BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO

*** * * * ***

RE: IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF COLORADO FOR AN ORDER GRANTING A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR DISTRIBUTION GRID ENHANCEMENTS, INCLUDING ADVANCED METERING AND INTEGRATED VOLT-VAR OPTIMIZATION INFRASTRUCTURE	**)** **)** **)** **)** **)** **)** **)** **)** **)**	**PROCEEDING NO. 16A-____E**

DIRECT TESTIMONY AND ATTACHMENTS OF SAMUEL J. HANCOCK

ON

BEHALF OF

PUBLIC SERVICE COMPANY OF COLORADO

August 2, 2016

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO**

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SUMMARY OF THE DIRECT TESTIMONY OF SAMUEL J. HANCOCK

Mr. Samuel J. Hancock is a Manager, Regulatory Project Management for Xcel Energy Services Inc. ("XES"). XES is the service company subsidiary of Xcel Energy Inc., the parent company of Public Service Company of Colorado ("Public Service" or the "Company"). In this position he is responsible for supporting various regulatory matters including competitive resource acquisition processes, new product design, economic analyses of existing and potential resource options, as well as other technical analyses for Xcel Energy's operating companies.

In his testimony, Mr. Hancock presents and explains the Company's quantitative cost-benefit model with respect to the components of the Advanced Grid Intelligence and Security ("AGIS") initiative that are the subject of the Company's application for a Certificate of Convenience and Public Necessity ("CPCN"). While Company witnesses Mr. Russell E. Borchardt, Mr. Chad S. Nickell, Mr. Wendall A. Reimer, and Mr. David C. Harkness support the individual forecasted costs and benefits of the Advanced Metering

Infrastructure ("AMI") and Integrated Volt-VAr Optimization ("IVVO") efforts, including the Field Area Network ("FAN") components and supporting information technology ("IT") and cyber security efforts associated with AMI and IVVO, Mr. Hancock explains how those quantitative inputs are utilized to provide an overall cost-benefit analysis. Mr. Hancock also supports the assumptions included in the model, and provides the results of an analysis the Company believes is a conservative representation of costs and benefits. He notes that although a cost-benefit model is one useful tool for evaluating the Company's proposal, the AMI and IVVO programs present a number of qualitative benefits, such as increased safety and customer satisfaction, that cannot be quantified but are a necessary component of Public Service's broader initiative to enhance customer choice, to support an advanced, more transparent grid, and to enhance demand side management ("DSM") goals.

Mr. Hancock estimates that the AMI and IVVO investments will provide a combined net present value benefit/cost ratio to Public Service customers of approximately 0.85 based on current cost and benefit forecasts, before taking into account the qualitative benefits of AMI and IVVO and the overall need to bring the grid into the future. In doing so, Mr. Hancock supports the Company's petition for a Certificate of Public Convenience and Necessity in this proceeding.

**BEFORE THE PUBLIC UTILITIES COMMISSION
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DIRECT TESTIMONY AND ATTACHMENTS OF SAMUEL J. HANCOCK

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GLOSSARY OF ACRONYMS AND DEFINED TERMS

Acronym/Defined Term	Meaning
ADMS	Advanced Distribution Management System
AGIS	Advanced Grid Intelligence and Security
AMI	Advanced Metering Infrastructure
AMR	Automated Meter Reading
ANSI	American National Standards Institute
BPL	Broadband over Power Line
C&I	Commercial and Industrial
CAIDI	Customer Average Interruption Duration Index
CBA	Cost-Benefit Analysis
CIS	Customer Information System
CMO	Customer Minutes Out
Commission	Colorado Public Utilities Commission
Company	Public Service Company of Colorado
CPCN	Certificate of Public Convenience and Necessity
CPCN Projects	AMI, IVVO, and the components of the FAN that support these components
CPE	Customer premise equipment
CRS	Customer Resource System
CSF	Cyber Security Framework
CVR	Conservation Voltage Reduction
DA	Distribution Automation
DDOS	Distributed Denial of Service
DER	Distributed Energy Resources
DOS	Denial-of-service
DR	Demand Response
DSM	Demand Side Management
DVO	Distribution Voltage Optimization
EPRI	Electric Power Research Institute
ERT	Encoder Receiver Transmitter
ESB	Enterprise Service Bus
FAN	Field Area Network
FLISR	Fault Locate Isolation System Restoration

Acronym/Defined Term	Meaning
FLP	Fault Location Prediction
GFCI	Ground Fault Circuit Interrupter
GIS	Geospatial Information System
HAN	Home Area Networks
ICE	Interruption Cost Estimation
IDS	Intrusion Detection System
IEEE	Institute of Electrical and Electronics
IPS	Internet Provider Security
IT	Information technology
IVR	Interactive Voice Response
IVVO	Integrated Volt-VAr Optimization
kVAr	Kilovolt-amperes reactive
kVArh	Reactive power
kW	Kilowatt
kWh	Kilowatt hours
LTCs	Load Tap Changers
LTE	Long-Term Evolution
MDM	Meter Data Management
MitM	Man-in-the-Middle Attack
MPLS	Multiprotocol Label Switching
NCAR	National Center for Atmospheric Research
NOC	Network Operations Center
NPV	Net Present Value
O&M	Operations and Maintenance
OMS	Outage Management System
OT	Operational Technology
PTMP	Point-to-multipoint
Public Service	Public Service Company of Colorado
RF	Radio frequency
RFP	Request for Proposal
RFx	Request for Information and Pricing
RTU	Remote Terminal Units

Acronym/Defined Term	Meaning
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCADA	Supervisory Control and Data Acquisition
SGCC	Smart Grid Consumer Collaborative
SGIG	Smart grid investment grants
SIEM	Security Incident and Event Management
SVC	Secondary static VAr compensators
TOU	Time-of-use
USEIA	United States Energy Information Administration
WACC	Weighted Average Costs of Capital
WAN	Wide Area Network
WiMAX	Worldwide Interoperability for Microwave Access
WiSUN	802.15.4g Standard
Xcel Energy Inc.	Xcel Energy
XES	Xcel Energy Services Inc.

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DIRECT TESTIMONY AND ATTACHMENTS OF SAMUEL J. HANCOCK

I. INTRODUCTION, QUALIFICATIONS, AND PURPOSE OF TESTIMONY

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Samuel J. Hancock. My business address is 1800 Larimer, Denver Colorado 80202, Suite 1400.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT POSITION?

