

**STATE OF IOWA
DEPARTMENT OF COMMERCE
BEFORE THE IOWA UTILITIES BOARD**

**FILED WITH
Executive Secretary
November 17, 2011
IOWA UTILITIES BOARD**

IN RE:)	
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PURPA STANDARDS IN THE)	DOCKET NO. NOI-2008-0003
ENERGY INDEPENDENCE AND)	
SECURITY ACT OF 2007)	

**RESPONSE OF MIDAMERICAN ENERGY COMPANY THE IOWA UTILITIES
BOARD'S QUESTIONS INTO PURPA STANDARDS IN THE ENERGY
INDEPENDENCE AND SECURITY ACT OF 2007**

COMES NOW, MidAmerican Energy Company (MidAmerican), pursuant to the Iowa Utilities Board's ("Board") Order Soliciting Comments issued on October 14, 2011 (Order), MidAmerican states the following.

Background

In its December 5, 2008 Order, the Board initiated a notice of inquiry into the requirements of the Energy Independence and Security Act of 2007 (EISA). The Board expanded its inquiry by order on March 9, 2010 to include smart grid deployment and the Federal Energy Regulatory Commission's directive to regional transmission organizations to amend its rules to allow aggregators of retail customers (ARCs) to offer demand resources into wholesale and ancillary services markets, if allowed by state commissions.

On March 29, 2010, the Board issued an order temporarily prohibiting ARCs from operating in Iowa. In its order, the Board noted its concerns that allowing ARCs to operate in Iowa may violate Iowa's exclusive service territory statutes and could impose costs on other ratepayers that could be found to be discriminatory. Pursuant to the Board's March 9, 2010 Order, MidAmerican submitted responses to the Board's

questions. Additionally, MidAmerican participated in the Board's workshop on April 16, 2010, to discuss ARC and smart grid issues.

In its October 14th Order, the Board noted numerous developments in smart grid technology, policy, and programs. In light of these and other smart grid developments since the Board last solicited input on smart grid issues, the Board is soliciting new input regarding smart grid developments, and updated comments on whether it would be appropriate to continue, modify, or withdraw the temporary prohibition on ARCs operating in Iowa. In response to the Board's questions set forth in its Order, MidAmerican submits the following responses.

Responses To Board Questions

1. What is your long-term vision for the future of the electric grid?

Response:

MidAmerican's position that full deployment of smart grid technologies should be driven by value to customers, not by policy initiatives, has remained unchanged. MidAmerican will make decisions about smart grid deployments as part of plans for capital deployment. MidAmerican will continue to monitor demonstration pilots throughout the country and MidAmerican will assess the value of strategic deployments. Additionally, MidAmerican will monitor customer feedback regarding smart grid technology applications. MidAmerican continues to follow the smart grid issues debate in national forums as the outcomes may impact reliability and national security, and will continue to inform the Board on smart grid deployments in lieu of filing formal plans.

2. What are the goals for your smart grid components and network? Will it be a flash cut approach or rolled out in phases?

Response:

MidAmerican's smart meter plans include developing strategies to take full advantage of automated meter reading-related technologies and deploying new technologies when customer benefits can be demonstrated. Demonstration projects and customer feedback will continue to be monitored and assessed. Opportunities for deployment of smart grid components on the transmission and distribution side of the business will also continue to be assessed. Pilot projects may be implemented to evaluate technologies, customer acceptance and benefits. MidAmerican will consider what approach to use, flash cut or phased, in its determination of when it would be beneficial to customers to implement smart grid components.

3. What changes in smart grid technology has your company seen in the last two to three years?

Response:

The U.S. Department of Energy selected the Virginia Tech Advanced Research Institute to design, populate, manage and maintain a public Smart Grid Information Clearinghouse (SGIC) portal to provide the latest information on smart grid developments. Contents in the SGIC portal include demonstration projects, use cases, standards, legislation, policy and regulation, lessons learned and best practices, smart grid technologies, and advanced topics dealing with research and development. The portal

also provides links to other pertinent sources or databases for additional data, case studies, and relevant information.¹

