MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. ER-2010-0356

DIRECT TESTIMONY

OF

JOHN J. REED

Submitted On Behalf

Of

SOUTHERN UNION COMPANY

D/B/A MISSOURI GAS ENERGY

NOVEMBER 17, 2010

NP

MGE Exhibit No. GMO-2201 NP
Date 1/18/11 Reporter LmB
File No. ER-2010-0356

Exhibit GMO-2201NP

TABLE OF CONTENTS

I. INTRODUCTION OF WITNESS AND PURPOSE OF TESTIMONY

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is John J. Reed, and my business address is 293 Boston Post Road West, Suite 500, Marlborough, MA 01752.

Q. BY WHOM YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am the Chairman and Chief Executive Officer of Concentric Energy Advisors, Inc. ("Concentric") and CE Capital Advisors ("CE Capital").

Q. PLEASE BRIEFLY DESCRIBE CONCENTRIC ENERGY ADVISORS, INC.

A. Concentric is a management and financial advisory firm focused on the North American energy industry. Concentric specializes in financial advisory assignments, market assessments and strategy development, ratemaking and utility regulation, litigation support, and management and operations consulting.

Q. PLEASE DESCRIBE YOUR EXPERIENCE AND QUALIFICATIONS.

A. I have more than 30 years of experience in the utility industry, having served as an executive in energy consulting firms, including the position of Co-Chief Executive Officer of the largest publicly-traded management consulting firm in the United States and as Chief Economist for the largest gas utility in the United

States. I have provided expert testimony on a wide variety of economic and financial issues related to the utility industry on numerous occasions before administrative agencies, utility commissions, courts, arbitration panels and elected bodies across North America. A summary of my educational background can be found in Attachment A, along with a list of my recent appearances as an expert witness.

Q. ON WHOSE BEHALF ARE YOU PROVIDING THIS TESTIMONY?

A. I am sponsoring this testimony on behalf of Southern Union Company d/b/a Missouri Gas Energy ("MGE" or the "Company").

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to recommend the initiation of a fuel switching program by KCP&L Greater Missouri Operations Company ("GMO") as part of GMO's energy efficiency and conservation measures. The testimony is supported by the analyses contained in Schedule Nos. JJR-1 through JJR-7.

Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS.

A. I recommend that the Missouri Public Service Commission (the "Commission") adopt a fuel switching program to be implemented by GMO as a cost effective way to promote energy efficiency and conservation by offering financial incentives to GMO customers to convert certain end-use applications such as water heating and space heating from electricity to natural gas. As explained later

in my testimony, the proposed fuel switching program would benefit GMO's residential and multi-family customers through lower energy use and reduced energy bills, while simultaneously reducing or deferring baseload capacity additions and reducing CO_2 emissions. For these reasons, implementation of the fuel switching program described herein is consistent with the intent of electric Demand Side Management ("DSM") programs (i.e., to cost-effectively reduce electricity demand), is in the public interest, and should be implemented by GMO, subject to the approval of the Commission.

II. METHODS FOR MEASURING ENERGY EFFICIENCY

Q. PLEASE EXPLAIN WHAT IS MEANT BY THE TERM FUEL SWITCHING.

A. Fuel switching or fuel conversion is commonly defined to occur when a customer switches from one fuel source to another for an end-use application such as water heating or space heating. In this particular circumstance, my testimony concentrates on switching certain end-use applications from electricity to natural gas.

Q. WHAT IS THE OBJECTIVE OF FUEL SWITCHING?

A. The objective of fuel switching is to promote the most efficient energy use for end-use applications (i.e., the right fuel for the right use.)

Q. PLEASE EXPLAIN THE CONCEPT OF "THE RIGHT FUEL FOR THE RIGHT USE."

A. The choice of which energy to use for certain end-use applications has significant implications in terms of efficiency, economics and the environment.[1] In order to make this choice, customers need information that allows them to compare the relative merits of appliances that use different fuel sources such as electricity and natural gas. According to an American Gas Association ("AGA") report:

[1] "A Comparison of Energy Use, Operating Costs, and Carbon Dioxide Emissions of Home Appliances," American Gas Association, Energy Analysis, EA 2009-3, October 20, 2009.

> Most current government policies and regulations that influence energy matters are "site-based" – that is, they only consider the impacts at the site where the energy is ultimately consumed. Site-based regulations, such as appliance efficiency standards and measurement, can lead to higher energy resource consumption as well as higher levels of pollution.[2]

Q. IS THE CURRENT SITE-BASED APPROACH TO MEASURING ENERGY CONSUMPTION UNDER REVIEW?

A. Yes, the U.S. Department of Energy ("DOE") is considering whether to adopt an alternative method for measuring energy consumption known as the full-fuel-cycle approach. The change being considered by the DOE is based on a Congressionally-mandated report from the National Research Council ("NRC"), which is part of the National Academy of Sciences.[3] The change would address the primary concern with the site-based method, which is that it does not allow for comparison between appliances that use more than one fuel source, or between appliances that perform the same function but use different types of fuel.

Q. PLEASE EXPLAIN THE FULL-FUEL-CYCLE APPROACH IN MORE DETAIL.

A. The full-fuel-cycle approach measures energy consumption by examining the impacts associated with energy use, including extraction/production, conversion/generation, transmission, distribution, and ultimate energy

---

[2] Ibid, at page 1.

[3] The National Academy of Sciences is a non-profit organization that was established by Congress in March 1863. Its stated purpose is to "investigate, examine, experiment, and report upon any subject of science or art" whenever called upon to do so by any department of government. The NAS is comprised of approximately 2,100 members and 380 foreign associates, of whom nearly 200 have won Nobel Prizes. Most of the National Academy of Sciences' science policy and technical work is conducted by its operating arm, the National Research Council.

consumption. Unlike the site-based method, the full-fuel-cycle method not only considers the total energy needed for end-use applications but also incorporates the importance of greenhouse gas emissions in the decision whether to use electricity or natural gas for certain end-use applications.

Q. WHAT WAS THE NATIONAL RESEARCH COUNCIL'S ULTIMATE RECOMMENDATION TO THE DOE?

A. In its May 2009 report, the NRC stated:

> The Committee's primary general recommendation is that the DOE/EERE consider moving over time to the use of a full-fuel-cycle measure of energy consumption for assessment of national and environmental impacts, especially levels of greenhouse gas emissions, and to providing more comprehensive information to the public through labels and other means, such as an enhanced website.
>
> The current use by DOE/EERE of site energy consumption is effective for setting standards for the operational efficiency of single-fueled appliances within the same class and should be continued without change. However, DOE/EERE's current use of site energy consumption does not account for the total consumption of energy when more than one fuel is used in an appliance (e.g., a heating system with a gas furnace and an electric fan) or when more than one fuel can be used for the same application. For these appliances, measuring full-fuel-cycle energy consumption would provide a more complete picture of energy used, allowing comparison across many different appliances as well as an improved assessment of impacts such as effects on energy security and the environment.[4]

[4] "Review of Site (Point-of-Use) and Full-Fuel-Cycle Measurement Approaches to DOE/EERE Building Appliance Energy Efficiency Standards," National Research Council, May 15, 2009, at page 10.

Q. WHY HAS THE NRC RECOMMENDED USING THE FULL-FUEL-CYCLE APPROACH TO CALCULATE ENERGY CONSUMPTION RATHER THAN THE SITE-BASED METHOD?

A. Using water heaters as an example, the NRC explained the difference between the site-based method and the full-fuel-cycle approach in measuring energy consumption:

> [B]ased on their site energy consumption, an electric storage water heater might operate with 90 percent efficiency and a natural gas water heater with 70 percent efficiency. But for the electric storage water heater, energy losses of about 70 to 75 percent occur in acquiring the primary fuel and in the generation, transmission, and distribution of the electricity, yielding an overall energy efficiency for the electric storage water heater of about 0.30 X 0.90, or 27 percent. This figure is much lower than the gas-fired storage water heater's overall energy efficiency of about 0.91 X 0.70, or 64 percent, when fuel-fuel-cycle energy consumption is the measure employed. In general, energy losses in heating applications with electric resistance heaters are greater than in heating applications with natural gas when the measure is full-fuel-cycle energy use.[5]

Q. HAVE ANY OTHER GOVERNMENT AGENCIES ALREADY DETERMINED THAT SOURCE-BASED CALCULATIONS (I.E., FULL FUEL CYCLE) ARE PREFERABLE TO SITE-BASED MEASURMENT?

A. Yes. The U.S. Environmental Protection Agency ("EPA"), which jointly establishes ENERGY STAR ratings with the DOE, has already determined that a source-based energy calculation is the most equitable method of evaluation. Source energy represents the total amount of raw fuel that is required, including all energy losses that occur during production, transmission and delivery, thereby

[5] Ibid, at page 6.

enabling a comprehensive assessment of energy efficiency.[6] Source-based calculations are comparable to the full-fuel-cycle approach, in that both rely on the same components to measure the total energy required, including energy losses.

Q. HOW DOES THE USE OF THE FULL-FUEL-CYCLE METHOD IMPACT THE DECISION BETWEEN ELECTRICITY AND NATURAL GAS FOR CERTAIN END-USE APPLICATIONS?

A. The AGA reports that when evaluated on a full-fuel-cycle basis, the use of natural gas rather than electricity in certain end-use residential applications results in (1) increased energy efficiency, (2) consumer energy cost savings, and (3) reduced environmental impacts.[7] The following section of my testimony discusses these advantages in more detail.

[6] ENERGY STAR Performance Ratings Methodology for Incorporating Source Energy Use, December 2007.

[7] "A Comparison of Energy Use, Operating Costs, and Carbon Dioxide Emissions of Home Appliances," American Gas Association, Energy Analysis, EA 2009-3, October 20, 2009, at page 11.

III. THE RELATIVE ADVANTAGES OF NATURAL GAS

Q. PLEASE DISCUSS THE FIRST ADVANTAGE THAT NATURAL GAS HAS WITH RESPECT TO ELECTRICITY IN CERTAIN END-USE APPLICATIONS UNDER THE FULL-FUEL-CYCLE APPROACH (I.E., INCREASED ENERGY EFFICIENCY).

A. Natural gas is more efficient than electricity under the full-fuel-cycle method due to the differences in energy losses between the fuel sources (i.e., the total energy input compared to the energy delivered to end-use customers). As discussed by the NRC, the cumulative efficiency of natural gas from the wellhead to the meter is 91.9 percent. This means that for every 100 MMBtu of energy produced, almost 92 MMBtu of energy is delivered to the consumer. By contrast, electricity on average delivers to the consumer only 31.9 percent of the energy produced. Coal-fired electric generation is even less efficient than average, delivering only 29.3 percent of the energy produced to the end-use customer. Energy losses associated with electricity occur during the generation process (as input energy is lost while steam is being produced to turn large turbines/generators) and due to transmission line losses that occur before the electricity reaches the ultimate consumer.[8]

[8] Ibid, at pages 5 and 6.

Table 1 demonstrates how energy losses associated with electricity result in that fuel source being less attractive than natural gas under the full-fuel-cycle approach, based on the energy requirements for a typical new home.

Table 1: Site-Based Method vs. Full-Fuel-Cycle (MMBtu per year) [9]

	Natural Gas	Electricity
Space Heating	74.3	31.5
Water Heating	25.4	16.6
Cooking	3.3	1.8
Clothes Drying	3.8	3.3
Total Site Use	**106.9**	**53.2**
Energy Losses	14.1	113.5
Full Fuel Cycle Use	**121.0**	**166.7**

As shown by Table 1 above, the total site-based energy consumption for natural gas is 106.9 MMBtu per year compared to site-based energy consumption for electricity of 53.2 MMBtu per year. However, when energy losses are included in the comparison, energy consumption for natural gas increases by approximately 13 percent to 121 MMBtu per year under the full-fuel-cycle method, while energy consumption for electricity increases by approximately 213 percent to 166.7 MMBtu per year. Consequently, natural gas becomes the preferred fuel choice for many end-use applications under the full-fuel-cycle approach.

On a full-fuel-cycle basis, natural gas is far more efficient than electricity for certain end-use applications. Table 2 compares the annual energy requirements for electricity and natural gas when measured on the full-fuel-cycle basis for water heating and space heating. In contrast to Table 1 above, the figure for

[9] Ibid, at page 8. The total site use figure of 31.5 MMBtu for electric space heating refers to an electric heat pump, not an electric resistance heating system. Under the full-fuel-cycle approach, the electric heat pump's energy use is 98.8 MMBtu.

electric space heating in Table 2 refers to an electric resistance heating system. As shown by Table 2, the annual energy requirements for electric water heating and electric resistance space heating under the full-fuel-cycle approach are more than twice the energy required for those same end-use applications with natural gas.

Table 2: Annual Energy Requirements under Full-Fuel-Cycle Approach (All values expressed in MMBtu)

Appliance	Natural Gas	Electricity
Water Heating[10]	27.6	51.9
Space Heating[11]	85.1	192.3
Total	112.7	244.2

Q. PLEASE DISCUSS THE SECOND ADVANTAGE THAT NATURAL GAS HAS RELATIVE TO ELECTRICITY (I.E., CONSUMER ENERGY COST SAVINGS).

A. The higher efficiency of natural gas on a full-fuel-cycle basis results in lower operating costs relative to electricity. Schedule JJR-1 presents the annual operating cost savings for certain end-use applications including water heating and space heating. This schedule assumes: (1) the energy consumption levels in Table 1 above, (2) the average price of natural gas for MGE of $11.35 per Mcf including transport, storage and hedging costs,[12] (3) the GMO average price of electricity for electric space heating of $0.0805/kWh (or $23.61 per MMBtu) and

[10] Ibid, at page 16.
[11] Ibid, at page 17.
[12] Information provided by Missouri Gas Energy in response to data request.

the GMO average price of electricity for water heating of $0.1004/kWh (based on the Residential General rate, or $29.44 per MMBtu).[13] Table 3 summarizes those estimated annual savings.

Table 3: Annual Operating Cost Savings
Natural Gas vs. Electricity

Appliance	Savings
Water Heating	$200
Space Heating	$606

As illustrated by Table 3, a customer that switched from electricity to natural gas for water heating and space heating would save approximately $200 and $606 per year, respectively.

