

Northeast Smart Grid Peer-to-Peer Workshop

July 18-19, 2011 Essex Junction, Vermont



Report compiled by Mackay Miller
National Renewable Energy Laboratory

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Introduction

Smart grid projects throughout the United States are transforming the nation's electric grid. In an effort to leverage the knowledge from these deployments, the Department of Energy's Office of Electricity Delivery and Energy Reliability (OE), in partnership with electric utilities, is convening a series of regional smart grid stakeholder workshops. The gatherings facilitate constructive peer-to-peer dialogue among stakeholders to identify best practices and lessons learned regarding consumer engagement and technical implementation of smart grid related technologies. These conversations provide support to smart grid implementers who are working to overcome challenges and make the Smart Grid a reality.



Participants of the Northeast Workshop, July 2011.

On July 18th and 19th of 2011, the Northeast Regional Smart Grid Peer-to-Peer Workshop took place in Essex Junction, Vermont and was hosted by the Vermont Electric Company (VELCO) and DOE OE. More than 75 professionals were in attendance, ranging from large investor-owned utilities to rural cooperatives and municipal electrical authorities, and from utility regulatory commissioners to consumer advocates.

The first day of the Workshop focused on providing utilities an opportunity to engage in an industry-led dialogue on issues, challenges and lessons learned with smart grid deployments and demonstrations. Participants included representatives from both DOE-funded and non-DOE-funded smart grid projects, as well as from regional reliability organizations. The agenda for the day was divided into two main topics: consumer engagement and technical implementation. The day consisted of panel discussions in which project leaders first provided a brief summary of important aspects of their projects followed by a question and answer session and roundtable discussion with all attendees to explore each topic in greater detail. (A full list of roundtable topic areas is provided in Appendix 2 – Workshop Agenda.)

The second day of the Workshop brought together a broader set of stakeholders including regulators, state energy offices, consumer advocates as well as state and local government representatives to promote open communication and relationship-building. The day's discussions emphasized smart grid deployment successes and lessons learned to provide community leaders information that will help them to make more informed decisions.

Discussions during the meeting provided insight into the state of grid modernization efforts in the Northeast and have implications for understanding the economic, consumer, and electrical system impacts of smart grid efforts. Highlights and high-level takeaways from the meeting are summarized below.

- **Smart grids are changing business:** New levels of grid intelligence and consumer engagement are changing the way utilities do business. For example, typical response times to outages are decreasing and options for managing demand are growing. The traditional silos within utilities are being renegotiated. Previously, various functions were compartmentalized within business organizations, while smart grid technologies cut across all organizations. As system operators and

consumers begin to explore the range of capabilities that are now possible with the deployment of 21st century systems, the future of the electricity business is changing more rapidly now than ever before.

- **One size does not fit all:** All communities are unique, with different goals and motivations for grid modernization. Take for example Groton, MA, whose grid modernization efforts have evolved organically over the past decade, making a series of successful business cases based on cost savings, to where the system now includes fully automated meter-reading and a highly connected outage management system. Although not all smart grids are alike technologically, approaches to implementation have similarities –utilities are unified in the challenges of integrating new technologies into legacy systems and approaches to consumer engagement.
- **Engaging customers is important:** One theme that was repeated throughout the Workshop was the importance of communicating with customers. There are clear benefits to engaging community leaders and local decision makers early in the process. Anticipating and addressing consumer concerns is also an important step in the communication process. Utilities should be ready with resources from unbiased, third parties regarding sensitive issues such as privacy, radio frequency (RF) and others. Providing multiple sources of information for customers allows them to do their own research and to gain confidence about the benefits of smart grid technologies.
- **Demand Response is a work in progress:** There are as many flavors of demand response as there are smart grid projects. In New York, a wide range of demand response programs targeted to commercial and industrial users have received positive feedback, as they unlock value for both the utility and the customer. In other localities, initial efforts are underway to pilot residential demand response, in the form of time-of-use pricing or real-time-pricing. In these instances, a portfolio of technology integration, consumer education, and effective market design will converge to unlock this resource.
- **Utilities as technology integrators:** A common refrain pinpoints the new role demanded of utilities: technology system integrator. In New Hampshire, a microwave and fiber communications network upgrade has yielded a flood of new data that presents new opportunities and challenges. In Connecticut, a consortium of municipal utilities is deploying a portfolio of technologies that help residential customers understand and manage their energy usage and costs. These information technology upgrades are rapidly moving utilities into new modes of operating and planning for the future and utilities are working with vendors and equipment manufacturers in ways not done previously.