In 2009, the Illinois Commerce Commission (Illinois Commission) initiated a process in which all stakeholders in the Illinois electric industry worked together to collect information, exchange ideas and develop a framework to assist the Illinois Commission's consideration of smart grid investments and related policies. MidAmerican was an active participant during the collaborative and helped draft the final report. The Illinois Commission investigated automated meter information-related metering technology and concluded that there have been significant advancements in the past two to three years. The core functionality of advanced metering infrastructure (AMI) smart meters has been proven in several large deployments, such as Connecticut Light and Power's Rate Pilot and Meter Study, Baltimore Gas and Electric's Smart Energy Pricing Pilot, and Commonwealth Edison Company's (Commonwealth) Customer Applications Program. Smart meter functionality for in-premises communications continues to develop with utilities attempting to validate the various technologies. Security measures relative to smart grid technologies are evolving and will remain a work-in-progress going forward as updates will constantly be needed to respond to new threats. There has been a significant increase in utility activities to support second generation plug-in electric vehicles coming on the market. This has resulted in pilot deployments of electric vehicle charging portal technology in limited scope by some utilities. There have also been advancements on the transmission and distribution side of the business as new versions of line and substation technologies are developed as electronics improve.²

¹ <http://www.sgiclearinghouse.org/>

² <http://www.ilgridplan.org/Shared%20Documents/ISSGC%20Collaborative%20Report.pdf>

4. Are your customers requesting smart grid services or devices?

Response:

MidAmerican's customers are not requesting smart grid services or devices at this time. However, when presented with information on smart grid at specific events, such as MidAmerican's 2011 EmpowerU customer meetings, customers have shown interest in hearing about the potential smart grid services and devices that MidAmerican is monitoring, and how new and future smart grid technologies could be integrated with the current AMR metering system.

5. To the extent smart grid installations have been deferred or delayed, why has that occurred?

Response:

Every smart meter deployment reviewed as part of a study conducted by the SmartGrid Consumer Collaborative experienced customer complaints. The customer complaints were typically related to radio frequency-related health impacts, data privacy and security, overbilling, rate increases, and meter reader job loss.³ In California, complaints led the California Public Utilities Commission to require the electric utilities to offer customers an option to opt out of smart meters at a reasonable cost to be paid by the customers who choose to opt-out. The Maine Public Utilities Commission earlier this year decided to permit customers to opt-out of Central Maine Power's smart meter program or have the radio transmitter in their smart meter turned off for an additional monthly fee.

³ <http://smartgridcc.org/sgccs-excellence-in-consumer-engagement-study>

Deferrals and delays in smart grid installations have occurred as utilities adjusted to control the scale of consumer complaints by conducting customer outreach and education in advance of smart meter deployments. Utilities have recognized that consumer education and communication regarding grid modernization should be part of their long-term smart grid strategies and should be implemented in the design phase.

Utilities are also delaying installations due to concerns about the value of smart grid investments, technology complexities, data storage costs and performance, security of data, and the lack of an interoperability and communication standard. Even with these types of deferrals and delays, the Institute for Electric Efficiency has improved its outlook for smart meter deployments from 60 million by 2019, previously reported in February 2010, to 65 million by 2015.⁴

6. What have been the advances in cyber security as it relates to protection of your individual customer data?

Response:

MidAmerican continually updates all of its computer systems and servers with the latest software updates and cyber security measures to ensure that all data is protected to the greatest extent possible. Individual customer usage data is protected on internal computer systems after it is retrieved by mobile collection devices from MidAmerican's AMR meters. The data communicated from the AMR meters provides the meter identification number and the latest meter read, not any customer-specific information. Additionally, customer usage data is not communicated back to MidAmerican over any type of network interface that would be susceptible to cyber attacks.

⁴ http://www.edisonfoundation.net/iee/issueBriefs/SmartMeter_Rollouts_0911.pdf

Cyber security in general will remain an issue to be monitored at the national level as the national Smart Grid Interoperability Panel continues to develop a catalog of standards and practices for coordinating the development of a framework of protocols and model standards for the smart grid. During the Illinois Commission's statewide smart grid collaborative, stakeholders agreed that successful resolution of issues regarding the availability and protection of AMI-enabled data access is crucial to smart grid deployment and operation. However, state policy with regard to data privacy and data access will also need to be monitored with respect to how the data of individuals and groups of consumers will have to be treated and protected by all parties with access to them.⁵

