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APR 29 2010
PUBLIC SERVICE COMMISSION

April 29, 2010

RE: ***Consideration of the New Federal Standards of the Energy Independence and Security Act of 2007* – Case No. 2008-00408**

Dear Mr. DeRouen:

Please find enclosed and accept for filing the original and ten (10) copies of this Joint Response developed by the utilties of record in the above referenced proceeding. The purpose of this response is to provide a plan on how to address the issues in Commission Staff's Smart Meter and Smart Grid Guidance document dated February 19, 2010.

A draft of this plan was provided in advance to the parties of record including the non-utility intervenors, and each were provided the opportunity to comment.

Should you have any questions regarding the enclosed, please contact me at your convenience.

Sincerely,

Lonnie E. Bellar

cc: Parties of Record

Joint Utility Response to
Case No. 2008-00408
Letter dated February 19, 2010

RE: Case No. 2008-00408
CONSIDERATION OF THE NEW FEDERAL STANDARDS OF THE ENERGY INDEPENDENCE AND SECURITY ACT OF 2007

Overview

The Commission Staff Smart Meter and Smart Grid Guidance Document provides proper guidance for compiling a comprehensive look into Smart Meter and Smart Grid technologies for Kentucky. The Staff Guidance Document provides questions which when addressed will educate utility customers and policy makers about the various facets of smart utility infrastructure.

The National Academy of Engineering stated that the greatest engineering achievement of the 20th century was "the vast networks of electrification". They concluded that these networks and the electricity they carried made most of the century's other advances possible.[1] Automated Metering Infrastructure (AMI) is an enabling technology and is an essential component to offering time-of-use rates, incentive-based demand response programs, and enabling future Home Area Network (HAN) deployments. This technology provides utilities in the Commonwealth with better information regarding individual customers' load profiles, conservation options, costs and prices. Integration of smart thermostats, in-home displays, appliances and other consumer devices is critical to providing consumers opportunities to reduce their energy use.

Jeff Osborne with Thomas Weisel Partners, LLC cites the International Energy Agency's projection that $10 trillion of investment in generation, transmission, and distribution assets will be needed nationally between 2005 and 2030 to meet demand. This under-investment coupled with growth in peak demand results in upward pressure on the price of electricity at best and reduced reliability if demand exceeds supply.[2] Demand Response is a cost-effective mechanism to address potential shortage of supply. The International Energy Agency estimated that even a 5% reduction in peak demand during the California energy crises of 2000-2001 would have reduced the highest wholesale prices by 50%.[3]

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[1] *Wiser Wires*, The Economist, October 10, 2009, pg 77.
[2] Osborne, Jeff, *A Primer on Demand Response – The Power Grid: Evolving from a "Dumb" Network to a "Smart" Grid, Thomas Weisel Partners, LLC. October 16, 2007 p. 8 – 11.*
[3] IBID p 11

"AMI thus differs from (1) conventional electromechanical "kilowatt-hour" meters, which account for more than 90% of the current meter population, record cumulative energy usage and are usually read once a month during an on-site visit by a utility employee and (2) automated meter reader systems (AMR), which adds a low-power transceiver to a conventional kWh meter."[4] Whether through the meter or other devices, two-way communications networks provide a grid operator and customers with more information regarding customer's usage patterns, identify and locate outages, assess the health of the energy delivery system, as well as provide price information or system conditions to the customer and in-home devices such as smart thermostats, air conditioning units, and computer networks that link to in-home appliances. Therefore, two-way communication networks have greater capacity to support various forms of demand response than one-way AMR.

Generally, the cost of Smart Meter deployment is a minor portion of the total cost of a full Smart Grid deployment. With many companies considering investing millions or even billions of dollars into capital investment, it is important that a collaborative group work to understand the impacts of decisions today on Kentucky's future.