In these topic areas and more, the Workshop was successful in fostering constructive dialogue between smart grid professionals, policymakers, and stakeholders. Participants gained valuable, real-time insights into the shared challenges and solutions of their peers and expanded their community of future collaborators. In addition, representatives from DOE were able to hear firsthand the challenging issues and suggestions of best practices in all facets of smart grid deployment.

The report now examines the main topic areas of the Northeast Workshop in more detail, with an emphasis on reporting the unique observations of the participants themselves.

1: Engaging Customers

Overview

Consumer engagement is a crucial topic, and participants agreed that sharing these experiences across utilities is highly valuable. Deployment of smart grid technologies is changing the way utilities communicate with consumers, which is a fundamental part of helping customers understand the capabilities and benefits of smart grid, and key to engaging them to use these new capabilities to manage their usage. As these communication methods and channels change, utilities benefit from hearing about the pitfalls and successes of other utilities. Some of the high-level observations regarding this topic include:

- Effectively communicating with the customer is critical to successful consumer engagement. Key to this effort is informing the consumer about what is taking place, what the benefits are, and why the modifications and changes are necessary. Using the “voice of customers” as part of the communication campaign, (“I know my utility is installing smart grid, but I don’t know much about it,”) is a strategy that one utility found to be very successful.
- Knowledge amongst consumers, whether young or old, rural or urban, varies widely, as do customers’ motivations for wanting to reduce electricity usage. Understanding customer preferences and motivations is a key requirement of successful program implementation and the key to a successful communication campaign. Utilities must understand market segmentation and develop a marketing plan that appeals to the motivations of the different segments.
- In the status quo, customers pay the most attention to the utility when the power is out. This is changing in a fundamental way, as energy usage and cost information becomes more visible in homes and businesses.
- While consumer satisfaction is generally widespread, in some locales there has been significant pushback from consumers. In general utilities have found that, armed with information and a better understanding of smart grid technologies, consumers are less likely to oppose grid modernization efforts. In fact, among consumers who understand their options and the reasons utilities are modernizing the grid, acceptance is quite strong.
- The utilities in attendance had a wide range of approaches to informing and educating consumers, from “get ahead of the problem” to “let sleeping dogs lie, but be ready if they awaken” to “under-promise and over-deliver.” Vocal minorities have had large impacts in a number of communities, and this impact can be inadvertently magnified by inaction on the part of the utility. The importance of providing credible, third-party data on topics of concern was stressed.
- Demand response itself is not entirely new. Many utilities have significant history (up to 10 years) with responsive load for *industrial* customers, and consumer-responsive load is viewed as an extension of that experience.



Participants of the Northeast Workshop, July 2011.

