

**Exhibit No.:**

**Issue(s):**

Energy Efficiency Funding

**Witness/Type of Exhibit:** Kind/Rebuttal Testimony

**Sponsoring Party:** Public Counsel

**Case No.:** GR-2009-0434

# **REBUTTAL TESTIMONY**

## **OF**

## **RYAN KIND**

Submitted on Behalf of the Office of the Public Counsel

THE EMPIRE DISTRICT GAS COMPANY

CASE NO. GR-2009-0434

December 18, 2009

**BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF MISSOURI**

In the Matter of The Empire District Gas )  
Company of Joplin, Missouri for )  
Authority to File Tariffs Increasing Rates )  
for Gas Service Provided to Customers in )  
the Missouri Service Area of the )  
Company. )

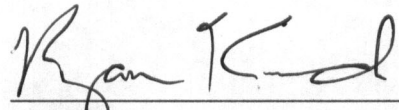
Case No. GR-2009-0434

**AFFIDAVIT OF RYAN KIND**

STATE OF MISSOURI )  
 ) ss  
COUNTY OF COLE )

Ryan Kind, of lawful age and being first duly sworn, deposes and states:

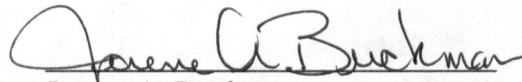
1. My name is Ryan Kind. I am Chief Utility Economist for the Office of the Public Counsel.
2. Attached hereto and made a part hereof for all purposes is my rebuttal testimony.
3. I hereby swear and affirm that my statements contained in the attached testimony are true and correct to the best of my knowledge and belief.

  
\_\_\_\_\_  
Ryan Kind

Subscribed and sworn to me this 18<sup>th</sup> day of December 2009.



JERENE A. BUCKMAN  
My Commission Expires  
August 23, 2013  
Cole County  
Commission #09754037

  
\_\_\_\_\_  
Jerene A. Buckman  
Notary Public

My Commission expires August 23, 2013.

**REBUTTAL TESTIMONY**  
**OF**  
**RYAN KIND**  
**EMPIRE DISTRICT GAS COMPANY**  
**CASE NO. GR-2009-0434**

1       **Q.     PLEASE STATE YOUR NAME, TITLE, AND BUSINESS ADDRESS.**

2       A.     Ryan Kind, Chief Energy Economist, Office of the Public Counsel, P.O. Box 2230,  
3             Jefferson City, Missouri 65102.

4       **Q.     PLEASE SUMMARIZE YOUR EDUCATIONAL AND EMPLOYMENT BACKGROUND.**

5       A.     I have a B.S.B.A. in Economics and a M.A. in Economics from the University of  
6             Missouri-Columbia (UMC). While I was a graduate student at UMC, I was employed as  
7             a Teaching Assistant with the Department of Economics, and taught classes in  
8             Introductory Economics, and Money and Banking, in which I served as a Lab Instructor  
9             for Discussion Sections.

10            My previous work experience includes several years of employment with the Missouri  
11            Division of Transportation as a Financial Analyst. My responsibilities at the Division of  
12            Transportation included preparing transportation rate proposals and testimony for rate  
13            cases involving various segments of the trucking industry. I have been employed as an  
14            economist at the Office of the Public Counsel (Public Counsel or OPC) since 1991.

15       **Q.     HAVE YOU TESTIFIED PREVIOUSLY BEFORE THIS COMMISSION?**

Rebuttal Testimony of  
Ryan Kind

1 A. Yes, prior to this case I submitted written testimony in numerous gas and electric rate  
2 cases and rate design cases, as well as other miscellaneous gas, water, electric, and  
3 telephone cases.

4 **Q. HAVE YOU PROVIDED COMMENTS OR TESTIMONY TO OTHER REGULATORY OR**  
5 **LEGISLATIVE BODIES ON THE SUBJECT OF ELECTRIC UTILITY REGULATION AND**  
6 **RESTRUCTURING?**

7 A. Yes, I have provided comments and testimony to the Federal Energy Regulatory  
8 Commission (FERC), the Missouri House of Representatives Utility Regulation  
9 Committee, the Missouri Senate's Commerce & Environment Committee and the  
10 Missouri Legislature's Joint Interim Committee on Telecommunications and Energy.

11 **Q. HAVE YOU BEEN A MEMBER OF, OR PARTICIPANT IN, ANY WORK GROUPS,**  
12 **COMMITTEES, OR OTHER GROUPS THAT HAVE ADDRESSED UTILITY REGULATION AND**  
13 **RESTRUCTURING ISSUES FOR GAS AND ELECTRIC UTILITIES?**

14 A. Yes. I was a member of the Missouri Public Service Commission's (the Commission's)  
15 Stranded Cost Working Group and participated extensively in the Commission's Market  
16 Structure Work Group. I am currently a member of the Missouri Department of Natural  
17 Resources Weatherization Policy Advisory Committee and the National Association of  
18 State Consumer Advocates (NASUCA) Electric Committee. I have served as the small  
19 customer representative on both the North American Electric Reliability Council (NERC)  
20 Standards Authorization Committee and the NERC Operating Committee and as the  
21 public consumer group representative to the Midwest ISO's (MISO's) Advisory  
22 Committee. During the early 1990s, I served as a Staff Liaison to the Energy and  
23 Transportation Task Force of the President's Council on Sustainable Development.  
24



**Q. WHAT ISSUE WILL YOU BE ADDRESSING IN THIS TESTIMONY?**

A. I will address the issue of the funding level for the energy efficiency programs that Empire District Gas Company (Empire or the Company) has proposed implementing in this case.

**Q. PLEASE EXPLAIN WHY YOU ARE NOT ADDRESSING ANY OF THE OTHER ENERGY EFFICIENCY ISSUES THAT WERE RAISED IN THE DIRECT TESTIMONY FILED BY EMPIRE GAS, THE COMMISSION STAFF (STAFF) OR THE MISSOURI DEPARTMENT OF NATURAL RESOURCES (DNR).**

A. I understand that all energy efficiency issues raised in direct testimony, except for the funding level of energy efficiency programs have been resolved by Stipulation and Agreements that were recently completed in this case. Two Stipulation and Agreements pertaining to energy efficiency and this testimony are being filed because of DNR's apparent opposition to the settlement agreement between Empire, Staff, and OPC regarding the appropriate funding level for the energy efficiency programs that Empire intends to implement. The Partial Stipulation and Agreement on DSM Funding and Implementation between Empire, Staff, and OPC includes agreement upon the energy efficiency program portfolio funding levels that are contained in the Direct Testimony of Empire witness Sherrill L. McCormack. DNR witness Laura Wolfe proposes a higher level of energy efficiency program funding in her direct testimony that is based upon the percentage of Empire's Gas's total annual operating revenues (including gas revenues).

