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BEFORE THE CORPORATION COMMISSION OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF )  
OKLAHOMA GAS AND ELECTRIC COMPANY )  
FOR COMMISSION AUTHORIZATION OF A )  
PLAN TO COMPLY WITH THE FEDERAL )  
CLEAN AIR ACT AND COST RECOVERY; AND )  
FOR APPROVAL OF THE MUSTANG )  
MODERNIZATION AND COST RECOVERY )

CAUSE PUD 201400229

REBUTTAL TESTIMONY

OF

SCOTT NORWOOD

ON BEHALF OF

OKLAHOMA INDUSTRIAL ENERGY CONSUMERS

PUBLIC VERSION

JANUARY 26, 2015

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REBUTTAL TESTIMONY OF SCOTT NORWOOD

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
I. INTRODUCTION .....	2
II. SUMMARY OF REBUTTAL TESTIMONY .....	3
III. LOSS OF FUEL DIVERSITY .....	6
IV. RATE IMPACTS OF PROPOSED COMPLIANCE PLANS .....	10
V. REBUTTAL TO OER’S RESPONSIVE TESTIMONY .....	13
VI. REBUTTAL TO SIERRA CLUB’S RESPONSIVE TESTIMONY.....	23
VII. FUTURE WIND ENERGY RESOURCES.....	27
VIII. MUSTANG MODERNIZATION PLAN.....	29
<u>EXHIBITS:</u>	
SN-R1 OER’s responses to OIEC 1-10 and 1-12	
SN-R2 OER’s response to OIEC 2-4	
SN-R3 Impact of OER Treatment of Wind Energy (CONFIDENTIAL)	
SN-R4 OER’s responses to OIEC 2-5 and 2-9	

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I. INTRODUCTION

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

A. My name is Scott Norwood. I am President of Norwood Energy Consulting, L.L.C. My business address is 9408 Bell Mountain Drive, Austin, Texas 78730.

**Q. HAVE YOU PREVIOUSLY FILED TESTIMONY IN THIS PROCEEDING?**

A. Yes. I filed responsive testimony in this case on behalf of Oklahoma Industrial Energy Consumers (“OIEC”) on December 16, 2014. A summary of my background and experience was provided in Exhibit SN-1 of my responsive testimony.

**Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?**

A. The purpose of my rebuttal testimony is to respond to certain analyses and recommendations regarding Oklahoma Gas and Electric Company’s (“OG&E”) proposed environmental compliance plan presented in the responsive testimonies of Oklahoma Energy Results, LLC (“OER”) witness Judah Rose and Sierra Club witnesses Jeremy Fisher, Tyler Comings and Rachel Wilson.

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II. SUMMARY OF REBUTTAL TESTIMONY

Q. PLEASE SUMMARIZE YOUR REBUTTAL TESTIMONY.

A. My rebuttal testimony focuses primarily on responding to the recommendations of OER witness Rose and Sierra Club witnesses Fisher, Comings and Wilson. My major concerns with the testimony of these witnesses are as follows:

Fuel Diversity Impacts

Despite the fact that OG&E’s proposed compliance plan has lower costs under most base case analyses and would remove 40% of the Company’s coal-fired generating capacity by 2020, OER witness Rose and Sierra Club witnesses Fisher, Comings and Wilson assert that it would be more reasonable for four of OG&E’s five coal-fired generating units to be retired or converted to burn natural gas by 2020. These alternative recommendations go far beyond the requirements of the Environmental Protection Agency’s (“EPA”) Federal Implementation Plan for compliance with the Regional Haze rule and would permanently eliminate over 80% of the existing low-cost coal-fired energy from the OG&E system and leave the Company’s Oklahoma customers almost entirely dependent upon gas-fired generation and SPP market purchases. At a time when there is great uncertainty regarding future environmental policies, gas prices and SPP market operations, these parties recommendations to permanently eliminate over 80% of the fuel diversity value supplied from OG&E’s coal fired generating units simply makes no sense.

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Environmental Compliance Plan Modeling

OER and Sierra Club witnesses conducted complex regional production cost modeling for the new SPP market alternative to assess costs of OG&E’s proposed compliance plan and their alternative proposals. My review indicates that the OER and Sierra Club modeling analyses are seriously flawed and unreasonably overstate benefits of their recommended alternative compliance plans.

The major flaw in the OER analysis is the questionable assumption that OG&E could acquire 1,900 MW of low cost wind energy in the alternative plans, but could acquire no additional wind under OG&E’s plan. A second major flaw in OER’s analysis is the questionable assumption that OG&E could acquire low cost existing combined cycle capacity in the alternative plans, but could not acquire such capacity under OG&E’s proposed compliance plan. As explained later in my testimony, if these and other questionable assumptions in OER’s analysis were corrected, the forecasted benefit of the OER’s alternative plans over OG&E’s proposal would be eliminated.

The major flaw in Sierra Club’s compliance plan analysis is the assumption that very high carbon prices will be enacted in the future. There is no basis for this assumption, which is inconsistent with both ICF’s own carbon price forecast for EPA, as well as the carbon compliance forecast of Synapse Energy, Sierra Club’s consultant in this case. As explained later in my testimony, if Sierra Club’s

1 analysis is adjusted to reflect a more reasonable carbon forecast, the forecasted  
2 benefits of implementing its alternative “no coal” compliance plans would be  
3 eliminated.  
4

5 **Rate Impact Analysis**

6 OER and Sierra Club witnesses fail to address or evaluate customer rate impacts  
7 of their alternative compliance proposals. This is a particularly serious flaw due  
8 to the fact that their “no coal” proposals would leave customers highly exposed to  
9 future natural gas and market price increases, without offering any suggestions as  
10 to how such impacts could be mitigated after the permanent loss of coal-fired  
11 energy on OG&E’s system occurs under their proposals.  
12

13 **Wind Energy Resources**

14 Virtually all parties in this proceeding have recognized the great value that  
15 additional wind energy could provide to OG&E as economy energy, a hedge  
16 against future natural gas price increases and as a low-cost means for mitigating  
17 carbon emissions on OG&E’s system. Given this broad consensus, I again  
18 recommend that that OG&E be encouraged to issue a request for proposals  
19 (“RFP”) for new wind energy as soon possible, and that additional cost-effective  
20 wind energy resources be included as a key element of the Company’s  
21 environmental compliance plan.  
22  
23



1 most all of the proposed compliance plans, including the Company's recommended  
 2 Scrub/Convert plan, there would be a significant reduction in coal-fired generation and  
 3 greater reliance upon natural gas and market energy purchases in the future. This will  
 4 result in higher and more volatile energy prices for OG&E's customers.