Strategies from the Field

- Successful approaches to consumer education have emerged from a variety of sources. Some approaches were identified early and deliberately in the communication process while other successful approaches were developed in response to developments in the field. One utility witnessed a small but actively negative reaction from consumers, and the utility's response to the negative press turned into an important opportunity for outreach and consumer education. Through this experience, the utility found that community opposition can be transformed to support by actively deploying credible information from the utility and third parties. Another utility faced a growing community backlash initiated by a vocal minority and carried out through social media channels. The utility found that by educating consumers about their options to opt out of the program, consumers appreciated the additional information, became more accepting, and opposition was substantially reduced.
- Improved Outage Management Systems (OMS) are an important technology in the Northeast and offer a valuable service that resonates with customers. For example, the recovery from an ice storm in 2008 was significantly accelerated with the use of a new OMS. It streamlined the identification of common device failures across the system and was able to inform linemen in the field of the situation. The bottom line is that customers value outage restoration as a key benefit to smart grid deployment.
- Smart grid deployments attract broad public interest and stand to receive significant coverage by local and regional news outlets. As deployments and visibility of smart grid grows, press coverage will, as well. Therefore, understanding and engaging with mainstream media will be increasingly important. Leveraging mainstream media coverage to promote essentially a public referendum on the project is a useful strategy, as public support will typically be positive. Another observation relates to leveraging the awareness garnered via 'bad' press. In tandem with successful customer service, an attentive and thorough response to bad press, complete with ample informational resources, can result in sharply declining levels of requests for opt-out.
- It is important to be conservative when estimating anticipated cost savings associated with smart grid technologies for individual homeowners. While important on a system level, especially with regard to managing demand during critical events, demand management could bring only moderate cost savings to individuals, and even those can be "avoided costs." When savings are in the form of avoided costs or avoided rate increases, the message is more complex to explain to consumers. Instead of over-emphasizing direct cost savings for individual customers, utilities should highlight other benefits such as, increased reliability, decreased time for power restoration after outages, and modernization that will unlock future uses and innovations.
- Implementing utilities are in the process of developing comprehensive internal management strategies for consumer engagement. Overarching frameworks for these strategies are important, for example a three-step consumer engagement framework might look like this:
 - 1) Engaging key stakeholders, including local politicians, is important. Inform regulators, policy makers and community leaders several months prior to



Comparing notes at the Northeast Workshop, July 2011.

- implementation. This can take the form of proactively seeking out public presentations to town Select Boards and town councils and establishing special meetings with senior citizens. Engagement with local government representatives has been observed to be just as important as communicating with customers.
- 2) Develop a customer support “SWAT team” to deal with hot spots, e.g. installation issues and time-sensitive questions. A vital dimension of this entails effectively training and deploying utility employees so that they can represent the program and respond to questions accurately.
 - 3) Communicate with customers and develop a strategy to “address the vocal minority” by crafting a pro-active message and providing information on sensitive topics from unbiased, credible third parties. Consider preparing a programmatic option to “Opt-Out”, with support by regulators, which allows the project to move forward with the vast majority of consumers. Interestingly, informing customers about the opt-out option can provide a unique opportunity to communicate with the customer, address their concerns, and communicate project benefits, often resulting in an “Opt-In.”
- Direct interaction with consumers is important: focus group research has indicated that less engaged consumers were the most suspicious and the least informed about smart grid benefits. Furthermore, engaging customers can provide key insights into the landscape of customer sentiment and provide a roadmap for education efforts. The level of awareness is typically quite low. For example, responses to a customer focus group included:
 - “I know my utility is installing a smart grid, but I don’t know what it is.”
 - “I don’t know what SmartPower is.”
 - “It sounds good, but I don’t know what it is.”
 - It is important to reference multiple sources of information for customers to do their own research (for example, with regard to radio frequency concerns). These sources should come from unbiased, third-parties.
 - Social networking outlets provide opportunities for utilities to communicate with customers, and they also present challenges: negative messages can spread quickly through these channels. Unaddressed, negative social media campaigns can hinder implementation. Strategies for social media should be incorporated into the overall communication strategy. Utilities need to provide credible information in response to attacks on social media outlets.
 - Some utilities follow a “Sleeping Dog” strategy: If there are possible objections – radio frequency (RF) concerns, layoffs of meter readers, increased bills – be ready for them. It is important to be prepared to fill the void with accurate, transparent, and credible information.
 - Customers primarily want to know WHY and WHEN. The WHY is primarily: “How can I impact my bill?” but also “How can I impact the environment?”

