OWEN Electric

A Touchstone Energy Cooperative

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PUBLIC SERVICE COMMISSION

# Case No. 2012-00428

## COMMISSION STAFF'S FIRST REQUEST FOR INFORMATION

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March 20, 2013

Mr. Jeff Derouen, Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
P.O. Box 615
Frankfort, Kentucky 40602-0615

RE: **Owen Electric Cooperative, Inc.**
**PSC Case No. 2012-00428**

Dear Mr. Derouen:

Please find enclosed the original and fourteen (14) copies of the responses of Owen Electric Cooperative, Inc., to the Commission Staff's "First Request for Information" posted on February 27, 2013, in Case No. 2012-00428.

Please contact me with any questions regarding this filing.

Respectfully yours,

CRAWFORD & BAXTER, P.S.C.

James M. Crawford
Attorney for Owen Electric Cooperative, Inc.

JMC/mns

cc: Attorney General
Utility Intervention and Rate Division
1024 Capital Center Drive
Frankfort KY 40601

CERTIFICATE OF SERVICE

I hereby certify that a true copy of the above Responses to Commission Staff's "First Request for Information" was served via e-mail to all parties on the 20th day of March, 2013, to the following:

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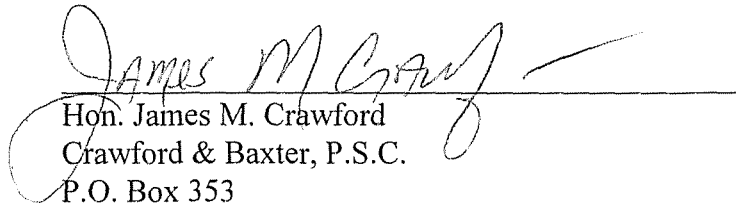

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COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

| | | |
|---|---|---|
| CONSIDERATION OF THE IMPLEMENTATION | ) | CASE NO. |
| OF SMART GRID AND SMART METER | ) | 2012-00428 |
| TECHNOLOGIES | ) | |

COMMISSION STAFF'S FIRST REQUEST FOR INFORMATION

The jurisdictional electric utilities,[1] the jurisdictional gas utilities[2] (collectively the "jurisdictional utilities") which have been made parties to this case and the Community Action Council for Lexington-Fayette, Bourbon, Harrison and Nicholas Counties, Inc., which has been granted intervention, pursuant to 807 KAR 5:001, are requested to file with the Commission the original and 14 copies of the following information, with a copy to all parties of record. The information requested herein is due not later than March 20, 2013. Responses to requests for information shall be appropriately bound, tabbed and indexed. Each response shall include the name of the witness responsible for responding to the questions related to the information provided.

[1] The jurisdictional electric utilities which have been made parties to this case are: Big Rivers Electric Corporation; Big Sandy Rural Electric Cooperative Corporation; Bluegrass Energy Cooperative Corporation; Clark Energy Cooperative Inc.; Cumberland Valley Electric; Duke Energy Kentucky, Inc.; East Kentucky Power Cooperative; Farmers Rural Electric Cooperative Corporation; Fleming-Mason Energy Cooperative; Grayson Rural Electric Cooperative Corporation; Inter-County Energy Cooperative Corporation; Jackson Energy Cooperative; Jackson Purchase Energy Corporation; Kenergy Corporation; Kentucky Power Company; Kentucky Utilities Company; Licking Valley Rural Electric Cooperative Corporation, Louisville Gas and Electric Company, Meade County Rural Electric Cooperative; Nolin Rural Electric Cooperative Corporation; Owen Electric Cooperative; Salt River Electric Cooperative Corporation; Shelby Energy Cooperative Inc.; South Kentucky Rural Electric Cooperative Corporation; and Taylor County Rural Electric Cooperative Corporation.

[2] The jurisdictional gas utilities which have been made parties to this case are: Atmos Energy Corporation; Columbia Gas of Kentucky, Inc.; Delta Natural Gas Company, Inc.; Duke Energy Kentucky, Inc.; and Louisville Gas and Electric Company.

Each response shall be answered under oath or, for representatives of a public or private corporation or a partnership or association or a governmental agency, be accompanied by a signed certification of the preparer or the person supervising the preparation of the response on behalf of the entity that the response is true and accurate to the best of that person's knowledge, information, and belief formed after a reasonable inquiry.

The parties shall make timely amendment to any prior responses if they obtain information which indicates that the response was incorrect when made or, though correct when made, is now incorrect in any material respect. For any request to which the parties fail or refuse to furnish all or part of the requested information, they shall provide a written explanation of the specific grounds for their failure to completely and precisely respond.

Careful attention shall be given to copied material to ensure that it is legible. When the requested information has been previously provided in this proceeding in the requested format, reference may be made to the specific location of that information in responding to this request. When applicable, the requested information shall be separately provided for total company operations and jurisdictional operations.

The Community Action Council for Lexington-Fayette, Bourbon, Harrison and Nicholas Counties, Inc. ("CAC") is to respond to the following questions:

1. Refer to the Direct Testimony of Charles D. Lanter ("Lanter Testimony") page 2, lines 27-29. Describe the types of cost benefits that Mr. Lanter believes should be provided to the consumers to offset Smart Grid investments. Provide any examples.

2. On pages 3 and 4, Mr. Lanter describes the various programs operated by CAC. Identify any programs that would be harmed by cost-effective Smart Grid investments.

3. Identify any problems or concerns CAC has with the use of smart meters (Automated Metering Infrastructure ["AMI"] that provide for two-way communication). State whether customers should be allowed to opt out of the use of smart meters. If the response is no, explain why not. If yes, describe the circumstances or conditions under which opt out should be allowed.

4. The following questions refer to the Lanter Testimony, page 5, lines 1-19, regarding who should bear the cost of Smart Grid investment.

a. Provide the average age of transformers in Kentucky and explain how it compares to the 40 years referenced in the testimony.

b. Identify what maintenance has been deferred.

c. Identify the replacement failures that have occurred.

d. Cite any Kentucky statute, regulation, reported court opinion, or Commission order that would support the assertion that regulated investor-owned utilities "are guaranteed and receive a reasonable rate of return" on their investments.

e. Provide a detailed explanation as to how a Kentucky regulated investor-owned utility could operate without exposing its shareholders to risk.

f. If utilities were required to return "every dollar saved by the implementation of Smart Grid devices and systems" to ratepayers after recovering reasonable capital expenditures, explain how the Commission would incentivize those utilities to invest in Smart Grid facilities.

5. Refer to the Lanter Testimony, page 5, lines 21-40 regarding Time of Use ("TOU") rates.

a. Explain how implementation of TOU rates should be limited.

b. Provide in detail the support for the statement that "...Smart Grid investments rely in part on Time of Use rate structures to recoup investment costs...."

6. The following questions refer to the Lanter Testimony, page 6, lines 1-16 regarding the utilities' ability to remotely disconnect customers.

a. Explain how the ability to remotely disconnect could increase shutoffs.

b. Assuming that the terms and conditions under which utilities are able to remotely disconnect are set forth in each utility's tariff, explain whether Mr. Lanter suggests that these terms and condition will be changed to accommodate Smart Grid applications or that utilities will not comply with their existing tariff provisions with regard to disconnection of service.

7. The following questions refer to the Lanter Testimony, page 6, lines 29-37 regarding the discussion of the customer charge. In addition to its belief that a higher customer charge reduces a customer's incentive to pursue conservation, state whether CAC also believes that a higher customer charge provides the customers with erroneous price signals.

8. As a party to Kentucky Utilities Company's ("KU") most recent rate case, 2012-00221,[3] CAC was a signatory in that case to the unanimous settlement, which was accepted by the Commission and which included an increase in KU's residential

[3] Case No. 2012-00221, *Application of Kentucky Utilities Company for an Adjustment of Its Electric Rates* (Ky. PSC, Dec. 20, 2012).

customer charge of approximately 26.5 percent. On pages 7-11 of the order accepting the settlement, the Commission discussed the residential customer charge and demonstrated, at different usage levels, that the difference in a customer's bill with no increase in the customer charge and with the increase contained in the settlement was minimal. Given those results and Mr. Lanter's acknowledgement that the rate changes he discusses reflect a "slow shifting of rate structures to higher fixed customer charges," explain how he determined that such rate structures cause customers to "lose their incentive to conserve ...."

9. State whether CAC has any objection to the voluntary use of prepaid meters.

10. With reference to Mr. Lanter's summary of his position regarding Smart Grid investments, explain why Smart Grid investment should be treated differently than any other utility investment in its infrastructure.

11. State whether CAC believes that customer information and other information that can be gathered from smart meters belongs to the customer or the customers' energy provider.