7. What rights over the consumer data does the utility have?

Response:

The Critical Consumer Issues Forum, a group of state commissioners, consumer advocates, and electric industry representatives working together to tackle tough consumer issues, concluded in their principles on grid modernization that protecting individual consumer information from unauthorized disclosure is essential to successful grid modernization. Electric utilities must continue to have access to and the ability to use customer-specific energy usage data, including operational data, to effectively render regulated services (e.g., to maintain safety and reliability, to properly and timely bill customers). Utilities must handle usage data in a manner that protects the information and the privacy of the consumer. Unless other uses are affirmatively authorized by a state or federal regulatory authority or affirmatively authorized by the consumer, utilities must

⁵ <http://www.ilgridplan.org/Shared%20Documents/ISSGC%20Collaborative%20Report.pdf>

limit their use of this data to that necessary for the provision of regulated services. Utilities and utility contractors must continue to protect consumer electricity usage data from unauthorized access and must have affirmative consent of consumers prior to disclosure of a consumer's personally identifiable energy usage data to any third party.⁶

8. What safeguards can be built into the system to prevent the consumer data from being stolen or corrupted as it is being sent from the premises?

Response:

MidAmerican uses encryption technology to protect its AMR meters usage data from being collected and interpreted without an authorized mobile collection device. The meters also provide notification when tampering has occurred. MidAmerican continually updates the software used in the mobile collection devices to ensure that the newest security updates are being used to provide the highest level of data protection. The usage data that comes from the AMR meters does not contain customer-specific information, only the latest meter read and the meter identification number.

9. Is there any history of smart meters, advance metering infrastructure, substation automation, or distributed automation communications networks being hacked or otherwise compromised? If so, please explain.

Response:

Historically, utility control systems were fully isolated networks. Utility control systems are now more integrated with other control systems, and thus, are becoming more vulnerable to attacks. MidAmerican's system has not been compromised by any type of cyber attack. However, MidAmerican is aware that the number of cyber attacks on United States utilities has significantly increased over the last year.

⁶ <http://www.nasuca.org/archive/CCIF%20Grid%20Modernization%20Report%20July2011%20Final.pdf>

The Department of Homeland Security has set up a control system program that includes an emergency response team, a Cyber Analysis Center where systems are tested for vulnerabilities, a malware laboratory for analyzing cyber threats and a classified “watch and warning center” where data about threats are assessed and shared with other cyber security and intelligence offices. The control system security program cyber experts based at the Idaho National Laboratory responded to 116 requests for assistance in 2010, and 342 by the third quarter of 2011. As stated in a Bloomberg Businessweek article, one such attack was on an Iranian uranium enrichment facility in Natanz last year. The virus used in this attack exploited well-known design flaws common to many system controllers, vulnerabilities that in general can’t be patched.⁷ These threats are always changing with hackers using more sophisticated methods to attack and take control of critical infrastructure. MidAmerican remains proactive in its approach to deploy the latest security measures to protect against such future attacks.

10. How will the consumer get access to the metered data and what software or other mechanisms will be made available to the consumer to understand their usage data?

Response:

Currently, customers of MidAmerican can access their monthly and historical meter data by logging into their account information on MidAmerican’s website. Improvements are constantly being made to MidAmerican’s website to provide additional information to educate customers on their electricity and gas usage. As part of an energy efficiency pilot project, MidAmerican is also deploying an Opower home energy report

⁷ <http://www.businessweek.com/ap/financialnews/D9Q2ILSG0.htm>

that provides some customers with a report detailing usage information and helpful tips for conserving electricity.

Smart grid devices will also continue to be developed that allow consumers access to their metered data. In-home displays (IHDs) are being tested that report load changes down to the tenth of a watt to provide customers with data about every type of load or load group within their home and the impact of changing an appliance's state. Since customers already have many types of displays within their home, IHDs will eventually be integrated with existing displays such as computers, televisions, and thermostats. Energy management systems (EMSs) are also being developed that will provide customers a means to act on the additional electricity consumption information that is being provided. An EMS can automate consumption management for individual appliances or a whole home, help customers stay within spending limits, or alert the customer about changing grid events and conditions.

11. What do you think the impact will be of behind-the-meter web tools that allow tracking of home energy usage on energy efficiency and other utility matters? Will these types of programs take the place of some smart grid functions?