**Q. HOW DOES DNR WITNESS LAURA WOLFE USE THE PERCENTAGE OF EMPIRE'S TOTAL ANNUAL OPERATING REVENUES TO DETERMINE THE AMOUNT THAT EMPIRE SHOULD SPEND ON ENERGY EFFICIENCY PROGRAMS?**

Rebuttal Testimony of  
Ryan Kind

1 A. At line 13 on page 11 of her direct testimony, Ms Wolfe states that Empire's annual  
2 operating revenue, including PGA revenues, was \$65,437,968. Based on this operating  
3 revenue figure, Ms. Wolfe calculates that Empire's energy efficiency budgets for years  
4 one and two of the new program portfolio (\$217,000) is .332 percent of annual revenues  
5 and that Empire's energy efficiency budgets for year three of the new program portfolio  
6 (\$227,776) is .348 percent of annual revenues. It should be noted that these energy  
7 efficiency expenditure percentages would be much higher if they were calculated as a  
8 percentage of **non-gas** annual revenues which was the way these types of percentages  
9 were used in the most recent Atmos rate case (Case No. GR-2006-0387).

10 In the answer beginning at line 11 on page 12 of her direct testimony, DNR witness  
11 Laura Wolfe provides her recommendation on the level of investment (annual funding)  
12 that should be made by Empire in each of the next three years. DNR's recommendations  
13 for annual energy efficiency funding by Empire are:

- 14 • \$217,000 (.332 percent of annual revenues, including gas revenues) in 2010
- 15 • \$327,000 (.5 percent of annual revenues, including gas revenues) in 2011
- 16 • \$655,000 (1.0 percent of annual revenues, including gas revenues) in 2012

17 At line 17 on page 12, Ms. Wolfe concludes that "this plan allows [Empire Gas] to ramp  
18 up the proposed efficiency programs and invest at least the minimum recommended  
19 amount of investment by 2011."

20 **Q. HOW DID DNR WITNESS LAURA WOLFE DETERMINE THE "MINIMUM RECOMMENDED**  
21 **AMOUNT OF INVESTMENT" THAT SHE REFERENCES IN THE QUOTE FROM HER**  
22 **TESTIMONY IMMEDIATELY PRECEDING THIS QUESTION?**

23 A. Beginning at line 19 on page 11 of her direct testimony, Ms. Wolfe states that she does  
24 not think Empire is committing enough funds to energy efficiency because the "financial

commitment to energy efficiency is falling short of levels being recommended for natural gas utilities.”

**Q. DOES DNR WITNESS LAURA WOLFE REFERENCE ANY SOURCES OR ANALYSIS THAT SHE RELIED UPON TO DETERMINE THE “ENERGY EFFICIENCY FUNDING LEVELS BEING RECOMMENDED FOR NATURAL GAS UTILITIES”?**

A. There are two places in Ms. Wolfe’s direct testimony where she references gas utility energy efficiency funding levels as a percentage of gas utility annual revenues cited by others. These references appear at line 9 on page 11 of her direct testimony (the NAPEE statement) and at line 2 on page 13 of her testimony (the Commission’s Atmos order).

**Q. WHAT IS YOUR RESPONSE TO HOW DNR WITNESS LAURA WOLFE INTERPRETS STATEMENTS IN THE NATIONAL ACTION PLAN FOR ENERGY EFFICIENCY (NAPEE) REGARDING THE APPROPRIATE ENERGY EFFICIENCY FUNDING LEVELS?**

A. Ms. Wolfe states at line 9 on page 11 of her direct testimony that:

NAPEE states that the most effective energy efficiency projects were funded at a level equal to a minimum range of 0.5 percent to 1.5 percent of a natural gas utility’s annual operating revenue.<sup>20</sup>

Footnote 20 at the end of the above quote provides a reference to page 6-5 of the July 2006 National Action Plan for Energy Efficiency (See Attachment A). I have reviewed page 6-5 and based upon my review, it was not correct for Ms. Wolfe to assert that this page of the NAPEE “states that the most effective energy efficiency projects were funded at a level equal to a minimum range of 0.5 percent to 1.5 percent of a natural gas utility’s annual operating revenue.”

1       **Q.     WHAT DOES NAPEE STATE ON PAGE 6-5 REGARDING ENERGY EFFICIENCY FUNDING**  
2       **LEVELS FOR GAS UTILITIES?**

3       A.     The passage from page 6-5 of the National Action Plan for Energy Efficiency that is  
4       relevant to this issue states:

5               Many energy efficiency programs are being delivered at a total program  
6               cost of about \$0.02 to \$0.03 per lifetime kilowatt-hour (kWh) saved and  
7               \$0.30 to \$2.00 per lifetime million British thermal units (MMBtu) saved.  
8               These costs are less than the avoided costs seen in most regions of the  
9               country. **Funding for the majority of programs reviewed ranges from**  
10              **about 1 to 3 percent of electric utility revenue and 0.5 to 1 percent of**  
11              **gas utility revenue. [Emphasis added]**

12       Ms. Wolfe assertion that “NAPEE states that the most effective energy efficiency  
13       projects were funded at a level equal to a minimum range of 0.5 percent to 1.5 percent of  
14       a natural gas utility’s annual operating revenue” is wrong for two reasons. First, contrary  
15       to Ms. Wolfe’s assertion, it is not correct to assert that page 6-5 of NAPEE concludes that  
16       “the most effective energy efficiency projects” were funded at any particular level. No  
17       such statement about “the most effective energy efficiency projects” appears on page 6-5  
18       of NAPEE. Second, it was also incorrect for her to cite funding level figures of “0.5  
19       percent to 1.5 percent of a natural gas utility’s annual operating revenue” when the  
20       corresponding range cited on page 6-5 of NAPEE for “the majority of programs  
21       reviewed” was “0.5 to 1 percent of gas utility revenue.”