Q. PLEASE DISCUSS THE THIRD ADVANTAGE THAT NATURAL GAS HAS WITH RESPECT TO ELECTRICITY (I.E., REDUCED ENVIRONMENTAL IMPACTS).

A. Compared to other fossil fuels, using natural gas rather than electricity results in numerous environmental benefits. Carbon dioxide emissions are about 36 percent lower for the natural gas residence than for an all-electric home.[14] Annual CO_2 emissions were 6.4 metric tons for natural gas appliances compared to 10.1 metric tons for electric appliances.[15] Table 4 compares the carbon dioxide emissions

[13] KCP&L GMO, 2009 FERC Form 1, at page 304.

[14] "A Comparison of Energy Use, Operating Costs, and Carbon Dioxide Emissions of Home Appliances, American Gas Association, Energy Analysis, EA 2009-3, October 20, 2009, at page 4.

[15] Ibid, at page 11. This analysis is based on new homes that meet the 2009 International Energy Conservation Code. An analysis of the existing housing stock would be even more favorable to natural gas, as older homes tend to require more energy due to their lower thermal integrity and less efficient equipment.

from natural gas, heating oil, and electricity for two new homes based on average household energy use. The table shows that CO_2 emissions from certain end-use applications that utilize electricity rather than natural gas are 2.65 times higher for a new 1,500 square foot home and 2.42 times higher for a new 3,000 square foot home.

Table 4: Total CO_2 Emissions for New Homes[16]

Total Energy Efficiency Carbon Dioxide Emissions for New Homes[1] (lbs of CO_2 per Average Household Energy Use[2])		
	1,500 SQ. FT.	3,000 SQ. FT.
Natural Gas	7,423	10,583
Oil	13,095	15,198
Electricity[3]:		
Coal-Based	17,560	22,828
Oil-Based	582	757
Natural Gas-Based	1,561	2,029
Total Electricity	19,703	25,614
[1] Based on hypothetical fuel generating mix.		
[2] Excludes energy use for cooling and base electric requirements.		
[3] For existing generating capacity only.		

Q. WHAT IS THE FUEL MIX ASSOCIATED WITH THE GENERATION USED IN THE ABOVE ANALYSIS OF CO_2 EMISSIONS?

A. The above analysis relied on the 2007 actual generation mix of fossil fuels, nuclear and renewable energy. According to the Energy Information Administration ("EIA"), the 2007 generation mix was as follows:

Table 5: 2007 Generation Fuel Sources[17]

Fuel	2007
Coal	49%
Natural Gas	22%
Nuclear	19%
Hydroelectric	6%
Other Renewables	3%
Petroleum Liquids	1%
Total	100%

16 "Electric-to-Gas Fuel Switching," NARUC Summer Meeting, Paul H. Raab, July 20, 2009, Slide 14.

17 "Net Generation by Energy Source: Total (All Sectors), 1996 through July 2010," Energy Information Administration, Report No DOE/EIA-0226, released October 14, 2010, Table 1.1

In summary, coal-based electric generation represented almost half of the electricity produced in 2007 with natural gas, nuclear and hydro-electric combined accounting for approximately the remaining 50 percent.

Q. DID YOU COMPARE THE CO_2 EMISSIONS RATE BETWEEN COAL AND NATURAL GAS IN THE GENERATION OF ELECTRICITY IN MISSOURI?

A. Yes. According to the U.S. Environmental Protection Agency's eGRID 2007 database, the CO_2 emission rate in Missouri in 2005 was 2,104 lbs/MWh for coal and 978 lbs/MWh for natural gas. In other words, the CO_2 emission rate for coal was more than twice the rate for natural gas.

Q. WHAT PERCENTAGE OF GMO'S GENERATION IS COAL-FIRED?

A. As shown in Table 6 below, approximately 80 percent of GMO's actual 2009 and estimated 2010 generation is coal-fired,[18] which is significantly higher than the national average of 49 percent in 2007.

Table 6: GMO Generation

Fuel	Estimated 2010	Actual 2009
Coal	80%	80%
Nuclear	17%	17%
Natural gas and oil	2%	2%
Wind	1%	1%
Total	100%	100%

[18] Great Plains Energy Inc., 2009 SEC Form 10-K, filed February 25, 2010, at page 8. On page 8 of the Form 10-K, KCP&L and GMO report their generation mix for 2009 and 2010 as if the operations of the two entities had been combined.

Q. HOW MUCH CARBON IS GMO'S CURRENT GENERATION PORTFOLIO EXPECTED TO PRODUCE?

A. GMO's current generation portfolio is estimated to produce about one ton of CO_2 per MWh, or approximately six million tons per year.[19]

Q. WOULD END-USE FUEL SWITCHING PROGRAMS CONTRIBUTE TO A REDUCTION IN CO_2 EMISSIONS?

A. Yes. Fuel switching programs that encourage customers to convert certain end-use applications from electricity to natural gas would contribute to a reduction in CO_2 emissions. Specifically, fuel switching programs would reduce the amount of generation required and therefore reduce the emissions associated with that reduction in generation. This is especially true in the case of electric utilities, such as GMO, which generates approximately 80 percent of its electricity from coal-fired plants. As indicated above, each MWh reduction in electricity usage would reduce CO_2 emissions by approximately one ton.

Q. GIVEN THE BENEFITS OF ENERGY EFFICIENCY AND CONSERVATION GENERALLY, WHY WOULD CUSTOMERS NOT PURSUE THESE OPPORTUNITIES ON THEIR OWN?

A. According to a July 2009 study by McKinsey & Company ("McKinsey"), there are several barriers to customer participation in energy efficiency and conservation programs.[20] These include: 1) up-front costs; (2) customer

[19] KCP&L GMO, 2009 FERC Form 1, at page 123.20

[20] McKinsey & Company, "Unlocking Energy Efficiency in the U.S. Economy," July 2009, p. 7.

behavioral issues; and (3) misaligned incentives. Each barrier is discussed in more detail below.

The first general barrier is that energy efficiency measures require large up-front capital outlays in order to achieve benefits in the form of energy savings that accrue over the measure's lifetime. Even if an efficiency measure is deemed cost-effective, that does not mean that it will be inexpensive. Many households may lack the up-front capital required to undertake energy efficiency projects, while others may prioritize Net Present Value-positive investments with shorter payback periods.

The second general barrier identified by McKinsey stems from customer behavior. Behavioral barriers include a lack of customer awareness, both of their own energy consumption and of the efficiency measures available to them. Another behavioral barrier is the financial time horizon. Customers tend to opt for the energy measure with the least expensive up-front cost, rather than the energy efficient option with the lowest cumulative cost over the lifetime of the measure. Customers also hesitate to invest in energy efficiency measures due to the risk that they will not own their home long enough to capture all of the benefits.

The third structural barrier involves the misalignment of incentives (e.g., landlords and tenants). Landlords, who pay for equipment, have an incentive to

select energy measures with the least expensive up-front cost, while the tenants, who pay the energy bills, have the incentive to invest in energy efficiency measures, which offer lower operating costs. Also, more energy efficient features of equipment are often bundled with other costly premium features, dissuading those who would otherwise be interested in low cost efficiency measures from purchasing the more efficient equipment.

In addition to the barriers identified by McKinsey, other barriers may include but are not limited to: promotional activities of utility service providers, promotional activities of appliance vendors, and difficulties that consumers may have in assessing the relative energy efficiency of appliances, particularly when those appliances may be fueled by different energy sources.

Q. GIVEN THE RELATIVE ADVANTAGES OF NATURAL GAS, WHY ARE CUSTOMERS RELUCTANT TO SWITCH FROM ELECTRICITY?

A. Customers may be reluctant to switch from electricity to natural gas because they tend to focus on the higher initial cost of natural gas appliances rather than the lower operating costs once installed. Additionally, customers consider the cost of installing a gas service line to their home if they are not currently served by the local gas distribution company, as well as the cost and inconvenience of installing interior piping and ventilation ductwork to accommodate natural gas applications.

Q. DOES GMO'S RATE STRUCTURE PROVIDE RESIDENTIAL CUSTOMERS A PRICE INCENTIVE NOT TO SWITCH FROM ELECTRICITY TO NATURAL GAS FOR CERTAIN END-USE APPLICATIONS SUCH AS SPACE HEATING?

A. Yes. For residential customers who use electric space heating as their primary heating source, the rate per kWh during winter months provides a price incentive to continue using electricity for space heating purposes, even though it is not the most efficient fuel source from the full-fuel-cycle perspective. Please refer to the Direct Testimony of MGE witness, Mr. Michael Noack, for a more detailed discussion of rate design issues.

IV. PROPOSED FUEL SWITCHING PROGRAM

Q. WHAT ARE THE COMPONENTS OF THE PROPOSED FUEL SWITCHING PROGRAM THAT GMO WOULD OFFER AS PART OF ITS ENERGY EFFICIENCY AND CONSERVATION MEASURES IN MISSOURI?

A. Under the proposed fuel switching program, GMO would offer financial incentives to either residential or multi-family customers in Missouri to encourage them to convert from electric water heating to natural gas water heating, and/or from electric resistance heat to natural gas heat.[21] The proposed fuel switching program would not include GMO customers who are currently using an electric heat pump. The fuel switching program would be available to customers who currently do not have a natural gas service line to their premise, and to customers who are not located near a gas main, if the customer is willing to make any necessary contributions for MGE to extend gas service lines or gas mains, as governed by MGE's currently effective tariff provisions regarding facilities extensions.

Q. HAVE FUEL SWITCHING PROGRAMS BEEN APPROVED AS PART OF ENERGY EFFICIENCY AND CONSERVATION MEASURES IN OTHER JURISDICTIONS?

[21] Depending on the success of the fuel switching program, it would be possible to expand the program to include additional end-use applications such as clothes drying and cooking equipment, as well as to additional types of customers such as small commercial.

A. Yes. Fuel switching programs have been approved for Puget Sound Energy in Washington and Oregon, CenterPoint in Texas, Avista Corporation in Idaho and Washington, and Philadelphia Electric Company in Pennsylvania, among others.

Q. HAVE YOU REVIEWED THE FUEL SWITCHING PROGRAMS THAT HAVE BEEN APPROVED FOR THE ABOVE UTILITIES?

A. Yes, I have. Schedule JJR-2 summarizes several of the fuel switching programs that have been approved in other jurisdictions. Some common characteristics of these fuel switching programs are as follows:

1. A major impetus for the development of the fuel switching programs has been the desire to reduce the demand for electricity;
2. The programs are offered to a variety of customer classes including, residential, multi-family, and commercial/industrial customers;
3. The programs offer customer rebates or bill credits, which provide a financial incentive to encourage customers to switch from electricity to natural gas for certain end-use applications; and
4. The programs are funded by both electric and natural gas customers, with electric customers generally funding some portion of the cost for converting the customer premise to natural gas and installing the natural gas appliance, while gas customers fund some portion of the cost to upgrade to a more energy-efficient natural gas appliance.

Q. ARE YOU AWARE OF ANY FUEL SWITCHING PROGRAMS WHERE THE ELECTRIC UTILITY PROVIDES FINANCIAL INCENTIVES FOR ITS CUSTOMERS TO SWITCH TO A DIFFERENT COMPANY FOR NATURAL GAS SERVICE?

A. Yes. Puget Sound Energy ("PSE") recently received regulatory approval to offer fuel switching rebate programs in Washington for water heating and space heating applications.[22] PSE is a combination gas and electric utility, and the financial incentives offered under its fuel switching program are available to customers who switch from PSE electric service to PSE natural gas service, as well as to customers who switch from PSE electric service to Cascade Natural Gas' service. Additionally, the City of Austin and Texas Gas Service are discussing initiation of a fuel switching program under which customers who currently obtain their electric service from the City of Austin would be eligible for rebates if they switched certain electric appliances to natural gas and obtained gas service from Texas Gas Service.[23]

Q. PLEASE EXPLAIN HOW THE PROPOSED FUEL SWITCHING PROGRAM FOR GMO WOULD OPERATE.

A. The proposed fuel switching program has two aspects: (1) as part of its current energy efficiency and conservation program in Missouri, GMO would offer rebates or bill credits to electric customers who convert their existing electric

[22] Puget Sound Energy filed tariff sheets with Advice Letter No. 2008-34, which was allowed to become effective by operation of law by the Washington Utility and Transportation Commission, effective January 19, 2009.

[23] Based on telephone conversation with representative of Texas Gas Service in October 2010.

appliances to natural gas or who install natural gas appliances in a new residence; and (2) in accordance with its existing approved energy efficiency and conservation programs, MGE would offer financial incentives to customers (many of whom are also customers of GMO) who purchase and install energy efficient natural gas appliances.

Q. WHAT IS REQUIRED IN ORDER TO CONVERT A RESIDENCE FROM ELECTRICITY TO NATURAL GAS?

A. If the customer does not currently have natural gas service, MGE would need to install a gas service line from its gas main to the customer premise. Additionally, the conversion would require interior piping and ventilation ductwork, as well as installation of the new natural gas appliance(s).

Q. WHAT IS THE ESTIMATED COST TO INSTALL: (I) A GAS SERVICE LINE; (II) INTERIOR PIPING AND VENTILATION DUCTWORK; AND (III) A GAS FURNACE AND/OR GAS WATER HEATER?

A. Under terms of the gas service line extension provision in MGE's tariff, the customer would share some portion of the cost to install the gas service if the installation requires more than 60 linear feet of pipeline. MGE estimates that the cost to install a gas service line to a customer whose residence is within 60 feet of MGE's gas main would be $1,770, all of which would be paid for by MGE and included in the rate for gas service.[24] According to information provided by

[24] MGE estimates the cost per linear foot at $29.50 to install a new gas service line.

