



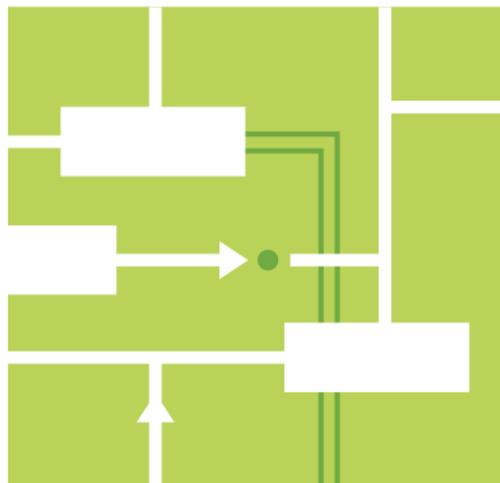
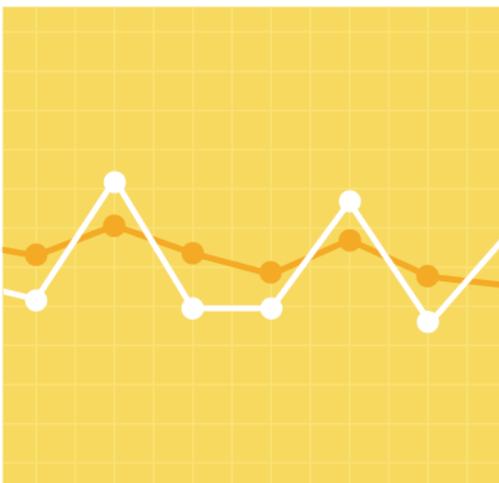
**Consumer Liaison Group
Coordinating Committee**

2015 Report of the Consumer Liaison Group

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**Joint Report of the Consumer Liaison Group Coordinating Committee
and ISO New England**

MARCH 8, 2016



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Section 1

Statement from the Consumer Liaison Group Coordinating Committee

Dear Reader,

Welcome to the *2015 Report of the Consumer Liaison Group* (CLG) prepared jointly by the Consumer Liaison Group Coordinating Committee (CLGCC) and ISO New England (ISO). This is the seventh annual CLG report, the first having been published in 2010 summarizing 2009 activities, the year the CLG was established.

The CLG was formed to meet the need, as cited in the Federal Energy Regulatory Commission's (FERC) Order No. 719, for heightened communication between Regional Transmission Organizations (RTOs) and their stakeholders, with a particular focus on electricity consumers, consumer advocates, and state government regulators. Like other RTOs across the country, ISO New England is responsible for the reliable operation of the region's bulk power system, administration of the region's wholesale electricity markets, and regional power system planning.

The CLG bylaws, formulated by stakeholders and the ISO, require the organization to be governed by a Coordinating Committee of up to 12 members. These members represent various stakeholder groups, with no more than four members coming from any one New England state. In 2015, the CLGCC welcomed Rebecca Tepper as the new Chair of the Coordinating Committee and replaced a member who resigned from Vermont. In 2016, the CLGCC looks forward to holding a Coordinating Committee election for the next two-year term.

ISO New England's information flow to the CLG has been instrumental in fulfilling the mandate to afford stakeholders a greater understanding of the ISO's activities and decision-making processes and the potential cost impacts of its decisions and initiatives on end users. The CLG and the ISO have worked collaboratively to identify issues of importance to end-use consumers and have provided information at the quarterly CLG meetings that include a range of cost implications for certain regional initiatives.

Because New England's wholesale electricity markets are continually evolving, the CLG also serves as a forum for consumers to provide input and information to the ISO and to each other regarding what is working well and what may need to be changed. Looking to the future, members of the CLGCC recognize that the CLG's full mandate cannot be fulfilled without greater participation from consumer members on the issues that concern them, including potential changes to the power system and the wholesale markets that might allow them to participate more profitably, purchase less expensively, and operate more efficiently.

For 2016, the CLG has the following goals:

1. To attract more commercial and nonprofit end users to actively participate in the organization
2. To attract greater attendance from each New England state

3. To heighten efforts to provide the ISO with a greater understanding of consumer issues, needs, and concerns relative to the electric power system and its costs by further developing the flow of information and advocacy from consumers and other stakeholders to ISO New England

We invite you to take an interest in the Consumer Liaison Group and to play a role in achieving these goals, which can lead to a better electricity industry in New England and an improved price structure for consumers. You are invited to review our webpage, part of the ISO New England website, including prior annual reports.

Please feel free to contact any one of us for more information.

Sincerely,

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Section 2

Purpose and Structure of the Consumer Liaison Group

The Consumer Liaison Group is a forum for sharing information between ISO New England and those who ultimately use and pay for electricity in New England. Through this forum, the ISO develops a better understanding of consumer issues, needs, and concerns relative to the electric power system and its costs. Similarly, consumers and their representatives gain a better understanding of regional electricity issues.

2.1 Objectives

The objectives of the CLG are as follows:

- Be generally informed of the operation of the power system and industry issues, which includes having access to ISO subject matter experts
- Be made aware of market changes, in advance of final consideration by the ISO when feasible, which can have an impact on consumers
- Work with the ISO to ensure that it provides timely quantitative and qualitative information on the cost impacts of important initiatives
- Have the ISO assist consumers in identifying the issues that can affect them economically
- Be informed of and participate in the stakeholder process that determines wholesale power market rules and power system needs
- Be informed of the results of any economic analysis conducted and presented to stakeholders in the regional stakeholder process
- Provide the ISO with a greater understanding of the specific issues of interest to consumers

2.2 Participation and Meeting Format

The Consumer Liaison Group is open to the public. Participants generally include consumers and consumer representatives (including state consumer and ratepayer advocates), state business and industry associations, chambers of commerce, individual businesses, trade groups, nonprofit organizations, and other end users. Because the CLG is an open forum, several New England Power Pool (NEPOOL) members and state regulators are also regular, active participants in CLG discussions.¹

The CLG meets quarterly and attracts a diverse group of approximately 75 attendees at each meeting, both in person and via teleconference. CLG meetings follow the same format:

- Opening remarks from a special guest speaker—typically, an industry or business executive, policymaker, or regulator—who provides a unique perspective on a particular topic or issue
- A panel discussion facilitated by a moderator who guides the discussion, often representing industry, the ISO, regulators, and consumer perspectives

¹ NEPOOL is a group formed in 1971 by the region's private and municipal utilities to foster cooperation and coordination among the utilities in the six-state region for ensuring a dependable supply of electricity. Today, NEPOOL members are ISO stakeholders and market participants. More information is available at www.nepool.com.

- A representative from the ISO, who provides an update on initiatives that have or will be taking place at NEPOOL and ISO stakeholder meetings and can have an impact on electricity prices, as well as other updates on ISO and regional energy issues

2.3 Governance

The Consumer Liaison Group Coordinating Committee is the governing body that works closely with the ISO to identify issues of importance to the CLG membership, sets the agenda for CLG meetings, and generally guides the work of the CLG.²

The CLGCC can consist of up to 12 members (six members and six alternates) with no more than four members from any one of the New England states. Specific membership requirements ensure that all consumers, including residential, commercial and industrial consumers, are represented from a majority of the New England states and that a range of consumer interests is considered when determining CLG priorities. The committee has at least one representative of residential ratepayers and one representative of commercial and industrial ratepayers, and members must be either a ratepayer (or directly represent ratepayers), a member of a consumer organization, or a government consumer or ratepayer advocate.

CLGCC members are selected by vote of the CLG at one of its quarterly meetings in an even-numbered calendar year and serve for a term of two years or until successors are selected. The Coordinating Committee annually designates a chairperson from its membership. Should a vacancy occur on the committee, the chairperson fills the vacancy with the approval of a majority of the remaining members. Current CLG Coordinating Committee members are listed on page 8. The ISO designates a point-of-contact within its External Affairs Department to work with the CLGCC.

2.4 Information and Communications

ISO New England facilitates the meetings and communications among CLG participants. A dedicated section of the ISO's website has been established for all CLG materials, communications, annual reports, newsletters, and other valuable information.³ This practice ensures that the body of information developed through the CLG is transparent, easily accessible, and available to all interested consumers and industry participants.

A glossary defining electricity market and power system terms is available on the ISO's website to assist CLG members in understanding frequently used electricity market or power system terms and acronyms.⁴

Additionally, in 2012, the ISO implemented *ISO to Go*, a free mobile application that provides smartphone access to the most frequently viewed real-time data on the ISO website and data portal

² Governance of the Consumer Liaison Group is fully explained in the "CLG Purpose and Structure" document available at http://www.iso-ne.com/static-assets/documents/committees/comm_wkgrps/othr/clg/consum_lias_grp_gov/clg_structure_document_revised_12_29_09.pdf.

³ ISO New England's Consumer Liaison Group webpage is available at <http://www.iso-ne.com/committees/industry-collaborations/consumer-liaison>.

⁴ ISO New England's glossary of terms is available at <http://www.iso-ne.com/participate/support/glossary-acronyms>.

ISO Express.⁵ Through the “app,” users can view current system conditions; the five-minute load graph, which compares forecasted demand and real-time consumer demand; the fuel mix by resource type currently providing electricity; and an array of real-time wholesale price data.