Growing Levels of Engagement

- As communication and awareness have grown, so have enrollment in dynamic rates and in-home-device installation. In this sense, the depth of the demand response resource is not a fixed quantity – it grows along



Roundtable breakout discussions at the Northeast Workshop, July 2011.

with customer outreach and engagement.

- In many ways, engagement follows traditional patterns: 10% classic early adopters, 80% “cautious optimists”, 10% disinterested or suspicious non-adopters. With this pattern, it is important to establish trust gradually, build awareness over time, then introduce new offerings that show clear customer benefits.
- One utility observed a variation on these adoption ratios. In their Time of Use rate program, they observed that 1/3 of customers did not alter their use at all, 1/3 demonstrated a very modest adjustment, and the final 1/3 did all the heavy lifting, resulting in a total peak reduction of 17%.
- For some utilities, the initial expectation was that they wouldn’t be able to recruit enough participants for a dynamic rate pilot program. However, they discovered that if they communicate with customers early about the upcoming program, the opposite was actually true.
- Customer complaints are being resolved more quickly with smart grid technologies installed. One utility reported that they have no unresolved customer complaints since they deployed their smart grid technologies. By being able to track energy use data more closely, utilities can alert customers when their electricity use suddenly spikes. By doing this, customers are better able to remember what behavior changed to cause the increase or the consumers are able to identify faulty appliances that are causing the increase. With more data, consumers are able to understand what is causing the increase, therefore, relieving the burden of the utility. One example of this is when one utility called to let a customer know of a dramatic change in usage. Even knowing the time and date of the usage change, the customer wasn’t able to identify the cause – at first blaming his wife and kids. However, several weeks later when usage changed again (declining substantially to previous levels) the customer was able to link the usage to equipment being charged at the house. The customer never imagined that the equipment being charged required so much energy. It was only through specific usage data that the problem was resolved.

Looking Ahead

When asked about the future of consumer engagement issues, responses included:

- “I hope it becomes very easy. Set it and forget it. Hand-held devices. Full integration.”
- “Really, really individualized services.”
- “We’re very skeptical about really invasive behavioral change avenues. But we anticipate more EVs, and Best Buy-type retail channels that offer local home-area network (HAN) products. How can we, as small, responsive co-ops, pull the skeptics along with everyone else?”

2: Technology Integration

Overview

Smart grid technology development is dramatically changing the level of visibility into the electricity system, and is also enabling new capabilities across the business of delivering electricity. These dual changes are particularly dependent upon the successful integration of a constellation of new technologies. The full capabilities of smart grid technology portfolios are still being explored and validated, so real-world, large-scale deployment is a highly dynamic process. In all cases, this work requires a highly collaborative management effort, typically with new relationships between utilities and vendors. For an industry that is accustomed to relatively slow technological change, utilities are having to adapt to faster technological change than they are accustomed to, and they increasingly find

themselves in the role of technology integrator and manager of an ecosystem of new vendors. Some observations about this new role include:

- For a long time, meter technology evolution was relatively slow-moving, and meter device lifecycle problems were not a critical issue. Today, overlapping technology lifecycles is an increasingly important question without an easy answer. Understanding the AMI business case is a case in point: What is the life of the meter now? Typically this was assumed to be 20 years. With the new pace of technological change, does the assumed lifetime of a meter unit become 10 years?
- Verifying technology performance claims is increasingly important for utilities. It is important to recognize that the ARRA investment is essentially ensuring that a lot of cutting-edge technology is getting tested through these projects. Furthermore, the performance of equipment in one setting (a major IOU) does not guarantee its performance in another setting (a rural cooperative). For the small, cash-strapped municipal utilities, it is a great time to watch, learn, and adopt. In other words, “stay 6-9 months behind the big leaders, and adopt what works.”
- Some areas of technology integration raise issues about the structure of markets. For example, it is unclear where the industry is in terms of capacity controllers. Traditionally the Transmission Operator wanted reactive resources, now various actors are trying to figure out who controls them, and whether there is central control. As a test, one utility plans to put reactive resources in place without AMI so as to be able to see pure impacts without the confounding impact of consumer behavior.
- Vendor relationships are crucial, and can also be very challenging. Technologies are continuing to evolve and utilities are, by default, acting as emerging-technology system integrators, which is not a typical role. Proper management of these relationships requires ongoing discussion, and could be the focus of future workshops.
- It is wise to exercise caution with a vendor that doesn't have a clear roadmap of their planned development. Putting the full onus of integration on the utility is a lot to ask for. If the vendor doesn't have signals that they're on their roadmap, it makes it harder. But even if they can show this, roadmaps are often crafted based on the RFP. Honesty from the vendor about where they really are in their development cycle would make technology integration easier.
- In pursuit of the goal of ensuring quality of production-level and system-integration-level testing, testing environments at the meter master level are crucial.
- The incremental collection of new systems is enabling entirely new possibilities: meter socket IDs have allowed syncing GIS and SCADA and meters. GIS + SCADA = hourly data on every transformer and fuse. This has changed the way utilities do business. Distribution-level technologies are providing much more granular information about distribution system health. When a hot summer came several years ago, one utility suffered the failure of 17 legacy transformers. Recently installed



