AARP, National Consumer Law Center, and Public Citizen Comments to:

DEPARTMENT OF ENERGY
Smart Grid RFI: Addressing Policy and Logistical Challenges

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CONSUMER COMMENTERS: AARP, National Consumer Law Center, and Public Citizen submit the following comments on consumers and smart grid issues in response to the Request for Information (Request or RFI) on smart grid policy and logistical challenges, published by the Department of Energy (DOE) on September 16, 2010.

- About AARP, National Consumer Law Center, and Public Citizen

Founded in 1958, AARP is nonprofit, nonpartisan membership organizations that helps people 50 and over improve the quality of their lives. AARP has offices in all 50 states, the District of Columbia, Puerto Rico and the U.S. Virgin Islands. For more than 50 years, AARP has been serving its members and creating positive social change through information, advocacy and service.

The National Consumer Law Center (NCLC) is a nonprofit organization founded in 1969 to help consumers, advocates, and public policy makers advance fairness in the marketplace for low-income consumers and preserve their access to safe and affordable energy and utility service.

Public Citizen is a national, consumer advocacy organization with over 150,000 dues-paying members across the United States. Public Citizen supports cost-effective clean energy and energy efficiency incentives for working families.

Introduction

On September 16, 2010, the Department of Energy issued a request for information concerning policy and logistical challenges that confront smart grid implementation, as well as recommendations on how to best overcome those challenges. Consumer Commenters support the modernization of the electricity grid. However, there remain many uncertainties regarding the costs and benefits of smart metering and dynamic pricing. In addition, some functionalities of smart metering threaten long-standing consumer protections. It is important to examine each smart metering proposal on its own merits and to allocate risks and rewards so that consumers are not asked to shoulder all the costs of the investments, while taking all the risks.

Consumer Commenters is responding to certain numbered questions from the RFI as set out below (in bold italics). The issues in this set of questions are discussed extensively in the report recently issued for AARP, National Consumer Law Center, National Association of State Utility Consumer Advocates, Consumers Union, and Public Citizen: *The Need for Essential Consumer Protections: Smart Metering Proposals and the Move to Time-Based Pricing (Essential Smart Metering Consumer Protections)*. These comments will highlight certain issues in response to these RFI questions. For a fuller discussion, please see the cited report, attached.

Consumer Commenters appreciate this opportunity to comment on these important smart grid issues.

1. Interactions With and Implications for Consumers

- ***What are the most important applications of smart grid for consumers (includes implications, cost and benefits)?***
- ***How do customers respond to pricing options, direct load control or other opportunities to save?***
- ***What are barriers to adopting of smart meter technologies and how should these be addressed (includes factors such as trust, control, civic obligation – social norms like recycling, time-varying pricing, energy efficiency programs)?***
- ***Role and design of education and communications campaigns****?*
- ***How should insights about consumer decision-making be incorporated into federal-state collaborative efforts such as the FERC National Action Plan on Demand Response?***

Consumer Commenters make the distinction between the modernization improvements to the transmission and distribution system which we regard as smart grid (new communication and digital seniors and automation capabilities for the distribution and transmission systems) versus the installation of new digital metering systems for ratepayers along with the direct interfaces between the new metering systems and customers through in-home technologies. These comments focus on the latter question: the impact from the meter to the home. As discussed in the attached white paper, we are concerned with early assertions of consumer benefit of these technologies as the early data thus far has not been conclusive as to the benefits to all consumers, low and fixed-income consumers in particular.

The potential benefits of the Smart Grid are typically presented as improving distribution service (by lowering operational expenses and improving the operation of the distribution and transmission grid to make service more reliable) and reducing generation supply costs and prices (by reducing peak load usage and usage overall). In addition to these potentially important benefits, Smart Grid investments are also linked to the ability to integrate new renewable resources and the expected increase in electrical powered vehicles. However, all of these benefits must be carefully proven in a state's review of the merits of any Smart Grid proposal.