A. I am employed by Xcel Energy Services Inc. ("XES") as a Manager, Regulatory Project Management. XES is a wholly-owned subsidiary of Xcel Energy Inc. ("Xcel Energy"), and provides an array of support services to Public Service Company of Colorado ("Public Service" or "Company") and the other utility operating company subsidiaries of Xcel Energy on a coordinated basis.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THE PROCEEDING?

A. I am testifying on behalf of Public Service.

Q. PLEASE SUMMARIZE YOUR RESPONSIBILITIES AND QUALIFICATIONS.

A. As a Manager, Regulatory Project Management, my duties include supporting various regulatory matters including competitive resource acquisition processes, new product design, economic analyses of existing and potential resource options, as well as other technical analyses for Xcel Energy's operating companies. A description of my qualifications, duties, and responsibilities is set forth after the conclusion of my testimony in my Statement of Qualifications.

Q. ARE YOU SPONSORING ANY ATTACHMENTS AS PART OF YOUR DIRECT TESTIMONY?

A. Yes, I am sponsoring the following:

- Attachment SJH-1: Summary of AMI/IVVO Cost-Benefit Analysis
- Attachment SJH-2: AMI Cost-Benefit Analysis
- Attachment SJH-3: IVVO Cost-Benefit Analysis
- Attachment SJH-4: CPCN Projects Cost-Benefit Analysis
- Attachment SJH-5: Brattle Group Elasticity Study

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose of my Direct Testimony is to present the Company's overall assessment of the costs and benefits of the programs for which Public Service is seeking a Certificate of Public Convenience and Necessity ("CPCN Projects"). I begin by presenting the Company's quantitative cost-benefit analysis, which consolidates and summarizes the quantifiable costs and benefits of the

Advanced Metering Infrastructure ("AMI") and Integrated Volt-VAr Optimization ("IVVO") programs, as well as the associated components of the Field Area Network ("FAN") and Information Technology ("IT") integration and security, which are included in this CPCN Projects Application.

I also support the costs and benefits of two particular aspects of the quantitative analyses: (i) the residential customer peak demand reduction and associated avoided capacity benefit associated with residential demand rates, which are enabled by AMI, and (ii) the potential improvements to our Saver's Switch program enabled through the two-way communication utilizing the FAN.

In addition, I explain that there are certain benefits of AMI and IVVO that cannot necessarily be captured by a cost-benefit analysis. While Company technical witnesses Mr. Chad S. Nickell and Mr. Russell E. Borchardt discuss these benefits in more detail, I provide context for these unquantified benefits and explain how they support this CPCN Projects Application.

II. COST-BENEFIT ANALYSIS OVERVIEW

A. Model Requirements

Q. PLEASE DESCRIBE PUBLIC SERVICE'S COST-BENEFIT MODEL IN THIS MATTER.

A. The cost-benefit model calculates the benefit-to-cost ratio of the portion of Public Service's advanced grid intelligence and security ("AGIS") initiative for which the Company is seeking a CPCN. Company witnesses Ms. Alice K. Jackson and Mr. John D. Lee discuss the broader AGIS initiative in more detail in their Direct Testimony. The benefit-to-cost ratio is set forth on a 2016 net present value ("NPV") basis, and evaluates the stand-alone costs and benefits of AMI and IVVO, respectively, incorporating the FAN and IT integration components specific to each program. Finally, the model evaluates the net present value of estimated costs and benefits for AMI and IVVO (including associated FAN and IT costs) on a combined basis.

Q. HOW DID PUBLIC SERVICE STRUCTURE THE COST-BENEFIT ANALYSIS PRESENTED IN YOUR TESTIMONY?

A. The model compares the upfront and ongoing costs against the benefits of the Company's proposed project over the analysis period, which is 2016 through 2035 with primary implementation occurring through 2021. The model views costs and benefits from the customer perspective, meaning that it quantifies the estimated net impact of costs and savings to customers. In this respect, all quantifiable utility costs and benefits were estimated in the model as they would be effectuated through utility electric rates. For example, Public Service

estimated meter installation costs as they would be included in rates.

We also estimated reasonably quantifiable direct-to-customer benefits of improvements in the Company's electric service that would not be incurred by the utility or directly affect customer rates. For example, an electrical outage has a direct impact on the customers' own activities, which can be measured through a "customer minutes out" ("CMO") metric.

Q. WHY IS THIS THE APPROPRIATE BASIS ON WHICH TO EVALUATE THE QUANTIFIABLE ASPECTS OF PUBLIC SERVICE'S CPCN PROJECTS APPLICATION?

A. By developing the model from the customer's perspective, Public Service is providing clear and comprehensive information about the overall impact of these programs to customers. The cost-benefit model also provides both a "high level" look at the costs versus the quantifiable benefits of AMI and IVVO for customers, as well as a more detailed breakdown of individual cost and benefits assumptions for each program. While not all reasons for undertaking the AGIS program or benefits of the program are quantifiable, the cost-benefit model provides an appropriate perspective on quantifiable considerations.

Q. PLEASE DESCRIBE THE PERIOD OF TIME THE MODEL EXAMINES.

A. The model examines the period beginning 2016 and ending 2035, beginning with early phase work to develop the AGIS initiative through a reasonable useful life of the AMI meters.

Q. WHY DOES THE MODEL EXAMINE THIS PERIOD OF TIME?

A. This twenty-year period for examination is well within the expected useful life of the AMI meters being deployed, and is also consistent with the industry standard for life cycle evaluation of similar projects. Although the vast majority of AMI meters being deployed are likely to continue to function beyond 2035, the twenty-year analysis period strikes a reasonable balance between a complete life cycle analysis of the meters being deployed, and a shorter forward-looking period wherein the Company has a higher degree of confidence in both the costs and benefits being quantified.

Q. HOW DID PUBLIC SERVICE DEVELOP THE COST AND BENEFIT INPUTS INTO THE MODEL?

A. The capital and Operations and Maintenance ("O&M") costs and benefits of AMI and IVVO, including the associated FAN and IT components, were determined by our metering, Business Systems and Distribution areas, as discussed in more detail below. These individuals further worked with our capital asset accounting group to ensure costs were properly categorized as capital or O&M, as applicable. I worked with these individuals and groups to coordinate these project planning efforts and to develop modeling assumptions consistent with the technical witnesses' cost and benefit estimates. The testimonies of the technical witnesses provide detail regarding the cost and benefit assumptions for each component of the CPCN Projects, while I summarize those model inputs and provide further explanation on the overall results of our cost-benefit analyses.