Reporting out from roundtable discussions at the Northeast Workshop, July 2011.

systems allow the utility to see their transformers with a new level of detail: this past summer they could see every transformer operating over 160% peak load on a hot day over 92 degrees, and subsequently upsized every transformer that was over that mark. This level of visibility prevents failures and outages, providing significant system benefits.

3: The Changing Nature of Being a Utility

Overview

Whether a small municipal utility, a rural cooperative, or a major investor-owned utility, the pace of industry change in the utility sector is faster than it has been in a half century. The impacts of this change are not just on the technical side of the business, but touch all divisions of the organization. Among the specific observations in this area:



Day 2 of the Northeast Workshop, July 2011.

- As smart grid projects are implemented, many business process functions now touch multiple departments. This is requiring changes to the organizational structures of utilities. Across the organization, what used to be a single-purpose job is now a cross-cutting job. Customer service personnel need to understand outage-management implications of smart grid. Linemen need to understand in-home devices. Executive level personnel need to understand smart grid activities at all levels. Utilities are grappling with how to best to structure the organization to handle these cross cutting issues.
- Utilities are staking out new ways to measure and define success. For example, awareness of smart grid deployments plays a real role in customer-satisfaction, whereas 10 year ago, reliability and cost were the main drivers of satisfaction. One utility saw consumer awareness grow from 25% to 40% in one year, while another saw awareness grow from 6% to 77%, due to increased media coverage. Tracking these new, non-technical metrics is important, and was discussed at some length, as described below.
- Change has typically been a nasty word in the utility business. But in other fields (IT), rapid change has always been the norm. The utility will need to begin to step into this faster stream. One potential solution is careful systems of monitoring and organizational control – establishing metrics, thresholds, and processes for new technology across the organization.

4: Measuring Results

Overview

A range of technical, cost, benefit, and customer metrics are being deployed in support of tracking smart grid investments. All participants agreed that metrics should capture the broad service area and should be designed to be sustained past the current funding environment. Some observations of best practices include:

- Meticulous development and maintenance of baseline data is vital. Cost data, reliability data, etc, should all be collected prior to a project, allowing projects to measure incremental progress from that benchmark and allowing evaluation of performance goals along the roadmap.
- In addition to tangible benefits, various participants reported measuring and valuing customer service metrics. AMI has virtually eliminated high-bill complaints. With that data, utilities can find every problem. In the past, customers typically believed “It’s the utilities fault.” Now with smart grid-enabled data, customer billing support staff can help identify the pattern that is behind the high-billing.
- Increasingly, it is important to initiate the discussion of how to value an avoided outage, especially on a hot day. Measuring and valuing avoided outages (and costs) is difficult but important.
- In some cases it has been possible to justify a full AMR system build-out based solely on meter-reading savings.



Introducing a panel discussion, Northeast Workshop, July 2011.