Response:

As economist John Kenneth Galbraith once said, “things that are measured tend to improve.” Customers who have access to electricity tracking tools will be able to monitor more closely what contributes to their energy consumption. This additional information will motivate some customers to reduce utility bills by minimizing electricity usage. These customers will seek out energy efficiency measures that help decrease their electricity usage and will likely continue to implement additional measures until the costs exceed the savings on their utility bills. Thus, electricity tracking tools should have a

short-term positive effect on the level of energy efficiency measures deployed by customers and could take the place of some smart grid functions for customers until additional smart grid measures become available.

The American Council for an Energy-Efficiency Economy conducted a review of a variety of new residential feedback initiatives, including real-time Web-based or in-home feedback devices and enhanced billing approaches, that on average have reduced individual household electricity consumption 4 to 12%. One of the pilots, conducted by Baltimore Gas and Electric (BGE), actually produced above average results, with average peak reductions of between 22 and 37 percent for the three years of the pilot. BGE deployed AMI solutions, dynamic pricing testing and demand response interventions to enhance reliability and provide energy management solutions to their 1.2 million customers. The pricing pilot was conducted with 1,000 randomly selected customers placed on either a peak-time rebate or critical-peak pricing and some receiving an in-home device or a smart thermostat/switch.⁸

12. Has your company (or an affiliate) studied the relationship between energy efficiency and smart grid? If so, what were the findings?

Response:

While MidAmerican and its affiliate, PacifiCorp, have been monitoring smart grid developments for potential deployment opportunities, a specific study of the relationship between energy efficiency programs and smart grid has not been conducted by either utility at this time. MidAmerican is currently following the trend in the industry of focusing on consumer outreach and education prior to undertaking smart grid advancements by deploying Opower home energy reports through an energy efficiency

⁸ <http://aceee.org/research-report/e105>

pilot project. These home energy reports focus on conservation and promote energy efficiency opportunities. Customers of other utilities who received Opower home energy reports have on average lowered their energy bills and implemented additional energy efficiency measures in the process. At this time, MidAmerican does not have any findings from its deployment of Opower home energy reports since the pilot began in late October and customers are just starting to receive their first reports.

13. Does the emergence of numerous "past-the-meter devices" (i.e., energy management devices) affect the benefits utilities expect from smart grid deployment?

Response:

The emergence of past-the-meter devices provides the potential for benefits to be experienced from technology deployments in all areas of the smart grid. The Critical Consumer Issues Forum concluded in its principles on grid modernization that smart grid developments will provide new opportunities for innovative technologies that result in direct and indirect benefits to all stakeholders. Customers will benefit from the increased capability, opportunity, and motivation to better manage energy budgets and consumption, in part through consumer-facing applications, such as home energy management devices and smart appliances. Utilities will benefit from improved outage prevention, detection and restoration, and facilitation of electric vehicles into the electric grid.⁹

The American Council for an Energy-Efficiency Economy concluded from their investigation of recent pilot projects that providing households with frequent, ongoing, and meaningful feedback regarding energy consumption resulted in significant residential

⁹ <http://www.nasuca.org/archive/CCIF%20Grid%20Modernization%20Report%20July2011%20Final.pdf>

sector energy savings. However, not all feedback technologies, programs, and contexts were the same, and the findings indicated that these differences helped determine the likely effectiveness of feedback in reducing energy consumption. Feedback gadgets alone did not maximize household energy savings. The success of the technologies tested depended heavily on consumer acceptance and participation. The best feedback approaches were incremental in nature and evolved as technologies became more sophisticated.¹⁰

14. Has the technology for consumer-level energy management devices progressed to the point where homeowners or small businesses find them cost-effective or feasible?

