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Witness: Gary L. Goble  
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**MISSOURI PUBLIC SERVICE COMMISSION**

**CASE NO.: ER-2010-0356**

**REBUTTAL TESTIMONY**

**OF**

**GARY L. GOBLE**

**ON BEHALF OF**

**KCP&L GREATER MISSOURI OPERATIONS COMPANY**

**Kansas City, Missouri  
December 2010**

*Cunningham* Exhibit No. GMO 14  
Date 1/31/11 Reporter NS  
File No. ER-2010-0356

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**REBUTTAL TESTIMONY**

**OF**

**GARY L. GOBLE**

**Case No. ER-2010-0356**

1 **I. INTRODUCTION OF WITNESS AND PURPOSE OF TESTIMONY**

2 **Q: Please state your name, occupation and business address.**

3 A: My name is Gary L. Goble. I am a Managing Consultant with the firm of  
4 Management Applications Consulting, Inc. ("MAC"). MAC's primary offices are  
5 located at 1103 Rocky Drive, Suite 201, Reading, PA 19609. My business  
6 address is 11405 Cezanne Street, Austin, TX 78726.

7 **Q: On whose behalf are you testifying and what is the purpose of your Rebuttal**  
8 **Testimony?**

9 A: I am testifying on behalf of KCP&L Greater Missouri Operations Company  
10 ("GMO" or "Company"). The purpose of my Rebuttal Testimony is to respond to  
11 proposals made by Mr. John Reed testifying on behalf of Missouri Gas Energy  
12 ("MGE") relating to electric to gas substitution (also referred to as "fuel  
13 switching").

14 **Q: Please describe your qualifications and experience.**

15 A: I am a consultant with over 36 years of experience in regulatory matters. I have  
16 an undergraduate degree (BSPA) from the University of Arkansas at Fayetteville,  
17 Arkansas, and a graduate degree (MBA) from St. Edward's University in Austin,  
18 Texas. I have worked as a staff analyst for two regulatory commissions and as a  
19 consultant to natural gas utilities, electric utilities, municipalities, electric  
20 cooperatives, and industrial consumers. I have provided expert testimony before

1 state and local regulatory agencies and boards on numerous occasions. The  
2 primary focus of my work experience has been in the areas of cost analysis,  
3 pricing, and economic analysis. My qualifications and experience are provided in  
4 greater detail in Schedule GLG-1.

5 **II. SUMMARY OF REBUTTAL ISSUES**

6 **Q: What issues are addressed in your Rebuttal Testimony?**

7 A: My Rebuttal Testimony addresses issues related to MGE's proposed electric to  
8 gas substitution payments to consumers for the purpose of influencing electric  
9 customers to switch to using natural gas water heaters and space heaters rather  
10 than electric appliances. My Rebuttal Testimony provides the following:

- 11 1. A discussion and assessment of the policy goals of electric to natural gas  
12 substitution. MGE's proposal involves changes to the existing energy  
13 supply market, end use appliance market, and GMO energy efficiency  
14 ("EE"), demand side management ("DSM") and Demand Response  
15 ("DR") activities. A number of problems will potentially arise if the  
16 Commission adopts MGE's proposed electric to gas substitution program.  
17 These problems may be substantial and will require a careful examination  
18 of the effects of electric to gas substitution upon costs faced by end-use  
19 consumers.
- 20 2. An examination of the methods for assessing EE, DSM and DR impacts  
21 upon program participants, other ratepayers, the environment, and upon all  
22 societal resources.

1           3. A critical review of methods for assessing EE, DSM and DR impacts.  
2           There are a number of recognized measures of energy efficiency impacts.  
3           Site specific methods address decisions consumers face once they have  
4           made their choice of whether to use electricity or natural gas. Societal test  
5           measures attempt to incorporate the total costs from the point of fuel  
6           extraction to the use of energy at the end-use site. Other evaluation  
7           methods examine the impact of a given program upon other ratepayers of  
8           the utility. Environmental costs not already taken into account by market  
9           prices of fuel costs may be measured in an evaluation of environmental  
10          impact.

11          4. An examination of other miscellaneous issues related to the proposal.  
12          These other issues include economic and miscellaneous issues.

13   **Q: Do you recommend that MGE's proposal for electric to gas substitution**  
14   **incentives to be paid for by GMO should be approved?**

15   **A:** No, I do not. I recommend that the proposal be rejected in the current docket. As  
16   described in my Rebuttal Testimony below, MGE's proposal seeks to employ  
17   regulatory mandates to achieve a greater market saturation of natural gas using  
18   appliances rather than relying upon market interactions and consumers' economic  
19   preferences. MGE's proposal will result in GMO failing to recover the fixed costs  
20   associated with the lost revenues of customers switching. Moreover, I believe  
21   that MGE's analyses are flawed, do not reflect accurate information, and provide  
22   results that are not credible. Finally, MGE's proposal would seriously undermine  
23   EE, DSM and DR programs that have previously been shown to be beneficial to

1 all parties and would stifle development and implementation of additional EE,  
2 DSM and DR program activity.

3 **III. POLICY ISSUES RELATED TO ELECTRIC TO GAS SUBSTITUTION**

4 **Q: In your opinion, would it be appropriate for the Missouri Public Service**  
5 **Commission ("MPSC" or "Commission") to first address certain**  
6 **fundamental policy decisions before approving the electric to gas substitution**  
7 **rebates that MGE witness Mr. Reed recommends on page 19, lines 7 through**  
8 **17?**

9 **A:** Yes, I believe that Mr. Reed has proposed a fundamental and potentially dramatic  
10 shift in regulatory policy that would interfere with market factors affecting  
11 electric and natural gas distribution industries. It is reasonable and prudent that  
12 regulators should undertake a close and careful examination of the proposed  
13 policies and undertake a thorough review of the consequences of MGE's electric  
14 to gas substitution proposal.

15 **Q: What policy issues must the MPSC address in adopting Mr. Reed's**  
16 **recommendations?**

17 **A:** I believe that the MPSC must examine and address the following issues in its  
18 consideration of MGE witness Mr. Reed's recommendations:

- 19 1. What is the appropriate role of the Missouri Public Service Commission in  
20 restructuring the power supply and end use appliance markets?
- 21 2. Should the Commission use this proceeding to implement electric to gas  
22 substitution?

- 1           3. How should the Commission balance social goals with economic
- 2           efficiency goals?
- 3           4. What are the true environmental impacts of electric to gas substitution?
- 4           5. Should the Commission adopt policies to address environmental impacts
- 5           in advance of pending investigations and deliberations currently underway
- 6           at the national level?
- 7           6. Should the Commission address GMO's loss of revenue recovering its
- 8           fixed costs which would result from electric to gas substitution?
- 9           7. Will MGE's proposal that GMO pay customers to switch from electric to
- 10          natural gas appliances benefit non-participating customers?
- 11          8. What impacts will the proposed incentives for electric to gas substitution
- 12          have upon existing or future energy efficiency, energy conservation,
- 13          demand side management and demand response activities of GMO?
- 14          9. How accurate are the data that must be used to assess the costs and
- 15          benefits of electric to gas substitution?
- 16          10. How have other stakeholders and regulatory agencies addressed electric to
- 17          gas substitution?