5 As shown in Table R1 below, under OG&E's proposed compliance plan, owned  
 6 coal-fired generating capacity on the Company's system would drop from its current  
 7 level of 37% of total installed capacity, to 21% under the Company's proposed  
 8 compliance plan, and to approximately 7% of total installed capacity under the OER and  
 9 Sierra Club proposed plans by 2020.

10  
 11

Table R1

OG&E's Owned Coal Capacity Mix, MW

	Current <u>2015</u>	OG&E Plan <u>2020</u>	OER/Sierra Club <u>2020</u>
Coal Capacity	2,540	1,542	500
Total Capacity	6,858	7,233	7,233
Coal % of Total	37.0%	21.3%	6.9%
Coal Reduction %		42.4%	81.3%

Source: OG&E's response to OIEC 1-16.

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The proposed 81% permanent reduction in coal-fired generating capacity proposed by OER and Sierra Club will greatly reduce fuel diversity of OG&E's system and could have severe economic consequences, particularly for Oklahoma consumers and industries that require large levels of energy for their operations.

1 Q. HAVE THE WITNESSES FOR OER AND SIERRA CLUB CONSIDERED HOW  
2 CUSTOMERS WOULD BE IMPACTED BY THE PERMANENT LOSS OF FUEL  
3 DIVERSITY THAT WOULD OCCUR UNDER THEIR RECOMMENDED  
4 COMPLIANCE PLANS?

5 A. No. Although both parties conducted certain gas price sensitivities in conjunction with  
6 their compliance analyses, as explained later in my testimony, these analyses are flawed  
7 and unreasonably biased in favor of their recommendations that four of OG&E's five  
8 coal units be retired or converted to natural gas by 2020. Moreover, the OER and Sierra  
9 Club witnesses have not addressed customer rate impacts including higher rate volatility  
10 due to the permanent loss of fuel diversity on OG&E's system resulting from their  
11 proposals. (See Exhibit SN-R1, OER's responses to OIEC 1-10 and 1-12 and Sierra  
12 Club's responsive testimony.)

13  
14 Q. WHY IS IT IMPORTANT TO CONSIDER FUEL DIVERSITY AND RATE  
15 IMPACTS WHEN EVALUATING OG&E ENVIRONMENTAL COMPLIANCE  
16 ALTERNATIVES?

17 A. As explained later in my testimony, the forecasted cost differences between OG&E's  
18 proposed Scrub/Convert plan and the Convert alternative which assumes conversion of  
19 four of OG&E's five coal units to natural gas by 2020 as generally supported by OER  
20 and Sierra Club, are relatively small when the uncertainty inherent in the compliance  
21 analyses is considered. For example, as summarized in Table R2 below, under OG&E's  
22 base case analysis the forecasted cost differences between the Company's proposed

1 “Scrub/Convert” plan and the “Convert” alternative is 0.6% (six tenths of one percent)  
2 over 30 years.

3 Table R2  
Forecasted Cost of OG&E Environmental Compliance Options  
Base Case, (2015-2044 Cumulative NPV, \$Billions)

		<u>%DIFF</u>
Scrub/Convert	\$22.351	-
Scrub	\$22.423	0.32%
Convert	\$22.484	0.60%
Scrub/Replace	\$23.229	3.93%
Replace	\$24.237	8.44%

Source: OG&E's response to OIEC 3-12, Attachment 86.

4  
5 This represents a very small difference in light of the uncertainty inherent in preparing a  
6 30-year forecast of SPP regional market operations, environmental policies and  
7 commodity price forecasts. Given the very small cost differences between OG&E's  
8 proposal and the Convert alternative, it is very important to consider secondary factors,  
9 such as fuel diversity and rate volatility, when judging the appropriate plan for OG&E  
10 and its customers. For example, as noted in Table 8 on page 28 of my responsive  
11 testimony, under OG&E's high gas price scenario, the proposed Scrub/Convert plan is  
12 forecasted to have a \$7.2 billion nominal cost advantage over the Convert compliance  
13 alternative.

14  
15 **Q. DO THE OER AND SIERRA CLUB WITNESSES EXPLICITLY ADDRESS THE**  
16 **IMPORTANCE OF FUEL DIVERSITY IN THEIR ANALYSIS OF OG&E'S**  
17 **ENVIRONMENTAL COMPLIANCE PLAN?**

1 A. No.

2

3 **Q. PLEASE SUMMARIZE YOUR CONCERNS REGARDING THE LOSS OF FUEL**  
4 **DIVERSITY THAT WOULD RESULT IF OER'S OR SIERRA CLUB'S**  
5 **ENVIRONMENTAL COMPLIANCE PROPOSALS FOR OG&E WERE TO BE**  
6 **IMPLEMENTED?**

7 A. The proposals of OER and Sierra Club to remove four of OG&E's five coal units from  
8 service by 2020 would permanently reduce OG&E's coal-fired generating capacity by  
9 more than 80%. This would significantly increase OG&E's reliance upon natural gas  
10 and SPP market purchases and almost certainly lead to higher and more volatile energy  
11 prices in the future. The failure of OER and Sierra Club witnesses to address the  
12 customer rate impacts due to the loss of fuel diversity under their proposals is a serious  
13 deficiency that the Commission should carefully consider in deciding the appropriate  
14 compliance plan for OG&E. To protect ratepayers, I recommend that the Commission  
15 only approve a plan that maintains the fuel diversity provided by OG&E's coal-fired  
16 generating assets at or near the current levels.

17

18 **IV. RATE IMPACTS OF PROPOSED COMPLIANCE PLANS**

19 **Q. HAVE ANY PARTIES OTHER THAN OIEC ADDRESSED THE RATE**  
20 **IMPACTS OF OG&E'S ENVIRONMENTAL COMPLIANCE PLAN**

21 A. Yes. Although OER and Sierra Club have ignored the customer rate impacts of their  
22 proposals, other parties, including OCC Staff witness Roach and Walmart witness Steve  
23 Chriss have expressed concerns regarding the potential rate impacts of OG&E's

1 environmental compliance plan and Mustang Modernization proposals, and have offered  
2 constructive recommendations to ensure that customers are protected to the extent  
3 possible from unreasonable cost increases under OG&E's environmental compliance  
4 proposal, and that the Company is held to traditional regulatory standards for recovery of  
5 costs of such plans.

