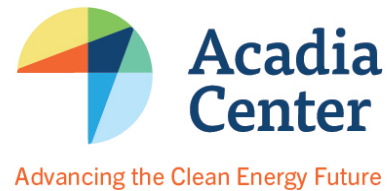


Grid Modernization and Utility Reform Policy Options

A Menu for the Northeast

July 2018



Introduction

Clean energy technologies offer a historic opportunity to build an energy future that produces large benefits: modernization of our energy systems, better options for all consumers to control energy costs, advanced economic growth, and dramatically reduced climate pollution. Numerous studies show that by leading on clean energy innovation, states can save residents and businesses money, keep more energy dollars in the region, grow the workforce, and secure a healthier future. In taking a comprehensive look at where states' efforts to expand clean energy resources can lead, Acadia Center's [EnergyVision 2030](#) shows that expanding adoption of modern, market-ready technologies can reduce climate pollution by 45% by 2030, a target needed to put the region on the path to meet emissions reductions of 80% by 2050. This is a commitment most of the Northeast states have made in some form. By acting now to reform outdated rules and financial incentives that still encourage investments in old and expensive energy choices, the regional can benefit all residents and achieve its climate commitments.

The rules and regulations that drive decision-making about our energy grid are out of sync with technological advances and consumer expectations for a clean, reliable energy system. Clean, local energy resources like energy efficiency, distributed renewable generation, and energy storage are tools that can solve grid problems instead of relying only on building expensive infrastructure projects. Sophisticated metering technology can support innovations in how consumers pay and are paid for electricity, rewarding them for optimizing their energy generation and consumption. Updated rules, planning processes, and financial incentives can enable the adoption of technologies critical to meet 2030 and longer-term emissions reductions targets. Acadia Center's [UtilityVision](#) (2015) confronts several categories of reforms needed to advance a consumer and environmentally-friendly energy grid. These reforms make up a comprehensive regulatory framework that integrates how parts of the new energy system can work to put the consumer at the center of the modern grid. Below are new proposals and recommendations to advance changes in each category.

1. Empowering Modern Energy Consumers and Communities

Consumer interests include a broad range of energy-related issues, from the bedrock consumer concern of affordability to newer considerations like improved energy control, sustainable energy, clear and accessible energy information, and the opportunity for consumers and communities to generate their own local energy and be compensated for it. Acadia Center's [UtilityVision](#) and [Community|EnergyVision](#) describe a major shift in consumers' role in the energy system, but consumers and communities must be guaranteed a future energy system that works to their benefit. Below are several recommendations to ensure that the modern energy system is safe and empowering for all consumers. Consumer input and concerns are also integrated into Acadia Center's recommendations on grid planning, reforms to the utility business model, and rate design. A full set of recommendations for clean energy action at the local level is available in Acadia Center's [Community|EnergyVision Action Guide](#).

Consumer Protection Measures

- Provide reasonable low-income discount rates and holistic protections from short-term special cost recovery measures for low-income customers.
- Establish arrearage management programs.
- Maintain disconnection protections, including seasonal, temperature-based, and vulnerable household protections. Requirements for personal contact with a household member before disconnection for nonpayment are critical to ensure health and safety. Consumers should be provided with reasonable payment agreements as an alternative to disconnection for nonpayment.
- Make it easier for low income residents to qualify for low income energy efficiency programs by utilizing a broader set of qualifying documents.
- Prohibit pre-paid utility service.
- Promote safer interactions with the market with standards for third-parties who interact directly with consumers.

