

Highlights from the Report

The electric distribution system in the U.S. is in a state of transition as the grid is modernized and consumers have more control over their energy usage. Utilities are proposing – and regulators are having to evaluate – a new class of “next-generation technologies” that are not a one-for-one replacement for aging infrastructure. For the regulator, this can create challenges.

The report [*A System in Transition: The Influence of Next Generation Technologies*](#) presents findings and advice from peer-to-peer conversations between commissioners from across the country regarding advanced metering infrastructure, distribution controls, electric vehicles, and data access and governance

The report is not a “how-to” guide, but a resource offering specific examples of rulings and orders from commissions around the country, plus macrorends, themes, common challenges, and a regulatory wish list. It includes advice participants might give to fellow regulators and lessons they have learned about grid modernization.

Following are excerpts from the report.



Macrotrends

The electricity landscape, especially at the distribution level, is changing quickly as the cost of distributed energy resources decrease and adoption levels increase. This is driving change in electric grid architecture. Five trends that encapsulate the changes taking place emerged from the conversations with regulators. These are not specific to a given technology, but representative of grid modernization challenges across the board.

Those trends were **Foundational Investments Underpin the Transformation, Regulatory Proceedings Are Evolving Too, There's More Than One Way, Benefits are Not Siloed, and Equity Is at the Forefront**. Further examination of each can be found in the full report.

There's More Than One Way

Grid modernization is complicated by an issue of abundance: identified issues can have multiple solutions. Next-generation technologies provide more options for meeting system needs for both bulk and local systems, and some solutions may come from entities outside the utility. Non-wires alternatives that do not use traditional utility assets provide new tools to meet demand and infrastructure needs. Third-party provider solutions can take advantage of grid-edge assets, but can limit the utility's visibility and control of these resources. Utilities and regulators alike must evaluate and choose the solution that is most beneficial and most cost-effective, but also reasonable and prudent. This can require an understanding of the individual technologies, how they are integrated and implemented, and what alternatives exist.



Key Themes

Traditional investments in hardware and maintenance are being complemented by more nuanced and interdependent investments that are transforming grid operations and providing customers with more options to control their energy consumption. One theme was that **Technologies Are Raising More Complicated Questions**. Next-generation technologies are generating a plethora of new questions that commissions are asking and are being asked to answer, whether these are fundamentally new questions or more complicated versions of questions commissions have always considered. Other themes explored in the report include **Holistic Planning Provides a Better Understanding of Needs, Scenario Planning Can Help Balance Risks and Benefits, Implementation Can Be Lengthy**, and **Regulatory Practices May Need Updating**.



Common Challenges

Many state commissions and utilities are grappling with an age-old challenge of whether it is preferable to be an early mover to wait until technologies mature. During the conversations with regulators, nine common challenges emerged, including **Understanding the Technological Nuances, Making Space for Innovation, Determining Boundaries, and Difficulty Navigating Opposing Positions**. Find the others in *A System in Transition: The Influence of Next Generation Technologies*.

Regulatory Wish List

Regulators all agreed that more information is imperative. Wherever it comes from, knowledge, expertise, and new perspectives are always welcome. Some items they wish they could have to make their jobs easier include:

- Actionable information to evaluate utility investment value and feasibility, as well as cost recovery during these changing times.
- Support for processes on standards development.
- More support orchestrating transparent, open distribution planning practices and processes.
- Frameworks for developing policies that encourage innovation and growth for new utility programs or services and for market innovation and growth.

Implementation Can Be Lengthy

Regulators in most states highlighted that both regulatory approval and implementation can extend over very long time horizons. Grid modernization proceedings that address the planning and the pacing of new investments in the distribution system have taken much longer than originally anticipated in many cases. While these proceedings and the conversations surrounding them often result in a more robust and thorough planning process, including specific directives or guidance, they can also be lengthy, sometimes taking multiple years.

Making Space for Innovation

As DERs proliferate across the system, an important question for regulators is whether some investment risks are better borne by the market and developers rather than the utility and its rate base. As noted by many participants, the traditional utility business model rewards capital investment, but does not necessarily incentivize innovation or entrepreneurial initiatives.



Technology Specific Findings

Many of the observations and learnings from commissions apply broadly to the vast suite of next-generation technologies, but other were specific to a particular technology or data topic discussed during the effort. Each is explored in its own chapter, which includes Insights and Advice, Powering Knowledge, Commission Happenings, and Battery of Resources.



Insights and Advice

For each technology, information shared by participants about what they wish they had known, advice they might give to fellow regulators, lessons they have learned along the way, or suggested actions that could assist regulators evaluating future utility proposals are presented.

The following example is from the AMI chapter.

