



Consumer Liaison Group  
Coordinating Committee

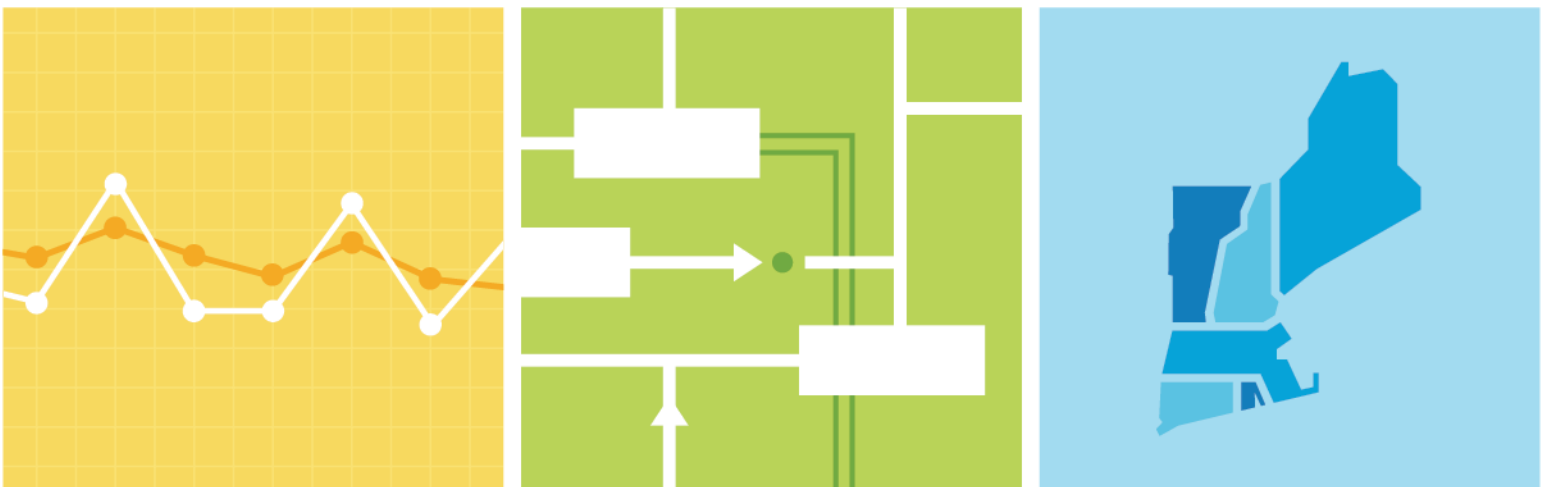
# 2017 Report of the Consumer Liaison Group

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

FEBRUARY 28, 2018

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# Section 1

## Statement from the Consumer Liaison Group Coordinating Committee

Dear Reader,

Welcome to the *2017 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 ninth 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 2016, the CLGCC held a Coordinating Committee election for the 2017–2018 term. New Coordinating Committee members were added to represent Connecticut and Rhode Island. Rebecca Tepper, Chief of the Energy and Telecommunications Division of the Massachusetts Attorney General's Office, continues to serve as Chair of the CLGCC.

ISO New England's information flow to the CLG is instrumental to fulfilling CLG's mandate to provide for greater understanding of the ISO's activities and decision-making processes and the potential cost impacts of its decisions and initiatives on consumers. 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 consumers on the issues that concern them, including potential changes to the power system and the wholesale markets that might allow consumers to participate more profitably, purchase less expensively, and operate more efficiently.

For 2018, the CLGCC's goals are to:

1. Increase dialogue and improve communication between ISO and the CLG
  - a. Meet with ISO to identify additional avenues of communication (e.g., increasing direct access to ISO personnel at CLG meetings, establishing a CLG/ISO Board relationship)

- b. 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 among consumers and other stakeholders to and from the ISO
- 2. Enhance communications between the CLGCC and the CLG
  - a. Update methods of communication (e.g., CLG twitter feed, possible recordings of the meetings)
  - b. Proactively solicit additional feedback from the CLG (suggestion cards, evaluations)
- 3. Engage the ISO in providing assistance to the CLG to enhance the CLG's presentation of the impacts on consumer costs and energy choice, as well as the New England electric power system, of proposed and newly enacted wholesale market and state policy actions
- 4. Ensure that CLG meeting topics and presentations address consumer cost impacts and, where possible, provide information on potential mechanisms to mitigate increased costs in an understandable and useful manner

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.

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

Sincerely,

Rebecca Tepper (MA)  
 Chair, Consumer Liaison Group Coordinating Committee  
 Chief, Energy and Telecommunications Division  
 Massachusetts Attorney General's Office  
[rebecca.tepper@state.ma.us](mailto:rebecca.tepper@state.ma.us)

Meredith Angwin (VT)  
 Owner  
 Carnot Communications  
[mjangwin@earthlink.net](mailto:mjangwin@earthlink.net)

Neil Beup (CT)  
 Director, Government Relations  
 Praxair, Inc.  
[Neil\\_Beup@Praxair.com](mailto:Neil_Beup@Praxair.com)

Robert Espindola (MA)  
 Energy Systems Program Manager  
 Acushnet Company  
[bob\\_espindola@acushnetgolf.com](mailto:bob_espindola@acushnetgolf.com)

August Fromuth (NH)  
 Managing Director  
 Freedom Energy Logistics  
[energy49@comcast.net](mailto:energy49@comcast.net)

Douglas Gablinske (RI)  
 Executive Director  
 The Energy Council of Rhode Island  
[doug@tecri.org](mailto:doug@tecri.org)

Agnes Gormley (ME)  
 Deputy Public Advocate  
 Office of the Maine Public Advocate  
[agnes.gormley@maine.gov](mailto:agnes.gormley@maine.gov)



Guy Page (VT)  
Communications Director  
Vermont Energy Partnership  
[page@vtep.org](mailto:page@vtep.org)

Joseph Rosenthal (CT)  
Principal Attorney  
Connecticut Office of Consumer Counsel  
[joseph.rosenthal@ct.gov](mailto:joseph.rosenthal@ct.gov)

Carter Wall (RI)  
Managing Director  
Franklin Beach Energy  
[cwall@franklinbeachenergy.com](mailto:cwall@franklinbeachenergy.com)

Robert Rio (MA)  
Senior Vice President, Government Affairs  
Associated Industries of Massachusetts  
[rrio@aimnet.org](mailto:rrio@aimnet.org)

Mary Smith (MA)  
Associate Director of Energy Supply and  
Utility Administration, Harvard University  
[mary\\_h\\_smith@harvard.edu](mailto:mary_h_smith@harvard.edu)

*Note: Coordinating Committee members' affiliations are listed for identification purposes only.*

## 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 improves its 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.

The Consumer Liaison Group is governed by a Coordinating Committee that sets the agenda for four quarterly meetings each year. The Coordinating Committee selects the topics and speakers featured at these meetings. ISO New England facilitates the meetings and communications among CLG participants. Consumer Liaison Group meetings provide a forum to share information on regional electricity issues, but they are not intended to be a substitute for end-user or consumer groups that wish to weigh in on items under discussion at the Planning Advisory Committee (PAC) or the New England Power Pool (NEPOOL) committees.<sup>1</sup>

#### 2.1 Objectives

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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

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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

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<sup>1</sup> The Planning Advisory Committee is an open stakeholder forum that provides input and feedback to ISO New England on the regional system planning process. More information on the PAC is available at <http://www.iso-ne.com/committees/planning/planning-advisory>. The New England Power Pool 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 on NEPOOL is available at [www.nepool.com](http://www.nepool.com).

industry associations, chambers of commerce, individual businesses, trade groups, nonprofit organizations, and other end users. Because the CLG is an open forum, several NEPOOL members and state regulators are also regular, active participants in CLG discussions.

CLG meetings attract a diverse group of approximately 75–100 attendees, both in person and via teleconference. CLG meetings follow the same general format:

- Opening remarks from a keynote speaker—typically, an industry or business executive, policymaker, or regulator—who provides a unique perspective on a particular topic or issue
- An update, by a representative from the ISO, on regional energy issues and initiatives that have or will be taking place at NEPOOL and ISO stakeholder meetings that may have an impact on electricity prices
- A panel discussion that provides different perspectives on a particular issue, facilitated by a moderator (panelists have included representatives from industry, the ISO, regulators, and consumer groups)

## 2.3 Governance

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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.<sup>2</sup>

The CLGCC consists 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 consumers (residential, commercial, and industrial) 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 CLGCC members are listed on pages 9 and 10. The ISO designates a point of contact within its External Affairs Department to work with the CLGCC.

## 2.4 Information and Communications

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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, and other valuable information.<sup>3</sup> This practice ensures that the body of information developed through

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<sup>2</sup> 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](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).

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

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.<sup>4</sup>

Additionally, in 2012, the ISO launched *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 ISO Express.<sup>5</sup> 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 online newsletter—the *ISO Newswire*—and subscribe to the mailing list to receive a monthly email highlighting some of the most recent articles.<sup>6</sup> Likewise, ISO New England's Regional Energy Outlook, issued at the beginning of each year, is a valuable source of information on current trends and issues affecting the regional electric power grid.<sup>7</sup>

Finally, ISO New England'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 of interest to consumers.<sup>8</sup>

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

<sup>5</sup> *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/>.

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

<sup>7</sup> The *2018 Regional Electricity Outlook* is available at <https://www.iso-ne.com/about/regional-electricity-outlook> and [https://www.iso-ne.com/static-assets/documents/2018/02/2018\\_reo.pdf](https://www.iso-ne.com/static-assets/documents/2018/02/2018_reo.pdf).

<sup>8</sup> The ISO's monthly memos are posted at <http://www.iso-ne.com/committees/industry-collaborations/consumer-liaison>.

## Section 3

### Consumer Liaison Group Meeting Summaries for 2017

In 2017, the Consumer Liaison Group held four quarterly meetings on issues of importance to electricity consumers in New England. The members of the CLG Coordinating Committee selected the topics, special guest speakers, moderators, and panelists featured at these meetings.

The topics discussed in 2017 were wide-ranging and diverse, including issues relating to nuclear power, distributed generation (DG), energy storage, and the role of public policy in transmission planning.<sup>9</sup> At the first quarterly meeting, attendees heard about the role that nuclear energy plays in the United States and differing views on the future of nuclear power in New England. In June, representatives from the solar industry, the ISO, and state government discussed the impacts investments in distributed solar have had on the New England electric grid. In September, the CLG focused on transmission planning now that FERC Order No. 1000 has been fully implemented.<sup>10</sup> At the end of the year, the CLG addressed the growing interest in energy storage in New England.

The four CLG meetings held in 2017 featured the following topics:

- **March 2:** The Role of Nuclear Power in New England—Reliability, Carbon Reduction, and Market Prices  
Meeting location: Westborough, Massachusetts
- **June 1:** Understanding Distributed Generation’s Impact on Grid Operations and Regional Planning  
Meeting location: York, Maine
- **September 7:** New England Transmission in a FERC Order 1000 World: Where Are We?  
Meeting location: Woodstock, Vermont
- **December 8:** The Future of Energy Storage in New England: What it Means for Customers  
Meeting location: Boston, Massachusetts

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

The following summaries capture the general discussions taking place at CLG meetings in 2017. They are not intended to capture every discussion and do not necessarily reflect the views of the ISO or the CLG Coordinating Committee.

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<sup>9</sup> DG resources are on-site, “behind-the-meter” sources of electric energy.