18   **Q: What do you believe is the appropriate role of the Missouri Public Service**  
19   **Commission concerning tariffs that serve to restructure the energy supply**  
20   **market?**

21   **A:** I am not an attorney. Nor have I reviewed the statutes of the State of Missouri  
22   that determine the MPSC's jurisdiction. However, I have broad experience over  
23   the course of several decades before numerous regulatory agencies, and, based

1 upon my experience, it would seem reasonable that the MPSC has the authority to  
2 determine whether the programs implemented by a utility are just and reasonable.  
3 Similarly, the Commission likely has the authority to consider the potential for  
4 fuel switching as it applies to the more general "public interest" standard.  
5 Although the Commission likely has broad authority, its authority is not  
6 unlimited. In approaching any issue, including fuel-switching, the Commission  
7 typically must focus on regulating the companies and avoiding managing the  
8 businesses. The Commission is typically authorized to perform the former, while  
9 the latter is within the realm of the companies' management and board of  
10 directors.

11 Additionally, the question of whether the Commission should use its  
12 authority to supplant the competitive fuel market and to promote one type of  
13 energy industry over a competing energy industry is a different matter. In my  
14 opinion, the Commission should not use its regulatory authority to skew market  
15 behavior, particularly when the actions of that market are beyond the control of  
16 the Company and the Commission. The economic justification for regulation is to  
17 serve as a substitute for competition in a monopoly market, and, in so doing,  
18 make the utility operate and set prices as if it were subject to competitive forces  
19 while simultaneously enabling the lower average costs that result from a single  
20 supplier of high fixed costs services. I believe that this requires the Commission  
21 to allow the market to function in an efficient manner when competition is  
22 present. I do not believe that the Commission should reduce competition and pick  
23 market winners and losers as MGE's proposal would require.

1 **Q: Is there any guidance available to the Commission that address this topic?**

2 A: Yes, there is. A May 29, 2009 National Regulatory Research Institute ("NRRI")  
3 paper "Electric-to-Gas Substitution: What Should Regulators Do?" identified the  
4 risks of regulatory intervention in the following manner:

5 Regulation has benefits and costs. The benefits are the removal of  
6 the economic efficiency losses associated with market defects and  
7 customer error. Regulatory failure occurs when there is  
8 intervention that is unwarranted, either because markets are  
9 performing adequately, because the intervention did not correct a  
10 market failure efficiently, or because the cost of regulatory  
11 intervention exceeds the benefits. The potential costs of regulatory  
12 intervention include: (1) inadvertent subsidies (e.g., improper  
13 price signals leading to a resource misallocation); (2) procedural  
14 delays and costs, especially those associated with multi-utility  
15 integrated resource planning; (3) welfare losses from stakeholders  
16 expending dollars and resources in the regulatory process to  
17 advance their positions (e.g., "fighting costs" from gas utilities  
18 pushing hard for electric-to-gas substitution, counteracted by  
19 electric utilities' resistance; and (4) administrative costs (e.g., the  
20 enforcement cost of regulatory mandates or targets).<sup>1</sup>

21 MGE's witness has not demonstrated that regulatory failure has occurred.  
22 Nor has he demonstrated that the costs of regulatory intervention outweigh any  
23 benefits that are likely to be derived as a result of MPSC market intervention in  
24 the manner recommended by Mr. Reed.

25 **Q: Should the Commission use this proceeding to implement electric to gas**  
26 **substitution?**

27 A: No, MGE's electric to gas substitution proposal should be rejected by the  
28 Commission. While Mr. Reed makes an argument for immediate action, there are  
29 far too many unanswered questions and far too much questionable information to  
30 implement fuel substitution in the immediate proceeding. Although a number of

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<sup>1</sup> National Regulatory Research Institute "Electric-to-Gas Substitution: What Should Regulators Do?" by Ken Costello, Principal, May 29, 2009, page 13.

1 other state regulatory commissions have addressed the subject of electric to gas  
2 substitution, Mr. Reed fails to mention that most have examined the subject and  
3 chosen to reject electric to gas substitution. After a thorough analysis, the  
4 Commission may be able to determine whether some sort of electric to gas  
5 substitution program has merit. However, to undertake such an analysis, the  
6 specific merits of fuel substitution programs in Missouri should first be  
7 quantified. When, and only if, the programs are found to be meritorious, should  
8 the Commission address the next threshold question regarding how should the  
9 programs be implemented. Obviously, MGE could offer fuel switching incentives  
10 without any involvement from GMO.

11 As discussed below, MGE witness Mr. Reed's analyses do not employ the  
12 utility specific information necessary to determine whether the costs of the  
13 proposed subsidy outweigh its benefits. Furthermore, his analyses understate the  
14 costs of natural gas service while overstating the benefits of natural gas service.  
15 He has not provided evidence that his proposed level of incentives are necessary  
16 nor sufficient. His electric to gas substitution proposal relies upon faulty  
17 reasoning and is not supported by evidence. Furthermore, he has not provided  
18 compelling evidence to suggest that GMO must offer the necessary customer  
19 incentives.

20 **Q: How should the Commission balance social goals with economic efficiency**  
21 **goals?**

22 **A:** I believe that the Commission should seek to protect and promote informed,  
23 unbiased consumer choice of efficiently priced energy. To that end, I believe that

1 the Commission should seek to implement economically justified goals.  
2 Naturally, the Commission can and should examine and consider social goals in  
3 its regulatory decisions. But in so doing, the costs of implementing these social  
4 goals should also be considered. The economic goal of regulation can, and  
5 should, seek to "internalize" social goals such as environmental impact to the  
6 extent practicable. For example, in estimating the costs of generating electricity,  
7 GMO internalizes environmental impacts by including an estimate of incremental  
8 environmental costs in its energy cost forecasts. In estimating the incremental  
9 costs of natural gas that might be expected from a fuel switching program, one  
10 must impute a value to the cumulative environmental impact of importing  
11 pollution from remote generation plant locations to the concentrated urban areas  
12 containing many gas-consuming appliances.

13 Another point to consider is that GMO profitably markets energy available  
14 from its coal generating units in order to minimize revenues required from  
15 ratepayers. As a result, most electric energy conserved by fuel substitution  
16 programs will still be generated and sold. The net effect of the fuel substitution  
17 program will not produce a positive environmental impact in Missouri. Quite the  
18 contrary, the total impact of the program will have a deleterious effect.

19 As discussed in the following section of my Rebuttal Testimony, imputing  
20 values to external factors beyond the control and direct knowledge of GMO and  
21 the Commission is a practice whose results should be carefully and fully  
22 scrutinized. Although the costs of pursuing social objectives through the utility  
23 ratemaking process are difficult to quantify, they are, nonetheless, real and

1 significant. MGE has proposed that the Commission tilt the fuels supply market  
2 to favor natural gas by making GMO pay its customers to replace their electric  
3 appliances with natural gas burning appliances. That recommendation obviously  
4 comes at a high cost to GMO and potentially to its ratepayers. While that cost  
5 may be difficult to quantify, it should nonetheless be taken into consideration by  
6 the Commission in assessing whether the social objectives sought are worth the  
7 costs.

8 **Q: What are the true environmental impacts of electric to gas substitution?**

9 A: It is not evident that electric to gas substitution will reduce energy consumption  
10 and, thus, carbon dioxide ("CO<sub>2</sub>") emissions. Mr. Reed's logic assumes that GMO  
11 would simply reduce electric generation if sales to residential customers declined.  
12 This is not likely to happen. GMO, like any economically rational utility with  
13 regulatory pressures to minimize its revenue requirements, would seek to market  
14 available capacity and energy in the wholesale power market. Any sales in such a  
15 market would lower the average costs of power to other customers and provide  
16 additional earnings to the Company. As long as GMO can sell the freed up  
17 capacity and energy at a price greater than its short-run marginal costs, both the  
18 Company and its customers will be better off if the capacity and energy can be  
19 marketed. Because the avoided energy resulting from electric to gas substitution  
20 would be sold to other energy market participants, total CO<sub>2</sub> emissions from  
21 GMO's generation resources would be more likely to increase since there would  
22 be little or no decrease in electric generation, but there would be added natural gas  
23 consumption at the customers' homes.