Q. CAN YOU PROVIDE MORE DETAIL AS TO HOW THE FAN COMPONENTS ARE INCORPORATED INTO THE MODEL?

A. Yes. As Company witnesses Mr. Lee and Mr. Wendell A. Reimer discuss in more detail in their Direct Testimony, the FAN will be a single, general-purpose, field area wireless networking resource that enables two-way communication of information and data to and from infrastructure at the Company's substations and the field devices. As such, the FAN will address the need for increased communication capacity that arises from the AGIS initiative, while also ensuring that the data being transmitted is secure. However, the FAN is not a standalone program that provides benefits in its own right; rather, it is the communications network necessary for AMI and IVVO to function and to provide their respective benefits to customers. Further, certain aspects of the FAN are specifically necessary to support AMI and IVVO, as Mr. Reimer describes in his Direct Testimony.

As a result, the cost-benefit model for this CPCN application includes the portions of the FAN that are designated as necessary to support AMI meters and IVVO – specifically, the Wireless Smart Utility Network ("WiSUN") that connects meters, sensors, distribution devices, and signal repeaters to create a reliable wireless mesh network. The meters and repeaters that constitute the AMI, along with the capacitors and voltage monitors that constitute the IVVO devices, will have embedded communication modules that will allow them to communicate directly with the FAN's access points on the WiSUN core mesh infrastructure. The AMI meters will also have the ability to communicate with each other on the

WiSUN network. As such, WiSUN costs are associated with AMI and IVVO and are included in the CPCN cost-benefit modeling.

As Mr. Weimer further discusses, implementation of the WiSUN component of the FAN communication network is necessary for the field technology components to operate. He notes that, as an example, AMI meters cannot be read automatically if they are installed before the FAN is deployed and operating. Consequently, the AMI, IVVO, and consolidated models assume implementation of the FAN from 2016 through 2021, consistent with the timeline to implement the AMI meters and IVVO assets slightly later.

Q. CAN YOU ALSO PROVIDE MORE DETAIL AS TO HOW THE IT COMPONENTS ARE INCORPORATED INTO THE MODEL?

A. Yes. As described by Company witness Mr. Harkness, IT efforts include the costs of integrating the components of the AGIS initiative with existing Company back-end applications that will utilize the data. Similarly, IT efforts are necessary to ensure the security of the data collected and transmitted as a result of advanced metering. As with the FAN, IT work is not a standalone program that provides benefits in its own right; rather, it is a necessary component of the AMI and IVVO programs. Therefore, the costs of IT efforts for AMI and IVVO are included in the cost-benefit model for these components of the CPCN Projects.

Q. HOW WERE THE MODEL'S COST AND BENEFITS INPUTS DETERMINED FOR 2016 THROUGH 2021?

A. Each subject matter expert provided estimated capital and O&M costs and benefits, as well as customer benefit estimates in 2016 dollars by year for the period 2016 through 2021. Almost all of these costs and benefits were converted into nominal dollars within the model using assumptions for labor and non-labor inflation over the analysis period. I say "almost all" because the costs of AMI meters during the initial deployment period were not escalated, as it is expected that during the period of deployment the Company will have a fixed price contract with the chosen AMI vendor for AMI meters. Therefore, escalating these costs to reflect inflationary pressures is not necessary. After the initial deployment of AMI meters, any additional meter costs for new connections or AMI meter failures were escalated.

Q. **HOW WERE THE MODEL'S COST AND BENEFITS INPUTS DETERMINED FOR 2022 THROUGH 2035?**

A. In addition to the costs and benefits for the period of 2016 through 2021, each subject matter expert estimated the trailing capital and O&M costs for each respective part of the project for the remaining years of the analysis period (i.e. 2022-2035). These trailing O&M and capital costs were provided in 2016 dollars by each technical witness and were escalated to nominal dollars for the full twenty-year analysis period (2016-2035). Estimating the trailing capital and O&M costs are necessary to examine the complete lifecycle costs and benefits of each of the CPCN Projects programs beyond the initial implementation period.

Benefits were also estimated for the period of 2022 through 2035 using the avoided fuel and capacity costs consistent with the Company's DSM assumptions, or by continuing to escalate the 2021 benefits to the appropriate future year.

Q. DO THE COST INPUTS FOR AMI AND IVVO INCLUDE CONTINGENCY ASSUMPTIONS?

A. Yes. In addition to the cost estimates, the technical witnesses developed contingency estimates for each aspect of the project that warranted a contingency. These contingency estimates are depicted on Attachment SJH-2, Attachment SJH-3, and Attachment SJH-4 as cost line items that include the identifier "CON." The testimonies of the technical witnesses for the Company provide additional support for the contingency amounts included in the cost-benefit analysis.

Q. HOW WERE THE ESTIMATES OF CONTINGENCY FOR EACH WORK STREAM INTEGRATED INTO THE MODEL?

A. The estimates of contingency were added to the estimated costs of the project and input into the model as a cost. In essence, the model evaluates the cost of the project as if the Company needed to spend up to the full contingency amounts. Doing so presents the project at the high end of the cost estimates, and thus in a conservative manner.

Q. ONCE THE COSTS AND BENEFITS FROM EACH SUBJECT MATTER EXPERT WERE INPUT INTO THE MODEL, WHAT CALCULATIONS DOES THE MODEL MAKE TO ESTIMATE THE CUSTOMER IMPACT?

A. First, it is necessary to take the projected capital costs and benefits and estimate a net capital revenue requirement. The net capital revenue requirement is the aggregate impact of both the additional capital costs and the capital savings over the analysis period. Therefore, the net capital revenue requirement estimates how the capital related costs and benefits would impact the customer through electric rates.

The model takes the annual capital costs and capital benefits and makes assumptions regarding how those costs and benefits may be reflected in rate base, and estimates a net capital revenue requirement as a function of depreciable book and tax lives for the assets, as well as the Company's weighted average costs of capital ("WACC") and tax rates. The estimated net revenue requirement associated with the capital costs and benefits represents the annual customer impact of the capital spend, which is how the Company would calculate electric rate recovery on the underlying investment.