<sup>10</sup> FERC, *Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities*, Order No. 1000, 18 CFR Part 35, 136 FERC ¶ 61,051 (July 21, 2011).

### 3.1 March 2: The Role of Nuclear Power in New England—Reliability, Carbon Reduction, and Market Prices

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Meeting objective: Discuss the role of nuclear power in New England, particularly its impacts on reliability, carbon reduction, and market prices

#### 3.1.1 Special Guest Speaker: Matthew Wald, Senior Communications Advisor, Nuclear Energy Institute

Keynote speaker Matthew Wald of the Nuclear Energy Institute—a trade association headquartered in Washington, DC—argued that the United States will not be able to achieve its carbon emission goals without nuclear power. Without some sort of corrective action, Wald argued, America’s nuclear plants will be driven to early retirement, resulting in significant economic and environmental harm to communities and ratepayers.<sup>11</sup> Wald discussed the causes of the nuclear industry’s problems, possible solutions, and some of the innovations underway in the industry.

Specifically, Wald said that the subsidization of renewables and the availability of low-priced natural gas have driven energy prices so low that nuclear plants cannot remain competitive in the energy market. He argued that wholesale electricity markets do not sufficiently value the diversity that nuclear plants provide. If the nuclear plants retire, he said, they will be replaced by natural gas-fired plants that will increase carbon emissions and be more expensive than keeping operational the nuclear plants that currently comprise more than 60% of the country’s non-carbon electricity generation.

Wald took questions from the audience on the role of fuel diversity in wholesale electricity markets, the technical limitations of nuclear plants’ cooling systems, matters regarding nuclear waste, the storage of nuclear waste, and carbon sequestration.

#### 3.1.2 Panel Discussion

**Meredith Angwin**, a member of the CLG Coordinating Committee, moderated a panel of energy industry representatives to discuss the role of nuclear power in New England. Panelists included William Berg, vice president of Wholesale Market Development at Exelon Corporation; Peter Fuller, vice president of Market and Regulatory Affairs at NRG Energy, Inc.; and Dr. Gilbert Brown, emeritus professor at the University of Massachusetts Lowell.

**William Berg** said that his company’s generation fleet, which is a mix of nuclear, natural gas, hydro, wind, and solar, is one of the cleanest in the country. He said that the company believes nuclear generators should be compensated for their carbon-free environmental attributes. Accordingly, the company supports a national carbon tax and believes that the New England power markets should also put a price on carbon. To that end, Exelon is participating in NEPOOL’s Integrating Markets and Public Policy (IMAPP) process, which is a collaborative effort to harmonize state environmental goals and wholesale market objectives.

**Peter Fuller** explained that his company’s fleet is also trying to decarbonize but does not believe that policymakers should subsidize power plants that would not otherwise recover their costs in the region’s competitive markets. Competitive wholesale markets have worked effectively, driving down prices and carbon emissions, Fuller said, but they only work because market actors have clear boundaries within which to operate. If policymakers undermine certainty in the wholesale markets, they will erode the

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<sup>11</sup> Matthew Wald, “The Cloudy Face of the Electricity Future,” CLG presentation (March 2, 2017). [https://www.iso-ne.com/static-assets/documents/2017/03/clg\\_meeting\\_wald\\_keynote\\_presentation\\_march\\_02\\_2017.pdf](https://www.iso-ne.com/static-assets/documents/2017/03/clg_meeting_wald_keynote_presentation_march_02_2017.pdf).

effectiveness of the markets, Fuller said. NRG also intends to continue to participate in NEPOOL's IMAPP process, he said.

**Dr. Gilbert Brown** argued that increasing the quality of life around the world will require increasing levels of electrification, and if the United States wants to combat climate change, it is imperative to continue to expand the use of nuclear generation. Brown said that no one technology is perfect, but that from a reliability, environmental, safety, and economic point of view, nuclear is superior to other sources of electric power generation.<sup>12</sup>

At the conclusion of the presentations, Matthew Wald joined the group for a question-and-answer session. Topics included public perceptions concerning the safety of nuclear energy, pending legislation in Connecticut regarding nuclear power, and carbon pricing.

### 3.1.3 ISO New England Update

External affairs representative **Mary Louise Nuara** provided the ISO New England update.<sup>13</sup>

- The CLG Coordinating Committee and the ISO had recently published the **2016 Report of the Consumer Liaison Group**, which summarizes the activities of the CLG in 2016. The ISO also recently released several other publications, including the **2017 Regional Electricity Outlook**, which provides an in-depth look at trends and challenges facing the New England power system.
- **Preliminary wholesale electricity costs** for 2016 were the lowest the region had seen since 2003, the year the markets were launched in their current form (see Section 7).
  - The low costs were largely due to low natural gas prices and mild weather that dampened electricity demand.
  - The total value of the energy market was **\$4.1 billion**, which is about 66% lower than the **\$12.1 billion** value—and high water mark—of the same market in 2008. (For more details, see Section 7.)
- The ISO was in the process of developing the **2017 Regional System Plan** (RSP) to identify the region's electricity needs and plans for meeting them over the next decade. System planning is one of the ISO's primary responsibilities as an RTO.
- New England's **11th Forward Capacity Auction (FCA #11)** was held on February 6, 2017, to procure the capacity resources needed to meet the region's electricity demand from June 1, 2020, to May 31, 2021.
- To provide context for the meeting, Nuara explained that **nuclear power accounts for more than 4,000 megawatts (MW) (roughly 13%) of installed generating capacity in New England** and about 31% of all electric energy production in the region.

Nuara responded to questions relating to the 2016/2017 Winter Reliability Program, explaining that the ISO administered the program, as in prior years, to mitigate the reliability risks associated with inadequate fuel supplies during extreme cold weather conditions.

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<sup>12</sup> Dr. Gilbert Brown, "Contextualizing Nuclear," CLG presentation (March 2, 2017), [https://www.iso-ne.com/static-assets/documents/2017/03/clg\\_meeting\\_brown\\_panelist\\_presentation\\_march\\_02\\_2017.pdf](https://www.iso-ne.com/static-assets/documents/2017/03/clg_meeting_brown_panelist_presentation_march_02_2017.pdf).

<sup>13</sup> Mary Louise Nuara, "ISO New England Update," CLG presentation (March 2, 2017), [https://www.iso-ne.com/static-assets/documents/2017/03/clg\\_meeting\\_nuara\\_iso\\_update\\_presentation\\_march\\_02\\_2017.pdf](https://www.iso-ne.com/static-assets/documents/2017/03/clg_meeting_nuara_iso_update_presentation_march_02_2017.pdf).

## 3.2 June 1: Understanding Distributed Generation's Impact on Grid Operations and Regional Planning

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Meeting objective: Discuss the impact of distributed generation on grid operations and regional planning

### 3.2.1 Special Guest Speaker: Timothy Schneider, Public Advocate, Maine Office of the Public Advocate

Keynote speaker **Timothy Schneider**, appointed in 2013 to a four-year term by Governor Paul LePage, described efforts his office conducted with a variety of stakeholders to move beyond solar net metering, which he said is not a suitable long-term policy for distributed energy resources. He also commented on the challenges of getting solar into the market and working with the ISO and other stakeholders to understand how to lessen the barriers to solar participation in wholesale markets. Schneider observed that Maine lags the region and the nation with solar installations due to a lack of policy support. He explained that the state's status as a "late mover" on solar created an opportunity to learn from other states and craft a comprehensive approach. Ultimately, however, legislation he supported to bring this about was vetoed in 2016. Schneider, who focused his remarks on lessons learned trying to craft state policy on distributed energy, noted that early in his term, he was publicly critical of the ISO for not more quickly accounting for state-supported investments in distributed energy in the region's long-term load forecast. However, Schneider said he has come to appreciate the work of the Distributed Generation Forecast Working Group (DGFWG). It's "far from perfect," he said, "but New England is leading the country" on the interactions of distributed energy resources with the bulk electric system.

Schneider also noted that large expansions of distributed generation on state distribution systems, such as the recent and rapid buildout of solar photovoltaic (PV) resources in New England, can create operational challenges for grid operators, including ISO New England. In particular, he pointed out the steep ramp in system load that occurs later in the day when solar resources go off line. Because of these challenges, the states and the ISO are facing a situation that could undermine the ability of both to achieve their objectives. For example, he said, ISO New England is obligated to take a technology-neutral approach to govern wholesale electricity markets. However, states, such as Maine, often take a different approach and select specific resource types, such as solar PV, to achieve specific environmental and economic development goals through legislation and ratemaking. Schneider explained some of the unintended consequences that result from these two approaches to energy policy.

Schneider said that when trying to craft state solar policy, net metering can be an unsuitable tool for a variety of reasons. For example, net metering often involves long-term contracts that can outlive their efficacy for the consumers who are paying for them. Schneider said every state is wrestling with this issue and he urged the ISO to continue to modify its rules around the reality of increasing amounts of distributed resources.

He concluded his remarks by saying that consumers benefit when different stakeholders collaborate, and that the DGFWG is a good example of that. He said he is encouraged by the ongoing regional efforts to solve these complex challenges.

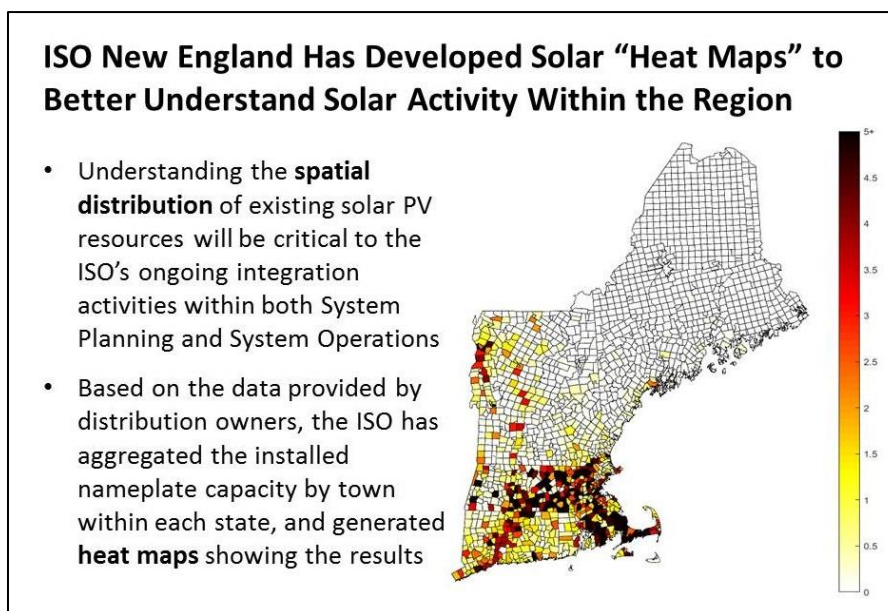
### 3.2.2 Panel Discussion

**Agnes Gormley**, who is deputy public advocate at the Maine Office of the Public Advocate and a member of the CLG Coordinating Committee, moderated a panel of energy industry representatives to discuss the impact that distributed generation is having on grid operations and regional planning.



Panelists included **Jonathan Black**, manager, Load Forecasting, System Planning, ISO New England; **Timothy Roughan**, director of Energy and Environmental Policy, National Grid; **D. Maurice Kreis**, consumer advocate, New Hampshire Office of the Consumer Advocate; and **Fortunat Mueller**, P.E., cofounder and managing partner, ReVision Energy.