Enabling Community Participation in the New Grid

- Keep state building codes up-to-date with the most efficient building energy code standards and give municipalities the authority to adopt stretch codes, including standardized EV-readiness, and solar-readiness provisions.
- Authorize Community Choice Aggregation.
- Clarify and/or establish regulations and processes for developing community microgrids and municipal utilities.
- Require utilities to sell streetlights to interested municipalities and establish reasonable requirements around the sale and purchase of streetlights.
- Ensure that streetlight tariffs include and adequately reflect savings from energy efficient options like LEDs, time controls, and dimming and encourage municipalities to take advantage of the non-energy benefits of LED streetlights, such as safety, parking management, and internet access.
- Authorize municipalities to establish Clean Energy Districts or regional planning commissions that will allow greater planning and financial incentivization of clean energy and energy efficiency.

2. Strategic Planning for a Consumer-Focused Power Grid

Traditionally, utilities and regional grid planners focused on maintaining the power grid for one-way flow of power from fossil-fuel generators over miles of lines to homes and businesses. To support growing energy demand in certain locations and maintain reliable service, utilities used infrastructure tools like new circuits, new substations, power lines, and larger conductors. Increasingly, states are seeking to shift the strategic focus of the electric utility to optimizing the electric grid—rather than the historical focus of building up the grid with conventional infrastructure. Cleaner and more cost-effective customer-side tools like energy efficiency, active load control, distributed generation, and demand response can be used instead of—or in combination with—traditional infrastructure projects for reliability. The reform recommendations below advance a new focus on improving overall system efficiency; reducing the need for redundancy while increasing system reliability and affordability; deferring or eliminating the need for long-lived infrastructure investments; and recognizing and incorporating the value of all available resources. Although this is a complex transition, there are reforms that

can be made in the short- and medium-term, as well as longer-term alternatives that restructure the role of the utility.

General Reform Concepts

- Implement integrated distribution system planning that includes a wide range of new technologies and customer-side resources and uses distributed energy resources (DER) proactively to avoid future grid issues;
- Design and invest in the grid to move towards an open, and flexible system that enables seamless DER integration; and
- Establish a comprehensive cost-benefit framework and stakeholder processes for decision-making that reflects the broad public interest.

Short- to Medium-Term Proposals

- Create a process for stakeholders to have fair and meaningful engagement in key decision-making processes of utilities, especially those regarding the use of distributed energy resources in addressing system needs.
- Use a collaborative stakeholder process to develop criteria and protocols for identifying whether local distributed energy resources can be used to defer or substitute for traditional infrastructure projects and require adoption of this criteria and protocol by utilities.
- Establish a Grid Modernization Consumer Board to provide stakeholder input on ongoing basis.
- Integrate resources such as demand response, active load management, and energy storage—both consumer-sited and utility-sited—into utility planning processes.
- Ensure that utility forecasting practices and methodologies accurately reflect current and anticipated investments in energy efficiency and other distributed energy resources.
- Set expectations for utilities to develop the capabilities to gather and provide valuable data on hosting capacity, forecasting, and the impacts of distributed energy resources on the grid by requiring, for instance, smarter circuit monitors and foundational investments like advanced metering infrastructure (AMI), if the costs are justified by benefits.
- Establish a process to enhance transparency and visibility into utility planning processes and utility capabilities, such as: investment plans, current and proposed projects, forecasting outcomes and methodologies, system needs analyses and decision-making processes, and benefit-cost analyses' results and assumptions.
- Examine smart inverters as a requirement for distributed solar PV systems to improve grid management and to allow solar systems to operate under a greater range of grid conditions.
- Require the provision of high-quality, publicly available maps that are updated regularly and include information on the grid's hosting capacity—the amount of distributed energy resources that can be accommodated without adversely impacting power quality or reliability, and areas of constraint where adding distributed resources would particularly benefit the grid.
- Standardize interconnection processes for distributed generation and establish a Grid Connection Guarantee.
- Mandate evaluation of cost-effective DER by utility and regulator prior to approving transmission and distribution (T&D) investments in existing procedures.