Second, for O&M costs, the model assumes that those costs would be expensed in the year they were incurred, and would be directly passed on to customers through Public Service's electric rates.

Q. HOW DOES THE MODEL CONVERT THE ESTIMATES OF NET CAPITAL REVENUE REQUIREMENT, O&M COSTS AND BENEFITS, AND CUSTOMER BENEFITS TO A BENEFIT-TO-COST RATIO?

A. Once the twenty year stream of the net capital revenue requirements, O&M costs and benefits, and customer benefits are calculated, the streams can be compared on a net present value basis. Each stream of costs or benefits is present valued back to 2016 dollars utilizing the Company's WACC as a discount rate. Then by dividing the net present value of benefits by the net present value of costs, a benefit-to-cost ratio can be calculated. A benefit-to-cost ratio of 1.0 indicates benefits equal costs; a ratio of less than 1.0 means costs exceed benefits; and a ratio of greater than 1.0 means benefits exceed costs. Summaries of these calculations are included as Attachments SJH-1.

Q. WHAT STEPS DID PUBLIC SERVICE TAKE TO VERIFY THAT THE MODEL IS STRUCTURALLY SOUND?

A. The modeling structure that was chosen was based on external benchmarking to similar exercises undertaken by other utilities in support of similar AMI and grid advancement programs. A number of business areas within the Company, including Regulatory Administration, Risk, Corporate Development, Capital Asset Accounting, Revenue Requirements and Demand Side Management, as well as Business Systems and Distribution, subsequently collaborated to develop and ensure the model incorporated requirements necessary to properly estimate the known and quantifiable life cycle value proposition of the CPCN Projects Application.

B. Quantitative Inputs

1. AMI Inputs

Q. WHAT ARE THE KEY COSTS AND BENEFITS OF AMI?

A. Company witness Mr. Borchardt discusses the costs and benefits of AMI in detail in his testimony. Overall, AMI meters will (i) provide customer energy usage information that supports greater customer energy usage choice; (ii) assist with service outages and restoration; (iii) provide voltage measurement information to assist in load flow and voltage calculations performed in the ADMS; and (iv) serve as signal repeaters for other AMI meters and FAN network components. The purchase of AMI meters also enables the Company to retire less advanced technology and avoid the purchase of additional, less functional advanced meter reading ("AMR") meters in the future.

The key costs of AMI include the meters themselves as well as the labor cost of installation, supporting FAN and IT resources, AMI program and change management, and other supporting labor.

Q. HOW WERE AMI CAPITAL COST AND BENEFIT INPUTS DERIVED FOR PURPOSES OF THE COST-BENEFIT MODEL?

A. Capital and O&M cost and benefit estimates for the AMI program were developed by the Company's subject matter experts and are detailed in the Direct Testimonies of Mr. Borchardt, Mr. Reimer, Mr. Lee, and Mr. Harkness:

Table SJH-1-Capital Costs

Capital Cost	**Description**	**Additional Detail**
Meters and Installation	The capital costs portion of AMI meter purchase and installation, per the Company's capitalization policy.	Direct Testimony of Mr. Borchardt.
Field Area Network (AMI)	The capital costs associated with implementation of the WiSUN network and associated assets.	Direct Testimony of Mr. Reimer.
IT Systems and Integration	The capital costs associated with the various IT infrastructure and integration in support of AMI.	Direct Testimony of Mr. Harkness.
Program Management	The capital costs associated with internal management of AMI.	Direct Testimony of Mr. Lee
Change Management:	The capital costs associated with Operational Change Management of AMI.	Direct Testimony of Mr. Lee.
AMI Operations (Personnel):	The capital costs of both internal and external support personnel.	Direct Testimony of Mr. Borchardt.

Table SJH-2-Capital Benefits

Capital Benefit	Description	Additional Detail
Distribution System Management	More efficient use of capital dollars to maintain the distribution system.	Direct Testimony of Mr. Borchardt.
Outage Management Efficiency	Improved capital spend efficiency during outage events.	Direct Testimony of Mr. Borchardt.
Avoided AMR Meter Purchases	By purchasing new advanced AMI meters, the Company avoids the need to replace failing AMR meters.	Direct Testimony of Mr. Borchardt.

Q. HOW WERE AMI O&M COST AND BENEFIT INPUTS DERIVED FOR PURPOSES OF THE COST-BENEFIT MODEL?

A. O&M estimates for the AMI program were likewise developed by the Company's technical witnesses. The costs and benefits associated with improvements to the Saver's Switch program are discussed later in my testimony.

Table SJH-3-O&M Costs

O&M Cost	Description	Additional Detail
Meters and Installation	The O&M costs portion of AMI meter purchase and installation, per the Company's capitalization policy.	Direct Testimony of Mr. Borchardt.
Field Area Network (AMI)	The O&M costs associated with implementation of the WiSUN network and associated assets.	Direct Testimony of Mr. Reimer.
IT Systems and Integration	The O&M costs associated with the various IT infrastructure and integration in support of AMI.	Direct Testimony of Mr. Harkness.
AMI Operations (Personnel)	The O&M costs of both internal and external support personnel.	Direct Testimony of Mr. Borchardt.
Program Management	The O&M costs associated with internal management of AMI.	Direct Testimony of Mr. Lee.
Change Management	The O&M costs associated with Operational Change Management of AMI.	Direct Testimony of Mr. Lee.
Saver's Switch Program Costs	The cost of upgrading the Saver's Switch program to utilize two-way communicating switches.	Additional detail contained later in my Testimony.