**Jonathan Black** explained that New England has experienced significant growth in solar PV resources, more are expected, and that the ISO is leading efforts to account for PV resources connected to the distribution system.<sup>14</sup> Black explained that ISO New England’s PV forecast is an iterative process, with methodology and policy inputs updated annually. He said that PV resources are having a significant impact on regional operations and planning, including both short- and long-term load forecasting and the timing of the peak energy use in New England. Refer to Figure 3-1.



**Figure 3-1: Spatial distribution of distributed solar resources in New England.**

**Note:** The legend shows the nameplate of megawatts installed per town.

**Timothy Roughan** discussed the variety of ways that more than 700 MW of solar have been deployed on the National Grid distribution system, explaining that the commercial applications account for less than 10% of the installations but 75% of the connected capacity.<sup>15</sup> He said that solar has become so popular that National Grid sees about as many applications for distributed generation as it does for natural gas.

**D. Maurice Kreis** listed “10 Consumer-Oriented Hypotheses” regarding distributed generation.<sup>16</sup> They include the idea that distributed generation should be valued in ways similar to large infrastructure,

<sup>14</sup> Jon Black, “Understanding the Impact of Behind-the-Meter Solar on Grid Operations and Regional Planning,” CLG presentation (June 1, 2017), [https://www.iso-ne.com/static-assets/documents/2017/05/clg\\_meeting\\_black\\_panelist\\_presentation\\_june\\_1\\_2017\\_final.pdf](https://www.iso-ne.com/static-assets/documents/2017/05/clg_meeting_black_panelist_presentation_june_1_2017_final.pdf).

<sup>15</sup> Timothy Roughan, “National Grid: Advancing Integration of Distributed Generation,” CLG presentation (June 1, 2017), [https://www.iso-ne.com/static-assets/documents/2017/05/clg\\_meeting\\_roughan\\_panelist\\_presentation\\_june\\_1\\_2017\\_final.pdf](https://www.iso-ne.com/static-assets/documents/2017/05/clg_meeting_roughan_panelist_presentation_june_1_2017_final.pdf).

<sup>16</sup> D. Maurice Kreis, “Understanding Distributed Generation’s Impact on Grid Operations and Regional Planning Ten Consumer-Oriented Hypotheses,” CLG presentation (June 1, 2017), [https://www.iso-ne.com/static-assets/documents/2017/05/clg\\_meeting\\_kreis\\_panelist\\_presentation\\_june\\_1\\_2017\\_final.pdf](https://www.iso-ne.com/static-assets/documents/2017/05/clg_meeting_kreis_panelist_presentation_june_1_2017_final.pdf).

such as transmission lines. He argued that utilities need to be incentivized to more fully value distributed generation. He said that NEPOOL conversations need to give more consideration to the needs of moderate- and low-income electricity consumers.

**Fortunat Mueller** said that it is important to decarbonize the economy by electrifying the transportation and heating sectors and ensuring that more renewable resources come on line to power these needs.<sup>17</sup> He said that his customers see solar as a gateway to distributed energy resources and that many opportunities exist for innovation through resources such as solar, storage, efficiency, and electric vehicle charging. Mueller also said he believes the technology and science already exist to provide consumers with the services they want, with the environmental attributes they want, and that regulation and policies need to change to support their use.

The topics for the question-and-answer period ranged from a clarification of the ISO's solar forecasting process to the potential impacts of strategic electrification, such as the increased use of heat pumps and electric vehicles.

### 3.2.3 ISO New England Update

Anne George, vice president for External Affairs and Corporate Communications at ISO New England, provided the ISO New England update:<sup>18</sup>

- ISO New England issued its **2017 Summer Outlook**, saying the region was expected to have adequate electricity supplies to meet consumer demand in summer 2017 but that tight supply margins could develop if forecasted peak conditions occurred.
- **Integrating Markets and Public Policy (IMAPP)** discussions were continuing, with ISO New England releasing a conceptual approach that can be implemented in the near term. The design accomplishes the following:
  - Accommodates subsidized resources in the Forward Capacity Market over time
  - Preserves competitive capacity price signals for unsubsidized resources needed to maintain resource adequacy
  - Builds on—but does not replace—the capacity market framework in New England

The ISO's discussions with stakeholders included a presentation at the June NEPOOL Markets Committee meeting.<sup>19</sup> The ISO was planning to file tariff revisions in December 2017, with the aim for any revisions to be in place in time for FCA #13, which will be run in February 2019.

- ISO New England's Internal Market Monitor, which reports directly to the ISO board of directors, released the *2016 Annual Markets Report*, stating the wholesale markets operated competitively in 2016.

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<sup>17</sup> Fortunat Mueller, CLG presentation (June 1, 2017), [https://www.iso-ne.com/static-assets/documents/2017/05/clg\\_meeting\\_mueller\\_panelist\\_presentation\\_june\\_1\\_2017.pdf](https://www.iso-ne.com/static-assets/documents/2017/05/clg_meeting_mueller_panelist_presentation_june_1_2017.pdf).

<sup>18</sup> Anne George, "ISO New England Update," CLG presentation (June 1, 2017), [https://www.iso-ne.com/static-assets/documents/2017/05/clg\\_meeting\\_george\\_iso\\_update\\_presentation\\_june\\_1\\_2017\\_final.pdf](https://www.iso-ne.com/static-assets/documents/2017/05/clg_meeting_george_iso_update_presentation_june_1_2017_final.pdf).

<sup>19</sup> Christopher Geissler, "Competitive Auctions with Subsidized Policy Resources: The ISO's Proposed Approach to Balancing Wholesale Markets and States' Policies," NEPOOL Markets Committee Meeting presentation (June 17, 2017), [https://www.iso-ne.com/static-assets/documents/2017/06/a5\\_presentation\\_competitive\\_auctions\\_with\\_subsidized\\_policy\\_resources.pptx](https://www.iso-ne.com/static-assets/documents/2017/06/a5_presentation_competitive_auctions_with_subsidized_policy_resources.pptx).

- The total value of the region’s wholesale electric energy market, at \$4.1 billion in 2016, was down 30% from the 2015 value of \$5.9 billion and was the lowest annual energy market value since 2003, the year New England’s wholesale energy markets were launched in their current form.
- The decline in wholesale power prices mirrored a **34% decline** in the average price of natural gas year-over-year, which is the fuel used most often to generate electricity in New England.
- ISO New England was in the process of analyzing the **fuel-security challenges** to the **continued reliability** of New England’s power system:<sup>20</sup>
  - In this context, fuel security refers to the ability of power plants to have or obtain the fuel required to generate electricity, especially during the winter peak season.
  - The study was examining more than a dozen cases of generating resource and fuel-mix combinations to quantify each case’s fuel-security risk (i.e., the number and duration of energy shortfalls that could occur during the entire winter period in 2025 and would require the implementation of emergency procedures to maintain reliability.)
  - The study is not focused on the effects of expanded access to natural gas and does not identify the need for new or expanded pipeline capacity or natural gas infrastructure.
  - The ISO is presenting the results to regional stakeholders for discussion and input and is working with stakeholders to determine whether further operational or market design measures will be needed to address the fuel security risk.

George responded to questions from the audience on topics including the changing times of the summer peak, the cost of transmission infrastructure, and points of clarification regarding the fuel-security study.

### **3.3 September 7: New England Transmission in a FERC Order No. 1000 World: Where Are We?**

Meeting objective: Update stakeholders on the implementation of the Federal Energy Regulatory Commission’s (FERC) *Order on Transmission Planning and Cost Allocation* (Order No. 1000) in New England

#### **3.3.1 Special Guest Speaker: Phil Scott, Governor of Vermont**

Governor Scott explained that one in every 16 workers in Vermont, about 6%, is employed by the clean energy sector, which he said is the highest per-capita rate of such employment in the nation. He said the state has a goal to meet 90% of its total energy needs from renewables by 2050. Although he said that sounds “daunting,” he believes it is an achievable goal. He noted the impact of the state’s investment in solar generation, saying that Vermont’s lowest electricity load is now in the middle of the afternoon, not at night when everyone is asleep, because so much of the state’s demand is met through solar installed on the distribution system.

Governor Scott shared some takeaways on electric vehicles from a meeting with Elon Musk, the cofounder and chief executive officer (CEO) of Tesla, Inc., who addressed the National Governors

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<sup>20</sup> For more information on the results of the ISO’s *Operational Fuel-Security Analysis*, which was released in January 17, 2018, see Section 5.1.2 of this report, ISO New England Activities and Initiatives.

Association this summer in Rhode Island. Musk told the governors that within 10 years, about 50% of the vehicles on the road will be electric, and within 20 years, this figure would rise to about 90%. Scott said that as communities begin to increase their use of electricity to decarbonize heating and transportation sectors, it will be important to avoid increasing peak demand or making New England less competitive because of high energy costs. It is also important, he said, to ensure we do not harm the most vulnerable by creating regressive policies. He touted the state's long energy partnership with Québec and discussed the benefits of the New England Clean Power Link.

He shared some of his personal background with the attendees, such as how his father, a double amputee, died of his wounds suffered in the D-Day invasion when Scott was only 11. He lamented the state of public discourse in the United States, saying he feels like a new issue each week divides the country that could have united it. A great threat to the United States, he said, is inside our borders, with the idea that compromise is unacceptable. He then shared what he said were the major lessons he has learned from his years in public service:

- Remember the Golden Rule and to “Tweet others the way you want to be tweeted.”
- Understand that how we act when we are not in the spotlight is just as important as how we act when we're center stage or center field.
- Understand the importance of integrity because it is how we will be remembered when our careers are over.
- If we listen to, and learn from, all people with different perspectives, we will be more effective leaders who will build bridges. It will help us do challenging things like move to a clean energy economy.

Scott's questions from the audience were about the challenges associated with siting renewable energy infrastructure and the opportunities for regional collaboration to enhance the economy.

### 3.3.2 Panel Discussion

**Guy Page**, communications director for Vermont Energy Partnership and a member of the CLG Coordinating Committee, served as moderator.

Panelists included **Jason Marshall**, general counsel at the New England States Committee on Electricity (NESCOE); **Mary Ellen Paravalos**, vice president for ISO, Siting, and Compliance at Eversource Energy; **Colin Owyang**, general counsel and corporate secretary at Vermont Electric Power Company (VELCO); **Donald Jessome**, chief executive officer at Transmission Developers Inc. (TDI).

**Jason Marshall** provided a history of FERC Order No. 1000 and the status of its implementation in New England.<sup>21</sup> He explained some of the legal challenges around the order in New England and some of the perspectives of the New England states. Marshall said that the high-level objective of Order No. 1000 was to improve transmission planning processes and cost-allocation mechanisms and ensure just and reasonable rates. Nationally, he said, it was meant to shift from utility company service-territory decisions to greater regional and interregional coordination and competition. He also described some implications of recent federal appeals court and US Supreme Court decisions on the implementation of

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<sup>21</sup> Jason Marshall, “Order 1000 in New England,” CLG presentation (June 7, 2017), [https://www.iso-ne.com/static-assets/documents/2017/09/clg\\_meeting\\_marshall\\_panelist\\_presentation\\_september\\_7\\_2017\\_final.pdf](https://www.iso-ne.com/static-assets/documents/2017/09/clg_meeting_marshall_panelist_presentation_september_7_2017_final.pdf).

the order. Marshall provided closing thoughts on cost containment and projects exempt from competition in New England. (Refer to 5.2.3 for more information on FERC Order No. 1000).

**Mary Ellen Paravalos** explained the reliability, economic, and environmental benefits of transmission upgrades.<sup>22</sup> Such benefits, she said, include a reduced risk of dangerous blackouts, the dispatch of lower-cost power plants, and the connection of renewable energy. She also described the benefits of Eversource’s proposed Northern Pass Transmission line, which would transport 1,090 MW of electricity from Québec through New Hampshire into the New England power grid.

