



November 18, 2015

VIA ELECTRONIC FILING

Mr. Daniel Wolf, Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101-2147

Re: Docket Number E999/CI-15-556 Request for Stakeholder Perspectives

Dear Mr. Wolf,

The mission of Advanced Energy Economy Institute (AEE Institute), the charitable and educational organization affiliated with Advanced Energy Economy (AEE), is to raise awareness of the public benefits and opportunities of advanced energy. As such, AEE Institute applauds the Minnesota Public Utility Commission for opening an Investigation into Grid Modernization and seeking stakeholder perspectives. AEE is a national business association representing leaders in the advanced energy industry. AEE supports a broad portfolio of technologies, products and services that enhances U.S. competitiveness and economic growth through an efficient, high-performing energy system that is clean, secure and affordable. AEE Institute, on behalf of AEE and its member companies, is pleased to offer the following stakeholder perspectives in the Matter of the Commission Investigation into Grid Modernization.

Please feel free to contact me with any questions that you might have. We hope that the comments below provide you with useful insights.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Hannah Polikov". The signature is fluid and cursive.

Hannah Polikov
Director, Public Utility Commission Engagement Program
Advanced Energy Economy Institute

What objectives and principles should guide grid modernization in Minnesota and an integrated distribution planning process?

AEE Institute recommends that the following objectives and principles guide grid modernization in Minnesota and an integrated distribution planning process:

- Empowering all customers (from residential to small and medium C&I to large C&I to low-income) with tools, information, pricing and other choices to help them manage their energy usage and costs and become more active participants in energy markets
- Creating opportunities for third-party product and service providers to bring capital and innovation to the electricity sector
- Making use of distributed energy resources (DER)¹ for system benefits and customer benefits
- Reducing total energy use and energy costs
- Achieving fuel and resource diversity
- Ensuring system reliability and resiliency
- Economically optimizing the electricity system, including but not limited to by improving utility capital asset utilization and optimizing demand, i.e., reducing peak demand
- Properly aligning utility financial incentives with public policy objectives and customer needs. This should include a shift towards rewarding performance (outcomes) instead of capital expenditures (inputs) and allowing utilities to take reasonable risks to encourage innovation and entrepreneurship and accelerate commercialization of new products and services
- Developing new market structures that enable two-way market signals to allow customer participation
- Utilizing standards and protocols ideally drawn from National standards, to ensure interoperability of devices located on the utility side of the meter and on customer premises
- Examining the role of rate design in helping to achieve the long run financial integrity of the grid as a platform
- Reducing greenhouse gas emissions and aiding in compliance with the Clean Power Plan

What pathways, both procedural and substantive, are necessary for the Commission to take? Please identify these steps by timing (near, mid or long term) or other relevant parameters.

From a procedural perspective, AEE Institute suggests that Minnesota apply a line of sight methodology: first identifying its strategic objectives, then the capabilities and functionalities needed to meet those objectives, then the enabling technologies needed to achieve those capabilities and functions, and finally the regulatory changes, such as rate designs, data access improvements and incentives, needed to fully take advantage of those new technologies.

¹ Distributed energy resources are defined broadly to include distributed generation of all types, energy storage,



For example:

Strategic objective: lower energy use and utility system costs

Strategic capability to achieve objective: help customers make smart decisions to use energy more efficiently and shift usage away from (and distributed generation supply toward) peak demand periods to lower overall system costs

Enabling technology to achieve strategic capability: advanced metering functionality and tools to help customers receive their usage data and modify their usage

Regulatory changes needed to take advantage of technology:

Rate design: time varying rates (TVR)

Access to data: give customers and customer-designated third parties easy and convenient access to granular, near real time energy usage data matched with price signals to enable customers to make informed decisions about their energy consumption and generation. (Examples: access to data enables a smart dishwasher to run in the middle of the night during off peak times or enables an energy storage battery to feed power back to the grid during on-peak times).

When applying the line of sight methodology, there are several additional considerations to note. First, new functionalities that will be used to pursue strategic capabilities are likely to rely upon Internet Protocols that are rapidly evolving. The Commission should examine this issue to help ensure that new IP services will be compatible with high levels of operational reliability, resiliency and security for the electric grid and programs designed to support it and motivate customer actions. Second, in thinking about what strategic capabilities are necessary to achieve the Commission's objectives, the Commission should also think about which entities are best positioned to carry out those strategic capabilities, whether that be a utility, a third party, a customer or some combination and/or collaboration of the three. Finally, in addition to addressing data access, the Commission should also examine issues surrounding the ownership and security of customer data that may need clarification as part of grid modernization and integrated distribution planning.

Building on the current workshops that the Commission is holding, AEE Institute suggests that the Commission continue an open, collaborative process, similar to the eight-month "Grid Mod" working group process that was convened in Massachusetts at the request of the Department of Public Utilities (DPU). At the end of that working group process, a report was filed that formed the basis for the DPU's Grid Modernization Orders.² The process should be accessible to a wide range of stakeholders via in-person and remote participation so that a wide range of perspectives can be heard, including third-party providers, consumer advocates, low-to-moderate income customers, environmental groups, industry and utilities.