MGE from contractors, the cost for interior piping that would accommodate the installation of a natural gas water heater would be estimated at **_____**, and the cost for interior piping and ventilation ductwork that would accommodate the installation of a natural gas fired furnace would be estimated at **_____**. These estimates include parts and labor, assume that the installation is performed in an unfinished basement, and assume in the case of the natural gas furnace that HVAC ductwork is already in place from the electric heating system. The installation cost is estimated at $800[25] for a natural gas furnace and $150[26] for a natural gas water heater, excluding the costs of the appliances themselves. See Confidential Schedule JJR-3 for a summary of these costs.

Q. WHAT REBATES/BILL CREDITS WOULD GMO OFFER TO ENCOURAGE CUSTOMERS TO SWITCH FROM ELECTRICITY TO NATURAL GAS?

A. Table 7 summarizes the proposed rebates/bill credits that GMO would offer its customers to convert from electric water heaters and electric resistance space heating to natural gas units:

Table 7: Proposed GMO Rebates

Appliance	Rebate
Water Heater	$700
Space Heater	$1,000
Water Heater and Space Heater	$1,200

[25] "EIA - Technology Forecast Updates – Residential and Commercial Building Technologies – Reference Case Second Edition (Revised)," Navigant Consulting, Inc., presented to the Energy Information Administration September 21, 2007, at page 6. My understanding is that MGE's experience has been that these costs can be slightly, but not significantly, higher.

[26] Ibid, at page 18.

The proposed rebates for installation/conversion represent approximately **_____** percent of the costs associated with completing interior piping and ventilation ductwork, plus the cost of installing the new appliance (not including the purchase price of the appliance itself). The customer would be responsible for the remaining **_____** percent of the cost.

Q. ARE THESE REBATE LEVELS CONSISTENT WITH THE AMOUNTS OFFERED THROUGH SIMILAR FUEL SWITCHING PROGRAMS IN EFFECT AT ELECTRIC UTILITIES ACROSS THE COUNTRY?

A. Yes. As shown in Table 8, the proposed rebates and bill credits for water heating and space heating are consistent with those offered through fuel switching programs offered by other electric utilities.

Table 8: Customer Rebates/Bill Credits Offered By Other Approved Fuel Switching Programs

Appliance	Puget Sound	Avista	TECO
Water Heater	$950	$250	$500
Furnace	$500 - $2,500	$750	$725
Water Heater and Furnace	$1,950 - $3,950	N/A	N/A

Q. WHAT REBATES/BILL CREDITS WOULD MGE OFFER TO ENCOURAGE CUSTOMERS TO INSTALL AN ENERGY EFFICIENT NATURAL GAS APPLIANCE?

A. Table 9 summarizes the rebates/bill credits that MGE currently offers customers to encourage them to install energy-efficient natural gas appliances. MGE would offer these same rebates to customers who participate in the fuel switching program. My understanding is that MGE may propose revisions to these amounts as part of a future tariff filing with the Commission.

Table 9: Proposed MGE Rebates

Appliance	Rebate
Water Heater - Tank	$40
Water Heater – Tankless	$200
Gas-fired Furnace	$200

Q. WHAT FACTORS MAY INFLUENCE THE LEVEL OF CUSTOMER PARTICIPATION IN FUEL SWITCHING PROGRAMS?

A. Customer participation rates depend on several factors, including (1) the number of potential customers that currently rely on electricity for certain end-use applications, and (2) the rebate level as a percentage of the conversion and installation costs. Also, customer participation rates tend to increase over time as customers become more aware of the rebate program.

Q. WHAT IS THE MARKET POTENTIAL FOR FUEL SWITCHING PROGRAMS IN MISSOURI?

A. The market potential for fuel switching programs can be estimated by considering the number of households that rely on electricity for space heating. According to GMO's 2009 FERC Form 1, GMO provided electric space heating to approximately 91,100 Missouri customers. A June 2009 report by the Gas Technology Institute indicates that in 2005 approximately 70 percent of electric heating in the West North Central census division (which includes Missouri) was provided by electric resistance heating, while 30 percent was provided by electric heat pumps.[27] By multiplying the 91,100 units by 70 percent, it suggests that approximately 63,770 customers use electric resistance heat in the GMO service territory in Missouri.

Q. WHAT CUSTOMER PARTICIPATION LEVEL WOULD YOU EXPECT DURING THE FIRST TWO OR THREE YEARS OF THE PROPOSED PROGRAM?

A. During the initial two or three years, it is reasonable to expect that customer participation in the fuel switching program offered by GMO would approximate levels that have been experienced at PSE, which offers similar fuel switching incentives. During 2009, PSE reported that 445 residential customers participated

[27] "2005 Residential Energy Consumption Survey: Table HC 12.4 Space Heating Characteristics by Midwest Census Region," Energy Information Administration. The data used is for the total Midwest. Electric resistance heat includes the Built-In Electric Units and Central Warm-Air Furnace categories. It should be noted that the sample size for the 2005 Residential Energy Consumption Survey was approximately 4,400 households, and therefore data points should be considered estimates.

in the fuel switching program, with 85 percent of those customers choosing to convert their water heater from electricity to natural gas and 15 percent converting their space heating from electricity to natural gas. In my Direct Testimony in Case No. ER-2010-355, I determined that the number of participants in the fuel switching program for Kansas City Power and Light ("KCP&L") would be similar to the experience at PSE in 2009. Because GMO has approximately twice as many electric space heating customers as KCP&L, I have assumed that the number of customers participating in the GMO fuel switching program also would be twice the number assumed for KCP&L. If approximately 800 customers participated annually in the GMO fuel switching program, that would represent about 1.25 percent of the 63,770 potential customers with electric resistance heat.

Q. BASED ON YOUR ANTICIPATED CUSTOMER PARTICIPATION LEVEL, HOW MUCH WOULD GMO AND MGE RESPECTIVELY SPEND ON THE PROPOSED FUEL SWITCHING PROGRAM?

A. Assuming that 800 customers participate in the proposed fuel switching program during the first year of availability, then GMO's total program spending would be $596,000 and MGE's total program spending would be $51,200 plus the cost to install 800 new service lines (approximately $1,416,000). Table 10 shows the breakdown for the proposed conservation program budget for GMO, assuming

680 participants (or 85 percent) qualify for the natural gas water heater rebate and 120 participants (or 15 percent) qualify for the natural gas furnace rebate.[28]

Table 10: Proposed GMO Conservation Budget

Appliance	Rebate	Participants	Budget
Water Heater	$700	680	$476,000
Furnace	$1,000	120	$120,000

Table 11 shows the breakdown for the proposed conservation program budget for MGE, under the same participation assumptions as stated above.

Table 11: Proposed MGE Conservation Budget

Appliance	Rebate	Participants	Budget
Water Heater	$40	680	$27,200
Furnace	$200	120	$24,000

Q. WHAT IS GMO'S CURRENT PROGRAM BUDGET FOR ENERGY EFFICIENCY AND CONSERVATION IN MISSOURI?

A. GMO's approved program budget for demand response, energy efficiency and affordability programs in Missouri in 2009 was $**_____** million. The proposed fuel switching program budget of $596,000 would represent approximately **____** percent of the total program budget for GMO.

[28] The water heater and furnace participation is consistent with the experience of Puget Sound Energy during the 2009 program year for its fuel switching program.

Q. HOW WOULD THE PROPOSED FUEL CONVERSION PROGRAMS BE FUNDED?

A. GMO would fund the costs associated with the conversion and installation portion of the fuel switching rebate program through its current energy efficiency and conservation program, under which GMO defers the costs of the program for possible future recovery in a rate case. MGE fully supports rate recovery of monies spent by GMO for the proposed fuel switching program, if it is approved by the Commission. It is my understanding that MGE would fund the costs related to the purchase of energy efficient natural gas appliances for customers who are converting from electricity to natural gas and the cost to install gas service lines to the customer premise (up to 60 linear feet). As the Commission is aware, the costs of MGE's energy efficiency programs are also deferred for future recovery.

Q. HAS THIS FUNDING MODEL BEEN ADOPTED BY OTHER ELECTRIC AND NATURAL GAS UTILITIES THAT HAVE IMPLEMENTED FUEL SWITCHING PROGRAMS?

A. Yes. This shared funding model has been implemented by other electric and natural gas utilities across the country including CenterPoint Energy in Texas, Puget Sound Energy in Washington and Oregon, and Avista Corporation in Washington and Idaho for purposes of promoting fuel switching. It is an equitable funding model because customers from both the electric and natural gas utility derive some benefits from fuel switching measures.

Q. WHY SHOULD GMO'S ELECTRIC CUSTOMERS FUND A FUEL SWITCHING PROGRAM THAT ENCOURAGES CUSTOMERS TO CONVERT TO NATURAL GAS PROVIDED BY MGE?

A. This program should be approved because: (1) it improves the energy efficiency of the State of Missouri, by increasing the total energy efficiency of residential end-users; (2) it improves Missouri's air quality by substantially reducing emissions from carbon and other pollutants; and 3) it represents a highly cost-effective application of electric utility energy efficiency program spending.

GMO's electric customers who convert to natural gas for certain end-use applications would directly benefit from the proposed fuel switching program through (1) reduced energy consumption, (2) lower energy bills, (3) rebates for purchasing new energy efficient natural gas appliances, and (4) the added value associated with the installation of a gas service line to their residence. GMO customers (including both program participants and non-participants) would also benefit from the fuel switching program through reduced electric demand, which translates into the following benefits: 1) GMO's ability to reduce or defer construction of additional generation and transmission capacity; 2) GMO's ability to reduce CO_2 emissions; and 3) spending a portion of GMO's energy efficiency and conservation budget on a fuel switching program which typically has one of the highest benefit/cost ratios among those energy efficiency programs offered to residential and multi-family customers. For all of these reasons, GMO customers

would derive significant benefits from the proposed fuel switching program and should contribute to its implementation and operation.

Q. WHAT SAVINGS WOULD GMO CUSTOMERS REALIZE BY PARTICIPATING IN THE PROPOSED FUEL SWITCHING PROGRAM?

A. As shown on Schedule JJR-4, a GMO customer who converts from electric to natural gas water heating could save $740 through rebates and $200 per year in operating costs. A customer who converts from electric resistance heating to a natural gas furnace could save $1,200 through rebates and $606 per year in operating costs. A customer who converts both water heating and space heating from electric to natural gas could save $1,440 through rebates and $806 per year in operating costs.

Q. HAVE YOU ESTIMATED THE CUSTOMER PAYBACK PERIODS FOR THE PROPOSED FUEL SWITCHING PROGRAM?

A. Yes. Confidential Schedule JJR-5 demonstrates the customer payback periods for the proposed fuel switching measures. As the schedule indicates, the payback period for converting from electricity to natural gas water heaters is approximately **___** years, and the payback period for converting from electric resistance heat to a natural gas furnace is approximately **___** years. If the customer converts both water heating and space heating from electricity to natural gas, the payback period would be approximately **___** years because

the costs to install the interior piping and ventilation ductwork would only be incurred once and would accommodate both end-use applications.

Q. DOES MGE HAVE THE CAPACITY TO SERVE ADDITIONAL CUSTOMERS WITHOUT ADDING NEW MAINS TO ITS GAS DISTRIBUTION SYSTEM IN MISSOURI?

A. Yes. My understanding is that MGE has sufficient capacity on its gas distribution system to add customers without incurring additional cost to add new mains. I also understand that MGE's distribution system has a high saturation level, meaning that the Company has gas mains running down most streets in urban and suburban locations. If the customer does not currently have a gas service line running to its house, MGE would need to install one before providing natural gas service.

Q. WHAT WOULD BE THE NET EFFECT OF THE PROPOSED FUEL SWITCHING PROGRAM ON MGE?

A. Based on the following assumptions: (1) that 800 customers participate in the fuel switching program during the first year; (2) that MGE's average cost to install the gas service line to the customer premise is $1,770; (3) that MGE offers customer rebates for installing energy efficient natural gas appliances in the amounts shown in Table 9; and 4) that MGE's fixed customer charge is $26.88

per month, Schedule JJR-6 shows that the proposed fuel switching program would produce net benefits for MGE after approximately 5.7 years.[29]

[29] This analysis does not include any costs associated with additional CO_2 emissions that might occur as a result of increased natural gas usage. The CO_2 reductions that would occur in connection with reducing electricity usage would more than offset the increased CO_2 emissions related to increased natural gas usage, resulting in another net benefit to Missouri residents.

V. IMPACT OF FUEL SWITCHING PROGRAM ON GMO

Q. WHAT WOULD BE THE IMPACT OF THE PROPOSED FUEL SWITCHING PROGRAM ON GMO'S ELECTRIC DISTRIBUTION REVENUES?

A. The revenue impact depends on the customer participation rate. As GMO customers convert from electricity to natural gas for certain end-use applications such as water heating and space heating, GMO's electric distribution revenues would be expected to be somewhat lower. These customers would continue to rely on GMO for electricity for other end-use applications such as lighting, refrigeration, televisions, computers, etc., and would continue to pay the fixed customer charge of $7.90 per month. Assuming that 800 customers participate in the fuel switching program during the first year, the revenue impact for GMO would be a reduction of approximately $506,274, or 0.078 percent of 2009 electric operating revenues in Missouri.[30] See Schedule JJR-7 for this calculation. This does not consider the savings that GMO could realize from avoided generation costs.

To the extent the Commission is concerned that GMO may not have the opportunity to earn its revenue requirement because some portion of its fixed costs are being recovered through volumetric rates, the Commission should consider allowing GMO to recover the lost revenue through the current DSM

[30] According to the 2009 FERC Form 1, GMO's operating revenues in 2009 were $646,852,000 in Missouri.

tracking mechanism, or through alternative rate mechanisms such as revenue decoupling or straight-fixed variable rates, to ensure that GMO does not have a disincentive to promote energy efficiency and conservation programs, including fuel switching. It is my understanding that MGE would support consideration of alternative rate mechanisms to mitigate the impact of fuel conversion on GMO's financial integrity.

Q. WOULD THE PROPOSED FUEL SWITCHING PROGRAM HELP GMO REDUCE ITS PEAK LOAD OR DEFER FUTURE PLANS FOR NEW GENERATION OR TRANSMISSION FACILITIES?

