CenterPoint™ Energy

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U.S. Department of Energy
Office of Electricity Delivery and Energy Reliability
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Washington, D.C. 20585
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Re: "Smart Grid RFI: Addressing Policy and Logistical Challenges"

Ladies and Gentlemen:

On September 17, 2010, the Office of Electricity Delivery and Energy Reliability published in the Federal Register at pages 57006 through 57011 a Request for Information seeking public comments concerning policy and logistical challenges that confront Smart Grid implementation as well as recommendations on how to best overcome those challenges. In response to this request for public comment, CenterPoint Energy Houston Electric, LLC ("CenterPoint Energy" or "the Company") offers the observations set forth below. CenterPoint Energy is currently deploying an Advanced Metering System ("AMS") throughout its entire service territory pursuant to an order and authorizing regulations of the Public Utility Commission Texas ("PUCT"). CenterPoint Energy also received a $200 million American Recovery and Reinvestment Act grant, which has allowed the Company to accelerate its AMS project timeline by two years and at the same time begin implementation of the first phase of its grid hardening and automation project, which it refers to as "Intelligent Grid" ("IG"). Company officials now estimate that installation of 2.2 million electric smart meters, related communications infrastructure and back-office systems will be completed in mid-2012, and the initial phase of the IG deployment will be completed in 2013.

CenterPoint Energy notes that it is a fully regulated transmission and distribution utility ("TDU") whose rates, operations, and services are subject to the jurisdiction of the PUCT. Following the restructuring of the Texas electric market on January 1, 2002, CenterPoint Energy no longer owns any generation assets, nor does it sell electricity at retail. On behalf of a number of Retail Electric Providers ("REPs"), CenterPoint Energy delivers electricity from power generators to over two million retail electric customers throughout its 5,000 square-mile electric service territory in the greater Houston area. Given CenterPoint Energy's role in the deregulated Texas market, CenterPoint Energy's comments will be primarily focused on issues affecting TDUs.

Smart Grid Definition and Scope

CenterPoint Energy does not take issue with the broad definition of Smart Grid laid out in title XIII of the Energy Independence and Security Act of 2007. That said, CenterPoint Energy acknowledges that there is no single, generally accepted definition of Smart Grid. CenterPoint Energy defines its Smart Grid implementation to include both its AMS and IG deployments, and to encompass the following key components:

1. High voltage control and monitoring of lines and substations;
2. An energy management system to automatically operate devices for isolation of faulted sections and restoration or maintenance of service to end users;
3. Transmission and substation SCADA for control of transmission and substation devices and monitoring of components;
4. Remote control of transmission, substation and distribution field devices;
5. A Distribution Management System to monitor and control the mid-grid network;

6. Distribution SCADA system for control and monitoring of distribution lines and devices;
7. Renewable energy sources and energy storage are enabled and easily integrated into the grid, both for transmission and distribution, to leverage their use and value;
8. Digital meters capable of interval load readings and remote connect/disconnect, and that also support two way communications;
9. A mechanism to support and enable electric vehicles' efficient and effective use and charging;
10. Two way, robust communications systems;
11. An infrastructure that enables interactive automated and interoperable consumer devices in the home; and
12. The Smart Meter Texas Portal, which enables consumers and REPS access to energy consumption data.

Interactions With and Implications for Consumers

In order to ensure consumer acceptance of the technology and to foster consumer behavioral changes, utilities must inform and educate consumers at every step of the Smart Grid implementation path. In general, the goals of a Smart Grid customer education program should be to build public awareness and interest in Smart Grid market benefits, and to educate and engage consumers to utilize the advanced meters and home area network ("HAN") devices. In areas in which the retail electric market is open to competition, a customer education program should also enable the retail electric providers to conduct their own marketing campaigns for products that would utilize the new technology.

Customer education is a critical component of CenterPoint Energy's Smart Grid implementation and its related Energy InSight program, which is a system of smart energy technologies that gives Houston-area consumers a powerful new tool to better understand

and manage their electric usage. From a consumer standpoint, the new technologies will give customers insight into their energy usage and allow them to make smart energy choices. From a business perspective, CenterPoint Energy will have greater insight into the status of its systems, including the ability to identify outages, and monitor meter usage and system load in near real time.