To date, the consumer-facing aspects of the smart grid have largely consisted of dynamic pricing pilots. One major utility, Pacific Gas & Electric, offers customers with smart metering installed the option of taking service under SmartRate^{tm}, a tariff critical peak price. In some pilots, utilities have also tested various in-home displays and in-home devices, such as programmable thermostats, that are intended to assist consumers in controlling their own usage.[1]

[1] See, e.g., Nancy Brockway, *Advanced Metering Infrastructure: A Snapshot of Smart Metering in North America, Mid-2010*, filed with the Alberta Public Utilities Commission, in Docket No. XXXXX by the Consumer Advocate (June 2010), and Nancy Brockway, *Advanced Metering Infrastructure: What Regulators Need to Know about its Value to Residential Customers*, NRRI Report No. 08-03 (February 2008) (together, "*Advanced Metering Infrastructure*"), and pilot evaluations cited.

The results of recent dynamic pricing pilots have shown that residential customers who volunteer for these pilot programs will lower peak load usage in response either to high critical peak prices or to the offer of a rebate or credit, at least for the duration of the pilot. Pilot participants on average have delivered significant peak load reductions during the pilot period. Customers with central air conditioning controlled by programmable communicating thermostats have provided the highest demand reduction in these pilots.[2]

The dynamic pricing and usage feedback made possible by smart metering tend to shift usage from peak periods to off-peak periods rather than reducing total energy consumption.[3]

The long-term demand response of consumers has not been tested, and remains uncertain. Past experience with time of use rates cautions that initial interest in such rates tapers over time. In addition, the low take-rate in the PG&E service territory over the last two years[4] does not bode well for the popularity of critical peak pricing.

Many utilities have offered successful direct load control (DLC) programs for a number of years.[5] Under these programs, customers receive financial compensation for allowing the utility to place a controller on the thermostat or other control of their central air conditioning or other high-demand appliance. Demand reductions enabled by such programs tend to be persistent and reliable. Utilities in recent years have expanded their DLC programs, soliciting a larger number of participants or expanding the appliances that may be controlled under the program.[6] When considering an investment in smart

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[2] See, ACEEE, *Advanced Metering Infrastructure*, above.

[3] Karen Ehrhardt-Martinez, et al, *Advanced Metering Initiatives and Residential Feedback Programs: a Meta-Review for Household Electricity-Saving Opportunities*, ACEEE Report Number E105 (June 2010), at 69. Note that dynamic pricing is not among the policy proposals of the American Council for an Energy Efficient Economy in its recent metastudy on feedback and consumption.

[4] Only 25 - 30 thousand customers out of PG&E's multimillion customer base have signed up for the tariff. See, Stephen George, et al. *2008 Ex Post Load Impact Evaluation for Pacific Gas and Electric Company's SmartRate™ Tariff*, Final Report, December 30, 2008, at 4. While low-income customers made up 35% of the customers who could choose SmartRate™, they were 56% of the customers taking SmartRate™ service.

[5] For example, as discussed in the FERC *National Action Plan on Demand Response*, "Detroit Edison maintains a significant Direct Load Control Interruptible Air Conditioning (IAC) program, which was established more than 20 years ago during the days of demand-side management.". *National Action Plan*, June 2010, Docket No. AD09-10, at Appendix B-9. See also Gulf Management Company, *Good Cents SELECT: Advanced Energy Management Program*, at slide 6 (2006), *available at* http://www.ewh.ieee.org/r3/nwflorida/presentations/01_19_06.ppt. And see B.J. Kirby and R.H. Staunton, *Technical Potential for Peak Load Management Programs in New Jersey, ORNL/TM-2002/271***,** October 18, 2002, at 20.

[6] For example, before federal AMI grants were offered, Baltimore Gas & Electric expanded its successful residential appliance control program. See Barbara R. Alexander, *Smart meters, demand response and "real time" pricing: too many questions and not many answers*, a presentation to the National Association of State Utility Consumer Advocates, November 17, 2008, slide 28. See also *Application of Nevada Power Company d/b/a NV Energy seeking acceptance of its Triennial Integrated Resource Plan covering the period 2010-2029, including authority to proceed with the permitting and construction of the ON Line transmission project*, Nevada Public Utilities Commission, Docket No. 09-07003, Volume 8, Exhibit B, Demand Side Plan, at 16-17.

metering to deliver demand response, policy makers should compare the costs of the smart metering system with these well- demonstrated direct load control programs.[7]

Asking a question regarding "barriers to adoption of smart grid technology" presupposes that the ultimate goal is the adoption of new technology, irrespective of whether the technology serves larger goals and benefits consumers. Consumer advocates are concerned that vulnerable customers, such as elders and low-income customers, may not be able to benefit from the technology and pricing plans, but will have to pay for its ubiquitous installation. Studies to date attempting to show that low-income customers will benefit do not demonstrate that such will be the case. Metering costs may outweigh any benefits of lowered off-peak pricing, and we know that high-use low-income customers suffered adverse bill impacts in the California SPP, even without counting the bill impacts of paying for the smart metering. More detailed and actionable information is needed about the specific impacts of dynamic pricing on vulnerable customers before introducing this technology.