CLG participants are also encouraged to follow the ISO’s news blog—ISO Newswire—and subscribe to the mailing list to receive monthly email highlighting some of the most recent articles.⁶

⁵ *ISO to Go* is available at <http://www.iso-ne.com/about/news-media/iso-to-go>. *ISO to Go* is available for free for the iPhone or iPad at the Apple App store or for Android devices at Google Play. ISO Express is available at <http://www.iso-ne.com/isoexpress/>.

⁶ The ISO Newswire is available at <http://isonewswire.com/>. To subscribe, send a blank email to isolist-isonewswire-subscribe@mail.iso-ne.com.

Section 3

Consumer Liaison Group Meeting Summaries for 2015

In 2015, the Consumer Liaison Group held four quarterly meetings on issues of importance to electricity consumers in New England. The topics, special guest speakers, moderators, and panelists featured at these meetings were selected by the CLG Coordinating Committee.

The topics chosen for discussion in 2015 were as timely as they were diverse, including issues relating to grid modernization, distributed generation (DG), state policymaking, renewable energy, and transmission planning.⁷ A major area of focus was the growth of renewable resources and their impact on the electric power grid, as well as consumers. At the first quarterly meeting, attendees heard from state representatives in Vermont on the significant renewable energy and carbon-reduction goals in place in the Green Mountain State. In June, representatives from all six New England states discussed recent energy policymaking and legislation passed during the 2015 legislative session, some of which was geared toward encouraging additional renewable energy development. Later in the year, the ISO discussed the challenges and opportunities associated with the development of large quantities of renewable resources in New England. The ISO explained that the current markets are equipped to respond appropriately to the entry of these resources and that the entry of these resources will likely affect wholesale electricity prices and the future resource mix in New England.

At the end of the year, the CLG addressed a topic that was new to many—transmission planning in New England and the shift to a competitive framework under Federal Energy Regulatory Commission (FERC) Order No. 1000. Order No. 1000 changes the way electric transmission is planned and paid for in the United States. Attendees heard from the ISO, the New England States Committee on Electricity (NESCOE), and transmission providers on what questions lie ahead for the implementation of Order No. 1000 in New England.

The four CLG meetings held in 2015 featured the following topics:

- **March 13:** New England and Vermont’s Energy Marketplace—Grid Modernization, Supply Diversification, Pricing
 - Meeting location: Stowe, Vermont
- **June 18:** After the Midterm Elections: New Energy Policymaking and Legislation in the New England States
 - Meeting location: Westborough, Massachusetts
- **October 9:** Integration of Renewable Resources into the Electric System—Opportunities and Challenges
 - Meeting location: Portsmouth, New Hampshire
- **December 3:** Transmission Planning in New England: The Shift to a Competitive Framework and Impact on Ratepayers
 - Meeting location: Boston, Massachusetts

Time is reserved during each meeting for questions and answers with the audience.

⁷ DG resources are on-site, “behind-the-meter” sources of electric energy.

The following summaries capture the general discussions taking place at CLG meetings in 2015. They are not intended to capture every discussion and do not necessarily reflect the views of the ISO or the CLG Coordinating Committee.

3.1 March 13: New England and Vermont’s Energy Marketplace—Grid Modernization, Supply Diversification, Pricing

Meeting objective: Discuss recent developments in Vermont and New England’s energy marketplace, including ways to reduce the cost of electricity in the state.

3.1.1 Special Guest Speaker: Christopher Recchia, Commissioner, Vermont Department of Public Service

Commissioner Chris Recchia provided opening remarks, touching on Vermont’s many objectives in the energy sector. He noted that 45% of Vermont’s electricity is generated by renewable resources and that the state plans to obtain 90% of its energy from renewable resources across all sectors by 2050. He also touched on Vermont’s carbon-reduction goals, which seek a 50% reduction in greenhouse gas (GHG) emissions from 1990 levels by 2028 and a 75% reduction in GHG emissions from 1990 levels by 2050 “if practicable using reasonable efforts.” Commissioner Recchia stated that Vermont will continue to work cooperatively with the other New England states on energy infrastructure, as the state may be host to one or more electric transmission projects bringing renewable energy and large-scale hydropower from northern New England and Eastern Canada to New England load centers.

3.1.2 Panel Discussion

Meredith Angwin, Director of the Energy Education Project for Ethan Allen Institute, moderated a panel of energy industry representatives, including TJ Poor, Energy Programs Manager for the Vermont Department of Public Service; Douglas Smith, Director of Power Supply for Green Mountain Power; John Goodrich, Vice President of Manufacturing, Power Operations, for Weidmann Electrical Technology, Inc.; and William Driscoll, Vice President of Associated Industries of Vermont.

TJ Poor discussed proposed legislation in Vermont (House Bill 40) to establish a Renewable Portfolio Standard for the state, requiring retail electricity providers to serve an increasing percentage of their retail load using renewable energy. He also discussed why, unlike the rest of New England, Vermont has not restructured its electric power industry. He stated that the primary reason, referencing Figure 1, is retail rate stability, followed by the ability to continue least-cost integrated resource planning in the state. This type of integrated thinking is possible, he said, because the same entities that own and operate the grid are also empowered to make power supply choices to address these needs and costs.⁸

⁸ TJ Poor, “Vermont Electricity Present and Future,” CLG presentation (March 13, 2015), http://www.iso-ne.com/static-assets/documents/2015/03/poor_presentation_clg_meeting_3_13_2015.pdf.

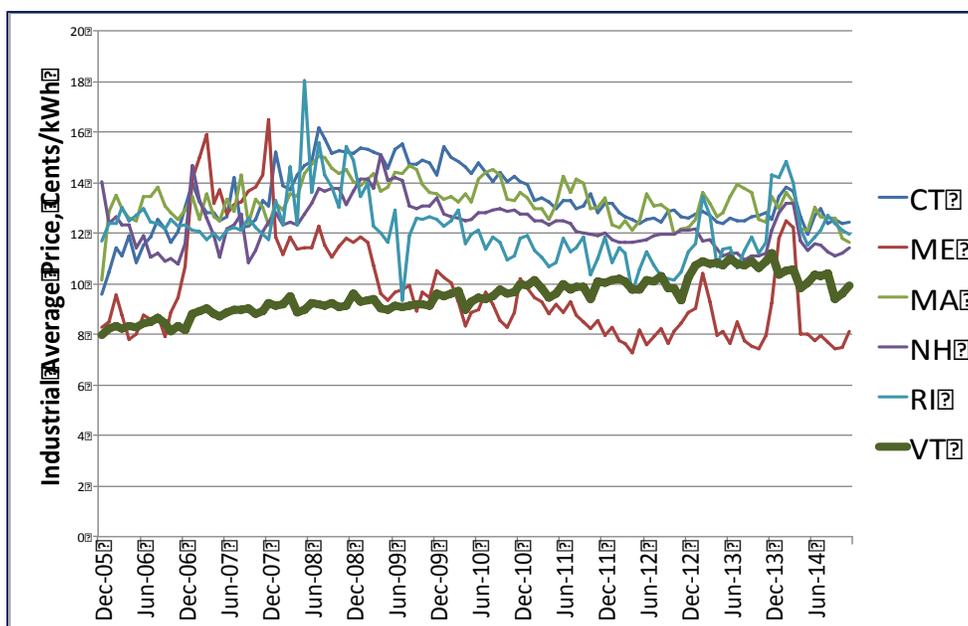


Figure 1: Industrial average price of electricity for the New England states from December 2005 to December 2014 in cents/kilowatt-hour (kWh).

Douglas Smith discussed Vermont House Bill 40 in greater detail, particularly the distributed generation component or “Tier 2” of the bill. The legislation would require 1% of retail electricity sales to be supplied by in-state distributed generation by 2017, increasing to 10% of retail electricity sales by 2032. Smith explained that while the distributed generation goals are challenging, they are achievable and consistent with Green Mountain Power customers’ preferences. He noted that increasing penetrations of distributed generation will require thoughtful system impact studies to identify required upgrades and protection regimes.⁹

John Goodrich, representing a company that provides electrical insulation and services to the electric power industry, provided the end-user perspective. Goodrich expressed concern over Vermont’s long-term renewable energy goals, fearing such goals will increase already high retail electricity rates in the state. According to Goodrich, high electricity costs render Vermont less hospitable to manufacturing, a mainstay of any healthy economy. Goodrich recommended the state moderate its renewable energy goals and work to restore Vermont’s economic competitiveness by reducing the cost of electricity in the state.¹⁰

William Driscoll discussed commercial and industrial electricity rates in Vermont, urging the state to consider alternatives for reducing the cost of electricity to improve Vermont’s economic competitiveness. He noted that practical options for lower-cost power supply in Vermont are limited due in part to aggressive renewable energy mandates. He recommended that the state look closely at regional investment and other measures to address natural gas pipeline constraints and other factors leading to price spikes in the natural gas used to generate electricity. He also

⁹ Douglas Smith, “Distributed Generation in Vermont,” CLG presentation (March 13, 2015), http://www.iso-ne.com/static-assets/documents/2015/03/smith_presentation_clg_meeting_3_13_2015.pdf.