All stakeholders, including utilities, retail electric providers (if applicable), state commissions, consumer representatives, and technology manufacturers should work collaboratively to manage the deployment of Smart Grid technology and the transformation of consumer-related business processes. One example of a best practice for this type of collaboration is formation of the PUCT's Advanced Metering Implementation Team ("AMIT"). Prior to the approval of the first utility deployment plans, the PUCT staff brought together representatives from the utilities, retail providers, consumer groups, and device vendors. Using the PUCT's advanced metering rule and the utilities' deployment plans as a baseline, the group followed a consensus-based approach to develop detailed business requirements for all aspects of the Smart Grid project. Although the initial focus has been on the advanced metering systems, ultimately this effort could be extended to the Intelligent Grid as well. The most tangible result of the AMIT process to date is Smart Meter Texas, a common data repository housing interval data, together with a portal available to all customers in the competitive areas of Texas who have an advanced meter. Smart Meter Texas enables users to view detailed consumption data, authorize third parties (e.g., REPs, aggregators) to view their data, and provision the use of in-home devices.

The costs related to customer education are perhaps underappreciated but an absolutely necessary component of Smart Grid deployment and should, therefore, be recovered along with all other prudently incurred costs. In Texas, advanced metering deployment plans such as the one approved by the PUCT for CenterPoint Energy included several million dollars dedicated to funding customer education programs and such costs are recovered through the monthly surcharge. The utilities work closely with the PUCT staff in the development and delivery of the programs, including print materials, door hangers, and radio and television advertising.

Utilities, Device Manufacturers and Energy Management Firms

There are multiple ways that customer-facing energy management equipment can be financed, and several key distribution channels by which it can be made available to consumers. The three most viable of these channels include:

1. Retail supplied. The customer purchases equipment from a third party retailer and is responsible for installing and provisioning the equipment. This allows customer-facing equipment manufacturers to market their products directly to the consumer. This method of distribution is fully financed by the consumer at the time of purchase.

2. Retail Electric Provider supplied (applicable in deregulated markets). The customer receives equipment from their REP. There are several options for the distribution and financing of the equipment. The REP may finance the cost of equipment and provide it to the customer free of charge. This may allow REPs to increase customer loyalty or incentivize customers to participate in specific programs or rate plans. Another option is for the REPs to provide equipment to customers for a fee. This could allow customers interested in feedback and energy management systems to reduce energy consumption and lower their electric bills by receiving and acting upon near real-time usage and price data, thereby managing their consumption more efficiently. The REPs' potential for revenue losses attributable to lower electric consumption could be at least partially offset by compensation from the supply side of the market as well as the fees collected for the energy management equipment. It may also be possible for

REPs to partner with TDUs, who could provide an incentive to the REPs for the installation of equipment. Advantages of this approach include the ability for REPs to customize installations, thereby creating benefits on an individual basis. A significant disadvantage would be that it may not result in every customer having equipment.

3. TDU supplied. The regulated electric utility provides customer-facing equipment free of charge in an effort to achieve state mandated energy efficiency goals. In fact, CenterPoint Energy, in conjunction with the PUCT, is already exploring this option with a plan to initially provide 500 in-home devices, which would function as a test sample for compatibility and user friendliness. In addition, load shifting and local distribution congestion issues may be positively influenced by the implementation of customer-facing equipment. The principal advantage of this approach would be that all consumers would receive equipment, presumably resulting in a lower cost/customer because of standardization and mass distribution. Disadvantages include the likelihood that not everyone will be equally motivated or sufficiently tech-savvy to derive benefit from having the equipment.