Response:

As part of an examination of the electric industry's key standards, competitive strategies, and emerging opportunities for leveraging home control technologies to integrate homes with the emerging smart grid, Greentech Media estimated that approximately 6 million U.S. households will have some type of home energy management device by 2015.¹¹ This represents about 10 percent of the expected 65 million households with smart meters. Despite this rapid growth in the home energy management space (almost 100 percent growth expected over the next 3-4 years), and the significant energy management opportunity that is unleashed by the combination of smart meters and smart home energy management devices, concerns about the adverse effects of smart meters continue to dominate conversations among regulators, consumer

¹⁰ <http://aceee.org/research-report/e105>

¹¹ <http://www.greentechmedia.com/research/report/smart-grid-han-strategy-2011>

advocates, and electric utilities. (*The Costs and Benefits of Smart Meters for Residential Customers*, Institute for Electric Efficiency Whitepaper, July 2011).¹²

Acceptance and adoption of consumer-level energy management devices and software may also be premature. Google PowerMeter and Microsoft Holm, both free energy monitoring tools designed to give people access to their energy information, were discontinued mainly due to very slow enrollment rates. IHDs were piloted in Commonwealth's Customer Applications Program project in Illinois with somewhat counterintuitive results. The Electric Power Research Institute concluded in its final analysis of Commonwealth's program that households that received either a basic or an advanced IHD showed a slight increase in electricity demand during all summer hours, summer peak hours, and event hours. Additionally, Commonwealth found that the workability of IHDs was limited by the range of the radio-based signal from the meter, so that only first floor customers in multi-family residences were able to effectively use an IHD. Installation rates of IHDs were low even when the unit was free to the customer.¹³

15. What studies are available on the topic of "phantom loads," that is, energy used in standby mode by various plug-in electrical devices (set-top boxes, battery chargers, and other devices that use electricity when they appear to be off)? Do any of these studies include data applicable to Iowa utilities or energy users?

Response:

Lawrence Berkeley National Laboratory (LBL) has an extensive website containing information on standby power.¹⁴ The LBL website includes tables and charts on a wide variety of appliances and electrical devices showing the energy used in standby

¹² http://www.edisonfoundation.net/iee/reports/IEE_BenefitsofSmartMeters_Final.pdf

¹³ <http://comedamifuture.com/Resources/ComEd%20CAP%20Final%20Analysis%201023644.pdf>

¹⁴ <http://standby.lbl.gov/standby.html>

mode.¹⁵ The Department of Energy also has a site showing the phantom power usage of various types of equipment.¹⁶

The LBL website includes a listing of reports and studies that provide additional insights into standby power.¹⁷ However, MidAmerican notes that these studies do not specifically include data applicable to Iowa.

17. What is the likelihood that issues relating to phantom loads will be resolved by improvements in specific technologies or federal standards? If phantom loads are not amenable to standards or in-the-box technology solutions, how likely are individual households to undertake the behavioral changes needed to manage these devices?

Response:

The United States Department of Energy has a number of rulemakings underway to look at standards for appliances like battery chargers and external power supplies, computers, set top boxes and network equipment and televisions. The status and impact of rulemaking activities related to these appliances can be found at the Appliance Standards Awareness Project website.¹⁸ An example of a product where no standard exists but is under active consideration is battery chargers.¹⁹ It is estimated that standards for consumer battery chargers, which would limit the energy consumption of battery chargers in active, standby and maintenance modes, would save 127 TWh (about 1.3 quads of primary energy) on a national level cumulatively by 2030 and generate \$5.8 billion in net present value savings.

¹⁵ <http://standby.lbl.gov/summary-table.html>

¹⁶ http://www.energysavers.gov/your_home/appliances/index.cfm/mytopci+10040http://www.energysavers.gov/your_home/appliances/index.cfm/mytopci+10040

¹⁷ <http://standby.lbl.gov/docs.html>

¹⁸ <http://www.appliance-standards.org/products>

¹⁹ <http://www.appliance-standards.org/product/battery-chargers>

Since there are only a few ways to cut standby power use without leading to inconvenience, it follows that improvements in technologies or federal standards would be a more effective way to address phantom load. Behavior changes available to address this issue include unplugging products that are rarely used, use of a power strip with a switch to control clusters of products and incentives to purchase low-standby products. However, it is difficult to identify low-standby products because few products list their standby power use. Most Energy-Star endorsed products have lower standby capability.

Additionally, as part of its Energy Efficiency Settlement in Docket EEP 08-2, MidAmerican has developed an educational piece on phantom load and distributes it to customers at various events promoting energy efficiency.