A. Yes. GMO (in combination with Kansas City Power and Light) has over 6,000 MWs of electric generating capacity, and the projected peak summer demand for 2010 is 5,515 MW. KCP&L and GMO expect to meet their projected capacity requirements through 2018 with generation assets, capacity purchases and demand side and efficiency programs. The companies expect to have Iatan No. 2, a coal-fired plant, in service during the fall of 2010, which will add approximately 620 MWs (KCP&L and GMO's share based on their 55 percent ownership stake) of generating capacity.[31] However, utility planning involves very long time horizons in order to meet future demand growth. To the extent fuel switching programs reduce electricity consumption, these programs would assist GMO in potentially reducing or deferring capital investments in generation and transmission capacity.

[31] Great Plains Energy Inc. 2009 Form 10-K, filed February 25, 2010, at page 7.

Q. HAS THE MISSOURI GENERAL ASSEMBLY RECENTLY PASSED LEGISLATION RELATING TO ENERGY EFFICIENCY INVESTMENTS BY ELECTRIC CORPORATIONS?

A. Yes. In 2009, the Missouri General Assembly passed Senate Bill 376, which provides that: "It shall be the policy of the state to value demand side investments equal to traditional investments in supply and delivery infrastructure and allow recovery of all reasonable and prudent costs of delivering cost-effective demand-side programs." Under SB 376, the Commission is directed to: 1) provide timely cost recovery for utilities; 2) ensure that utility financial incentives are aligned with helping customers use energy more efficiently and in a manner that sustains or enhances utility customers' incentives to use energy more efficiently; and 3) provide timely earnings opportunities associated with cost-effective measurable and verifiable energy savings.

Q. WHAT ARE THE IMPLICATIONS OF THIS NEW LEGISLATION?

A. It is clear from this legislation that the Missouri General Assembly is encouraging electric companies to make significant expenditures on energy efficiency and conservation. The Commission has opened a rule-making docket to implement this legislation. The proposed fuel switching program would further the Missouri General Assembly's directive to ensure that utility financial incentives are aligned to help customers use energy more efficiently.

VI. ASSESSING COST EFFECTIVENESS AND THE PUBLIC INTEREST

Q. WHAT COST EFFECTIVENESS TEST DOES THE COMMISSION USE TO EVALUATE ENERGY EFFICIENCY AND CONVERSATION MEASURES?

A. The Commission has adopted the Total Resource Cost ("TRC") test to evaluate energy efficiency and conservation measures in Missouri. The TRC test measures the net costs of a DSM program as a resource option based on the total costs of the program including both the participants' and the utility's costs. This test represents the combination of the effects of a program on both the customers participating and those not participating in a program.[32] Table 12 shows the benefits and costs that are included in the TRC test.

Table 12: Benefits and Cost Included in TRC Test

Benefits	Costs
➢ Savings from avoided supply costs using net program savings (i.e., savings net of changes in energy use that would have happened in the absence of the program) ➢ Avoided supply costs for the energy using equipment not chosen by the program participant	➢ Program costs incurred by both the utility and the participant • Equipment • Operation and maintenance • Installation • Program administration • Removal of equipment (less salvage) ➢ Increase in supply costs for periods in which load is increased ➢ Tax credits (considered reduction in costs) ➢ Increased supply costs for utility providing fuel that is chosen as result of the program

[32] State of California, Governor's Office of Planning and Research, "California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects," July 2002, at 18.

Q. PLEASE EXPLAIN THE RELATIONSHIP BETWEEN THE TRC TEST AND THE FULL-FUEL-CYCLE APPROACH.

A. There is no direct relationship between these two concepts. The TRC test is one method to evaluate the cost effectiveness of an energy efficiency program such as fuel switching, while the fuel-fuel-cycle approach measures energy consumption, including all energy losses that occur before the energy reaches the ultimate consumer. As noted earlier in my testimony, the full-fuel-cycle approach allows for comparison between appliances that use more than one fuel source, or between appliances that perform the same function but use different types of fuel, but it does not tell us whether the fuel switching program is cost-effective for the utilities.

Q. HAVE YOU ANALYZED THE COST EFFECTIVENESS OF THE PROPOSED FUEL SWITCHING PROGRAM?

A. No, I have not been able to analyze the cost effectiveness of the proposed fuel switching program. I have received responses to data requests from GMO; however, the information contained in those responses still does not allow me to perform a benefit/cost analysis for the fuel switching program using the TRC test. I will continue to work with GMO to clarify the information that has been provided, especially as it relates to the avoided cost calculations, and I reserve the right to supplement my testimony when the necessary information becomes available.

Q. ARE SIMILAR FUEL SWITCHING PROGRAMS OFFERED BY ELECTRIC UTILITIES IN OTHER JURISDICTIONS COST EFFECTIVE UNDER THE TRC TEST?

A. Yes. The fuel switching program offered by Puget Sound Energy reported a benefit/cost ratio under the TRC test of 2.66 in Washington, while the fuel switching program offered by Avista Corporation reported a benefit/cost ratio under the TRC test of 3.38 in Idaho and 3.72 in Washington. In the case of Puget Sound Energy, the fuel switching program has the highest benefit/cost ratio of any residential energy efficiency program the company offers in Washington.

Q. IN ITS FEBRUARY 2010 DECISION IN MGE'S MOST RECENT GENERAL RATE PROCEEDING, THE MISSOURI PSC INDICATED THAT MGE SHOULD TAKE STEPS TO REDUCE OVERALL NATURAL GAS CONSUMPTION IN MISSOURI. DO YOU BELIEVE THAT THE PROPOSED FUEL SWITCHING PROGRAM IS CONSISTENT WITH THAT DECISION?

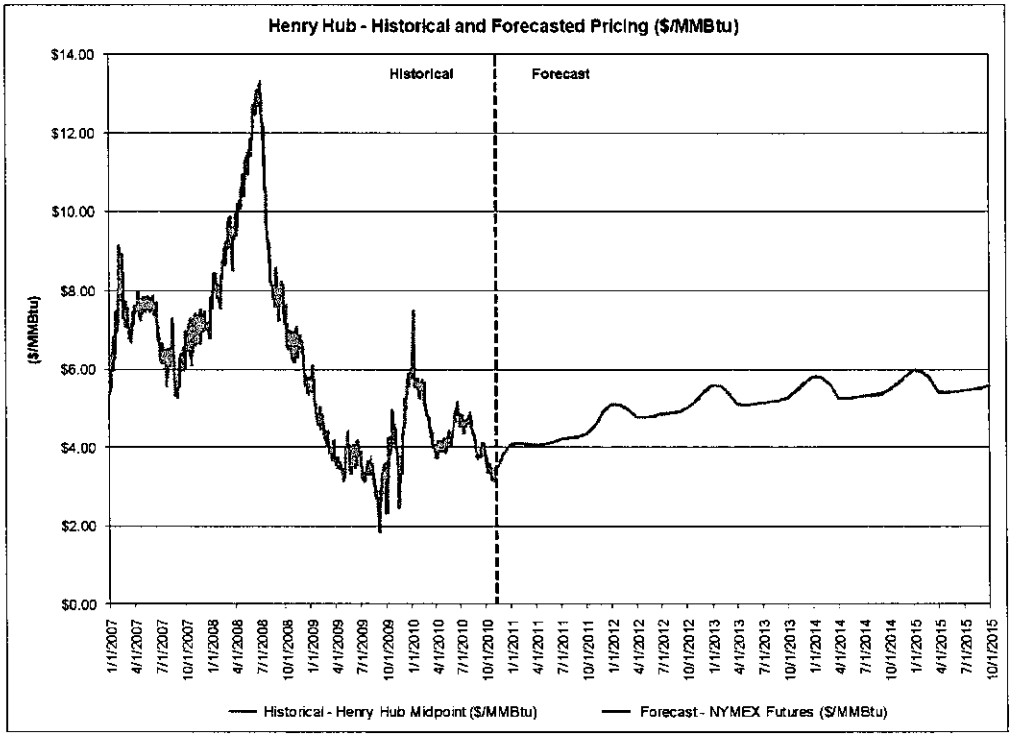
A. Yes. The proposal for GMO to initiate a fuel switching program is consistent with the Missouri PSC's overall objective of encouraging energy efficiency and conservation. The information on which the Commission relied in its February 2010 decision has changed somewhat since the decision was issued. Specifically, the Commission relied on a report by the American Council for an Energy Efficient Economy ("ACEEE") which indicated that reducing natural gas consumption would help to drive down the wholesale price of natural gas. Since

that ACEEE report was issued, natural gas prices have fallen substantially and the prevalence of shale gas has had a significant impact on gas supplies and forecasted natural gas prices.

Q. PLEASE ELABORATE ON THE CURRENT SITUATION IN NATURAL GAS MARKETS.

A. The situation in natural gas markets has changed considerably since the ACEEE report was issued. As shown on Figure 1, natural gas prices are forecasted to be much more stable than historical prices.

Figure 1: Henry Hub – Historical and Forecasted Pricing[33]



[33] Source: Historical prices are taken from Platt's Gas Daily; forecasted prices are taken from Bloomberg Financial and are based on closing prices on November 3, 2010.

Q. WHAT IMPACT IS SHALE GAS EXPECTED TO HAVE ON NATURAL GAS SUPPLIES OVER THE LONGER TERM?

A. According to a June 2009 study by the Potential Gas Committee associated with the Colorado School of Mines, the baseline of technically recoverable natural gas resources grew by 39 percent (or 515 trillion cubic feet ("Tcf")) from year end 2006 to year end 2008, and together with natural gas reserves of 238 Tcf reported by the Energy Information Administration ("EIA") represents a technically recoverable endowment of 2,074 Tcf.[34] Based on 2009 natural gas consumption levels reported by EIA, U.S. natural gas reserves would not be exhausted for approximately 91 years.

Q. HAS PIPELINE CAPACITY INCREASED DURING THE PAST THREE YEARS?

A. Yes. Natural gas pipeline capacity has increased significantly from 2007 through 2009 due to the construction of new pipelines. According to the EIA, 134 new interstate/intrastate pipelines were placed in service during 2007 and 2008 thereby adding more than 5,500 miles and 59,000 MMcf/day of new capacity in the United States. The EIA estimates that in 2009 an additional 78 pipeline projects were placed in service, further expanding U.S. natural gas pipeline capacity by an additional 3,600 miles and 36,000 MMcf/day.[35]

[34] http://www.mines.edu/Potential-Gas-Committee-reports-unprecedented-increase-in-magnitude-of-U.S.-natural-gas-resource-base

[35] "Expansion of the U.S Natural Gas Pipeline Network: Additions in 2008 and Projects Through 2011," Energy Information Administration, Office of Oil and Gas, September 2009.

Q. HOW HAS THE COMMISSION DEFINED THE TERM "PUBLIC INTEREST" IN MISSOURI?

A. In approving the acquisition of Aquila, Inc. by Great Plains Energy, Incorporated, the Commission defined the term public interest as follows:

> The public interest is a matter of public policy to be determined by the Commission. It is within the discretion of the Public Service Commission to determine when the evidence indicates the public interest would be served. Determining what is in the public interest is a balancing process. In making such a determination, the total interests of the public served must be assessed. This means that some of the public may suffer adverse consequences for the total public interest. Individual rights are subservient to the rights of the public. The 'public interest' must necessarily include the interests of both the ratepaying public and the investing public; however, as noted, the rights of individual groups are subservient to the rights of the public in general.[36]

Q. DO YOU BELIEVE THAT THE PROPOSAL FOR GMO TO INITIATE A FUEL SWITCHING PROGRAM IN MISSOURI IS IN THE PUBLIC INTEREST? IF SO, WHY?

A. Yes. The proposal for GMO to initiate a fuel switching program in Missouri would benefit customers through lower energy use and reduced energy bills, while simultaneously reducing CO_2 emissions and potentially reducing or deferring investment in additional generation and transmission capacity. For these reasons, I believe the proposed fuel switching program is in the public interest and should be approved by the Commission.

[36] Missouri Public Service Commission, Case No. EM-2007-0374, *In the Matter of the Joint Application of Great Plains Energy Incorporated, Kansas City Power and Light Company, and Aquila, Inc., for Approval of the Merger of Aquila, Inc., with a Subsidiary of Great Plains Energy Incorporated and Other Related Relief*, July 1, 2008.

Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS.

A. I recommend that the Commission approve the proposal for GMO to initiate a fuel switching program as part of its existing energy efficiency and conservation measures. The fuel switching program is a cost effective way to promote energy efficiency and conservation by offering financial incentives (i.e., rebates) to GMO's residential and multi-family customers to convert certain end-use applications such as water heating and space heating from electricity to natural gas.

Q. DOES THIS CONCLUDE YOUR TESTIMONY AT THIS TIME?

A. Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of the Application of KCP&L Greater Missouri Operations Company for Approval to Make Certain Changes in its Charges for Electric Service	))))	ER-2010-0356

AFFIDAVIT OF JOHN J. REED

COMMONWEALTH OF MASSACHUSETTS COUNTY OF MIDDLESEX	)))	ss.

John J. Reed, of lawful age, on his oath states: that he has participated in the preparation of the foregoing Direct Testimony in question and answer form, to be presented in the above case; that the answers in the foregoing Direct Testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true and correct to the best of his knowledge and belief.

JOHN J. REED

Subscribed and sworn to before me this 10th day of November 2010.

JOANNE P. BICKFORD
NOTARY PUBLIC
COMMONWEALTH OF MASSACHUSETTS
MY COMMISSION EXPIRES
OCTOBER 15, 2015

Joanne P. Bickford
Notary Public

My Commission Expires: Oct. 15, 2015

John J. Reed
Chairman and Chief Executive Officer

John J. Reed is a financial and economic consultant with more than 30 years of experience in the energy industry. Mr. Reed has also been the CEO of an NASD member securities firm, and Co-CEO of the nation's largest publicly traded management consulting firm (NYSE: NCI). He has provided advisory services in the areas of mergers and acquisitions, asset divestitures and purchases, strategic planning, project finance, corporate valuation, energy market analysis, rate and regulatory matters and energy contract negotiations to clients across North and Central America. Mr. Reed's comprehensive experience includes the development and implementation of nuclear, fossil, and hydroelectric generation divestiture programs with an aggregate valuation in excess of $20 billion. Mr. Reed has also provided expert testimony on financial and economic matters on more than 150 occasions before the FERC, Canadian regulatory agencies, state utility regulatory agencies, various state and federal courts, and before arbitration panels in the United States and Canada. After graduation from the Wharton School of the University of Pennsylvania, Mr. Reed joined Southern California Gas Company, where he worked in the regulatory and financial groups, leaving the firm as Chief Economist in 1981. He served as executive and consultant with Stone & Webster Management Consulting and R.J. Rudden Associates prior to forming REED Consulting Group (RCG) in 1988. RCG was acquired by Navigant Consulting in 1997, where Mr. Reed served as an executive until leaving Navigant to join Concentric as Chairman and Chief Executive Officer.

