VEIC Study Review Synthesis
Chapter 8 - Smart Grid Deployment Review and Assessment
July 5, 2012

Summary of Chapter 8

Chapter 8, Smart Grid Development Review and Assessment, provides a broad overview of smart grid technology, how it might be applied in New Hampshire, the status of smart grid deployment in NH, and recommendations for policies and programs that will help NH benefit from smart grid investment. However, the recommendations presented in this chapter are based on the premise that smart grid technology is mature enough to be widely deployed in the state. Despite the fact that there have been dozens of dynamic pricing pilots implemented throughout the country, the protocols, standards and technology are still in the development stage. The study does not address either the likelihood of major deployment of the technology or how such investment might be economically and politically justified. The chapter also does not distinguish which specific smart grid components must be deployed for any given recommendation.

When and how smart grid technology will be widely deployed in New Hampshire will be highly influenced by state energy policy. The focus of such a policy should be on long term performance while allowing flexibility and innovation to respond to this changing market. Such flexibility will be important to realize success relative to smart grid deployment.

Because of the factors discussed above the review team concluded that implementation of many of the specific recommendations of this chapter is premature, but that certain actions should be considered in the near and long term. Additionally, several of the recommendations can be, and are being, implemented by the utilities without smart grid deployment, or, in the case of outreach and education, should be implemented in advance of actual deployment. Some of those recommendations are included in priorities for the medium and long term below.

Chapter Teams Findings

Top Priorities for Early Action.

The review team does not envision the need for legislative action relative to smart grid in the short term.

8.2.1 Continue the State demand response program and expand if possible
The state demand response participation has been successful and is generating cost savings for the state. State participation in the ISO-NE Demand Response program and other related efforts should continuously be reviewed for fiscal effectiveness as those programs are continuously changed, and participation expanded when and where feasible.

Education and Outreach
While not recommended in the VEIC study, one priority identified for early action is to develop education and outreach directed primarily at policy makers. There is not widespread understanding about smart grid technology, its purpose and its potential to help the state achieve energy efficiency goals. Education of policy makers now will help ensure well informed policy decisions in the future regarding this technology.

Priorities for Medium or Long-Term Action.

8.1.2 Provide meaningful feedback
Energy use data in and of itself will not motivate consumers to reduce their energy use, Such data must be provided within a context that allows them to judge whether their individual usage is above or below the norm, and also provide them with ways in which to reduce their use and reasons why they should.

8.2.2 Offer demand response to all rate payers; and
8.2.3 Offer automated demand response
Demand response technology and deployment will likely evolve a great deal over the next decade, but not all demand response requires smart grid technology be in place. Each utility will need to analyze the cost-benefits of the level and timing of demand response deployment as the technology evolves. An over-arching state energy policy will influence that analysis, as well as the timing of subsequent deployment efforts. In the near term demand response can and is offered to large customers.

8.2.4 Offer dynamic pricing as market based demand response; and
8.2.5 Educate customers about dynamic pricing
As noted in the VEIC study there are multiple levels of dynamic pricing. Real-time pricing would be difficult to administer on a wide-spread basis and even more difficult for the average ratepayer to understand without significant education and outreach efforts. Therefore, this action is likely a long term prospect. However, time of use (TOU) pricing can be deployed without AMI/smart grid. "Dumb meters" have been used for TOU rates for decades. What smart meters and associated communication technologies provide is the ability to provide more granular usage information closer to real-time and at lower cost than previously to the ratepayer.

8.3.2 Consider the larger system during evaluation, not each project in isolation
The study's recommendation to "consider the larger system" is simply Good Utility Practice and therefore, each utility would likely argue that is already happening.

8.4.1 Ensure customers are aware of data about them; and
8.4.2 Protect ratepayers' control of data about them
Standards for smart grid data security have been developed by the National Institute of Standards and Technology and are also under review by the North American Electric Reliability Corporation. California has established rules to protect information about consumer use of smart meter electrical services. In addition, the Electronic Privacy Information Center has made some specific recommendations on this issue. New Hampshire will need to evaluate the standards established by NIST and NERC as well as those established by other states or recommended by consumer groups to ensure adequate protection. Basic customer information is already protected by state law.

Areas for Further Consideration

While not a specific recommendation of the VEIC study, consumer education and outreach efforts as smart grid technology is ready to be deployed will help pave the way for future acceptance of what is currently a relatively misunderstood, and by some feared, technology. As part of a broader education and outreach effort associated with smart grid deployment it will be essential to provide consumers with clear information regarding the data that is, and is not, gathered by the utilities, how that data is used, and what consumer protections are in place.

Background

The smart grid is a system of digital two-way communication between electric utilities, generators, meters, and other connected devices. The physical infrastructure enables programs and policies that provide more timely information on energy use and grid conditions. This information can then be used to improve grid performance and services. Smart grid infrastructure combined with appropriate programs and policy can:

- Reduce energy consumption,
- Reduce peak demand,
- Increase the system load factor, which reduces the fixed cost per unit energy,
- Better integrate variable renewable energy sources,
- Reduce emissions,
- Improve utility outage management,
- Reduce meter-reading costs, and
- Provide information on all fuels and even water use.

Smart grid technology includes addition of computerized data collection and two-way communications on all aspects of the electric utility grid, including generating facilities, wires, substations, switches, transformers, and metering within an individual account.

The NH Electric Cooperative is in the process of deploying an Advance Meter Infrastructure (AMI) system to its 80,000 members and the required related communications infrastructure to enable it. NHEC's AMI infrastructure and its Meter Data Management system will, once fully implemented, provide meaningful feedback to its members that will enable them to compare their own usage before and after making a behavioral or equipment change. There are also alternative customer feedback programs that do not require smart grid technology.

In its 2012 Core Program Filing, PSNH proposed a customer engagement pilot program. The parties are currently engaged in finalizing the program details for a pilot slated to commence in September.

In 2008, Unitil Energy Systems completed deployed of its AMI system that provides fully automated meter reading and 2-way communications over powerlines. In 2011 Unitil completed a Time-of-Use / Critical Peak pilot program which tested the response of residential consumers with central AC to TOU/CP pricing, TOU/CP pricing with in-home technology and Controllable thermostats, and the response of a small set of non-residential customers to CPP pricing only. The evaluation reports on the pilot program have been filed with the Commission.

PSNH also conducted a demand response pilot program called Peak Smart. The funding for the program came through ISONE. With the introduction of the Forward Capacity Market the funding for the pilot was discontinued and the program ended. The FCM is not really set up to handle a program such as demand response because utilities bid into the FCM 3 years in advance. Therefore, programs like this are best handled by companies such as Enernoc who work with utilities to design energy curtailment plans to reduce non-essential energy use during critical periods of imbalance between electricity supply and demand on the grid.

When and how smart grid technology will be widely deployed in New Hampshire will be highly influenced by state energy policy. The discussion in Chapter 1, Sections 1.7 and 1.8 offers guidance for establishing a policy that provides a focus on long term performance while allowing flexibility

and innovation to respond to this changing market. Such flexibility will be important to realize success relative to smart grid deployment. In addition to the costs associated with such deployment, there is a great deal of education and outreach that must be done so consumers are not afraid of the technology, either for safety or privacy concerns, and fully understand the potential benefit of utilizing the technology to reduce energy use. The PUC will have an integral role to play in further development of demand response programs that encourage innovation, but still provide reasonable returns to ratepayers.

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