



Mr. David J. O'Brien
Vice President, Grid Transformation
BRIDGE Energy Group
377 Simarano Drive
Marlborough, MA 01752

September 17, 2015

New Hampshire Public Service Commission
21 South Fruit Street, Suite 10,
Concord, N.H. 03301-2429

Re: IR 15-296 Electric Distribution Utilities
Investigation into Grid Modernization

Attention: Executive Director

The BRIDGE Energy Group is pleased to provide the attached comments regarding the Commission's Investigation into Grid Modernization.

We hope that our comments are responsive to the Commission's interest in hearing from grid modernization practitioners. BRIDGE Energy Group is the leading consulting and systems integration company focused on improving utility operational performance. We combine business, operational technology (OT) and information technology (IT) domain expertise to deliver and optimize innovative grid operations solutions. We have actively been a part of the examination of modern grid requirements from a business, functionality and enabling technology perspective for our clients and within state policy investigations.

We look forward to the technical sessions and are available to answer any specific questions of the Commission.

Sincerely,

A handwritten signature in black ink, appearing to read "David J. O'Brien", is written over a light gray rectangular background.

David J. O'Brien
Vice President, Grid Transformation



**THE STATE OF NEW HAMPSHIRE
PUBLIC UTILITIES COMMISSION
IR 15-296
ELECTRIC DISTRIBUTION UTILITIES
Investigation into Grid Modernization**

Initial Comments of BRIDGE Energy Group

BRIDGE Energy Group (BRIDGE) appreciates the opportunity to respond to the Commission's request for comment on the definition, or elements, of grid modernization that should be included in its Investigation into Grid Modernization in Docket No. IR 15-296. We are pleased to have an opportunity to offer our thoughts and applaud the Commission's effort to examine these issues.

We believe the New Hampshire Public Service Commission (NHPC) enters this endeavor with a sound foundation and vision that has been articulated in the New Hampshire Energy Strategy. The Strategy captures well the macro drivers that are reshaping operation of the distribution grid and utility business model. The industry and its regulatory approach have reached a point of structural change because of advancing technology, policy and customer expectations.¹

State utility commissions and policymakers have an opportunity to identify these macro trends and their implications for long rung infrastructure modernization in a proactive fashion that can maintain both the integrity of the regulatory compact and the distribution grid. There are excellent reference examples to consider in the states of Massachusetts, New York and California. However these are reference cases and what is most critical is that New Hampshire examine industry change and develop a response that best matches its policy objectives, market structure and values.

¹ See "Searching for Equilibrium, How to Achieve It in the Era of Distributed Energy", David O'Brien, Public Utility Fortnightly, August 2015.



About BRIDGE

BRIDGE Energy Group is the leading consulting and systems integration company focused on improving utility operational performance. We combine business, operational technology (OT) and information technology (IT) domain expertise to deliver and optimize innovative grid operations solutions. Our clients are predominantly electric distribution utilities and much of our work is to help utilities develop long term infrastructure strategies that are responsive to fundamental business drivers and to implement responsive systems and solutions.

Our approach to our work in this industry is to be agnostic as to product or vendor solution and instead focus on the best possible set of technologies to meet the operational or business requirements of our clients. In our big picture view grid modernization is the means by which the electric distribution grid can be made more intelligent and adaptive that facilitates the achievement of public policy goals and increasing customer expectations.

Scope of Comments

In our comments we seek to briefly describe the drivers of a modern grid environment and how grid modernization represents the collection of enhanced grid capability and companion regulatory reform that is required to meet policy objectives and customer expectations. So often grid modernization is thought of as “smart grid”, a collection of advanced grid infrastructure such as advanced metering (AMI) or distribution automation sensors and systems. But we think of it as a broad subject that takes into account the operation of the grid with advanced technologies as well as the utility business model, new products and services and the regulatory process.

We see an emerging grid environment that is increasingly dynamic, multi-dimensional and interdependent as service to customers are provided not only by incumbent utilities and retail suppliers but a whole new constellation of market actors. Increasingly the system will need to accommodate two-way power flow and a much more dynamic “grid edge” environment.² Grid modernization is the solution set of enabling technologies and business processes that enable the grid to operate as an interdependent and enabling platform.

We have brief thoughts on how the NHPUC might approach the consideration of these issues to tightly connect the requirements of a modern grid to a suite of enabling technologies that will become the

² The propagation of distributed energy resources and customer energy management solutions requires dramatic changes to power infrastructure, market design, and utility business models. Greentech Media calls this market shift "the grid edge".

“must haves” for the distribution grid to not only respond to the emerging grid environment but also optimize its value for customers and society.