¹⁰ John Goodrich, “New England and Vermont’s Energy Marketplace: Grid Modernization, Supply Diversification, Pricing,” CLG presentation (March 13, 2015), http://www.iso-ne.com/static-assets/documents/2015/03/goodrich_presentation_clg_meeting_3_13_2015.pdf.

recommended the creation of specific discounted rate classes, like a manufacturing rate, to strengthen the underlying economy, as well as alternative financing for energy-efficiency programs to reduce the impacts on retail rates.¹¹

3.1.3 ISO Update

Anne George, Vice President of External Affairs and Corporate Communications for ISO New England, provided an update on the 2014/2015 Winter Reliability Program, which proved beneficial to power system operations during the winter months because generators had the fuel they needed to operate when dispatched by the ISO. She noted that, for much of the winter, wholesale electricity prices were lower than the 2013/2014 winter, owing to lower fuel prices for natural gas, liquefied natural gas (LNG), and oil. George also summarized the results of the ninth Forward Capacity Auction (FCA #9), whose higher prices demonstrated a need for new resources to ensure reliability due to the large number of generator retirements in the region.¹² Finally, George provided an update on recent market rule changes proposed by the ISO to improve the interconnection process for elective transmission upgrades, as well as the energy-efficiency and solar photovoltaic (PV) forecasts planned for release in May 2015.¹³ More information on these initiatives is included in Section 5: ISO New England Activities and Initiatives.

3.2 June 18: After the Midterm Elections—New Energy Policymaking and Legislation in the New England States

Meeting objective: Discuss recent energy policymaking and legislation in the New England states.

3.2.1 Special Guest Speaker: Matthew Beaton, Secretary of Energy and Environmental Affairs, Massachusetts

Secretary Matthew Beaton provided keynote remarks, laying out Governor Charlie Baker's vision for energy policy in the Commonwealth of Massachusetts. He explained that the Governor seeks to employ a balanced approach to energy policy through three guiding principles: (1) reduce and stabilize the rising cost of electricity, (2) encourage more renewable energy resources to enter the fuel mix, and (3) reduce greenhouse gas emissions. On the issue of reducing and stabilizing the cost of electricity, Secretary Beaton noted that he and Governor Baker agree that additional natural gas pipeline capacity is needed to address the region's constrained natural gas pipeline system, one of the primary drivers of volatile wholesale electricity prices. To promote more renewable energy, Secretary Beaton stated that a multi-utility, multi-state approach to procuring renewable resources is a cost-effective way to achieve the state's goals. On reducing greenhouse gas emissions, Secretary Beaton noted that the Baker administration's Energy Storage Initiative will ensure Massachusetts is at the forefront of adopting innovative technologies that can harness carbon-free renewable energy.

3.2.2 Panel Discussion

The panel featured representatives from the five remaining New England states, including Katie Dykes, Deputy Commissioner of the Connecticut Department of Energy and Environmental

¹¹ William Driscoll, "How to Address Cost Concerns in Vermont, with Possible Considerations for New England," CLG presentation (March 13, 2015), http://www.iso-ne.com/static-assets/documents/2015/03/driscoll_presentation_clg_meeting_3_13_2015.pdf.

¹² Forward Capacity Auction (FCA) is the "descending-clock" annual auction of the Forward Capacity Market during which the price for capacity will be decreased until the quantity of capacity remaining in the auction equals the quantity of capacity needed.

¹³ Anne George, "ISO New England Update," CLG presentation (March 13, 2015), http://www.iso-ne.com/static-assets/documents/2015/03/iso_new_england_clg_meeting_george_presentation_3_13_2015_final.pdf.

Protection; Mark Vannoy, Chairman of the Maine Public Utilities Commission; Meredith Hatfield, Director of the New Hampshire Office of Energy and Planning; Nicholas Ucci, Chief of Staff for the Rhode Island Office of Energy Resources; and Edward McNamara, Regional Policy Director of the Vermont Department of Public Service. Also contributing to the panel was Heather Hunt, Executive Director of the New England States Committee on Electricity.

Connecticut

Katie Dykes discussed major energy legislation passed by the Connecticut General Assembly in 2015, including Senate Bill No. 1078—*An Act Concerning Affordable and Reliable Energy*. The purpose of the legislation is to secure cost-effective energy resources to provide more reliable electric service for Connecticut ratepayers, particularly during winter peak demand, and to meet the state’s energy and environmental goals established in the Integrated Resources Plan and the Comprehensive Energy Strategy. The legislation gives the Commissioner of the Department of Energy and Environmental Protection the authority to issue solicitations for a wide variety of resources and direct the state’s electric distribution companies to enter into long-term contracts (up to 20 years) for any combination of these resources, provided the benefits outweigh the costs to electric ratepayers.¹⁴

Maine

Mark Vannoy discussed the current focus of the Maine Public Utilities Commission (PUC), which is the implementation of the Omnibus Energy Bill enacted in 2013—*An Act to Reduce Energy Costs, Increase Energy Efficiency, Promote Electric System Reliability, and Protect the Environment*. Among other things, the Omnibus Energy Bill authorizes the Maine PUC to enter into a contract for natural gas pipeline capacity in an attempt to reduce the basis differential (the difference between the spot price for natural gas at the Henry Hub in Louisiana and the spot price for natural gas in New England). The bill also directs the Maine PUC to ensure that Maine’s electric and natural gas utilities procure all cost-effective energy-efficiency resources on behalf of their customers.

New Hampshire

Meredith Hatfield discussed the many energy bills considered by the New Hampshire legislature in 2015. Several bills relating to New Hampshire’s Renewable Portfolio Standard (RPS) were introduced, but none, she explained, passed the legislature. One bill sought to repeal the state’s RPS law, while another attempted to add large-scale hydropower to the definition of Class I renewable energy sources. She also discussed a bill passed by both the House and Senate that would require Eversource New Hampshire to divest all of its electric generating plants in New Hampshire. Hatfield noted that the governor was expected to sign it.¹⁵

Rhode Island

Nicholas Ucci outlined some of Rhode Island’s in-state policies and regional efforts, reflected in Table 1, intended to help achieve the state’s energy and environmental goals. He highlighted Governor Gina Raimondo’s proposal to create the Rhode Island Infrastructure Bank, a centralized

¹⁴ Katie Dykes, “Connecticut Energy Legislative Update,” CLG presentation (June 18, 2015), http://www.iso-ne.com/static-assets/documents/2015/06/ct_deep_clg_presentation_june_18_2015.pdf.

¹⁵ Meredith Hatfield, “Legislative and Policy Update for Consumer Liaison Group,” CLG presentation (June 18, 2015), http://www.iso-ne.com/static-assets/documents/2015/06/nh_oep_clg_presentation_june_18_2015.pdf.

hub for existing and new green infrastructure financing initiatives. The infrastructure bank will employ a property-assessed clean energy (PACE) financing mechanism to allow residential and commercial property owners to access affordable, long-term financing for renewable energy and energy-efficiency upgrades.¹⁶

Table 1
Rhode Island In-State Policies and Initiatives and Regional Efforts
to Help Achieve the State’s Energy and Environmental Goals

In-state Policies & Initiatives	Regional Efforts
Least-cost Procurement and nation-leading Energy Efficiency Programs	Regional collaboration on cost-effective energy infrastructure (via ACES)
Renewable Energy Growth Program supporting 160 MW of DG (thru 2019)	Multi-state Clean Energy RFP (w/ CT & MA)
RI Infrastructure Bank, including residential and commercial PACE programs (proposed)	Ensure that local investment in clean energy solutions are accounted for in regional system planning (EE, DG)
Long-term Renewable Contracting	Multi-state Collaboration on Off-shore Wind (w/ MA, ME, NY; proposal pending)
Renewable Energy Standard (14.5% by 2019)	
Nation’s first Off-shore Wind Project (operational ≈ 4Q 2016)	

Note: The table provides representative examples of energy initiatives in Rhode Island and is not intended to be all-inclusive.

Source: Rhode Island Office of Energy Resources

Vermont

Edward McNamara discussed legislation passed by the Vermont legislature establishing a Renewable Portfolio Standard for the state. The legislation includes a total renewable energy requirement where 55% of retail electricity sales must be supplied by renewable energy in 2017, increasing to 75% in 2032, as well as a distributed generation carve out and energy innovation projects requirement. McNamara also touched on the state’s Comprehensive Energy Plan, which must be updated every five years. The subsequent plan was due to the Vermont legislature by January 1, 2016.¹⁷

New England States Committee on Electricity

Heather Hunt discussed the new transmission planning process under FERC Order No. 1000 and whether the New England states will seek to use Order No. 1000 to execute their clean energy and

¹⁶ Nicholas Ucci, “Rhode Island Energy Policy Update,” CLG presentation (June 18, 2015), http://www.iso-ne.com/static-assets/documents/2015/06/ri_oer_clg_presentation_june_18_2015.pdf.

¹⁷ Edward McNamara, “Vermont Energy Policy Update,” CLG presentation (June 18, 2015), http://www.iso-ne.com/static-assets/documents/2015/06/vt_dps_clg_presentation_june_18_2015.pdf.

environmental policies. She made clear that Order No. 1000 may be one way, but not the only way, transmission projects that further public policy objectives could move forward in New England. To that point, Hunt highlighted the multi-state Request for Proposals (RFP) developed by state agencies and utilities in Massachusetts, Connecticut, and Rhode Island soliciting clean energy proposals and transmission to deliver clean energy to the New England power system.¹⁸

3.2.3 ISO Update

Anne George, Vice President of External Affairs and Corporate Communications for ISO New England, discussed the ISO's role in the state policymaking arena. She explained that while the ISO's primary role is to monitor energy developments in the six New England states (and at the federal government), the ISO does work to incorporate, to the extent feasible, the states' energy policies into ISO planning, markets, and operations. Examples of these efforts include the ISO's energy-efficiency and solar PV forecasts to account for the significant growth in these resources through New England state policies and programs. George also highlighted an ISO discussion paper on the capacity market and the impact of increasing levels of renewable resources (i.e., wind and solar) on the wholesale electricity markets.¹⁹ Finally, George highlighted the *2014 Annual Markets Report* released in May 2015, which assessed the state of competition in the wholesale electricity markets administered by the ISO during the prior operating year.²⁰ More information on these initiatives is included in Section 5: ISO New England Activities and Initiatives.