Table SJH-4-AMI O&M Benefits

O&M Benefit	**Description**	**Additional Detail**
Reduction in Meter Reading Costs	Less labor required to read meters.	Direct Testimony of Mr. Borchardt.
Reduction in Field & Meter Services	Less labor required to address meter and outage complaints.	Direct Testimony of Mr. Borchardt.
Reduction in Energy Theft	Easier identification of energy theft and an associated reduction in the amount of theft.	Direct Testimony of Mr. Borchardt.
Improvement in Customer Care	Call center intake reduced after initial adoption period.	Direct Testimony of Mr. Borchardt.
Distribution System Management	Increased efficiency of distribution maintenance costs.	Direct Testimony of Mr. Borchardt.
Outage Management Efficiency	Improved O&M spend efficiency during outage events.	Direct Testimony of Mr. Borchardt.
Reduced Consumption Inactive Premise	Expedited ability to turn off power quickly when determined premise has been vacated.	Direct Testimony of Mr. Borchardt.
Reduced Uncollectible/Bad Debt	Decreased loss due to uncollectible accounts.	Direct Testimony of Mr. Borchardt.
Customer Outage Reduction	Reduction in customer outage minutes due to faster response capability	Direct Testimony of Mr. Borchardt.
Demand Response: Avoided Capacity	Improved capability and performance of the Saver's Switch program.	Additional detail contained later in my Testimony.
Elasticity: Avoided Capacity	Customer demand savings in response to new rate structures.	Brattle Group Report, Attachment SJH-5.

Q. CAN YOU PROVIDE AN OVERVIEW OF THE SAVER'S SWITCH PROGRAM AND DESCRIBE HOW THE UTILIZATION OF AMI AND THE FAN CAN IMPROVE THE PROGRAM?

A. Yes. The Company's Saver's Switch program is a voluntary direct load control program wherein the Company installs a switch on a participant's air conditioning unit, and is permitted to shut off the participant's air conditioning for short periods of time during high load hours. The implementation of the AMI meters and associated infrastructure provide an opportunity for the Company to improve the performance of its Saver's Switch program in two ways:

First, by retrofitting the existing one-way communication switches with two-way communication switches, the Company will be able monitor which switches are performing correctly and replace failing or troublesome devices. These two-way switches will utilize the FAN for communication, and would be directly enabled through the actions of this CPCN.

Secondly, the current one-way paging system does not always reach all switches. A more robust FAN network will be able to better reach a higher percentage of the switches during load control hours, and provide better response to direct load control events.

Q. WHAT COSTS AND BENEFITS DOES THE COMPANY ESTIMATE WOULD BE INCURRED IF THE CURRENT SAVER'S SWITCH TECHNOLOGY WERE RETROFITTED?

A. The Company estimates that it would cost an incremental $9.27 million to retrofit the current population of approximately 185,000 Saver's Switch participants to

the two-way communication enabled devices rather than the current Saver's Switch technology. As a result of this upgrade, the Company estimates that the successful execution of direct load control events would increase from an historical rate of 86% to 94%. This is estimated to result in an additional 13.8 MW of direct load control available through the Saver's Switch program without otherwise growing participation. These costs and benefits are captured within Attachment SJH-2 on the "Saver's Switch" line of O&M costs and the "Demand Response" line of Energy and Capacity benefits.

Q. IS THE COMPANY SEEKING PERMISSION TO IMPLEMENT THESE CHANGES TO THE SAVER'S SWITCH PROGRAM AS PART OF THIS CPCN?

A. No, it is not. The estimated costs and benefits of this enhanced two-way communication functionality were included in the cost-benefit analysis as this is a new capability that is enabled by the technologies sought through this CPCN, and can be used in the future to benefit our customers. We believe including both the costs and the benefits provides a more complete overall view. However, the Company is not seeking Commission approval of the costs or benefits of these changes to the Saver's Switch program. To the extent the Commission approves the Company's proposal to implement the technologies proposed in this CPCN, the Company would bring forth a more robust discussion of these changes to the Saver's Switch program in the appropriate proceeding.

Q. CAN YOU PROVIDE MORE INFORMATION REGARDING PUBLIC SERVICE'S ELASTICITY ASSUMPTIONS?

A. Yes. Public Service engaged The Brattle Group to model likely residential customer response to demand rates the Company proposes to make available as enabled by AMI implementation. The Brattle Group's analysis is attached to my Direct Testimony as Attachment SJH-5. As noted on pages four and five of Attachment SJH-5, The Brattle Group analysis shows that annual customer class peak demand would likely be reduced by an average of 11.6% across all customers over the measuring period, using a system-based approach to measuring customer response. The Brattle Group further concluded at page 5 of Attachment SJH-5 that its recommended approach is "an internally consistent modeling framework that has been adopted by regulatory commissions in other jurisdictions in the context of assessing the benefits and costs of grid modernization."

Public Service therefore relied upon The Brattle Group's elasticity analysis to assume that a consistent reduction in peak demand would be achievable as a function of the demand rates AMI will enable as part of the Company's CPCN Projects proposal. This reduction is then incorporated into the cost-benefit analysis as a benefit of AMI.

Q. WHAT ASSUMPTIONS ARE MADE WITH RESPECT TO CUSTOMER ADOPTION OF THESE NEW TECHNOLOGIES?

A. As discussed in more detail by Company witnesses Ms. Jackson and Mr. Borchardt, Public Service proposes an opt-out approach to AMI metering,

meaning that customers will be automatically integrated into the new system unless they actively opt out. The Brattle Group elasticity analysis assumed this opt-out approach, and de-rated the estimated peak reductions of customers who opt out by 40% in its model. However, the opt-out deployment approach tends to result in overall higher enrollment rates than when utilities adopt an opt-in approach to AMI, and therefore enables larger aggregate demand impacts via the more advanced rate structures AMI enables. Further, Company witness Mr. Borchardt investigated the likely opt-out rates based upon other utilities' experiences. Mr. Borchardt discusses the review in his Direct Testimony.

Q. WHAT IS THE IMPACT OF THESE OPT-OUT ASSUMPTIONS ON THE COST-BENEFIT ANALYSIS?

A. There is no net cost impact because Public Service proposes to have those customers who opt out pay for the cost of a new meter capable of storing data needed for future rate designs. In addition, customers who opt out would incur a monthly charge to cover the cost of meter reading. As Mr. Borchardt explains in more detail, these charges would be established in an amount that directly offsets the costs of opting out, such that there is no material net impact to the cost-benefit analysis.

2. IVVO Inputs

Q. WHAT ARE THE PRIMARY BENEFITS AND COSTS OF IVVO?

A. Company witness Mr. Nickell discusses the primary purpose, costs and benefits of the IVVO program from his perspective as Manager, System Planning and Strategy South. Generally speaking, IVVO is a leading technology that automates and optimizes the operation of distribution voltage regulating devices and VAr control devices to maximize system efficiency. Currently, the Company is not able to consistently monitor voltage levels throughout its feeders, and therefore must operate the system at a higher voltage than may be required with better monitoring capability.