1           In addition, although natural gas CO<sub>2</sub> emissions are lower than for the coal  
2 generation of electricity, there are additional environmental consequences with  
3 the use of natural gas that must be considered. For example, CO<sub>2</sub> emissions that  
4 would have occurred at a remotely located generation station will now be  
5 imported to the appliance site, i.e., to the residential consumer's home. Although  
6 the CO<sub>2</sub> emissions of natural gas are lower than for the coal generation of  
7 electricity, none of the electric caused emissions are local while much of the  
8 natural gas emissions taken into account occur locally. Just as important, electric  
9 generation is a central station technology that allows for cost effective treatment.  
10 In past years, a number of technologies have been implemented such as taller  
11 smokestacks to disperse emissions more effectively into the higher atmosphere,  
12 CO<sub>2</sub>, SO<sub>2</sub> and NO<sub>x</sub> treatments to lower emissions. The consumption of natural  
13 gas in a large number of dispersed small appliances makes it impractical to  
14 implement subsequent environmental protection strategies.

15           Furthermore, while Mr. Reed's testimony is quick to point out line losses  
16 on electric systems, he is silent concerning natural gas leaks. My experience is  
17 that natural gas systems lose between one to four percent of their throughput.  
18 Considering that natural gas is a greenhouse gas 20 times more potent than CO<sub>2</sub> in  
19 trapping heat in the atmosphere<sup>2</sup>, it is far from clear that the environmental  
20 benefits of fuel switching are as advantageous as Mr. Reed claims.

21 **Q: Are there concerns about the environmental consequences of natural gas**  
22 **extraction?**

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<sup>2</sup> "Methane as a Greenhouse Gas", fact sheet generated by the U.S. Climate Change Science Program Office, January 2006.

1 A: Yes, there are. Natural gas extraction is not without serious environmental  
2 consequences of its own. On page 40, lines 1 through 3, of his Direct Testimony,  
3 Mr. Reed testifies that "... the prevalence of shale gas has had a significant impact  
4 on gas supplies ...". On page 41, lines 8 through 10, he states that "Based upon  
5 2009 natural gas consumption levels reported by EIA, U.S. natural gas reserves  
6 would not be exhausted for approximately 91 years." Although it is true that  
7 hydraulic fracturing of shale formations has led to significant increases in the  
8 availability of natural gas supplies, this process of natural gas extraction is not  
9 without its environmental critics. Critics have argued that the process of  
10 extraction of natural gas from shale formations has forced methane gas into  
11 people's homes and water supplies and that the fluid used to fracture shale  
12 formations regularly employs chemicals that have been linked to cancer or other  
13 health problems.<sup>3</sup> In New York concerns are so great that the New York state  
14 assembly recently passed a bill placing a moratorium on hydraulic fracturing. A  
15 Cornell University analysis stated that

16 Natural gas is being widely advertised and promoted as a clean  
17 burning fuel that produces less greenhouse gas emission than coal  
18 when burned. While it is true that less carbon dioxide is emitted  
19 from burning natural gas than from burning coal per unit of energy  
20 generated, the combustion emissions are only part of [the] story  
21 and the comparison is quite misleading. **A complete**  
22 **consideration of all emissions from using natural gas seems**  
23 **likely to make natural gas far less attractive than other fossil**  
24 **fuels in terms of the consequences for global warming.**<sup>4</sup>  
25

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<sup>3</sup> For example, in June 2010, the Pennsylvania Department of Environmental Protection publication, "Chemicals Used by Hydraulic Fracturing Companies" identified ethyl benzene, thylene glycol, glutaraldehyde, isopropanol, and methanol as some of the chemicals employed in the fluid used in the hydro-fracturing process. These chemicals have been linked to cancer and other health problems.

<sup>4</sup> "Preliminary Assessment of the Greenhouse Gas Emissions from Natural Gas obtained by Hydraulic Fracturing" 17 March 2010 draft by Dr. Robert W. Howarth, Department of Ecology and Evolutionary Biology, Cornell University.

1 Any discussion of the environmental consequences of electric to gas substitution  
2 should also include an assessment of all environmental impacts of natural gas  
3 extraction. Failure to recognize the environmental costs of natural gas extraction  
4 would understate the environmental costs of natural gas use and give natural gas  
5 an undue market advantage over electricity.

6 Furthermore, the electric to gas substitution program proposed by Mr.  
7 Reed would result in additional MGE gas customers, which, in turn, would have  
8 an unintended consequence. Connecting existing customers requires excavation,  
9 construction and resurfacing, all of which have some environmental  
10 consequences. In addition, the new customer will require meter reading and  
11 billing, processes which also result in some impact to the environment.

12 The replacement of existing electric appliances represents another  
13 environmental factor to consider. An electric to gas substitution program may  
14 result in the premature replacement of serviceable electric equipment, which will  
15 affect the timing and level of environment impact considering the disposal of  
16 existing equipment and the impact of manufacturing new equipment. A fuel  
17 substitution program will also have an economic impact as resources are  
18 expended for the premature replacement of usable equipment.

19 **Q: Do you believe that the Commission should adopt policies to address**  
20 **environmental impacts in advance of pending investigations at the national**  
21 **level?**

22 **A:** No. I believe it would be more expedient and prudent to study the issues being  
23 addressed at the national level and allow those issues to be fully vetted before

1 attempting to address the issues at the state level. Determinations made by the  
2 MPSC in this proceeding would be premature insofar as its actions may be  
3 preempted or limited by subsequent federal action. Furthermore, the Commission  
4 could build upon the experiences of the DOE and others if it determines that the  
5 full-fuel-cycle analysis proposed by Mr. Reed should be adopted. For these  
6 reasons, I do not believe it would be prudent to approve MGE's proposed electric  
7 to gas substitution subsidy in this proceeding.

8 **Q: Assuming for the sake of discussion that the Commission approves MGE's**  
9 **proposed electric to gas substitution programs, do you believe that the**  
10 **Commission should recognize the resulting GMO revenue shortfalls?**

11 **A:** Yes, if the Commission approves MGE's proposal, I believe the Commission  
12 should provide a means to allow GMO recovery of that portion of revenues  
13 associated with the recovery of the Company's fixed costs. GMO will not be able  
14 to recover its allowed return under MGE's proposal, and this earnings shortfall  
15 should be addressed by the MPSC. Nowhere in MGE's proposal is a discussion of  
16 how GMO will recover the fixed costs embedded in the sales that migrate from  
17 electric appliances to natural gas appliances as a result of the proposed natural gas  
18 subsidy payments. Because GMO will not have a reasonable opportunity to earn  
19 its allowed return on the lost revenues, GMO stockholders will be harmed as a  
20 result of the proposed subsidies unless the Commission provides a means for  
21 GMO to recover the "lost" fixed cost revenue levels that would have otherwise  
22 occurred. For this reason, if the Commission finds it fair and reasonable to adopt  
23 MGE's proposal, I believe that it should also recognize GMO's loss of fixed cost

1 recovery and provide for the recovery of these earnings. Regardless of the cost  
2 recovery mechanism ultimately employed, GMO should not be adversely  
3 impacted financially by the promotion of EE, DSM and DR activities. From a  
4 policy standpoint, the Commission should avoid implementing programs that are  
5 not "self-policing". In this case, the programs should be designed so that  
6 implementation benefits the utility's ratepayers as well as its stockholders.  
7 Without this common goal, the program provides a disincentive for proper  
8 implementation.

