STATE OF IOWA
DEPARTMENT OF COMMERCE
BEFORE THE IOWA UTILITIES BOARD

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

OFFICE OF CONSUMER ADVOCATE COMMENTS

The Office of Consumer Advocate (OCA), a division of the Iowa Department of Justice, responds as follows to the questions posed by the Iowa Utilities Board's October 14, 2011, Order Soliciting Comments. Due to a number of questions being primarily directed to utility companies, OCA appreciates having the opportunity to review the utility responses in formulating its comments.

Questions Regarding Smart Grid Issues

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

The primary function of the electric grid has been to enable the provision of reliable electric service to consumers at just and reasonable rates. In recent years, the electric grid has been utilized to support the achievement of a robust wholesale energy market and to integrate new generation resources needed to meet electric demand.

Various forces are converging that will force the grid to adapt to evolving economic and environmental circumstances.[1] In addition to its current functions, the electric grid will be important in expanding and integrating new generation resource developments, including

[1] Fribush, Parker and Enterline (Vermont Energy Investment Corporation (VEIC)), "Electric Evolution: Issues Posed and Opportunities Presented by the Emergence of the Smart Grid," a Discussion Paper for Electric Utilities, Legislators, Regulators and Consumers, p. 4, www.veic.org/ResourceLibrary/VEIC_Resources_on_Smart-Grid.aspx (Jan. 2010).

demand side management, renewable resources, and distributed generation. Vermont Energy Investment Corporation (VEIC) published a paper in 2010 discussing major areas of efficiency opportunities for smart grid technologies as well as policy considerations that arise in these contexts. These experts have suggested that the smart grid should evolve to provide the greatest efficiency and reliability in the generation, delivery, and use of electricity, while minimizing long-term consumer and environmental costs.[2]

OCA has previously emphasized the benefits of smart grid enhancements that would improve distribution system reliability.[3] These enhancements do not depend on consumer response or consumer education. OCA continues to see distribution system enhancements as leading smart grid opportunities. This view appears to be supported by Interstate Power and Light Company's (IPL's) response, indicating that "technological developments regarding Smart Grid over the past several years have shifted somewhat from primarily customer-facing applications toward technologies that support improved delivery system (grid) operational performance and efficiencies." (IPL Nov. 17, 2011 Response to Q.1). Rather than a shift in technological development, OCA submits that there may simply be greater interest in implementing smart grid delivery system enhancements that offer more certain benefits that are not dependent on consumer receptiveness or action.

OCA agrees with MidAmerican's view that full deployment of smart grid technologies should be driven by value to customers. As discussed in OCA's August 3, 2009, comments in this proceeding, widespread deployment of smart grid technologies should be predicated on a thorough benefit-cost analysis and preceded by steps to mitigate rate impacts associated smart

[2] *Id.*, Document Summary page.
[3] *PURPA Standards in the Energy Independence and Security Act of 2007*, IUB Docket No. NOI-08-3, OCA Response, pp. 5-8 (Aug. 3, 2009).

grid investments.[4] As utilities and other stakeholders continue to monitor smart grid deployments throughout the country, it will be useful to periodically evaluate findings based on this monitoring effort through this or a related inquiry proceeding.

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

Investments in smart grid components and network should be demonstrated to be cost-effective investments that will advance the availability of efficient and reliable utility service to end-use consumers at just and reasonable rates and terms. These considerations must also guide decisions about components and the scope of their availability.

Smart grid components such as Advanced Metering Infrastructure (AMI) devices which are dependent on consumer action for their efficient function should be thoroughly evaluated prior to full implementation. This evaluation or pilot phase should assess needed customer education, customer satisfaction, and whether the component actually delivers more efficient utility service to consumers. Services such as Time-of-Use (TOU) rates and Critical Peak Pricing should be offered as a voluntary basis, particularly to residential and smaller general service customers. OCA incorporates by reference its August 3, 2009, response on this topic in the above-captioned proceeding, in particular pp. 17-18, and OCA's response in IUB Docket No. NOI-06-3, "Inquiry into Advanced Metering and Time-Based Rates," pp. 12-24 (Sept. 29, 2006). At the conclusion of the Advanced Metering Notice of Inquiry proceeding, the Board noted the need for additional research and expressed its intent to begin informal discussions with utilities

[4] *PURPA Standards in the Energy Independence and Security Act of 2007*, IUB Docket No. NOI-08-3, OCA Response, pp. 15-16 (Aug. 3, 2009); *see also*, NASUCA Resolution 2009-01, "Advanced Electric Metering and Advanced Electric Metering Infrastructure Principles" (June 30, 2009), and NASUCA Resolution 2009-03, "Smart Grid Principles of the National Association of State Utility Consumer Advocates," June 30, 2009 (http://www.nasuca.org).