Another major consumer concern that has yet to be addressed by smart metering proponents is the threat smart meters pose to consumer protections that have been developed over the last 30 years. Smart meters have been touted by industry proponents as offering the benefit of remote disconnection. From a consumer perspective, this is not a benefit but rather an erosion of fundamental consumer rights. Similarly, smart meters can readily be adapted to introduce pre-payment plans that consumer groups have (largely successfully) opposed in recent decades. Smart meters can also be used to support service limitation technology, which similarly leave consumers at risk of self-disconnection.

Residential customers who are remotely disconnected without a last chance to make payment arrangements, or who shut themselves off with no utility contact (when their prepayment card runs out of funds) are at great risk in terms of health and safety.[8] A recent investigative news report from Texas (where deregulated electricity commodity vendors can offer service on a pre-paid only basis) tells of vulnerable pre-payment electricity customers being cut off without notice.[9] Families with children have had to

[7] Direct Load Control can be provided with one-way communications, such as power-line carrier technology using existing infrastructure. Such programs do not require the utility to install a Meter Data Management System. Their implementation can be targeted to high-response households such as those with central air conditioning; it is not necessary to install the technology in every home in order to obtain demand response benefits of DLC. They can cost about 12 times as much, and deliver the same or more demand reduction benefit. For these reasons, putting aside the operational savings that some utilities can obtain through AMI, NERA Economic Consulting (NERA) recently estimated that DLC in Australia could produce more demand reductions than AMI-enabled load response, for much lower costs (e.g. a1.1 benefit-to-cost ratio for DLC versus a 0.06 benefit/cost ratio for AMI-enabled load response, at a minimum response level, making DLC almost 20 times more cost-effective under such assumptions). NERA, *Report for the Ministerial Council on Energy Smart Meter Working Group: Consultation Report - Cost Benefit Analysis of Smart Metering and DLC* (February 2008), Table E-2.

[8] There are fewer public policy concerns with the use of smart meter functionality to remotely connect or disconnect service when customers move in or out of a home or rental unit.

[9] Steve McGonigle and Ed Timms, "Cutoffs, complaints abound with Texas' prepaid electric providers," Dallas Morning News, October 4, 2009.

abandon their homes. A paraplegic who requires air conditioning to maintain a safe body temperature lost his electricity on days when the temperature exceeded 100 degrees. A heart failure patient who needed power for an oxygen machine was cut off twice by her pre-payment meter in one summer.

The risks of disconnection by remote control or by automatic action of a pre-payment meter or service limiter are also shown in the case of a 90-year old Michigan man who froze to death in his own kitchen last winter. When he was found, there were funds to pay for his bill on the table. But he had missed a payment and the utility had installed a service limiter. When the service limiter tripped, the gentleman could not or did not know how to reset the limiter.

Customers whose utilities are disconnected have died from hypothermia, from fires set by candles used for lighting in the absence of electricity, and from other consequences of loss of power. The concern of consumer advocates over the dangers of involuntary remote controls on household usage cannot be overstated.

The failure to address and resolve questions about the benefits of smart metering and dynamic pricing versus the risks noted by consumer advocates has led such organizations to view smart metering propositions with mistrust. This initial impression has been reinforced by utility filings in which the utility asks the regulator to require consumers to pay all the costs of the investments as they are paid out, rather than once the investment is in place *and* is useful to the consumer, providing the promised benefits. The Maryland Public Service Commission put it exactly right in its June 21 Order denying BGE's smart grid proposal: "ratepayers should not exclusively shoulder the burden in the event that costs associated with the Proposal are greater than expected, or that anticipated benefits do not materialize."