The capital expense necessary to deploy Smart Meters across the Commonwealth and the need to fully consider benefits to Kentucky consumers supports a collaborative approach which includes jurisdictional electrical utilities and non-utility organizations interested in the deployment of Smart Meter technology and time-of-use rates. The Commission Staff's Smart Meter and Smart Grid Guidance Document identifies issues and questions that, when addressed, provide the reader with greater knowledge on which to base their decisions on the advantages of Smart Grid deployment. Smart Meters must be implemented with the broader goal of Smart Grid technology deployment to gain greater automation of the distribution and transmission systems and achieve greater integration of the Smart Meters with customers, generation, distribution, and transmission operations.

The Parties in Case No. 2008-00408 have been monitoring the evolution of AMI, Smart Meter technology, and time-of-use rates. Several utilities throughout Kentucky are in the midst of ongoing advanced metering programs to understand the technological, operational, and societal issues associated with this evolution. Smart Metering and, eventually, Smart Grid are the beginning of a complex transformation of the electric utility industry as depicted in Figure 1 on the next page.

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[4] Osborne, Jeff, *A Primer on Demand Response – The Power Grid: Evolving from a "Dumb" Network to a "Smart" Grid, Thomas Weisel Partners, LLC. October 16, 2007 p. 11*

In part, goals of metering programs are to determine customers' ability and willingness to shift usage from higher-demand and higher-cost time periods to lower-demand and lower-cost time periods. These programs are designed to monitor and deliver information and greater control to the customers to assess their behavior toward a more efficient use of energy by coupling price with demand side management technology.

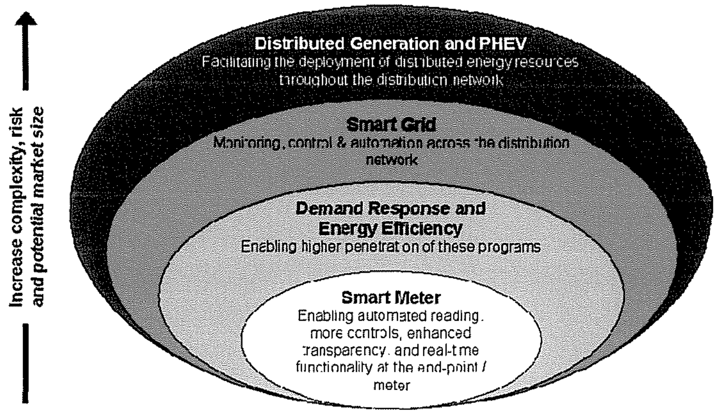

Figure 1

Four areas contemplated for a fully developed and functional Smart Grid are (a) AMI, (b) Demand Response (DR)/Energy Efficiency (EE), and (c) Distribution Automation, Transmission Automation, and (d) Distributed Generation (DG), and Plug-in Hybrid Electric Vehicles (PHEV) as shown in Figure 1. At a minimum, each of these areas are interdependent which provide for increasing enhancements and efficiencies for subsequent expansion.

Providing customers with technologies and detailed usage and pricing information coupled with education will empower them to make decisions about their personal energy consumption. Deployment of Smart Meter technology will pave the way for future integration of DR savings and a much different customer interaction than has been historically possible with one-way communication to DR devices.

The Parties agree that the following schedule allows for collaboration of all parties to review and discuss the engineering, societal, and financial issues surrounding Smart Meter and Smart Grid deployment. The plan calls for drafting of a comprehensive report that addresses all of the issues and questions in the document titled "Commission Staff Smart Meter and Smart Grid Guidance." The final document will serve as an educational foundation for policy makers to understand the numerous challenges facing Kentucky electric service providers such that they may make informed decisions on Smart Meter and Smart Grid strategies for Kentucky.

Schedule

Timeframe[5]:

June, 2010:	Phase I – Industry data gathering and consensus on definitions.
August, 2010:	Phase II – Draft table of contents inclusive of issues and questions from the "Commission Staff's Smart Meter and Smart Grid Guidance" document.
Sept, 2010:	Phase III – Incorporate collaborative comments on table of contents and draft initial report and response.
October, 2010:	Phase IV – Incorporate collaborative comments on initial draft report and revise/redistribute report for comments and input.
October/November:	Schedule an Informal Conference at the KPSC to review progress of the collaborative group and provide input or direction to the final report.
December, 2010:	Phase V - Incorporate collaborative comments on second draft report and revise/redistribute report for final comments and input.
January, 2011:	Phase VI - Route collaborative DRAFT response for final review.
March 31, 2011:	Submit Final Joint Response Report to KPSC