**Donald Jessome** told the group that efforts to build transmission have been stalled because of a lack of planning, a lack of cost-allocation methods, and impediments in siting.<sup>23</sup> He said that FERC Order No. 1000 offers opportunities to help address some of these challenges while also improving reliability and the integration of renewable resources and making energy markets more competitive. He explained the details of the State of Massachusetts’ request for proposals (RFP) for clean energy resources.<sup>24</sup> Jessome also described his company’s submission to that RFP process, the New England Clean Power Link, a 1,000 MW line that would run under Lake Champlain and bring energy from Canada into the New England power grid.

**Colin Owyang** explained that VELCO is unique in the region because it was formed by the state’s vertically integrated utilities, which together own a majority of the company today.<sup>25</sup> Thus, when large transmission lines, such as the New England Clean Power Link, are proposed, VELCO must look at them from the point of view of ratepayers. Owyang shared the principles that guide VELCO’s interactions and negotiations with developers. He also described the settlements VELCO has reached with the developers of three lines proposed to affect Vermont’s land or electric power system: two projects proposed by National Grid—the Vermont Green Line and the Granite State Power Link—and TDI’s New England Clean Power Link.

The questions for the panelists were on the impact of RFPs on consumer costs, the role of natural gas exports on the reliability of the electricity grid, and the challenges of siting energy infrastructure projects.

### 3.3.3 ISO New England Update

Anne George, vice president for External Affairs and Corporate Communications at ISO New England, provided the ISO New England update:<sup>26</sup>

- **Forward Capacity Auction #12**—This annual auction procures both supply and demand resources to meet New England’s forecasted capacity needs three years in the future and is

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<sup>22</sup> Mary Ellen Paravaolos, “Customer Benefits Provided by the Electric Transmission System,” CLG presentation (September 7, 2017), [https://www.iso-ne.com/static-assets/documents/2017/09/clg\\_meeting\\_paravalos\\_panelist\\_presentation\\_september\\_7\\_2017\\_final.pdf](https://www.iso-ne.com/static-assets/documents/2017/09/clg_meeting_paravalos_panelist_presentation_september_7_2017_final.pdf).

<sup>23</sup> Donald Jessome, CLG presentation, (September 7, 2017), [https://www.iso-ne.com/static-assets/documents/2017/09/clg\\_meeting\\_jessome\\_panelist\\_presentation\\_september\\_7\\_2017\\_final.pdf](https://www.iso-ne.com/static-assets/documents/2017/09/clg_meeting_jessome_panelist_presentation_september_7_2017_final.pdf).

<sup>24</sup> More information is available at <https://macleanenergy.com/>.

<sup>25</sup> Colin Owyang, CLG presentation, (September 7, 2017), [https://www.iso-ne.com/static-assets/documents/2017/09/clg\\_meeting\\_owyang\\_panelist\\_presentation\\_september\\_7\\_2017\\_final.pdf](https://www.iso-ne.com/static-assets/documents/2017/09/clg_meeting_owyang_panelist_presentation_september_7_2017_final.pdf).

<sup>26</sup> Anne George, “ISO New England Update,” CLG presentation (September 7, 2017), [https://www.iso-ne.com/static-assets/documents/2017/09/clg\\_meeting\\_george\\_iso\\_update\\_presentation\\_september\\_7\\_2017\\_final.pdf](https://www.iso-ne.com/static-assets/documents/2017/09/clg_meeting_george_iso_update_presentation_september_7_2017_final.pdf).

designed to encourage long-term investments needed for reliability. The ISO follows a series of processes leading up to the auction that include forecasting future electricity demand and determining how many capacity zones will be modeled in the auction. (The ISO has since submitted an informational filing to FERC in November 2017 regarding the auction and its processes, which in February 2018, procured the resources needed from June 1, 2021, to May 31, 2022). (Refer to Section 5.3.2 for more on FCA#12.)<sup>27</sup>

- **The Integrating Markets and Public Policy (IMAPP) project**—IMAPP is a stakeholder process that NEPOOL launched in 2016 to discuss potential market rule changes aimed at harmonizing the region’s wholesale electricity markets with the public policy goals of the New England states. ISO New England has offered a conceptual approach that could be implemented in the near term, called Competitive Auctions with Sponsored Policy Resources (CASPR). (The ISO has since sought feedback from stakeholders and discussed design details with the NEPOOL Markets Committee and filed tariff revisions with FERC in early 2018, with the aim for any approved market revisions to be in place in time for FCA #13, which will be run in February 2019.)<sup>28</sup> (Refer to Section 5.3.3 for more information on CSAPR.)
- **The 2018 budget**—ISO New England is a not-for-profit corporation that collects revenue from wholesale electricity market participants to fund the ISO’s operating expenses. As part of an annual, formal process, the ISO proposed an operating budget for 2018 that, before depreciation and true up, is projected to be \$164.6 million. That budget is \$5.7 million—or 3.5%—higher than the 2017 operating budget. If the ISO’s projected revenue requirement for 2018 was fully passed through to end-use customers, based on average consumption, their cost would average \$1.03 per month. Under the formal budget review process, the New England states have the opportunity to submit questions and comments to the ISO before the budget is voted on by the ISO board of directors in October. (The ISO has since filed the budget with FERC, as well as the questions and comments that came from stakeholders, on October 16, 2017, which FERC approved on January 1, 2018.)<sup>29</sup> (Refer to Section 5.4 for more information on the ISO’s budget process.)
- **FERC Order No. 1000**—As the New England’s Regional Transmission Organization (RTO), the ISO is required to identify transmission infrastructure solutions essential for maintaining power system reliability. In May 2015, the ISO implemented changes to the transmission planning process to comply with the directives of FERC Order No. 1000. George answered questions that included the causes of increased transmission costs in 2017, the process for public policy transmission upgrades, and the ability of transmission companies to recover the costs of storm damage. She also noted the benefits associated with transmission investments in addition to

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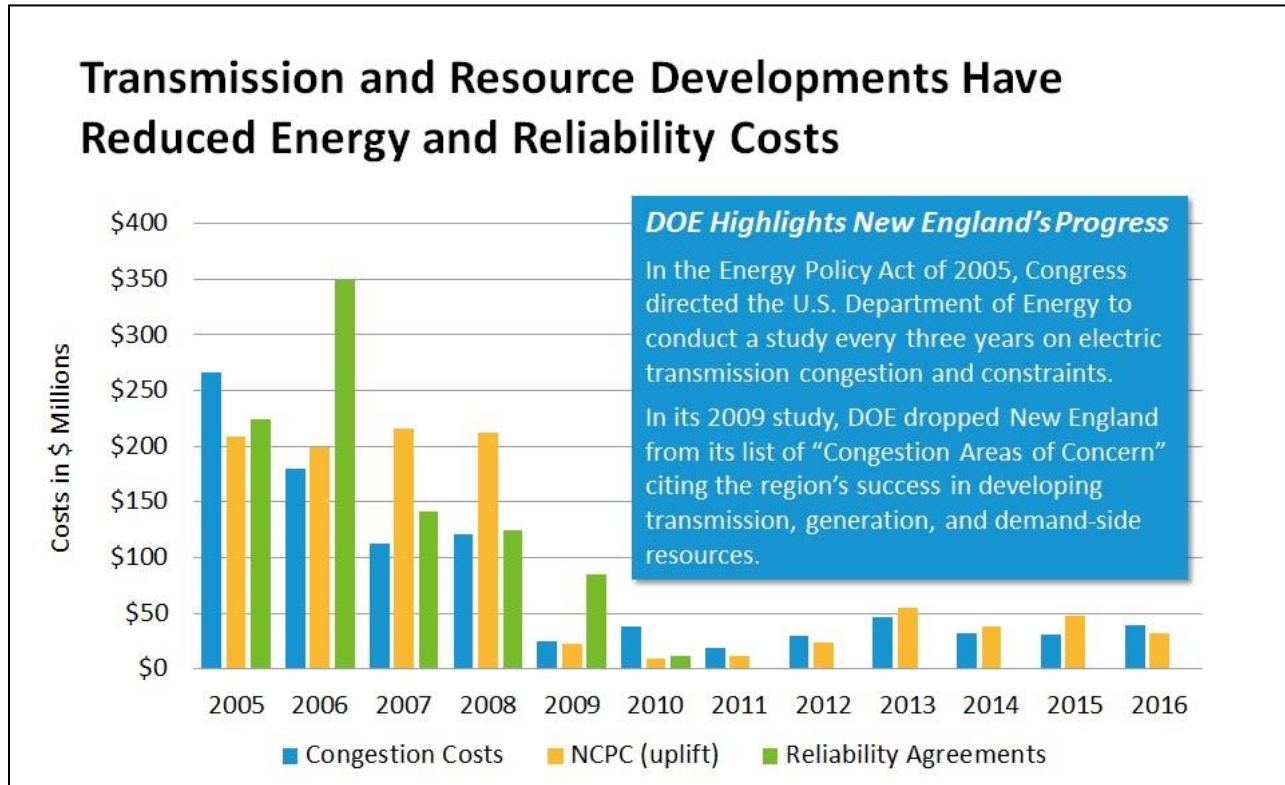
<sup>27</sup> Also refer to the ISO’s “Forward Capacity Market (FCA #12) Result Report” (February 7, 2018), [https://www.iso-ne.com/static-assets/documents/2018/02/fca\\_12\\_result\\_report.pdf](https://www.iso-ne.com/static-assets/documents/2018/02/fca_12_result_report.pdf).

<sup>28</sup> ISO New England, *Revisions to ISO-NE Tariff Related to Competitive Auctions with Sponsored Policy Resources*, Docket No. ER18-619-000, FERC filing (January 8, 2018), [https://www.iso-ne.com/static-assets/documents/2018/01/er18-619-000\\_caspr\\_filing.pdf](https://www.iso-ne.com/static-assets/documents/2018/01/er18-619-000_caspr_filing.pdf).

<sup>29</sup> ISO New England, *2018 Capital Budget and Revised Tariff Sheets for Recovery of 2018 Administrative Costs*, Docket No. ER18-77-000, FERC filing (October 16, 2017), [https://www.iso-ne.com/static-assets/documents/2017/10/2018\\_admin\\_and\\_capital\\_budget.pdf](https://www.iso-ne.com/static-assets/documents/2017/10/2018_admin_and_capital_budget.pdf), and *Revised Tariff Sheets for Recovery of Costs for the 2018 Operation of NESCOE*, Docket No. ER18-85-000 (October, 17, 2017), [https://www.iso-ne.com/static-assets/documents/2017/10/rec\\_of\\_costs\\_2018\\_nescoe.pdf](https://www.iso-ne.com/static-assets/documents/2017/10/rec_of_costs_2018_nescoe.pdf).



meeting reliability needs. See Figure 3-2. (Also refer to 5.2.3 for more information on Order No. 1000.)



**Figure 3-2: Congestion, uplift, and Reliability Agreement costs since 2005 (millions of \$).**

**Notes:** *Congestion* is a condition that arises on the transmission system when one or more restrictions prevent the economic dispatch of electric energy from serving load. *Net Commitment-Period Compensation* is a payment to an eligible resource that operated out of merit and did not fully recover its costs in the energy market. *Reliability Agreements* are special reliability contracts between the ISO and an approved generator whereby the generator continues to operate, even when it is not economical to do so, to ensure transmission system reliability.