So far the push for smart metering has been a top-down policy initiative with federal leadership and the initiative of a small number of states. Federal-state collaborative efforts such as the FERC National Action Plan on Demand Response have provided a forum for state regulators to express their concerns about the move to smart metering. Former NARUC President Fred Butler summarized the concern of state regulators in testimony before the Senate Committee on Energy and Natural Resources in March 2009:

> The Smart Grid has [the] potential [to help this country become more efficient while bolstering the existing transmission grid], but only if embraced by utilities and, most importantly, consumers. *Without getting the consumers on board, the Smart Grid may just be another good intention.* (Emphasis supplied)

To get consumers *on board*, so to speak, it will be necessary to undo the impacts of the top-down approach of the last several years. To do this, policy makers must consult with consumer advocates, and not only attempt to address their concerns, but work directly with the consumer community in identifying concerns and developing policy responses. For example, it would be helpful to bring into the National Collaborative on Demand Response not one, but several representatives of various groups of customers. The

federal government can fund research into the varied situations of low-income and other vulnerable customers, carried out not by industry proponents or consultants, but by groups familiar with such customers and concerned with the impacts on them of smart grid and dynamic pricing. DOE can similarly work to assure that sufficient data on such impacts and such customers' responses is developed in the program of smart grid and dynamic pricing pilots funded via ARRA.

2. Assessing and Allocating Costs and Benefits

- *How should the benefits of smart meters be quantified?*

Operational savings are more straightforward to estimate than resource benefits. A utility can typically identify the number of truck rolls for meter reading, for example, that will be saved by remote meter reading. Claims of reduced costs of disconnection and reconnection should be broken out, so that the net cost of involuntary remote disconnection can be isolated and removed. If a utility does not quantify claimed cost savings, they should not be counted.

Resource savings pose a bigger problem, because there are numerous unknowns, all of which can have large impacts on the benefits to be gained from smart metering and dynamic pricing. The unknowns include (a) the extent to which the entire customer base will respond to dynamic pricing in the same way as the pilot groups, (b) the presence of consumption reductions versus load shaving or shifting, (c) the extent to which the customers opt in to the offered dynamic rate, and the future value of such demand response.

To accommodate such wide variations in possible benefit levels, it is important that resource benefits be estimated under conditions of maximum possible stress (e.g., lower-than-pilot average reductions, absence of consumption reductions or even consumption increases, the extent to which customers opt in to the rate, and the future value of the rate) and the utility should bear the risk that the benefits they project do not in fact materialize.

- *How to deal with cost overruns?*

As with any other utility capital investment, the question of whether the costs of the investment were all prudently incurred can be best determined once the project is complete. Regulators (and intervenors) can then pinpoint problems such as cost overruns, and their significance can be weighed in the context of the overall investment. Such investment should not be financed through "trackers" or other prepayment methods, which shift all, or the vast share of the investment risk to ratepayers.

- *"With numerous energy efficiency and renewable energy programs across the country competing for ratepayer funding, how should State Commissions*

assess proposals to invest in smart grid projects where the benefits are more difficult to quantify and the costs are uncertain?"

Utility proposals to invest in smart grid projects should be subject to the same cost-effectiveness standards as other investments. Investments with the highest net present total resource cost should be pursued first, all other things equal. All other things are not usually equal in reality. Comparisons of resource options need to take all factors into account. The reliability of results, the distribution of costs and benefits, the sustainability of results, and other investment impacts are among the other factors that should guide resource planning.

Well designed and implemented, utility efficiency programs do well by these criteria, compared to smart metering and dynamic pricing investments. Such utility efficiency programs have an average TRC (Total Resource cost) cost-benefit score of 2.6.[10] By contrast, dynamic pricing for residential customers has not yet been evaluated over long periods of time;[11] its potential impact on vulnerable customers remains a concern, and smart metering poses risks to consumer protection,[12] privacy[13] and cyber-security[14] that are not raised by energy efficiency. These factors need to be considered when comparing the two options.

When it is not possible to estimate with certainty the costs and benefits of a system-wide investment, utilities will sometimes start with a small investment to test the value of the approaches. Only after benefits are proven do most states promote widespread implementation of such initiatives. A similar approach would be prudent in the case of smart metering.