Big Rivers Electric Corp. ("Big Rivers"), Jackson Purchase Energy Corp. ("Jackson Purchase"), Kenergy Corp. ("Kenergy"), and Meade County Rural Electric Cooperative Corp. ("Meade County") (collectively referred to as "Big Rivers and each member") are to respond to the following questions:

12. Refer to page 6 of the Direct Testimony of Roger D. Hickman ("Hickman Testimony"), lines 19-20. Provide a description of the Cooperative Research Network ("CRN"), including the types of research it performs, its membership, and its funding sources.

13. Refer to the Hickman Testimony regarding the experience of Jackson Purchase and Meade County with Smart Grid investments, pages 8-11.

a. State the capabilities of Jackson Purchase's and Meade County's AMI meters.

b. State which AMI capabilities Jackson Purchase and Meade County utilize and whether each cooperative plans to utilize more of the capabilities in the future.

c. State whether Jackson Purchase's self-healing network is limited to the three substations surrounding the Kentucky Oaks Mall.

i. If the response is no, provide a further description of Jackson Purchase's self-healing network.

ii. If yes, provide any plan Jackson Purchase has for expansion of the self-healing network.

14. Refer to page 9 of the Hickman Testimony, at lines 11-16, concerning technical issues related to Jackson Purchase's AMI system.

a. Provide an explanation as to why Jackson Purchase's AMI system is unable to remotely read 500-1,000 meters on a monthly basis.

i. Is the problem isolated to the same 500-1,000 meters each month?

ii. Other than installing repeaters, what steps has Jackson Purchase taken to address and resolve this issue?

b. Regarding the band-rate issues, what steps has Jackson Purchase taken to address and resolve this issue?

c. State whether it is likely that the band-rate issues identified by Jackson Purchase are correctable, and if so, provide the potential cost of correcting the issues. If such issues are not correctable, explain why Jackson Purchase chose to implement a full-scale AMI system rather than an Automated Meter Reading ("AMR") system, given that future AMI options are limited.

15. Refer to the Hickman Testimony, page 10, regarding the experience of Kenergy with Smart Grid investments.

a. Provide a more detailed explanation of Kenergy's pilot programs and the results of the pilots.

b. Provide with more specificity the reasons why Kenergy suspended its two AMI pilot programs.

c. What is the current timeline for the full system deployment feasibility study? Provide a copy of the study when completed.

16. Refer to the Hickman Testimony, page 11 regarding the experience of Meade County with Smart Grid investments. Describe any self-healing network that Meade County operates.

17. Refer to page 12 of the Hickman Testimony. Fully explain the rationale why Big Rivers believes that not all Smart Grid investments necessarily would be subject to approval by the Commission, pursuant to KRS 278.020.

18. Refer to the Hickman Testimony, page 13 beginning at line 18, which states that Big Rivers and its member cooperatives believe any Smart Grid investment standard adopted by the Commission should also clearly define the Commission's position regarding cost recovery. State whether Big Rivers and its member

cooperatives have a position concerning the cost-recovery mechanism that should be used if a Smart Grid investment standard is adopted.

19. Refer to the Hickman Testimony beginning on page 16 regarding dynamic pricing.

a. Describe the type of cost-benefit analysis that should support dynamic pricing.

b. Identify which forms of dynamic pricing (TOU pricing, critical peak pricing, real-time pricing, etc.) that each Big Rivers member cooperative can implement. Explain your response.

20. Refer to the Hickman Testimony, page 20, lines 7-16, regarding the data network architecture for Smart Grid technology.

a. Identify the areas of Big Rivers and each member cooperative that are not Internet Protocol ("IP") ready.

b. Identify the network architecture that Big Rivers and each member cooperative support. Explain.

21. Refer to the Hickman Testimony, page 21, lines 12-21 and page 22, lines 1-2. Explain procedurally how any university research can be performed in conjunction with EPRI, IEEE, EEI, and NRECA/CRN.

22. Refer to the Hickman Testimony, page 25 which discusses the belief of Big Rivers and its member cooperatives that energy-efficiency upgrades to housing and small-commercial structures is a better, more cost-effective option to increase energy conservation and efficiency than Smart Grid and/or smart meter implementation.

Provide the current efforts of Big Rivers and its member cooperatives to encourage and promote energy-efficiency upgrades to housing and small-commercial property.

23. Refer to the Hickman Testimony, page 25, lines 18-21. Provide the specific features Big Rivers and its member cooperatives believe should be included in the opt-out provisions of any programs involving smart meters.

Duke Energy Kentucky, Inc. ("Duke Kentucky") is to respond to the following questions:

24. Kentucky has traditional vertically integrated utilities and has not experienced deregulation to the extent of Duke Energy Ohio.

a. State whether there are any aspects of the traditionally regulated utility structure found in Kentucky that in Duke Kentucky's opinion make dynamic pricing any more or less difficult to implement in Kentucky than in Ohio.

b. State whether there are any aspects of the traditionally regulated utility structure found in Kentucky that in Duke Kentucky's opinion make grid modernization any more or less difficult to implement in Kentucky than in Ohio.

c. State whether there are any aspects of the traditionally regulated utility structure found in Kentucky that in Duke Kentucky's opinion make grid modernization any more or less beneficial in Kentucky than in Ohio.

25. Refer to the Direct Testimony of Mark D. Wyatt ("Wyatt Testimony"), page 3, lines 13-22, regarding Duke Energy Corp.'s ("Duke Energy") investment in grid modernization technologies.

a. Describe in more detail what is meant by the term "near-real time" communication.

b. If not addressed elsewhere, identify and describe definitive examples of the technologies that have been implemented and the resulting improvements and benefits that have been experienced and measured.

c. Identify and describe technologies or projects that Duke Energy plans to implement in the future. Include a discussion of the anticipated improvements and benefits.

26. Refer to the Wyatt Testimony, page 4, lines 2-8. Explain in more detail how deploying advanced energy technologies and modernizing the power grid will provide Duke Energy's customers with more choice and control of their energy usage.

27. Refer to the Wyatt Testimony, page 5, regarding Actual Metering.

a. Provide the number of gas meters located inside the homes of Kentucky residential customers that Duke Kentucky must read by entering the customers' premises.

b. Provide the number of electric meters located inside the homes of Kentucky residential customers that Duke Kentucky must read by entering the customers' premises.

c. For a. and b. above, explain how often these meters are read and how often they are estimated.

28. Refer to the Wyatt Testimony, pages 5 and 6, regarding Remote Connections/Disconnections. Explain whether Duke Kentucky expects disconnects to increase with the deployment of the technology that allows for remote connections and disconnections.

29. Refer to the Wyatt Testimony, page 7, lines 16-19, regarding Distribution Automation ("DA"), self-healing technology and automated distribution line power devices.

a. Describe how and by what signal these automated devices are activated, and how or if these devices interact automatically with one another.

b. Identify any other devices that are available on the market and are being considered by Duke Energy. Describe how such automated devices operate and would interact with the other devices currently in use.

30. Refer to the Wyatt Testimony, page 10, lines 17-22, and page 11, lines 1-2, regarding Duke Energy's evaluation of vendors of smart products. Provide a list of the vendors currently utilized by Duke Energy in the development of the referenced architecture. Include details regarding the products they manufacture as well as the function of the product as it relates to Duke Energy's grid modernization program.

31. Refer to the Direct Testimony of Timothy J. Duff ("Duff Testimony") regarding dynamic pricing on pages 3 and 4.

a. Explain what prompted Duke Energy Ohio to undertake dynamic pricing in Ohio.

b. Describe the efforts that have been undertaken to implement dynamic pricing in Kentucky.

32. Refer to the Duff Testimony, page 3, lines 12 through 14, which describes time-based pricing of electric services: "time-of-use pricing (TOU pricing), whereby electricity prices are set for a specific time period on an advance or forward basis,

typically not changing more often than twice a year." Explain why Duke Energy does not consider rates changing twice per day (on-peak and off-peak) as TOU pricing.

33. Refer to the Duff Testimony, pages 4 and 5, regarding the Ohio stakeholders involved in discussions to facilitate the Smart Grid program. Identify the stakeholders referenced in the Testimony. Identify the Ohio Collaborative members referenced if that group is different from the stakeholders' referenced above.

34. Refer to the Duff Testimony, pages 3 and 4, regarding dynamic pricing. Identify any of the dynamic-pricing or time-differentiated rates that Duke Energy Ohio has made available to Ohio customers that are not voluntary. In your response, identify each dynamic-pricing tariff available from Duke Energy Ohio in Ohio.

35. Refer to the Duff Testimony, page 6, lines 19 through 22, which states:

> As a result, Duke Energy Ohio decided it would be prudent to give customers some experience with the new meters prior to moving forward with new rates. This plan was successful as evidenced by the fact that Duke Energy Ohio received very few complaints associated with the accuracy of the new meters to date.

Provide the following:

a. The number of the "new meters" Duke Energy Ohio installed, along with the total number of Duke Energy Ohio customers.

b. The number of complaints associated with the accuracy of the "new meters" Duke Energy Ohio has received to date.