**Sources:** Regional System Plans, ISO-NE Annual Markets Reports.

### 3.4 December 7: The Future of Energy Storage in New England: What it Means for Consumers

Meeting objective: Discuss recent developments in energy storage investment and policy and possible impacts on consumers in New England.

#### 3.4.1 Special Guest Speaker: Neil Chatterjee, Commissioner, Federal Energy Regulatory Commission

Commissioner Chatterjee discussed ongoing matters at FERC, including the introduction of a quorum of commissioners, the Department of Energy's (DOE's) Notice of Proposed Rulemaking (NOPR) on recommended wholesale market changes to provide cost-of-service payments to certain capacity resources, and his priorities for the commission.

- *Quorum*—Chatterjee explained that his arrival to the commission in August gave the agency a quorum, which it had lacked since February 2017. He served as chairman of FERC from his appointment until the morning of the CLG meeting, when President Donald Trump swore in Kevin J. McIntyre as the new chairman.

Much of Chatterjee’s work since August has been focused on reducing what he called a significant backlog of pending matters that had accrued in the months FERC lacked a quorum. He said that he believes that FERC will take on matters of increasing complexity over the next two years when it is not expected to have significant turnover.

Chatterjee, who served as energy policy advisor to US Senate Majority Leader Mitch McConnell (R-KY) before joining the commission, indicated that moving matters of significance through the legislative process in Washington, D.C. has become increasingly difficult over the last decade. Rather, federal energy policy is made through the tax code, in large spending bills, and at executive agencies throughout the federal government. Chatterjee said he believes that for policy changes to have a lasting impact, they need to be made by the legislative branch, not the executive branch. However, he indicated that FERC provides stability amid uncertainty and that the agency will not go in a dramatically different direction under its new leadership.

- *Department of Energy Notice of Proposed Rulemaking*—FERC is currently examining the US Department of Energy’s (Notice of Proposed Rulemaking (NOPR), which calls for compensation for the “resiliency attributes” of certain power plants.<sup>30</sup> Chatterjee told the audience that the questions posed in the DOE NOPR are serious and worth examining and that he and his colleagues at FERC are taking the matter seriously but that the challenges that DOE highlighted cannot be solved overnight. FERC is reviewing all the comments filed in the proceeding and could propose an interim solution pending a longer-term examination of the issues raised in the NOPR.<sup>31</sup>
- *Commissioner’s Priorities*—Chatterjee also shared some of his priorities for the next several years, including removing barriers for new technologies, such as energy storage and distributed energy resources. Making the agency more accessible to the public and ensuring that the nation’s grid is resilient against emerging threats such as those posed by cyberattacks are also high priorities.

Commissioner Chatterjee took questions from the audience on topics including the rates of return on natural gas pipeline infrastructure; improving permitting processes for infrastructure projects; and what Regional Transmission Organizations (RTOs) can do to improve transparency.

### 3.4.2 Panel Discussion

**Robert Espindola**, Energy Systems program manager at Acushnet Company, moderated the panel.

Panelists included **Christopher Parent**, director, Market Development, ISO New England; **Judith Judson**, commissioner, Massachusetts Department of Energy Resources; **Lewis Milford**, president, Clean Energy Group; and **Ted Ko**, director of Policy, Stem, Inc.

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<sup>30</sup> The DOE NOPR, called the “Grid Resiliency Pricing Rule,” directed FERC to make changes to wholesale electricity markets to provide full cost recovery to baseload resources with 90 days of on-site fuel storage, such as coal-fired and nuclear power plants. The NOPR’s premise was that the wholesale power markets do not adequately compensate the “resiliency attributes” of resources with on-site fuel. For more information, visit the US DOE website: <https://energy.gov/articles/secretary-perry-urges-ferc-take-swift-action-address-threats-grid-resiliency>.

<sup>31</sup> On January 8, 2018, FERC unanimously rejected the NOPR, noting that it did not sufficiently demonstrate that current wholesale markets are in violation of statutory standards, and therefore the NOPR docket must be terminated. The commission paired its rejection of the NOPR with the initiation of a new proceeding on bulk power system resiliency, directing the operators of the regional wholesale power markets to provide information as to whether FERC and the markets must take additional action on resilience. FERC asked market operators to respond by March 9, 2018.



**Christopher Parent** explained that battery storage can participate in the markets today and that the ISO has recently made rule changes to better integrate storage and other technologies into the markets. He also stated that the ISO is looking at further enhancements to better incorporate technologies into the markets and that the region will need flexible resources to help balance the quantities of wind and solar being added to the system.<sup>32</sup>

**Judith Judson** explained the Massachusetts' energy policy goal is to reduce and stabilize the rising cost of energy; continue the state's commitment to a clean energy future; and ensure safe, reliable, and resilient energy infrastructure.<sup>33</sup> She reviewed the state's Energy Storage Initiative, which dedicated funding for a study and demonstration projects, and discussed the unique challenges energy storage poses from a supply-chain point of view. She also explained recent legislation intended to foster the development of battery storage in Massachusetts. She also shared news about a recent announcement regarding \$20 million in grants awarded to 26 projects across the commonwealth.

**Lewis Milford** offered observations on energy storage in Massachusetts.<sup>34</sup> He said more than 50,000 customers could save up to \$720 million annually through investments in battery storage. He broke down the costs and savings of one specific solar PV and battery storage project at a 250-unit affordable housing project and compared and contrasted the different storage environments in California and Massachusetts.

**Ted Ko** explained the different components of an energy storage system, including both software and hardware.<sup>35</sup> He said customers are able to adopt the new systems with ease, and a variety of storage systems can be networked together to create "virtual power plants" without inconveniencing customers. He explained how utilities and grid operators can employ software for using storage devices to help maintain reliable operations.

The audience asked the panel to clarify the ways aggregated battery installations participate in the California wholesale markets and about Massachusetts' storage procurement targets and the rules regarding the ancillary services market.

### 3.4.3 ISO New England Update

Anne George, vice president of External Affairs and Corporate Communications for ISO New England, delivered the ISO update, providing information on the 2017/2018 winter season, Forward Capacity

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<sup>32</sup> Christopher Parent, "The Expanding Role of Energy Storage in the Regional Power System," CLG presentation, (December 7, 2017), [https://www.iso-ne.com/static-assets/documents/2017/12/clg\\_meeting\\_parent\\_panelist\\_presentation\\_december\\_7\\_2017\\_final.pdf](https://www.iso-ne.com/static-assets/documents/2017/12/clg_meeting_parent_panelist_presentation_december_7_2017_final.pdf).

<sup>33</sup> Judith Judson, CLG presentation, (December 7, 2017), [https://www.iso-ne.com/static-assets/documents/2017/12/clg\\_meeting\\_judson\\_panelist\\_presentation\\_december\\_7\\_2017\\_final.pdf](https://www.iso-ne.com/static-assets/documents/2017/12/clg_meeting_judson_panelist_presentation_december_7_2017_final.pdf).

<sup>34</sup> Lewis Milford, "Demonstrations to Markets: Some Observations on Energy Storage in Massachusetts," CLG presentation, (December 7, 2017), [https://www.iso-ne.com/static-assets/documents/2017/12/clg\\_meeting\\_milford\\_panelist\\_presentation\\_december\\_7\\_2017\\_final.pdf](https://www.iso-ne.com/static-assets/documents/2017/12/clg_meeting_milford_panelist_presentation_december_7_2017_final.pdf).

<sup>35</sup> Ted Ko, "Store, Save and Support: Energy Storage for Customers Today and Tomorrow," CLG presentation, (December 7, 2017), [https://www.iso-ne.com/static-assets/documents/2017/12/clg\\_meeting\\_ko\\_panelist\\_presentation\\_december\\_7\\_2017\\_final.pdf](https://www.iso-ne.com/static-assets/documents/2017/12/clg_meeting_ko_panelist_presentation_december_7_2017_final.pdf).

Auction #12, the ISO's *Operational Fuel-Security Analysis*, projected wholesale market costs for 2017, and the Competitive Auctions with Sponsored Policy Resources proposal:<sup>36</sup>

- **2017/2018 Winter**—The ISO expects **sufficient electricity supplies to meet consumer demand during the 2017/2018 winter season**, barring any unexpected resource outages or fuel-delivery constraints. The ISO will administer its fifth and final Winter Reliability Program this season. The program was designed to address fuel-delivery constraints into the region by providing compensation for some of the costs associated with unused oil inventories and unused liquefied natural gas (LNG) contract volumes at the end of the winter, as well as supplemental demand response.
- **FCA #12—Forward Capacity Auction #12** will take place in February 2018 to procure the capacity resources needed to meet the installed capacity target for the June 1, 2021, to May 30, 2022, capacity commitment period (see Sections 3.3.3 see 5.3.2). The ISO qualified 35,007 MW of existing capacity resources and 5,605 MW of new capacity resources to compete in the auction to satisfy the capacity target, which is 33,725 MW. The auction modeled three capacity zones:
  - Northern New England, including Vermont, New Hampshire, and Maine
  - Southeastern New England, including the Northeast Massachusetts (NEMA)/Boston zone and Southeast Massachusetts/Rhode Island (SEMA/RI) zone
  - Rest-of-Pool, including Western/Central Massachusetts and Connecticut

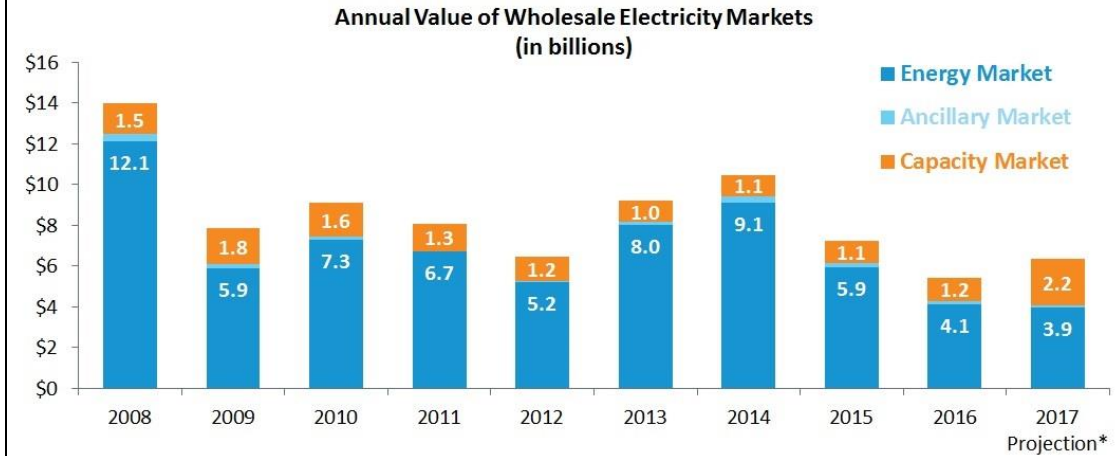
The Northern New England capacity zone will be modeled as an export-constrained zone, and the Southeastern New England capacity zone will be modeled as an import-constrained zone.

- **Fuel Security Analysis**—The ISO's *Operational Fuel-Security Analysis* examines more than 20 cases of generating resource and fuel-mix combinations during the 2024/2025 winter. It quantifies each case's fuel-security risk (the number and duration of energy shortfalls that could occur and that would require the implementation of emergency procedures to maintain reliability). The study is not focused on the effects of expanded access to natural gas and does not identify the need for new or expanded pipeline capacity or natural gas infrastructure. The ISO delayed release of the analysis pending resolution of DOE's notice of proposed rulemaking on grid resiliency pricing (see Section 3.4.1). The initial results have since been presented to regional stakeholders for discussion in early 2018. (Refer to Section 5.1.2 for more information on the results of the ISO's Operational Fuel-Security Analysis, which was released in January 2018.)
- **Projected 2017 Wholesale Market Costs**—For 2017, the value of the energy market, the ancillary services market, and the capacity market is projected to total about \$6.3 billion (see Figure 3-3).