6  
7 **Q. WHY IS IT IMPORTANT TO EXAMINE CUSTOMER RATE IMPACTS OF**  
8 **THE VARIOUS ENVIRONMENTAL COMPLIANCE PROPOSALS?**

9 A. The Commission must recognize that the environmental compliance plan costs presented  
10 in the testimonies of OG&E, OER and Sierra Club are simply estimates. Moreover, in  
11 comparing the various compliance options, these parties have focused for the most part  
12 on the cumulative present value of total costs of these plans (i.e., base rate and fuel) over  
13 the entire 30-year period addressed by their analyses. At best, these long-term forecasts  
14 are highly uncertain, and do not reflect the actual impacts of each plan on rates paid by  
15 OG&E's customers. However, from a customer's perspective, it is equally if not more  
16 important to know the near-term rate impacts of each plan, how such impacts will be  
17 allocated to each customer class, and the volatility in base rates and fuel charges that  
18 would result from each compliance plan. While OG&E has provided certain rate impact  
19 information for its proposal, OER and Sierra Club have essentially ignored rate impacts  
20 of their proposals. For example, under the OER and Sierra Club proposals there are  
21 likely to be near-term rate impacts associated with stranded cost recovery of OG&E coal  
22 units that are retired many years before the end of their useful operating lives. These and

1 other customer rate impacts of the OER and Sierra Club proposals have not been  
2 addressed to date.

3

4 **Q. WHAT IS YOUR OPINION REGARDING THE PROPOSAL OF OCC STAFF**  
5 **WITNESS ROACH TO CAP OG&E'S RECOVERY OF COSTS OF**  
6 **IMPLEMENTING THE COMPANY'S ENVIRONMENTAL COMPLIANCE**  
7 **PLAN?**

8 A. I agree with the essence of Mr. Roach's recommendation that OG&E should be held  
9 accountable for demonstrating the reasonableness of the costs of their environmental  
10 compliance plan in future regulatory proceedings. This would include a requirement that  
11 the Company demonstrate that any incurred variance from the costs assumed in justifying  
12 the proposed Scrub/Convert plan are reasonable. It should be noted that this is the  
13 standard that has traditionally been applied to major utility investments in past Oklahoma  
14 regulatory proceedings, so it should not be viewed as an extraordinary or higher standard  
15 for recovery.

16

17 **Q. SHOULD THE SAME STANDARD OF REVIEW APPLY TO ANY OG&E**  
18 **COMPLIANCE PLAN THAT IS ULTIMATELY APPROVED BY THE**  
19 **COMMISSION?**

20 A. Yes. It is important that the standard for review and recovery of environmental  
21 compliance costs be applied consistently to all compliance options, and that the  
22 Company's ultimate decision to select a compliance plan is not influenced by a perceived  
23 higher standard of regulatory scrutiny for any certain plan.

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**Q. DO YOU HAVE ANY OTHER COMMENTS REGARDING RATE IMPACTS OF THE ENVIRONMENTAL COMPLIANCE PROPOSALS OF OER AND SIERRA CLUB?**

A. Yes. Although I do not recommend adoption of the alternative compliance plan proposals advocated by OER and Sierra Club witnesses for the reasons addressed in my responsive and rebuttal testimonies, in the event the Commission determines that these alternative proposals should be adopted, it will be essential to evaluate the rate impacts of these proposals on each OG&E customer class. For example, it would not be equitable to require customers who consume large volumes of energy to disproportionately bear the cost of future fuel cost volatility and increases that would almost certainly result under the OER and Sierra Club proposals. The Commission should recognize that it will need to address such potential ratemaking equity issues in the event it adopts the OER or Sierra Club proposals.

**V. REBUTTAL TO OER’S RESPONSIVE TESTIMONY**

**Q. WHAT ARE THE PRIMARY RECOMMENDATIONS OF OER WITNESS JUDAH ROSE?**

A. OER witness Rose generally concludes that OG&E’s failure to evaluate wind energy resources and existing gas-fired generating facilities as future supply resources represents a fatal flaw in OG&E’s environmental compliance plan analysis. He further asserts that ICF’s analysis shows that alternative compliance plans that include 1,900 MW of new wind energy in combination with existing and new gas-fired power plants could produce

1 savings of approximately \$3.0 to \$3.3 billion when compared to OG&E's recommended  
2 Scrub/Convert plan. Based on these claimed estimated savings, Mr. Rose recommends  
3 that OG&E conduct market-based RFP for production tax credit ("PTC") qualified wind  
4 energy resources, existing natural gas-fired generating capacity, prior to moving forward  
5 with its environmental compliance proposal. He also recommends that OG&E conduct  
6 an RFP for alternatives to the proposed Mustang modernization plan.  
7

8 **Q. WHAT ALTERNATIVE COMPLIANCE PLANS WERE EVALUATED BY OER**  
9 **WITNESS ROSE?**

10 A. OER witness Rose evaluated six alternative compliance plans. All six plans assume that  
11 OG&E's Sooner Coal Units 1 and 2 are retired by 2020, that the Company acquires 1,900  
12 MW of new wind energy by 2020, and that the Company acquires existing power plants  
13 and a gas-fired new combined cycle by 2020. In three of the plans, OER witness Rose  
14 assumes that Muskogee coal Units 4 and 5 are retired by 2020, and in the other three  
15 plans he assumes that these units are converted to natural gas by 2020. Mr. Rose also  
16 evaluated risk associated with possible termination of the wind PTC by considering  
17 plans in which 100%, 50% and 0% of the full PTCs are in effect. Finally, Mr. Rose  
18 evaluated the impact of higher and lower gas prices on each of his six alternative  
19 compliance plans.  
20

21 **Q. HOW WOULD MR. ROSE'S ALTERNATIVE COMPLIANCE PLANS IMPACT**  
22 **THE FUEL DIVERSITY OF OG&E'S SYSTEM?**

1 A. As noted earlier in my testimony, each of Mr. Rose's alternative compliance plans would  
2 reduce OG&E's coal-fired generating capacity to approximately 7% of total system  
3 capacity by 2020, which would represent an 81% reduction from OG&E's existing level  
4 of owned coal-fired capacity.

5  
6 **Q. HAS MR. ROSE PREVIOUSLY TESTIFIED IN CASES INVOLVING UTILITY  
7 PROPOSALS TO RETROFIT COAL-FIRED POWER PLANTS WITH  
8 SCRUBBERS?**

9 A. Yes. Mr. Rose filed testimony on behalf of Public Service Company of Oklahoma's  
10 affiliate, Southwestern Electric Power Company ("SWEPCO"), in a 2012 regulatory  
11 proceeding before the Arkansas Public Service Commission ("APSC") involving the  
12 proposed retrofit of SWEPCO's Flint Creek coal-fired plant. (See APSC Docket No. 12-  
13 008-U.)