36. Refer to the Duff Testimony regarding the two Ohio dynamic-pricing programs (TD-AM and PTR).

a. Provide the current status of each pilot.

b. If not addressed above, state whether these tariffs are currently available on a system wide basis.

c. State whether availability of either tariff was limited due to equipment, software, or other items.

d. Regarding the concerns outlined relating to the TD-AM and PTR pilots, state whether there are similar concerns that Duke Kentucky would need to address if such programs were offered in Kentucky.

37. Refer to the Duff Testimony regarding the Home Energy Management Device ("HEM"). Provide a more detailed description of the HEM and a discussion of how it allows for or assists in the control of air conditioners and pool pumps.

38. Refer to the Duff Testimony, page 10, lines 13-17 regarding the "TD-Lite" and HEM pilot program. The last sentence states, "A much higher acquisition rate was achieved." Provide the acquisition rate.

39. Refer to the Duff Testimony, pages 18 and 19, regarding the recommendation about residential dynamic-pricing opportunities in Kentucky.

a. Provide in greater detail Duke Kentucky's concerns regarding the confusion customers might experience by pursuing dynamic pricing while pursuing grid modernization.

b. Explain in greater detail what is meant by the term "full deployment," as used in the context of this discussion.

40. Refer to the Duff Testimony, pages 19 and 20, regarding Duke Energy Ohio's experience with dynamic pricing.

a. Provide a more detailed explanation of why a utility will receive less revenue yet incur the same level of cost if no shift of usage occurs.

b. State whether a shift in usage should be required for customers who wish to participate in dynamic-pricing programs.

c. State whether a requirement to shift usage would punish customers whose normal usage patterns fit the parameters of a dynamic-pricing program.

41. Refer to the Testimony of Don Wathen ("Wathen Testimony") pages 3 and 4, regarding Duke Energy Ohio's implementation of a full-grid modernization initiative and the tracker used to recover Grid Modernization ("GM") expenditures. Describe in more detail what is meant by incremental capital investment and incremental plant as used in this discussion. Include in the discussion any differences between incremental plant and any typical plant investment.

42. Refer to the Wathen Testimony, page 5. Provide a detailed discussion of the financial and physical audits.

43. Refer to the Wathen Testimony, page 6, regarding the discussion relating to the deployment of GM in Ohio. Explain in detail why deployment would be slower without a tracker if GM is cost-effective.

44. Refer to the Wathen Testimony, page 7, lines 15-23, regarding Duke Energy Ohio's ability to maximize the potential benefits of GM for both gas and electric customers. Describe the benefits of GM to gas customers.

45. Refer to the Wathen Testimony, pages 8 and 9, regarding savings from GM. Other than meter reading expenses, identify specific O&M savings.

46. Refer to the Direct Testimony of Donald L. Schneider, Jr. ("Schneider Testimony"), page 3, line 20 through page 4, line 20, regarding the implementation of a "new Distribution Management System." If not provided elsewhere, provide a detailed discussion of this system.

47. Refer to the Schneider Testimony, page 4, lines 4-5, regarding GM and emerging technologies. If not provided elsewhere, identify and describe these emerging technologies, including cost and manufacturer information, as well as function and operation information related to the devices.

48. Refer to the Schneider Testimony, page 5, regarding AMI deployment in Ohio.

a. Explain the meaning of "communication nodes."

b. Lines 12-14 discuss the process of certification of meters. Provide the typical timeframe for this process.

49. Refer to the Schneider Testimony, page 5, lines 9-18, regarding the AMI project in Ohio. Provide the same statistics for Kentucky.

50. Refer to the Schneider Testimony, page 6, lines 5-12, regarding DA deployment in Ohio. Provide the same statistics for Kentucky.

51. Refer to the Schneider Testimony, page 7, regarding Hard to Access ("HTA") meters.

a. If not provided previously, provide the number of both gas and electric HTA meters in the Duke Kentucky service area.

b. If not provided previously, provide the per-meter cost and total cost to read each gas and electric HTA meter.

c. State whether Duke Kentucky believes that it is equitable for all customers to bear any additional costs to read HTA meters.

d. Describe any plans Duke Kentucky has to reduce the number of HTA meters.

52. Refer to the Schneider Testimony, page 8, regarding Duke Energy Ohio's GM deployments.

a. At lines 16-17, the testimony indicates that increased customer reliability is evident through reductions seen in the System Average Interruption Frequency Index ("SAIFI") values.

i. Provide an annual comparison of SAIFI values system wide since the deployment of Duke Energy Ohio's GM began.

ii. Provide some examples of specific circuits in which annual SAIFI values have improved and provide an annual comparison of SAIFI values for those circuits since deployment began.

b. At lines 20-23, regarding the 20 self-healing operations which have resulted in savings, identify the 20 operations and describe how each led to the experienced benefit.

53. Describe any complaints regarding GM or smart meters expressed by Ohio customers.

54. State whether smart meters are required in Duke Energy Ohio's service area and whether there are opt-out provisions.

55. Describe any self-healing, sectionalization and remote-control efforts in Duke Kentucky's service area.

56. Describe the "self-healing team solution" as referenced on page 10 of the Schneider Testimony.

57. Refer to page 9 of the Schneider Testimony. Duke Energy's installation of three self-healing teams is mentioned as part of the utility's "normal reliability and integretity [sic] program" aimed at improving distribution system reliability. The claim is made that, due to the success of self-healing teams put in place as part of the GM deployment in Ohio, Duke Energy now has "the self-healing team solution as another tool in our toolbox for reliability improvement solutions."

a. Assuming Mr. Schneider meant to use "integrity," provide a definition of integrity as used in the context of this statement.

b. Provide specific details related to what is meant by a "self-healing team." Include any information as to the size, components, system, responsibilities, and personnel involved as part of the teams.

58. Refer to the Schneider Testimony, page 10, lines 6-11, regarding deployment strategy for Duke Kentucky.

a. Identify what steps, or actions, Duke Kentucky must take in order to decide on a deployment strategy for grid modernization and provide a timetable for when such a decision is anticipated.

b. Other than the deployment model, regulatory treatment and rate recovery, provide examples of any other possible strategies that might be utilized in Kentucky.

59. Refer to the Wathen Testimony, pages 3 and 4, regarding Duke Energy Ohio's implementation of a full GM initiative and generally to the Schneider Testimony. Describe the grid in Ohio before the implementation of the GM program.

East Kentucky Power Cooperative ("EKPC") and its member distribution cooperatives (collectively referred to as "EKPC and each member") are to respond to the following questions:

60. Refer to the Direct Testimony of Isaac S. Scott ("Scott Testimony"), page 6. Describe Mr. Scott's understanding of the Commission's experience with technological obsolescence in the telecommunications industry.

61. Refer to the Scott Testimony, page 13, lines 20-24, which refer to customer education. State whether Mr. Scott is familiar with the customer education efforts undertaken by Owen Electric Cooperative in conjunction with its Energy Innovation Vision program and, if so, whether those efforts are consistent with the type of effort to which he refers.

62. Refer to the Scott Testimony, page 14, lines 17-19, which indicate that EKPC and its members believe the Commission should consider cost recovery through a rate case or "through a rider mechanism." To date, EKPC and its members have expressed a preference for recovery of Demand-Side Management ("DSM") and energy-efficiency program costs through base rates rather than through a DSM surcharge. State whether this statement indicates a different position by EKPC and its members concerning Smart Grid and smart meter cost recovery than their position concerning DSM and energy-efficiency cost recovery.

63. Refer to the Scott Testimony, page 15, lines 15-17. Provide a general framework concerning how EKPC and its members would engage and educate their

customers on customer risks, responsibilities, and benefits associated with the implementation of smart technology. Include in this discussion whether EKPC and its members are conducting similar consumer-education programs in connection with any of their current DSM, or energy-efficiency, programs.

64. Refer to the Scott Testimony, page 17, lines 22 through 24, which state, "Especially in deployments of smart meters, the achievability of the benefits is significantly dependent upon customer response and participation, which often is not determinable prior to deployment." Explain how Smart Grid investments differ from DSM investments in that regard. Include in the explanation details regarding whether experiences of other utilities and cost/benefit tests similar to those used in determining the cost-effectiveness of DSM programs could be used in making the Smart Grid investment decision

65. Refer to the Scott Testimony, page 20, item 4, Basic Consumer Protections; Disconnects. State what changes EKPC and its members would make to how remote disconnects are handled.

66. Refer to the Scott Testimony, page 33, lines 3-23, and the statement that ". . . groups of customers have and are resisting these deployments and insisting on 'opt-out' provisions . . . ." Describe in detail the experience of EKPC's members regarding opt out requests.

67. Describe the extent to which EKPC has implemented Smart Grid technology pertaining to its transmission system and substations. Include in the explanation details regarding whether the technology is reliability-related, security-related, or efficiency-related. Also include details regarding whether EKPC believes

further investment in such technology could be beneficial, and if so, its plans for future implementation.

