Grid Modernization in Massachusetts: The Role of Energy Efficiency

Presented at the 2013 ACEEE National Conference on Energy Efficiency as a Resource
Sept. 23, 2013

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Caveats

- This presentation does not reflect the views of the MA DPU or the MA DPU Commission.
- The process is ongoing, and many of the issues addressed here, though publicly raised in the MA Grid Mod process, have not been settled…

Outline of Presentation

- Summary of MA DPU Grid Mod Working Group Process and Report
- Big Questions: Energy Efficiency and Grid Mod
- Clues from statute, order, and Working Group report
- The future and next steps

DPU Grid Modernization NOI

- Oct. 2012 – DPU Issued Notice of Investigation (NOI) Order on Grid Modernization…
  - "to investigate policies that will enable Massachusetts electric distribution companies and their customers to take advantage of grid modernization opportunities."
  - "examine our policies to ensure that electric distribution companies adopt grid modernization technologies and practices in order to enhance the reliability of electricity service, reduce electricity costs, and empower customers to adopt new electricity technologies and better manage their use of electricity."
  - " the purpose of this investigation will be to solicit input from stakeholders that will guide the Department's approach to grid modernization over the short, medium, and long term. "(NOI at 1)

Why a stakeholder proceeding investigating Grid Mod?

- The issues are broad
  - Everything from "smart meters" to "self-healing grid," time varying rates (TVR) to conservation voltage reduction (CVR), peak shifting to line losses, customer protections to cybersecurity…
- Issues are complex, for example…
  - MA distributions companies have automated meter reading (AMR) at least, so some operational benefits often associated with automated metering infrastructure (AMI) are not applicable
  - MA is a restructured state, and customers may get "electricity supply" from utility ("basic service") or competitive supplier. What are implications if a goal is TVR and peak shifting? What are implications for assessing benefit of load shifting for business case?
- Many different stakeholders perspectives, insights, goals, including third party providers
- Questions regarding incentives, risk, cost recovery, planning for utilities, customers, other stakeholders

Summary of Working Group Process

- NOI Created a working group process, which culminated in a report to DPU on July 3, 2013
- Over 25 stakeholders, including: EE advocacy; EE vendor; distribution companies and municipal aggregator (also EE program administrators); ISO; low-income advocate; Attorney General (consumer advocate); retail supply advocate;"clean energy coalition;" environmental advocate, etc.
- Facilitation consultant team - Goal to gain stakeholder input and achieve consensus where possible, to delineate different options where not
- 15 full day meetings, sub-working groups, many expert presentations, calls, drafts, etc.
- People put in a LOT of work
- 150 page Working Group Report, followed by comments (29 sets)

Summary of Working Group Report

Key components include:

- Ch. 3 - Grid Modernization Taxonomy
  - What is grid modernization?
- Ch. 4 - Background Information & Joint Fact Finding
  - "Grid facing," Time Varying Rates (TVR), Metering
- Ch. 5 - Principles and Recommendations
- Ch. 6 - Regulatory Framework Proposals
- Ch. 7 - Cost-Effectiveness Frameworks
- Ch. 8 - Next Steps for the Regulatory Process

Figure 3-1: Massachusetts Grid Modernization Taxonomy

Outcomes	Capabilities/Activities*	Network Systems Enablers
Reduce Impact of Outages	Fault Detection, Isolation and Restoration	• Communications • SCADA / Distribution Management System • Outage Management System • Geospatial Information System
	Automated Feeder Reconfiguration	
	Intentional Islanding	
Optimize Demand	Volt/VAR Control, Conservation Voltage Reduction	• Communications • SCADA / Distribution Management System • Metering System • Meter Data Management System • Billing System
	Load Control	
	Home Area Network Capability	
	Advanced Load Forecasting	
	Time Varying Rates	
Integrate Distributed Resources	Voltage Regulation	• Communications • SCADA / Distribution Management System
	Load Leveling and Shifting	
	Remote Connect / Disconnect	
Workforce and Asset Management	Mobile Workforce Management	• Communications • Outage Management System • Geospatial Information System
	Mobile Geospatial Information System	
	Remote Monitoring and Diagnostics	
Prevent Outages	System Hardening	
	Aging Infrastructure Replacement	
	Vegetation Management	