14  
15 **Q. IS THE FLINT CREEK PLANT SIMILAR IN SIZE AND VINTAGE TO OG&E'S  
16 SOONER AND MUSKOGEE COAL-FIRED UNITS?**

17 A. Yes. Flint Creek has a net dependable capacity rating of 528 MW and commenced  
18 commercial operations in 1978, and burns low-sulfur powder river basin coal. The  
19 Sooner and Muskogee units at issue in this case are rated between 500 MW and 520 MW,  
20 also burn low-sulfur powder river basin coal, and like Flint Creek, commenced  
21 commercial operations in the late-1970s.

22

1 Q. WHAT WAS MR. ROSE'S RECOMMENDATION REGARDING THE FLINT  
2 CREEK PLANT IN APSC DOCKET NO. 12-008-U?

3 A. Mr. Rose recommended that SWEPCO's Flint Creek coal-fired generating unit be  
4 retrofitted with scrubbers and maintained in service, citing the great fuel diversity value  
5 of coal as a primary basis for his recommendation. (See the testimony of Judah Rose in  
6 APSC Docket No. 12-008-U.)

7  
8 Q. DID THE APSC ADOPT MR. ROSE'S RECOMMENDATION THAT THE  
9 FLINT CREEK COAL PLANT BE RETROFITTED WITH SCRUBBERS?

10 A. Yes. (See the Final Order in APSC Docket No. 12-008-U.)

11  
12 Q. WHAT WERE MR. ROSE'S CONCLUSIONS REGARDING THE OPTION OF  
13 RETIRING AND REPLACING THE FLINT CREEK COAL PLANT WITH  
14 NATURAL GAS-FIRED GENERATION IN APSC DOCKET NO. 12-008-U?

15 A. Mr. Rose concluded that proposals by other parties that Flint Creek be retired and  
16 replaced with natural gas-fired generation, or converted to burn natural gas, were too  
17 costly and risky for ratepayers.

18  
19 My conclusion is the exact opposite regarding the natural gas conversion option,  
20 namely it is the worst option. This is because it is such an expensive option and  
21 carries huge risks. As shown by my direct testimony (see Exhibit 1), the natural  
22 gas conversion option is by far the most costly option.

23  
24 (See page 4 of Sur-surrebuttal testimony of Judah Rose in APSC Docket No. 12-008-U.)

25 The few coal plants being converted to natural gas-fired steam units are in very  
26 different circumstances than Flint Creek. The few plants undergoing this  
27 conversion are much smaller than Flint Creek and, as a consequence, have

1           prohibitively high retrofit costs. These plants are also older and have higher  
2           delivered coal costs than Flint Creek. The natural gas conversion option is not  
3           attractive because it results in a high emitting, inefficient, and inflexible power  
4           plant that exposes customers to extremely high costs in the event that natural gas  
5           prices are high.

6  
7           (See page 15 of the Sur-surrebuttal testimony of Judah Rose in APSC Docket No. 12-  
8           008-U.)  
9

10   **Q.   WHY HAS MR. ROSE REACHED ENTIRELY DIFFERENT CONCLUSIONS**  
11   **REGARDING THE COST-EFFECTIVENESS AND RISKS OF REPLACING**  
12   **OG&E COAL UNITS WITH NATURAL-GAS FIRED GENERATION IN THIS**  
13   **CASE?**

14   A.   While there have been changes in forecasted natural gas prices and other costs since the  
15   Flint Creek case, the primary difference between Mr. Rose's analysis of the coal  
16   replacement option in APSC Docket No. 12-008-U and his analysis of OG&E's  
17   compliance plan in this case appear to be due to unexplained changes in the method of his  
18   modeling of wind energy resources and existing gas-fired generating resources in both  
19   cases. In fact, Mr. Rose's treatment of these options in his evaluation of OG&E's  
20   environmental compliance plan is directly contrary to his analysis in the Flint Creek case  
21   and serves to greatly overstate benefits of his proposed coal replacement compliance plan  
22   for OG&E.

23  
24   **Q.   PLEASE EXPLAIN THE PROBLEMS WITH MR. ROSE'S TREATMENT OF**  
25   **WIND ENERGY RESOURCES IN THIS CASE.**

26   A.   Mr. Rose included 1,900 MW of new low-cost wind energy in his analyses of all six  
27   alternative compliance plans for OG&E, while he assumed no new wind energy in his

1 analysis of OG&E's proposed Scrub/Convert compliance plan. Because wind energy  
2 resources are forecasted to be lower than other energy options, this assumption obviously  
3 resulted in huge wind energy savings in his alternative plans which are not reflected in  
4 his analysis of OG&E's compliance plan.

5 Moreover, in his sur-surrebuttal testimony in the Flint Creek case in Arkansas,  
6 Mr. Rose criticized other parties for the very same inconsistent treatment of wind energy  
7 that he used in his analysis of OG&E compliance options in this case; i.e., overstating  
8 the benefits of replacing existing coal units with natural gas-fired resources by  
9 selectively including new wind energy resources in the analysis of such alternatives while  
10 assuming no wind could be purchased in cases where coal units were retrofitted and  
11 retained in service. (See pages 7-8 of the Sur-surrebuttal testimony of Judah Rose in  
12 APSC Docket No. 12-008-U.)

13

14 **Q. HAS MR. ROSE PROVIDED ANY EXPLANATION FOR INCLUDING NEW**  
15 **WIND ENERGY IN THE ANALYSIS OF HIS ALTERNATIVE PLANS BUT NOT**  
16 **IN ANALYZING OG&E'S PROPOSED COMPLIANCE PLAN?**

17 A. No. There is simply no basis for this assumption. In fact, in response to OIEC's  
18 discovery, Mr. Rose admits there is no reason why OG&E could not purchase similar  
19 levels of wind energy under the Company's compliance plan. (See Exhibit SN-R2,  
20 OER's response to OIEC 2-4.) Moreover, OG&E has clearly indicated in its direct  
21 testimony that the Company intends to acquire additional wind energy in the near future.  
22 (See page 20 of the direct testimony of OG&E witness Howell.) Mr. Rose's decision to  
23 ignore these facts underscores the unreasonableness of his assumption that the Company

1 would acquire additional wind energy only under OER's selected alternative compliance  
2 plans.