Kentucky Power Co. ("Kentucky Power") is to respond to the following questions:

68. Refer to pages 5-7 of the Direct Testimony of Lila P. Munsey ("Munsey Testimony") regarding primary Kentucky Power Smart Grid initiatives implemented and the focus on DA, Volt/VAR Optimization ("VVO"), and Supervisory Control and Data Acquisition ("SCADA").

a. Refer to page 6 at lines 9-15 regarding VVO technology. The testimony indicates that 25 circuits are planned for VVO technology by the end of 2013. Provide a more detailed discussion of VVO technology and what it entails. Also, explain why implementation of this technology has not taken place prior to this time.

b. Refer to the Munsey Testimony, page 6, lines 19-20. Kentucky Power states that "SCADA is needed to support DA and VVO, as well as to provide other reliability benefits." Describe the needed SCADA support involved.

69. Refer to the Munsey Testimony, pages 5 and 6, which identify three Smart Grid initiatives initiated to date.

a. Describe the cost savings to date in terms of amount and type of savings.

b. Describe how these initiatives have improved reliability on the Kentucky Power system.

70. Refer to the Munsey Testimony, pages 6-7, regarding AMR meters.

a. Confirm that Kentucky Power's AMR meters are only capable of communicating one-way.

b. If the answer to part a. is yes, state whether Kentucky Power's current AMR meters can be upgraded to have two-way communication functionality.

c. If the answer to part b. is yes, has Kentucky Power considered or evaluated the feasibility of upgrading its existing AMR meters in order to be able to communicate two-way? Provide a summary of this consideration or evaluation.

d. Provide the name(s) of the manufacturer(s) of the meters.

e. State whether the energy data available to customers is real-time. If not real-time, include in the explanation how current the available data is.

f. State whether Kentucky Power's AMR meters have the capability to provide any functions other than remote meter reading and making energy-usage information available to customers.

g. State whether Kentucky Power's AMR meters are upgradable either through software updates or modular upgrades.

h. Provide the total investment cost to Kentucky Power of switching to AMR meters. Also include, but identify separately, the total depreciation expense assigned to the replacement meters to date.

71. Refer to the Munsey Testimony, page 7, lines 5-6. Does Kentucky Power have the capability to track how many of its customers access their usage data through Kentucky Power's website? If so, provide on a monthly basis the average number of customers who access their usage data through Kentucky Power's website.

72. Refer to the Munsey Testimony, page 7, lines 13-20, concerning the DA installation on certain of Kentucky Power's distribution circuits and the benefits derived therefrom.

a. Provide the year in which the DA installation was completed on the five circuits in the Ashland District, the two circuits in the Hazard District, and the two circuits in the Pikeville District.

b. For each of the nine circuits mentioned in part a., provide the SAIFI and the System Average Interruption Duration Index ("SAIDI") data for each of the five years prior to the DA installation and for each of the years after the DA installation.

c. Provide the basis for the statement that approximately more than five million customer-outage minutes have been avoided since the DA installation began.

d. When does Kentucky Power anticipate the installation of DA to be completed for the 22 circuits referenced on page 6 of the Munsey Testimony?

73. Refer to the Munsey Testimony, page 10, regarding the Green Button initiative. Provide a more detailed description of the Green Button initiative and how Kentucky Power will participate.

74. Refer to the Munsey Testimony, page 14. Provide the status and findings of Kentucky Power's testing of radio-frequency transceivers and radio repeaters to determine reliability of communications process to remote devices during storm events.

75. Refer to the Munsey Testimony, page 15, lines 10-23, regarding Kentucky Power's participation in Smart Grid Pilots. For each American Electric Power operating company, provide a list and description of each Smart Grid pilot project being conducted. Identify the Smart Grid pilots in which Kentucky Power participates.

76. Refer to the Direct Testimony of David M. Roush ("Roush Testimony"), page 6, lines 12-14, which state, "While time based pricing or load management

provisions are available to most Kentucky Power customers, less than one-half of one percent of the Company's customers have elected to take service under one of these provisions."

a. Provide the percentage of Kentucky Power's customers that are able to take service under time-based pricing or load management provisions.

b. Describe how these options have been communicated to Kentucky Power's customers, including the frequency of such communications.

c. Compare and contrast the acceptance of time-based pricing and load management provisions by Kentucky Power customers with that of other AEP subsidiary utilities.

Kentucky Utilities Co. ("KU") and Louisville Gas and Electric Co. ("LG&E") are to respond to the following questions:

77. Refer to the Initial Testimony of Lonnie E. Bellar ("Bellar Testimony"), page 4, lines 18-19. Do LG&E and KU track how often their customers access usage data online, either by the number of customers who access usage data and/or the frequency with which usage information is accessed by a customer?

78. Refer to the Bellar Testimony, page 5, lines 2-4, which state that customers tend not to respond to time-of-use pricing to a great extent. State whether this statement pertains to all customer classes, or only to particular customer classes.

79. Refer to the Bellar Testimony, page 11, lines 5-7. State whether the "rigorous cost-benefit analysis" to be performed when considering a Smart Grid investment is envisioned to mirror the analysis performed when considering a DSM program investment. Provide any known or foreseen differences in the analysis of DSM and Smart Grid investments.

80. Refer to the Bellar Testimony, page 12, in which Mr. Bellar notes agreements with the Attorney General's ("AG") and CAC's recommendation regarding performance metrics. Identify the performance metric which LG&E and KU believe to be appropriate.

81. Refer to the Bellar Testimony, page 18. Explain the potential security vulnerabilities associated with a data network architecture that is IP based.

82. Refer to the Initial Testimony of David E. Huff ("Huff Testimony"), page 1. Mr. Huff states that time-of-use pricing was divided into three time periods and the rates ranged from low to medium to high. Provide details of when these periods occurred, their length, and the electric rates associated with each.

83. Refer to the Huff Testimony, page 1, line 21 through page 2, line 4 regarding the discussion of the real-time pricing component. Provide details concerning the periods of around 80 hours per year of critical peak pricing and the five times higher rates in effect during those periods.

84. Refer to the Huff Testimony, page 2, regarding the use of in-home monitors as a component of the smart meter pilot program.

a. State whether the use of such devices required a resident to be present near the monitor during rate changes. If the response is no, explain why not.

b. If not addressed above, discuss the possibility of information from the in-home monitors being displayed, or transferred, to other equipment or mobile devices (smart phones, iPads, laptops, etc.) which would allow customers' decisions or actions to be made remotely.

85. Refer to the Huff Testimony, page 2. Those individuals who were the control group and not direct participants in the smart meter pilot program were noted as receiving "...various levels of equipment ..." Describe the type of equipment provided to those customers and the benefits afforded the customers who received that equipment.

86. Refer to the Huff Testimony, pages 2 and 3 regarding the "bounce back" effect.

a. Provide a more detailed explanation of the "bounce back" effect and its impact on the LG&E system.

b. If the participants saved energy and presumably lowered expenses by shifting their usage to lower cost periods, explain the statement on page 3, lines 7-9, that they used more energy and that it was counterproductive from an energy-efficiency standpoint.

c. State whether the participants saved money on their overall energy bills.

d. Refer to page 3, lines 21-23. Mr. Huff states that ". . . results indicated there were load reductions, shifts in peak usage to off-peak periods, but that customers receiving critical peak pricing signals created higher peaks and consumed more energy." Provide further information to explain these results

87. Refer to the Huff Testimony, page 3.

a. Lines 6 and 7 indicate that customers tend not to respond to time-of-use pricing changes to a great extent and their overall energy usage tends to go up. Given that in the Smart Meter Pilot customers' overall usage went up, explain whether the customers' overall bills also went up. Include in the explanation whether the

decreased rate during non-peak hours gave the customers the opportunity to decrease bills, while at the same time increase usage.

b. Lines 10-13 indicate that two-way communications could not be fully tested and evaluated because fully embedded systems were not readily available or economically feasible during the pilot, and that hardware and software employed became outdated and limited. Given these limitations, describe the usefulness of the pilot. Include an explanation for why LG&E proceeded with the pilot, rather than suspend the pilot until the limitations could be addressed.

88. Refer to the Huff Testimony, page 4, regarding federal stimulus funding. State whether KU or LG&E pursued or acquired any federal stimulus funding for any Smart Grid initiatives. If the response is yes, provide the amount of funds received and the initiatives pursued. If no, explain why not.

89. Refer to the Huff Testimony, page 7, regarding customer-education efforts concerning smart meters. Identify and describe the customer-education tools or methods used in the pilot and those that might be used in the future to encourage or compel participation in such a pilot.

90. Refer to the Initial Testimony of Edwin R. "ED" Staton ("Staton Testimony"), page 1. Describe the KU and LG&E transmission system in a manner similar to the description of the Kentucky Power system provided on page 5 of the Munsey Testimony.