Long-Term Alternative Visions

- Distribution Resource Planning (DRP) adopted in California:
 - Utilities lead the charge to integrating DER through planning and investment.
 - Create and employ uniform methodology to identify the full value of DERs including locational value (imposes benefit-cost analysis in planning process).
 - Planning reforms that require utilities to identify scenarios for DER growth, with details of impacts on distribution planning and expected siting at substation level.
 - Demonstration Projects and Implementation of DRP.
- Market-Based Reforms envisioned in New York:
 - Transition the utility to the role of market coordinator—an entity that facilitates market interactions between customers, communities, and third-parties to manage a reliable and resilient energy grid.
 - Establish data-sharing standards (such as NY's 15x15 rule) to protect privacy while providing customers and third-parties with access to data that allows them to participate in the market more effectively.

3. Updating the Utility Business Model

The primary way for regulated utilities to earn income is by making capital investments on which the utility earns a specified rate of return that is set by regulators. This system gives utilities incentives to build or upgrade traditional infrastructure, which is increasingly at odds with new technologies that can optimize the energy system and increase energy efficiency and consumer adoption of clean energy technologies. The regulatory model needs to evolve to provide utilities with the appropriate financial incentives to be full partners in achieving states' consumer and environmental goals. Instead of earning income primarily from building more infrastructure, utilities should be rewarded for achieving energy efficiency and clean energy goals, minimizing the cost of the grid, and providing choices, opportunities, and control to customers.

General reform concepts

An updated utility business model should seek to level the playing field for non-capital strategies (both utility-owned and third-party investment), incentivize the utility to engage in activities that would otherwise threaten its bottom line, and give regulators new tools to save money for ratepayers. Generally, this will require long-term strategic utility planning linked to new performance incentive mechanisms and should consider several elements:

- Implement decoupling to reduce the utility's financial disincentive to invest in energy efficiency and distributed generation.
- Set revenue targets using multi-year, strategic plans for modernizing the grid.
- Shift emphasis of utility shareholder returns away from return on equity for capital investments and towards performance incentive mechanisms designed around the achievement of consumer benefits and policy goals.

Adopting a New Utility Business Model

Given the scale of change under consideration, a gradual transition to a new regulatory model is warranted. A gradual process of adopting performance incentive mechanisms could include the following steps that should be guided and monitored by utility regulators:

- Identify the relevant areas of utility performance;
- Develop metrics for tracking and reporting;
- Set performance targets; and
- Add financial rewards and penalties.

Regulators could consider applying a revenue cap to either all utility revenue or a specific subset of expenditures, as well as increasing the scale and scope of earnings regulated under the new model over time and in proportion to the amount of rewards the utility may earn in performance incentives.

4. Sustainable Rate Design and DER Compensation

Acadia Center's UtilityVision outlines comprehensive long-term rate reforms to align the way consumers pay for delivered power and how they get credited for power, attributes, and services provided to the grid. These reforms would improve incentives for energy efficiency and distributed generation, preserve equitable access to clean energy, maintain protection of low income ratepayers, and reflect equitable recovery of costs for use of the distribution grid. Implementation of these long-term reforms will require advanced metering, energy management technology that is affordable for small customers, and significant customer education. In the short term, Acadia Center recommends 5 actions for sustainable rate design. For the medium and long term, it recommends policies that align rates with real costs, and compensation for DER with real benefits.

High Level Principles

Acadia Center's principles for reform begin with general long-standing principles for rate design from the canonical 1961 book by James Bonbright, *Principles of Public Utility Rates*, which can be summarized as:

- Simplicity, understandability, and feasibility;
- Effectiveness at yielding revenue requirements, revenue stability, and rate stability;
- Fairness in apportionment of costs and avoidance of undue discrimination; and
- Efficiency in discouraging wasteful use.

In addition, Acadia Center proposes four modern rate design principles that are more specific to provide clear guidance to Commissions and other policymakers:

- Monthly customer charges should be no higher than the cost of connecting a customer to the grid and related customer service;
- Other components of electricity rates can be reformed to align customer incentives with cost drivers and the value customers can provide to the electric system;
- Self-generation consumed directly on-site should be treated the same as reductions in usage; and
- Ratepayers must be able to understand significant reforms to their rates and have a basis on which to respond and manage bills.