22       **Q.     LET’S TURN NOW TO THE OTHER STATEMENT YOU REFERENCED ABOVE, THAT**  
23       **APPEARS AT LINE 2 ON PAGE 13 OF MS. WOLFE’S DIRECT TESTIMONY, WHERE SHE**  
24       **CITES A GAS UTILITY ENERGY EFFICIENCY FUNDING LEVEL AS A PERCENTAGE OF GAS**  
25       **UTILITY ANNUAL REVENUES IN THE COMMISSION’S ATMOS ORDER. WHAT IS YOUR**  
26       **RESPONSE TO MS. WOLFE’S TESTIMONY ABOUT THE COMMISSION’S ENERGY**  
27       **EFFICIENCY FUNDING LEVEL REQUIREMENT FOR ATMOS ENERGY CORPORATION**  
28       **(ATMOS) IN ITS REPORT AND ORDER IN CASE NO. GR-2006-0387?**

Rebuttal Testimony of  
Ryan Kind

1 A. On page 13 of her direct testimony, Ms. Wolfe cites the Commission's Order in the  
2 Atmos case as an example of where "the Commission used utility operating revenue as  
3 the basis to fund energy efficiency initiatives." At line 2 on page 13 of her testimony, she  
4 provides a quote from page 21 of the Commission's Report and Order in Case No. GR-  
5 2006-0387 where the Commission stated:

6 ... the Commission finds that it would be just and reasonable and in the  
7 public interest to implement a fixed delivery charge rate design as  
8 proposed by Staff on the condition that Atmos contribute annually, one  
9 percent (1%) of its annual gross revenues (currently, approximately  
10 \$165,000) to be used for an energy efficiency and conservation program.

11 **Q. ARE THE "ANNUAL GROSS REVENUES" THAT THE COMMISSION REFERENCED IN THE**  
12 **ABOVE QUOTE FROM ITS REPORT AND ORDER IN CASE NO. GR-2006-0387 THE**  
13 **SAME AS THE VARIOUS PHRASES THAT DRN WITNESS LAURA WOLFE REFERENCES IN**  
14 **HER TESTIMONY TO DESCRIBE ANNUAL REVENUES?**

15 A. No. The "annual gross revenues" that the Commission referred to in its Report and Order  
16 in Case No. GR-2006-0387 was a reference to "annual gross **non-gas** revenues."

17 **Q. HOW DO YOU KNOW THAT THE COMMISSION'S REFERENCE TO "ANNUAL GROSS**  
18 **REVENUES" IN ITS REPORT AND ORDER IN CASE NO. GR-2006-0387 WAS A**  
19 **REFERENCE TO "ANNUAL GROSS NON-GAS REVENUES?"**

20 A. The Commission's reference to "annual gross revenues" in its Report and Order in Case  
21 No. GR-2006-0387 can be readily interpreted as referring to "annual gross **non-gas**  
22 revenues" for a couple of reasons. First, the Commission referenced the amount of  
23 Atmos's non-gas annual margin revenues on page 21 of that order where it referred to  
24 "one percent (1%) of its annual gross revenues (currently, approximately \$165,000)."  
25 \$165,000 is 1% of \$16,500,000. On page 6 of that same order, the Commission stated  
26 that "Atmos' gross annualized revenue of \$16,507,737 was stipulated to in the Partial

Non-Unanimous Stipulation and Agreement.” The “gross annualized revenue” figure that the Commission referred to was a figure for the non-gas revenues of Atmos since setting the appropriate level of non-gas costs was the focus of the rate case.

Second, it’s clear that the Commission was referring to “annual gross **non-gas** revenues” in its Report and Order in Case No. GR-2006-0387 because in a subsequent order in the same case (Order Denying Application for Rehearing and Clarifying Report and Order) the Commission stated on page 2:

However, the Commission required that Atmos make a commitment to contribute **1% of its annual gross non-gas revenues** to be used for the program and to have the program in place no later than August 31, 2007. The Commission determined that 1% of **non-gas** revenues contributed to such a program would result in a substantial program. [Emphasis added]

**Q. DOES DNR ALSO KNOW THAT THE COMMISSION’S REFERENCE TO “ANNUAL GROSS REVENUES” IN ITS REPORT AND ORDER IN CASE NO. GR-2006-0387 WAS A REFERENCE TO “ANNUAL GROSS NON-GAS REVENUES?”**

**A.** Yes. DNR’s witness in Case No. GR-2009-0355, John Buchanan, addressed this subject on pages 8 and 9 of his rebuttal testimony in that case where he stated:

The Commission’s Report and Order in Case No. GR-2006-0387 (Atmos Energy Corporations’ last rate case), states that funding for Atmos Energy Corporation’s energy efficiency programs should be based on “annual gross revenues”. In fact, funding was based on annual adjusted gross operating revenue that **excluded natural gas-related costs**. This approach created only \$165,000 in annual funding for energy efficiency programs to be designed and implemented by Atmos no later than August 2007. By contrast, if funding for energy efficiency programs was based on an initial target for annual energy efficiency program expenditures at 1 percent of annual gross operating revenues, which was reported at \$57.104 million (Atmos Exhibit 105, Staff Accounting Schedules, Schedule 9 – 1), there would have been about \$571,000 in annual funding available from Atmos for energy efficiency programs. [Emphasis added]

1       **Q.     DID DNR WITNESS LAURA WOLFE MAKE ANY ATTEMPT TO DISTINGUISH BETWEEN**  
2                   **THE MEANING OF THE TERM “ANNUAL GROSS REVENUES” THAT THE COMMISSION**  
3                   **USED IN ITS REPORT AND ORDER IN CASE NO. GR-2006-0387 AND THE WAY THAT**  
4                   **SHE USES VARIOUS PHRASES IN HER TESTIMONY TO REFER TO ANNUAL REVENUES?**

5       A.     No. Throughout her testimony, Ms. Wolfe uses various phrases to refer to annual  
6                   revenues including:

7                   annual operating revenue (see page 11, line 11)

8                                   \*\*\*

9                   total operating revenues for 2008, including revenue from the PGA (see  
10                   page 11, line 13)

11                                  \*\*\*

12                   EGD’s 2008 total revenue (see page 11, line 16)

13                                  \*\*\*

14                   total annual revenue (see page 12, line 19)

15                                  \*\*\*

16                   utility operating revenue (see page 13, line 1)

17                                  \*\*\*

18                   Except for the reference that Ms. Wolfe makes to “total operating revenues for 2008,  
19                   including revenue from the PGA” at line 13 on page 11 of her testimony, it is not clear  
20                   whether she is referring to total revenues **including** gas revenues or total revenues  
21                   **excluding** gas revenues.