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<sup>36</sup> Anne George, "ISO New England Update," CLG presentation (December 7, 2017), [https://www.iso-ne.com/static-assets/documents/2017/12/clg\\_meeting\\_george\\_iso\\_update\\_presentation\\_december\\_7\\_2017\\_final.pdf](https://www.iso-ne.com/static-assets/documents/2017/12/clg_meeting_george_iso_update_presentation_december_7_2017_final.pdf).

## Energy Market Values Vary with Fuel Prices While Capacity Market Values Vary as Existing Resources Retire and Investment in New Resources Is Needed



**Figure 3-3: Wholesale Energy Market prices since 2008 (billions of \$).**

**Notes:** \*Data are presented for illustrative purposes; they are preliminary projections for these markets subject to reconciliation. The 2017 projection is the sum of preliminary 2017 January–October actuals and the November–December projected values. The November–December projections were derived as follows: on average, over the past five years (2012–2016), the value of the energy market and the ancillary services market accrued over the first 10 months of the year was approximately 83.30% and 78.95% of the annual total for each respective market. These percentages were applied to the totals from the first 10 months of 2017 to produce the November–December constant for the remainder of the year. The capacity market values reflect the October 2017 value held preliminary and subject to reconciliation.

**Source:** The [2016 Report of the Consumer Liaison Group](#).

- Competitive Auctions with Sponsored Policy Resources**—Following the Integrating Markets and Public Policy (IMAPP) initiative, a stakeholder process that NEPOOL launched in 2016, the ISO proposed Competitive Auctions with Sponsored Policy Resources (CASPR) as a mechanism to accommodate public policy resources while protecting price formation in the capacity market. (ISO New England has since filed the proposal for approval with FERC with the aim for any market changes to be made in time for FCA #13, which will be run in February 2019 (refer to Section 5.3.3 for additional information on CASPR).

## 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.

To fully engage consumers and consumer advocates, the members of the CLG Coordinating Committee meet before each of the quarterly meetings to identify and select topics of interest to address at future CLG meetings. In particular, the CLG Coordinating Committee attempts to identify market or policy issues likely to have a direct impact on consumers. The objective is to provide information and perspectives on a topic that consumers and consumer advocates may not otherwise acquire in the course of their other professional responsibilities.

The locations of the CLG quarterly meetings rotate among the New England states, and Coordinating Committee members from the host state typically recommend people who might deliver the keynote address and others who might contribute to the panel discussion. The remaining CLG Coordinating Committee members provide additional assistance and approvals, when necessary. Before the CLG meeting, confirmed panelists participate in a planning call with the panel moderator (a CLG Coordinating Committee member) and ISO New England to plan for a robust, diverse, and well-organized discussion.

When choosing a topic for discussion, the CLG Coordinating Committee relies on conversations with and recommendations from the CLG membership as well as the participant survey conducted after each quarterly CLG meeting. The CLG Coordinating Committee encourages all interested participants to recommend potential topics, either via the participant survey or direct communication with the CLG Coordinating Committee.

## Section 5

# ISO New England Activities and Initiatives

This section highlights the major topics presented by the ISO at CLG meetings in 2017. 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.<sup>37</sup>

### 5.1 Challenges and Opportunities Facing the New England Power System

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The New England power system is undergoing a dramatic transformation, presenting challenges and opportunities for the region. Over the last 17 years, New England has seen a major shift toward natural-gas-fired generation, which in 2017 was the source for nearly 50% of the electricity generated in New England, up from 15% in 2000.<sup>38</sup> The combined use of coal and oil has fallen dramatically over the same period—from 40% down to 3%—and these resources usually only operate during the summer when electricity demand is high and in the winter when natural gas pipelines are constrained.<sup>39</sup> One result of additional gas-fired resources has been lower overall wholesale electricity prices and emissions in New England. Additionally, due to generally low natural gas prices, added renewable energy resources, and emissions regulations, coal and oil generators are retiring.

Limited gas pipeline capacity in New England, largely built to serve natural gas customers other than electric power generators, exposes the regional electric power system to potential reliability problems and an associated increased cost of electricity when natural gas prices are high. Pipelines can be constrained at any time of the year, but cold-weather conditions and the subsequent heavy demand for space heating fueled by natural gas can exacerbate regional fuel-security issues.

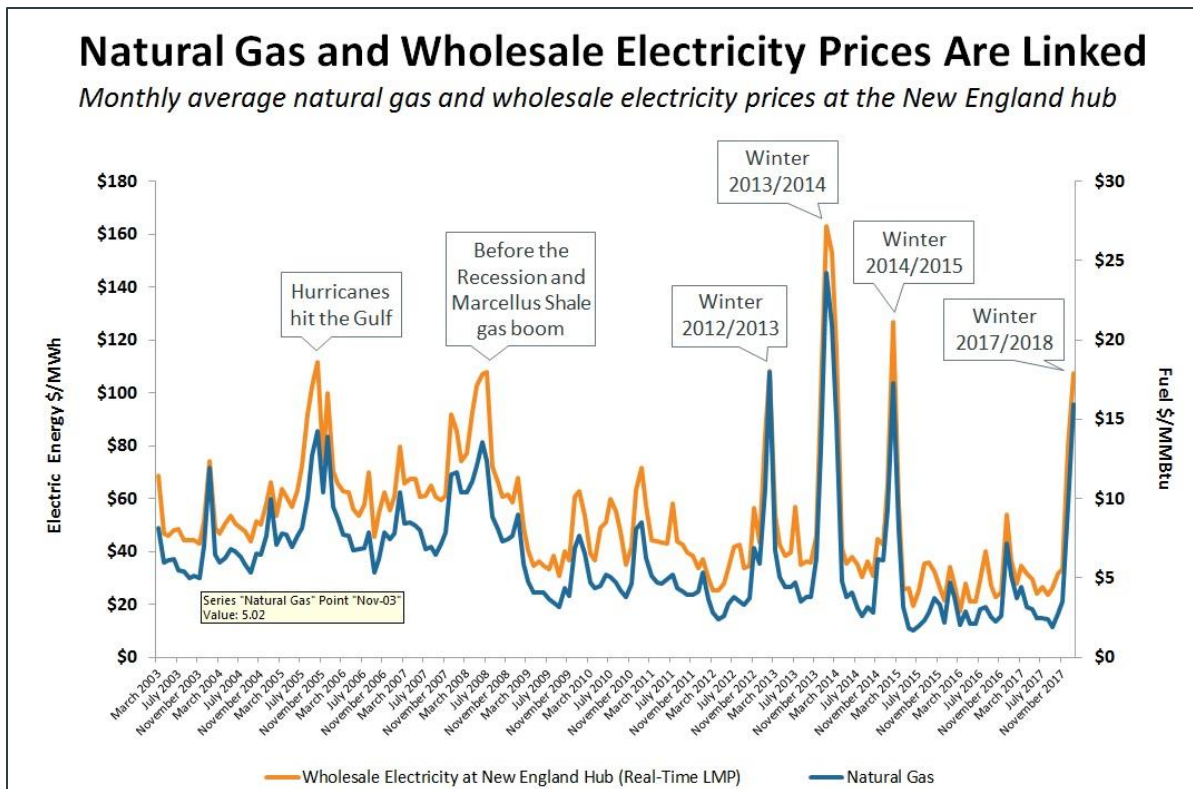
Because natural gas represents such a large portion of the region's generating fleet, the availability of natural gas for power generation has an impact on grid reliability and wholesale electricity costs. For instance, as illustrated in Figure 5-1, record high natural gas prices during the 2017/2018 winter contributed to significant wholesale electricity price volatility in New England.

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<sup>37</sup> The monthly memos are posted at <http://www.iso-ne.com/committees/industry-collaborations/consumer-liaison>.

<sup>38</sup> ISO New England, *Peak Energy and Net Load by Source*; see the "Energy, Load, and Demand Reports," webpage (2018), <http://www.iso-ne.com/isoexpress/web/reports/load-and-demand/-/tree/net-ener-peak-load>.

<sup>39</sup> ISO New England, *2017 Regional System Plan* (November 2, 2017), <https://www.iso-ne.com/system-planning/system-plans-studies/rsp>.



**Figure 5-1: Monthly average natural gas and wholesale electricity prices in New England (\$/MWh/British thermal unit [Btu] and \$/MWh).**

Natural-gas-fired generation’s proportion of the capacity located in the region is expected to grow from 44.5% in 2017 to approximately 50.9% by 2020 and 56.0% by 2026.<sup>40</sup> The Pilgrim nuclear plant in Massachusetts is scheduled for retirement in 2019, and uncertainty surrounds the future of 3,300 MW from the region’s remaining nuclear plants. Therefore, the current situation where natural gas fuel prices typically set the marginal price for wholesale electricity is projected to continue over the planning horizon.

### 5.1.1 Winter Reliability

For well over a decade, the ISO has worked closely with the natural gas industry to improve the coordination between gas and electricity sector operations and communications. More recently, the ISO’s Winter Reliability Program has provided incentives to generators to secure contracts for winter deliveries of oil and LNG. The Winter Reliability Program was designed as a stop-gap measure until a new capacity market design, known as pay for performance, takes effect in June 2018. The final Winter Reliability Program ends at the conclusion of the 2017/2018 winter period.

### 5.1.2 Fuel-Security Analysis

In late 2016, the ISO began conducting a study of fuel-security challenges to the continued reliability of New England’s power system. In this context, fuel security refers to the ability of power plants to have or obtain the fuel required to generate electricity, especially during the winter peak season. The study

<sup>40</sup> ISO New England, *2017 Regional System Plan* (November 2, 2017), <https://www.iso-ne.com/system-planning/system-plans-studies/rsp>.

examines how anticipated generating resource and fuel-mix combinations could impact the reliable operation of the regional bulk power system during the winter period.

ISO New England is focused on fuel security for several reasons. Summarizing what was explained above:

- The regional power system is increasingly dependent on natural gas for power generation.
- The capacity of the region's natural gas infrastructure is not always adequate to deliver all the fuel needed for both heating and power generation during winter.
- The region has limited dual-fuel generating capability, with emissions restrictions on burning oil.
- Coal, oil, and nuclear power plants, which are needed to maintain reliability when natural gas is in short supply, are retiring.
- Natural gas is the fuel of choice for a large segment of new power plants.

The study examined 23 hypothetical combinations of different regional resource portfolios. These hypothetical future conditions were developed based on a range of resource and fuel types that could realistically be expected to be available in the 2025 timeframe. Each case is populated with differing levels of non-natural-gas generator retirements, imports from neighboring power grids, dual-fuel power plants (that can generate electricity using natural gas or oil), liquefied natural gas (LNG) imports, and renewable resource development. All the cases take into account the ISO's forecasts for demand reductions provided by energy-efficiency measures and distributed solar generation in 2025.