3  
4 **Q. WHAT IS THE IMPACT OF MR. ROSE'S SELECTIVE TREATMENT OF**  
5 **WIND ENERGY ON THE FORECASTED BENEFITS OF HIS PROPOSED**  
6 **ALTERNATIVE COMPLIANCE PLANS?**

7 A. As summarized in my Confidential Exhibit SN-R3, Mr. Rose's questionable treatment of  
8 new wind energy serves to overstate the forecasted benefits of these alternative  
9 compliance plans by approximately \$1.8 billion. When adjustments are made to  
10 eliminate the impact of Mr. Rose's questionable treatment of wind energy the total  
11 forecasted costs under OG&E's proposed compliance plan (as interpreted by Mr. Rose)  
12 and OER's alternative compliance plans are very close. (See last column of Confidential  
13 Exhibit SN-R3.) However, as discussed further below, there are other flaws in Mr.  
14 Rose's analysis that serve to overstate his forecasted cost advantage of compliance  
15 alternatives over OG&E's proposed plan.

16  
17 **Q. WHAT IS THE SECOND MAJOR FLAW IN MR. ROSE'S ANALYSIS OF**  
18 **ALTERNATIVES TO OG&E'S PROPOSED ENVIRONMENTAL**  
19 **COMPLIANCE PLAN?**

20 A. The second major flaw in Mr. Rose's analysis of OG&E environmental compliance  
21 options is his assumption that the Company could acquire 801 MW of relatively low cost  
22 capacity and energy from existing gas-fired generating facilities, plus another 700 MW of  
23 new gas-fired combined cycle generating capacity and energy in his alternative

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compliance plans, but would not be able to also acquire such low-cost resources under the Company’s proposed Scrub/Convert compliance plan. Moreover, this questionable treatment of existing generating capacity purchases by Mr. Rose is precisely the same inconsistent treatment that Mr. Rose criticized other parties for making in his testimony in the Flint Creek case in APSC Docket No. 12-008-U. (See page 19 of the Surrebuttal testimony of Judah Rose in APSC Docket No. 12-008-U.)

**Q. HAS MR. ROSE PROVIDED ANY EXPLANATION FOR INCLUDING EXISTING AND NEW GAS-FIRED COMBINED CYCLE GENERATING CAPACITY ACQUISITIONS IN THE ANALYSIS OF HIS ALTERNATIVE COMPLIANCE PLANS BUT NOT IN ANALYZING OG&E’S PROPOSED COMPLIANCE PLAN?**

A. No. There is no apparent basis for Mr. Rose’s assumption that OG&E could only acquire these relatively low-cost combined cycle resources in his alternative compliance scenarios. This assumption, serves to further bias Mr. Rose’s analysis in favor of his alternative plans and against OG&E’s proposed Scrub/Convert plan. Again, in response to discovery, OER witness Rose admits that OG&E could purchase similar or equal amounts of existing gas units under its proposed compliance case. (See Exhibit SN-R4, OER’s response to OIEC 2-5.) Moreover, OG&E’s proposed Scrub/Convert compliance plan explicitly includes new combined cycle capacity acquisitions. (See Exhibit SN-8 of my responsive testimony.) This fact makes Mr. Rose’s assumption that OG&E would not acquire any existing or new combined cycle capacity under the Company’s proposed compliance plan highly questionable.

1 Q. WHAT IS THE IMPACT OF MR. ROSE'S ASSUMPTION THAT OG&E COULD  
2 ACQUIRE EXISTING AND NEW COMBINED CYCLE CAPACITY ONLY IN  
3 HIS ALTERNATIVE PLANS ON THE FORECASTED BENEFITS OF SUCH?

4 A. In response to discovery, Mr. Rose indicates that he has not evaluated the impact of this  
5 assumption. (See Exhibit SN-R4.) However the approximate cost difference between a  
6 new combined cycle unit and Mr. Rose's assumed discounted capital cost for the  
7 assumed purchase of 801 MW from existing gas units is approximately \$320 million.  
8 This represents a lower bound estimate of the impact of Mr. Rose's questionable  
9 treatment of purchases from existing generating units, since there would also be improper  
10 operating cost savings related to this error.

11 The impact of Mr. Rose's assumption that OG&E could acquire 700 MW of new  
12 gas-fired combined generating capacity only in OER's alternative plans would also  
13 significantly inflate the forecasted benefits of his alternative plans since OG&E's IRP  
14 analysis indicates that combined cycle options provide greater benefits than gas-fired  
15 simple cycle combustion turbines which are the only new resource included by Mr. Rose  
16 in his analysis of OG&E's proposed compliance plan.

17  
18 Q. ARE THERE OTHER PROBLEMS WITH MR. ROSE'S ANALYSIS OF OG&E  
19 ENVIRONMENTAL COMPLIANCE OPTIONS?

20 A. Yes. As I just alluded to, Mr. Rose's analysis of "OG&E's Plan" is not really OG&E's  
21 plan at all, but rather a totally different resource plan that Mr. Rose has created. In  
22 particular, Mr. Rose's assumption that OG&E would add gas-fired simple cycle  
23 combustion turbine units to fulfill all future capacity requirements under its compliance

1 plan appears to be particularly baseless and arbitrary. OG&E's IRP analysis  
2 demonstrates that gas-fired combined cycle generating resources are the lowest  
3 reasonable cost option for supplying the Company's future capacity and energy  
4 requirements. Mr. Rose's assumption that the Company would instead construct all gas-  
5 fired simple cycle combustion turbines under his interpretation of "OG&E's Plan"  
6 obviously increases costs of "OG&E's Plan" due to the much lower efficiency (and  
7 therefore higher variable operating costs) of combustion turbine units. This serves to  
8 effectively engineer apparent savings of his alternative compliance scenarios by inflating  
9 the cost of "OG&E's Plan".  
10

11 **Q. HAS MR. ROSE PROVIDED ANY JUSTIFICATION FOR HIS ASSUMPTION**  
12 **THAT ALL FUTURE OG&E CAPACITY ADDITIONS WOULD BE GAS-FIRED**  
13 **COMBUSTION TURBINES WHEN THE COMPANY'S OWN ANALYSIS**  
14 **INSTEAD INCLUDES ALL COMBINED CYCLE RESOURCES?**

15 A. No. (See Exhibit SN-R4.)  
16

17 **Q. DOES OER WITNESS ROSE'S ANALYSIS OF ALTERNATE COMPLIANCE**  
18 **PLANS SUPPORT HIS RECOMMENDATION TO DELAY IMPLEMENTATION**  
19 **OF OG&E'S PROPOSED PLAN UNTIL RFP'S FOR WIND AND EXISTING**  
20 **GAS-FIRED GENERATING RESOURCES CAN BE CONDUCTED?**