Drivers of the Modern Grid Environment

So much is occurring in the electric sector that impacts the operations of distribution utilities and raises the criticality of advanced grid capabilities. There is a convergence of new technologies, products and services and customer expectations that is causing utility commissions and utilities to examine the long range grid modernization capabilities as well as utility business model and regulatory frameworks. The New Hampshire Public Service Commission’s (NHPUC) investigation into grid modernization is an excellent example of the proactive and deliberate approach that has also been taken in recent years in California, Massachusetts and New York.

The emphasis that has been placed over the past two decades on end use energy efficiency has had a profound impact on electricity consumption. In 2013 \$6.9 billion was budgeted for energy efficiency programs – up from \$ 2.7 billion in 2007, reflecting an average annual growth rate of 18 percent. As spending on electric efficiency has risen dramatically over the past decade, it has exerted a profound impact on total electric consumption, with 126 million terawatt-hours (TWh) of electricity saved by 2012. Today, in 2015, efficiency standards have expanded dramatically, with Energy Star appliances now commonplace. Energy efficiency has become part of the culture. Today’s consumers look to purchase efficient appliances, light bulbs, and home energy devices, such as intelligent thermostats. As a result we see a considerable impact (downward) on the overall consumption of electricity.

Concurrently distributed generation largely in the form of small scale solar has greatly matured and proliferated on the distribution grid. It is a function of another driver of the modern grid, increasing customer sophistication as well as prevailing public policy.

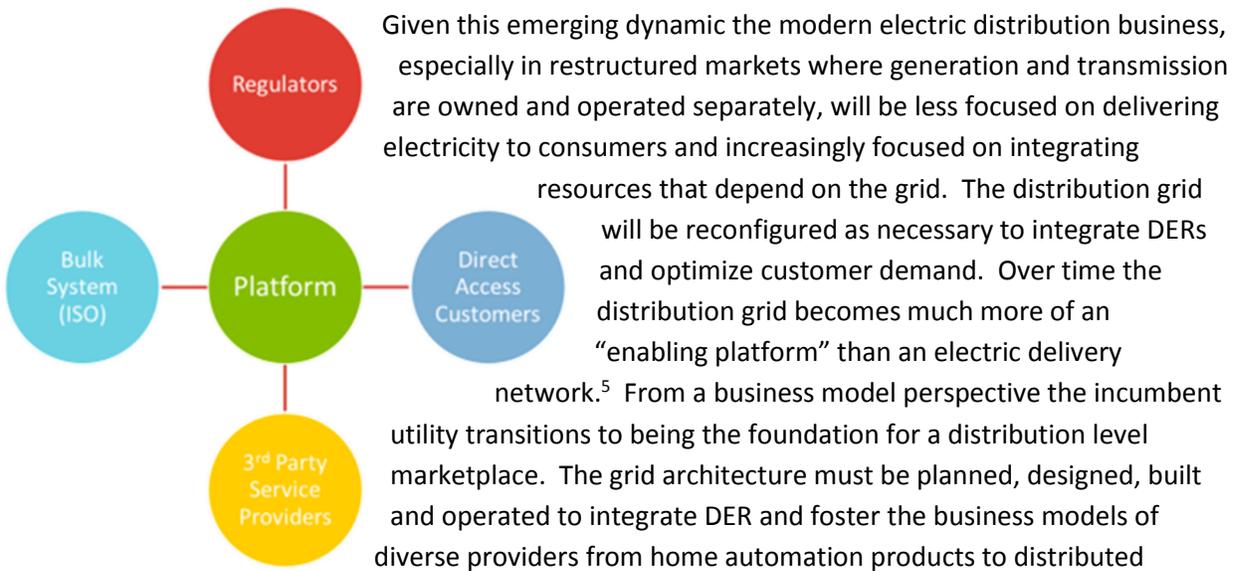
Rapidly advancing technology is considerable factor as a driver behind both the declining cost of solar as well as portfolio of smart grid infrastructure broadens and matures. The broad financial incentives for solar distribution and the effect of net energy metering have greatly bolstered production levels and fostered continued advancements in the output and cost of solar arrays. Advancing technology has also brought about the smart grid hardware and software. In essence the “smart grid” represents how the digital and IT evolution that has transformed global business is now increasingly available to plan, design and operate the electric grid.

Emerging Grid Environment

The macro drivers we identify are converging to reshape both the physical and financial aspects of the distribution utility business. As customers increase their levels of energy efficiency through both traditional and emerging home automation solutions, they are also meeting their electric demand with

onsite supply. These factors combined translate to less demand for traditional utility service causing a structural shift in utility revenues.