91. Refer to the Staton Testimony, page 3, lines 3 through 5, which state, "These relays also provide numerous functions within a single box, replacing up to nine discrete devices with a single relay." Provide the following:

a. Identify and describe the benefits associated with the digital relays as compared to the electromechanical relays.

b. Provide a comparison regarding the unit cost, the cost of maintenance and the cost of installation for digital relays as opposed to the traditional electromechanical relays.

c. Provide a discussion of digital relays, including details concerning their size, placement within the transmission system, and the functions they perform that allow them to replace up to nine other devices.

d. Provide the average installed costs of each of the nine "discrete devices" broken down by cost of the "discrete device," any associated overhead, any associated labor costs, any associated transportation costs, and any other costs incurred to install these "discrete devices."

e. Provide the average installed costs of the "single relay" broken down by cost of the "single relay," any associated overhead, any associated labor costs, any associated transportation costs, and any other costs incurred to install these "single relays."

f. Provide any cost savings realized by the utilities and their ratepayers associated with the installation of the "single relays" versus the installation of the nine "discrete devices."

92. Refer to the Staton Testimony, page 3, lines 6 through 8, which state, "If interconnected in the future, these networks can provide automation and efficiency gains through remote access that can allow for gathering detailed events remotely..."

Provide a detailed explanation as to why local substation networks are not interconnected today.

93. Refer to the Staton Testimony, page 3, lines 18 through 22, which state: "For new projects and existing control house upgrades, the Companies are implementing these new technologies through the use of drop-in control houses that are built off-site with the new technologies pre-installed and wired, which enables the Companies to install, test, and commission new equipment in a relatively short time frame, reducing system impacts." Provide a detailed explanation as to what is included in a "drop-in control house," the purpose, the size, and average installed cost of a "drop-in control house, along with any other information as it relates to "drop-in control houses" the companies feel is appropriate.

94. Refer to the Staton Testimony, page 3, lines 6-17. Provide a more detailed and descriptive discussion of the following terms as used in the testimony:

a. Local substation networks;

b. Gathering and distributing Synchrophasor data; and

c. Deployment of communication processors.

95. Refer to the Initial Testimony of David S. Sinclair ("Sinclair Testimony") in which Mr. Sinclair expresses several concerns with dynamic pricing as part of a smart meter program. Explain whether those concerns are diminished if participation in the program is solely on a voluntary basis.

Atmos Energy Corporation (Atmos Energy"); Columbia Gas of Kentucky, Inc. (Columbia KY"); and Delta Natural Gas Company, Inc. ("Delta Gas") either individually or jointly are to respond to the following questions:

96. Refer to the Joint Direct Testimony of Glenn R. Jennings on Behalf of Atmos Energy Corporation, Columbia Gas of Kentucky, Inc., and Delta Natural Gas Company, Inc. ("Joint LDC Testimony"), page 3, lines 2 through 4, which states "Atmos and Columbia have some automated meter reading and Delta has had 100% automated meter reading for its customers for several years." Provide the following:

a. total number of automated meter reading meters installed by Delta Gas, total number of customers involved, and benefits Delta and its customers have received from the installation of the automated meter reading meters.

b. total number of automated meter reading meters installed by Atmos Energy, total number of customers, any benefits Atmos and its customers have received from the installation of the automated meter reading meters, and any plans to convert more of its system to automated meter reading.

c. total number of automated meter reading meters installed by Columbia KY, total number of customers, any benefits Columbia KY and its customers have received from the installation of the automated meter reading meters, and any plans to convert more of its system to automated meter reading.

97. Refer to the "Natural Gas in a Smart Energy Future" white paper ("white paper"), discussed on pages 4 and 5 of the Joint LDC Testimony and filed in the record of Case No. 2008-00408.[4]

a. Explain what kind of actions Atmos Energy, Columbia KY, and Delta Gas (collectively "the Joint LDCs") foresee they can realistically take on their own systems to create or enhance key capabilities within:

[4] Case No. 2008-00408, *Consideration of the New Federal Standards of the Energy Independence and Security Act of 2007* (Ky. PSC July 24, 2012).

i. the "Supply" sector, as enumerated in the bullet points in the first half of page 3 under the heading *Achieving the Vision* pages and further discussed on pages 11 through 14.

ii. the "Delivery" sector, as enumerated in the bullet points in the bottom half of page 3 under the heading *Achieving the Vision* and further discussed on pages 11, 14, and 15.

iii. the "End Use" sector, as enumerated in the bullet points in the middle of page 4 under the heading *Achieving the Vision* and further discussed on pages 11, 15, and 16.

b. To the extent that any of the Joint LDCs have already taken actions to develop the capabilities and improved technologies in the sectors references in part a. above, explain in detail what has been accomplished.

c. Explain to what extent any of the capabilities and improved technologies referenced in a. above are unrealistic for a jurisdictional LDC in Kentucky to undertake.

d. Provide specific comments on each bullet point on pages 5 and 6 in the ***Recommendations for Action*** section, paying special attention to each action that the Joint LDCs recommend be accomplished by Kentucky policymakers and industry and their suggestions for achieving those actions.

e. Discuss the five categories of benefits of a smarter gas infrastructure which are listed as bullet points on page 17 and are further discussed through page 22. The discussion should include the extent to which the Joint LDCs

have achieved, are in the process of achieving, or have plans to achieve an increased level of infrastructure performance as it relates to the five categories.

f. To the extent not previously addressed, discuss the 20 functions included in the table on page 27 that would contribute to achieving the objectives of energy resources and infrastructure being clean and sustainable; reliable and secure; affordable and efficient; and robust and flexible as outlined on page 26, as they relate to jurisdictional Kentucky LDCs and their ability to achieve the benefits included in the table on page 33.

All Electric utilities shall respond to the following questions:

98. With regard to calendar years 2007 through 2012, identify and discuss what Smart Grid and/or Smart Meter initiatives the utility implemented. The discussion should include but not be limited to the reasons why each initiative qualifies as a Smart Grid and/or Smart Metering initiative; the date of installation; the total cost of installation; and any benefits resulting from the initiatives, quantifiable or otherwise, received by both the utility and the customers.

99. With regard to calendar years 2013 through 2018, identify and discuss what additional Smart Grid and/or Smart Meter initiatives the utility has forecasted to be implemented. The discussion should include but not be limited to why each forecasted initiative qualifies as a Smart Grid and/or Smart Metering initiative; the forecasted date of installation; the forecasted total cost of installation; and any forecasted benefits to result from the initiatives, quantifiable or otherwise, received by both the utility and the customers.

100. With regard to DA Smart Grid Initiatives provide the following:

a. the number of DA systems installed as of December 31, 2012, along with the associated benefits realized.

b. the number of DA systems to be installed in the next five years.

c. the total number of DA systems to be installed when the DA system is completely deployed.

101. With regard to Volt/VAR Optimization, provide the following:

a. the number of Volt/VAR Optimization systems installed as of December 31, 2012, along with the associated benefits realized.

b. the number of Volt/VAR Optimization systems to be installed in the next five years, along with the forecasted in-service date.

c. the total number of Volt/VAR Optimization systems to be installed when the Volt/VAR Optimization system is completely deployed.

102. With regard to Supervisory Control and Data Acquisition ("SCADA") Smart Grid Initiatives, provide the following:

a. the number of SCADA systems installed as of December 31, 2012, along with the associated benefits realized.

b. the number of SCADA systems to be installed in the next five years, along with the forecasted in service date.

c. the total number of SCADA systems to be installed when the SCADA system is completely deployed.

103. As it relates to Dynamic Pricing (where rates are established hourly throughout the day) Tariffs or TOU Tariffs, provide the following:

a. the number of customers the utility has or had on these types of tariffs, identified separately by specific tariff.

b. whether these customers shifted load from high-price times periods to lower-priced time periods.

c. whether these customers consumed more, less or the same number of kWh.

d. whether the utility reached any findings or conclusions based on its experience with customers on Dynamic Pricing and/or TOU Tariffs.

104. Describe precautions taken and/or standards developed by the utility to address concerns regarding cybersecurity and privacy issues.

105. Provide a discussion and details of progress made regarding the concern raised by the utilities as it relates to the interoperability standards for Smart Grid equipment and software.

106. Provide a discussion concerning how the costs (investment and operating and maintenance costs) associated with the installation of Smart Grid facilities should be recovered from the ratepayers.

107. State whether the utility would favor a requirement that it report to the Commission so that the Commission is aware of the jurisdictional Smart Grid and/or Smart Meter activities within the Commonwealth. As a specific example, the requirement could order that a report be provided each September regarding the Smart Grid and/or Smart Meter activities the utility is planning to perform during the upcoming calendar year, followed by an April report of the Smart Grid and/or Smart Meter activities the utility completed the preceding calendar year.

108. State whether the utility believes KRS 278.285 is an appropriate approach to recovering the costs (investment and operation and maintenance) associated with Smart Grid investments.