and other interested parties to develop a pilot project to test various types of advanced metering and time-based rates.[5]

Although IPL indicates a shift in interest from primarily customer-facing applications toward technologies that support improved delivery system (grid) operational performance and efficiencies, as noted above, IPL still discusses the possibility of deploying metering-related AMI infrastructure and associated software being on a flash cut or staged basis. (Comments, p. 5). Thus, it appears that IPL is continuing to consider multiple Smart Grid options. IPL notes that "if a utility expects customers want to see additional data from advanced two-way meters at the same time they install the meters, the decision to invest in CIS [Consumer Information Systems] and expand customer online tools needs to happen before the meters are installed." (Comments, p. 3). As IPL continues to consider a staged or flash cut implementation of metering-related AMI infrastructure, it is critical that CIS and online capabilities also be fully evaluated.

The VEIC report points out that analyses of AMI should include demand response as a primary benefit, which necessitates a transition from flat-rate pricing to dynamic pricing, which more accurately reflects the true costs of electricity delivery at different times of the day. The shift in consumption patterns resulting from dynamic pricing are expected to lead to a more capital efficient and energy-efficient grid.[6] Comments in IUB Docket No. NOI-06-3 have suggested that with well-designed dynamic pricing programs, it will be possible to attract good levels of voluntary participation. The VEIC report notes that the argument for widespread deployment seems to be at least partially contradicted by pilot studies showing that the average

[5] *Inquiry into Advanced Metering and Time-Based Rates*, Docket No. NOI-06-3, "Order Declining to Adopt Standard, Closing Docket, and Commencing Pilot Project Discussions, pp. 5-6 (Mar. 6, 2007).
[6] VEIC "Electric Evolution: Issues Posed and Opportunities Presented by the Emergence of the Smart Grid," a Discussion Paper for Electric Utilities, Legislators, Regulators and Consumers, p. 33, www.veic.org, (Jan. 2010).

decrease in peak consumption as driven by a small number of "star" performers who reduced consumption dramatically.[7]

Before any widespread deployment of AMI, VEIC identifies the following issues for policymakers to address:

- Determining which type of dynamic pricing to implement.
- Establishing minimum technology standards for AMI technologies.
- Ensuring that lowest-first-cost requirements do not result in an underinvestment in sufficiently upgradable technology.
- Ensuring consumers have the appropriate technologies [and information] that enable them to effectively respond to dynamic prices.
- Providing for protection of customers who are unable to respond effectively to dynamic prices.
- Finding the right balance between compensating utilities for legitimately unforeseeable stranded asset cases while holding utilities responsible for making short-sighted investments.
- Pacing investments in Smart Grid in such a way that the cumulative benefits correspond with the timing needs (consumer and/or utility). For example, a utility will need to launch its demand response program several years ahead of when it needs the additional capacity.

Consideration of these types of smart grid policy issues, perhaps as part of an AMI pilot or through technical workshops, will be useful as a foundation for current and future smart grid deployments.

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

OCA currently has no information responsive to this question.

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

Apart from the Dubuque Smart Meter initiative mentioned in IPL's comments, OCA is not aware of Iowa customers requesting smart grid devices.

[7] VEIC Report, p. 29.

Consumer interest in smart grid services or devices has been declining in some instances. For example, the Boulder smart meter initiative has experienced a significant decline in participants.[8] For the 669 customers dropping out of the Boulder pilot, the following reasons were cited: customer moves (216), customer choice (65), conflict with other program (saver switch programs) (311), and other reasons (77). While the Boulder smart grid pricing pilot started with an initial enrollment of 4,685, the September 15, 2011 report indicates that just over 4,000 customers remain enrolled.

Some Minnesota utilities are reporting customer reluctance to use smart grid technology and related rate formats, which is resulting in a major barrier to their wider use. (Platts Electric Utility Week, p. 22 (Sept. 26, 2011)). This article also reported that Connexus Energy, the largest cooperative in Minnesota, is taking a three-year break from considering installing AMI on customer buildings based on results of a recent pilot program. The Minnesota PUC plans to hold periodic stakeholder smart grid meetings.

The Smart Grid Consumer Collaborative, noted in MidAmerican's comments, concludes that "[t]o fully engage consumers, utilities must transform their core service model from one that focuses primarily on the reliable delivery of electricity to one that also focuses on customer needs and engagement."[9]

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

Based on its review of industry publications, OCA understands that customer concerns have arisen in almost all large scale deployments of AMI technology. Although the number of customer complaints is generally reported as being small in the overall scope of deployments, it is likely that customer concerns are more wide spread than just the documented complaints

[8] Colorado PUC Docket No. 09A-796E, July 20, 2011 Report and September 15, 2011 Report.
[9] Platts Electric Utility Week, p. 2 "Get to Know Customers and Keep Message Simple for Smart Grid Success, Group Advises" (Oct. 31, 2011).

received. OCA generally agrees with comments of MidAmerican Energy Company regarding the nature of concerns that have arisen and which have contributed to delays in AMI deployments or steps to allow customers to opt-out of such deployments.