Process:

- Throughout the process, the parties will seek input from interested third parties to assure that the final report coalesces with current technological offerings, addresses Kentucky issues, and delivers comprehensive knowledge of the Smart Meter and Smart Grid issues.
- Distribute materials, collect individual collaborative responses, aggregate, and distribute to collaborative members for review and comments.
- Collaborative group members develop and meet with their company-designated teams to develop responses and submit information/prepare presentation for collaborative meetings.
- Monthly collaborative conference calls to review items, comments, and gain consensus.

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[5] Phases described in more detail in the attached document.

Guiding Principles for Collaboration and Engagement:

- Communicate early, honestly, and completely with all collaborative members.
- Listen to others' points of view and remain open to being persuaded. Be tactful, but candid.
- Contribute constructively by exercising the highest level of professional, ethical and caring behavior.
- Resolve conflict constructively.
- Confidential treatment of discussions (until group agrees to release publicly).

PSC Case 2008-00408
Smart Grid Guidance Collaborative
Phase I – VI
Detailed Work Plan
May, 2010 – March, 2011

Task	Deadline

1. **Define "Smart Meter"** — **7/30**

   Consideration to the following:
   a. Bidirectional data communications
   b. Recording usage data on at least an hourly basis once per day
   c. Providing customers with direct access to and use of price and consumption information
   d. Providing customers with information on their hourly consumption
   e. Enabling time of use rates and real-time price programs
   f. Supporting the automatic control of the customer's electric consumption.

   Identify individual incremental costs for deploying and operating the following Smart Meter technology capabilities:
   a. Ability to remotely disconnect and reconnect
   b. Ability to provide 15-minute or shorter interval data
   c. On-board meter storage of meter data
   d. Ability to upgrade these minimum Smart Meter capabilities as technology advances and becomes economically feasible
   e. Ability to monitor voltage at each meter and report data in a manner that allows the utility to react to the information
   f. Ability to remotely reprogram the meter
   g. Ability to communicate outages and restorations
   h. Ability to support net metering of customer-generators

2. **Define "Smart Grid"** — **7/30**

   Identify and describe Smart Grid applications that have as their primary benefit:
   a. Reduced transmission and distribution losses
   b. Improved outage management
   c. More effective customer load control
   d. More effective distribution monitoring and load control
   e. More effective transmission monitoring and load control
   f. Increased system reliability

Identify and describe Smart Grid applications that can be effective with and without implementing time of use rates. **8/30**

Consideration to the following:

a. Bidirectional data communications
b. Recording usage data on at least an hourly basis once per day
c. Providing customers with direct access to and use of price and consumption information
d. Providing customers with information on their hourly consumption
e. Enabling time of use rates and real-time price programs
f. Supporting the automatic control of the customer's electric consumption.

3. **Identify the essential functions of Smart Meter and Smart Grid Systems** **8/30**

4. **Identify essential components of Smart Meter and Smart Grid systems necessary to utilize the functions identified above.** **7/30**

5. **Identify benefits to the following from the Smart <u>Meter</u> functions previous identified:** **8/30**
   a. Utilities
   b. Consumers
   c. Public
   d. Indirect

6. **Identify benefits to the following from the Smart <u>Grid</u> functions previous identified:** **8/30**
   a. Utilities
   b. Consumers
   c. Public
   d. Indirect

7. **Identify and describe those benefits of Smart Grid and Smart Meters that can be quantified within the context of a cost benefit analysis and those benefits that cannot be so quantified.** **10/30**

8. **Identify and describe the ways that utilities and regulators can ensure that Smart Grid and Smart Meter investments avoid premature obsolescence.** **8/30**

9. **The U.S. D.O.E. has identified the following five technologies that will "drive" the Smart Grid:** 8/30

(1) integrated communications;
(2) sensing and measurement technology;
(3) advanced components (superconductivity, storage, power electronics and diagnostics);
(4) advanced control methods; and
(5) improved interfaces and decision support.