QUESTIONS REGARDING AGGREGATORS OF DEMAND RESOURCES

MidAmerican concurs with the Board's ruling and believes ARCs are prohibited from directly serving customers by Iowa's exclusive assigned electric service area provisions. The Board, in its March 29, 2010 order in this proceeding, temporarily suspended and prohibited the operation of ARCs in Iowa stating concerns with their legal operation. Although the Midwest Independent Transmission System Operator, Inc. (MISO) filed tariff revisions to reflect ARCs on October 2, 2009 in Docket No. ER09-1049-002, they have not been acted upon by FERC. FERC has recognized in Order No. 719-A²⁰ that MISO cannot accept bids from ARCs if prohibited by law or regulation.

²⁰ *Wholesale Competition in Regions with Organized Electric Market*, 125 FERC ¶ 61,071 (October 17, 2008), 73 Fed. Reg. 64,100 (Oct. 28, 2008), FERC Stats & Regs. ¶ 31,281 (2008); *order on reh'g*, 128 FERC ¶ 61,059 (July 16, 2009), 74 Fed. Reg. 37,772 (July 29, 2009), FERC Stats. & Regs. ¶ 31,292 (2009); *order on reh'g*, 129 FERC ¶ 61,252 (December 17, 2009).

Therefore, there have not been any proceedings on the federal level that would prompt the Board to re-examine its earlier decision.

1. How might the operation of ARCs in Iowa affect the participation of utility customers in demand response tariffs or programs, such as interruptible, time-of-use, or direct load control programs?

Response:

ARCs are effectively an alternative to utility energy efficiency and demand response programs. A customer, given the choice between participating in an ARC's demand response activities and a retail utility's demand response programs, should be expected to compare price and program flexibility. If participation in a MISO ARC program is chosen, the ability of the retail utility and its customers to benefit directly from the management of the customer's load is lost and the benefits of demand response from the retail customer accrue instead to the entire MISO grid.

Recognizing that ARCs are alternatives to retail utility programs, MidAmerican has worked to establish terms that are as flexible as possible while remaining consistent with the MISO tariff. MidAmerican's incentives are also periodically reviewed to ensure they are commensurate with the savings.

2. How might the operation of ARCs in Iowa affect the forecasts of Iowa utilities with respect to peak load, reserve margins, energy sales, and other parameters?

Response:

The proposed MISO ARC tariff provided that utilities would be notified whenever an ARC registers load in its region. For this reason, MidAmerican's response in 2010 to this question was that ARCs would not significantly hamper MidAmerican's

ability to forecast peak load and energy usage. Since the MISO tariff has not been implemented, and it is not known whether a retail utility would know whether its customers had selected to be interrupted as MISO ARCs, presumably their loads would need to be treated as firm by the retail utility for planning purposes with corresponding requirements to procure reserve margin.

3. If ARCs are allowed to operate in Iowa, would utilities seek to alter the goals in their energy efficiency plans for capacity and energy savings?

Response:

As long as there are no rules for ARC programs, MidAmerican is unable to determine what their impact would be on energy efficiency programs. If ARCs were allowed to operate, it is possible that MidAmerican would alter its energy efficiency plans based on its interaction and actual experience with ARCs, as opposed to hypothetical concepts of how they will operate and affect Iowa retail electric customers.

4. If the Board takes no action with respect to ARCs, what effect will that have on Iowa load serving entities in the short-term and long-term?

Response:

MidAmerican is not clear what is meant by “take no action with respect to ARCs”. The Board has already taken action in its March 29, 2010 order to temporarily suspend ARC activity. MidAmerican believes this action is consistent with Iowa exclusive assigned service territory law as stated in its earlier comments in this docket. If the Board takes no **further** action regarding ARCs, it is possible that an ARC could file a complaint asking the Board to remove the temporary prohibition or a request for a declaratory ruling on the legal issues. MidAmerican would suggest that it is in Iowa retail

customers' interests for the Board to act on ARCs on its own motion instead of awaiting a complaint or declaratory order request. If the Board acts on its own motion, it could employ rulemaking or investigation administrative processes that would lead to broader policy considerations.

WHEREFORE, MidAmerican Energy Company respectfully requests the Iowa Utilities Board to give these comments due consideration. MidAmerican representatives will be made available to meet with the Board or Board Staff to answer any additional questions or to provide any additional information.

Dated this 17th day of November, 2011.

Respectfully submitted,

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