109. State whether the utility believes a tracking mechanism as described beginning on page 3 of the Wathen Testimony on behalf of Duke Kentucky is an appropriate approach to recovering the costs associated with Smart Grid investments.

110. State whether the utility has commissioned a thorough DSM and Energy Efficiency ("DSM-EE") potential study for its service territory. If the response is yes, provide the results of the study. If no, explain why not.

111. Refer to the Munsey Testimony on behalf of Kentucky Power, page 10, lines 11-19 regarding the Green Button initiative. Describe the extent of your utility's participation in this industry-led effort.

112. Refer to the Roush Testimony on behalf of Kentucky Power, DMR Exhibit 1. Provide a similar exhibit containing a list of time-differentiated rates available to your customers.

All Electric and All Gas utilities shall respond to the following questions:

113. Provide a description of the type of meters (mechanical, electro-mechanical, AMR [one-way communication], AMI [two-way communication]) currently used by the utility. Include in the description the reasons the current meters were chosen and any plans to move to a different type of metering configuration.

114. If either AMR or AMI metering is in use, state whether the utility has received any customer complaints concerning those meters. If the response is yes, provide the following:

a. the number of complaints, separated by gas and electric if a combination utility, along with the total number of customers served.

b. how the complaints were addressed by the utility.

c. a detailed explanation as to whether customers should have the ability to opt out of using either AMR or AMI metering.

d. If customers were to be given the opportunity to opt out of using either AMR or AMI metering, provide:

i. an explanation as to whether the utility should establish a monthly manual metering reading tariff or charge applied to the opt-out customers to recover the costs associated with manually reading the non-AMR or -AMI accounts.

ii. an explanation as to whether these opt-out customers could still receive benefit from the utility using either AMR or AMI metering.

iii. an explanation addressing the point at which opt-out customers, either in terms of number of customers or a percent of customers, affect the benefits of the utility using either the AMR or AMI metering.

115. In testimony, each utility cited cybersecurity as an area of concern related to the implementation of Smart Grid technologies. Provide and describe your company's policy regarding cybersecurity or the standard your company has adopted governing cybersecurity. If your company has not adopted any policy or standard, identify and describe any industry or nationally recognized standards or guidelines that

you may be aware of that the Commission should consider relating to cybersecurity issues and concerns.

116. If not previously addressed, provide a detailed discussion of whether deployment of smart meters should allow for an opt-out provision.

Jeff Derouen
Executive Director
Public Service Commission
P.O. Box 615
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DATED FEB 27 2013

cc: Parties of Record

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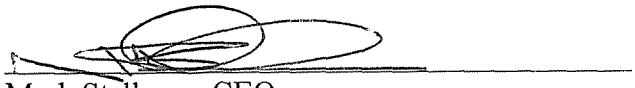
Affiant, Mark Stallons, states that the answers given by him to the foregoing questions are true and correct to the best of his knowledge and belief.



Mark Stallons - CEO

Subscribed and sworn to before me by the affiant, Mark Stallons, this 19th day of March, 2013.

Notary Shannon Kaye Chappell
State-at-Large

My Commission expires April 25, 2015

Affiant, Michael Cobb, states that the answers given by him to the foregoing questions are true and correct to the best of his knowledge and belief.

Michael Cobb, Senior Vice President – Customer Service and Marketing

Subscribed and sworn to before me by the affiant, Michael Cobb, this 19th day of March, 2013.

Notary Shannon Kaye Chappell
State-at-Large

My Commission expires April 25, 2015

Affiant, James Bridges, states that the answers given by him to the foregoing questions are true and correct to the best of his knowledge and belief.

James Bridges, P.E.
James Bridges, Vice President of Engineering

Subscribed and sworn to before me by the affiant, James Bridges, this 19th day of March, 2013.

Notary Shannon Kaye Chappell
State-at-Large

My Commission expires April 25, 2015

Affiant, Charles Gill, states that the answers given by him to the foregoing questions are true and correct to the best of his knowledge and belief.

Charles Gill – Manager of Information Systems and Technology

Subscribed and sworn to before me by the affiant, Charles Gill, this 19th day of March, 2013.

Notary Shannon Kaye Chappell
State-at-Large

My Commission expires April 25, 2015

Affiant, James Petreshock, states that the answers given by him to the foregoing questions are true and correct to the best of his knowledge and belief.

James Petreshock – Manager of System Operations

Subscribed and sworn to before me by the affiant, James Petreshock, this 19th day of March, 2013.

Notary Shannon Kaye Chappell
State-at-Large

My Commission expires April 25, 2015

OWEN ELECTRIC COOPERATIVE
CASE NO. 2012-00428
RESPONSE TO THE COMMISSION STAFF'S FIRST DATA REQUEST

**Request 98.**

With regard to calendar years 2007 through 2012, identify and discuss what Smart Grid and/or Smart Meter initiatives the utility implemented. The discussion should include but not be limited to the reasons why each initiative qualifies as a Smart Grid and/or Smart Metering initiative; the date of installation; the total cost of installation; and any benefits resulting from the initiatives, quantifiable or otherwise, received by both the utility and the customers.

**Response 98.**

**With regard to the years 2007 through 2012, the following Smart Grid and/or Smart Meter initiatives were implemented by Owen Electric Cooperative.**

1. **AMI metering System: The initial $9,894,835.93 investment was to install our single phase AMI system. From 2009 to the present, additional investment was made to (1) install repeaters to increase the number of meters read, (2) install additional equipment for two new substations, (3) replace failed meters and equipment, and (4) to install our three phase AMI project. At present we are reading roughly 99% of our single phase meters and near 80% of our three phase meters. We manually read around 780 meters per month.**

   **Date of Installation:** **2006 through 2008**
   **Total Cost:** **$9,894,835.93**
   **Additional investment:** **2009-present**
   **Total Cost:** **$1,692,814.07**
   **Benefits: AMI benefits include(1) the reduction in manual meter reading expense, (2) improved meter reading accuracy, (3) reduction in manual disconnect and reconnect expense, (4) improved outage prediction, management, and response,(5) improved power quality data and analysis including blink and voltage information, (6) improved line loss, (7) ability to measure and verify energy efficiency and demand response impacts, (8) ability to offer advanced tariff options such as smart home and prepay**

**metering tariff options, (9) the ability to install Meter data management system and associated member energy portal, (10) the ability to offer EKPC Simple Saver Demand response program.**

2. **Beat the Peak Pilot**

   **Date of Installation: 2011**

   **Total Cost: $45,880.80**

   **Benefits: The Beat the Peak pilot was Owen Electric's first DOE pilot project. Owen installed Beat the Peak modules in 100 member homes allowing Owen to alert the members when a monthly demand peak was occurring. The purpose was to encourage members to voluntarily reduce their peak energy usage during the alert thereby reducing the need for additional generation to be brought on to the grid. The results of the study showed that there was no statistical difference between the 100 members with the Beat the Beak module, the 100 members who received a text or phone call, or the control group of 100 members. As a result Owen did not deploy "Beat the Peak" system wide. The pilot also allowed Owen to develop and test its measurement and verification (M&V) capability in regards to demand response.**

3. **Penn Self Healing Pilot**

   **Date of Installation: 2011**

   **Total Cost: $73,369.20**

   **Benefits: The Penn self healing grid has been very successful in significantly reducing our outage duration in the Georgetown area thereby improving our reliability and member satisfaction. For more information please refer to Response 100.**

4. **Volt Var Pilot Project**

   **Date of Installation: 2012 through 2014**

   **Total Cost to date: $182,851.54**

   **Benefit: The purpose of this pilot project is to identify the energy efficiency savings resulting from Volt Var Optimization and to determine if the investment is justified by**

**the benefits. If the project yields significant benefits we will consider full system deployment. For more information please refer to Response 101.**

5. **SD1 Self Healing Projects**

   **Date of Installation: 2011 through March 2013**

   **Total Cost to date: $259,433.04**

   **Benefit: These two self healing systems were requested by Boone County Kentucky Sewer District 1. The project purpose is to provide backup power from an alternate feeder or substation in case power from the primary source is lost. For more information please refer to Response 100.**

6. **Communication**

   **Date of Installation: 2011 through 2012**

   **Total Cost to date: $359,356.25**

   **Benefit: Owen Electric installed jointly with East Kentucky Power Cooperative a fiber optic communication system to our western and northern Boone County substations and our Walton Operations Center. The project purpose is to provide redundant communications between our Owen Headquarters and our Walton Service Center in addition to improving the communication reliability with our Western and Northern Boone County Substations.**

7. **SCADA**

   **Date of Installation: 2011 through 2012**

   **Total Cost to date: $485,016.67**

   **Benefit: The purpose was to upgrade our old SCADA system which was installed in the late 1980's. The system provides our system operators with continuous "round the clock" substation control and system data to manage outages, power quality, and crew response. For more information please refer to Response 102.**

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**8. Smart Home**

**Date of Installation: 2012 through 2014**

**Total Cost to date: $466,757.8**

**Benefit: The Smart Home pilot provides demand response and energy management solutions to about 173 residential members in Owen Electric's service territory. The pilot's purpose is to determine if home energy management solutions yield positive benefits to the member and Owen Electric Cooperative to a level where it is cost justifiable to offer the Smart Home option to all our members.**

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**Request 99.**

With regard to calendar years 2013 through 2018, identify and discuss what additional Smart Grid and/or Smart Meter initiatives the utility has forecasted to be implemented. The discussion should include but not be limited to why each forecasted initiative qualifies as a Smart Grid and/or Smart Metering initiative; the forecasted date of installation; the forecasted total cost of installation; and any forecasted benefits to result from the initiatives, quantifiable or otherwise, received by both the utility and the customers.