Regardless of the source of equipment and funding, there may be significant barriers to technology acceptance. From a customer's perspective, a major barrier to achieving acceptance is that the cost of energy may not be a substantial burden on most consumer budgets. Customers may be confused by the availability of equipment through different distribution channels. Customers may be under the mistaken impression that a utility could unilaterally exert control of specific devices such as thermostats, switches and appliances. Finally, customers may not be willing to install, learn to operate, and/or actively employ additional electronic devices within their home. In this regard, these home-monitoring devices can be likened to the personal computer, which initially was almost exclusively a business tool but today has found its way into every aspect of daily life.

In certain markets, critical peak pricing ("CPP"), time of use rates ("TOU") and real-time pricing ("RTP") are not yet prevalent, making it difficult to gain customer acceptance of equipment designed to take advantage of these pricing structures. In the deregulated Texas market, REPs, not TDUs, design, implement and market programs addressing CPP, TOU and RTP pricing. Also, direct interactions between utilities and consumers may be limited due to state regulations. In Texas, for example, communications between the TDU and the consumer are strictly regulated. As a result, Texas TDUs must use third-party consultants for energy efficiency program implementation.

From a technological perspective, the utility must be able to ensure that equipment is compatible with its advanced metering system and that the security of its system is not compromised. Technology is advancing at a rapid pace for meters and devices which may make connectivity difficult to maintain. Devices purchased at retail locations may not be verified as compatible with the local utilities' advanced metering system. To ensure the operability of devices with a TDU's advanced metering system, and to ensure the interoperability of devices between advanced metering systems across Texas, the ZigBee Alliance and Texas TDUs are sponsoring workshops. These "ZigFest" workshops allow device manufacturers to test their devices against each of the TDU's systems. Device manufacturers can then quickly optimize their devices to work with all advanced metering systems in Texas. This model, on a broader scale, could ensure that a smart device purchased in Texas could be moved to another area of the country and still be expected to work effectively with the local electric provider's system.

Long Term Issues: Managing a Grid with High Penetration of New Technologies

CenterPoint Energy has fully considered and addressed cyber security concerns relating to Smart Grid. As a TDU, CenterPoint Energy has extensive experience in administering cyber security protection on its bulk electric system. CenterPoint Energy has been an active participant in the development of NERC's cyber security standards and has fully implemented those standards for its transmission system. While sharing of grid operational data must be performed in a manner consistent with existing requirements, CenterPoint Energy is confident that the current policies pertaining to operational data allow for proper data sharing needed to enable grid automation to achieve reliability and performance improvements in the grid. However, there is concern for policy conflicts between state and federal policies pertaining to customer load data. The federal government should inquire into each state's customer data privacy policies to avoid conflicts that may be created by new policy. Interoperability standards and cyber security guidelines need to be flexible and able to be applied within the context of multiple layers of alternative solutions and mitigating controls that include policy and procedural controls, physical security controls, and cyber security controls.

Federal and state government should coordinate to fill the gap between vulnerabilities and reasonable cyber security measures. Individual utilities and the utility industry would benefit from a centralized repository of current threats. The federal government should develop a single comprehensive center for evaluation and notification of threats with the potential to impact grid reliability. A federal testing center for cyber security threats could reduce the cost of threat testing, by adding resources not available to individual utilities. CenterPoint Energy deploys various systems throughout the Smart Grid environment to detect actual as well as attempted exploits and/or incidents. A federal testing facility could be used to test these mechanisms and other effectiveness in detecting current threats and developing comprehensive correction plans for utilities impacted by exploits of the identified threats.

CenterPoint Energy is open to coordinating with federal and state governments to ensure a secure and reliable Smart Grid. Federal and state governments should continue inquiries into the experience individual utilities have with regard to securing grid operation.

Managing Transitions and Overall Questions

As exemplified by consumer behavior following transition from traditional electric utility structure to consumer retail choice in the Electric Reliability Council of Texas ("ERCOT") portion of the Texas electric market in the early 2000's, even when there are clear and rational reasons for change, consumers resist. During this time, consumers were offered the opportunity to choose to purchase their electricity from scores of REPs at a wide range of costs, terms and other characteristics such as generation source mix, but the number of consumers choosing to switch remained low for years even when switching could have provided significant cost savings. The key lesson learned from this experience is that clear and ongoing consumer education focused on the highest perceived barriers to change is critical to driving change, and that any change in consumer behavior, even by willing participants, will take time to yield results.