3.3 October 9: Integration of Renewable Resources into the Electric System—Opportunities and Challenges

Meeting objective: Discuss the opportunities and challenges associated with integrating renewable resources into the electric power system at the national, regional, and state level.

3.3.1 Special Guest Speaker: James Bride, President, Energy Tariff Experts

James Bride focused his discussion on the region's capacity market, explaining how end-use customers are charged for the capacity required to serve their electricity needs. In New England, wholesale users of electricity are assigned an Installed Capacity Tag (ICAP Tag) based on their electricity demand during the ISO New England annual system peak hour. The customer payment period for the associated ICAP Tag takes effect one year later, as illustrated in Figure 2. He explained that flexible customers can take control of this charge by reducing their loads on the hottest days of the year or by working with an energy service company that warns customers when peak load hours are likely to occur. He explained how behind-the-meter solar PV resources can affect customer load profiles and, in turn, a customer's capacity charges.²¹

¹⁸ Heather Hunt, "Order 1000 in New England," CLG presentation (June 18, 2015), <http://www.iso-ne.com/static-assets/documents/2015/06/nescoc clg presentation june 18 2015.pdf>.

¹⁹ ISO New England, *The Importance of a Performance-Based Capacity Market to Ensure Reliability as the Grid Adapts to a Renewable Energy Future*, draft discussion paper (June 3, 2015), <http://www.iso-ne.com/static-assets/documents/2015/06/iso ne capacity mkt discussion paper 06 03 2015.pdf>.

²⁰ Anne George, "ISO New England Update," CLG presentation (June 18, 2015), <http://www.iso-ne.com/static-assets/documents/2015/06/iso new england clg meeting george presentation 6 18 2015 final.pdf>.

²¹ James Bride, "Presentation to ISO-NE CLG," CLG presentation (October 9, 2015), <http://www.iso-ne.com/static-assets/documents/2015/10/clg james bride keynote presentation 10 9 2015.pdf>.

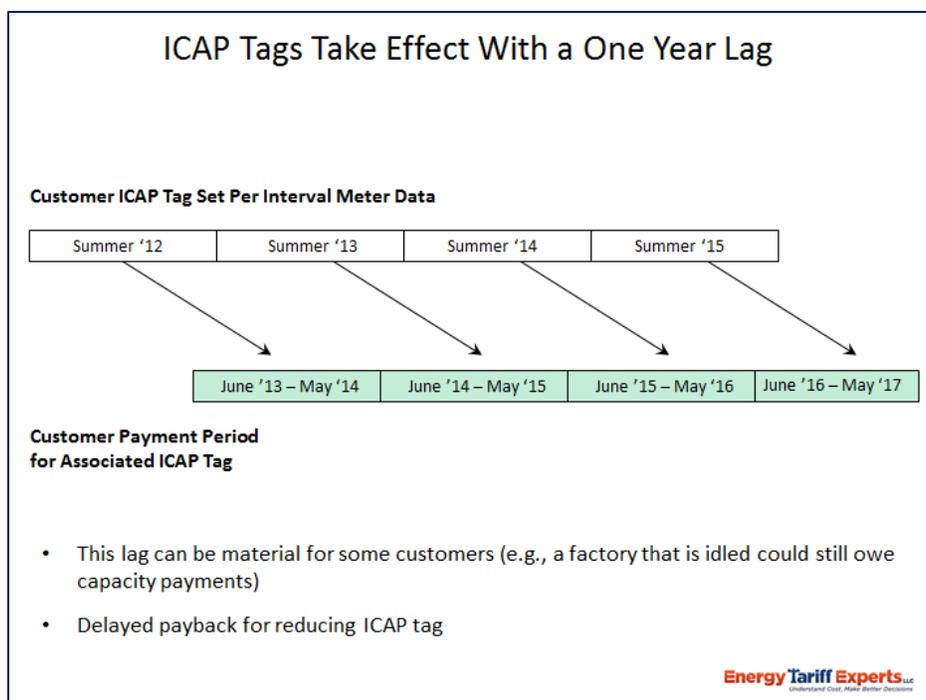


Figure 2: The end-use customer payment period for an Installed Capacity Tag takes effect one year after that tag is assigned.

Bride explained that a proper market construct must ensure generation adequacy and economic adequacy for generation units participating in the market, at least up to the level of resources needed to meet reliability standards. Baseload units have high fixed costs but low variable costs, he explained, whereas peaking units have low fixed costs but high variable costs. If the energy market does not supply enough revenue to provide financial adequacy to a unit, the shortfall, he explained, is referred to as the “missing money.” The capacity market is designed to provide an opportunity for resources to recover a portion of this “missing money” (a portion of their fixed costs).

In describing the linkages between the energy and capacity markets, Bride referenced the ISO’s discussion paper released in June 2015, titled *The Importance of a Performance-Based Capacity Market to Ensure Reliability as the Grid Adapts to a Renewable Energy Future*.²² Bride highlighted the paper’s discussion of how an increase in renewable energy will impact the region’s wholesale electricity markets. Specifically, he observed that the suppression of wholesale energy prices will put upward pressure on capacity prices. This paper was the focus of the ISO’s presentation during the subsequent panel discussion.

In discussing the growth of renewable resources in New England, like wind and solar, Bride explained how the ISO is actively planning for the integration of more renewables into the electric system (e.g., through the forecast of solar PV resources). He spotlighted, however, several challenges for integrating wind resources in northern New England, particularly in Maine.

²² ISO New England, *The Importance of a Performance-Based Capacity Market to Ensure Reliability as the Grid Adapts to a Renewable Energy Future*, draft discussion paper (June 3, 2015), http://www.iso-ne.com/static-assets/documents/2015/06/iso_ne_capacity_mkt_discussion_paper_06_03_2015.pdf. A revised version of this discussion paper is available at http://www.iso-ne.com/static-assets/documents/2015/10/iso-ne_discussion_paper_-_capacity_market_and_renewable_energy_future_-_revised_version_-_10-30-2015.pdf.

3.3.2 Panel Discussion

August Fromuth, Managing Director at Freedom Energy Logistics, moderated a panel of ISO and energy industry representatives, including Jurgen Weiss, Principal for The Brattle Group; Robert Ethier, Vice President of Market Operations for ISO New England; and Greg White, Vice President of Field Operations for Green Mountain Power. Each panelist provided his unique perspective on the opportunities and challenges associated with integrating more renewable resources into the electric power system.

Jurgen Weiss provided the national perspective on the integration of renewable resources. He examined the various tools that ISOs and RTOs can use to facilitate this process in the short, medium, and long terms. Weiss first outlined the costs associated with integrating more renewable resources, which relates, in the short run, to their impact on power system operations (e.g., the need to carry more flexible resources to balance the intermittency of renewables). He suggested that improving the accuracy of forecasting renewable energy output and adjusting market rules could reduce the costs of integration in the short and medium terms. For the long term, Weiss outlined a mix of options that could advance integration. These include investing in new transmission, integrating the electricity and heating sectors, and shaping a mix of renewable resources to result in a steady output of power.²³

Robert Ethier provided a regional perspective on the integration of renewable resources, focusing mainly on the ISO's discussion paper released in June 2015 that assesses the impact of increasing levels of renewables on New England's wholesale electricity markets. Ethier explained that because renewable resources typically have no fuel costs, they are often dispatched ahead of conventional resources (like coal-, oil- and gas-fired resources) with higher fuel costs. This decreases prices in the energy market and adds financial pressure to energy-market-dependent resources. He indicated that this will make conventional resources more dependent on revenues from the capacity market and likely cause capacity prices to rise in order to attract sufficient resources to ensure reliability in the region. He concluded that the current market design should ensure that the resource mix appropriately complements the capabilities and limitations of the renewable resources entering the market.²⁴

Greg White discussed the integration of renewables at the state and electric utility level. He contended that technology and local renewable resources have created an opportunity to embrace progress and transition to a new business model. He identified three strategic imperatives to addressing the increase in renewable resources on the electric power system: (1) changing the distribution grid model, (2) engaging customers to add value, and (3) increasing reliance on local renewable resources. White stated that the focus must shift from the bulk power system to the near-customer distribution grid to create value from renewable energy assets behind customer meters. Like the other panelists, he noted that increased penetrations of renewable resources can

²³ Jurgen Weiss, "Integration of Renewable Resources into the Electric System," CLG presentation (October 9, 2015), http://www.iso-ne.com/static-assets/documents/2015/10/clg_jurgen_weiss_panel_presentation_10_9_2015.pdf.