**Response 99.**

1. **Meter Data Management & Pre-pay Metering System**
   **Date of Installation: 2013**
   **Total Cost: $35,000 (2013 budget item)**
   **Benefits: The 2013 budgeted project is to install a software system that will safely and securely store our member's meter data and allow us to move forward with Pre pay metering and advanced billing strategies such as critical peak pricing.**

2. **Cellular AMI pilot**
   **Date of Installation: 2013**
   **Total Cost: $20,000 (2013 budget item)**
   **Benefits: Owen Electric is investigating alternative methods to remotely read meters on an hourly and daily basis to support our long term Smart Home deployment efforts.**

3. **Fault Indication & Smart Switches**
   **Date of Installation: 2013**
   **Total Cost: $103,000 (2013 budget item)**
   **Benefit: The purpose of this pilot project is to investigate more simple and cost effective methods of installing self healing grid systems to improve system reliability,**

**save outage response expense, and improve member satisfaction. If the project yields significant benefits we will consider additional system deployments.**

4. **Solar Project**

   **Date of Installation: 2013 through 2018**

   **Total Cost to date: To be determined**

   **Benefit: Owen is working within the RE/DSM Collaborative process to investigate an optional solar tariff where members who choose to pay more for green energy may do so and in return receive solar power from a central solar system installed on Owen or an EKPC member system. The tariff would work similar to the existing Envirowatts program.**

5. **Distributed Energy**

   **Date of Installation: 2013 through 2018**

   **Total Cost to date: To be determined**

   **Benefit: Owen Electric is investigating distributed generation options where significant capital investment can be delayed or deferred or where system reliability can be improved.**

6. **RF Mesh AMI Pilot**

   **Date of Installation: 2013-2018**

   **Total Cost: To be determined**

   **Benefits: Owen Electric is investigating alternative methods to remotely read meters on an hourly and daily basis to support our long term Smart Home deployment efforts.**

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**Request 100.**

With regard to DA Smart Grid Initiatives provide the following:

a. the number of DA systems installed as of December 31, 2012, along with the associated benefits realized.

b. the number of DA systems to be installed in the next five years.

c. the total number of DA systems to be installed when the DA system is completely deployed.

**Response 100.**

**a. As of December 31, 2012, Owen Electric has deployed 2 self-healing systems. The Penn Self Healing project, in Scott County, has successfully reduced SAIDI during three self-healing events. In the most recent event, interruption time to approximately 250 members was reduced by 1.5 hours.**

**The other self-healing installation provides emergency backup to a large wastewater treatment facility. This installation was commissioned in April 2012. To date, no system failures requiring an automated self-healing event have occurred on this feeder.**

**b. The third self-healing installation, also at a water treatment facility, was successfully tested and placed into service on March 1, 2013. Beyond this third installation, there are no specific plans for additional feeder self-healing projects. The next DA project will consist of smart fault indicators placed on a selected feeder. These indicators will communicate via cellular technology from the field back to the SCADA system master control. If successful, additional fault indicators will be strategically located on the system. Some areas may then be additionally**

**equipped with a smart switch for automated self-healing. The initial portion of the project is scheduled for late summer 2013.**

**c. It is difficult to specify a given number of recloser-based and automatic switch-based DA systems that will ultimately be installed. Continuing improvements in technology and cost justification, on a case-by-case basis, will be the determining factors in the future expansion of the Owen DA system.**

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**Request 101.**

With regard to Volt/VAR Optimization, provide the following:

a. the number of Volt/VAR Optimization systems installed as of December 31, 2012, along with the associated benefits realized.

b. the number of Volt/VAR Optimization systems to be installed in the next five years, along with the forecasted in-service date.

c. the total number of Volt/VAR Optimization systems to be installed when the Volt/VAR Optimization system is completely deployed.

**Response 101.**

**a. As of December 31, 2012, Owen Electric has not fully deployed a Volt/VAR Optimization (VVO) system. Preliminary work that is required prior to implementing such a system is currently in progress.**

**b. We anticipate having two VVO systems, which encompass six distribution feeders, installed within the next five years. At this time, the anticipated service date for this is July 2014.**

**c. At this point, there are no plans to expand the program beyond the two VVO installations noted above, however, if it is found that the benefit from the two installations exceed their costs, OEC will consider expanding the program.**

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**Request 102.**

With regard to Supervisory Control and Data Acquisition ("SCADA") Smart Grid Initiatives, provide the following:

a. the number of SCADA systems installed as of December 31, 2012, along with the associated benefits realized.

b. the number of SCADA systems to be installed in the next five years, along with the forecasted in service date.

c. the total number of SCADA systems to be installed when the SCADA system is completely deployed.

**Response 102.**

**For the purpose of answering question 102, Owen Electric Cooperative shall define "SCADA Smart Grid Initiatives" as field equipment such as Remote Telemetry Units (RTU) or other Intelligent Electronic Devices (IED) that communicate directly to our SCADA System, or those devices that are not specifically address by questions 100 and 101. As December 31, 2012 Owen Electric has RTUs deployed at 28 of 28 substation sites.**

**a. With the completion of our SCADA upgrades in 2012 as part of our Smart Grid demonstration project through NRECA and the DOE we have increased situational awareness aided by a factor of 4 increase in the volume of data being obtained from substation field devices. Two areas of immediate benefit from this upgrade are the identification of equipment problems and retrieval of fault event data. We are now able to monitor substation equipment for failures that previously could have been gone unnoticed between scheduled maintenance visits thus allowing for the repair of the equipment prior to unnecessary and possibly extensive outages to our membership. Additionally, we are now retrieving fault current information from the substation equipment automatically allowing our**

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**System Operators to know both the magnitude and phasing of fault events. Previously field personnel were dispatched to perform this task first and we are now able to direct field personnel directly to the outage thus reducing outage durations for our membership.**

**b. The number of SCADA RTUs to be deployed over the next 5 years will depend upon the new substation construction schedule determined by our G&T, East Kentucky Power Cooperative.**

**c. Our SCADA RTU deployment is currently 100% complete with all of our substation sites having SCADA.**

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**Request 103.**

As it relates to Dynamic Pricing (where rates are established hourly throughout the day) Tariffs or TOU Tariffs, provide the following:

a. the number of customers the utility has or had on these types of tariffs, identified separately by specific tariff.

b. whether these customers shifted load from high-price times periods to lower-priced time periods.

c. whether these customers consumed more, less or the same number of kWh.

d. whether the utility reached any findings or conclusions based on its experience with customers on Dynamic Pricing and/or TOU Tariffs.

**Response 103.**

| a. # Members | Tariff | Sheet No. |
|---|---|---|
| 2 | Schedule 1-B1 – Farm & Home Time-of-Day | 23A |
| 1 | Schedule 1-B2 – Farm & Home Time-of-Day | 23B |
| 1 | Schedule 1-B3 – Farm & Home Time-of-Day | 23C |
| 165 | Schedule 1-B4 – Smart Home Pilot Time-of-Day | 23D |
| 2 | Schedule 1-C – Small Commercial Time-of-Day | 24 |
| 12 | Schedule 2-A – Large Power Time-of-Day | 25 |

**b. The information is not available at this time. The measurement and verification process will commence with the smart home pilot which began in late 2012 and is scheduled to conclude in late 2014. The pilot is designed to provide energy use data (demand and energy) by Time of Day for the Smart Home Pilot participants.**

**c. See Response provided to Request 103(b)**

**d. See Response provided to Request 103(b)**

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**Request 104.**

Describe precautions taken and/or standards developed by the utility to address concerns regarding cybersecurity and privacy issues.

**Response 104.**

**OEC has adopted industry standards for cyber security including best practices from NIST framework and IS 27001/27002. Policies and procedures have been implemented to address privacy issues and compliance with applicable regulations such as PCI and confidentiality.**

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**Request 105.**

Provide a discussion and details of progress made regarding the concern raised by the utilities as it relates to the interoperability standards for Smart Grid equipment and software.

**Response 105.**

**OEC has been cautious in the implementation of smart grid equipment and software by utilizing the IP based network tools and applications that are well proven in conjunction with the "MultiSpeak" interface platform and vendor specific standards and protocols.**

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**Request 106.**

Provide a discussion concerning how the costs (investment and operating and maintenance costs) associated with the installation of Smart Grid facilities should be recovered from the ratepayers.