In particular, OCA agrees with responses to this question indicating that consumer surveys, education, and outreach are essential in understanding customer needs and facilitating successful AMI technology choices and deployments. One factor contributing to consumer discontent in this context has been that education and outreach activities have been overly focused on utility operational benefits, while not enough attention has been given to consumer benefits. Another strategy for improving customer receptivity has been to use consumer forums in advance of smart meter deployments. The Sacramento Municipal Utility District used consumer forums prior to AMI deployment and, according to reports[10], has avoided major issues with its deployment.

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

OCA currently has no information responsive to this question.

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

OCA generally agrees with comments indicating the utilities have the right to use consumer data as necessary in their provision of regulated utility services.

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?

OCA currently has no information responsive to this question.

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

OCA currently has no information responsive to this question.

[10] Platts Electric Utility Week, p. 2 (Oct. 31, 2011).

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?

One of the key attributes of smart grid components such as the smart meter is the ability to enable customer management of energy consumption. As such, utilities implementing such smart grid components should fully evaluate meter components that will enable these customer guided efficiency opportunities. OCA generally agrees with utilities' responses discussing software and other mechanisms that can be provided to the consumer to understand usage data.

Regulators have a role to play in guiding utilities' selection of software or other mechanisms to enable consumer access and understanding of usage data. The VEIC study points out that the key challenge for regulators is to keep a clear perspective on big-picture goals to help assure that the right technology is selected. In this regard, VEIC suggests that regulators ask the following questions[11]:

- Are software and firmware easily upgradeable remotely?
- What is the optimal latency of meter reading, one that finds a proper balance between creating the greatest functionality while still being economical to deploy and use?
- Since upgradeable equipment often has higher first costs than non-upgradeable equipment, how can decision makers ensure that they do not under invest in technology due to the lowest first-costs planning requirements only to have higher operational or upgrade-related costs in the future?

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?

All web tools that track energy usage need customer energy consumption data. There are two kinds of web tools, one reads smart meter data and the other does not need a smart meter. For example, Google's PowerMeter needs inputs from installed smart meters or other energy

[11] VEIC Smart Grid Report, p. 28.

measurement devices, while Energy Watchdog needs customer to enter monthly energy bills. The key difference is that one reads real time data and the other reads monthly summary data.

These web tools will analyze the data collected, report or give customer advice based on the analysis. These web tools that read real time data will enhance the functions of smart meters by making the data more user-friendly.

These types of web tools will take the place of some smart grid functions. It is the customers who decide when and how to use energy with or without the expensive real time feedback.

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

Although the utilities apparently do not yet have much information about the relationship between energy efficiency and smart grid, the VEIC report, pp. 22-27, provides a good discussion of this relationship as well as other efficiency justifications for smart grid.

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

New energy management devices, such as Internet connected programmable thermostats, will perform some of the same functions of smart grid, but at much lower costs. If more of these types of devices are installed, the expected benefits from deployment of smart grid will be affected, because the energy savings have already been realized. It is possible that smart grid deployments such as AMI will encourage more installations and more rapid adoption of "past-the meter devices" than would otherwise occur.

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

OCA has recommended the investor-owned electric utilities evaluate this question as part of the utilities' ongoing energy efficiency assessment of potential.

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?

The early research papers on standby power (or informally called phantom load) were released by a staff scientist, Alan Meier, and his colleagues at the Lawrence Berkeley National Laboratory (LBNL) in Berkeley, California. Meier started to publish his research in the mid 1990s on standby power. LBNL has a website on the subject of standby power and has a list of important research papers. *See* http://standby.lbl.gov/docs.html.

A comprehensive research document on this topic is the September 2008 report prepared by LBNL for California Energy Commission's Public Interest Energy Research Program, LOW-POWER MODE ENERGY CONSUMPTION IN CALIFORNIA HOMES. *See* http://www.energy.ca.gov/2008publications/CEC-500-2008-035/CEC-500-2008-035.PDF. The research project estimated that in 2006 the average low-power mode energy use in California was 980 kWh per home, or roughly 13 percent of residential electricity use. The report also summarized other major studies on standby power around the world in Section 7.

Another good website to find more recent studies in other countries is the International Energy Agency (IEA) Implementing on Efficiency Electrical End Use Equipment (4E) website, http://standby.iea-4e.org/. The IEA has worked to raise the profile of standby power starting in early 1990's and has proposed to limit the standby power to 1-Watt per device around the world.