22       **Q.     WHY IS IT IMPORTANT TO DISTINGUISH BETWEEN ANNUAL GAS UTILITY REVENUES**  
23                   **WITH OR WITHOUT GAS COSTS?**

24       A.     Making this distinction is important because gas cost tend to be about two-thirds of total  
25                   annual utility costs. If utility energy efficiency funding is viewed as a percentage of

1 annual gas utility revenues excluding gas revenues, then Empire's proposed energy  
2 efficiency budget for year three (\$227,776) are a much higher % of annual revenues than  
3 the percentages shown by Ms. Wolfe in lines 12 through 17 on page 11 of her direct  
4 testimony.

5 **Q. DOES DNR WITNESS LAURA WOLFE CITE ANY SOURCES BESIDES NAPEE TO**  
6 **SUPPORT HER RECOMMENDATION FOR INCREASING THE LEVEL OF FUNDING FOR**  
7 **EMPIRE'S ENERGY EFFICIENCY PROGRAMS?**

8 A. Yes. She provides her interpretation of a paper titled "Examining the Potential for  
9 Energy Efficiency To Help Address the Natural Gas Crisis in the Midwest" that describes  
10 a study performed for the American Council for an Energy-Efficient Economy  
11 ("ACEEE") as support for her conclusion that the level of funding for Empire's energy  
12 efficiency programs is not "adequate." At line 15 on page 10 of her testimony, Ms.  
13 Wolfe states:

14 From a regional perspective, to reduce natural gas demand sufficiently to  
15 place downward pressure on wholesale prices, the study roughly  
16 estimated that **Missouri would be required to expend approximately**  
17 **\$12 million per year for natural gas energy efficiency programs**  
18 **through the year 2020.**<sup>18</sup>[Emphasis added]

19 Footnote number 18 at the end of the above quote refers to page 35 of the ACEEE Report  
20 titled "Examining the Potential for Energy Efficiency to Help Address the Natural Gas  
21 Crisis in the Midwest" (ACEEE Study). Pages 28 through 35 of this study are included  
22 in Attachment B to this testimony. The \$12 million dollar figure cited by Ms. Wolfe in  
23 the above quote appears in Table 23 on page 35 of the ACEEE Study. However, as  
24 indicated on page 34 of this study, this \$12 million annual expenditure on gas utility  
25 energy efficiency programs is only a portion of the actions required to obtain the gas  
26 savings results predicted by the study. In the first two full paragraphs on page 34 of the  
27 study, it states:



ACEEE anticipates that the energy efficiency savings modeled in this study would be best achieved through a mixture of policy mechanisms, including such things as utility and/or “public benefits fund” supported energy efficiency programs; building energy codes; equipment standards; informational and market transformation strategies; etc. Some of these would require explicit upfront “program” funding (e.g., utility/public benefits programs) while others would be accomplished through other statutory, regulatory, or informational mechanisms (e.g., codes and standards, public information efforts, etc.).

**For the purposes of estimating what kind of explicit “program” funding might be required, we assumed that one-half of the total savings would be achieved through actual “program” funding and one-half through the other regulatory, policy, and informational mechanisms. With that assumption, we computed the amount of upfront utility/system benefit program funding that would be required to save the targeted amount of energy, using a standard formula for calculating the “Cost of Conserved Energy” [Emphasis added]**

The above two paragraph show that the study results are premised upon the assumption that one-half of the load reductions and energy savings would be the result of actions other than the annual funding of utility energy efficiency programs so one must be careful not to conclude, as Ms. Wolfe appears to have done, that the dollar savings found by the study can be achieved solely by gas utility funded energy efficiency programs.

**Q. WHY DO YOU BELIEVE THAT DNR WITNESS LAURA WOLFE ASSUMES IN HER DIRECT TESTIMONY THAT THE DOLLAR SAVINGS SHOWN BY THE ACEEE STUDY CAN BE ACHIEVED SOLELY BY GAS UTILITY FUNDED ENERGY EFFICIENCY PROGRAMS?**

A. Ms. Wolfe appears to be saying that almost a billion dollars per year can be saved by Missourians from an investment of \$12 million per year for natural gas energy efficiency programs. She appears to draw this conclusion on pages 10 and 11 of her direct testimony where she states:

...the study roughly estimated that Missouri would be required to expend approximately \$12 million per year for natural gas energy efficiency programs through the year 2020.<sup>18</sup> The study estimates that the dollar savings impact of the associated natural gas price reductions from this

level of investment would be approximately \$921 million for Missouri by 2015 and an additional \$847 million by the year 2020.<sup>19</sup>

Footnote 19 at the end of the above quote references pages 28 – 32 of the ACEEE Study which are included in Attachment B. It is a huge overstatement to conclude that by investing \$12 million per year for natural gas energy efficiency programs, Missourians could be expected to receive savings per year in the range of \$847,000,000 to \$921,000,000. As I noted above, the study results are premised upon the assumption that one-half of the load reductions and energy savings would be the result of actions other than the annual funding of utility energy efficiency programs. These other actions are things like enhanced building codes and appliance standards. While Ms. Wolfe pointed out that the savings were premised upon the \$12 million annual funding of **gas** utility programs shown in Table 23 on page 35 of the ACEEE Study, she failed to point out that **the \$55 million annual funding of electric utility programs shown in Table 24 on page 35 is also necessary** to achieve savings per year in the range of \$847,000,000 to \$921,000,000.

**Q. WOULD IT HAVE BEEN POSSIBLE FOR DNR WITNESS LAURA WOLFE TO MORE ACCURATELY PORTRAY THE SAVINGS FROM MISSOURI GAS ENERGY EFFICIENCY PROGRAMS THAT ARE INDICATED BY THE ACEEE STUDY?**

A. Yes, in order to do so, Ms. Wolfe should have started by revealing that the study results are premised upon the assumption that one-half of the load reductions and energy savings would be the result of actions other than the annual funding of utility energy efficiency programs, as I explained above. Then, instead of referring to the total study savings in the range of \$847,000,000 to \$921,000,000, Ms. Wolfe should have referenced the savings that are associated only with gas energy efficiency programs that appear in Tables 20a, 20b, 20c, and 20d on pages 29 and 30 of the ACEEE Study. These savings

Rebuttal Testimony of  
Ryan Kind

1 associated with gas energy efficiency programs are only a fraction of the savings range of  
2 \$847,000,000 to \$921,000,000 that Ms. Wolfe presented in her testimony.