The study was released in January 2018, outlining six major conclusions:<sup>41</sup>

- **Outages:** The region is vulnerable to the season-long outage of any of several major energy facilities.
- **Stored fuels:** Power system reliability is heavily dependent on LNG and electricity imports; more dual-fuel capability is also a key reliability factor, but permitting for construction and emissions is difficult.
- **Logistics:** The timely availability of fuel is critical, highlighting the importance of fuel-delivery logistics.
- **Risk trends:** All but four scenarios result in fuel shortages requiring rolling blackouts, indicating the trends affecting New England's power system may intensify the region's fuel-security risk.
- **Renewables:** More renewable resources can help lessen the region's fuel-security risk but are likely to drive coal- and oil-fired generation retirements, requiring higher LNG imports to counteract the loss of stored fuels.
- **Positive outcomes:** Higher levels of LNG, imports, and renewables can minimize system stress and maintain reliability; to attain these higher levels, delivery assurances for LNG and electricity imports and transmission expansion will be needed.

The study did not focus on the effects of expanded access to natural gas from the region's pipeline

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<sup>41</sup> ISO New England, *Operational Fuel-Security Analysis*, (January 17, 2018), [https://www.iso-ne.com/static-assets/documents/2018/01/20180117\\_operational\\_fuel-security\\_analysis.pdf](https://www.iso-ne.com/static-assets/documents/2018/01/20180117_operational_fuel-security_analysis.pdf).



network and assumed that no additional natural gas pipeline capacity to serve generators would be added within the timeframe of this study. The ISO plans to discuss the results of this operational fuel-security analysis with stakeholders, regulators, and policymakers through 2018. A key question will be the level of fuel-security risk the ISO and the region would be willing to tolerate.

As the system operator mandated to maintain a reliable power system, the ISO must conduct its own assessment of the level of risk to reliable operations. A primary consideration will be ISO New England's responsibility, as a regional reliability coordinator, to operate the region's power system in a way that maintains the reliability of not only the region but also the entire Eastern Interconnection.

## 5.2 Regional System Planning

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The ISO conducts comprehensive regional power system planning pursuant to a FERC-approved tariff and publishes a Regional System Plan that summarizes the long-term (10-year) reliability needs of New England's transmission system.<sup>42</sup> Stakeholders, including state consumer advocates, provide input to the planning process and the RSP through the Planning Advisory Committee (PAC).<sup>43</sup> The RSP is published every other year.

### 5.2.1 2017 Regional System Plan and Public Meeting

On September 14, 2017, the ISO held its biennial public meeting to review the draft Regional System Plan. Former US EPA administrator and current Connecticut Green Bank board member Gina McCarthy delivered the keynote address, which touted the New England states' record of promoting renewable energy and curbing carbon emissions, and noted the growth of the clean energy industry in the region.

A panel of industry and policy experts discussed how to plan for the future hybrid grid and successfully integrate increasing levels of renewable energy, energy storage, and other distributed energy resources. The panel included Katie Scharf Dykes, chair of the Connecticut Public Utilities Regulatory Authority; Chris Root, chief operating officer (COO) of VELCO, Stephen Pike, CEO of the Massachusetts Clean Energy Center; Nick Miller, senior technical director of Energy Consulting for GE Energy; and Ed McNamara, director of the Planning and Energy Resources Division at the Vermont Department of Public Service. The panel touched on the technical implications of large penetrations of photovoltaics, international efforts at renewables integration, and electrification of the transportation and heating sectors. Paul Levy, a member of ISO New England Board of Directors, served as moderator.

Stephen Rourke, the ISO's vice president of System Planning, and Mike Henderson, director of Regional Planning and Coordination at the ISO, presented the key topics of the *2017 Regional System Plan*, including the integration of renewable resources, fuel security, and transmission projects being developed to improve electric reliability. The ISO issued the latest report in November 2017.

### 5.2.2 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

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<sup>42</sup> ISO New England, *2017 Regional System Plan* (November 2, 2017), [https://www.iso-ne.com/static-assets/documents/2017/11/rsp17\\_final.docx](https://www.iso-ne.com/static-assets/documents/2017/11/rsp17_final.docx).

<sup>43</sup> 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>.



overall demand for energy. The ISO uses this information in long-term planning studies beyond the three-year FCM timeframe. The latest 2017 EE forecast was released on May 1 2017.<sup>44</sup>

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. Solar PV resources represent the largest share of DG resources throughout New England. The final 2017 PV forecast shows steady growth in PV through 2026, with roughly 1900 MW of AC nameplate capacity installed through the end of 2016 and more than 4,700 MW of AC nameplate capacity anticipated by 2026.<sup>45</sup> The latest DG forecast was released on May 1, 2017. Table 5-1 shows the 2017 PV forecast for New England.

**Table 5-1  
ISO New England 2017 PV Forecast (Nameplate Capacity, MW<sub>ac</sub>)**

States	Annual Total MW (AC nameplate rating)											Totals
	Thru 2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
CT	281.5	132.8	132.8	132.8	58.9	44.7	43.5	42.2	40.9	39.6	38.4	<b>988.2</b>
MA	1324.8	273.9	260.2	164.4	160.0	155.6	151.1	146.7	71.1	68.9	66.7	<b>2,843.3</b>
ME	22.1	6.8	6.8	6.8	6.2	5.8	5.8	5.8	5.8	5.8	5.8	<b>83.7</b>
NH	54.3	18.1	12.0	7.4	7.2	7.0	6.8	6.6	6.4	6.2	6.0	<b>138.2</b>
RI	36.8	41.3	41.3	35.3	31.8	15.2	11.3	11.1	10.8	10.6	10.4	<b>255.9</b>
VT	198.4	25.0	25.0	25.0	22.5	21.3	21.3	21.3	21.3	21.3	21.3	<b>423.4</b>
<b>Regional - Annual (MW)</b>	<b>1918.0</b>	<b>497.9</b>	<b>478.2</b>	<b>371.8</b>	<b>286.6</b>	<b>249.6</b>	<b>239.8</b>	<b>233.6</b>	<b>156.3</b>	<b>152.4</b>	<b>148.5</b>	<b>4,732.7</b>
<b>Regional - Cumulative (MW)</b>	<b>1918.0</b>	<b>2415.9</b>	<b>2894.1</b>	<b>3265.9</b>	<b>3552.5</b>	<b>3802.1</b>	<b>4041.9</b>	<b>4275.5</b>	<b>4431.8</b>	<b>4584.2</b>	<b>4732.7</b>	<b>4,732.7</b>

**Notes:** The forecast values include FCM resources, non-FCM generators, and behind-the-meter PV resources. It reflects discount factors meant to capture uncertainty in policy achievement. All values represent end-of-year installed capacities.

### 5.2.3 FERC Order No. 1000

In compliance with FERC Order No. 1000, ISO New England began its first public policy process in January 2017 through a public notification to the Planning Advisory Committee. The notification solicited stakeholder input to the New England States Committee on Electricity regarding state and federal public policy requirements and to the ISO for local (e.g., municipal and county) public policy requirements identified as driving transmission needs in New England.<sup>46</sup> In response to the notification, members of the PAC provided input to ISO New England and NESCOE. On May 1, 2017, NESCOE submitted a communication to the ISO explaining that, at that time, no federal or state public policy

<sup>44</sup> ISO New England, *Final 2017 Energy-Efficiency Forecast for 2021-2026* (May 1, 2017), <https://www.iso-ne.com/system-planning/system-forecasting/energy-efficiency-forecast>. More information on the ISO’s energy-efficiency forecast is available at its “Energy-Efficiency Forecast Working Group,” webpage (2018), <http://www.iso-ne.com/committees/planning/energy-efficiency-forecast>.

<sup>45</sup> ISO New England, *Final 2017 Solar PV Forecast* (May 1, 2017), [https://www.iso-ne.com/static-assets/documents/2017/05/2017\\_solar\\_forecast\\_details\\_final.pdf](https://www.iso-ne.com/static-assets/documents/2017/05/2017_solar_forecast_details_final.pdf). More information on the ISO’s PV forecast is available at its “Distributed Generation Forecast Working Group,” webpage (2018), <http://www.iso-ne.com/committees/planning/distributed-generation>.

<sup>46</sup> ISO New England, *Public Notification for Public Policy Requirements Submittals* (January 11, 2017), [https://www.iso-ne.com/static-assets/documents/2017/01/a10\\_2017\\_public\\_policy\\_transmission\\_upgrde\\_process\\_announcement.pdf](https://www.iso-ne.com/static-assets/documents/2017/01/a10_2017_public_policy_transmission_upgrde_process_announcement.pdf).

requirements were driving the need for a regionally developed transmission solution.<sup>47</sup> The NESCOE submission included responses from the NESCOE managers from each of the six New England states. In June, the ISO informed stakeholders that it will not pursue a public policy transmission study at that time.

Order No. 1000 also pertains 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 FERC 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 existing interregional planning and transmission development protocols with neighboring power systems (PJM and NYISO).<sup>48</sup> The ISO plans to focus in 2018 on additional implementation efforts with respect to competitive transmission processes.

### 5.3 Wholesale Electricity Markets

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In 2017, the ISO New England provided updates regarding the markets it designs and operates, with key points summarized below.

#### 5.3.1 Reports on Market Performance

The ISO regularly reports on the performance of the region's wholesale electricity markets.<sup>49</sup> 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.<sup>50</sup>

In May 2017, the Internal Market Monitor published the *2016 Annual Markets Report*.<sup>51</sup> 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, 2016, and found that the markets operated competitively, with prices that reflected the cost of production. Moreover, the report said that the total wholesale cost in 2016, at \$7.6 billion, was considerably lower than 2015, decreasing by 18%, or by

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<sup>47</sup> NESCOE, "NESCOE Submission Regarding Transmission Needs Driven by State and Federal Public Policy Requirements," (May 1, 2017), [https://www.iso-ne.com/static-assets/documents/2017/05/nescoc\\_submission\\_public\\_policy\\_transmission\\_upgrades.pdf](https://www.iso-ne.com/static-assets/documents/2017/05/nescoc_submission_public_policy_transmission_upgrades.pdf).

<sup>48</sup> *2015 Northeast Coordinated System Plan* (April 11, 2016), [https://www.iso-ne.com/static-assets/documents/2016/04/2015\\_ncsp\\_041116\\_final.docx](https://www.iso-ne.com/static-assets/documents/2016/04/2015_ncsp_041116_final.docx) and the ISO's "Interregional Planning Stakeholder Advisory Committee," webpage (2018), <https://www.iso-ne.com/committees/planning/ipsac/>.

<sup>49</sup> The ISO's various market reports are posted at its "Market Performance Reports," webpage (2018), <http://www.iso-ne.com/markets-operations/market-performance/performance-reports>.

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

<sup>51</sup> ISO New England, *2016 Annual Markets Report* (May 30, 2017), [https://www.iso-ne.com/static-assets/documents/2017/05/annual\\_markets\\_report\\_2016.pdf](https://www.iso-ne.com/static-assets/documents/2017/05/annual_markets_report_2016.pdf).

\$1.7 billion. This was due to the decline in energy costs of \$1.8 billion (30%) compared with 2015, which continue to be driven primarily by natural gas prices. Natural gas prices averaged \$3.12/MMBtu, a 34% reduction on 2015 prices.<sup>4</sup> This significant decline in annual average natural gas prices and energy costs was driven by the price and cost declines in the first quarter of 2016. Due to milder weather, natural gas prices were down 70% in the first quarter compared with the same quarter in 2015, which resulted in \$2 billion in lower energy costs quarter-over-quarter. For the remaining three quarters of 2016, natural gas prices and energy costs increased moderately compared with 2015.