9 Lost revenue is an important issue. It is also quite complex and does not  
10 lend itself to a one-size-fits-all policy. I understand that GMO and other parties  
11 have engaged in discussions regarding the cost recovery mechanisms that are  
12 needed for implementation of Senate Bill No. 376. A rulemaking addressing  
13 proposed rules to implement the provisions of the Missouri Energy Efficiency  
14 Investment Act consolidated the workshop dockets into Docket No. EX-2010-  
15 0368. Until such time as adequate cost recovery mechanisms are in place to  
16 assure GMO of a reasonable opportunity to earn its allowed rate of return it is  
17 premature to implement electric to gas substitution payments from GMO to  
18 promote natural gas service.

19 **Q: In your opinion, will MGE's proposal that GMO pay customers to switch**  
20 **from electric to natural gas appliances benefit non-participating customers?**

21 **A:** No, non-participating customers will see their bills rise as a result of the added  
22 costs as well as the stranding of fixed cost recovery. In describing the benefits of  
23 his recommendations on page 30, line 11, through page 31, line 2, MGE witness

1 Mr. Reed states that both program participants and non-participants will benefit  
2 from his electric to gas substitution proposal. One of the cost savings necessary  
3 for non-participants to benefit from this program is that future GMO revenue  
4 requirements will be lower with the electric to gas substitution than without it. As  
5 recognized by Mr. Reed on page 30, lines 18 and 19, deferral of future generation  
6 and transmission capacity expansion is the only benefit that GMO will  
7 theoretically receive from the proposal.

8 However, it is not evident that capacity will be deferred by MGE's  
9 proposed electricity to gas substitution proposal. Since GMO is primarily a  
10 summer peaking utility, a reduction in water heating and space heating load will  
11 have minimal impact to capacity needs. Since the impact to capacity needs will  
12 be minimal, MGE's electric to gas substitution proposal is more likely to have a  
13 negative impact on rates. Rather than lowering the rates to non-participating  
14 customers, MGE's proposal is more likely to increase the rates of non-  
15 participating customers in the long term. Revenues to be recovered from  
16 customers must inevitably increase, since the incentive payments must be  
17 recovered from ratepayers. Moreover, these increased costs as well as existing  
18 fixed costs must be spread among fewer and fewer billing determinants with each  
19 succeeding rate case causing prices to rise. See the discussion of the Ratepayer  
20 Impact Measurement ("RIM") test in Section V. Analysis of Costs and Benefits of  
21 my Rebuttal Testimony for more information about measuring the impact of  
22 electric to gas substitution upon ratepayers.

1 **Q: Mr. Reed has justified his electric to gas substitution proposal using full fuel**  
2 **cycle economics. What impacts will a shift to full fuel cycle economics have**  
3 **upon GMO's existing and future energy efficiency, energy conservation and**  
4 **demand side management activities?**

5 A: Because GMO, like most utilities, currently employs site based analyses of DSM,  
6 DR and EE programs, major changes in the market place and in the economics of  
7 these measures will require a complete re-evaluation of all GMO's existing and  
8 contemplated programs. Programs that have previously been justified by site  
9 based studies may no longer appear to be beneficial. As explained below, the  
10 numerous unsupported data assumptions inherent in the full-fuel-cycle approach  
11 MGE recommends make the results of any such study highly unreliable. MGE  
12 proposes to modify the energy market and estimate the impact of the market  
13 preferences based upon unreliable, suspect data. Decisions that establish market  
14 preferences should be made based upon reasonable information. I do not believe  
15 that it would be prudent for GMO to continue with its current EE, DSM and DR  
16 programs without a full re-evaluation of the programs if the MPSC were to adopt  
17 new EE, DSM and DR measurement standards, revise program requirements and  
18 adopt new methods of program evaluation in response to the MGE proposal. The  
19 need to establish EE, DSM and DR standards, methods, and data is likely to take  
20 some time and introduce delay further activity for some time to come. This result  
21 is contrary to the notion of giving customers more choices in their energy  
22 decisions. I believe that the Commission should be more focused on expanding  
23 rather than limiting the options available to utility customers in Missouri.

1 Q: **How accurate are the data that Mr. Reed employ to assess the costs and**  
2 **benefits of electric to gas substitution?**

3 A: The data are neither accurate nor reliable as described in Section IV below, most  
4 of the information employed by MGE witness Mr. Reed in support of his  
5 recommendations relies upon data that does not represent GMO's service territory,  
6 GMO's operating characteristics, or GMO customer characteristics. In my  
7 opinion, the quality and accuracy of the data and analyses employed by Mr. Reed  
8 are unreliable that the results of these analyses are not credible. The potential  
9 consequences of adopting MGE's proposed subsidy are sufficiently great that it  
10 would be imprudent to rely upon unreliable data to support such an action by the  
11 Commission.

12 Q: **How have other stakeholders and regulatory agencies addressed electric to**  
13 **gas substitution?**

14 A: Contrary to the implications of Mr. Reed's testimony, there has certainly been no  
15 significant nationwide movement to implement electric to gas substitution. Some  
16 regulatory agencies such as the Arkansas Public Service Commission and the  
17 Oregon Public Utility Commission have investigated electric to gas substitution  
18 and found that fuel switching should not be included as part of those states'  
19 energy efficiency programs. In Arkansas Public Service Commission Order No.  
20 12 in APSC Docket No. 06-004-R (a rulemaking for developing and  
21 implementing energy efficiency programs), the Arkansas Commission ruled that  
22 fuel switching may not be included as part of utilities' energy efficiency and  
23 conservation (EE&C) program. Energy Trust of Oregon, Inc. (Energy Trust),

1 which provides guidance and whose guidelines are consistent with the Oregon  
2 Public Utility Commission, has developed a policy on fuel-switching as it applies  
3 to energy efficiency. This policy states, "Energy Trust should not advocate fuel-  
4 switching, but may provide fuel-neutral technical information on efficiency  
5 options."<sup>5</sup>

6 In the Kansas Corporation Commission Docket No. 09-GIMX-160-GIV,  
7 the Commission Staff filed its report and recommendations on September 28,  
8 2010. Among other recommendations in the Staff report, the Staff recommended

9 Finally, Staff recommends that the Commission should not pursue  
10 a policy to proactively encourage use of natural gas over  
11 electricity. Staff suggests that, at this time, the Commission  
12 maintain its definition of energy efficiency as encourage site  
13 efficiency of the particular fuel used for a particular end-use.  
14 Additionally, maintaining this definition will allow the  
15 Commission to preserve its current benefit-cost analysis for energy  
16 efficiency programs at least until the DOE makes progress in  
17 adopting the recommendation of the NAS Letter Report to  
18 incorporate source-to-site analysis. The Commission can then  
19 build upon the experience of the DOE if the Commission  
20 determines that source-to-site analysis should be incorporated into  
21 benefits-cost analysis at a later date.<sup>6</sup>

22 In addition, the Staff Report also pointed out that issues such as incentives offered  
23 to developers, builders and equipment dealers as well as the line extension  
24 policies of both electric and gas distribution utilities must also be examined. The  
25 Kansas Staff's recommendations are consistent with my recommendations  
26 contained herein.

27 In cases in which regulatory agencies have accepted electric to gas  
28 substitution within EE&C plans, some have allowed it as an option, but not a

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<sup>5</sup> Source <http://energytrust.org/library/policies/4.03.000-P.pdf>

<sup>6</sup> "Second Staff Report and Recommendations", before the State Corporation Commission of the State of Kansas, Docket No. 09-GIMX-160-GIV, page 3.

1 mandate. This approach enables the regulatory agencies to neither encourage nor  
2 discourage electric to gas substitution. Instead, each specific electric to gas  
3 substitution proposal would compete against the other potential EE, DSM, and  
4 DR programs considered by the stakeholders to meet the mandated consumption  
5 and demand reduction targets.