21 A. No. OG&E's proposal is forecasted to provide similar if not higher benefits and much  
22 greater fuel diversity than OER's alternative plans once the flaws in Mr. Rose's analysis  
23 are corrected. Moreover, additional wind energy and acquisitions of existing gas-fired

1 resources should be evaluated to supply future energy and capacity requirements of  
2 OG&E's system under any compliance scenario, and therefore should not be used to  
3 delay implementation of the proposed Scrub/Convert compliance plan. The delay  
4 suggested by Mr. Rose could unnecessarily jeopardize OG&E's ability to meet the  
5 established RH deadlines and thereby result in penalties or replacement energy costs that  
6 are not justified by any forecasted benefit that could be derived from such delay.  
7

8 **Q. PLEASE SUMMARIZE YOUR REBUTTAL OF OER WITNESS ROSE'S**  
9 **ANALYSIS OF OG&E ENVIRONMENTAL COMPLIANCE OPTIONS.**

10 **A.** OER witness Rose's analysis is fatally flawed in several respects and, as a result, greatly  
11 overstates both the forecasted costs of OG&E's proposed compliance plan, and  
12 forecasted benefits of OER's alternative compliance plans. Furthermore, his proposed  
13 alternative compliance plans would reduce OG&E's coal-fired generating capacity by  
14 approximately 81% by 2020 and leave the Company and its customers highly reliant on  
15 volatile natural gas-fired energy and SPP market prices in the future. Mr. Rose's analysis  
16 should not be relied upon to delay implementation of OG&E's proposed Scrub/Convert  
17 compliance plan. Any such delay could jeopardize OG&E's ability to meet the required  
18 RH compliance deadline and result in unnecessary penalties or replacement energy costs.  
19

20 **VI. REBUTTAL TO SIERRA CLUB'S RESPONSIVE TESTIMONY**

21  
22 **Q. WHAT ARE THE PRIMARY RECOMMENDATIONS OF SIERRA CLUB**  
23 **WITNESSES FISHER, COMINGS AND WILSON REGARDING OG&E'S**  
24 **ENVIRONMENTAL COMPLIANCE PLAN?**

1 A. Sierra Club's three witnesses in this case, who are employees of Synapse Energy  
2 Economics, Inc., address various aspects of OG&E's environmental compliance plan and  
3 generally conclude that OG&E's compliance analysis is flawed and overstates benefits of  
4 the Company's proposed Scrub/Convert plan by failing to consider carbon cost risk in the  
5 base case analysis, by failing to adequately consider future environmental risk, and by  
6 failing to include additional wind generation in its modeling analyses. Moreover, Sierra  
7 Club witness Comings asserts that OG&E's own analysis demonstrates that the  
8 Company's recommended Scrub/Convert plan is not the least cost option. (See pages 13-  
9 14 of witness Comings' Responsive Testimony.)

10 **Q. WHAT ALTERNATIVE COMPLIANCE PLANS WERE EVALUATED BY**  
11 **SIERRA CLUB'S WITNESSES?**

12 A. Sierra Club witness Rachel Wilson Rose conducted the modeling of compliance plan  
13 alternatives to OG&E's proposed Scrub/Convert plan. Ms. Wilson indicates that she  
14 assumed that OG&E's CO2 sensitivity case represents a reasonable base case analysis for  
15 comparison purposes. She further indicates that she evaluated two additional compliance  
16 scenarios. The first scenario includes costs associated with the assumed installation of  
17 selective catalytic reduction ("SCR") systems on Sooner Units 1 and 2. The second  
18 scenario she evaluated used a higher CO2 control cost based on EPA estimates of the  
19 price necessary to comply with the EPA's recently proposed 111(d) rule. See page 7 of  
20 witness Wilson's Responsive Testimony.)

21  
22 **Q. HOW DID THE CHANGES MODELED BY SIERRA CLUB CHANGE THE**  
23 **RESULTS OF OG&E'S BASE CASE ANALYSIS?**

1 A. The results of Sierra Club's modeling analyses are presented in Table R4 below. As  
 2 shown, these alternative analyses do not materially impact the relative ranking of  
 3 OG&E's proposed Scrub/Convert plan, which is ranked first or second in each of the  
 4 scenarios evaluated by Sierra Club witness Wilson and only 1.55% higher on average  
 5 than Sierra Club's forecast of costs of the Convert option.  
 6

7 Table R4

Sierra Club Forecast of OG&E Environmental Compliance Option Costs  
 Base Case, (2015-2044 Cumulative NPV, \$Billions)

	<u>OGE Base</u>	<u>OGE CO2</u>	<u>Synapse CO2</u>	<u>Average</u>	<u>%DIFF</u>
Scrub/Convert	\$22.351	\$26.404	\$27.163	\$25.306	-
Scrub	\$22.423	\$27.049	\$27.911	\$25.794	1.93%
Convert	\$22.484	\$25.879	\$26.379	\$24.914	-1.55%
Scrub/Replace	\$23.229	\$26.867	\$28.009	\$26.035	2.88%
Replace	\$24.237	\$26.800	\$28.215	\$26.417	4.39%

8 Source: Table 1 on page 8 of Sierra Club witness Wilson's Responsive Testimony.  
 9

10 **Q. DOES THE FORECASTED DIFFERENCE BETWEEN THE SCRUB/CONVERT**  
 11 **AND CONVERT SCENARIOS PRESENTED IN ABOVE IN TABLE R4**  
 12 **SUPPORT SIERRA CLUB'S CONCLUSION THAT FOUR OF OG&E'S FIVE**  
 13 **COAL UNITS SHOULD BE CONVERTED TO NATURAL GAS?**

14 A. No. While a 1.55% cost differential between Scrub/Convert and Convert options might  
 15 justify the Convert option if all else was equal, the Convert option involves much higher  
 16 risk and would permanently reduce OG&E's existing coal-fired generating capacity by  
 17 more than 80%. In fact, OER witness Rose recognized the much higher risk and other

1 disadvantages of the coal conversion option in his testimony in APSC Docket No. 12-  
2 008-U:

3 The natural gas conversion option is not attractive because it results in a high  
4 emitting, inefficient, and inflexible power plant that exposes customers to  
5 extremely high costs in the event that natural gas prices are high.