The group shared a wide range of new metrics for quantifying the benefits and costs of smart grid investments. The following metrics of measuring results could include:

- Energy (kWh) and dollars.
- Rates of complaints and opt-outs.
- Awareness levels (measured via focus groups / surveys). The question was raised about how to build this into long-term plans, and how to use it to establish important strategic partnerships with key stakeholders.
- Number and usage of customer service products and programs.
- The running ratio of call rates versus web-based customer interactions.
- Relative customer satisfaction to outage response (compared to previous baselines).

The general benefits of collecting and analyzing data were also widely recognized, as effective data analysis can provide vital insight into:

- Understanding power factor.
- Equipment load monitoring.
- Financial and cost information topology.
- Dealing with bill complaints.
- Load settlement.

5: Challenges and Opportunities Ahead

Overview

Enormous progress that has been made in a short amount of time, but all agreed that there are challenges and opportunities that have not been fully explored. The group identified a range of issues that will likely persist in future conversations of smart grid deployment, and should be considered for subsequent Workshops:

- Cyber-security and privacy concerns deserve significant attention, as they are bringing changes to a wide range of operational procedures, from vetting the hardware supply chain, to identifying custody of consumer data across all vendors. There is a significant need for further work in this area. Key issues subtopics in this domain include:
 - *Changes to Standards*
 - The key question here is “Which do we meet, and which require attention?” Tracking this field is important and challenging for utilities on their own.
 - *Access, authentication, authorization, and encryption*
 - How to limit and permit access to a variety of devices
 - Long-term security management of the system
 - *Deployment*
 - Supply chain management – It is important to think about how to validate security of hardware.
 - Unit testing and intercommunication testing and management is a growing area of expertise that is needed.
 - *Data Privacy*
 - Encryption between Zigbee chips and meters is an important issue.
 - Third-party access holds a lot of promise for consumer engagement, but is also an unexplored area.
 - What are best practices for dealing with third parties? Is operational data sufficiently anonymous? Is there a risk transfer to the customer if they take ownership and provide/authorize third-party access?
 - What to do in the case of a breach? What about proving the origin of the breach, which in some cases may originate with the customer.
 - Privacy threats are not new or unique, and are lower than the credit card risk endemic in all sorts of consumer transactions.
 - Physical and Logical security: There is a lot of data traveling over common networks. What are the issues involved with using 3rd party vs. utility-owned networks?



Breakout discussions in beautiful Vermont, July 2011.

Resolving these issues, managing overlapping technology lifecycles that are now out in the field (especially 5-10 year old AMR meters), and leveraging future investments to keep up with AMI will all be critical. Related issues of effectively managing networks of vendors also deserve ongoing discussion and collaboration. And issues around best practices in consumer engagement are certain to motivate further peer-to-peer workshops.

Appendix 1: Participant List

Ken Nolan Burlington Electric Department	Brian Otley Green Mountain Power	Jim McNierney NY ISO	Rebecca Wigg Vermont Law
Barbara Grimes Burlington Electric Department	Neale Lunderville Green Mountain Power	Laurie Burnham Sandia National Laboratory	David Mullett Vermont Public Power Supply Authority
Tom Buckley Burlington Electric Department	Mary Powell Green Mountain Power	Ellen Burt Stowe Electric Department	Kerrick Johnson Vermont Transco (VELCO)
Chris Burns Burlington Electric Department	Kevin Kelly Groton Electric Light Department	Aimee Green Stowe Electric Department	Allen Stamp Vermont Transco (VELCO)
Brenda Benner Central Maine Power	Noel Wehner Groton Utilities	Charles Underhill Town of Danvers	Deena Frankl Vermont Transco (VELCO)
John Miller Central Maine Power	Eric Wilkinson ISO New England	Margaret McCarthy Town of Danvers	Shana Duval Vermont Transco (VELCO)
Laney Brown Central Maine Power	Jason Rauch Maine PUC	Paul Hines University of Vermont	Chris Dutton Vermont Transco (VELCO)
Sara Burns Central Maine Power	Leslie Raber Maine PUC	Steve Fitzhugh Norwich University	Tom Berry VT Congressional Delegation-Leahy
Jeff Monder Central Vermont Public Service	Jacquelyn Bean National Energy Technology Laboratory	Chris Koliba University of Vermont	Corey Chase VT Department of Public Service
Todd Kowalczyk Central Vermont Public Service	Ryan Egidi National Energy Technology Laboratory	Melody Burkins University of Vermont	Tamera Pariseau VT Department of Public Service
Amanda Beraldi Central Vermont Public Service	Peter Rothstein New England Clean Energy Council	Allan St. Peter Vermont DPS	Karen Marshall VT Governor's Office
Joan Gamble Central Vermont Public Service	Normand Brien New Hampshire Electric Cooperative	Elizabeth Miller Vermont DPS	Tim Jerman VT House of Representatives
Greg White Central Vermont Public Service	Guy Ford New Hampshire Electric Cooperative	Randy Pratt Vermont Electric Cooperative	Bill Powell Washington Electric