6 With regard to the utilities that Mr. Reed indicates are contemplating  
7 providing incentives for fuel switching, on page 21, lines 11 through 15, of his  
8 Direct Testimony, Mr. Reed states that

9 Additionally, the City of Austin and Texas Gas Service are  
10 discussing initiation of a fuel switching program under which  
11 customers who currently obtain their electric service from the City  
12 of Austin would be eligible for rebates if they switched certain  
13 electric appliances to natural gas and obtained gas service from  
14 Texas Gas Service.

15 A footnote to this assertion indicates that this statement was based on a telephone  
16 conversation with representatives of Texas Gas Service Company in October,  
17 2010. However, I believe that the statement quoted above is incorrect. In  
18 response to my inquiry to Austin Energy<sup>7</sup> management regarding Mr. Reed's  
19 assertion, I was advised that Austin Energy has had discussions with Texas Gas  
20 Service aimed at reducing barriers to more efficient use of energy, but Austin  
21 Energy rebates are not being considered.

22 Based upon the above information, I believe that there is no clear  
23 indication that electric to gas substitution programs are gaining acceptance in  
24 other regulatory jurisdictions or by the energy industry.

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<sup>7</sup> Austin Energy is the City of Austin's municipally-owned electric utility.

1 **IV. CRITICAL ASSESSMENT OF MGE PROPOSED INCENTIVES**

2 **Q: Have you examined the Tables and Schedules prepared by Mr. Reed's ?**

3 **A:** Yes.

4 **Q: Please refer to Tables 1 and 2 presented on pages 10 and 11 of Mr. Reed's**  
5 **Direct Testimony. Are the data presented on these tables specific to GMO**  
6 **and MGE, or are the data based upon more general information from other**  
7 **sources that do not include GMO?**

8 **A:** These data do not reflect GMO or Missouri specific information. Mr. Reed relied  
9 on an American Gas Association ("AGA") report to provide estimates of the  
10 electric consumption for electric water heaters and resistance space heating  
11 equipment. Unfortunately, this data is not utility specific, and Mr. Reed has not  
12 demonstrated that the data from the AGA report is representative of and  
13 applicable GMO. Consider that the footnotes of Mr. Reed's Tables 1 and 2, states  
14 that the data on these tables are from a document entitled "A Comparison of  
15 Energy Use, Operating Costs, and Carbon Dioxide Emissions of Home  
16 Appliances" prepared by the AGA. A review of that AGA document (that is the  
17 source of Mr. Reed's information) indicates that the AGA information was, in  
18 turn, developed by the Gas Technology Institute for Codes & Standards Research  
19 Consortium in a paper entitled "Source Energy and Emission Factors for Building  
20 Energy Consumption" which was published in August 2009. In this original  
21 source of the information relied upon by Mr. Reed is the following statement:

22 Average energy and emissions calculations may be appropriate for  
23 inventory purposes, but they do not necessarily provide good

1 information when evaluating competing energy efficiency  
2 measures.<sup>8</sup>

3 The authors of the original information relied upon by Mr. Reed  
4 specifically state that the information used by MGE to evaluate competing energy  
5 efficiency measures do not provide good information for use in such evaluations.  
6 The process of "laundering" data through AGA publications does not make the  
7 data any more useful than they were in their original presentation. Therefore, Mr.  
8 Reed's analyses must be considered suspect and are not reliable for the purposes  
9 Mr. Reed has used them.

10 **Q: Is the general data from the AGA study relied upon by Mr. Reed a**  
11 **reasonable proxy for data specific to GMO?**

12 A: I cannot be certain, because the Company does not have appliance-specific  
13 consumption data. However, I am aware that usage varies significantly among  
14 utilities. As an example, Mr. Reed's Table 1 shows that site based water heater  
15 usage totaled 16.6 MMBtu annually. That is the equivalent to 4,864 kWh<sup>9</sup>. The  
16 DOE's Energy Information Administration states that the average household  
17 consumption for electric water heaters in 2001 was 2,552 kWh<sup>10</sup>, which is a  
18 significantly lower figure. A 1985 Electric Power Research Institute ("EPRI")  
19 publication summarized electric water heater load research data for twelve  
20 different utilities measured in 1979. Of course, conservation measures such as  
21 flow restrictors and more efficient appliances have reduced consumption levels  
22 since that time. As a result, the absolute level of consumption from the 1979

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<sup>8</sup> "Source Energy and Emission Factors for Building Energy Consumption", Natural Gas Codes and Standards Research Consortium, August 2009, page 31.

<sup>9</sup> One kWh = 0.003412 MMBtu

<sup>10</sup> See: [http://www.eia.doe.gov/emeu/reps/enduse/er01\\_us\\_tab1.html](http://www.eia.doe.gov/emeu/reps/enduse/er01_us_tab1.html)

1 study may be overstated in comparison to today's usage. However, it is important  
2 to note that the utilities' average annual consumption at the time of the EPRI study  
3 ranged from 4,097 to 9,613 kWh per year. Obviously, with this large magnitude  
4 of variance in usage, one must question the credibility of Mr. Reed's reliance on  
5 the AGA figure as a proxy for GMO's Missouri customers.

6 **Q: Please describe your understanding of the calculations shown on Mr. Reed's**  
7 **Schedule JJR-1 and summarized on Table 3 set forth on page 12 of Mr.**  
8 **Reed's Direct Testimony.**

9 A: I believe these calculations are intended to measure the relative costs of  
10 employing water heating and space heating gas and electric appliances. On  
11 Schedule JJR-1 consumption is taken from Table 2, which is measured in MMBtu  
12 using the full fuel cycle approach. The prices are computed using average  
13 revenue per billing unit.

14 **Q: Do you agree with Mr. Reed's calculated annual operating savings as**  
15 **computed on his Schedule JRR-1?**

16 A: No, I do not agree that Mr. Reed's calculations reflect the cost savings of  
17 switching from electric water heating and space heating to natural gas appliances.  
18 I believe these calculations incorporate underlying conceptual errors which must  
19 be corrected before meaningful calculations are possible. In particular, the price  
20 does not reflect the actual decremental electric billings nor incremental natural  
21 gas billings expected from a fuel substitution program. Mr. Reed has chosen to  
22 apply average revenues rather than employ the actual price structures of the  
23 individual utilities which distorts the results. However, before discussing the

1 details of the calculations, it is useful to understand what each calculation is  
2 attempting to measure. I believe that two alternative calculations can and should  
3 be made to provide useful insights into the fuel substitution question:

4 1. Full Fuel Cycle - When consumption is measured using the full fuel  
5 cycle, the calculation will show the cost of society's resources  
6 consumed. That is accomplished by using well-head or energy  
7 feedstock prices. This calculation was not provided by Mr. Reed.

8 2. Rate Payer - The second calculation, similar to Mr. Reed's Schedule  
9 JJR-1, should present the conventional rate payer analysis showing the  
10 utility's metered and billed quantities and the rates charged consumers.

11 Both calculations provide meaningful results.

12 **Q: Have you evaluated the full fuel cycle calculation?**

13 A: Yes, but I must qualify it to say that the prices I employed are only  
14 approximations. I began with the full fuel cycle consumption levels including all  
15 losses. Using the forecasted prices available from the Department of Energy's  
16 Energy Information Administration, I computed the average price for wellhead  
17 gas and for mine-mouth coal, both in units of \$/MMBtu. The data show that  
18 natural gas is a valued commodity with a price that is over three times that of  
19 coal, reflecting its desirability. Recognizing that natural gas and coal price  
20 forecasts are subject to error, I evaluated an alternative source of prices - the  
21 NYMEX futures market. Since these markets are actively traded and extend for a  
22 number of years into the future, they are not forecasts; they represent the  
23 competitive prices available today for natural gas and coal. Regardless of my

1 choice of pricing assumption, the conclusions remain the same - the resources  
2 consumed by gas water heaters are more costly than those required by coal  
3 generated electricity. As economists will agree, competitive prices are the best  
4 measure of the values society places on its resources. The conclusion is  
5 significant. The total cost of the natural gas resources consumed for water heating  
6 and space heating exceed the costs for coal, even recognizing the inefficiencies of  
7 converting coal to electricity to serve the end-use needs of consumers. While this  
8 conclusion ignores the absolute level of energy consumed and the environmental  
9 impacts of consuming that energy, the implications of this result are far from  
10 trivial; they have major policy implications.