REPRESENTATIVE PROJECT EXPERIENCE

Executive Management

As an executive-level consultant, worked with CEOs, CFOs, other senior officers, and Boards of Directors of many of North America's top electric and gas utilities, as well as with senior political leaders of the U.S. and Canada on numerous engagements over the past 25 years. Directed merger, acquisition, divestiture, and project development engagements for utilities, pipelines and electric generation companies, repositioned several electric and gas utilities as pure distributors through a series of regulatory, financial, and legislative initiatives, and helped to develop and execute several "roll-up" or market aggregation strategies for companies seeking to achieve substantial scale in energy distribution, generation, transmission, and marketing.

Financial and Economic Advisory Services

Retained by many of the nation's leading energy companies and financial institutions for services relating to the purchase, sale or development of new enterprises. These projects included major new gas pipeline projects, gas storage projects, several non-utility generation projects, the purchase and sale of project development and gas marketing firms, and utility acquisitions. Specific services provided include the development of corporate expansion plans, review of acquisition candidates, establishment of divestiture standards, due diligence on acquisitions or financing, market entry or expansion studies, competitive assessments, project financing studies, and negotiations relating to these transactions.

Litigation Support and Expert Testimony

Provided expert testimony on more than 150 occasions in administrative and civil proceedings on a wide range of energy and economic issues. Clients in these matters have included gas distribution utilities, gas pipelines, gas producers, oil producers, electric utilities, large energy consumers, governmental and regulatory agencies, trade associations, independent energy project developers, engineering firms, and gas and power marketers. Testimony has focused on issues ranging from broad regulatory and economic policy to virtually all elements of the utility ratemaking process. Also frequently testified regarding energy contract

interpretation, accepted energy industry practices, horizontal and vertical market power, quantification of damages, and management prudence. Have been active in regulatory contract and litigation matters on virtually all interstate pipeline systems serving the U.S. Northeast, Mid-Atlantic, Midwest, and Pacific regions.

Also served on FERC Commissioner Terzic's Task Force on Competition, which conducted an industry-wide investigation into the levels of and means of encouraging competition in U.S. natural gas markets. Represented the interests of the gas distributors (the AGD and UDC) and participated actively in developing and presenting position papers on behalf of the LDC community.

Resource Procurement, Contracting and Analysis

On behalf of gas distributors, gas pipelines, gas producers, electric utilities, and independent energy project developers, personally managed or participated in the negotiation, drafting, and regulatory support of hundreds of energy contracts, including the largest gas contracts in North America, electric contracts representing billions of dollars, pipeline and storage contracts, and facility leases.

These efforts have resulted in bringing large new energy projects to market across North America, the creation of hundreds of millions of dollars in savings through contract renegotiation, and the regulatory approval of a number of highly contested energy contracts.

Strategic Planning and Utility Restructuring

Acted as a leading participant in the restructuring of the natural gas and electric utility industries over the past fifteen years, as an adviser to local distribution companies (LDCs), pipelines, electric utilities, and independent energy project developers. In the recent past, provided services to many of the top 50 utilities and energy marketers across North America. Managed projects that frequently included the redevelopment of strategic plans, corporate reorganizations, the development of multi-year regulatory and legislative agendas, merger, acquisition and divestiture strategies, and the development of market entry strategies. Developed and supported merchant function exit strategies, marketing affiliate strategies, and detailed plans for the functional business units of many of North America's leading utilities.

PROFESSIONAL HISTORY

Concentric Energy Advisors, Inc. (2002 – Present)
Chairman and Chief Executive Officer

CE Capital Advisors (2004 – Present)
Chairman, President, and Chief Executive Officer

Navigant Consulting, Inc. (1997 – 2002)
President, Navigant Energy Capital (2000 – 2002)
Executive Director (2000 – 2002)
Co-Chief Executive Officer, Vice Chairman (1999 – 2000)
Executive Managing Director (1998 – 1999)
President, REED Consulting Group, Inc. (1997 – 1998)

REED Consulting Group (1988 – 1997)
Chairman, President and Chief Executive Officer

R.J. Rudden Associates, Inc. (1983 – 1988)
Vice President

Stone & Webster Management Consultants, Inc. (1981 – 1983)
Senior Consultant
Consultant

Southern California Gas Company (1976 – 1981)
Corporate Economist
Financial Analyst
Treasury Analyst

EDUCATION AND CERTIFICATION

B.S., Economics and Finance, Wharton School, University of Pennsylvania, 1976
Licensed Securities Professional: NASD Series 7, 63, and 24 Licenses

---

BOARDS OF DIRECTORS (PAST AND PRESENT)

Concentric Energy Advisors, Inc.
Navigant Consulting, Inc.
Navigant Energy Capital
Nukem, Inc.
New England Gas Association
R. J. Rudden Associates
REED Consulting Group

AFFILIATIONS

National Association of Business Economists
International Association of Energy Economists
American Gas Association
New England Gas Association
Society of Gas Lighters
Guild of Gas Managers

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Alaska Public Utilities Commission				
Chugach Electric	12/86	Chugach Electric	Docket No. U-86-11	Cost Allocation
Chugach Electric	6/87	Enstar Natural Gas Company	Docket No. U-87-2	Tariff Design
Chugach Electric	12/87	Enstar Natural Gas Company	Docket No. U-87-42	Gas Transportation
Chugach Electric	2/88	Chugach Electric	Docket No. U-87-35	Cost of Capital
California Energy Commission				
Southern California Gas Co.	8/80	Southern California Gas Co.	Docket No. 80-BR-3	Gas Price Forecasting
California Public Utility Commission				
Southern California Gas Co.	3/80	Southern California Gas Co.	TY 1981 G.R.C.	Cost of Service, Inflation
Pacific Gas Transmission Co.	10/91	Pacific Gas & Electric Co.	App. 89-04-033	Rate Design
Pacific Gas Transmission Co.	7/92	Southern California Gas Co.	A. 92-04-031	Rate Design
Colorado Public Utilities Commission				
AMAX Molybdenum	2/90	Commission Rulemaking	Docket No. 89R-702G	Gas Transportation
AMAX Molybdenum	11/90	Commission Rulemaking	Docket No. 90R-508G	Gas Transportation
Xcel Energy	8/04	Xcel Energy	Docket No. 031-134E	Cost of Debt
CT Dept. of Public Utilities Control				
Connecticut Natural Gas	12/88	Connecticut Natural Gas	Docket No. 88-08-15	Gas Purchasing Practices
United Illuminating	3/99	United Illuminating	Docket No. 99-03-04	Nuclear Plant Valuation
Southern Connecticut Gas	2/04	Southern Connecticut Gas	Docket No. 00-12-08	Gas Purchasing Practices
Southern Connecticut Gas	4/05	Southern Connecticut Gas	Docket No. 05-03-17	LNG/Trunkline
Southern Connecticut Gas	5/06	Southern Connecticut Gas	Docket No. 05-03-17PH01	LNG/Trunkline
Southern Connecticut Gas	8/08	Southern Connecticut Gas	Docket No. 06-05-04	Peaking Service Agreement

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
District Of Columbia PSC				
Potomac Electric Power Company	3/99	Potomac Electric Power Company	Docket No. 945	Divestiture of Gen. Assets & Purchase Power Contracts (Direct)
Potomac Electric Power Company	5/99	Potomac Electric Power Company	Docket No. 945	Divestiture of Gen. Assets & Purchase Power Contracts (Supplemental Direct)
Potomac Electric Power Company	7/99	Potomac Electric Power Company	Docket No. 945	Divestiture of Gen. Assets & Purchase Power Contracts (Rebuttal)
Fed'l Energy Regulatory Commission				
Safe Harbor Water Power Corp.	8/82	Safe Harbor Water Power Corp.		Wholesale Electric Rate Increase
Western Gas Interstate Company	5/84	Western Gas Interstate Company	Docket No. RP84-77	Load Fcst. Working Capital
Southern Union Gas	4/87	El Paso Natural Gas Company	Docket No. RP87-16-000	Take-or-Pay Costs
Connecticut Natural Gas	11/87	Penn-York Energy Corporation	Docket No. RP87-78-000	Cost Alloc./Rate Design
AMAX Magnesium	12/88	Questar Pipeline Company	Docket No. RP88-93-000	Cost Alloc./Rate Design
Western Gas Interstate Company	6/89	Western Gas Interstate Company	Docket No. RP89-179-000	Cost Alloc./Rate Design, Open-Access Transportation
Associated CD Customers	12/89	CNG Transmission	Docket No. RP88-211-000	Cost Alloc./Rate Design
Utah Industrial Group	9/90	Questar Pipeline Company	Docket No. RP88-93-000, Phase II	Cost Alloc./Rate Design

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Iroquois Gas Trans. System	8/90	Iroquois Gas Transmission System	Docket No. CP89-634-000/001; CP89-815-000	Gas Markets, Rate Design, Cost of Capital, Capital Structure
Boston Edison Company	1/91	Boston Edison Company	Docket No. ER91-243-000	Electric Generation Markets
Cincinnati Gas and Electric Co., Union Light, Heat and Power Company, Lawrenceburg Gas Company	7/91	Texas Gas Transmission Corp.	Docket No. RP90-104-000, RP88-115-000, RP90-192-000	Cost Alloc./Rate Design Comparability of Svc.
Ocean State Power II	7/91	Ocean State Power II	ER89-563-000	Competitive Market Analysis, Self-dealing
Brooklyn Union/PSE&G	7/91	Texas Eastern	RP88-67, et al	Market Power, Comparability of Service
Northern Distributor Group	9/92	Northern Natural Gas Company	RP92-1-000, et al	Cost of Service
Canadian Association of Petroleum Producers and Alberta Pet. Marketing Comm.	10/92	Lakehead Pipe Line Co. L.P.	IS92-27-000	Rate Case Analysis Cost of Service
Colonial Gas, Providence Gas	7/93	Algonquin Gas Transmission	RP93-14	Cost Allocation, Rate Design
Colonial Gas, Providence Gas	8/93	Algonquin Gas Transmission	RP93-14 – Rebuttal	Cost Allocation, Rate Design
Iroquois Gas Transmission	94	Iroquois Gas Transmission	RP94-72-000	Cost of Service and Rate Design
Transco Customer Group	1/94	Transcontinental Gas Pipeline Corporation	Docket No. RP92-137-000	Rate Design, Firm to Wellhead
Pacific Gas Transmission	2/94	Pacific Gas Transmission	Docket No. RP94-149-000	Rolled-In vs. Incremental Rates
Tennessee GSR Group	1/95	Tennessee Gas Pipeline Company	Docket Nos. RP93-151-000, RP94-39-000, RP94-197-000, RP94-309-000	GSR Costs

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Pacific Gas Transmission	2/95	Pacific Gas Transmission	RP94-149-000	Rate Design
Tennessee GSR Customer Group	3/95	Tennessee Gas Pipeline Company	Docket Nos. RP93-151-000, RP94-39-000, RP94-197-000, RP94-309-000	GSR Costs
ProGas and Texas Eastern	1/96	Tennessee Gas Pipeline Company	RP93-151	Declaration
PG&E and SoCal Gas	96	El Paso Natural Gas Company	RP92-18-000	Stranded Costs
Iroquois Gas Transmission System, L.P.	97	Iroquois Gas Transmission System, L.P.	RP97-126-000	Cost of Service, Rate Design
BEC Energy - Commonwealth Energy System	2/99	Boston Edison Company/ Commonwealth Energy System	EC99-___-000	Market Power Analysis – Merger
Central Hudson Gas & Electric, Consolidated Co. of New York, Niagara Mohawk Power Corporation, Dynegy Power Inc.	10/00	Central Hudson Gas & Electric, Consolidated Co. of New York, Niagara Mohawk Power Corporation, Dynegy Power Inc.	Docket No. EC00-___	Market Power 203/205 Filing
Wyckoff Gas Storage	12/02	Wyckoff Gas Storage	CP03-33-000	Need for Storage Project
Indicated Shippers/Producers	10/03	Northern Natural Gas	Docket No. RP98-39-029	Ad Valorem Tax Treatment
Maritimes & Northeast Pipeline	6/04	Maritimes & Northeast Pipeline	Docket No. RP04-360-000	Rolled-In Rates
ISO New England	8/04	ISO New England	Docket No. ER03-563-030	Cost of New Entry
Transwestern Pipeline Company, LLC	9/06	Transwestern Pipeline Company, LLC	Docket No. RP06-614-000	
Portland Natural Gas Transmission System	6/08	Portland Natural Gas Transmission System	Docket No. RP08-306-000	Market Assessment, natural gas transportation; rate setting