For initiatives that expand the utility's rate base, such as smart meters and smart grid, the utility should not need pre-approval of or payment by consumers of any investments in smart grid, until they are operating and providing the promised benefits. Utilities may not earn excessive returns on this investment over time. They do, however, earn just and reasonable returns that amply compensate them for the risks they take in making such investments.

- ***How should the costs of smart grid technologies be allocated? And who bears the risks if the benefits don't materialize?***

Utilities should take the risks if the benefits do not materialize and the utility was imprudent in expending the money for the system. Costs of smart metering should be allocated to customer classes with a usage-based allocator, not a per-customer allocation. Within classes, costs should be borne by those who benefit from the metering.

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[10] ACEEE, *Saving Energy Cost-Effectively: A National Review of the Cost of Energy Saved Through Utility-Sector Efficiency Programs,* September 2009, Report No. U092, Table 3.
[11] The longest pilot was for 4 years, in Chicago. Most other pilots have been conducted for one or two peak seasons.
[12] See, e.g., *Essential Smart Metering Consumer Protections,* attached. And see also Barbara R. Alexander, *Smart Meters, Real Time Pricing, and Demand Response Programs: Implications for Low Income Electric Customers"* Update, May 30, 2007. Available at: http://www.pulp.tc/Smart_Meters__Real_Time.pdf
[13] NIST and SMIP, *Guidelines for Smart Grid Cyber Security,* September 2010, (NISTIR 7628), Vol. II.
[14] *Id.,* at Volume I.

3 Utilities, Device Manufacturers and Energy Management Firms

- ***"Do electric service providers have the right incentives to use smart grid technologies to help customers save energy or change load shapes given the current regulatory structure?" (Fed Reg 57010):***

  Current regulatory structures provide the right incentives for vertically-integrated electric utilities to help customers change load shapes. Shaving critical peaks lowers the cost of power, while making minimal reductions in overall sales (the higher price operates only in 80-100 hours per year). As to the merits of incentives to help customers save energy through AMI, dynamic pricing enabled by advanced metering infrastructure has not been reliably proven to help consumers save energy. In fact, in some cases dynamic pricing participants actually increased their energy consumption.[15] Lower off-peak rates may encourage load shifting or valley filling, which do not constitute energy savings. More research is needed on the relationship between smart metering technologies and pricing on the one hand, and consumption on the other.[16] Until the issue is resolved conclusively, it would not be a sound idea to incent utilities to install smart metering grids as a way to help consumers save energy (see the detailed discussion in the attached paper).

- ***How can state and federal regulators better coordinate wholesale and retail power markets?***
- ***How will programs that reduce consumption affect the operations, efficiency, and competitiveness of wholesale power markets?***

These two questions make the implicit assumption that wholesale power markets are competitive, and further, that power sold out of these markets is sold at the least cost.

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[15] Karen Herter, Patrick McAuliffe and Arthur Rosenfeld, "An exploratory analysis of California residential customer response to critical peak pricing of electricity," Energy, 32 (2007):25-34 (Exploratory Analysis), available at **www.elsevier.com/locate/energy**, at 26. See also Pat McAuliffe and Arthur Rosenfeld, "Response of Residential Customers to Critical Peak Pricing and Time of Use Rates During the Summer of 2003," California Energy Commission, September 23, 2004; and Research Reports International, "The Impacts of Dynamic Pricing on Electricity Usage. These studies report that in the California Special Pricing Program, in one mild-temperature period, customers in one treatment group increased load by 8 percent. In a real time pricing pilot fielded by the Pacific Northwest National Laboratory, peak load decreased by 15 to 17 percent, but overall energy consumption increased by approximately 4 percent. Similarly, AmerenUE found that participants in its Residential TOU Pilot who were on the CPP rate with a smart thermostat (the treatment group that consistently shows the highest demand responses to such AMI-supported pricing) increased their usage during the three-hour period after the end of a critical peak period, by 11.6%. Evaluators of the Anaheim (CA) Critical Peak Pricing Experiment found that customers in the treatment group used more energy on the critical peak days than the control group. In Ontario, participants increased load during one critical peak period. Time-of-Day-Only customers in the Idaho Power pilot increased their consumption during on-peak hours in one of the years of the pilot.