6  
7 (See page 15 of the Sur-surrebuttal testimony of Judah Rose in APSC Docket No. 12-  
8 008-U.)  
9

10 **Q. DOES SIERRA CLUB'S ANALYSIS SUPPORT ITS EXPRESSED CONCERNS**  
11 **REGARDING THE POTENTIAL IMPACT OF FUTURE ENVIRONMENTAL**  
12 **RISKS UPON COSTS UNDER OG&E'S PROPOSED SCRUB/CONVERT**  
13 **COMPLIANCE PLAN?**

14 A. No. Sierra Club witness Wilson indicates that the assumed installation of SCR systems  
15 on OG&E's Sooner coal units, which are identified as the primary environmental risk  
16 faced by OG&E, would increase the cost under OG&E's proposed compliance plan from  
17 \$19.59 billion to \$19.612 billion. This represents an increase of 0.11% (eleven  
18 hundredths of one percent) over the 30-year study period, which is a very small increase  
19 given the uncertainty inherent in Sierra Club's compliance analysis.  
20

21 **Q. DO YOU AGREE WITH SIERRA CLUB WITNESS WILSON THAT OG&E'S**  
22 **CARBON FORECAST SENSITIVITY REPRESENTS A REASONABLE BASE**  
23 **CASE FORECAST FOR EVALUATING OG&E'S COMPLIANCE PLAN?**

24 A. No. It would be difficult to make any firm conclusions regarding the impact of EPA's  
25 proposed 111(d) carbon regulations for existing plants until the regulations are final.  
26 Even then, it will be years before there will be any certainty as to how the new carbon

1 regulations impact OG&E and its coal units, since that will depend on the compliance  
2 plan ultimately established by the State of Oklahoma. Moreover, OG&E's carbon  
3 forecast is much higher than the carbon forecast presented in this case by OER witness  
4 Rose, who is employed by ICF, EPA's primary consultant for modeling impacts of the  
5 proposed 111(d) regulations.  
6

7 **Q. PLEASE SUMMARIZE YOUR REBUTTAL OF SIERRA CLUB'S RESPONSIVE**  
8 **TESTIMONY REGARDING OG&E'S ENVIRONMENTAL COMPLIANCE**  
9 **OPTIONS.**

10 **A.** Sierra Club's claim that OG&E's own analysis indicates that the proposed Scrub/Convert  
11 plan is not the lowest reasonable cost option, ignores the fact that OG&E's proposal is  
12 highly ranked in most scenarios on a pure economic basis, and would provide much  
13 greater fuel diversity value than the Convert plan, which is the next highest ranked  
14 proposal. Moreover, to the extent Oklahoma law prohibits the Commission from  
15 reflecting costs of federal regulations which do not exist, as Sierra Club's analysis does,  
16 the results of Sierra Club's analysis should not be relied upon in determining the  
17 appropriate compliance plan for OG&E.  
18

19 **VII. FUTURE WIND ENERGY RESOURCES**

20 **Q. HAVE ANY PARTIES RECOMMENDED THAT OG&E NOT PURSUE**  
21 **ADDITIONAL WIND ENERGY PURCHASES IN THEIR RESPONSIVE**  
22 **TESTIMONY?**

1 A. No. There seems to be broad agreement among the parties that it would be prudent for  
2 OG&E to immediately solicit and evaluate new wind resources. In fact, OG&E has  
3 indicated in its testimony and in discovery responses that it intends to evaluate  
4 opportunities to acquire new wind resources in the near future.

5

6 **Q. DO YOU HAVE ANY COMMENTS OR RECOMMENDATIONS BASED ON**  
7 **YOUR REVIEW OF THE TESTIMONY REGARDING OG&E'S FUTURE WIND**  
8 **ENERGY PURCHASES?**

9 A. Yes. Given the broad consensus that OG&E should evaluate new wind energy purchases  
10 before the wind PTC expires, the historically low level of current wind energy prices, the  
11 value of wind as a means to mitigate carbon and other emissions, and the value of wind  
12 contracts as a long-term hedge against future natural gas and SPP market energy price  
13 increases, I again recommend that OG&E be encouraged to solicit bids to acquire  
14 additional wind energy as soon as possible.

15

16 **Q. IS ADDITIONAL WIND ENERGY POTENTIALLY AN ESSENTIAL ELEMENT**  
17 **OF OG&E'S ENVIRONMENTAL COMPLIANCE PLAN?**

18 A. Yes. To the extent that OG&E's wind energy RFP produces offers that are consistent  
19 with the results of the Company's 2013 wind solicitation, wind energy should be  
20 recognized as an essential element of OG&E's environmental compliance plan, since  
21 cost-effective wind energy would help hedge against future natural gas price risk as well  
22 as future environmental risk associated with the continued ownership of coal-fired  
23 generating assets under OG&E's Scrub/Convert plan. In this regard, it is important for

1 OG&E to act now to procure additional wind energy at the maximum levels it can  
2 reliably integrate into its system as a means of lowering and stabilizing future energy  
3 prices on its system and reducing power plant emissions. OG&E should be held  
4 accountable for acquiring additional cost-effective wind energy as a key component of its  
5 environmental compliance plan.  
6

7 **VIII. MUSTANG MODERNIZATION PLAN**

8  
9 **Q. HAVE ANY PARTIES RECOMMENDED THAT OG&E'S MUSTANG**  
10 **MODERNIZATION PLAN BE APPROVED AS PROPOSED BY THE**  
11 **COMPANY?**

12 **A.** No. There seems to be broad agreement among the parties that OG&E has not  
13 demonstrated that the proposed Mustang Modernization plan represents the lowest  
14 reasonable cost alternative for replacing the existing Mustang gas units.  
15

16 **Q. DO YOU HAVE ANY COMMENTS BASED ON YOUR REVIEW OF THE**  
17 **RESPONSIVE TESTIMONY REGARDING OG&E'S PROPOSED MUSTANG**  
18 **MODERNIZATION PLAN?**

19 **A.** Yes. OCC Staff witness Craig Roach and Oklahoma Cogeneration witness Dan Peaco  
20 recommend that OG&E be required to conduct a competitive solicitation for generating  
21 capacity to replace the retired Mustang units. I do not believe it is appropriate to order  
22 OG&E to conduct such a solicitation until the Company is able to demonstrate that  
23 retirement of the Mustang units is necessary and that such capacity must be replaced  
24 under the timeline proposed by OG&E. Evidence presented in my responsive testimony

1 indicates that there are no apparent operating problems that would require immediate  
2 retirement of the existing Mustang gas units as proposed by OG&E. In light of the  
3 significant costs of implementing OG&E's compliance plan and other costs anticipated  
4 over the next five years, and due to uncertainty which presently exists regarding the  
5 manner in which the existing units or new replacement units would operate in the new  
6 SPP integrated market, it would be reasonable and appropriate to defer any decision to  
7 retire and replace the existing Mustang units until such actions are shown to be truly  
8 necessary.