3 **Q. YOU HAVE PRESENTED A NUMBER OF CRITICISMS OF THE ASSERTIONS MADE BY DNR**  
4 **WITNESS LAURA WOLFE IN HER DIRECT TESTIMONY. ARE YOU OPPOSED TO**  
5 **EXPANDING FUNDING FOR ENERGY EFFICIENCY PROGRAMS IN MISSOURI?**

6 A. Definitely not. I have consistently supported sound energy efficiency efforts in Missouri  
7 for over fifteen years. I believe that energy efficiency is best promoted by presenting  
8 facts and analysis that accurately represent the contributions that energy efficiency can  
9 make to addressing Missouri's energy issues. Furthermore, Public Counsel strongly  
10 supports that increased level of energy efficiency expenditures agreed upon in the Partial  
11 Stipulation and Agreement on DSM Funding and Implementation.

12 **Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

13 A. Yes.



# National Action Plan for Energy Efficiency

A PLAN DEVELOPED BY MORE THAN 50 LEADING  
ORGANIZATIONS IN PURSUIT OF ENERGY SAVINGS  
AND ENVIRONMENTAL BENEFITS THROUGH  
ELECTRIC AND NATURAL GAS ENERGY EFFICIENCY

JULY 2006

Attachment A

## Key Findings

Overviews of the energy efficiency programs reviewed for this chapter are provided in Table 6-2 and 6-3. Key findings drawn from these programs include:

- Energy efficiency resources are being acquired on average at about one-half the cost of the typical new power sources, and about one-third of the cost of natural gas supply in many cases—and contribute to an overall lower cost energy system for rate-payers (EIA, 2006).
- Many energy efficiency programs are being delivered at a total program cost of about \$0.02 to \$0.03 per lifetime kilowatt-hour (kWh) saved and \$0.30 to \$2.00 per lifetime million British thermal units (MMBtu) saved. These costs are less than the avoided costs seen in most regions of the country. Funding for the majority of programs reviewed ranges from about 1 to 3 percent of electric utility revenue and 0.5 to 1 percent of gas utility revenue.
- Even low energy cost states, such as those in the Pacific Northwest, have reason to invest in energy efficiency, as energy efficiency provides a low-cost, reliable resource that reduces customer utility bills. Energy efficiency also costs less than constructing new generation, and provides a hedge against market, fuel, and environmental risks (Northwest Power and Conservation Council, 2005).
- Well-designed programs provide opportunities for customers of all types to adopt energy savings measures and reduce their energy bills. These programs can help customers make sound energy use decisions, increase control over their energy bills, and empower them to manage their energy usage. Customers can experience significant savings depending on their own habits and the program offered.
- Consistently funded, well-designed efficiency programs are cutting electricity and natural gas load—providing annual savings for a given program year of 0.15 to 1 percent of energy sales. These savings typically will accrue at this level for 10 to 15 years. These programs are helping to offset 20 to 50 percent of expected energy growth in some regions without compromising end-user activity or economic well being.
- Research and development enables a continuing source of new technologies and methods for improving energy efficiency and helping customers control their energy bills.
- Many state and regional studies have found that pursuing economically attractive, but as yet untapped energy efficiency could yield more than 20 percent savings in total electricity demand nationwide by 2025. These savings could help cut load growth by half or more, compared to current forecasts. Savings in direct use of natural gas could similarly provide a 50 percent or greater reduction in natural gas demand growth. Potential varies by customer segment, but there are cost-effective opportunities for all customer classes.
- Energy efficiency programs are being operated successfully across many different contexts: regulated and unregulated markets; utility, state, or third-party administration; investor-owned, public, and cooperatives; and gas and electric utilities.
- Energy efficiency resources are being acquired through a variety of mechanisms including system benefits charges (SBCs), energy efficiency portfolio standards (EPPSs), and resource planning (or cost of service) efforts.
- Cost-effective energy efficiency programs for electricity and natural gas can be specifically targeted to reduce peak load.
- Effective models are available for delivering gas and electric energy efficiency programs to all customer classes. Models may vary based on whether a utility is in the initial stages of energy efficiency programming, or has been implementing programs for a number of years.

**Examining the Potential for Energy Efficiency  
To Help Address the Natural Gas Crisis in the Midwest**

**Martin Kushler, Ph.D., Dan York, Ph.D., and Patti Witte, M.A.**

**January 2005**

**Report Number U051**

**© American Council for an Energy-Efficient Economy  
1001 Connecticut Avenue, NW, Suite 801, Washington, DC 20036  
(202) 429-8873 phone, (202) 429-2248 fax, <http://aceee.org> Web site**



**Table 18. Dollar Savings Impacts of Natural Gas Price Reduction  
Residential, Commercial, and Industrial Combined  
in Key Benchmark Years**

Midwest Energy Efficiency Scenario  
(millions \$)

State	2006	2010	2016	2020
Illinois	\$101	\$262	\$333	\$234
Indiana	\$62	\$164	\$346	\$380
Iowa	\$22	\$57	\$94	\$89
Michigan	\$90	\$226	\$307	\$390
Minnesota	\$36	\$94	\$118	\$136
Missouri	\$26	\$66	\$109	\$102
Ohio	\$84	\$221	\$461	\$428
Wisconsin	\$42	\$118	\$160	\$197
Total Region	\$462	\$1,205	\$1,898	\$1,928

**Table 19. Dollar Savings Impacts of Natural Gas Price Reduction  
for Power Generation in Key Benchmark Years**

Midwest Energy Efficiency Scenario  
(million \$)

State	2006	2010	2016	2020
Illinois	\$21	\$39	\$69	\$21
Indiana	\$7	\$10	\$124	\$138
Iowa	\$13	\$29	\$110	\$65
Michigan	\$23	\$36	\$145	\$156
Minnesota	\$27	\$47	\$171	\$101
Missouri	\$76	\$129	\$526	\$309
Ohio	\$3	\$2	\$136	\$160
Wisconsin	\$6	\$11	\$17	\$7
Total Region	\$176	\$303	\$1,297	\$957

### Overall Customer Savings

To summarize, the total dollar savings to Midwest customers from the energy efficiency policy impacts examined in this study are comprised of four basic components: (1) direct savings on natural gas bills from energy efficiency reductions in consumption; (2) direct savings in electricity bills from energy efficiency reductions in consumption; (3) savings in natural gas bills across all customers due to reductions in the wholesale market price of gas; and (4) savings to electricity customers due to the reduced cost of natural gas for electricity generation.<sup>25</sup> The combined savings estimates from these four components are presented for

<sup>25</sup> There is actually a fifth area of customer savings that we were unable to model in this study. That is the likely downward pressure on electricity market prices due to the effect of electricity energy efficiency programs, especially those targeted at summertime electricity use (when natural gas generation is at its highest). While we

4 key benchmark years in Tables 20a through 20d. These tables provide the corresponding data for each individual state and for the region as a whole.