11 **Q: Have you performed the second calculation, the Rate Payer calculation to**  
12 **identify the potential savings to consumers?**

13 A: Yes, I have identified the alternative annual utility charges for electric and gas  
14 water heating and space heating appliances and the resulting decremental and  
15 incremental consumer charges. In the case of electric rates, a fuel substitution  
16 program would reduce the customer's billed energy. Most of this consumption is  
17 currently billed in the tail block rate or in the water and space heating rates. All  
18 of these rates are substantially lower than the figures employed by Mr. Reed. In  
19 the case of natural gas rates, the fuel substitution program will create new gas  
20 customers from MGE. In accordance with MGE's tariffs, customers will be billed  
21 a fixed monthly delivery charge as well as a volumetric charge. Mr. Reed's use of  
22 an average revenue rate, significantly understates the actual costs customers will  
23 be billed, especially in the case for water heating fuel substitution. The difference

1 between electric and gas utility charges represents potential savings to the  
2 consumer.

3 **Q: What conclusions can you draw from your calculations?**

4 A: Rate payers switching from electricity to natural gas for their water heating needs  
5 alone will experience no savings. To the contrary, their annual bill will increase  
6 by approximately \$178 per year. This result is markedly different than the \$200  
7 savings Mr. Reed computed on Table 3. Recall that Mr. Reed's expected first  
8 year acceptance rates for his proposed incentive program projected that 85% of  
9 the customers participating in the fuel substitution program would choose to  
10 convert only their water heater. This conclusion is not supported by any  
11 evidence. I strongly suspect that customers would reject the incentives for the  
12 water heater fuel substitution program knowing that they will experience no  
13 savings.

14 **V. ANALYSIS OF COSTS AND BENEFITS**

15 **Q: Has the MPSC established a standard methodology for the evaluation of  
16 potential EE measures?**

17 A: Yes, as Mr. Reed pointed out, the MPSC has routinely employed the Total  
18 Resource Cost ("TRC") test in its economic analyses.

19 **Q: Could you briefly describe that method?**

20 A: The TRC test, also known as the "All Rate Payers Test", provides a measure of  
21 the net resource expenditures of a DSM program from the point of view of the  
22 utility and its ratepayers as a whole. Resource benefits include the utility's  
23 avoided supply costs. Resource costs include the utility's and participant's direct

1 costs. Because the utility and its ratepayers are taken as a whole, incentives and  
2 revenue changes are ignored.

3 **Q: Is that method commonly employed to evaluate the effectiveness of EE, DSM**  
4 **and DR measures?**

5 A: Yes. From my experience, the TRC test is method most commonly employed by  
6 state regulators.

7 **Q: Did Mr. Reed provide the results of any TRC tests for his proposed water**  
8 **heating and space heating fuel substitution programs?**

9 A: No, he did not.

10 **Q: Has he provided sufficient information to perform these tests?**

11 A: No, I do not believe so. He has provided very little of the required information.

12 **Q: Did you attempt to perform these tests?**

13 A: Yes, I have attempted to estimate the required data in order to provide a very  
14 crude TRC test.

15 **Q: Please summarize your analysis.**

16 A: The costs exceed the benefits in absolute as well as on a present worth basis.  
17 Even using very favorable assumptions, the benefit-cost ratios from all  
18 perspectives is less than 1.0, with the more favorable combination over 24 years  
19 providing only a 0.97 benefit-cost ratio.

20 **Q: Are you suggesting that all water heater fuel substitution programs should be**  
21 **shelved as a result of your TRC analysis?**

22 A: I prefer not to generalize, especially knowing the quality of data I employed in my  
23 analysis is suspect. However, I can unequivocally conclude that it would be

1 imprudent to implement the hastily designed electric to gas water heater  
2 substitution program recommended by MGE's witness John Reed on the basis of  
3 economics. Mr. Reed's recommended electric to gas substitution recommendation  
4 should be rejected.

5 **Q: Did you limit your analysis to the TRC test?**

6 A: No, I conducted a Ratepayer Impact Measure test and a Total Participants Test, as  
7 well.

8 **Q: Without delving into the details of these tests, please interpret the results of  
9 the Ratepayer Impact Measure test.**

10 A: The net present value of the costs exceed the net present value of the benefits.  
11 While not unexpected, this result suggest that implementation of MGE's proposed  
12 water heater fuel substitution program will result in higher rates for GMO's  
13 customers.

14 **Q: What were your results for the Total Participants test?**

15 A: Again, the customer's costs would exceed the associated benefits every year as  
16 well as on a present worth basis. Even using very favorable assumptions, the  
17 Benefit-Cost ratio is only 0.6.

18 **Q: Up until now, you have only discussed a water heater conversion program.  
19 Did you perform an analysis of MGE's proposed space heating electric to  
20 natural gas fuel substitution program?**

21 A: Yes, I performed a similar analysis.

22 **Q: How did the space heating analysis differ from the water heater analysis?**

1 A: At a general level they did not differ. Even recognizing that much of the data  
2 were not rigorously developed, I still have no reason to believe that the proposed  
3 space heating fuel substitution program would pass the TRC test.

4 **Q: What were the results of the Ratepayer Impact Measure and Total**  
5 **Participants tests?**

6 A: All three tests revealed costs slightly in excess of benefits. Simply put, neither the  
7 participant, the non-participants, nor society as a whole would benefit  
8 economically from the substitution of electricity by natural gas for both the water  
9 and space heaters.

10 **VI. ENVIRONMENTAL ISSUES**

11 **Q: Please summarize Mr. Reed's position regarding the potential benefits of fuel**  
12 **substitution.**

13 A: Beginning on page 12, line 14, of his Direct Testimony, Mr. Reed sets forth his  
14 argument that using natural gas rather than electricity results in a reduction in  
15 carbon dioxide emissions. Mr. Reed's argument is predicated upon the  
16 assumption set forth on page 15, lines 10 through 15, that "... fuel switching  
17 programs would reduce the amount of generation required and therefore reduce  
18 the emissions associated with that reduction in generation."

19 **Q: Do you agree with his arguments?**

20 A: No, I do not agree. There are several problems with the assumptions made in his  
21 arguments. First, whether or not GMO will actually reduce output is problematic.  
22 It is more likely that GMO, like any economically rational utility, would sell  
23 available capacity and energy in the wholesale supply market whenever such a

1 sale was profitable. In selling the capacity and energy made available by fuel  
2 switching, GMO would be able to generate additional margins, thereby reducing  
3 the costs to serve to other customers. However, in the process of producing the  
4 power to sell the otherwise avoided energy, emissions will continue to occur as  
5 before from electric generation. These additional natural gas sales will continue  
6 to produce pollution as before. As a result, there is some likelihood that pollution  
7 may actually increase since the added pollution from natural gas is added to the  
8 pollution from electric generation. This raises the very real concern that the  
9 additional pollution caused by the natural gas appliances will occur at the  
10 customer's site rather than at a remote generation station whose location was  
11 carefully chosen as the most advantageous site for any emissions to occur.  
12 Electric appliances produce little or no carbon or other air pollutants, unlike  
13 natural gas appliances. This factor can and should be examined as a possible  
14 issue in urban non-attainment areas.