9

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

11 A. Yes; however, I reserve the right to supplement this testimony if necessary to respond to  
12 any new issues which may be raised in the rebuttal testimony filed by OG&E or other  
13 parties.

SN-R1

**Oklahoma Industrial Energy Consumers  
Data Request OER-1  
Cause No. PUD 201400229**

10. Provide the estimated annual rate impacts (base rate and fuel) for OG&E customers for each of the first ten years of each of the analyses of environmental compliance plans addressed in the responsive testimony of OER witness Rose.

**Response:** Mr. Rose did not perform this analysis.

Response provided by:  
Response provided on:  
Contact & Phone No:

Judah L. Rose  
January 7, 2015  
Cheryl Vaught (405) 848-2255

\*By responding to these Data Requests, OER is not indicating that the provided information is relevant or material and OER is not waiving any objection as to relevance or materiality or confidentiality of the information or documents provided or the admissibility of such information or documents in this or in any other proceeding.

**Oklahoma Industrial Energy Consumers**  
**Data Request OER-1**  
***Cause No. PUD 201400229***

12. Discuss actions recommended by OER witness Rose to mitigate the increased fuel price risk on the OG&E system that would result from the loss of fuel diversity due to the retirement or conversion of coal-fired generating units under the alternative environmental compliance plans addressed in his responsive testimony when compared to OG&E's proposed Scrub/Convert plan.

**Response:** These issues are outside the scope of Mr. Rose's analysis.

Response provided by: Judah L. Rose  
Response provided on: January 7, 2015  
Contact & Phone No: Cheryl Vaught (405) 848-2255

\*By responding to these Data Requests, OER is not indicating that the provided information is relevant or material and OER is not waiving any objection as to relevance or materiality or confidentiality of the information or documents provided or the admissibility of such information or documents in this or in any other proceeding.

SN-R2

**Oklahoma Industrial Energy Consumers**  
**Data Request OER-2**  
*Cause No. PUD 201400229*

4. Confirm that ICF's analysis of the "OGE 2014 IRP Capacity Expansion Plan" assumes no additional wind energy additions beyond OG&E's existing wind resources, while other cases evaluated by ICF assume 1,900 MW (nameplate) of new wind energy is added to OG&E's system. Explain why OG&E could not purchase similar if not equal levels of wind energy in the IRP case, and provide the estimated impact on APC for OG&E in the IRP case resulting from this assumed difference in wind resources.

**Response:** Mr. Rose confirms that in the "OGE 2014 IRP Capacity Expansion Plan", OGE does not own or control addition wind capacity beyond its existing wind resources. Furthermore, Mr. Rose confirms that in the other cases, OGE has the additional ownership of 1,900 MW of wind capacity. OGE could purchase similar or equal amounts of wind in its IRP case, but this would require a modification by OGE to its IRP Capacity Expansion Plan. Unless and until OGE makes that choice, Mr. Rose could not include additional wind and still refer to it as the OGE IRP plan. While such a scenario could be run and be referred to by a different name other than OGE IRP plan, Mr. Rose did not perform such an analysis.

Response provided by:	<u>Judah L. Rose</u>
Response provided on:	<u>January 8, 2015</u>
Contact & Phone No:	<u>Cheryl Vaught (405) 848-2255</u>

\*By responding to these Data Requests, OER is not indicating that the provided information is relevant or material and OER is not waiving any objection as to relevance or materiality or confidentiality of the information or documents provided or the admissibility of such information or documents in this or in any other proceeding.

SN-3

**This Exhibit is Confidential**



**Oklahoma Industrial Energy Consumers**  
**Data Request OER-2**  
**Cause No. PUD 201400229**

5. Confirm that ICF's analysis of the "OGE 2014 IRP Capacity Expansion Plan" assumes no purchases of capacity from existing gas units while, while other cases evaluated by ICF assume significant purchases of existing capacity beginning in 2018. Explain why OG&E could not purchase similar if not equal levels of existing capacity in the IRP case, and provide the estimated impact on APC for OG&E in the IRP case resulting from this assumed difference in existing capacity purchases.

**Response:** Mr. Rose confirms that in the "OGE 2014 IRP Capacity Expansion Plan", OGE does not purchase additional capacity from existing gas units other than those mentioned in Exhibit ICF C-9 of Mr. Rose's testimony. Furthermore, Mr. Rose confirms that in the other cases, OGE purchases capacity from other gas units starting in 2018. OGE could purchase similar or equal amounts of existing gas units in its IRP case, but this would require a modification by OGE to its IRP Capacity Expansion Plan. Unless and until OGE makes that choice, Mr. Rose could not include existing gas plants in this case and still refer to it as the OGE IRP plan. While such a scenario could be run and be referred to by a different name other than OGE IRP plan, Mr. Rose did not perform such an analysis.

Response provided by:  
Response provided on:  
Contact & Phone No:

Judah L. Rose  
January 8, 2015  
Cheryl Vaught (405) 848-2255

\*By responding to these Data Requests, OER is not indicating that the provided information is relevant or material and OER is not waiving any objection as to relevance or materiality or confidentiality of the information or documents provided or the admissibility of such information or documents in this or in any other proceeding.

**Oklahoma Industrial Energy Consumers**  
**Data Request OER-2**  
***Cause No. PUD 201400229***

9. Explain why the OG&E IRP Plan analysis presented in OER witness Rose's responsive testimony reflects all new gas-fired generating unit additions as CTs while OG&E's IRP analysis reflects that all new gas-fired generating unit additions would be combined cycle units and provide the estimated impact of this difference on APC for OG&E in the IRP case.

**Response:** Mr. Rose used the combustion turbine alternative to avoid creating surplus capacity conditions in the OGE system. Surplus capacity conditions would have occurred if combined cycles were used in the near term. ICF did not perform other alternative approaches.

Response provided by: Judah L. Rose  
Response provided on: January 8, 2015  
Contact & Phone No: Cheryl Vaught (405) 848-2255

\*By responding to these Data Requests, OER is not indicating that the provided information is relevant or material and OER is not waiving any objection as to relevance or materiality or confidentiality of the information or documents provided or the admissibility of such information or documents in this or in any other proceeding.