Collectively, these principles provide a robust framework for evaluating new proposals and ideas, but public policy goals such as equitable access to clean energy options, such as community solar, must also be kept in mind.

Short-Term Proposals

In the short term, changes to rate design and DER compensation should be gradual and must primarily use the existing metering infrastructure. Acadia Center recommends a five-point plan¹ to improve the cost causation basis of rates, fairly share the costs of the distribution system across all customers, and enable mechanisms to equitably share the benefits of solar incentive programs.

- Limit reliance on fixed monthly customer charges. Cap customer charges at the cost of connecting customers to the distribution system, including metering, billing, service drop, and elements of customer service.
- Implement Acadia Center's Distribution Reliability Charge policy to begin to account for distribution system costs that cannot be avoided by distributed energy resources.
- Offer easy-to-understand opt-in time-of-use rates in the immediate near-term, which should be aligned with cost causation and sufficiently differentiated to drive customer action.
- Enable or maintain virtual net metering for community and municipal distributed generation, with a robust low-income component.
- Begin to align net metering credits with ratepayer value and remove any caps on net metering.

No state in the region has all five of these reforms in place, but nearly every component has been implemented in at least one state. In many cases, these reforms do not require additional legislation and can be implemented by each state's public utility commission. However, issues related to net metering (the removal of any caps, authorization of community distributed generation, and new net metering credit structures) typically do require legislation.

Long-Term Vision and Medium-Term Concepts

In the long term, customers should be charged for the products and services they receive and credited for the products and services they provide on a granular basis. Charges should reflect equitable recovery of costs for use of the distribution grid. Credits for exports and other services should reflect the net value, including both benefits and costs to the system. This vision includes time-varying charges and credits for energy supply, transmission, and distribution. There could be charges and credits for new retail-level markets and products, and additional values related to the environment and public health could be reflected as well. All charges and credits, except those that reflect any environmental or public health values, should be on a technology-neutral basis. It may also include well-designed demand charges that are focused around local or system peaks. For customers with distributed generation or storage, netting of energy imports and exports would occur on a granular basis, instead of the current practice of monthly netting for many types of customers. This long-term vision will require advanced metering functionalities, billing system upgrades, energy management technologies that are affordable for small customers, significant customer education efforts, and processes to fairly determine the charges and credits for distinct types of products and services.

¹ <https://acadiacenter.org/document/sustainable-rate-design-near-term-consumer-friendly-reforms-for-a-clean-energy-future/>

However, medium-term steps will be necessary to bridge between the short and long term. These medium-term steps will become clearer over time, but could include:

- Default time-of-use rates for certain categories of customers, including time-of-use netting for distributed generation customers;
- Charging for embedded distribution system costs and public policy costs for imports and crediting for value to the distribution system for exports;
- Incremental avoided environmental and public health compliance costs can be credited for exports on a technology-specific basis; and
- Charges and credits corresponding to other portions of the electric system (energy, capacity, and transmission) can be symmetric for imports and exports.

These reforms would logically link short-term steps with Acadia Center's long-term vision. Default time-of-use rates and time-of-use netting is a significant step beyond current practices, particularly for DG customers for whom monthly netting is currently the norm. These medium-term reforms would require substantial processes to unbundle distribution values and determine other appropriate credits and charges by time-of-use period and by technology as appropriate.

Conclusion

Creating a customer-centric electricity grid of the future will require wide-ranging reforms to (1) protect consumers and give them more opportunities to participate in clean energy, (2) improve planning and stakeholder processes, (3) change the business model and incentives of electric utilities, and (4) provide more granular price signals to ratepayers for both consumption and generation. Acadia Center's UtilityVision lays out a high-level framework for reforms, and this menu of options provides the next level of detail on policies to pursue throughout the Northeast.

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