Internet literature review has not discovered any study that uses Iowa data, however, these studies should be applicable to Iowa utilities and energy users. Iowa customers use the same electricity-consuming products—TVs, computers, set-top boxes, audio components, coffee makers, garage door openers, and dishwashers.

16. 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?

Currently there are no federal standards on standby power. However, the federal government does run two programs that promote more efficient standby power devices. First, the Energy Independence and Security Act (EISA 2007) and Executive Order 13221 require Federal agencies to purchase products with a standby power level of 1 watt or less. The U.S. Department of Energy (DOE) manages a website to help buyers to find low standby power products. *See* http://www1.eere.energy.gov/femp/technologies/standby_power.aspx.

Second, the DOE regulates external power supplies and battery chargers based upon the EISA 2007 legislation, mandating minimum energy-performance standards (MEPS) for external power supplies and battery chargers. Most modern electronics devices use external power supplies and battery chargers which contribute to standby power. More detailed information on this mandatory program can be found at DOE's website: http://www1.eere.energy.gov/buildings/appliance_standards/residential/battery_external.html.

California is the only state that regulates standby power, limiting external power supply standby power to 0.5 watts. *See* http://www.energy.ca.gov/releases/2007_releases/2007-06-30_power_supplies.html.

The issues relating to phantom loads will not be soon resolved by improvements in specific technologies or federal standards. New electronic devices will be more efficient than

before thanks to the research work on the subject and governments intervention around the world. According to the CA study, considerable progress has been made in reducing the standby power use in some products, especially in televisions, computers, and external power supplies. However, many newer televisions, computer printers, and other high-tech consumer electronics still draw power even when switched off, not to mention those older devices.

Consumers need to be educated to change behaviors to reduce standby mode energy consumptions, including the following:

- Consider plugging these devices into a power strip and turning off the strip.
- Consider buying ENERGY STAR® appliances. For example, ENERGY STAR televisions can save 75 percent of standby electricity losses.
- Replace old, heavy chargers with new chargers.

Questions Regarding ARCs Issues

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?**

Traditionally, interruptible programs have been limited to large commercial and industrial loads. Direct load control programs that allow utility control of air conditioners, water heaters, or thermostats primarily during times of high or peak system demand have been more widely available to residential and smaller general service customers.

OCA addressed the efficiency potential associated with advanced metering devices and demand response aggregation in its comments in IUB Docket No. NOI-06-3, including the following:

> Aggregation is a key feature of ISO demand response programs. Electric utilities, by their very nature, are natural aggregators for ISO demand response programs . . . . Unless utility programs can be developed that give customers full access to the wholesale market and the ability to respond and profit from high prices, the potential for new demand response may be limited. Access to third-party aggregators can add value to both customers and to the wholesale market. Probably the most valuable role for third-party

> aggregators is to aggregate small and other hard to reach customers…these customers may not currently be customers of competitive retailers, and thereby cannot be aggregated by non-utility market participants. Access to third party aggregators will allow this group of customers access to wholesale market and will increase the price elasticity of demand.[12]

On this topic, OCA also recommended the comments of the Midwest Independent System Operator in the Federal Energy Regulatory Commission's Assessment of Demand Response, Docket No. AD06-2-000.

As such, it is very possible that ARCs could enable more diverse load management and demand response programs and thereby expand the number of participants and overall amount of interruptible and demand response enrolled in such programs. Currently, ARCs can only operate in cooperation with electric utilities in Iowa, so these expanded opportunities would likely only occur in conjunction with current rate-regulated operations and demand side management programs. OCA is not aware of specific cooperative activities in this context. Without the current restrictions on their activities in Iowa, ARCs would be able to directly offer aggregated demand response services and potentially compete with demand side management programs operated by electric utilities. It is unknown what impact this would have on the utilities' demand side management programs.

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

Assuming ARCs would need to meet MISO's criteria for demand response compensation, this should generally align with existing criteria for interruptible load for which the utilities currently adjust forecast of peak load and reserve margins. Currently, energy savings

[12] OCA Comments in Docket No. NOI-06-3 (Sept. 29, 2006), p. 23-24, quoting National Association of Regulatory Utility Commissioners (NARUC), *Policy and Technical Issues Associated with ISO Demand Response Programs*, p. 48, (prepared for NARUC by Dr. David Kathan).

associated with demand response, to the extent it is quantified at all, is not a significant source of energy savings impacts.

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?

It is difficult to estimate the impact that ARCs operating in Iowa, independent of utility DSM programs, would have. It is possible that ARCs would target demand response that is not currently enrolled in a utility DSM programs. Possibly, ARC operations in Iowa would stimulate changes in utility DSM programs that would yield higher levels of participation. OCA would expect any resulting impacts to be reflected in energy efficiency goals.

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?

If the Board takes no action with respect to ARCs, OCA would expect a continuation of status quo for Iowa load serving entities.

Respectfully submitted,

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