[16] See, e.g., ACEEE recommendations in its Report *Advanced Metering Initiatives and Residential Feedback Programs: a Meta-Review for Household Electricity-Saving Opportunities*, Report No. U092. Note that ACEEE does not recommend advanced metering as a tool to procure efficiency savings. See also, *Residential Electricity Use Feedback: a Research Synthesis and Economic Framework*. EPRI, Palo Alto, CA: 2009. 1016844, and *Guidelines for Designing Effective Energy Information Feedback Pilots: Research Protocols.* EPRI, Palo Alto, CA: 2010. 1020855, at 1-1. *Guidelines for Designing Effective Energy Information Feedback Pilots: Research Protocols.*

Residential consumers are skeptical of the net benefits of such markets.[17] They do not trust that the wholesale market is delivering reliable power at the least cost. Consumers in Pennsylvania, for example, have expressed outrage and consternation at the wholesale price increases passed through upon the end of price caps in that state. Consumers in Ohio have pressed for extensions of price protections beyond the original transition period. Maryland consumers forced concessions from the major provider in that state. Pro-market policymakers in California remain unable to institute retail competition there a decade after the Western market debacle at the turn of the century.

Such public skepticism is warranted. Studies that have attempted to show that unregulated wholesale power markets provide power at lower costs (than cost-plus regulation or its variants) have been shown to be unsupported by the facts, or reliant on poor methodologies.[18]

To the extent consumers are aware of wholesale markets, they are also aware of allegations of market manipulation, such as the transparency crisis that led to a change in management at the PJM in recent years. There is no groundswell of support for markets among consumers. Even industrial consumers have withdrawn their original advocacy for wholesale markets.
As to the assumption that smart metering and dynamic pricing will reduce consumption, we repeat that there is as yet no reliable data supporting this premise.

- **How should customer-facing equipment such as programmable communicating thermostats, feedback systems be made available and financed?**

There remains significant uncertainty around the value of feedback systems such as in-home displays. However, to the extent that installation of such devices is a component of a utility's business plan, the devices should be made available without cost to low-income customers.

Conclusion

The policy solutions developed concerning the issues raised in this RFI will have a profound impact on residential consumers, and low-income and fixed-income seniors in particular. It is unfortunate that many continue to inappropriately lump smart grid and smart meters together in a way that fails to address the consumer protections that are necessary in a transition to smart meters. As outlined in the attached paper, the adoption of smart meters should be carefully examined and considered in light of key concerns and, where implemented, should be accompanied by several essential consumer protections. These include:

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[17] See, for example, letter filing by Maryland Governor Martin O'Malley to the Maryland Public Service Commission in Cases 9214 and 9117, December 18, 2009, available at *www.governor.maryland.gov/documents/091218PSC.pdf* - Large commercial and industrial customers who had earlier promoted competitive markets to provide benefits to all consumers have backed off their support, pointing out flaws in market designs that have led to higher revenues for suppliers at the expense of consumers. See, e.g., *Statement of John Anderson, President of the Electricity Consumers Resource Council (ELCON), in Response to the Release of the GAO Report on Electricity Restructuring*, September 29, 2008. Available via www.elcon.org.

[18] See, e.g., Prof. John Kwoka, Restructuring the U.S. Power Sector: a Review of Recent Studies, Northeastern University, a report prepared for the American Public Power Association (2006).

- Smart meter proposals must be cost effective, and utilities must share the risks associated with the new technologies and the benefits used to justify the investment.

- Time-of-use or dynamic pricing must not be mandatory; consumers should be allowed to opt-in to additional dynamic pricing options.

- Regulators should assess alternatives to smart meters to reach the same load management goals, particularly direct load control programs.

- Smart meter investments should not result in reduced levels of consumer protections, especially relating to the implementation of remote disconnection, and traditional billing and dispute rights should be retained.

- Privacy and cyber-security concerns must be addressed prior to a smart meter rollout.

- Utilities and other policymakers should include comprehensive consumer education and bill protection programs in any evaluation or implementation of smart meter proposals.

- Investments in Smart Grid need to be verifiable and transparent and the utilities need to be held accountable for the costs they want customer to pay and the benefits they promise to deliver. Costs should be reasonable and prudent.

The Consumer Commenters look forward to engaging in discussion with the Administration and the Smart Grid Subcommittee on the issues we have addressed in these comments.