15 Second, Mr. Reed's assume some average mix of electric generation fuels.  
16 In practice, any reduction in generation will probably not be made from a base  
17 load coal generating unit, but from a generating resource that can cycle quickly  
18 and has a higher variable cost. Emissions vary by type of generation that is  
19 displaced by EE avoided energy. Moreover, the displaced generating unit will  
20 potentially change from minute to minute as generation units respond to load  
21 changes and other factors. Estimating the actual CO<sub>2</sub> emissions is far more  
22 involved than Mr. Reed's simple comparison suggests. Furthermore, the full fuel  
23 cycle approach advocated by Mr. Reed does not account for the efficiencies and

1 environmental benefits of renewable resources and nuclear power. The full fuel  
2 cycle analysis penalizes electricity generated by renewable resources and nuclear  
3 energy.

4 **Q: Has he ignored other environmental impacts from his proposed fuel**  
5 **switching programs?**

6 A: Yes, I believe he has. As mentioned earlier, generation is primarily a central  
7 station technology. In an electricity to natural gas fuel substitution program,  
8 central station emissions are replaced with the emissions from many dispersed  
9 natural gas-fired appliances. Future efforts to further reduce emissions are more  
10 easily and much most cost-efficiently achieved by treating a few central station  
11 sources rather than a large number of small individual in-home installations.

12 **Q: Does the Total Resource Test include an analysis of environmental impacts?**

13 A: Generally, the TRC does not include any considerations of environmental  
14 impacts. However, there is a variant of the TRC that does consider environmental  
15 costs, i.e., the Societal test. The Societal test is an expansion of the TRC that  
16 includes externalities such as environmental impacts, national security, national  
17 economic implications, and other similar hard to define societal costs. The  
18 Societal test also excludes tax credit benefits and uses a different discount rate.  
19 The Societal test has found little practical application with state regulatory  
20 agencies due to the difficulty in quantifying its additional data requirements.

21 **Q: If state regulators are not addressing the question of environmental impacts,**  
22 **are they being addressed at the national level ?**

1 A: Yes, as Mr. Reed points out in his direct testimony, the DOE is examining many  
2 issues of critical national importance, including consideration of the full fuel cycle  
3 analysis. The issue of pollution has been on the forefront of such examinations  
4 for many years. For the electric utility industry, the federal government has  
5 promulgated increasingly stringent regulations resulting in the development and  
6 implementation of numerous emissions reductions programs.

7 **Q: Has the DOE drawn any conclusions to date?**

8 A: To my knowledge, the DOE has not reached any conclusions regarding the use of  
9 the full fuel cycle approach or the more general policy of encouraging fuel  
10 switching. Since these topics are still under review at the national level, I believe  
11 that it would be premature to adopt the full fuel cycle approach until the approach  
12 has been fully vetted. This would allow the Commission to better review the  
13 benefits and problems with the approach prior to committing to its use and to  
14 more fully examine all aspects of the approach.

15 **Q: At present, electric generators are provided many regulatory incentives to  
16 control emissions. How do you see these programs affecting consumer  
17 choice?**

18 A: Over time, federal regulations are requiring successively cleaner, albeit more  
19 costly, electric generation technologies. In effect, the cost of generation  
20 emissions is being internalized into the price of electricity.

21 **Q: If the environmental costs of emissions are internalized into the energy prices  
22 provided to consumers, would the competitive marketplace address many of  
23 the concerns Mr. Reed has voiced?**

1 A: I am a firm believer in allowing the marketplace to guide consumer decisions. As  
2 electric prices necessarily increase, consumers will be able to examine the relative  
3 merits of electric to natural gas fuel switching and make logical decisions without  
4 the need to intervene. At some point, natural gas utilities might demonstrate cost  
5 effective incentives for fuel switching. After careful review, regulators may judge  
6 such expenses as prudent and allow gas utilities to actively encourage fuel  
7 substitution programs. However, those programs will not require a mandate for  
8 electric utility participation.

9 **VII. OTHER ISSUES**

10 **Q: On page 6, lines 6 through 29, Mr. Reed states that the full fuel cycle**  
11 **approach was recommended to the Department of Energy ("DOE") by the**  
12 **National Research Council ("NRC"). Can you comment on this statement?**

13 A: It is important to note that this is simply a recommendation at this time. To my  
14 knowledge, the DOE has not endorsed this recommendation and other parties  
15 have disputed it. Despite its status as "under review", Mr. Reed has  
16 recommended that the MPSC adopt the concept of full fuel cycle analysis  
17 immediately, treating it as a foregone conclusion. I believe that it would be  
18 premature to act upon the assumption that the DOE will approve the NRC report  
19 in total with no caveats or restrictions. I believe it would be much more  
20 reasonable to await the final outcome of the policy debate and to engage in a more  
21 deliberative examination of the full fuel cycle analysis.

22 **Q: Does reliance upon the NRC report suggest that the interests of the State of**  
23 **Missouri and the interests of DOE are the same?**

1 A: Yes, that is the implication of Mr. Reed's testimony. However, the portion of the  
2 report quoted on page 6 of Mr. Reed's testimony states, in part, on lines 9 through  
3 12,

4 The Committee's primary general recommendation is that the  
5 DOE/EERE consider moving over time to the use of a full-fuel-  
6 cycle measure of energy consumption **for assessment of national**  
7 **and environment impacts** ... [emphasis added]

8 Note that the report is specific to national impacts. However, I believe  
9 that the MPSC must also consider whether or not the interests of Missouri  
10 ratepayers are best served by use of the full fuel cycle approach. The interests of  
11 DOE are national and the interests of the MPSC are generally limited to the State  
12 of Missouri. From a national perspective, overall efficiency of energy is  
13 maximized through a combination of resources occurring across any number of  
14 states. From a national perspective, it does not matter in which states the costs of  
15 EE, DSM and DR programs occur nor which states receive the benefits of the  
16 activities. However, from the perspective of a single state, costs incurred  
17 elsewhere and/or benefits received by residents of other states may not be costs  
18 and benefits to inure to that single state. In other words, under the full fuel cycle  
19 approach, Missouri may well be paying the entire costs of increased energy  
20 efficiency, but not receiving all of the benefits resulting from these costs.

21 **Q: Do you have any concerns about the procedures employed to measure energy**  
22 **efficiency using the full fuel cycle approach?**

23 A: Yes, I do. The full fuel cycle approach should always employ the actual prices of  
24 electricity and natural gas instead of imputing some other value to the energy  
25 source to compensate for that energy source being either less efficient or more

1 efficient. The price of electricity should reflect its attendant higher consumption  
2 of energy in producing and delivering electricity compared with natural gas.  
3 Greater energy losses for electricity translated into a higher price, which would  
4 make electricity less economically favorable to natural gas. Therefore, imputing a  
5 separate value to natural gas because it has a higher energy efficiency from the  
6 full fuel cycle perspective will double count the benefits of natural gas.

7 **Q: On page 18 of his Direct Testimony, MGE witness Mr. Reed states that**  
8 **GMO's residential rate structure provides a price incentive not to switch**  
9 **from electricity to natural gas for certain end-use applications such as space**  
10 **heating. Is that correct?**

11 **A:** While it is true that GMO's rate structure offers lower rates to residential heating  
12 customers, it is also true that GMO's rate structure is designed to reflect the cost  
13 of providing service. GMO is a summer peaking system whose capacity needs  
14 are primarily driven by summer peak demands. GMO's cost of service study  
15 seasonally differentiates costs and clearly demonstrates that GMO's costs are  
16 significantly higher in the summer air-conditioning season than during the winter  
17 season. GMO's rate structure is designed to reflect the higher costs of providing  
18 service during peak summer periods. The Company's residential rate structure is  
19 not designed as an incentive to prevent customers from taking natural gas service.  
20 It is designed to reasonably reflect the costs of providing service.