The primary costs of implementing IVVO relate to installation of application assets and communications, communications operations, asset operations, and personnel support. The benefits of IVVO that were quantified in the cost-benefit analysis are the impacts of avoided capacity and energy costs associated with the program. As described in more detail in the Direct Testimony of Mr. Nickel, through the implementation of IVVO the Company will be able to control the voltage on a distribution feeder to a much tighter tolerance, permitting the Company to lower the voltage on that controlled feeder while still maintaining a high level of service quality. This lower voltage will result in a customer's devices operating more efficiently, and will effectuate energy and demand savings for the system.

Q. ARE THERE ANY POTENTIALLY QUANTIFIABLE CUSTOMER BENEFITS OF IVVO THAT THE COMPANY DID NOT ATTEMPT TO ESTIMATE?

A. Yes. The Company only quantified the benefits of IVVO that would be socialized to the entire system; these are avoided capacity, avoided energy and deferred transmission and distribution capital investment.

In addition to these broad benefits, the customers whose feeders are equipped with IVVO assets will experience higher efficiencies from their personal electrical devices. This improved efficiency will result in lower bills for those customers. However, since the Company is not proposing to implement IVVO for the entirety of its service territory through this CPCN, and these efficiency benefits would not apply to all customers, the Company chose not to quantify them as part of this CPCN. In this way, Public Service remained consistent with its efforts to provide a conservative view of costs and benefits of IVVO (and AMI).

Q. HOW WERE IVVO CAPITAL INPUTS DERIVED FOR PURPOSES OF THE COST-BENEFIT MODEL?

A. Capital and O&M cost and benefit estimates for the IVVO program are detailed in the Direct Testimony of Company witnesses Mr. Nickell, Mr. Lee, Mr. Reimer, and Mr. Harkness.

Q. WHAT ARE THE CAPITAL COSTS AND BENEFITS OF IVVO?

A. A summary of capital costs is set forth in Table SJH-5, below. IVVO's quantifiable benefits are largely O&M benefits; therefore, I do not include a capital benefits table.

Table SJH-5-Capital Costs of IVVO

Capital Cost	Description	Additional Detail
Assets and Installation	The capital costs of the IVVO devices and installation.	Direct Testimony of Mr. Nickell.
Field Area Network (IVVO)	The capital costs associated with implementation of the WiSUN network and associated assets.	Direct Testimony of Mr. Reimer.
IT Systems and Integration	The capital costs associated with the various IT infrastructure and integration in support of IVVO.	Direct Testimony of Mr. Harkness.
Program Management	The capital costs associated with internal management of IVVO.	Direct Testimony of Mr. Lee.
Change Management	The capital costs associated with Operational Change Management of IVVO.	Direct Testimony of Mr. Lee.
IVVO Integration (Personnel)	The capital costs of both internal and external support personnel.	Direct Testimony of Mr. Nickell.

Q. HOW WERE IVVO O&M INPUTS DERIVED FOR PURPOSES OF THE COST-BENEFIT MODEL?

A. IVVO O&M costs and benefits were developed by Public Service's technical witnesses as set forth below:

Table SJH-6-IVVO O&M Costs

O&M Cost	Description	Additional Detail
Assets and Installation	The O&M costs of the IVVO devices and installation.	Direct Testimony of Mr. Nickell.
Field Area Network (IVVO)	The O&M costs associated with implementation of the WiSUN network and associated assets.	Direct Testimony of Mr. Reimer.
IT Systems and Integration	The O&M costs associated with the various IT infrastructure and integration in support of IVVO.	Direct Testimony of Mr. Harkness.
Program Management	The O&M costs associated with internal management of IVVO.	Direct Testimony of Mr. Lee.
Change Management	The O&M costs associated with Operational Change Management of IVVO.	Direct Testimony of Mr. Lee.

Table SJH-7-O&M Benefits

O&M Benefit	Description	Additional Detail
Fuel Savings (Avoided Energy)	Fuel cost savings associated with avoided energy and line losses.	Direct Testimony of Mr. Nickell
Avoided Capacity Costs	Avoided generation, transmission, and distribution capacity costs achieved through demand reduction.	Direct Testimony of Mr. Nickell

Q. HOW WOULD YOU CHARACTERIZE THE COST AND BENEFIT BUDGETING ASSUMPTIONS FOR AMI AND IVVO?

A. I would characterize this model as a conservative representation of estimated costs and benefits. Because AMI and IVVO planning are still in their early phases, consistent with a project for which the Commission has not yet determined whether the project is needed, the contingencies represent early estimates of potential additional costs. Likewise, Public Service has estimated customer adoption and response on the basis of historically available information; as technologies continue to improve, the benefits associated with these technologies may also increase. Public Service's goal is to represent a conservative but realistic analysis to support the Commission's review of the Company's CPCN Project's Application.

C. <u>Qualitative Analysis</u>

Q. WILL THE AMI PROGRAM PROVIDE BENEFITS TO CUSTOMERS OR THE DISTRIBUTION SYSTEM THAT WERE NOT MODELED IN YOUR ANALYSIS?

A. Yes. There are a number of benefits of AMI that cannot be quantified in whole or in part. For example, it is difficult to quantify Public Service customers' broad expectation to have more choice in and control over their energy usage. Our analysis captures estimates of customer adoption of technologies to support customer choice and the impacts on energy usage, but cannot fully quantify customer satisfaction associated with having better energy usage and pricing information. Nor can it fully quantify the convenience to customers of better outage management.

These unquantifiable benefits are largely discussed by Company witnesses Mr. Borchardt and include but are not limited to:

- Improved customer choice and experience, leading to customer empowerment and satisfaction;
- Enhanced distributed energy resource integration;
- Environmental benefits of enhanced energy efficiency;
- Improved safety to both customers and public service employees; and
- Improvements in power quality.

Q. ARE THERE ANY BENEFITS THAT THE IVVO PROGRAM PROVIDES TO CUSTOMERS OR THE DISTRIBUTION SYSTEM THAT WERE NOT MODELED IN YOUR ANALYSIS?