Which of these will be the most cost-effective components of a Smart Grid and why?

10. **What is your understanding of consumer attitudes and preferences regarding key applications such as Energy Information Displays and Demand Response?** 9/30

11. **Which consumer-oriented applications are the simplest for consumers to understand and use?** 8/30

12. **Identify and discuss cost recovery issues and mechanisms from a base rate perspective or through the use of an automatic adjustment mechanism or surcharge mechanism.** 10/30

13. **Identify and address cyber security issues that may result from the deployment of Smart Meters and Smart Grid.** 9/30

14. **Overall Adaptability** 8/30

(1) a. Should there be some common "plug and play" format and/or hardware on the meter to accommodate future technology changes? If so, provide suggestions to address this capability.

15. **Home Area Network (HAN) Protocols:** 8/30

(2) a. What HAN protocol may be appropriate from the meter to the customer? What HAN protocols are most readily available and accessible to customers? Should the Commission standardize a protocol? Should there be more than one protocol?

b. Should Smart Meter information be available through a HAN or an Internet browser? If through an internet browser, should this come from a Web site, or directly from the meter, or both? Through which browsers should this be made available?

c. Should there be other interconnectivity between the meter and other equipment in the home? If so, how much? [read capability vs. two way communication]

16. Utility usage data and meter access: **9/30**

(3)

a. What usage data should the utility acquire through the smart metering system?
b. Should the Commission establish minimum requirements on how often the utility should acquire the usage data from the meter?
c. Should the Commission establish minimum data intervals? If so, what should that be? [Examples: 15 minutes, 30 minutes, one hour]
d. Should this usage data be validated?
e. Should the Commission establish a common validation or error detection protocol? If so, what *should* that be?
f. How should customers be provided direct access to usage information? [examples: Web site access, HAN to an in-home display or other devices]
g. Should the Commission establish standard protocols and communication media for providing direct access to usage information from the meter to the HAN? If so, what should those be?
h. How should this Commission provide direct access to the meter to authorized third parties? What policies or regulations should this Commission promulgate to ensure that these third parties are provided timely access under reasonable terms and conditions to the customer metering facilities?
i. What communications, software or hardware can facilitate this direct access to the meter for customers or authorized third parties, and should the Commission establish requirements and or standards to facilitate this access?
j. What electronic access to customer meter data would authorized third parties need?

17. Meter to EDC Communications: **9/30**

(4)

a. Should the Commission set requirements for public protocols from the meter to the grid?
b. If certain protocols are not effective in certain geographic or rural regions, should the Commission adopt a list of protocols that can accommodate all of Kentucky customers' communication requirements? If so, what additional protocols should be adopted?
c. What bidirectional communication media [example: broadband over power-line, cellular, phone lines, RF] are least cost? What are the pros and cons of each?

18. Access to Price Information: **8/30**

(5)

a. How should customers be provided direct access to pricing information? [examples: Web site access, HAN to an in-home display or other devices]

b. Should the Commission require the meter to communicate price information, or should this information be provided over another communication medium?

c. What pricing information should the Commission require to be provided?

d. Should the Commission establish minimum requirements on how frequently price information should be provided? If so, what should be the minimum requirement?

e. Should the Commission establish standard formats for presentation of price information? If so, suggest a format.

19. Automatic Control:

(6)

a. How can Smart Meters 'effectively support" automatic control of electricity consumption by customers, utilities or other parties? **8/30**

b. How is the smart metering system engaged in the initiation, maintenance, relinquishment, and verification of the automatic control of customer consumption?

c. What smart metering protocols and communication media are needed to implement these automated controls? Should the Commission establish any requirements or standards for this purpose?

d. What energy consuming customer assets can be controlled by these Smart Meter systems for each of the customer segments, and how is control of these assets impacted by the choice of communication medium and protocol?

20. Smart Metering Acceleration: **9/30**

(7)

a. To the extent permissible under the law, should the Commission or another entity of the Commonwealth provide an incentive to utilities to accelerate their Smart Meter deployment? If so, identify possible incentives and the entity that should provide such incentives.