**Table 20a. 2006 Total Dollar Savings to Midwest Customers**  
**Midwest Energy Efficiency Scenario**  
(in Millions\$)

<b>State</b>	<b>Dollar Savings Due to Natural Gas EE</b>	<b>Dollar Savings Due to Electricity EE</b>	<b>Dollar Savings Due to Reduction in Price</b>	<b>Dollar Savings Due to Reduction in Cost of NG used in Electric Generation</b>	<b>Total</b>
Illinois	\$181	\$191	\$101	\$21	\$493
Indiana	\$77	\$98	\$62	\$7	\$244
Iowa	\$37	\$47	\$22	\$13	\$120
Michigan	\$132	\$120	\$90	\$23	\$365
Minnesota	\$59	\$70	\$36	\$27	\$193
Missouri	\$29	\$57	\$26	\$76	\$187
Ohio	\$123	\$182	\$84	\$3	\$393
Wisconsin	\$79	\$88	\$42	\$6	\$214
<b>Total Region</b>	<b>\$719</b>	<b>\$852</b>	<b>\$462</b>	<b>\$176</b>	<b>\$2,208</b>

**Table 20b. 2010 Total Dollar Savings to Midwest Customers**  
**Midwest Energy Efficiency Scenario**  
(in Millions\$)

<b>State</b>	<b>Dollar Savings Due to Natural Gas EE</b>	<b>Dollar Savings Due to Electricity EE</b>	<b>Dollar Savings Due to Reduction in Price</b>	<b>Dollar Savings Due to Reduction in Cost of NG used in Electric Generation</b>	<b>Total</b>
Illinois	\$272	\$432	\$262	\$39	\$1,006
Indiana	\$122	\$223	\$164	\$10	\$518
Iowa	\$58	\$88	\$57	\$29	\$232
Michigan	\$192	\$291	\$226	\$36	\$745
Minnesota	\$82	\$140	\$94	\$47	\$364
Missouri	\$41	\$126	\$66	\$129	\$361
Ohio	\$182	\$385	\$221	\$2	\$790
Wisconsin	\$123	\$174	\$118	\$11	\$425
<b>Total Region</b>	<b>\$1,076</b>	<b>\$1,859</b>	<b>\$1,205</b>	<b>\$303</b>	<b>\$4,443</b>

were unable to model that impact in this study, others have researched that effect on electricity market prices extensively (e.g., Cowart 2001), and we feel confident in asserting that this effect would produce significant additional economic benefits for electricity customers in the Midwest.



**Table 20c. 2015 Total Dollar Savings to Midwest Customers**  
**Midwest Energy Efficiency Scenario**  
(in Millions\$)

State	Dollar Savings Due to Natural Gas EE	Dollar Savings Due to Electricity EE	Dollar Savings Due to Reduction in Price	Dollar Savings Due to Reduction in Cost of NG used in Electric Generation	Total
Illinois	\$355	\$780	\$333	\$69	\$1,538
Indiana	\$182	\$398	\$346	\$124	\$1,051
Iowa	\$74	\$148	\$94	\$110	\$426
Michigan	\$227	\$532	\$307	\$145	\$1,211
Minnesota	\$98	\$242	\$118	\$171	\$628
Missouri	\$60	\$225	\$109	\$526	\$921
Ohio	\$266	\$672	\$461	\$136	\$1,535
Wisconsin	\$162	\$298	\$160	\$17	\$637
<b>Total Region</b>	<b>\$1,457</b>	<b>\$3,296</b>	<b>\$1,898</b>	<b>\$1,297</b>	<b>\$7,948</b>

**Table 20d. 2020 Total Dollar Savings to Midwest Customers**  
**Midwest Energy Efficiency Scenario**  
(in Millions\$)

State	Dollar Savings Due to Natural Gas EE	Dollar Savings Due to Electricity EE	Dollar Savings Due to Reduction in Price	Dollar Savings Due to Reduction in Cost of NG used in Electric Generation	Total
Illinois	\$630	\$1,179	\$234	\$21	\$2,063
Indiana	\$303	\$596	\$380	\$138	\$1,417
Iowa	\$135	\$216	\$89	\$65	\$505
Michigan	\$434	\$803	\$390	\$156	\$1,784
Minnesota	\$189	\$358	\$136	\$101	\$784
Missouri	\$97	\$339	\$102	\$309	\$847
Ohio	\$432	\$993	\$428	\$160	\$2,013
Wisconsin	\$292	\$440	\$197	\$7	\$936
<b>Total Region</b>	<b>\$2,542</b>	<b>\$4,923</b>	<b>\$1,928</b>	<b>\$957</b>	<b>\$10,351</b>

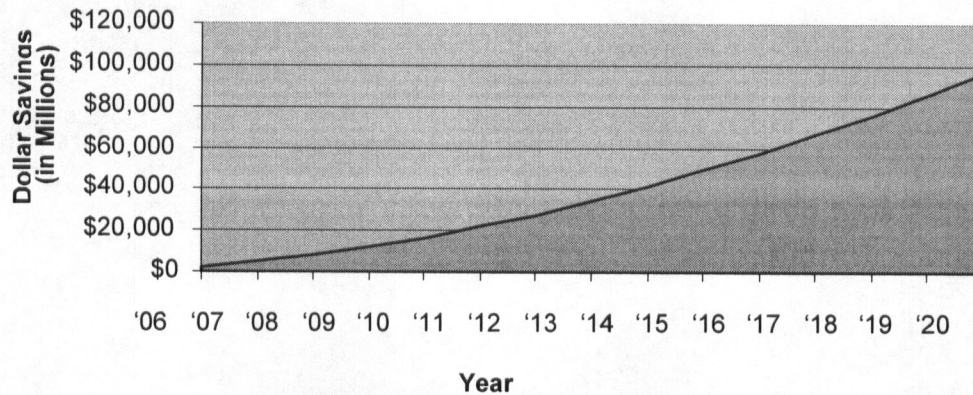
### Cumulative Savings

The data on dollar savings presented in Tables 15 through 20d has been presented using the convention of providing total annual savings in each of 4 key years: 2006, 2010, 2015, and 2020 (corresponding to years 1, 5, 10, and 15 of an energy efficiency policy initiative). The data represent the savings realized in that year, from that and all prior years' energy efficiency improvements produced by the policy.