A. Yes. As with AMI, there are benefits of IVVO that the Company did not attempt to quantify. They include but are not limited to:

- Customer bill savings specific to customers whose feeders are equipped with IVVO assets;
- Enhanced access of low income customers to energy efficiency savings;
- Environmental benefits of enhanced energy efficiency; and
- Increased hosting capacity of distributed energy resources.

Q. CAN PUBLIC SERVICE PROVIDE MORE DETAIL REGARDING THESE QUALITATIVE BENEFITS OF IVVO?

A. Yes. Company witness Mr. Nickell addresses the above benefits in his Direct Testimony. With respect to low income customers' access to energy efficiency savings, I note that Mr. Nickell explains how IVVO can reduce voltage, and

therefore save customers money, without requiring any change in energy usage or activities on the customers' part. Therefore, IVVO has the added benefit of saving money for low income customers without implementing new low income-specific programs.

Q. WHY DIDN'T THE COMPANY ATTEMPT TO QUANTIFY THESE BENEFITS?

A. Although the Company feels strongly that these benefits are achievable and meaningful to our customers, it is difficult and often highly subjective to attempt to place a dollar value on them. For example, customer satisfaction and empowerment are important to Public Service's business model and role as a public utility, but do not directly lend themselves to monetization. Similarly, while safety and environmental benefits are quantified in some circumstances, doing so often requires placing values on human health – which Public Service opted not to attempt.

The Company therefore concluded that it was best to provide a cost and benefit analysis to the Commission that fairly represents the cost and benefits of quantifiable CPCN Projects components, and which we were able to value with the highest degree of confidence, and then ask the Commission to weigh the other impacts to our customers as it sees fit. In this way, the Commission may rely on the cost-benefit analysis as a baseline of our business case for our CPCN Projects, and then evaluate and discuss the merits of the additional beneficial impacts to our customers.

III. COST-BENEFIT ANALYSIS RESULTS

Q. PLEASE SUMMARIZE THE QUANTITATIVE COST AND BENEFIT COMPARISON FOR THE AMI PROGRAM.

A. Table SJH-8 summarizes the results of the Company's evaluation of AMI.

Table SJH-8

AMI	
Benefits ($M)	**(401)**
O&M Savings & Customer Benefits	(159)
Avoided Energy and Capacity	(241)
Costs ($M)	**452**
O&M Cost	115
Change in Cap Revenue Requirement	337
Benefit/Cost Ratio	**0.89**

Attachment SJH-2 to my Direct Testimony provides more detail regarding the results of the Company's analysis of the costs and benefits of AMI, including FAN components.

Q. WHAT DO YOU CONCLUDE REGARDING THE OVERALL COSTS AND BENEFITS OF AMI?

A. On a total resource benefit-to-cost ratio basis, AMI is expected to have a benefit-to-cost ratio of approximately 0.89, which indicates that the costs exceed quantitative benefits over the analysis period. As described above, this analysis assumes a conservative approach to cost estimates, given that Public Service is in the early stages of seeking a determination of need for the project before entering detailed design, contracting, and engineering phases.

Q. PLEASE SUMMARIZE THE QUANTITATIVE COST AND BENEFIT COMPARISON FOR THE IVVO PROGRAM.

A. Table SJH-9 summarizes the results of the Company's evaluation of IVVO:

Table SJH-9

IVVO	
Benefits ($M)	**(144)**
O&M Savings & Customer Benefits	0
Avoided Energy and Capacity	(144)
Costs ($M)	**189**
O&M Cost	47
Change in Cap Revenue Requirement	142
Benefit/Cost Ratio	**0.76**

Attachment SJH-3 to my Direct Testimony provides more detail regarding the results of the Company's analysis of the costs and benefits of IVVO, including FAN components.

Q. WHAT DO YOU CONCLUDE REGARDING THE OVERALL COSTS AND BENEFITS OF THE IVVO PROGRAM, INCLUDING THE FAN COMPONENT?

A. On a total resource benefit-to-cost ratio basis, IVVO costs are expected to exceed quantifiable IVVO benefits, with an expected benefit-to-cost ratio of approximately 0.76. As described above, this analysis assumes a conservative approach to cost estimates and benefits, given that Public Service is in the early stages of seeking a determination of need for the project before entering detailed design, contracting, and engineering phases.

Q. IS THERE ANOTHER FRAMEWORK THAT COULD ENHANCE THE BENEFIT-TO-COST RATIO OF THE IVVO PROGRAM?

A. Yes. By Commission Decision C14-0731 in Docket No. 13A-0686EG, the Commission determined that programs like Distribution Voltage Optimization ("DVO") are in fact DSM programs, and can be evaluated consistent with other DSM measures using a Modified Total Resource Cost Test ("mTRC"). Company witness Mr. Lee explains that both DVO and IVVO provide DSM benefits through voltage optimization.

Q. WHAT IS THE MODIFIED TOTAL RESOURCE COST TEST?

A. The mTRC is one of the cost tests that the Commission and Company use to evaluate DSM measures and help determine if a proposed portfolio of DSM measures is likely to be cost effective. In similar fashion to the cost-benefit analysis presented here, the mTRC compares the costs and benefits of a given DSM measure or DSM portfolio, but includes an additional 10% adder to the benefits. The 10% adder, also known as the Non-Energy Benefits Adder, is designed to help provide a quantification of other positive attributes of DSM such as health and well-being, customer satisfaction, and economic benefits of lower energy bills.

Q. HAVE YOU CALCULATED THE mTRC SCORE OF IVVO?

A. Yes. Using a 10% non-energy benefit adder consistent with the Company's prior DSM plan filings, IVVO has an mTRC score of 0.84.

Q. HAVE YOU BENCHMARKED THE COSTS OF THE COMPANY'S IVVO PROGRAM AGAINST THE DVO PROGRAM THAT THE COMPANY PROPOSED IN PROCEEDING 13A-0686EG?

A. Yes I have. In proceeding 13A-0686EG, Company witness Ms. Kelly A. Bloch testified that DVO was projected to cost approximately $92 million dollars over the five-year implementation period, with the costs including distribution equipment, distribution upgrades, software, and communications. IVVO is projected to cost approximately $151 million from 2016 to 2022 inclusive of the assets and upgrades necessary to enable IVVO, as well as its allocation of FAN costs, IT, and operational change management. Although IVVO is more expensive over the implementation period than DVO was projected to be, IVVO is more integrated with the distribution grid and is a more dynamic system as compared to DVO and is capable of achieving greater energy savings. The differences between IVVO and DVO are discussed in more detail in the Direct Testimony of Mr. Lee.