²⁴ Robert Ethier, "Integration of Renewables into the Electric System: Opportunities and Challenges," CLG presentation (October 9, 2015), http://www.iso-ne.com/static-assets/documents/2015/10/clg_robert_ethier_panel_presentation_10_9_2015_final.pdf.

present challenges for operating the system, and outlined the tools that can help manage these risks, such as improved load forecasting, advanced weather analytics, and battery storage.²⁵

3.3.3 ISO Update

Anne George, Vice President of External Affairs and Corporate Communications for ISO New England, discussed key developments since the CLG meeting in June. She outlined the separate pricing zones identified for use in the tenth Forward Capacity Auction (FCA #10): a “Southeastern New England” zone including eastern Massachusetts and Rhode Island, and a “Rest-of-Pool” zone including the rest of the region. George also provided an update on the 2015/2016 Winter Reliability Program, explaining that FERC approved the proposal set forth by NEPOOL, which was largely based on the 2014/2015 winter program. George concluded with an update on the U.S. Environmental Protection Agency’s (EPA) Clean Power Plan, highlighting the reliability considerations EPA incorporated into the final rule, released in August 2015.²⁶ More information on these initiatives is included in Section 5: ISO New England Activities and Initiatives.

3.4 December 3: Transmission Planning in New England—The Shift to a Competitive Framework and Impact on Ratepayers

Meeting objective: Discuss changes to the transmission planning process in New England pursuant to a FERC order on transmission planning and cost allocation (Order No. 1000).

3.4.1 Special Guest Speaker: Larry Gasteiger, Chief of Staff to Chairman Norman Bay, FERC

Larry Gasteiger focused his remarks on the significant changes taking place in the energy industry and his views on how FERC has reacted in the face of this transition. Among the changes he noted were the Marcellus Shale gas revolution, the growth of renewables and distributed generation, and the increasing impact of state and federal policies on the energy industry. From the perspective of Chairman Norman Bay, Gasteiger explained that FERC is focused on making deliberate, incremental progress toward ensuring “just and reasonable” electricity rates. In terms of priorities for the upcoming year, Gasteiger said that FERC is focused on improving price signals in the energy and ancillary services markets, addressing the need for additional electric transmission and gas pipeline infrastructure, and enhancing grid reliability through greater gas-electric coordination and improved physical and cyber security.

3.4.2 Panel Discussion

Robert Rio, Senior Vice President and Counsel for Associated Industries of Massachusetts, moderated a panel of ISO, state, and energy industry representatives, including Alan McBride, Director of Transmission Strategy and Services for ISO New England; Heather Hunt, Executive Director of NESCOE; Timothy Martin, Principal Program Manager for National Grid; and Donald Jessome, Chief Executive Officer for Transmission Developers, Inc. Each panelist provided his or her perspective on the transmission planning process in New England and the shift to a competitive framework under Order No. 1000.

²⁵ Greg White, “Integration of Renewable Resources into the Electric System: Opportunities and Challenges,” CLG presentation (October 9, 2015), http://www.iso-ne.com/static-assets/documents/2015/10/clg_greg_white_panel_presentation_10_9_2015.pdf.

²⁶ Anne George, “ISO New England Update,” CLG presentation (October 9, 2015), http://www.iso-ne.com/static-assets/documents/2015/10/clg_meeting_george_iso_update_presentation_10_9_2015_final.pdf.

Alan McBride described the ISO's role in the transmission planning process and the changes that have been made pursuant to Order No. 1000.²⁷ These changes include (1) moving from an ISO-led development of transmission solutions to a process where developers submit project proposals, (2) adding a transmission planning process to satisfy public policy objectives, and (3) updating existing interregional planning and transmission development protocols with neighboring power systems (PJM and the New York ISO).²⁸ McBride explained that for public policy transmission planning, FERC imposed an obligation on the ISO to select the most cost-effective transmission project to address identified public policy objectives.²⁹ McBride made clear that the ISO plans to work closely with the states on transmission planning for public policy.

Heather Hunt announced a comparative survey NESCOE commissioned to develop an objective, fact-based summary of the transmission planning approaches and methodologies used by Regional Transmission Organizations across the country, including ISO New England.³⁰ Hunt noted that NESCOE has advocated for a central role for the states in the area of transmission planning for public policy needs. She also highlighted some questions that lie ahead for Order No. 1000 implementation in New England, including whether cost should be the only consideration that matters when the ISO is evaluating competitive bids for transmission.³¹ These issues and others were discussed at a Competitive Transmission Forum co-hosted by NESCOE and ISO New England in October 2015.

Timothy Martin provided National Grid's perspective on the shift to a competitive framework under Order No. 1000, expressing support for the selection of transmission solutions with the best combination of performance, cost, system flexibility, and ability to meet the required timeframe. He recognized that cost is an important factor but stated that cost should not be the only consideration when choosing a transmission solution to meet an identified need.³²

Donald Jessome provided an update on the New England Clean Power Link project, a proposed 1,000 MW high-voltage direct-current (HVDC) transmission line from the Canadian border to Ludlow, Vermont. Most of the transmission line will travel underneath Lake Champlain. The line is intended to deliver additional supplies of Canadian hydropower to the New England market. He

²⁷ Alan McBride, "Overview of the Transmission Planning Process and the Role of ISO New England," CLG presentation (December 3, 2015), http://www.iso-ne.com/static-assets/documents/2015/12/clg_meeting_mcbride_panel_presentation_12_3_2015_final.pdf.

²⁸ PJM is the RTO for all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia.

²⁹ NESCOE, jointly with five New England states, appealed FERC's compliance orders to the U.S. Court of Appeals for the District of Columbia Circuit arguing that FERC unlawfully expanded Order No. 1000 in obligating ISO New England to select public policy-driven transmission projects.

³⁰ NESCOE, *Comparison of Transmission Reliability Planning Studies of ISO/RTOs in the U.S.* (February 5, 2016), <http://nescoe.com/resources/t-planning-comparison-feb2016/>.

³¹ Heather Hunt, "Transmission in New England," CLG presentation (December 3, 2015), http://www.iso-ne.com/static-assets/documents/2015/12/clg_meeting_hunt_panel_presentation_12_3_2015.pdf.

³² Timothy Martin, "Transmission Planning in New England: The Shift to a Competitive Framework and Impact on Ratepayers," CLG presentation (December 3, 2015), http://www.iso-ne.com/static-assets/documents/2015/12/clg_meeting_martin_panel_presentation_12_3_2015.pdf.

provided information on the drivers and benefits of the project, including a purported savings of \$1.9 billion over the first 10 years of operation for New England ratepayers.³³

3.4.3 ISO Update

Anne George, Vice President of External Affairs and Corporate Communications for ISO New England, provided an update on the ISO's 2015/2016 winter outlook, which projected sufficient electricity supplies to meet consumer demand in New England, as well as the Winter Reliability Program, intended to improve fuel security and protect overall power system reliability during the winter. She provided an update on the informational filing the ISO submitted to FERC for Forward Capacity Auction #10, including the zones selected for modeling in the auction, the Installed Capacity Requirement, and the resources qualified to participate in the auction. Finally, George shared the ISO's projection of wholesale market costs for 2015. Due to fewer price spikes during the winter and record low wholesale electricity prices in the spring and summer, wholesale prices were projected to be lower for 2015 compared to 2014 and 2013.³⁴ More information on these initiatives is included in Section 5: ISO New England Activities and Initiatives.

³³ Donald Jessome, "Transmission Planning in New England: The Shift to a Competitive Framework and Impact on Ratepayers, A Developer's Perspective," CLG presentation (December 3, 2015), http://www.iso-ne.com/static-assets/documents/2015/12/clg_meeting_jessome_panel_presentation_12_3_2015.pdf.

³⁴ Anne George, "ISO New England Update," CLG presentation (December 3, 2015), http://www.iso-ne.com/static-assets/documents/2015/12/clg_meeting_george_iso_update_presentation_12_3_2015_final.pdf.

Section 4

Consumer Liaison Group Future Initiatives

ISO New England, working with the CLG Coordinating Committee and CLG members, will continue to conduct outreach in the states to inform consumers and consumer advocates of the existence, role, and information provided by the Consumer Liaison Group. Additionally, the CLG Coordinating Committee will continue striving to attract more end-user participation, to increase participation from all New England states, and to increase the consumers' presence in ISO New England stakeholder discussions and initiatives. The CLG Coordinating Committee will also explore more ways to educate end users about industry institutions, such as NEPOOL and FERC, and about how consumers can advocate before industry institutions, government bodies, and elected officials. Additional efforts will be made to pinpoint and explain to end users the basic policy dilemmas and choices currently facing the energy industry, the public, and government.

Section 5

ISO New England Activities and Initiatives

This section highlights the major topics presented by the ISO at CLG meetings in 2015. In addition to these presentations, the ISO's External Affairs Department issues a memo each month that provides timely updates on regional energy issues, stakeholder meetings, and other information that may be relevant to consumers.³⁵

5.1 Challenges and Opportunities Facing the New England Power System

The New England power system is undergoing a dramatic transformation, presenting challenges and opportunities for the region. Over the last 15 years, New England has seen a major shift toward natural gas-fired generation. In 2015, nearly half the region's electricity was sourced by natural gas, up from 15% in 2000.³⁶ The combined use of coal and oil has fallen dramatically over the same 15-year period—from 40% to 6%—and these resources usually only operate during the summer when electricity demand is high and in the winter when natural gas pipelines are constrained.