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Portland Natural Gas Transmission System	5/10	Portland Natural Gas Transmission System	Docket No. RP10-729-000	Business risks; extraordinary and non-recurring events pertaining to discretionary revenues
Morris Energy	7/10	Morris Energy	Docket No. RP10-	Affidavit re: Impact of Preferential Rate
Florida Public Service Commission				
Florida Power and Light Co.	10/07	Florida Power & Light Co.	Docket No. 070650-EI	Need for new nuclear plant
Florida Power and Light Co.	5/08	Florida Power & Light Co.	Docket No. 080009-EI	New Nuclear cost recovery
Florida Power and Light Co.	3/09	Florida Power & Light Co.	Docket No. 080677-EI	Benchmarking in support of ROE
Florida Power and Light Co.	3/09	Florida Power & Light Co.	Docket No. 090009-EI	New Nuclear cost recovery
Florida Power and Light Co.	3/10; 5/10, 8/10	Florida Power & Light Co.	Docket No. 100009-EI	New Nuclear cost recovery
Florida Senate Committee on Communication, Energy and Utilities				
Florida Power and Light Co.	2/09	Florida Power & Light Co.		Securitization
Hawaii Public Utility Commission				
Hawaiian Electric Light Company, Inc. (HELCO)	6/00	Hawaiian Electric Light Company, Inc.	Cause No. 41746	Standby Charge
Indiana Utility Regulatory Commission				
Northern Indiana Public Service Company	10/01	Northern Indiana Public Service Company	Docket No. 99-0207	Direct Testimony, Valuation of Electric Generating Facilities
Northern Indiana Public Service Company	01/08	Northern Indiana Public Service Company	Cause No. 43396	Asset Valuation
Northern Indiana Public Service Company	08/08	Northern Indiana Public Service Company	Cause No. 43526	Fair Market Value Assessment

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Iowa Utilities Board				
Interstate Power and Light	7/05	Interstate Power and Light and FPL Energy Duane Arnold, LLC	Docket No. SPU-05-15	Sale of Nuclear Plant
Interstate Power and Light	5/07	City of Everly, Iowa	Docket No. SPU-06-5	Public Benefits
Interstate Power and Light	5/07	City of Kalona, Iowa	Docket No. SPU-06-6	Public Benefits
Interstate Power and Light	5/07	City of Wellman, Iowa	Docket No. SPU-06-10	Public Benefits
Interstate Power and Light	5/07	City of Terril, Iowa	Docket No. SPU-06-8	Public Benefits
Interstate Power and Light	5/07	City of Rolfe, Iowa	Docket No. SPU-06-7	Public Benefits
Maine Public Utility Commission				
Northern Utilities	5/96	Granite State and PNGTS	Docket No. 95-480, 95-481	Transportation Service and PBR
Maryland Public Service Commission				
Eastalco Aluminum	3/82	Potomac Edison	Docket No. 7604	Cost Allocation
Potomac Electric Power Company	8/99	Potomac Electric Power Company	Docket No. 8796	Stranded Cost & Price Protection (Direct)
Mass. Department of Public Utilities				
Haverhill Gas	5/82	Haverhill Gas	Docket No. DPU #1115	Cost of Capital
New England Energy Group	1/87	Commission Investigation		Gas Transportation Rates
Energy Consortium of Mass.	9/87	Commonwealth Gas Company	Docket No. DPU-87-122	Cost Alloc./Rate Design
Mass. Institute of Technology	12/88	Middleton Municipal Light	DPU #88-91	Cost Alloc./Rate Design
Energy consortium of Mass.	3/89	Boston Gas	DPU #88-67	Rate Design
PG&E Bechtel Generating Co./ Constellation Holdings	10/91	Commission Investigation	DPU #91-131	Valuation of Environmental Externalities

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Coalition of Non-Utility Generators		Cambridge Electric Light Co. & Commonwealth Electric Co.	DPU 91-234 EFSC 91-4	Review Integrated Resource Management Filing
The Berkshire Gas Company Essex County Gas Company Fitchburg Gas and Elec. Light Co.	5/92	The Berkshire Gas Company Essex County Gas Company Fitchburg Gas & Elec. Light Co.	DPU #92-154	Gas Purchase Contract Approval
Boston Edison Company	7/92	Boston Edison	DPU #92-130	Least Cost Planning
Boston Edison Company	7/92	The Williams/Newcorp Generating Co.	DPU #92-146	RFP Evaluation
Boston Edison Company	7/92	West Lynn Cogeneration	DPU #92-142	RFP Evaluation
Boston Edison Company	7/92	L'Energia Corp.	DPU #92-167	RFP Evaluation
Boston Edison Company	7/92	DLS Energy, Inc.	DPU #92-153	RFP Evaluation
Boston Edison Company	7/92	CMS Generation Co.	DPU #92-166	RFP Evaluation
Boston Edison Company	7/92	Concord Energy	DPU #92-144	RFP Evaluation
The Berkshire Gas Company Colonial Gas Company Essex County Gas Company Fitchburg Gas and Electric Company	11/93	The Berkshire Gas Company Colonial Gas Company Essex County Gas Company Fitchburg Gas and Electric Co.	DPU #93-187	Gas Purchase Contract Approval
Bay State Gas Company	10/93	Bay State Gas Company	Docket No. 93-129	Integrated Resource Planning
Boston Edison Company	94	Boston Edison	DPU #94-49	Surplus Capacity
Hudson Light & Power Department	4/95	Hudson Light & Power Dept.	DPU #94-176	Stranded Costs – Direct
Essex County Gas Company	5/96	Essex County Gas Company	Docket No. 96-70	Unbundled Rates
Boston Edison Company	8/97	Boston Edison Company	D.P.U. No. 97-63	Holding Company Corporate Structure
Berkshire Gas Company	6/98	Berkshire Gas Mergeco Gas Co.	D.T.E. 98-87	Regulatory Issues
Eastern Edison Company	8/98	Montaup Electric Company	D.T.E. 98-83	Marketing for divestiture of its generation business.
Boston Edison Company	98	Boston Edison Company	D.T.E. 97-113	Fossil Generation Divestiture
Boston Edison Company	98	Boston Edison Company	D.T.E. 98-119	Nuclear Generation Divestiture

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Eastern Edison Company	12/98	Montaup Electric Company	D.T.E. 99-9	Sale of Nuclear Plant
NStar	9/07, 12/07	NStar, Bay State Gas, Fitchburg G&E, NE Gas, W. MA Electric	DPU 07-50	Decoupling
Mass. Energy Facilities Siting Council				
Mass. Institute of Technology	1/89	M.M.W.E.C.	EFSC-88-1	Least-Cost Planning
Boston Edison Company	9/90	Boston Edison	EFSC-90-12	Electric Generation Mkts
Silver City Energy Ltd. Partnership	11/91	Silver City Energy	D.P.U. 91-100	State Policies; Need for Facility
Michigan Public Service Commission				
Detroit Edison Company	9/98	Detroit Edison Company	Case No. U-11726	Market Value of Generation Assets
Consumers Energy Company	8/06	Consumers Energy Company	Case No. U-14992	Sale of Nuclear Plant
Minnesota Public Utilities Commission				
Xcel Energy/No. States Power	9/04	Xcel Energy/No. States Power	Docket No. G002/GR-04-1511	NRG Impacts
Interstate Power and Light	8/05	Interstate Power and Light and FPL Energy Duane Arnold, LLC	Docket No. E001/PA-05-1272	Sale of Nuclear Plant
Northern States Power Company d/b/a Xcel Energy	11/05	Northern States Power Company	Docket No. E002/GR-05-1428	NRG Impacts on Debt Costs
Northern States Power Company d/b/a Xcel Energy	09/06	NSP v. Excelsior	Docket No. E6472/M-05-1993	Industry Norms and Financial Impacts
Northern States Power Company d/b/a Xcel Energy	11/06	Northern States Power Company	Docket No. G002/GR-06-1429	Return on Equity
Northern States Power	11/08	Northern States Power Company	Docket No. E002/GR-08-1065	Return on Equity
Northern States Power	11/09	Northern States Power Company	Docket No. G002/GR-09-1153	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Missouri Public Service Commission				
Missouri Gas Energy	1/03	Missouri Gas Energy	Case No. GR-2001-382	Gas Purchasing Practices; Prudence
Aquila Networks	2/04	Aquila-MPS, Aquila_L&P	Case Nos. ER-2004-0034 HR-2004-0024	Cost of Capital, Capital Structure
Aquila Networks	2/04	Aquila-MPS, Aquila_L&P	Case No. GR-2004-0072	Cost of Capital, Capital Structure
Missouri Gas Energy	11/05	Missouri Gas Energy	Case Nos. GR-2002-348 GR-2003-0330	Capacity Planning
Montana Public Service Commission				
Great Falls Gas Company	10/82	Great Falls Gas Company	Docket No. 82-4-25	Gas Rate Adjust. Clause
Nat. Energy Board of Canada				
Alberta-Northeast	2/87	Alberta Northeast Gas Export Project	Docket No. GH-1-87	Gas Export Markets
Alberta-Northeast	11/87	TransCanada Pipeline	Docket No. GH-2-87	Gas Export Markets
Alberta-Northeast	1/90	TransCanada Pipeline	Docket No. GH-5-89	Gas Export Markets
Indep. Petroleum Association of Canada	1/92	Interprovincial Pipe Line, Inc.	RH-2-91	Pipeline Valuation, Toll
The Canadian Association of Petroleum Producers	11/93	Transmountain Pipe Line	RH3-93	Cost of Capital
Alliance Pipeline L.P.	6/97	Alliance Pipeline L.P.	GH-3-97	Market Study
Maritimes & Northeast Pipeline	97	Sable Offshore Energy Project	GH-6-96	Market Study
Maritimes & Northeast Pipeline	2/02	Maritimes & Northeast Pipeline	GH-3-2002	Natural Gas Demand Analysis
TransCanada Pipelines	8/04	TransCanada Pipelines	RH-3-2004	Segmented Service
Brunswick Pipeline	9/06	Brunswick Pipeline	GH-1-2006	Market Study

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
TransCanada Pipelines Ltd.	3/07	TransCanada Pipelines Ltd.: Gros Cacouna Receipt Point Application	RH-1-2007	
Repsol Energy Canada Ltd	3/08	Repsol Energy Canada Ltd	GH-1-2008	Market Study
New Brunswick Energy and Utilities Board				
Atlantic Wallboard/JD Irving Co	1/08	Atlantic Wallboard/JD Irving Co.	MCTN #298600	Rate Setting for EGNB
Atlantic Wallboard/Flakeboard	09/09, 6/10, 7/10	Atlantic Wallboard/Flakeboard		Rate Setting for EGNB
Maritimes and Northeast Pipeline	7/10	Maritimes & Northeast Pipeline	File OF-Tolls-Group1-M124-2010-01 01	Ratemaking treatment of Escrow Account
NH Public Utilities Commission				
Bus & Industry Association	6/89	P.S. Co. of New Hampshire	Docket No. DR89-091	Fuel Costs
Bus & Industry Association	5/90	Northeast Utilities	Docket No. DR89-244	Merger & Acq. Issues
Eastern Utilities Associates	6/90	Eastern Utilities Associates	Docket No. DF89-085	Merger & Acq. Issues
EnergyNorth Natural Gas	12/90	EnergyNorth Natural Gas	Docket No. DE90-166	Gas Purchasing Practices
EnergyNorth Natural Gas	7/90	EnergyNorth Natural Gas	Docket No. DR90-187	Special Contracts, Discounted Rates
Northern Utilities, Inc.	12/91	Commission Investigation	Docket No. DR91-172	Generic Discounted Rates
New Jersey Board of Public Utilities				
Hilton/Golden Nugget	12/83	Atlantic Electric	B.P.U. 832-154	Line Extension Policies
Golden Nugget	3/87	Atlantic Electric	B.P.U. No. 837-658	Line Extension Policies
New Jersey Natural Gas	2/89	New Jersey Natural Gas	B.P.U. GR89030335J	Cost Alloc./Rate Design
New Jersey Natural Gas	1/91	New Jersey Natural Gas	B.P.U. GR90080786J	Cost Alloc./Rate Design
New Jersey Natural Gas	8/91	New Jersey Natural Gas	B.P.U. GR91081393J	Rate Design; Weather Norm. Clause
New Jersey Natural Gas	4/93	New Jersey Natural Gas	B.P.U. GR93040114J	Cost Alloc./Rate Design

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
South Jersey Gas	4/94	South Jersey Gas	BRC Dock No. GR080334	Revised levelized gas adjustment
New Jersey Utilities Association	9/96	Commission Investigation	BPU AX96070530	PBOP Cost Recovery
Morris Energy Group	11/09	Morris Energy Group	BPU GR 09050422	Discriminatory Rates
New Jersey American Water Co.	4/10	New Jersey American Water Co.	BPU WR 1040260	Tariff Rates and Revisions
New Mexico Public Service Commission				
Gas Company of New Mexico	11/83	Public Service Co. of New Mexico	Docket No. 1835	Cost Alloc./Rate Design
New York Public Service Commission				
Iroquois Gas. Transmission	12/86	Iroquois Gas Transmission System	Case No. 70363	Gas Markets
Brooklyn Union Gas Company	8/95	Brooklyn Union Gas Company	Case No. 95-6-0761	Panel on Industry Directions
Central Hudson, ConEdison and Niagara Mohawk	9/00	Central Hudson, ConEdison and Niagara Mohawk	Case No. 96-E-0909 Case No. 96-E-0897 Case No. 94-E-0098 Case No. 94-E-0099	Section 70
Central Hudson, New York State Electric & Gas, Rochester Gas & Electric	5/01	Joint Petition of NiMo, NYSEG, RG&E, Central Hudson, Constellation and Nine Mile Point	Case No. 01-E-0011	Section 70, Rebuttal Testimony
Rochester Gas & Electric	12/03	Rochester Gas & Electric	Case No. 03-E-1231	Sale of Nuclear Plant
Rochester Gas & Electric	01/04	Rochester Gas & Electric	Case No. 03-E-0765 Case No. 02-E-0198 Case No. 03-E-0766	Sale of Nuclear Plant; Ratemaking Treatment of Sale
Rochester Gas and Electric and NY State Electric & Gas Corp	2/10	Rochester Gas & Electric NY State Electric & Gas Corp	Case No. 09-E-0715 Case No. 09-E-0716 Case No. 09-E-0717 Case No. 09-E-0718	Depreciation policy