Q. HAVE YOU ALSO BENCHMARKED THE BENEFITS OF THE COMPANY'S IVVO PROGRAM AGAINST THE DVO PROGRAM?

A. Yes I have. In proceeding 13A-0686EG, Company witness Ms. Debra L. Sundin testified that DVO was projected to achieve energy savings of approximately 506 GWh and reduce system peak demand by approximately 11 MW over the five year term of the DVO project. Similarly, IVVO is projected to achieve energy savings of approximately 1,160 GWh and reduce system peak demand by approximately 44 MW over the first five years of operation (2019 through 2023).

If compared on a dollar per GWh saved basis over the first five years of operation, DVO was projected to cost approximately $182,000/GWh versus IVVO at approximately $130,000/GWh. We provide this information to briefly show how IVVO compares to DVO in terms of both costs and energy savings.

Q. DO YOU ALSO PROVIDE A COMBINED SUMMARY OF THE COSTS AND QUANTITATIVE BENEFITS OF THE PROGRAMS THAT ARE THE SUBJECT OF THIS CPCN APPLICATION?

A. Yes. Table SJH-10 summarizes the results of the Company's evaluation of the combined AMI/IVVO program:

Table SJH-10

CPCN (AMI and IVVO)	
Benefits ($M)	**(544)**
O&M Savings & Customer Benefits	(159)
Avoided Energy and Capacity	(385)
Costs ($M)	**640**
O&M Cost	161
Change in Cap Revenue Requirement	479
Benefit/Cost Ratio	**0.85**

Q. WHAT DO YOU CONCLUDE REGARDING THE OVERALL VALUE OF THE PROGRAMS INCLUDED IN THIS CPCN APPLICATION?

A. On a combined basis, the quantitative benefits of AMI and IVVO are expected to be lower than program costs, with an expected benefit-to-cost ratio of approximately 0.85. This total represents a simple combination of AMI and IVVO respective costs and benefits, inclusive of the costs attributable to that portion of the FAN needed to enable AMI and IVVO, presented on a 2016 NPV basis. As discussed earlier in my testimony, if IVVO is evaluated using its mTRC score of

0.84, the combined benefit to cost ratio of both AMI and IVVO would improve to 0.87.

Q. WHY SHOULD THE COMMISSION CONSIDER GRANTING A CPCN FOR AMI AND IVVO IF COMBINED PROGRAM COSTS EXCEED THE OVERALL QUANTITATIVE BENEFITS?

A. There are several reasons why AMI and IVVO are overall valuable resources, even if costs slightly exceed estimated quantifiable benefits.

First, the Company cannot achieve greater transparency into its distribution system, greater opportunities for demand side management, and improved reliability without the AMI and IVVO implementation. As Ms. Jackson discusses, these are also necessary components of any new rate structures or other initiatives the Commission may wish to implement; right now, Public Service simply does not have the technical capability or insight into customer usage to implement such technologies or customer support without AMI and IVVO.

Second, as discussed by Company witnesses Mr. Lee and Ms. Jackson, AMI, IVVO, and their related FAN components are part of a larger grid advancement effort that includes Public Service's ordinary-course investments in the Advanced Distribution Management System ("ADMS") and the Fault Location Isolation and Service Restoration ("FLISR") application. As discussed by Mr. Nickell, ADMS acts as a centralized support system that assists with monitoring and control of the electric distribution system, and will work in tandem with AMI and IVVO to establish a comprehensive grid communication tool. As Mr. Nickell

further notes in his Direct Testimony, data from AMI meters will inform FLISR calculations regarding the location of line faults and the most appropriate switching plan. IVVO voltage regulation works in tandem with FLISR, identifying optimal voltage levels both before and after a FLISR event. ADMS ties the various pieces of the system together, with all components utilizing and relying upon the FAN. Accordingly, approval of the AMI and IVVO programs should be viewed in the larger context and with the broader goal of advancing Public Service's distribution grid as a whole.

Third, this model can only quantify that which is quantifiable. Its expression of benefits does not include such qualitative benefits as customer choice and convenience, human safety, and potential support for future distributed energy resources. Public Service recognizes that choice, convenience, and greater control over energy costs and usage are of increasing importance to our customers. Customer satisfaction and customer empowerment with respect to their energy choices are of central importance to the public utility model.

Fourth, it is important to advance Public Service's grid to continue providing safe, increasingly reliable electric service to our customers not just in the present but also into the future. Consequently, the AGIS program will support a fundamental utility function while solving for existing infrastructure that is no longer maximizing service to our customers.

Overall, our AGIS program is necessary to bring our distribution grid into the future, offer greater customer choice, and take advantage of opportunities to

use up-to-date technology to support demand side management, peak demand reductions, and a more resilient, responsive grid.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

Statement of Qualifications

Samuel J. Hancock

I graduated from the University of Colorado, Boulder, with a Bachelor of Science Degree in Mechanical Engineering.

I began my employment with Xcel Energy Services, Inc. in September 2012, as a Resource Planning Analyst II. In December 2015, I was promoted to Manager, Regulatory Project Management which is my current role. My responsibilities have included supporting various regulatory matters including competitive resource acquisition processes, new product design, economic analyses of existing and potential resource options, as well as other technical analyses for Xcel Energy's operating companies.

Prior to my employment with Xcel Energy Services, Inc., I was employed by the consulting firm Energy & Resource Consulting Group, LLC ("ERG") as a Senior Engineer. My responsibilities at ERG included various engineering and financial analysis related to the electric and natural gas utility industry. This includes supply planning, engineering analysis, demand side management, regulatory compliance review, engineering simulation and modeling, as well as financial auditing. I have also provided technical support in several regulatory dockets which have involved independent system operators, formula rate plans, rate design, utility system planning, fuel forecasting, storm cost auditing, utility system agreements, demand side management and energy efficiency program design.

I have testified before the Colorado Public Utilities Commission in Proceeding Nos. 13A-0836E, 14A-0302E, 15A-0304E, and 16A-0319E. I have also presented testimony before the City Council of New Orleans in Proceeding No. UD-11-03

regarding an application to enter into a power purchase agreement for the capacity and energy associated with a 550 MW combined cycle gas turbine facility.