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Connecticut Municipal
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David Hallquist
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Camilo Serna
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George Twigg
Vermont Energy
Investment Corporation

Eric Lightner
Department of Energy

Steven Hauser
National Renewable
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Shawn Enterline
Vermont Energy
Investment Corporation

Michelle Dallafior
Department of Energy

Mackay Miller
National Renewable
Energy Laboratory

Kevin Jones
Vermont Law

Tanya Burns
Energetics

Doug Horton
NSTAR

Appendix 2: Workshop Agenda



U.S. DEPARTMENT OF
ENERGY

July 19

The Inn at Essex, 8:30am-5pm

8:30 Light Breakfast and Registration

9:00 Welcome and Introduction – VELCO and DOE

9:30 Panel Discussion: Consumer Outreach and Education: Messages, Mechanisms, Activities, Success

Moderator: Chris Koliba, Director of University of Vermont MPA Program

Panelists:

- Amanda Beraldi (Central Vermont Public Service)
- Laney Brown (Central Maine Power)
- Dave Halquist (Vermont Electric Company)
- Kenneth Horne (ConnSMART Program Director)

10:15 Break

10:30 Breakout Discussions: Consumer Outreach and Education: Messages, Mechanisms, Activities, Success

Facilitated breakout discussion at each table

Table Topics:

- **Messages:** Which messages are resonating best with consumers? Are there messages that haven't appealed to consumers?
- **Segmentation:** Is it necessary to develop different messages for various market segments? How are you segmenting your consumer base? What market segments are being targeted? Do you have different educational approaches or messages for different segments?
- **Mechanisms:** What mechanisms are you using to reach consumers? Which ones are you finding the most effective? Do mechanisms differ depending on the customer segment being targeted?
- **Measuring Results:** How do you measure success in educating or reaching out to consumers?
- **Community Involvement:** What efforts are being undertaken to involve the community? Are there efforts focused on community groups or are individual consumers the target audience?
- **Consumer Pushback/Opt-out Programs:** There has been push back from consumers on smart meter rollouts and some PUC's are approving opt-out plans. How are these consumer attitudes being addressed? How do utility outreach mechanisms changed in states with opt-out plans? Have any programs had to be discontinued?
- **Underserved Populations:** Have we developed education programs for low income consumers or senior citizens?
- **Educational Efforts:** Have educational programs or activities been developed to educate at the K-12, community college or university level? What programs have been most effective?
- **Behavior Studies.** How do the education efforts for Consumer Behavior Studies differ from that of general outreach?
- **Data Privacy.** Are there best practices to "bake-in" privacy to grid implementations? What technical and business processes have you found effective at ensuring data privacy?
- **Cyber Security.** What are the systems and processes that you are implementing to
- **Customer Support:** Smart grid implementation is increasing consumer participation and can have a significant impact on the relationship between the consumer and their utility. Have customer support mechanisms had to change?