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Oklahoma Corporation Commission				
Oklahoma Natural Gas Company	6/98	Oklahoma Natural Gas Company	Case PUD No. 980000177	Evaluate their use of storage
Oklahoma Gas & Electric Company	9/05	Oklahoma Gas & Electric Company	Cause No. PUD 200500151	Prudence of McLain Acquisition
Oklahoma Gas & Electric Company	03/08	Oklahoma Gas & Electric Company	Cause No. PUD 200800086	Acquisition of Redbud generating facility
Ontario Energy Board				
Market Hub Partners Canada, L.P.	5/06	Natural Gas Electric Interface Roundtable	File No. EB-2005-0551	Market-based Rates For Storage
Pennsylvania Public Utility Commission				
ATOC	4/95	Equitrans	Docket No. R-00943272	Tariff Changes
ATOC	3/96	Equitrans	Docket No. P-00940886	Rate Service - Direct
Rhode Island Public Utilities Commission				
Newport Electric	7/81	Newport Electric	Docket No. 1599	Rate Attrition
South County Gas	9/82	South County Gas	Docket No. 1671	Cost of Capital
New England Energy Group	7/86	Providence Gas Company	Docket No. 1844	Cost Alloc./Rate Design
Providence Gas	8/88	Providence Gas Company	Docket No. 1914	Load Forecast., Least-Cost Planning
Providence Gas Company and The Valley Gas Company	1/01	Providence Gas Company and The Valley Gas Company	Docket No. 1673 and 1736	Gas Cost Mitigation Strategy
The New England Gas Company	3/03	New England Gas Company	Docket No. 3459	Cost of Capital
Texas Public Utility Commission				
Southwestern Electric	5/83	Southwestern Electric		Cost of Capital, CWIP

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
P.U.C. General Counsel	11/90	Texas Utilities Electric Company	Docket No. 9300	Gas Purchasing Practices
Oncor Electric Delivery Company	8/07	Oncor Electric Delivery Company	Docket No. 34040	Rate Filing Package; Regulatory Policy, Rate of Return, Return of Capital and Consolidated Tax Adjustment
Oncor Electric Delivery Company	6/08	Oncor Electric Delivery Company	Docket No.35717	Rate Filing
Oncor Electric Delivery Company	10/08	Oncor, TCC, TNC, ETT, LCRA TSC, Sharyland, STEC, TNMP	Docket No. 35665	Competitive Renewable Energy Zone
CenterPoint Energy	6/10 10/10	CenterPoint Energy/Houston Electric	Docket No. 38339	Cost of Service Rate Adjustment
Texas Railroad Commission				
Southern Union Gas	5/85	Southern Union Gas Company	G.U.D. 1891	Cost of Service
AtmosPipeline Texas	8/10	Atmos Pipeline Texas	GUD 10000	Ratemaking Policy
Utah Public Service Commission				
AMAX Magnesium	1/88	Mountain Fuel Supply Company	Case No. 86-057-07	Cost Alloc./Rate Design
AMAX Magnesium	4/88	Utah P&L/Pacific P&L	Case No. 87-035-27	Merger & Acquisition
Utah Industrial Group	7/90	Mountain Fuel Supply	Case No. 89-057-15	Gas Transportation Rates
AMAX Magnesium	9/90	Utah Power & Light	Case No. 89-035-06	Energy Balancing Account
AMAX Magnesium	8/90	Utah Power & Light	Case No. 90-035-06	Electric Service Priorities

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Questar Gas Company	12/07	Questar Gas Company	Docket No. 07-057-13	Benchmarking in support of ROE
Vermont Public Service Board				
Green Mountain Power	8/82	Green Mountain Power	Docket No. 4570	Rate Attrition
Green Mountain Power	12/97	Green Mountain Power	Docket No. 5983	Tariff Filing
Green Mountain Power	7/98	Green Mountain Power	Docket No. 6107	Direct Testimony
Green Mountain Power	9/00	Green Mountain Power	Docket No. 6107	Rebuttal Testimony
Wisconsin Public Service Commission				
WEC & WICOR	11/99	WEC	Docket No. 9401-YO-100 Docket No. 9402-YO-101	Approval to Acquire the Stock of WICOR
Wisconsin Electric Power Company	1/07	Wisconsin Electric Power Co.	Docket No. 6630-EI-113	Sale of Nuclear Plant
Wisconsin Electric Power Company	10/09	Wisconsin Electric Power Co.	Docket No. 6630-CE-302	CPCN Application

SPONSOR	• D	CASE/APPLICANT	DOCKET NO.	SUBJECT
American Arbitration Association				
Michael Polsky	3/91	M. Polsky vs. Indeck Energy		Corporate Valuation, Damages
ProGas Limited	7/92	ProGas Limited v. Texas Eastern	Arbitration Panel	Gas Contract Arbitration
Attala Generating Company	12/03	Attala Generating Co v. Attala Energy Co.	Case No. 16-Y-198-00228-03	Power Project Valuation; Breach of Contract; Damages
Nevada Power Company	4/08	Nevada Power v. Nevada Cogeneration Assoc. #2		Power Purchase Agreement
Commonwealth of Massachusetts, Suffolk Superior Court				
John Hancock	1/84	Trinity Church v. John Hancock	C.A. No. 4452	Damages Quantification
State of Colorado District Court, County of Garfield				
Questar Corporation, et al	11/00	Questar Corporation, et al.	Case No. 00CV129-A	Partnership Fiduciary Duties
State of Delaware, Court of Chancery, New Castle County				
Wilmington Trust Company	11/05	Calpine Corporation vs. Bank Of New York and Wilmington Trust Company	C.A. No. 1669-N	Bond Indenture Covenants
Illinois Appellate Court, Fifth Division				
Norweb, plc	8/02	Indeck No. America v. Norweb	Docket No. 97 CH 07291	Breach of Contract; Power Plant Valuation
Independent Arbitration Panel				
Alberta Northeast Gas Limited	2/98	ProGas Ltd., Canadian Forest Oil Ltd., AEC Oil & Gas		

SPONSOR	• D	CASE/APPLICANT	DOCKET NO.	SUBJECT
Ocean State Power	9/02	Ocean State Power vs. ProGas Ltd.	2001/2002 Arbitration	Gas Price Arbitration
Ocean State Power	2/03	Ocean State Power vs. ProGas Ltd.	2002/2003 Arbitration	Gas Price Arbitration
Ocean State Power	6/04	Ocean State Power vs. ProGas Ltd.	2003/2004 Arbitration	Gas Price Arbitration
Shell Canada Limited	7/05	Shell Canada Limited and Nova Scotia Power Inc.		Gas Contract Price Arbitration
International Court of Arbitration				
Wisconsin Gas Company, Inc.	2/97	Wisconsin Gas Co. vs. Pan-Alberta	Case No. 9322/CK	Contract Arbitration
Minnegasco, A Division of NorAm Energy Corp.	3/97	Minnegasco vs. Pan-Alberta	Case No. 9357/CK	Contract Arbitration
Utilicorp United Inc.	4/97	Utilicorp vs. Pan-Alberta	Case No. 9373/CK	Contract Arbitration
IES Utilities	97	IES vs. Pan-Alberta	Case No. 9374/CK	Contract Arbitration
State of New Jersey, Mercer County Superior Court				
Transamerica Corp., et. al.	7/07	IMO Industries Inc. vs. Transamerica Corp., et. al.	Docket No. L-2140-03	Breach-Related Damages, Enterprise Value
State of New York, Nassau County Supreme Court				
Steel Los III, LP	6/08	Steel Los II, LP & Associated Brook, Corp v. Power Authority of State of NY	Index No. 5662/05	Property seizure
Province of Alberta, Court of Queen's Bench				
Alberta Northeast Gas Limited	5/07	Cargill Gas Marketing Ltd. vs. Alberta Northeast Gas Limited	Action No. 0501-03291	Gas Contracting Practices

SPONSOR	• D	CASE/APPLICANT	DOCKET NO.	SUBJECT
State of Rhode Island, Providence City Court				
Aquidneck Energy	5/87	Laroche vs. Newport		Least-Cost Planning
State of Texas Hutchinson County Court				
Western Gas Interstate	5/85	State of Texas vs. Western Gas Interstate Co.	Case No. 14,843	Cost of Service
State of Utah Third District Court				
PacifiCorp & Holme, Roberts & Owen, LLP	1/07	USA Power & Spring Canyon Energy vs. PacifiCorp. et. al.	Civil No. 050903412	Breach-Related Damages
U.S. Bankruptcy Court, District of New Hampshire				
EUA Power Corporation	7/92	EUA Power Corporation	Case No. BK-91-10525-JEY	Pre-Petition Solvency
U.S. Bankruptcy Court, District Of New Jersey				
Ponderosa Pine Energy Partners, Ltd.	7/05	Ponderosa Pine Energy Partners, Ltd.	Case No. 05-21444	Forward Contract Bankruptcy Treatment
U.S. Bankruptcy Court, No. District of New York				
Cayuga Energy, NYSEG Solutions, The Energy Network	09/09	Cayuga Energy, NYSEG Solutions, The Energy Network	Case No. 06-60073-6-sdg	Going concern
U.S. Bankruptcy Court, So. District Of New York				
Johns Manville	5/04	Enron Energy Mktg. v. Johns Manville; Enron No. America v. Johns Manville	Case No. 01-16034 (AJG)	Breach of Contract; Damages

SPONSOR	• D	CASE/APPLICANT	DOCKET NO.	SUBJECT
U.S. Bankruptcy Court, Northern District Of Texas				
Southern Maryland Electric Cooperative, Inc. and Potomac Electric Power Company	11/04	Mirant Corporation, et al. v. SMECO	Case No. 03-4659; Adversary No. 04-4073	PPA Interpretation; Leasing
U. S. Court of Federal Claims				
Boston Edison Company	7/06	Boston Edison v. Department of Energy	No. 99-447C No. 03-2626C	Spent Nuclear Fuel Litigation
Consolidated Edison of New York	08/07	Consolidated Edison of New York, Inc. and subsidiaries v. United States	No. 06-305T	Leasing Litigation
Consolidated Edison Company	2/08	Consolidated Edison Company v. United States	No. 04-0033C	SNF Expert Report
Vermont Yankee Nuclear Power Corporation	6/08	Vermont Yankee Nuclear Power Corporation	No. 03-2663C	SNF Expert Report
U. S. District Court, Boulder County, Colorado				
KN Energy, Inc.	3/93	KN Energy vs. Colorado GasMark, Inc.	Case No. 92 CV 1474	Gas Contract Interpretation
U. S. District Court, Northern California				
Pacific Gas & Electric Co./PGT PG&E/PGT Pipeline Exp. Project	4/97	Norcen Energy Resources Limited	Case No. C94-0911 VRW	Fraud Claim
U. S. District Court, District of Connecticut				
Constellation Power Source, Inc.	12/04	Constellation Power Source, Inc. v. Select Energy, Inc.	Civil Action 304 CV 983 (RNC)	ISO Structure, Breach of Contract

SPONSOR	• D	CASE/APPLICANT	DOCKET NO.	SUBJECT
U. S. District Court, Massachusetts				
Eastern Utilities Associates & Donald F. Pardus	3/94	NECO Enterprises Inc. vs. Eastern Utilities Associates	Civil Action No. 92-10355-RCL	Seabrook Power Sales
U. S. District Court, Montana				
KN Energy, Inc.	9/92	KN Energy v. Freeport MacMoRan	Docket No. CV 91-40-BLG-RWA	Gas Contract Settlement
U.S. District Court, New Hampshire				
Portland Natural Gas Transmission and Maritimes & Northeast Pipeline	9/03	Public Service Company of New Hampshire vs. PNGTS and M&NE Pipeline	Docket No. C-02-105-B	Impairment of Electric Transmission Right-of-Way
U. S. District Court, Southern District of New York				
Central Hudson Gas & Electric	11/99	Central Hudson v. Riverkeeper, Inc., Robert H. Boyle, John J. Cronin	Civil Action 99 Civ 2536 (BDP)	Expert Report, Shortnose Sturgeon Case
Central Hudson Gas & Electric	8/00	Central Hudson v. Riverkeeper, Inc., Robert H. Boyle, John J. Cronin	Civil Action 99 Civ 2536 (BDP)	Revised Expert Report, Shortnose Sturgeon Case
Consolidated Edison	3/02	Consolidated Edison v. Northeast Utilities	Case No. 01 Civ. 1893 (JGK) (HP)	Industry Standards for Due Diligence
Merrill Lynch & Company	1/05	Merrill Lynch v. Allegheny Energy, Inc.	Civil Action 02 CV 7689 (HB)	Due Diligence, Breach of Contract, Damages
U. S. District Court, Eastern District of Virginia				
Aquila, Inc.	1/05	VPEM v. Aquila, Inc.	Civil Action 304 CV 411	Breach of Contract, Damages

SPONSOR	• D	CASE/APPLICANT	DOCKET NO.	SUBJECT
U. S. District Court, Portland Maine				
ACEC Maine, Inc. et al.	10/91	CIT Financial vs. ACEC Maine	Docket No. 90-0304-B	Project Valuation
Combustion Engineering	1/92	Combustion Eng. vs. Miller Hydro	Docket No. 89-0168P	Output Modeling; Project Valuation
U.S. Securities and Exchange Commission				
Eastern Utilities Association	10/92	EUA Power Corporation	File No. 70-8034	Value of EUA Power
Council of the District of Columbia Committee on Consumer and Regulatory Affairs				
Potomac Electric Power Co.	7/99	Potomac Electric Power Co.	Bill 13-284	Utility restructuring

Annual Operating Cost Savings: Water Heating and Space Heating

Water Heating

	Consumption MMBtu		Price		Operating Cost
Gas	25.40	$	11.35	$	288.29
Electric	16.60	$	29.44	$	488.70
Savings				$	200.41

Space Heating

	Consumption MMBtu		Price		Operating Cost
Gas	74.30	$	11.35	$	843.31
Electric	61.40	$	23.61	$	1,449.65
Savings				$	606.35

MGE		Revenue	Mcf		Cost / Mcf	Source
2009	$	473,442,858	39,495,114	$	11.9874	MGE data request
2008	$	404,043,071	36,182,498	$	11.1668	MGE data request
2010 (thru Sept)	$	303,339,279	28,338,007	$	10.7043	MGE data request
	$	1,180,825,208	104,015,619	$	11.3524	

GMO		Revenue	Mwh		Cost / Kwh	Source
Residential space heat - MPS	$	100,357,734	1,161,629	$	0.0864	2009 FERC Form 1, p 304
Residential space heat - SJ	$	23,237,081	373,448	$	0.0622	2009 FERC Form 1, p 304
Average	$	123,594,815	1,535,077	$	0.0805	
Convert Kwh to MMBtu					0.00341	EIA
Rate per MMBtu				$	23.61	

GMO		Revenue	Mwh		Cost / Kwh	Source
Residential general - MPS	$	155,824,319	1,492,792	$	0.1044	2009 FERC Form 1, p 304
Residential general - SJ	$	31,563,652	373,612	$	0.0845	2009 FERC Form 1, p 304
Average	$	187,387,971	1,866,404	$	0.1004	
Convert Kwh to MMBtu					0.00341	EIA
Rate per MMBtu				$	29.44	

Summary of Fuel Switching Programs Offered by Other Electric Utilities

Puget Sound Energy

Program Offering

In December 2008, Puget Sound Energy ("PSE") implemented a tariff in Washington that created an incentive for residential customers to convert from electric service to natural gas. PSE electric customers are eligible for the incentive whether they are switching to PSE natural gas service or Cascade Natural Gas service. These programs are consistent with PSE's 2007 Integrated Resource Plan, in which the company determined that it could meet electric energy efficiency goals in part through fuel conversion to natural gas. PSE estimates that it can save 8,760 MWh in 2010 and 2011 through fuel conversion, which is enough electricity to power 730 average homes. This savings represents approximately 0.037 percent of total MWh in 2009.[1]

PSE offers one-time cash payments to existing residential customers (one to four units)[2] who convert to highly efficient natural gas space heating or domestic water heating equipment or both. The Company provides incentives for replacing existing electric forced-air or baseboard space heating equipment or tank style water heating equipment with high efficiency natural gas space heating equipment or high efficiency natural gas domestic water heating equipment, or a combination of such equipment.