² See MA DPU Grid Modernization homepage: <http://www.mass.gov/eea/energy-utilities-clean-tech/electric-power/grid-mod/grid-modernization.html>, which in turn references the MA Grid Modernization Working Group facilitator's website: <http://magrid.raabassociates.org/schedule.asp>



What are the benefits and costs that could result from grid modernization? Are there regulatory steps the Commission should take to balance the costs and benefits for the public interest?

Benefits are likely to include:

- Energy savings for customers via increased energy efficiency
- A more flexible, bi-directional digital grid with ability to integrate increasing levels of DER
- Reduced system-wide costs due to better management of peak demand
- Lower emissions
- Empowered customers
- Enhanced system resiliency and grid security

Costs will include the necessary investments by utilities to enable the new functionality the grid will need to achieve the benefits. AEE Institute's *Benefit-Cost Analysis for Distributed Energy Resources Report*³ lays out a framework for estimating the full range of benefits and costs associated with distributed energy resources that underpin grid modernization as summarized in the table below.

³ "Benefit Cost Analysis for Distributed Energy Resources," prepared by Synapse Energy Economics, Inc. for Advanced Energy Economy Institute, September 2014. Available at: <http://info.aee.net/benefit-cost-analysis-for-der-synapse>.



Table 1. Universe of Relevant Distributed Energy Resource Impacts

	BENEFITS		COSTS	
	Category	Examples	Category	Examples
Impacts on All Customers	1 Load Reduction & Avoided Energy Costs	Avoided energy generation and line losses, price suppression	1 Program Administration Costs	Program marketing, administration, evaluation; incentives to customers
	2 Demand Reduction & Avoided Capacity Costs	Avoided transmission, distribution, and generation capacity costs, price suppression	2 Utility System Costs	Integration capital costs, increased ancillary services costs
	3 Avoided Compliance Costs	Avoided renewable energy compliance costs, avoided power plant retrofits	3 DSP Costs	Transactional platform costs
	4 Ancillary Services	Regulation, reserves, energy imbalance		
	5 Utility Operations	Reduced financial and accounting costs, lower customer service costs		
	6 Market Efficiency	Reduction in market power, market animation, customer empowerment		
	7 Risk	Project risk, portfolio risk, and resiliency		
Participant Impacts	1 Participant Non-Energy Benefits	Health and safety, comfort, tax credits	1 Participant Direct Costs	Contribution to measure cost, transaction costs, O&M costs
	2 Participant Resource Benefits	Water, sewer, and other fuels savings	2 Other Participant Impacts	Increased heating or cooling costs, value of lost service, decreased comfort
Societal Impacts	1 Public Benefits	Economic development, reduced tax burden	1 Public Costs	Tax credits
	2 Environmental Benefits	Avoided air emissions and reduced impacts on other natural resources	2 Environmental Costs	Emissions and other environmental impacts

AEE Institute recommends that Minnesota take a broad view of the benefits and costs of grid modernization, looking at the impact on all customers, participants, utilities and society at large, with particular focus on recognizing the public interest benefits of grid modernization.⁴

⁴ For more information on how New York is addressing benefits and costs in the “Reforming the Energy Vision” Proceeding and how a broad view can be applied, see AEE Institute’s comments on the Staff’s Benefit Cost Analysis White Paper available here as filing number 452: <http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterSeq=44991&MNO=14-M-0101>



What specific regulatory barriers exist to meeting your objectives? These can be barriers the utilities are facing, as well as barriers to customers and other participants.

There are 4 primary regulatory barriers that exist today that inhibit grid modernization. First, there is a lack of certainty of the value of and revenue stream for distributed energy resources (DER). Minnesota did trailblazing work with its state-wide value of solar methodology, but that methodology only applies to solar. In order to realize the full value of DER, valuation will need to focus on desired services and attributes provided by DER in a way that allows multiple technologies to participate. Also important is structuring compensation so that it encourages DER to support the grid in a way that meets temporal and locational needs. One example is in the New York Reforming the Energy Vision proceeding, which is investigating a way to determine other values, including distribution level values of DER, that are not included in wholesale energy prices

Second, limited access to system data can have a chilling effect on grid modernization. Greater transparency and access to utility system data highlighting system needs and constraints is important. Also, developing a methodology for compensating DER that includes temporal and locational grid needs could potentially complement increased access to data by helping third parties identify, based on price signals, where the needs are on the grid for DER.

Third, technological innovation has blurred and shifted the lines between what is a monopoly function and what can be provided by the competitive market. Clearly defining the roles of utilities vs. third parties, including over ownership of DER assets, and identifying opportunities for collaboration will provide the certainty both need to invest and develop their businesses.

Fourth, utility incentives need to be more properly aligned with widespread DER deployment. Utilities should be made indifferent as to whether they or a third party/customer funds an investment or whether the investment is in a traditional capital asset or an operating asset such as a solar power purchase agreement or a demand response contract. At the end of the day, the goal should be to make the best investment overall.