Because natural gas represents such a large portion of the region's generating fleet, the availability of natural gas for power generation has a profound impact on grid reliability and wholesale electricity costs. For instance, as illustrated in Figure 3, record high natural gas prices during the 2013/2014 winter contributed to significant wholesale electricity price volatility in New England.

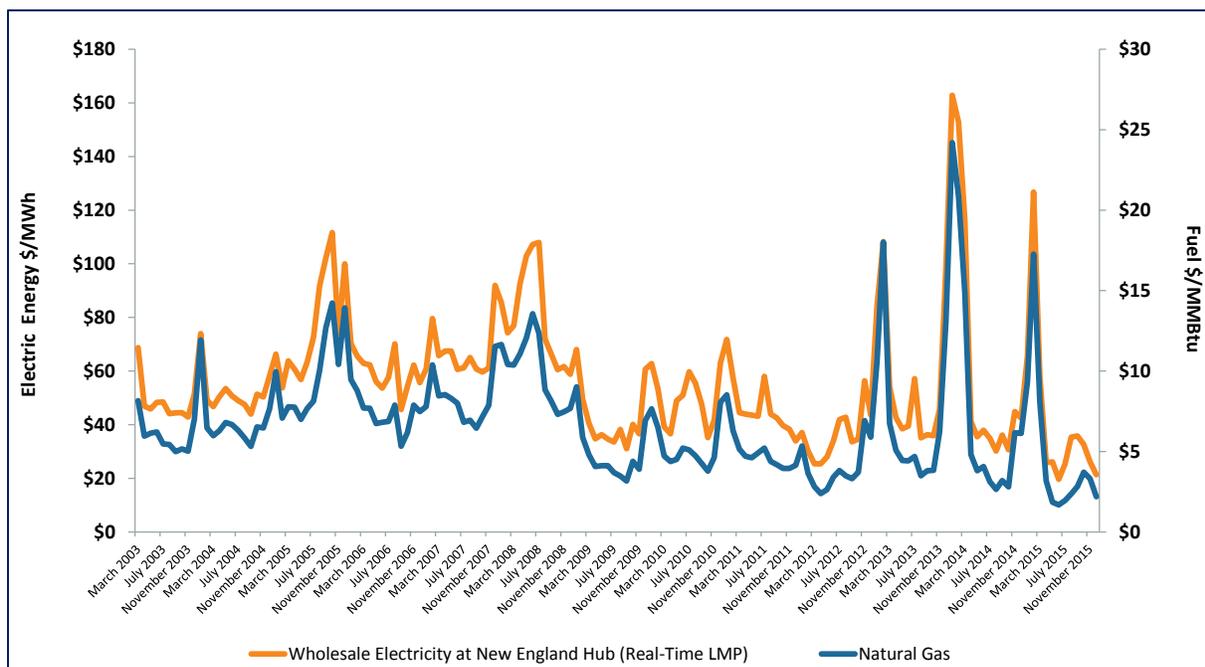


Figure 3: Monthly average natural gas and wholesale electricity prices in New England.

³⁵ The monthly memos are posted at <http://www.iso-ne.com/committees/industry-collaborations/consumer-liaison>.

³⁶ ISO New England, *Peak Energy and Net Load by Source*, <http://www.iso-ne.com/isoexpress/web/reports/load-and-demand/-/tree/net-ener-peak-load>.

In addition to administering three winter reliability programs, the ISO has taken major steps to increase market efficiency and improve gas-electric coordination to address the challenges posed by the region's reliance on natural gas and constrained natural gas pipeline system. These efforts include the following:

- Increased information sharing with the natural gas pipelines to improve communications with the natural gas industry and develop decision-support tools for ISO system operators
- Shifting the day-ahead energy market timeline to better align the electricity and natural gas markets and give generators more time to procure the gas they need to run
- Tightening the "shortage event" trigger in the Forward Capacity Market (FCM) to improve incentives for resources to perform³⁷
- Implementing energy market offer-flexibility enhancements to allow participants to update their offers in real-time to reflect changing fuel costs
- Increasing payments to resources providing reserves during scarcity conditions to give resources better incentives to perform when needed the most
- Implementing long-term FCM enhancements, called "pay for performance" (PFP), to provide strong incentives for resources to invest in operational improvements and secure fuel arrangements to ensure resource performance³⁸

5.1.1 Winter Reliability

Winter operational concerns regarding fuel adequacy and the need to mitigate seasonal reliability risks prompted the ISO to develop winter reliability programs for the 2013/2014 and 2014/2015 winters. These programs provided incentives to generators to firm up their fuel supplies before the start of winter. They proved invaluable to power system operations during extreme cold weather conditions because generators had the fuel they needed to run when called on by the ISO.

In orders approving the winter programs, FERC made clear that market-based solutions are generally preferable to out-of-market solutions but recognized the temporary nature of the programs and the need to address particular challenges to reliability during the winter.

In its September 9, 2014 order accepting the 2014/2015 Winter Reliability Program, FERC directed the ISO to initiate a stakeholder process to develop a proposal to address reliability concerns for the 2015/2016 winter and future winters, as necessary.³⁹ On January 20, 2015, FERC issued an order clarifying that the ISO must develop a market-based solution if a winter reliability solution is needed for the 2015/2016 winter and future winters.⁴⁰ The ISO filed a request for rehearing in

³⁷ Through the Forward Capacity Market, the ISO projects the capacity needs of the power system three years in advance and then holds an annual auction to purchase the resources that will satisfy the regional requirements. The resources that clear in the auction are obligated to provide power or curtail demand when the ISO calls on them during the one-year commitment period that correlates with each auction.

³⁸ Additional information about the ISO's pay-for-performance proposal is available in the *2014 Report of the Consumer Liaison Group*; http://www.iso-ne.com/static-assets/documents/2015/03/2014_clg_report_final.pdf.

³⁹ FERC, *Order Accepting Tariff Revisions* (148 FERC ¶ 61,179, Docket Nos. ER14-2407-000, ER14-2407-001, ER14-2407-003) (September 9, 2014), http://www.iso-ne.com/static-assets/documents/2014/09/er14-2407-000_9-9-14_order_accept_winter_reliability.pdf.

⁴⁰ FERC, *Order on Clarification* (150 FERC ¶ 61,029, Docket No. ER14-2407-003) (January 20, 2015), http://www.iso-ne.com/static-assets/documents/2015/01/er14-2407-003_1-20-15_order_winter_rel_clarification.pdf.

response to the clarification order, raising concerns about whether it would be able to implement a cost-effective market-based solution that provides an adequate level of reliability.⁴¹ The ISO asked FERC to permit the continuation of the current out-of-market winter reliability program construct, possibly with an expanded scope to encompass other resource types.

On April 17, 2015, FERC granted the ISO's request for rehearing, allowing the ISO to file additional out-of-market winter reliability programs. However, FERC made clear that it expected the ISO to abide by its commitment to work with stakeholders to expand any future programs to include "all resources that can supply the region with fuel assurance," such as nuclear, coal, and hydro resources.⁴²

On July 15, 2015, the ISO and the New England Power Pool submitted two alternative sets of market rule changes to establish a winter reliability program for the 2015/2016, 2016/2017, and 2017/2018 winters.⁴³ Because NEPOOL's alternative proposal received sufficient support from stakeholders, it was filed alongside the ISO proposal in what is called a "jump-ball" proceeding, giving FERC the opportunity to adopt either proposal or a combination of the two proposals. Both proposals were intended serve as a stop-gap measure until longer-term capacity market changes go into effect on June 1, 2018 (the ISO's pay-for-performance program).

NEPOOL's proposal was based on the design of the 2014/2015 program, which provided compensation for (1) a portion of the carrying costs of fuel oil that was unused at the end of the winter; (2) unused LNG contract volumes; and (2) supplemental demand response. The ISO's proposal shared the first two design features of NEPOOL's proposal, but also provided compensation for any generator supplied by on-site fuel (e.g., coal-fired units, nuclear units fueled by uranium, biomass resources, and units fueled by water, including pumped storage facilities).

On September 11, 2015, FERC accepted the NEPOOL proposal as just and reasonable and preferable to the ISO proposal. While the ISO proposal was an attempt to comply with FERC's directive to work with stakeholders to expand the program, FERC found that including additional resource types would not incent any additional fuel procurement. In addition, the NEPOOL proposal was widely supported by a majority of stakeholders representing the six NEPOOL sectors. FERC acknowledged that neither proposal was market-based but recognized that out-of-market solutions might be appropriate in certain circumstances. "Given the difficulties associated with creating and implementing a temporary and effective market-based reliability solution in a short timeframe, we are satisfied that an out-of-market program is an appropriate and necessary interim measure to aid in maintaining reliability during the next three winters, until the market-based pay-for performance revisions become effective in 2018."⁴⁴

⁴¹ ISO New England, *Rehearing Request of ISO New England Inc.* (Docket No. ER14-2407-003) (February 19, 2015), http://www.iso-ne.com/static-assets/documents/2015/02/er14-2407-003_2-19-15_req_for_rehearing_clarification_order.pdf.

⁴² FERC, *Order Granting Rehearing* (151 FERC ¶ 61,052, Docket No. ER14-2407-004) (April 17, 2015), http://www.iso-ne.com/static-assets/documents/2015/04/er14-2407-004_4-17-15_order_granting_rehearing_winter_reliability.pdf.