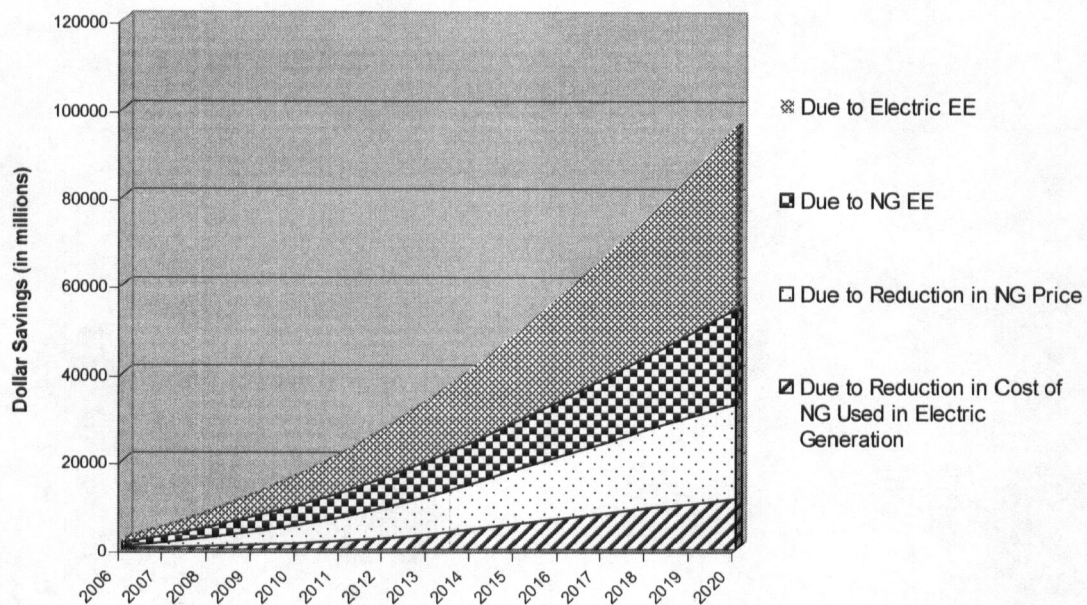
Another interesting way to view the data, however, is to consider the cumulative total of savings over time. Figure 7 presents a graph illustrating the growth in grand total cumulative

dollar savings for Midwest customers through 2020. Figure 8 then presents that grand total savings graph with the data disaggregated into each of the four components (i.e., savings due to electric energy efficiency improvements, natural gas energy efficiency improvements, natural gas price reductions to customers, and natural gas price reductions to electricity generators).

**Figure 7. Cumulative Grand Total Dollar Savings**



**Figure 8. Cumulative Dollar Savings by Source of Savings**





As can be seen in Figures 7 and 8, the cumulative dollar savings from an aggressive but achievable energy efficiency policy initiative would be quite substantial. After just 5 years, cumulative savings to customers in the region would total over \$16 billion, and after 15 years, cumulative savings would approach \$100 billion. The single largest component (over 40 percent) would be due to the direct savings from electric energy efficiency. Roughly another 20 to 25 percent each would result from direct natural gas energy efficiency improvements and reductions in the market price of natural gas. The remaining 10 percent would result from the reduction in the cost of natural gas used in electricity generation.

### **Costs to Achieve These Savings**

As one might expect, in order to achieve these substantial economic benefits there would need to be significant investments in improving energy efficiency. To estimate these associated costs, ACEEE researched its existing data sets and the extensive literature available within the industry on the costs involved in acquiring energy efficiency savings.

As a general frame of reference, there is considerable research from leading states to document that a portfolio of electric energy efficiency programs can save electricity at a cost of 3 cents/kWh, and a portfolio of natural gas energy efficiency programs can save natural gas at a cost of \$1.50 per Mcf (Elliott et al. 2003). For this study, ACEEE identified costs specifically at the customer sector level (residential, commercial, and industrial) and applied those costs in proportion to where the study projected that the electricity and natural gas consumption reductions would need to be achieved. Tables 21 and 22 provide the cost estimates developed for each sector and the weighted overall cost (weighted by the proportion of overall energy savings expected from each sector).

**Table 21. Cost per Mcf to Achieve Savings  
Natural Gas**

<b>Sector</b>	<b>Technology Cost</b>	<b>Admin. Adder</b>	<b>Cost of Saved Energy</b>
<b>Residential</b>	\$1.920	25%	\$2.57
<b>Commercial</b>	\$0.667	20%	\$0.86
<b>Industrial</b>	\$0.600	15%	\$0.74
<b>Weighted Overall Cost</b>			\$1.67

**Table 22. Cost per kWh to Achieve Savings  
Electric**

Sector	Technology Cost	Admin. Adder	Cost of Saved Energy
Residential	\$0.033	25%	\$0.044
Commercial	\$0.019	20%	\$0.024
Industrial	\$0.016	15%	\$0.020
<b>Weighted Overall Cost</b>			<b>\$0.029</b>

Consistent with patterns observed in decades of research in the energy efficiency field, the levelized cost per lifetime unit of energy saved is the most expensive in the residential sector (\$2.57 per Mcf and \$.044 per kWh), followed by the commercial sector (\$.86 per Mcf and \$.024 per kWh), and least expensive in the industrial sector (\$.74 per Mcf and \$.02 per kWh). More importantly, all of these costs of conserved energy are much cheaper than the corresponding costs to obtain "supply side" energy resources,<sup>26</sup> thus these energy efficiency programs would be very cost-effective just for the energy "resource" they provide...without even including their beneficial impacts on lowering wholesale market prices. When those larger benefits are taken into account, the benefits to consumers exceed the costs by nearly 4 to 1.