** Note: Capabilities/Activities are connected here to their primary outcomes. Some Capabilities/Activities can also help facilitate other outcomes (see definitions).*

Grid Mod and EE - Big Questions

- What is the relationship between Grid Mod and EE?
- Do they or should they overlap in policy making and implementation?
- Are they looking at different things in terms of physical focus?
  - EE –customers (i.e., buildings)
  - GM – customers and electric grid ("customer facing," "grid facing")
- Are they looking at different things in terms of energy focus
  - EE – total energy reduction; what about peak?
  - GM – peak energy use; what about total energy?
- Different Regulatory Frameworks?
  - EE - programs separately funded and evaluated ; mature and well-established in MA (Three Year Plans in MA with high benefit cost ratios, nearly $9 billion benefits statewide)
  - GM – A specific GM process for proposals, review, cost recovery to be determined; should it be different than "traditional" utility investing, planning, regulation, including service quality.

Grid Mod and EE - Big Questions (cont.)

- EE vs. GM - What about when looking at benefits?
  - Save customers money on energy bills
  - Avoiding investment in energy infrastructure (T&D)
  - Environmental benefits (emissions reductions)
  - Promoting clean energy economy
  - Better service quality, customer satisfaction, enable customer control over energy use and costs
  - Reliability, outage response
- Conducting benefit cost analysis– a framework like the total resource cost test, used in MA EE?

Statutory Framework

- St. 2008, c. 169, An Act Relative to Green Communities ("Green Communities Act")
- Energy Efficiency (Section 11)
  - "delivered in a cost-effective manner capturing all available efficiency opportunities"
  - "…programs for energy efficiency including, but not limited to, demand side management programs."
- Smart Grid Pilot Programs (Section 85)
  - "A specific objective of the pilot shall be to reduce, for those customers who actively participate in the pilot, peak and average loads by a minimum of 5 per cent."

NOI Document

- "We expect that grid modernization offers the opportunity to…
  - (7) enhance the success of the Massachusetts energy efficiency initiatives, through the use of marketing campaigns and the advancement of technologies that both reduce peak demand and save energy.
  - (8) reduce GHG emissions from the electric sector by: increasing the operational efficiency of the grid, thus reducing emissions associated with line losses; reducing the need for higher emissions generating plants, which run primarily during times of peak electricity demand; empowering customers to use energy more efficiently; and facilitating the integration of demand resources into the grid." (NOI at 4-5)

Stakeholder recommendations from Working Group Report

- Each utility should file a company-specific grid modernization plan taking into account but not limited to the capabilities, activities, and enablers
  - – Including "geo-targeting of energy efficiency" (p. 46)
- GM proposal must fit with other programs, including energy efficiency (p. 50).
- New rate structures and information from advanced metering should foster customer education, behavioral changes and participation in energy efficiency and demand response programs. (p. 56)
- Sharing of customer data to third party vendors (p. 50).
- "Distribution services pricing" regulatory model:
  - Customers with demand side resources could "realize opportunities to provide services to the distribution utility by offering" demand side resources, including "energy efficiency" and others "to allow deferral of investments by the utility that may be necessary to resolve short or long term reliability or stability issues on specific areas of the grid." (p. 70)

Two Dichotomies

- Buildings vs. Grid
  - Customer Facing vs. Grid Facing - a bit of a false division in Grid Mod context
  - What about EE GM investment on the grid? Potential to achieve benefits including,
    - Reduction in total energy use, energy costs
    - Environmental benefits
  - Is it useful to think of Grid EE as EE, when the focus is on strengthening and improving PA EE programs and offerings? Maybe not…
- Conservation vs. peak shaving

Going forward…

- New EE offerings enabled by Grid Mod (e.g., AMI)? GM Offerings (what will that look like??)
  - New data; third party providers; new technologies; new programs; new benefits
- Grid Mod and EE… separate processes?
- Changes in process? Changes in thinking?
- Next Steps for MA DPU Grid Mod
- The future of efficiency, the future of the grid

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