⁴³ ISO New England and New England Power Pool, *Filings of Winter Reliability Programs* (Docket No. ER15-2208-000) (July 15, 2015), http://www.iso-ne.com/static-assets/documents/2015/07/er15-2208-000_7-15-15_winter_reliability_program.pdf.

⁴⁴ FERC, *Order on Proposed Tariff Revisions* (152 FERC ¶ 61,190, Docket No. ER15-2208-000) (September 11, 2015), <http://www.iso-ne.com/static-assets/documents/2015/09/er15-2208-000.pdf>.

5.2 Regional System Planning

The ISO conducts comprehensive regional power system planning pursuant to a FERC-approved tariff and publishes a regional system plan (RSP) that summarizes the long-term (10-year) reliability needs of New England's transmission system.⁴⁵ Stakeholders, including state consumer advocates, provide input to the planning process and the RSP through the Planning Advisory Committee.⁴⁶ The ISO and stakeholders have agreed to the issuance of the RSP every other year. With approval from FERC of this decision, the next RSP will be issued in 2017.

5.2.1 Energy-Efficiency and Distributed Generation Forecasts

Since 2012, the ISO has developed an energy-efficiency (EE) forecast to equip system planners with information about the long-term impacts of state-sponsored EE investments on the region's peak and overall demand for energy. The ISO uses this information in long-term planning studies beyond the three-year FCM timeframe. The 2012 EE forecast was the nation's first regional EE forecast. A final 2015 EE forecast was released in April 2015.⁴⁷

Since 2013, the ISO has led a regional Distributed Generation Forecast Working Group (DGFWG) to collect data on distributed generation (DG) policies and implementation and to forecast long-term incremental DG growth in New England. For purposes of this forecast, DG resources are 5 MW or less in nameplate capacity and are interconnected to the distribution system. Currently, solar PV resources represent the largest share of DG resources throughout New England. The final 2015 solar PV forecast shows steady growth in solar PV through 2024, with roughly 900 MW of AC nameplate capacity installed through 2014 and more than 2,400 MW of AC nameplate capacity anticipated by 2024.⁴⁸

5.2.2 FERC Order No. 1000

In July 2011, FERC issued Order No. 1000, a final rule pertaining to intra- and interregional transmission planning and cost-allocation practices. The rule requires ISOs and RTOs to (1) participate in a regional transmission planning process that produces a regional transmission plan; (2) amend its transmission tariff to consider local, state, and federal policies in the regional transmission planning process; and (3) remove the federal right of first refusal for certain new transmission facilities.

The ISO, working with stakeholders, developed and submitted multiple filings to comply with the new requirements. The ISO developed significant new processes for competitive solicitations for transmission projects that address reliability needs expected to emerge more than three years out, as well as planning for transmission projects to meet public policy objectives. The ISO also updated

⁴⁵ ISO New England, *2015 Regional System Plan* (November 5, 2015), http://www.iso-ne.com/static-assets/documents/2015/11/rsp15_final_110515.docx.

⁴⁶ More information on the Planning Advisory Committee is available at <http://www.iso-ne.com/committees/planning/planning-advisory>. ISO New England's *Open Access Transmission Tariff* (OATT) is available at <http://www.iso-ne.com/participate/rules-procedures/tariff/oatt>.

⁴⁷ ISO New England's *Final 2015 Energy-Efficiency Forecast for 2019-2024* is available at http://www.iso-ne.com/static-assets/documents/2015/04/iso_ne_final_2015_ee_forecast_2019_2024.pdf. More information on the ISO's energy-efficiency forecast is available at <http://www.iso-ne.com/committees/planning/energy-efficiency-forecast>.

⁴⁸ ISO New England's *Final 2015 Solar PV Forecast* is available at http://www.iso-ne.com/static-assets/documents/2015/05/final_2015_pv_forecast.pdf. More information on the ISO's solar PV forecast is available at <http://www.iso-ne.com/committees/planning/distributed-generation>.

existing interregional planning and transmission development protocols with neighboring power systems (PJM and NYISO).

5.3 Wholesale Electricity Markets

In 2015, the CLG discussed the *Annual Markets Report* and the decisions made by the ISO leading up to FCA #10, as summarized below.

5.3.1 Reports on Market Performance

The ISO regularly reports on the performance of the region's wholesale electricity markets.⁴⁹ In addition to detailed quarterly, monthly, and weekly reports, the ISO's internal and external market monitors prepare comprehensive annual reports on the development, operation, and performance of the markets.⁵⁰

In May 2015, the Internal Market Monitor published the *2014 Annual Markets Report*.⁵¹ The report assessed the state of competition in the wholesale electricity markets administered by the ISO during the prior operating year, January 1 to December 31, 2014, and found that the markets operated competitively, with prices that reflected the cost of production.

5.3.2 Forward Capacity Auction #10

The tenth Forward Capacity Auction (FCA #10) was held on February 8, 2016, to procure the capacity resources needed to meet demand for electricity in New England for the 2019/2020 capacity commitment period (June 1, 2019 through May 31, 2020). The ISO modeled two capacity zones in FCA #10:

- Southeastern New England (SENE) capacity zone, which included Northeastern Massachusetts (NEMA)/Boston, Southeastern Massachusetts (SEMA), and Rhode Island
- Rest-of-Pool capacity zone, which included Connecticut, Maine, Western/Central Massachusetts, New Hampshire, and Vermont

The SENE capacity zone was modeled as an import-constrained capacity zone. There were no export-constrained capacity zones modeled in FCA #10.

Finalized results indicate that the auction concluded with 35,567 MW of capacity acquired regionwide, including more than 1,400 MW of new generation.⁵² The Installed Capacity Requirement (ICR) for the 2019/2020 commitment period is 34,151 MW; however, with the sloped demand curve, the region can acquire more or less than the ICR, depending on reliability requirements and price.

⁴⁹ The ISO's various market reports are posted at <http://www.iso-ne.com/markets-operations/market-performance/performance-reports>.

⁵⁰ The Internal Market Monitor's annual report is posted at <http://www.iso-ne.com/markets-operations/market-monitoring-mitigation/internal-monitor>. The External Market Monitor's annual report is posted at <http://www.iso-ne.com/markets-operations/market-monitoring-mitigation/external-monitor>.

⁵¹ ISO New England, *2014 Annual Markets Report* (May 20, 2015), <http://www.iso-ne.com/static-assets/documents/2015/05/2014-amr.pdf>.

⁵² ISO New England, *Forward Capacity Auction Results Filing*, Docket No. ER16-____-000 (February 29, 2016), http://www.iso-ne.com/static-assets/documents/2016/02/er16-____-000_2-29-16_fca_10_results_filing.pdf.

This year's descending-clock auction concluded systemwide after four rounds of competitive bidding, with a clearing price of \$7.03/kW-month, at the point on the demand curve where resources were still sufficient to meet demand. The price of \$7.03/kW-month is less than the preauction estimate of the cost of building a new natural gas-fired power plant in New England (cost of new entry or CONE), at \$10.81/kW-month.

The clearing price was more than 25% lower than last year's clearing price of \$9.55/kW-month for most resources. The lower clearing price reflects strong competition among resources and demonstrates that the capacity market is working as designed: higher prices resulting from resource shortfalls in earlier auctions sent price signals to developers to bring new—and needed—resources to the market.

The \$7.03/kW-month clearing price will be paid to new and existing resources in both capacity zones. At \$7.03/kW-month, the total value of the capacity market for the 2019/2020 commitment period will be approximately \$3 billion, down from the estimated \$4 billion for 2018/2019.⁵³

5.4 The ISO's Budget Review Process

The ISO's budget development process begins in January of each year with stakeholder discussions on priorities in planning, operations, and capital projects. The ISO then presents a five-year strategic plan to give stakeholders a better understanding of its longer-term, multi-year objectives. In the June and August timeframe, the ISO presents proposed operating and capital budgets to its stakeholders for review. By the end of October, the ISO submits its final operating and capital budgets to FERC for review. The ISO's board of directors plays an active role throughout the budget review process, taking into account feedback from stakeholders before voting on the proposed budget in October.

In May 2013, the ISO filed a settlement agreement with FERC on the ISO's 2013 budget, formalizing the budget review process with state regulators.⁵⁴ This process includes a preliminary budget presentation at the annual New England Conference of Public Utilities Commissioners (NECPUC) Symposium in June and an additional budget presentation with the New England states in August. After the budget presentation in August, the New England states have the opportunity to submit questions and comments on the proposed budget. These questions and comments are followed by formal responses from the ISO. The comments submitted by the New England states and the ISO's responses are filed with FERC alongside the proposed budget in October.

After an extensive budget review process with state regulators, the ISO filed its proposed 2016 budget with FERC on October 16, 2015.⁵⁵ On December 4, 2015, FERC approved the ISO's budget for 2016.⁵⁶

⁵³ A press release detailing the results of the auction is available at http://www.iso-ne.com/static-assets/documents/2016/02/20160229_fca10_finalresults.pdf.

⁵⁴ ISO New England, *Settlement Agreement*, Docket Nos. ER13-185, ER13-192 (May 13, 2013), http://www.iso-ne.com/regulatory/ferc/filings/2013/may/er13-185-000_5-9-13_settlement_agreement.pdf.

⁵⁵ ISO New England, *Filing of 2016 Capital Budget and Revised Tariff Sheets for Recovery of 2016 Administrative Costs*, Docket No. ER16-92-000 (October 16, 2015), http://www.iso-ne.com/static-assets/documents/2015/10/er16-92-000_2016_cap_budget.pdf.

