilities for efficiency improvement.

[2] http://www.xcelenergy.com/Energy_Solutions/Business_Solutions

The Heating Efficiency product follows the marketing strategy of other prescriptive products, leveraging the BSC to improve the level of knowledge on heating efficiency in the marketplace. The Company also provides a newsletter and direct communication campaigns to customers and trade allies, and participates in trade shows and other events. These tactics make customers aware of the key benefits of energy efficiency and its applicability to heating systems. The Company provides fact sheets and rebate applications to customers directly, and via trade allies, to encourage them to consider leveraging Heating Efficiency rebates as they make equipment purchase decisions. An online case study helps customers, identifying the energy and non-energy benefits of upgrading to high efficiency equipment and auxiliary equipment. In addition, Public Service's Account Managers and BSC will educate customers on the project's energy savings potential, impact of the rebate on the payback calculation, and how to complete the application process. Trade allies can get similar assistance from the Company's Trade Relations Manager.

The Heating Efficiency product may also follow-up on customer opportunities identified following participation in the Business Energy Analysis product—communications will center on the benefits of energy efficiency through reduced paybacks and lifecycle costs, and greater environmental benefits.

E. Product-Specific Policies

Gas Transport Only customers cannot participate in rebates for the Heating Efficiency product. Participating customers must be a business retail natural gas customer of Public Service at the time the gas rebate is issued and must be an electric only or a combination electric and gas customer to qualify for the electric ECM rebate.

F. Stakeholder Involvement

Public Service routinely consults with several of the major equipment suppliers and contractors for guidance when refining the Heating Efficiency product for Colorado.

These stakeholders provided insight into the types of products to rebate, the incremental and total equipment costs to be expected, and how the application process can be improved. The Company also works closely with state and local governments to promote energy efficiency and holds semi-annual Heating Advisory Board meetings to engage with contractors and seek feedback and input on product updates and other considerations in delivering this product.

G. Rebates & Incentives

Rebate levels have been designed to encourage customers to install high efficiency equipment. Auxiliary equipment rebates are available to encourage customers to further

improve the standard choices that could be made. Pipe insulation and boiler tune-ups are lower cost options for customers who wish to enhance the overall performance and efficiency of their system.

There are two levels of hot water boiler equipment rebates. The Plan A-1 boiler measure rebates systems greater than 85% efficiency which is the lowest efficiency hot water boiler rebate offered. Plan A-2 covers boilers greater than 92% efficiency. Both plans are for Public Service customers who have installed a new boiler where no previous boiler existed, an existing boiler that is no longer functional is being replaced, or the customer has a desire to upgrade the existing functioning boiler to a more efficient model.

Hot Water Boilers*		
Minimum Requirements	**Plan A-1** 85% minimum efficiency	**Plan A-2** 92% minimum efficiency
Rebate	$750/MMBTUH	$3,500/MMBTUH

**Conditions:* (1) Equipment must use natural gas fuel as the primary fuel but can have dual fuel capability for backup. (2) Efficiency is based on either thermal 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.

Rebates for furnaces must meet minimum efficiency requirements that align with ENERGY STAR guidelines and are AFUE rated. Customers may receive rebates of $80 per unit for systems with minimum 92% AFUE, or $120 per unit for systems, with minimum 94% AFUE. The electric savings for ECMs will be calculated based on space cooling, space heating, motor horsepower, and geographical region (Denver/Front Range, Western Slope, or Alamosa/Mountain). The rebate is $100 for new or retrofit units.

Commercial water heater equipment rebate levels are set at $200/100,000 BTUH per unit (greater than 150 MBTUH). Rebates apply to tankless water heaters, or units with storage. They must be at least 92% efficient to qualify.

Pipe insulation rebates are based on the pipe's diameter and the linear feet of insulation. Larger diameter pipes will be eligible for the highest rebates.

Pipe Insulation Rebate Schedule						
	Miniumum Insulation Thickness		Miniumum Insulation Thickness		Miniumum Insulation Thickness	
Pipe Size	105 - 200 Deg (Hot Water Heating and Domestic Hot Water) Conductivity 0.21 - 0.29 Btu in/ (h ft2	Rebate $ / ft of pipe per inch of pipe diameter	201 - 250 Deg (Low Pressure Steam) Conductivity 0.27 - 0.30 Btu in/ (h ft2 deg F)	Rebate $ / ft of pipe per inch of pipe diameter	251 - 350 Deg (High Pressure Steam) Conductivity 0.29 - 0.32 Btu in/ (h ft2 deg F)	Rebate $ / ft of pipe per inch of pipe diameter
0.5" to < 1"	1	$5	1.5	$6	2	$8
1" to < 1.5"	1	$5	1.5	$6	3	$8
1.5" to < 4"	2	$6	2.5	$8	4.5	$9
4" and larger	2	$6	3	$8	4.5	$9

~~Pipe insulation rebate levels are based on the size of the pipe being insulated and the R-value of the insulation. Larger diameter pipes with thicker insulation will be eligible for the highest rebates. Rebates are issued per linear foot of insulation installed, as detailed in the table below.~~

~~Pipe Insulation~~		
~~Pipe Diameter~~	~~R-Value~~	~~Rebate per linear foot per inch of pipe~~
~~0.5" – 2"~~	~~3.5~~	~~$3.00~~
~~0.5" – 6"~~	~~5.0~~	~~$4.00~~
~~2.5" – 12"~~	~~7.0~~	~~$5.00~~

Retrofit Controls, Heat Recovery and System Improvements

i. Boiler Tune-Ups:
   - $250/MMBTUH (only available on the same boiler every two years)

ii. Boiler Efficiency Retrofits:
   - Modular Burner Control, 5:1 Turndown Ratio or Greater: $750/MMBTUH;
   - $2,000 max
   - Outdoor Air Reset Controls: $250/MMBTUH
   - Stack Dampers: $250/MMBTUH
   - Steam Trap Replacement/Parts: 25% up to $250/trap; max $10,000/facility

The following equipment information must be included on the application when applying for rebates on system improvements:

- boiler use for use (space heat and/or domestic water heat or both)
- process load percentage
- boiler size (MMBTUH)
- quantity
- cost

Unit Heaters

Customers are paid using the following table for each unit heater installed:

- Non-Condensing (minimum 83% efficiency) $50/100,000 BTUH

- Condensing (minimum 90% efficiency) $500/100,000 BTUH
- Infrared (minimum 80% efficiency) $125/100,000 BTUH