Rhode Island Division of Public Utilities and Carriers &
Office of Energy Resources

Power Sector Transformation

Notice of Inquiry into Distribution System Planning and Request for Stakeholder Comment

June 2, 2017

Following the Distribution System Planning Technical Session held on May 26, 2017, stakeholders are invited to submit comments in response to the discussion and additional questions provided in this document to inform the ongoing inquiry into distribution system planning. Comments should be submitted by **June 19, 2017**.

Introduction

Over the last decade, Rhode Island's power sector has begun to change. The signs of change include a greater number of electric customers who participate actively in energy production, the utility's increased capability to view and remotely control the electric system, the promise of new kinds of services to optimize the efficiency of the electric system, and the creation of topically focused performance incentive regulation. Together, these changes reflect a larger transformation of the power sector from a system organized around the flow of electricity from central station generators to end users toward a system with multi-directional power flow, greater flexibility, and higher system efficiency.

The Rhode Island Power Sector Transformation Initiative seeks to shape the ongoing transformation of the electric grid to achieve three policy objectives:[1]

- **Control the long-term costs of the electric system**
  The regulatory framework should promote a broad range of resources to increase the ratio of average to peak electric load, helping to right-size the electric system to Rhode Islanders' needs.

- **Give customers more energy choices**
  The regulatory framework should allow customers to use emerging technologies and commercial arrangements to manage their energy production and use.

- **Build a flexible grid to integrate more clean energy generation**

[1] Rhode Island's goals for the electric sector include providing adequate, efficient, and economical energy at just, reasonable, and nondiscriminatory rates. State policy has also adopted new environmental, societal, and economic goals. In Docket 4600, Investigation into the Changing Electric Distribution System, the PUC adopted, as guidance for regulating National Grid's electric business, a set of goals, which can be accessed at http://www.ripuc.org/eventsactions/docket/4600page.html.

The regulatory framework should promote the flexibility needed to allow the electric grid to incorporate an increasing proportion of variable clean energy through use of demand response and energy storage, for example.

Reasons to Inquire into Distribution System Planning

The electric utility is charged with the complex task of maintaining the safe and reliable operation of the electric distribution system. To achieve this objective, the utility performs *distribution system planning* ("DSP") – a set of activities to assess the grid's performance under changing future conditions and recommend solutions to proactively address identified needs. Because the utility uses DSP to inform investment decisions in the grid, the results of the planning process impact the costs we incur on our bills for delivery service and the value we receive from our electric grid.

Traditional utility infrastructure – substations, feeders, transformers, etc. – form the conventional set of solutions in the utility toolbox to address system requirements. In today's changing technology landscape, new resources and strategies – such as energy efficiency, renewable energy, storage, and even dynamic electric rates – offer the potential to substitute for conventional infrastructure solutions. In many instances, these solutions may be implemented by customers at their own place of residence or business, as opposed to being owned by the utility. For example, under Rhode Island's System Reliability Procurement planning process, pilots have tested the ability for geotargeted customer offerings of energy efficiency, demand response, and solar PV to defer the need for a substation feeder upgrade by providing load reductions coincident with periods of peak demand.[2]

In other words, not only are customers impacting the system in new – and potentially significant – ways, but they are also now able to become part of the solution set to address grid needs through their own investment choices. DSP, a process which identifies and characterizes areas of need on the grid, will adapt to the changing marketplace and become a valuable tool for guiding not only utility investment, but also customer and marketplace activity, which can provide value to the grid and the system.

What should be the key elements of DSP?

One important step to establish the future direction of DSP is to identify the necessary elements of DSP. The potential elements of DSP for a twenty-first century utility may include:

- *Forecasting*, where energy demands are projected on the system to determine future peak requirements.

- *Power flow analysis*, to test whether the existing system can accommodate forecasted demands and maintain voltages within established standards.

[2] http://www.ripuc.org/eventsactions/docket/4655page.html

- *Condition assessments*, to determine the health of system components and develop replacement strategies before failure.