⁵⁶ FERC, *Letter Order Accepting 2016 Capital Budget and Revised Tariff Sheets for Recovery of 2016 Administrative Costs* (Docket No. ER16-92-000) (December 4, 2015), <http://www.iso-ne.com/static-assets/documents/2015/12/er16-92-000.pdf>.

The ISO's budget review process is open and transparent. All materials are posted on the NEPOOL Budget and Finance Subcommittee page of the ISO New England website.⁵⁷ The ISO also maintains a separate webpage for budget information and materials.⁵⁸

⁵⁷ The NEPOOL Budget and Finance Subcommittee webpage is available at <http://www.iso-ne.com/committees/participants/budget-finance>.

⁵⁸ The ISO's budget webpage is available at <http://www.iso-ne.com/about/corporate-governance/budget>.

Section 6

Analysis of Wholesale Costs and Retail Rates

One of the primary goals among CLG participants when the group first formed was to better understand how a typical retail consumer’s bill reflects wholesale market costs. The ISO first conducted this analysis in 2009 and has subsequently updated it each year for the Annual Report.

The analysis concluded that wholesale costs and the rates for residential retail power supply can vary dramatically among the states and from year to year, mainly because wholesale electricity markets and retail electricity markets are used to obtain different products. Wholesale markets reflect the short-term spot market for electric energy, whereas retail rates reflect longer-term, fixed-price contracts. The relationship between wholesale costs and retail rates will also vary with the retail power procurement policies of each utility and state. Understanding these differences is essential when comparing the two markets.

Table 2 shows the range of wholesale market costs for the 12 months ending December 2012, December 2013, December 2014, and December 2015 (calendar years 2012, 2013, 2014, and 2015) among the New England states and the range of residential retail power supply rates in effect immediately following those time periods (January 1, 2013, January 1, 2014, January 1, 2015, and January 1, 2016) for each of the states with unbundled retail electricity markets.

Table 2
Wholesale Market Costs and Residential Retail Power Supply Rates^(a)

	Wholesale Market Costs (¢/kWh)	Effective Date of Residential Retail Power Supply Rates	Residential Retail Power Supply Rates ^(b) (¢/kWh)
January – December 2012	4.82 – 5.10	January 1, 2013	7.19 – 9.08
January – December 2013	6.75 – 7.23	January 1, 2014	6.81 – 9.56
January – December 2014	7.53 – 8.27	January 1, 2015	7.56 – 15.56
January – December 2015	5.43 – 5.78	January 1, 2016	6.56 – 11.85

(a) The analysis is based on a hypothetical residential consumer that uses 750 kWh per month. The values indicate a range of lowest to highest costs among the states.

(b) The range of residential retail power supply rates includes the states that have unbundled retail electricity markets. Vermont has not unbundled its retail electricity market; therefore, its rates are not included as part of this analysis.

Additional results of the analysis are as follows:

- From 2014 to 2015, wholesale market costs decreased 28 to 30% in all of the New England states, largely because of decreases in wholesale energy costs during 2015. All of the New England states (with unbundled retail electricity markets) saw a decrease in power supply rates effective January 1, 2016, compared to power supply rates effective January 1, 2015.

- All but one of the New England states saw a decrease in total residential retail electricity rates from January 1, 2015 to January 1, 2016. These rates include costs for power supply, transmission, distribution, and all other delivery service charges.⁵⁹
- The estimated *regional* transmission rate increased by approximately 8% from 2014 to 2015 (from 1.3685 ¢/kWh in 2014 to 1.4754 ¢/kWh in 2015) and is equivalent to 7 to 10% of total residential retail electricity rates effective January 1, 2016, which ranged from 14.45 ¢/kWh to 21.53 ¢/kWh.⁶⁰
- A review of *actual* transmission rates for residential retail consumers in Connecticut, Massachusetts, Maine, New Hampshire, and Rhode Island effective January 1, 2016 shows that transmission represents 10 to 17% of the total residential retail electricity rate.⁶¹

⁵⁹ Total residential retail electricity rates effective January 1, 2015 ranged from 15.29 ¢/kWh to 24.20 ¢/kWh among the New England states. Total residential retail electricity rates effective January 1, 2016 ranged from 14.45 ¢/kWh to 21.53 ¢/kWh among the New England states.

⁶⁰ The regional transmission rate reflects the costs of reliability projects identified through the regional transmission planning process as providing a regional benefit. These costs are considered part of the regional network service (RNS). The regional transmission rate is calculated as the sum of all RNS charges for the specific period, divided by the total net energy for load for the same period. For 2015, the period is based on the 12 months ending December 31, 2015. The regional transmission rate is established by the region's transmission owners and is collected through ISO New England's *Transmission, Markets, and Services Tariff*. For more information, see <http://www.iso-ne.com/participate/rules-procedures/tariff> and <http://www.iso-ne.com/participate/support/faq/oatt-iso-tariff>.

The net energy for load is detailed at <http://www.iso-ne.com/isoexpress/web/reports/load-and-demand/-/tree/net-ener-peak-load>.

⁶¹ The difference between actual transmission rates for residential consumers and the regional transmission rate is the inclusion of local transmission costs and projects in the residential transmission rates. Additionally, methodologies to allocate transmission costs to residential customers are likely to vary by state and utility.

Section 7

New England Wholesale Electricity Costs

The annual wholesale costs of meeting consumer demand for electricity in New England can vary significantly. Total annual costs have ranged from a low of \$8 billion in 2012 to a high of nearly \$15 billion in 2008 over the past eight years (see Table 3).

Table 3
New England Wholesale Electricity Costs, 2008 to 2015
(in Millions and ¢/kWh)^(a)

	2008		2009		2010		2011		2012		2013		2014		2015 ^(g)	
	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh
Wholesale market costs																
Energy (LMPs)^(b)	\$12,085	9.1	\$5,884	4.6	\$7,284	5.6	\$6,695	4.9	\$5,193	3.9	\$8,009	6.0	\$9,079	6.9	\$5,909	4.5
Ancillaries^(c)	\$366	0.3	\$190	0.1	\$164	0.1	\$39	0.0	\$56	0.0	\$155	0.1	\$330	0.2	\$209	0.2
Capacity^(d)	\$1,505	1.1	\$1,768	1.4	\$1,647	1.3	\$1,345	1.0	\$1,195	0.9	\$1,057	0.8	\$1,063	0.8	\$1,110	0.8
Subtotal	\$13,956	10.5	\$7,842	6.1	\$9,095	7.0	\$8,079	5.9	\$6,444	4.8	\$9,220	6.9	\$10,472	8.0	\$7,228	5.5
Transmission charges^(e)	\$869	0.7	\$1,155	0.9	\$1,417	1.1	\$1,378	1.0	\$1,532	1.1	\$1,806	1.3	\$1,815	1.4	\$1,954	1.5
RTO costs^(f)	\$124	0.1	\$116	0.1	\$145	0.1	\$130	0.1	\$139	0.1	\$167	0.1	\$165	0.1	\$165	0.1
Total	\$14,949	11.3	\$9,113	7.1	\$10,657	8.2	\$9,588	7.0	\$8,115	6.0	\$11,193	8.3	\$12,452	9.5	\$9,346	7.1

(a) Average annual costs are based on the 12 months beginning January 1 and ending December 31. Costs in millions = the dollar value of the costs to New England wholesale market load servers for ISO-administered services. Cents/kWh = the value derived by dividing the dollar value (indicated above) by the real-time load obligation. These values are presented for illustrative purposes only.

(b) Energy values are derived from wholesale market pricing.

(c) Ancillaries include first- and second-contingency Net Commitment-Period Compensation (NCPC), forward reserves, real-time reserves, regulation service, and a reduction for the Marginal Loss Revenue Fund.

(d) Capacity charges are those associated with the Forward Capacity Market.

(e) Transmission charges reflect the collection for transmission owners' revenue requirements and tariff-based reliability services, including black-start capability and voltage support. In 2015, the cost of payments made to these generators for reliability services under the ISO's tariff was \$41.9 million.

(f) RTO costs are the costs to run and operate ISO New England Inc.

(g) 2015 wholesale values are preliminary and subject to reconciliation.

The wholesale costs include the cost of traditional supply resources and demand resources and the annual cost of transmission investment to serve all the region's power needs. These costs also include the cost of all ISO functions to operate the power grid; administer the markets; implement the 10-year system planning process, including the interconnection of new generators and the qualification of new demand resources; and provide market monitoring oversight of participant behavior and in-depth market analysis and reporting. In the eight years between 2008 and 2015, the ISO's annual costs have ranged from \$116 million to \$167 million.

Wholesale electricity costs are paid for by market participants that purchase electricity from the wholesale market for their own use or to supply to retail customers. In turn, suppliers and utilities provide electricity to retail customers according to the retail market structures and requirements of the six New England states. Utilities charge retail customers for power supply through their monthly bills using the rates approved by the state or local public utilities commissions. Retail

customers share in the cost of regional transmission upgrades for reliability and generally pay for it over a 35- to 40-year period through the transmission rates in their retail bill.

In 2015, the total value of all wholesale electricity costs, including the cost of regional transmission upgrades and ISO operations, was approximately \$9.3 billion. Allocating this cost across the load served at a wholesale level (real-time load obligation) in 2015 yields a rate of 7.1 ¢/kWh.