### Understanding the Associated Costs

In understanding how the associated costs relate to the savings achieved, there are two ways to conceptually frame the costs. The first is to attribute the cost per Mcf or kWh in the year that the Mcf or kWh unit is saved. This recognizes that energy efficiency measures have long useful lifetimes and is appropriate in terms of fairly comparing the benefits and costs of the policy over time. From a conceptual standpoint, this is analogous to regulatory ratemaking treatment of a power plant capital investment, where the costs are amortized and recovered in rates over many years. If this conceptual approach were applied here, the "costs" associated with the energy savings produced by the energy efficiency policies and programs could simply be estimated by multiplying the costs per Mcf (Table 21) or costs per kWh (Table 22) times the respective Mcf or kWh savings credited in each year, and summed over the lifetime of the energy efficiency measures producing the savings. (This approach would not make any distinction as to who pays the cost, e.g., the end-use customer, some type of utility program, or some combination.)

Unfortunately, that approach to conceptualizing the costs does not mesh well with the practical realities of how energy efficiency programs are typically funded. From a practical standpoint, most state programs for energy efficiency set up their funding mechanisms to "frontload" the costs. For example, a system benefits charge may collect \$10 million to spend on programs delivered in year 1, whereas the savings from that program will continue

<sup>26</sup> For example, the projected wholesale cost of natural gas in 2006 is over \$7.00 per Mcf, and a typical average cost for delivered electricity might be in the range of 5 to 6 cents per kWh.



to accrue over 10 to 15 years or more. Over that 10 or 15 years, the cost per Mcf or kWh saved will work out to be equivalent to the year-by-year approach above. However, for policymakers thinking of choosing a frontloaded funding approach, a more pragmatic way to illustrate the associated costs is required. Such an approach is explored in the next section.

### **Estimating Program Funding Needed**

ACEEE anticipates that the energy efficiency savings modeled in this study would be best achieved through a mixture of policy mechanisms, including such things as utility and/or “public benefits fund” supported energy efficiency programs; building energy codes; equipment standards; informational and market transformation strategies; etc.<sup>27</sup> Some of these would require explicit upfront “program” funding (e.g., utility/public benefits programs) while others would be accomplished through other statutory, regulatory, or informational mechanisms (e.g., codes and standards, public information efforts, etc.).

For the purposes of estimating what kind of explicit “program” funding might be required, we assumed that one-half of the total savings would be achieved through actual “program” funding and one-half through the other regulatory, policy, and informational mechanisms. With that assumption, we computed the amount of upfront utility/system benefit program funding that would be required to save the targeted amount of energy, using a standard formula for calculating the “Cost of Conserved Energy”.<sup>28</sup>

The average annual savings for the first 5 years of the Midwest energy efficiency policy scenario modeled in this study were 34.6 million Mcf and 6.1 billion kWh.<sup>29</sup> We then divided those annual savings figures by two, to reflect the assumption that half the total savings are achieved through specifically funded utility and/or public benefits programs. That results in average annual “program” savings of 17.3 million Mcf and 3.05 billion kWh. Taking reasonable ballpark assumptions for lifetime costs of conserved energy for such programs (i.e., 3.0 cents per kWh and \$2.00 per Mcf), and assuming reasonable typical values for measure lifetime (i.e., 12 years) and a discount rate (i.e., 5 percent real discount rate), we were able to estimate annual “program” funding requirements. We estimate that across the region, annual utility/public benefits program funding of approximately \$310 million for gas energy efficiency programs and \$800 million for electric energy efficiency programs would be required.

For a rough estimate of funding per state, one could divide those figures by eight (for the eight states we included in the region), resulting in average annual program funding of \$39 million for gas energy efficiency programs and \$100 million for electric energy efficiency programs. Obviously some states would need to spend more, and some less. The relative allocation among states could be roughly estimated by examining the proportion of total regional savings attributed to each state in Tables 13 and 14.

---

<sup>27</sup> See *Energy Efficiency's Next Generation: Innovation at the State Level* (Prindle et al. 2003) for a thorough discussion of energy efficiency policy options available to states.

<sup>28</sup> See *Supplying Energy Through Greater Efficiency* (Meier, Wright, and Rosenfeld 1983).

<sup>29</sup> Obtained from Tables 13 and 14 (essentially 2010 reported total savings divided by five, to derive an average annual savings across the first 5 years of programs).

For the purposes of illustration, we have done such an allocation here. Tables 23 and 24 below present what the estimated required energy efficiency program funding per state would be if that proportional allocation of the total program funding were applied.

**Table 23. Amount of Annual Funding Needed to Achieve Projected Savings  
Natural Gas**

State	Percentage of Total Regional Savings <sup>a</sup>	Required Funding (in millions)
Illinois	24%	\$75
Indiana	11%	\$35
Iowa	5%	\$16
Michigan	19%	\$59
Minnesota	9%	\$27
Missouri	4%	\$12
Ohio	16%	\$51
Wisconsin	11%	\$34
<b>Total Region</b>	<b>100%</b>	<b>\$310</b>

<sup>a</sup> Percentages based on 2010 savings for each state as a proportion of 2010 grand total regional natural gas savings in Table 13.

**Table 24. Amount of Annual Funding Needed to Achieve Projected Savings  
Electricity**

State	Percentage of Total Regional Savings <sup>a</sup>	Required Funding (in millions)
Illinois	21%	\$167
Indiana	14%	\$113
Iowa	5%	\$40
Michigan	14%	\$109
Minnesota	8%	\$66
Missouri	7%	\$55
Ohio	21%	\$166
Wisconsin	10%	\$83
<b>Total Region</b>	<b>100%</b>	<b>\$800</b>

<sup>a</sup> Percentages based on 2010 savings for each state as a proportion of 2010 grand total regional electricity savings in Table 14.

Obviously states could choose to provide greater or lesser amounts of energy efficiency program funding than the proportional allocations presented in Tables 23 and 24. However, the state-by-state energy and dollar savings benefits presented throughout this report are based on those assumed proportional allocations of energy savings accomplishments.

### Broader Economic Benefits

The consumer cost reduction impacts resulting from the energy efficiency policies also would produce certain other broader economic benefits to the states and to the region, principally due to the effects of lower overall energy costs and reducing the amount of