PSE offers the following rebates to single-family electric customers:

- ✓ Water heating only: $950
- ✓ Home heating only: $500 to $2,500[3]
- ✓ Home and water heating: $1,950 to $3,950

However, the rebate amount is limited to 75% of the total equipment and installation cost.

Budget and Cost Recovery

PSE proposed an annual 2010/2011 budget for the fuel switching program of about $4.5 million, 2.7 percent of the electric energy efficiency program budget of $167 million. PSE expects to conserve approximately 1.7 MWs through the gas conversion program. The fuel switching incentive represents about 6 percent of the existing residential program in terms of dollars spent and approximately 5.3 percent in terms of megawatts saved. PSE is allowed to recover the costs for this fuel switching program through its Electric Conservation Rider, which is assessed on all electric customers. PSE expects the gas conversion program will have a benefit/cost ratio of 2.66 using the

---

1 According to Puget Sound Energy's 2009 FERC Form 1, their total MWh in 2009 were 23,926,211.

2 Puget Sound Energy multi-family program, which serves buildings with five or more units, is also listed under the residential class in the company's report to the Idaho PUC.

3 Rebate level is inversely proportional to energy usage. The logic is that customers with higher KWH usage have a natural incentive to convert to natural gas, while customers with lower KWH usage – and therefore a longer payback period - would require more financial incentive.

TRC test and 5.65 using the Utility Cost test.[4] Both ratios are the highest of any energy efficiency program offered by PSE to residential customers.

Customer Participation

During 2009, 434 customers participated in the fuel switching rebate program, with 85% of customers choosing to participate only in the water heating conversion program. Based on the $950 rebate for water heating conversions, PSE would have spent approximately $350,000 on this program element during 2009. PSE's program goals for 2010 and 2011 are for conversion of 1,500 water heaters and 300 space heaters.

CenterPoint - Texas

Program Offerings

In response to 1999 electric restructuring legislation in Texas that required electric utilities to reduce peak demand by at least 15% of projected annual load growth, CenterPoint ("CNP") developed a market transformation program that was intended to increase awareness of alternatives to electric water heating and space heating in multi-family residences. In 2007, Texas revised its energy efficiency goals for electric utilities in Texas through the passage of House Bill 3693, which required each investor-owned electric utility to reduce Texas customers' energy consumption by a minimum of 20% of the utility's annual growth in 2010.

CNP determined that in the single-family residential sector, natural gas water heating and space heating systems already were preferred by homebuyers because of their lower operating costs. However, a 2005 market research study indicated that Houston area developers used electric resistance water heating and space heating in over 95% of affordable, low-rise multi-family properties primarily because of the lower installation costs. The Multi-Family Water and Space Heating program provides incentives to multi-family project developers who facilitate the installation of non-electric water heating in both market rate and affordable rate multi-family projects within CNP's electric distribution service territory. These financial incentives are available to customers served either by CNP or Texas Gas Services. In addition to water heating, CNP has attempted to encourage the adoption of alternatives to electric resistance space heating in these same projects. The principal target of the program is new construction. Existing multi-family projects may receive incentives for other measures under CNP's existing standard offer incentive programs.

The primary barrier to the installation of non-electric technologies in multi-family properties is the higher initial cost associated with the installation of gas lines and gas appliances. The program addresses this barrier by offering incentives to project sponsors who install non-electric domestic water heating systems. For projects involving the installation of individual water heaters, the program provides different incentive levels for market-rate and affordable-rate projects. The incentive for market-rate projects is $250 per unit, and the incentive for affordable-rate projects is $450 per unit. The incentive amount is based on the PUC of Texas-approved deemed savings values for replacing an electric resistance water heater with a natural gas water heater which meets or exceeds minimum efficiency standards.

---

4 Puget Sound Energy, Appendix C: Program Cost Effectiveness, January 1, 2010, at page 4.

The installation of non-electric space heating equipment is also encouraged. While additional incentives are not available for the installation of space heating equipment, one of the application selection criteria is the residents' projected annual energy bill savings. Applications that include the installation of gas space heating are likely to be rated higher, based on this criterion.

CNP also offers incentives to certain mid- and high-rise new construction projects with central water heating systems. In order to be eligible for these incentives, the project sponsor must demonstrate that the installation of gas water heating systems would not have occurred in the absence of CNP's Multi-Family Water and Space Heating Program. For projects with central water heating systems, the incentives are based on the projected annual KWh and peak KW savings for the project. The incentive for market-rate projects is $200 per unit, and the incentive for affordable rate projects is $350 per unit.

Budget and Cost Recovery

The primary objective of the Multi-Family Water and Space Heating Program is to increase the market penetration of high-efficiency gas water and space heating in multi-family properties. The goal for the 2010 program is the installation of non-electric water and space heating systems in a minimum of 1,400 multi-family properties. The 2010 program budget is set at $400,000 for customer incentives and $52,700 for administration. This amount is collected through the Energy Efficiency Cost Recovery Factor, which is assessed to electric utility customers. In October 2009, CNP-TX was approved to recover energy efficiency costs of $8 million through this tracking mechanism; however, recovery was deferred until July 2010 due to a rate freeze.

Customer Participation and Energy Savings

Over 7,200 units have been converted to natural gas since CNP started the Multi-Family Water and Space Heating Program in 2007. Verified energy savings in 2009 as a result of this program were 2,957 MWh and 0.63 MW. Verified energy savings for the Multi-Family program in 2008 were 3,174 MWh and 0.53 MW. For 2010, CNP forecasts energy savings of 2,176 MWh and demand reduction of 0.75 MW. The following table summarizes program results in 2009.

Program	Units	Average Rebate	2009 Spending
Houston Electric	1,274	$361	$460,050
Houston Gas	1,275	$176	$223,950

Avista Corporation

Program Offering

Avista offers a variety of fuel switching programs to residential, multi-family, and commercial and industrial customers. For residential electric customers, Avista offers $750 to replace electric space heat system with natural gas heat (or an electric heat pump), and a $250 rebate to replace an electric water heater with a natural gas model. Customers may also qualify for rebates for installing high efficiency appliances.

Avista offers a $2,000 incentive to developers of multi-family projects for installing gas space heating and water heating rather than electric. This incentive applies to new construction projects only, and the developer may qualify as long as 75% of the multi-family project is heated by natural gas.

For commercial and industrial customers, Avista offers a rebate of $150 for customers replacing an electric water heater with a natural gas model. The water heater must be 80 gallons or smaller, and the building must by 4,000 square feet or smaller. The water heater must have an Energy Factor greater than or equal to 0.60 and an AFUE of greater than or equal to 90%. This rebate is only available to those customers who purchase both electric and gas service from Avista.

In Washington, Avista's conservation programs are funded through a tariff rider, which collects $10 million per year from electric customers and $4 million per year from gas customers.

Philadelphia Electric Company

Program Offering

Philadelphia Electric Company ("PECO") offers a fuel switching program to residential customers in its service territory whereby the company offers a $200 rebate for conversion from electricity to natural gas home heating. If the customer does not have a gas service line to their home, they can earn credits toward the installation cost of a gas line for each gas appliance they install. This program only applies to existing houses, not to new construction. The customer must be located in the PECO service territory for natural gas in order to qualify for the rebate. In 2008, PECO estimated that it had 154,000 electric space heating customers. Like other energy efficiency and conservation programs, the PECO fuel switching program for space heating is funded through a tariff rider/adjustment mechanism.

In addition, PECO offers residential customers a $300 rebate for upgrading to an Energy Star qualified gas furnace with an efficiency rating of 90% or a gas boiler with an efficiency rating of 85%, and a $50 rebate for upgrading to a high-efficiency natural gas water heater with an energy factor greater than or equal to 0.62.

Esimated Cost to Install Gas Water Heater and Gas Furnace

Cost to Install New Gas Water Heater	Estimate		Source
Service Line to Customer Premise - 60 feet	$	1,770	MGE
Interior Piping in Basement	***		Contractor Estimate
Unit Cost	$	600	Navigant Study
Installation Cost	$	150	Navigant Study
Total Cost	***		

Cost to Install New Gas Furnace	Estimate		Source
Service Line to Customer Premise - 60 feet	$	1,770	MGE
Interior Piping and Ductwork in Basement	***		Contractor Estimate
Unit Cost	$	1,900	Navigant Study
Installation Cost	$	800	Navigant Study
Total Cost	***		

Cost to Install New Gas Water Heater & Furnace	Estimate		Source
Service Line to Customer Premise - 60 feet	$	1,770	MGE
Interior Piping and Ductwork in Basement	***		Contractor Estimate
Unit Cost - Water Heater	$	600	Navigant Study
Unit Cost - Furnace	$	1,900	Navigant Study
Installation Cost - Water Heater	$	150	Navigant Study
Installation Cost - Furnace	$	800	Navigant Study
Total Cost	***		

Estimated Customer Savings: Conversion/Installation, Appliance Upgrade, and Annual Operating Savings

Customer Savings - Gas Water Heater		Estimate	Source
Service Line to Customer Premise	$	-	No cost if < 60 feet
Rebate - Conversion/Installation	$	700	GMO
Rebate - Energy Star Gas Furnace	$	40	MGE
Annual Operating Savings	$	200	Schedule JJR-1

Customer Savings - Gas Furnace vs. Electric Resistance Heat		Estimate	Source
Service Line to Customer Premise	$	-	No cost if < 60 feet
Rebate - Conversion/Installation	$	1,000	GMO
Rebate - Energy Star Gas Furnace	$	200	MGE
Annual Operating Savings	$	*606*	Schedule JJR-1

Customer Savings - Gas Water Heater and Gas Furnace		Estimate	Source
Service Line to Customer Premise	$	-	No cost if < 60 feet
Rebate - Conversion/Installation	$	1,200	GMO
Rebate - Energy Star Water Heater and Gas Furnace	$	240	MGE
Annual Operating Savings	$	806	Schedule JJR-1

Customer Payback Period - Water Heating and Space Heating

Customer Payback Period - Gas Water Heater	Estimate		Source
Out of Pocket Costs:			
Service Line Cost	$	-	MGE
Conversion/Installation Cost	***		Cost minus GMO rebate
Equipment Cost	$	560	Cost minus MGE rebate
Annual Operating Savings	$	200	Schedule JJR-4
Payback Period (years)	***		Calculation

Customer Payback Period - Gas Furnace vs. Electric Resistance Heat	Estimate		Source
Out of Pocket Costs:			
Service Line Cost	$	-	MGE
Conversion/Installation Cost	***		Cost minus GMO rebate
Equipment Cost	$	1,700	Cost minus MGE rebate
Annual Operating Savings - vs. electric resistance heat	$	606	Schedule JJR-4
Payback Period (years) - vs electric resistance heat	***		Calculation

Customer Payback Period - Water Heater & Gas Furnace	Estimate		Source
Out of Pocket Costs:			
Service Line Cost	$	-	MGE
Conversion/Installation Cost	***		Cost minus GMO rebate
Equipment Cost - Water Heater	$	560	Cost minus MGE rebate
Equipment Cost - Furnace	$	1,700	MGE rebate
Annual Operating Savings - Water heater	$	200	Schedule JJR-4
Annual Operating Savings - Furance	$	606	Schedule JJR-4
Payback Period (years)	***		Calculation

Effect of Fuel Switching Program on MGE

Effect on MGE		Estimate	Source
Service Line to Customer Premise - 60 feet	$	1,416,000	800 customers
Customer Rebates for energy efficient upgrade	$	51,200	MGE rebate
SFV revenue for 800 new customers - annual	$	258,048	MGE tariff
Payback period (years)		5.69	

Effect of Fuel Switching Program on GMO Revenues

Effect on GMO		Estimate	Source
Lower distribution revenue from 800 customers	$	506,274	See Below
Lower distribution revenues			
Annual cost to operate electric water heater	$	488.70	Schedule JJR-4
Customers converting from electric to natural gas water heater		680	
Lower revenue from water heating	$	332,316	
Annaul cost to operate electric resistance heat	$	1,449.65	Schedule JJR-4
Electric resistance heat		120	
Lower revenue from space heating	$	173,958	
Total lower revenue from water heating and space heating	$	506,274	
2009 Electric Revenue - Missouri	$	646,852,000	2009 FERC Form-1
% Lower Revenue		0.078%	