At the same time the continued addition of resources and customer actions at the edge of the system is changing the very topography of the distribution grid. The NH Energy Strategy has a stated objective to encourage the further development of small scale renewables. The distribution grid was originally designed to facilitate the flow of power from central station generators to ultimate customers, but the increasing presence of Distributed Energy Resources (DER) shifts the operating paradigm of the distribution grid towards two-way power flow.³ To support this more dynamic grid edge environment requires a much greater degree of system intelligence that can foster automated response and much greater visibility and control to the edge of the system by grid operators.⁴



generation and storage. The regulatory treatment in terms of ratemaking, rate design, capital recovery etc. all must be re-examined given the changing profile of incumbent utility requirements and shifting core revenues.

³ DER is a term that incorporates end-use energy efficiency, demand response, distributed generation such as rooftop solar, energy storage, and micro grids.

⁴ See also “The Integrated Grid”, Electric Power Research Institute, 2014.

⁵ See Grid Modernization Plan of Fitchburg Gas & Electric d/b/a Unitil in Massachusetts DPU 12-76. In their plan Unitil describes their long term view as an enabling platform and the grid capabilities that are vital to that environment.

Grid Modernization as Solution Set

The way to think about grid modernization is not the central topic perhaps but more as a pivotal means to an end. Our collective inertia of policy objectives, advancing technology and customer expectations presents a new set of requirements for utility operations. The enabling platform environment we envision represents a new business model for the utility as their focus shifts towards integrating resources and customers with the larger electric system instead of providing just electric service. Therefore the nature of how utilities recover costs through retail rates will have to transition along with the nature and sophistication of grid infrastructure.

Grid modernization should be considered broadly as not just the advanced hardware and software systems of a smarter grid but also utility business models, rate design and performance frameworks. We would encourage the NHPC to consider this examination in this way and include in the process the following:

- The composition of distribution fixed and operating costs and hence the direction and structure of rate design
- The varying products and services that can be offered in a platform environment and what should remain the responsibility of the incumbent regulated provider versus the private marketplace
- Develop a comprehensive profile of the foundational technologies and systems that can advance policy goals and foster the enabling platform environment.

An Approach – Line of Sight

The NHPUC process will be well served by starting from a high level framework that connects policy goals to grid functionality and then to enabling technology. This approach was used very effectively in the Platform Technology Working Group within the Reforming the Energy Vision (REV) process in New York. Also the State of Massachusetts developed a grid modernization taxonomy that captured the critical grid modernization capabilities and their impacts on objectives. Once a full inventory is taken of in force policy goals and objectives a line of sight mapping can be done to connect to grid functionality and enabling technologies.

By profiling grid modernization investment in this way a common profile and reference framework is established for regulators, utilities and stakeholders. Such alignment is crucial to foster common understanding of forward looking grid investment for all parties. This effort would help carry out the NH Energy Strategy objective regarding “anticipated future infrastructure needs”.



See DPU 12-76 Massachusetts Electric Grid Modernization Stakeholder Working Group Process: Report to the Department of Public Utilities from the Steering Committee dated July 2, 2013, Grid Modernization Taxonomy (pgs. 11-19)

In Track 1 of REV the Platform Technology Working Group put considerable effort into mapping policy objectives to enabling grid technologies. See the NYPSC Staff Track 1 Straw Proposal August 22, 2014, Pages 41-42, and Appendix A which was affirmed by the NYPSC Track 1 Order dated February 26, 2015.

The NHPUC would also benefit from reviewing the Distributed Resource Planning (DRP) process underway in California. The DRP process is focused on the enhanced system planning and grid modernization that is needed to support increasing integration of DER into the distribution grid.⁶

Regulatory Considerations

We also would emphasize the importance for the NHPUC to examine the business model and regulatory framework implications that are integral to a modern grid environment. The New York Public Service Commission (NYPSC) has done a commendable job of articulating these issues in their REV Track 1 Order. One very tangible solution area to examine is modern performance based ratemaking frameworks. The e21 Initiative in Minnesota and Xcel Energy have also soundly articulated the rationale for a shift to an outcomes based regulatory structure.⁷ We would suggest the MPUC also look at *Utility of the Future, Today* performance based framework developed within the Massachusetts Stakeholder Working Group Process that garnered overwhelming support from stakeholders.⁸

⁶ See “Assigned Commissioner’s Ruling on Guidance for Public Utilities Code Section 760 – Distribution Resource Planning, Michael Picker CPUC President, August 14, 2014.

⁷ “Request for Planning Meeting and Dialog Roadmap for Supporting the e21 Initiative, Christopher B. Clark, President Elect, Northern States Power, Dec. 22, 2014.

⁸ Massachusetts Electric Grid Modernization Stakeholder Working Group Process: Report to the Department of Public Utilities from the Steering Committee, (DPU 21-76), Final Report, July 2, 2013.