**Response 106.**

**Owen Electric references the response to PSC Request #106 submitted by EKPC and adopts that response as its own.**

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**Request 107.**

State whether the utility would favor a requirement that it report to the Commission so that the Commission is aware of the jurisdictional Smart Grid and/or Smart Meter activities within the Commonwealth. As a specific example, the requirement could order that a report be provided each September regarding the Smart Grid and/or Smart Meter activities the utility is planning to perform during the upcoming calendar year, followed by an April report of the Smart Grid and/or Smart Meter activities the utility completed the preceding calendar year.

**Response 107.**

**Owen Electric references the response to PSC Request #107 submitted by EKPC and adopts that response as its own.**

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**Request 108.**

State whether the utility believes KRS 278.285 is an appropriate approach to recovering the costs (investment and operation and maintenance) associated with Smart Grid investments.

**Response 108.**

**Owen Electric references the response to PSC Request #108 submitted by EKPC and adopts that response as its own.**

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**Request 109.**

State whether the utility believes a tracking mechanism as described beginning on page 3 of the Wathen Testimony on behalf of Duke Kentucky is an appropriate approach to recovering the costs associated with Smart Grid investments.

**Response 109.**

**Owen Electric references the response to PSC Request #109 submitted by EKPC and adopts that response as its own.**

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**Request 110.**

State whether the utility has commissioned a thorough DSM and Energy Efficiency ("DSM-EE") potential study for its service territory. If the response is yes, provide the results of the study. If no, explain why not.

**Response 110.**

**Owen Electric references the response to PSC Request #110 submitted by EKPC and adopts that response as its own.**

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**Request 111.**

Refer to the Munsey Testimony on behalf of Kentucky Power, page 10, lines 11-19 regarding the Green Button initiative. Describe the extent of your utility's participation in this industry-led effort.

**Response 111.**

**While Owen Electric is not presently participating in the "Green Button" program, Owen's Smart Home Pilot program does include a web-based and smartphone experience that offers its participants easy access to their energy usage data. As technological and cost barriers diminish, Owen will continue to investigate and develop additional offerings that will allow its members utilize a broad array of web and smartphone tools to access and monitor their energy usage.**

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**Request 112.**

Refer to the Roush Testimony on behalf of Kentucky Power, DMR Exhibit 1. Provide a similar exhibit containing a list of time-differentiated rates available to your customers.

**Response 112.**

| Tariff | Description of Service/Provision | Currently in Effect | Commission Case | Order Date |
|---|---|---|---|---|
| Residential | | | | |
| Schedule 1 - B-1 Farm & Home - Time-of-Day | Time-of-Day | X | 2011-00037 | 2/29/2012 |
| Schedule 1 - B-2 Farm & Home - Time-of-Day | Time-of-Day | X | 2011-00037 | 2/29/2012 |
| Schedule 1 - B-3 Farm & Home - Time-of-Day | Time-of-Day | X | 2011-00037 | 2/29/2012 |
| Schedule 1 - B-4 Smart Home Pilot - Time-of-Day | Time-of-Day Pilot | X | 2012-00154 | 6/25/2012 |
| Schedule 1 – A Farm & Home – Off Peak Marketing | Off-Peak | X | 2010-00507 | 5/31/2011 |
| Commercial | | | | |
| Schedule 1-C Small Commercial -Time-of-Day | Time-of-Day | X | 2010-00507 | 5/31/2011 |
| Schedule 2-A Large Power -Time-of-Day | Time-of-Day | X | 2010-00507 | 5/31/2011 |
| Schedule 14 Voluntary Interruptible Service | Interruptible | X | 2008-00421 | 3/31/2009 |
| Schedule 15 Commercial and Industrial Interruptible Service | Interruptible | X | 2008-00421 | 3/31/2009 |
| Schedule RTP-DA Real-Time Pricing, Day Ahead, Pilot Program | Real Time Pricing | X | 2007-00165 | 2/1/2008 |

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**Request 113.**

Provide a description of the type of meters (mechanical, electro- mechanical, AMR [one-way communication], AMI [two-way communication]) currently used by the utility. Include in the description the reasons the current meters were chosen and any plans to move to a different type of metering configuration.

**Response 113.**

**Owen decided in 2006 to implement the Cooper Power Systems Power Line Carrier (PLC) Advanced Metering Infrastructure (AMI) system. At that time we decided to change out our residential meters from mechanical to solid state. Our C/I meters were already solid state and we retrofitted those with the AMI communication modules. The AMI modules in both residential and commercial/industrial meters are used for two-way communications. We opted to go with new solid state meters for increased accuracy, compatibility with the AMI modules, and to mitigate any retrofit issues that may arise when installing the module in mechanical meters. The selection of a two-way communications system allows Owen to obtain 'kWh' data, demand, voltage, blink counts, outage/service restoration verification, the capability to connect/disconnect remotely, and facilitates measurement and verification for Owen's energy innovation pilot projects.**

**Owen is evaluating other meter communication methods including Radio Frequency (RF) and Cellular. Those communication methods would still utilize solid state meters. This technology may prove beneficial in areas where we require larger amounts of data in a shorter timeframe than the present communications method allows.**

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**Request 114.**

If either AMR or AMI metering is in use, state whether the utility has received any customer complaints concerning those meters. If the response is yes, provide the following:

a. the number of complaints, separated by gas and electric if a combination utility, along with the total number of customers served.

b. how the complaints were addressed by the utility.

c. a detailed explanation as to whether customers should have the ability to opt out of using either AMR or AMI metering.

d. If customers were to be given the opportunity to opt out of using either AMR or AMI metering, provide:

i. an explanation as to whether the utility should establish a monthly manual metering reading tariff or charge applied to the opt-out customers to recover the costs associated with manually reading the non-AMR or -AMI accounts.

ii. an explanation as to whether these opt-out customers could still receive benefit from the utility using either AMR or AMI metering.

iii. an explanation addressing the point at which opt-out customers, either in terms of number of customers or a percent of customers, affect the benefits of the utility using either the AMR or AMI metering.

**Response 114.**

**Yes**

**a. Nine (9) of Owen's 57,774 members have expressed concerns about Owen's AMI meters.**

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**b. Members who express concern about Owen's AMI system are handled on a case by case basis. The member is engaged in a discussion to fully understand and learn what their concerns are. Information is then provided that addresses their particular concern.**

**c. See response provided to Request 116.**

**d.**

**i. See response provided to Request 116.**

**ii. An opt-out member would still receive AMI system benefits from enhanced outage predictions and engineering analysis capabilities.**

**iii. The impact is dependent on the number of opt-outs. The impact would be minimal if only a few members opt out and would increase if Owen had to begin manually reading meters for a larger number of members. A fully allocated cost per member of the AMI system is approximately $37 annually. Shifting the cost for these nine members would result in a cost shifting of $333 to all of Owen's other members.**

**In addition to a cost shifting impact, having a significant number of members opt-out would diminish Owen's ability to leverage the overall cost/benefit of its AMI system, would increase Owen's monthly costs to obtain metering readings, and would diminishes Owen's outage prediction capabilities, and engineering studies/planning analysis capabilities.**

**Owen would be concerned with the adverse impact when the number of opt outs reached the 1%-2% range of our members.**

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**Request 115.**

In testimony, each utility cited cybersecurity as an area of concern related to the implementation of Smart Grid technologies. Provide and describe your company's policy regarding cybersecurity or the standard your company has adopted governing cybersecurity. If your company has not adopted any policy or standard, identify and describe any industry or nationally recognized standards or guidelines that you may be aware of that the Commission should consider relating to cybersecurity issues and concerns.

**Response 115.**

**OEC has adopted the best practice standards of NIST and ISO in its implementation of Smart Grid Technologies as well as vendor specific practices. The NIST information security framework and ISO 27001/27002 provide robust and comprehensive guidelines for cyber security.**

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**Request 116.**

If not previously addressed, provide a detailed discussion of whether deployment of smart meters should allow for an opt-out provision.

**Response 116.**

**Owen does not support and will not encourage its members to opt out. However a small number of members (nine to date) have expressed concerns regarding the use of AMI technology. In these cases, Owen has provided these members with communication and educational materials in an attempt to alleviate their concerns. For those members who continue to insist that AMI technology not be used, it is Owen's strategy to give our members choice in order to foster positive member satisfaction. Owen has filed an application with Kentucky Public Service Commission (Case 2012-00468) requesting that a manual meter reading fee be approved in instances where, due to member objection, the Cooperative is prohibited from obtaining remote meter readings via the use of its AMI system. Owen believes that this manual meter reading fee is justified to recover the additional costs that will be incurred to manually read the meters. It is Owen's contention that this additional cost should not be borne by its other members and should be borne by those members who cause the cost to be incurred.**