21 **Q: On page 40, lines 7 through 9, Mr. Reed downplays uncertainties**  
22 **surrounding natural gas prices and availability. Do you agree with his**

1 **statement on lines 8 and 9, that "... natural gas prices are forecasted to be**  
2 **much more stable than historical prices."**

3 A: I neither agree nor disagree insofar as that conclusion cannot be reached from the  
4 graph that Mr. Reed references on Figure 1 of his testimony. The forecast is a  
5 point estimate of probabilistic future values. It cannot be compared to actual  
6 prices that were subject to market impacts that have been normalized out of the  
7 forecast. A more informative graph would have included high and low price  
8 forecast ranges as well as the range of prices likely to occur at a specified  
9 confidence level. The graph does not support Mr. Reed's contention that future  
10 gas prices will become more stable than past gas prices. As a result, the MPSC  
11 has no assurance that MGE's proposal will produce the best economic alternative  
12 for the consumer. As stated in the NRRI paper discussed earlier "The problem for  
13 regulators is discerning when electric-to-gas substitution makes economic sense  
14 to customers. Regulators may encourage electric-to-gas substitution, but risk  
15 harming customers when natural gas prices rise."<sup>11</sup> The potential for significant  
16 and sudden changes in natural gas prices is an important concern that the MPSC  
17 should not ignore.

18 **Q: What is your position on long-run availability of natural gas?**

19 A: Mr. Reed has emphasized that known gas reserves have increased with the  
20 quantification of shale gas. However, he misses the point. Natural gas is not a  
21 renewable energy resource; its availability is finite. The same is true of coal.  
22 Relatively speaking, coal is more available than natural gas and policies to  
23 encourage depletion of relative scarce resources should be viewed with caution.

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<sup>11</sup> Ibid, page 9.

1 **Q: In your opinion, would it be appropriate for the Commission to consider fuel**  
2 **substitution programs using renewable energy sources before implementing**  
3 **those using natural gas?**

4 A: Yes. Sound policy would call for incentives to disseminate fuel switching  
5 programs employing renewable technologies before considering electric to gas  
6 substitution. Obviously, renewable programs, especially zero emissions programs  
7 such as solar water heating, should be considered before fuel substitution  
8 programs. However, Mr. Reed did not examine the economics of encouraging  
9 solar panels to pre-heat water feeding electric or gas-fired water heaters. In the  
10 same vein, solar panels could serve to reduce the energy requirements for oil-fired  
11 or gas-fired hot water heating systems. Frankly, I cannot comment on the  
12 economics of these alternatives without a much closer and in-depth analysis. I  
13 can only conclude that rushing to implement MGE's proposal for an electric to  
14 natural gas fuel switching program without considering other potentially more  
15 beneficial programs would be neither reasonable nor prudent.

16 **VIII. SUMMARY AND CONCLUSION**

17 **Q: Please summarize your rebuttal of MGE's electric to gas substitution**  
18 **proposal.**

19 A: I recommend that the MPSC reject MGE's proposed electric to gas substitution  
20 proposal at the present time. MGE's proposal seeks to achieve a greater market  
21 saturation of natural gas using appliances by regulatory mandates instead of  
22 market interactions, an action that will distort economically efficient price signals  
23 provided to consumers. MGE's proposal will result in GMO failing to recover the

1 fixed costs associated with the lost revenues of customers switching. Since  
2 MGE's proposal will not result in any avoided capacity, the ultimate effect of the  
3 proposal is to increase the rates paid by non-participants. Among the more  
4 egregious problems with Mr. Reed's recommendations is that his analyses are  
5 flawed and they do not reflect accurate information. As a result, the conclusions  
6 and results of his analyses are not credible. In addition, MGE's proposal would  
7 seriously undermine EE, DSM and DR programs that have previously been shown  
8 to be beneficial to all parties and would stifle development and implementation of  
9 additional EE, DSM and DR program activity. MGE's proposal fails to consider  
10 that these incentive programs could possibly be implemented without any  
11 participation from GMO. Finally, the costs and benefits measured by the full fuel  
12 cycle approach do not measure the costs and benefits of Missouri ratepayers and  
13 the process does not insure that either economic efficiency or energy efficiency in  
14 Missouri achieved. For these reasons and for the reasons set forth in my Rebuttal  
15 Testimony, I recommend that the Commission reject MGE's electric to gas  
16 substitution proposal.

17 **Q: Does this conclude your Rebuttal Testimony?**

18 **A:** Yes, it does.



### QUALIFICATIONS AND EXPERIENCE

I graduated from the University of Arkansas at Fayetteville in 1974 with a Bachelor of Science degree in Public Administration. In 1980, I received a Master of Business Administration degree from Saint Edward's University in Austin, Texas. Upon graduation from the University of Arkansas, I was employed by the Arkansas Public Service Commission and held several positions with the Arkansas Public Service Commission staff, including Chief of the Rates Section and Interim Chief of the Finance Section. My activities in these positions included developing and presenting staff analyses and testimony concerning cost allocation studies and rate design for electric, natural gas, water, and telephone utilities; ensuring utility compliance with Arkansas Public Service Commission rate and tariff requirements; and providing supervision and management to staff financial analysts in the determination of utility cost of capital and capital structure.

In 1978, I accepted the position of Manager of Electric and Water Rates in the Economic Research Division of the Public Utility Commission of Texas. In this capacity, I was responsible for staff analyses, testimony, and activities concerning cost analysis, rate design, pricing strategies, tariffs, and econometric applications for regulated utilities.

In 1980, I was employed by Gilbert Associates, Inc. as a Management Consultant. I was promoted to Senior Management Consultant in March 1981 and to Principal Management Consultant in July 1981. In July 1981, I became Manager of Cost and Load Analysis in Gilbert Associates' Austin office. My responsibilities at this consulting firm included the duties and areas of expertise previously described, as well as management of projects and project teams working on behalf of utility clients.

I became a principal at Management Applications Consulting, ("MAC") at the time of its formation in May 1984. My experience at MAC included continued work in the electric and gas utility industry representing investor-owned utilities, electric cooperatives, and municipally-owned utility systems. My duties at MAC included the duties and areas of expertise described above. I remained a principal at MAC from May 1984 until January 2006.

From January 2006 through March 2007, I was employed as a management consultant by R. J. Covington Consulting, LLC. While employed by this firm, I continued to provide consulting services similar to those previously described as well as work in the areas of business valuation, affiliate transactions, and revenue requirement adjustments in regulatory proceedings.

In April 2007 I returned to MAC as a managing consultant. My responsibilities and job duties at MAC are the same as those previously described.

I have previously submitted testimony before the Public Service Commission of the State of Montana, the Public Utility Commission of Texas, the Arkansas Public Service Commission, the Louisiana Public Service Commission, the Railroad Commission of Texas, the Public Service Commission of Wyoming, the North Carolina Utilities Commission, the Arizona Corporation Commission, the New Mexico Public Regulation Commission, and the New Hampshire Public Utilities Commission. In addition, I have provided formal rate presentations to a number of municipally-owned and cooperative electric utilities. I am currently, or have in the past, been a member of the following organizations: Association of Energy Economics, Association of Energy Engineers, Association of Energy Services Professionals, American Statistical Association, NARUC Committee on Utility Billing Practices (past member), and the NARUC Ad Hoc Committee on Section 133 of PURPA (past member). During the past 34 years, I have made a number of presentations at various industry associations and trade groups.