Cyber and physical security measures generally involve prevention, detection, hardening and adaptation. These measures apply to computer and control systems, but also to physical legacy systems. One strategy that can be used to improve security of legacy electrical grid equipment to non-traditional failure is to explicitly include consideration and mitigation of this type of failure in system design. Legacy equipment can easily continue to serve its function in the modernized grid as long as the design of the equipment is suitable for the application to which it is being subjected which may be different than in the past, and analysis and engineering must be performed to assess suitability. For new equipment, the ability to remotely upgrade software and firmware to take advantage of new technologies and capabilities will be critical since the rate of change and hence vulnerability with the software-based portions of this equipment will be higher than the industry has traditionally experienced. Cyber security must be understood and built into new equipment.

Smart Grid technologies may facilitate the more widespread interconnection of distributed generation sources to electric distribution systems. To the extent that these distributed generation sources become more widespread in electric distribution systems, rate structure designs for cost recovery may need to adapt, since most current cost recovery structures are based on one way power flows measured volumetrically at consumption points. Smart Grid technologies may enable new operating processes and may require new or different skill sets. The implications include the need for advanced training and a continuing focus on process improvement to reap the potential market benefits of the Smart Grid.

Investment in new and evolving technology should be guided by a set of foundational principles. These principles should include ensuring that the benefits to the market are sufficiently positive to overcome uncertainty about potential loss of opportunity costs. At the same time, we should avoid being overly reluctant to deploy beneficial new technology due to the fact that technology cannot mature until it is deployed. Smart Grid technologies will mature over time but delayed adoption must be balanced against the possible business advantages of the "first to adopt" strategy.

Investment in Smart Grid technology in the U.S. is generally expected to provide positive economic benefit and/or improvement to the quality of service. Policy changes are needed where normal economic forces would not be sufficient to cause the effect or where the time frame over which this would take place would be extremely extended. Examples of policy changes that have worked in the past include mandated appliance, electrical equipment and vehicle energy efficiency standards, made domestically requirements for federal grants, electric reliability standards and renewable energy portfolio requirements. Increases in requirements in these policies, with appropriate cost recovery mechanisms or tax incentives, would allow for increased investment, research and deployment of Smart Grid technologies in the U.S., thereby increasing domestic competitiveness overall.

The priorities for federally funded research should be directed toward advancing key technology that enables the Smart Grid, in providing incentives to businesses for the acceleration of Smart Grid systems and research to help determine ways to leverage the Smart Grid to achieve efficiencies and realize the promise of the Smart Grid.

A significant issue is the realistic time and effort required to build and implement Smart Grid technologies. The electric delivery infrastructure in the United States is large and complex. We must allow the time and collaboration necessary to accomplish the changes effectively and efficiently. Technology and systems are evolving rapidly, but are not yet mature and we should take the time to get it right. All agree a key feature of the Smart Grid is interoperability. Likewise, industry standardization is vital to the rapid implementation and effectiveness of the technology. The federal government could support interoperability and Smart Grid standardization work by providing tax credits to participating utilities, standards organizations and research groups involved in the work. Research and development work also needs to be encouraged and continued.

Utilities are unlikely to make the significant investments required to implement a Smart Grid without reasonable assurance that their prudent investments will be recovered. State legislatures and regulatory commissions can facilitate investment in Smart Grid through cost recovery mechanisms that allow recovery based on estimates of project costs that are periodically reconciled with actual project costs. At the outset, project goals, scope, functionality, and deliverables must be clearly defined. Given the nature of large, complex technology projects, there will be unanticipated changes and costs along the way. However, these can be successfully managed if the utility, regulator(s), and stakeholders are working together.

CenterPoint Energy appreciates the opportunity to submit comments on the questions raised by the Office of Electricity Delivery and Energy Reliability concerning policy and logistical challenges associated with Smart Grid implementation, and looks forward to participating in future discussions.

Respectfully submitted,

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