Insights

- **Benefits create a conundrum.** AMI can enable benefits for other programs. Indirect benefits that are realized because of the foundational investment in AMI might not show up in an initial proposal. For example, benefits can show up in other dockets, such as grid modernization, storm restoration, and energy efficiency.
- **Commissions are interested in how other jurisdictions use technology and data.** Having more knowledge about how AMI and its data can be used to achieve value or being aware of value streams other utilities are realizing can help commissions evaluate proposals or provide guidance.

Advice

- **Cost-benefit analysis presumes a level of precision that does not exist.** A CBA evaluates whether AMI is worthwhile today but does not address whether the technology will be worthwhile in 10 years. It also cannot provide insights into whether a utility's plan for AMI represents the best value or the best designed system.
- **Limiting data access may not be in the best interest of customers.** When AMI was initially deployed, one commission found that not allowing access to data in response to consumer privacy concerns limited customers' choices for energy efficiency programs.



Insights from DOE's An EV Future: Navigating the Transition Report

The EV Future initiative engaged stakeholders to explore and discuss what the transition to electric vehicles will mean from

DataGuard

DataGuard is a data access and privacy framework for customer energy use data that was developed through an open, consensus stakeholder process led by DOE. The key tenets of the program are:

Distribution System Planning

Distribution system planning is an approach to assess needed physical and operational changes to the local grid in order to maintain safe, reliable, and affordable service. Traditional distribution system planning takes place inside the utility; however, the focus is shifting to having a more public, collaborative planning process whereby stakeholders can provide input and review projections, assumptions, and analysis results in a more structured way. This includes formalizing processes across utilities inside a given state, common reporting requirements, planning horizons, and organization of the plan itself.

Specific requirements, mandates, or state goals around reliability and resilience, grid modernization, greenhouse gas emissions, and/or renewable energy targets set the context for distribution system planning and grid investments. Utility business objectives within the larger regulatory and prudence framework also play an important role in investment decisions.



Massachusetts Grid Modernization Proceeding

The Massachusetts Department of Public Utilities. As stated, “The Department’s industry towards a more sustainable regulatory business objectives.”²⁶ As part of this grid utility filings were to “submit a grid modern progress towards” Massachusetts’ grid modernization goals.

- Evouroute spend \$20 million to improve (SIO million for the first two years)
- National Grid spend \$48 million for modeling, ADMS build and application development

Kentucky Commission Directs Utility to Investigate Alternative Solutions

In a recent proceeding before the Kentucky Energy Metering Compensation, as part of system in order to mitigate the impacts took issue with LG&E/KU’s explanation of additional, alternate solutions. Due to the apparent lack of familiarity with advanced investigation beyond investing in technology that LG&E/KU have identified a substantial more incremental and likely cost-effective

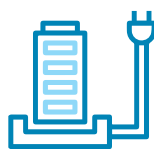
To read the full order, visit: <https://psc.ky.gov/pdfs/20180606.pdf>

New York Order Adopting DISIP Guidance

The April 2016 Order, Adopted Distribution System Implementation Plan (DISIP) Guidance, identified the need for an improved planning process that is more collaborative and grounded in the use and availability of information to improve system efficiency and quality. The utility DISIP filings “require utilities to describe and analyze certain specified processes and data related to distribution system planning and distribution grid operations that account for distributed energy resources (DERs). The utility DISIP filings will also address common grid architecture approaches and interfaces that will be necessary, current and planned, advanced metering initiatives, and gathering and sharing of customer data to support robust and liquid retail markets.” (p.3)

Read the full order: [https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?docRefId=\[B0C7035C-B447-469A-895F-20BF3BD6B00F\]](https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?docRefId=[B0C7035C-B447-469A-895F-20BF3BD6B00F])

Access the utility DISIP plans: <https://joinutilitiesofny.org/utility-specific/pages/system-data/dsisps>



BATTERY OF RESOURCES

The image displays a horizontal row of five report covers. From left to right: 1. 'The Road to Transportation Decarbonization: Understanding Gas Impacts of Electric Fleets' by the U.S. Environmental Protection Agency, featuring a white van at a charging station. 2. 'A Regulatory Roadmap for Vehicle-Grid Integration' by the American Council on Energy-Efficient Buildings, with a blue and green geometric design. 3. 'The Road to Fleet Electrification' by the Center for Sustainable Systems, showing two white semi-trucks. 4. 'AMI in Review' by the American Water Works Association, depicting a city skyline at sunset with a bridge. 5. 'Electric Vehicle Roadmap' by the Electric Vehicle Association, showing a close-up of a car's charging port.

To read the full report, download [A System in Transition: The Influence of Next Generation Technologies](#)