11:15 Discussion Report-Out from each table

12:00 Description of UVM/Sandia "Smart Grid Short Courses"

Domenico Grasso, Vice President for Research and Dean of the Graduate College, UVM

12:15 Lunch and informal networking

1:30 Panel Discussion: Technical Implementation of Smart Grid Deployments

Moderator: Bill Capp, CEO of Beacon Power

Panelists:

- Allen Stamp (VELCO)
- Norm Brien (New Hampshire Electric Cooperative)
- Bob Rowe (Long Island Power Authority)
- Kevin Kelly (Groton Electric Light Department)

2:15 Break

2:30 Breakout Discussions: Technical Implementation of Smart Grid Deployments

Facilitated breakout discussion at each table

Table Topics:

- **Operations:** How are smart grid deployments improving operations? With all of the new information that is being collected, what analysis is taking place so that it can be used to effectively improve operations?

- **Measurement:** *What significant successes have been achieved and (how) were they measured? How have discussions of benefits and costs impacted your internal measurement processes?*
- **Challenges:** *What technological or other challenges have been encountered? How were they overcome? Were the challenges expected or unforeseen?*
- **DOE Reporting/Interaction:** *What type of support and guidance would be most useful from DOE? What have been the benefits and challenges of grant reporting requirements?*
- **Technology Needs:** *Are new technologies needed to address gaps? Have there been technological difficulties that were unforeseen?*
- **Cybersecurity:** *How is cybersecurity being addressed? What changes to operations have been made to prevent cyber attacks?*
- **Privacy:** *How is data privacy being handled from a technical perspective?*
- **Demand Response Resource:** *How are consumers reacting to dynamic pricing, direct load control or other programs? Has consumer reaction been mostly positive, neutral or negative? What types of load reductions have been achieved?*
- **Change Management:** *How is the amount of data available with smart grid enable technologies changing operations? With smart grid, many changes are being implemented from consumer involvement to new technologies. How are these changes being managed within the organization?*

3:15 Discussion Report-Out from each table

4:00 Discussion of Next Steps

4:30 Closing Remarks and Adjourn

Reception at The Inn at Essex, 4:30pm-6:30pm

JULY 20 The Inn at Essex, 8:30am-3:00pm

8:30 Refreshments and Registration 9:00

Welcome and Introduction – VELCO and DOE

Smart Grid – Towards a National Policy Framework

Michelle Dallafior, Senior Policy Advisor, DOE Office of Electricity Delivery and Energy Reliability

9:45 Smart Grid in the Northeast: A Unique Collection of Innovative and Successful Projects

- Karen Marshall (Chief of ConnectVT)
- Aseem Kapur (Department Manager, Smart Grid Implementation Group, Consolidated Edison)

10:30 Break

10:45 Panel: Smart Grid in the Northeast

Moderator: Peter Rothstein, New England Clean Energy Council

Panelists:

- Camilo Serna (Director of Strategic Planning, Northeast Utilities)
- Larry Gelbein (Vice President, Engineering, NSTAR)
- Guy Ford (Information Systems Security Compliance Executive, New Hampshire Electric Cooperative)
- Chuck Underhill (Integrated Power Resource Director, Town of Danvers)

Noon Lunch Keynote

Introduction by Chris Dutton, CEO of VELCO

Peter Shumlin, Governor of Vermont

1pm Successful Approaches to Consumer Engagement

- Elizabeth Miller (Commissioner, Vermont Department of Public Service)
- David Halquist (CEO, Vermont Electric Company)

1:30 Panel: Successful Approaches to Consumer Engagement

Moderator: Deena Frankel, VELCO

Panelists:

- Barbara Grimes (General Manager, Burlington Electric Department)
- George Twigg (Deputy Policy Director, VEIC / Efficiency Vermont)
- Sarah Burns (CEO, Central Maine Power)
- Kerrick Johnson (Vice President, External Affairs, VELCO)

2:45 Closing Comments and Next Steps

3:00 Adjourn