- *Solution identification*, where options are selected to address identified needs – the solution could be an operational change by the utility operator (e.g., reconfiguring a feeder), a traditional utility infrastructure project (e.g., a new feeder), a "non-wires" alternative (e.g., customer investments in energy efficiency, renewables, or storage), or a combination of any of the above.

- *Hosting capacity analysis*, to determine the maximum amount of distributed energy resources (DER) that a substation feeder can support without additional upgrades.

The electric utility performs many, but not all, of these elements of DSP today. As technology improves and learning occurs over time, the electric utility will be able to improve features of each DSP element to better achieve the objective of supporting an optimized deployment of resources on the system that provide maximum net benefit to customers, the system, and society.

Questions for stakeholders on DSP elements

1) How important are each of the DSP elements described here to the future electric utility? Are there additional elements not described here that should be included as a strategic focus of the electric utility? What does success look like for each element?

2) Utility investment in grid modernization capabilities will provide increasing visibility into the system, allowing a more sophisticated and granular approach to DSP. What should the future state of planning look like as visibility improves? What should the transition look like between current DSP and the future state of DSP?

How should DSP offer transparency where appropriate to relevant utility, market, and policy actors?

As clean energy technologies become more widespread and affordable, growing numbers of consumers choose to invest in their own on-site energy reduction, management, production, or even storage. In doing so, these customers may impose incremental costs or help reduce costs on the electric grid. The nature of the impact varies based on technology type and location of the investment. For example, if enough customers implement energy efficiency projects on a given feeder, the cumulative impact could defer the projected need for a system capacity expansion project. A similar benefit could be achieved through customer adoption of rooftop solar, depending on the orientation of the systems and the type of capacity need. On the other hand, deployment of solar in a different location might require circuit upgrades if the existing distribution system cannot accommodate the new generation.

Access to data – system data and customer data – could help customers become resources towards meeting grid needs and maximizing the net benefits of customer investments in clean

energy technologies. For example, clean energy companies might be able to use information on the location and characteristics of grid needs to target offerings to customers located in beneficial areas. The ability to retrieve customer data – with the proper privacy and security protections in place – could allow clean energy companies to tailor offerings to customers or for customers themselves to take action on their energy use.

Questions for stakeholders on DSP transparency

1) Who are the users of system and customer data? What data do users need to guide investment decisions, support business models, or guide policy/program activities? What are the specific use cases for each dataset? What is the desired format of each dataset? What is the frequency with which datasets should be updated?

2) What are the key data access safety and security considerations? How should customer privacy be protected? How will the utility's requirement to protect the grid and maintain sensitive information be balanced with the need for more visibility?

What should the DSP process look like?

Currently, the electric utility performs DSP in house. Stakeholders may see certain outputs of DSP in PUC docket proceedings, namely the Infrastructure, Safety and Reliability dockets and the System Reliability Procurement dockets.[3] However, there is no regular docket proceeding or filing associated with DSP activities specifically.

Questions for stakeholders on DSP process

1) What DSP information – such as information associated with the DSP elements identified earlier in this document – should be made available to users, including the market, regulators, and policymakers?

2) How often should this information be made available and in what format? Should this information be compiled in a new DSP docket proceeding (or filing within an existing docket)? How should any new DSP filings be coordinated with ISR and SRP? How should they be coordinated with any other applicable filings?

3) Utility DSP must take into account both current and long term system impacts. Solutions require multiple years for design and implementation. How will the utility and stakeholders coordinate efforts to develop solutions, particularly those that are implemented by customers and not controlled by the utility, such that there is certainty of implementation before system operational issues arise? How will a "safety net" be implemented to ensure that the utility can implement solutions (traditional or NWA) if third party commitments fail, particularly when there are long lead times for implementation?

[3] http://www.ripuc.org/eventsactions/docket/4682page.html

Stakeholders are invited to submit their comments and any additional materials relevant to distribution system planning they may wish to provide. All comments will be made available to the public on the DPUC website. Please submit comments by **Monday, June 19th** by electronic mail to DPUC.powertransformation@dpuc.ri.gov.