### **5.3.2 Forward Capacity Auction #12**

The FCM procures the resources the region needs to meet projected demand in three-years' time. Capacity resources can include traditional power plants, renewables generation, imports, and demand-side resources, such as load management and energy-efficiency measures. Resources clearing in the auction will receive a monthly payment during the delivery year in exchange for their commitment to provide power or curtail demand when called on by the ISO. The capacity market is separate from the energy market, where resources compete on a daily basis to provide power and are paid for the electricity they produce.

The 12th Forward Capacity Auction (FCA #12), which was conducted February 5 to 6, 2018, procured 34,828 MW of capacity, including a surplus 1,103 MW, to meet the 33,725 MW capacity target for 2021–2022. (The auction rules allow the region to acquire more or less than the capacity target, providing flexibility to acquire additional capacity and enhanced reliability at a cost-effective price.)

The auction acquired 30,011 MW of generation, including 174 MW of new generation. The auction procured 514 MW of new energy-efficiency and demand-reduction measures. In all, more than 3,600 MW of EE and demand-reduction resources cleared. The FERC filing includes a list of resources that have an obligation to be available in 2021–2022.

In all, 511 MW of resources, including one large generator (the 383 MW Bridgeport Harbor #3 coal-fired unit) submitted retirement bids accepted before FCA #12.

The auction clearing price was \$4.63 per kilowatt-month (kW-month), compared with \$5.30/kW-month in the previous year. The preliminary, estimated total annual cost of capacity payments in 2021–2022 will be approximately \$2.07 billion. (See Section 6 for more details on historic wholesale electricity pricing, including those associated with the FCM.)

### **5.3.3 Competitive Auctions with Sponsored Policy Resources**

In 2016, NEPOOL launched a formal stakeholder process, Integrating Markets and Public Policy (IMAPP), to discuss potential market rule changes to integrate the region's wholesale electricity markets with the public policy goals of the New England states.<sup>52</sup> At the heart of their efforts was a discussion of ways to harmonize state policy goals with the wholesale markets operated by ISO New England. At the conclusion of the IMAPP stakeholder process, ISO New England was asked to develop a market change that might address near-term concerns regarding the intersection of markets and public policy.

In response, the ISO introduced a conceptual solution in April 2017. The ISO's proposal, called Competitive Auctions with Sponsored Policy Resources (CASPR), proposes to use the Forward Capacity

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<sup>52</sup> All resources associated with NEPOOL's IMAPP process are available at the NEPOOL website: <http://www.nepool.com/IMAPP.php>.

Market to accommodate the entry of significant sponsored resources while also continuing to maintain competitive markets that attract private investment.<sup>53</sup> The ISO discussed its conceptual approach at the final NEPOOL IMAPP meeting in May and then worked with stakeholders through the formal NEPOOL committee process for the rest of the year. After months of such discussions with market participants and other stakeholders, the ISO finalized its proposal and put it before the New England Power Pool (NEPOOL) Participants Committee (PC) on December 8 for an advisory vote.<sup>54</sup>

The ISO's CASPR proposal received support from 57.75% of the PC, and the ISO filed the proposal with FERC in early January 2018.<sup>55</sup> If approved, the changes to the FCM would be in effect for Forward Capacity Auction #13 in February 2019 for the capacity commitment period that runs from June 1, 2022 through May 31, 2023.

As the ISO explained in its filing, the New England states have instituted policies that go beyond the ISO's market objectives of achieving reliability at the lowest cost; over the past decade, the New England states have sought to reduce greenhouse gas emissions and meet climate goals through various mechanisms outside the ISO-administered competitive wholesale markets. These mechanisms include mandates that state-regulated utilities enter into long-term contracts with renewable resource developers. These out-of-market actions could have adverse consequences for the FCM. The ISO explained these possible consequences in detail in the filing. Moreover, because of recent policy developments at the state level, New England now faces "a potentially significant overbuild of the system—against the backdrop of a New England power system that already has substantially more capacity than required."

If sponsored resources are permitted to include out-of-market revenue in their FCM bids, and thereby increase the likelihood that they sell capacity, the clearing prices in the FCM may become suppressed. This, in turn, can reduce the efficiency of the markets and undermine their ability to attract private investment. However, if the sponsored resources are not permitted to include out-of-market revenue in their FCM bids, they will likely not clear the auction and the FCM clearing price will not be suppressed. In this case consumers would then run the risk of "paying twice" for resources: once for the cost of the capacity procured in the FCM, and a second time for the additional generation capacity obtained through the out-of-market contracts with preferred policy resources.

The ISO therefore proposed CASPR as a mechanism to more effectively accommodate public policy resources (thereby avoiding the concern for "paying twice" for resources) while still maintaining competitively based FCM prices and enabling the FCM to continue to attract private investment when needed. To jointly achieve both these objectives, CASPR seeks to coordinate the entry of new sponsored policy resources with the retirement of existing capacity resources through a new substitution auction that would be run immediately following the existing (primary) Forward Capacity Auction.

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<sup>53</sup> All materials on the ISO's CASPR proposal are available at its "Wholesale Markets and State Public Policy Initiative," webpage (2018), <https://www.iso-ne.com/committees/participants/wholesale-markets-state-public-policy-initiative>.

<sup>54</sup> NEPOOL Participants Committee, "Competitive Auctions with Sponsored Policy Resources," memorandum for December 8, 2017, meeting (December 1, 2017), [https://www.iso-ne.com/static-assets/documents/2017/12/npc\\_20171208\\_caspr\\_composite.pdf](https://www.iso-ne.com/static-assets/documents/2017/12/npc_20171208_caspr_composite.pdf).

<sup>55</sup> ISO New England, *Revisions to ISO New England Transmission, Markets and Services Tariff Related to Competitive Auctions with Sponsored Policy Resources*, Docket ER18-619 (January 8, 2018), [https://www.iso-ne.com/static-assets/documents/2018/01/er18-619-000\\_caspr\\_filing.pdf](https://www.iso-ne.com/static-assets/documents/2018/01/er18-619-000_caspr_filing.pdf).

## 5.4 The ISO's Budget Review Process

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After an extensive review process with state regulators, the ISO filed its proposed 2018 administrative and capital budgets with FERC on October 16, 2017.<sup>56</sup> The ISO's 2018 revenue requirement, after depreciation and true-up for actual expenses and collections in 2016, is \$195.5 million, which is \$3.2 million or 1.7% higher than the 2017 revenue requirement. If the ISO's projected revenue requirement for 2018 were fully passed through to end-use customers, their cost would average \$1.03 per month. The 2018 capital budget is projected to be \$28 million, the same as the 2017 capital budget. On December 6, 2017, FERC issued a letter order accepting the ISO's proposed 2018 budgets, effective January 1, 2018.<sup>57</sup>

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, multiyear objectives. In the June to August timeframe, the ISO presents preliminary 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.

The ISO's formal budget-review 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.<sup>58</sup> After the budget presentation in August, the New England states can submit questions and comments on the proposed budget, for which the ISO issues formal responses. The comments submitted by the New England states and the ISO's responses are filed with FERC in October alongside the proposed budget.

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<sup>56</sup> ISO New England Inc., *Filing of 2018 Capital Budget and Revised Tariff Sheets for Recovery of 2018 Administrative Costs*, Docket No. ER18- (October 16, 2017), [https://www.iso-ne.com/static-assets/documents/2017/10/2018\\_admin\\_and\\_capital\\_budget.pdf](https://www.iso-ne.com/static-assets/documents/2017/10/2018_admin_and_capital_budget.pdf).

<sup>57</sup> FERC, *2018 Capital Budget and Revised Tariff Sheets for Recovery of 2018 Administrative Costs*, Docket No. ER18-77-000 (December 6, 2017), <https://www.iso-ne.com/static-assets/documents/2017/12/er18-77-000.pdf>.

<sup>58</sup> 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](http://www.iso-ne.com/regulatory/ferc/filings/2013/may/er13-185-000_5-9-13_settlement_agreement.pdf).

## 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 CLG 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 practices of each utility and state. Understanding these differences is essential when comparing the two markets.

Table 6-1 shows the range of average wholesale market costs for calendar years 2012 to 2017 among the New England states and the range of residential retail power supply rates in effect immediately thereafter (i.e., on January 1 of each year) for each of the states with unbundled retail electricity markets.

**Table 6-1**  
**Wholesale Market Costs and Residential Retail Power Supply Rates<sup>(a)</sup>**

	Wholesale Market Costs (¢/kWh)	Residential Retail Power Supply Rates in Effect on Date Specified Below	Residential Retail Power Supply Rates <sup>(b)</sup> (¢/kWh)
<b>2012</b>	4.82 – 5.10	<b>January 1, 2013</b>	7.19 – 9.08
<b>2013</b>	6.75 – 7.23	<b>January 1, 2014</b>	6.81 – 9.56
<b>2014</b>	7.53 – 8.27	<b>January 1, 2015</b>	7.56 – 15.56
<b>2015</b>	5.43 – 5.78	<b>January 1, 2016</b>	6.56 – 11.85
<b>2016</b>	4.11 – 4.37	<b>January 1, 2017</b>	6.64 – 10.36
<b>2017</b>	5.36 – 5.68	<b>January 1, 2018</b>	7.83 – 12.61

(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. Wholesale markets costs for 2017 are preliminary.

(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 2016 to 2017, wholesale market costs increased 30 to 32% in all the New England states, largely because of increases in wholesale capacity costs during 2017, which were driven by resource retirements ahead of FCA #8. Connecticut, Maine, Massachusetts, New Hampshire, and Rhode Island (the five states with unbundled retail electricity rates) saw an increase in power supply rates in effect on January 1, 2018, compared with power supply rates in effect on January 1, 2017.

- All six states saw an increase in total residential retail electricity rates in effect on January 1, 2018, compared with total residential retail electricity rates in effect on January 1, 2017. These rates include costs for power supply, transmission, distribution, and all other delivery service charges.<sup>59</sup>
- The estimated *regional* transmission rate increased by approximately 7% from 2016 to 2017 (from 1.6071 ¢/kWh in 2016 to 1.7190 ¢/kWh in 2017) and is equivalent to 7 to 11% of total residential retail electricity rates in effect on January 1, 2018, which ranged from 16.20 ¢/kWh to 24.20 ¢/kWh.<sup>60</sup>
- A review of *actual* transmission rates for residential retail consumers in Connecticut, Maine, Massachusetts, New Hampshire, and Rhode Island in effect on January 1, 2018 shows that transmission represents 11 to 20% of total residential retail electricity rates.<sup>61</sup>

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<sup>59</sup> Total residential retail electricity rates in effect on January 1, 2017, ranged from 15.02 to 21.18 ¢/kWh among the New England states. Total residential retail electricity rates in effect on January 1, 2018, ranged from 16.20 to 24.20 ¢/kWh among the New England states.

<sup>60</sup> 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 and tariff-based reliability services for the specific period, divided by the total net energy for load for the same period. For 2017, the period is based on the 12 months ending December 31, 2017. 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>. Information on net energy for load is available at <http://www.iso-ne.com/isoexpress/web/reports/load-and-demand/-/tree/net-ener-peak-load>.

<sup>61</sup> 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. Over the past 10 years, total annual costs have ranged from a low of \$7.7 billion in 2016 to a high of nearly \$15 billion in 2008. Table 7-1 summarizes New England's wholesale electricity costs for 2008 to 2017.



**Table 7-1  
New England Wholesale Electricity Costs, 2008 to 2017 (in Millions and ¢/kWh)<sup>(a)</sup>**

	2008		2009		2010		2011		2012		2013		2014		2015		2016		2017 <sup>(b)</sup>		
	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	
<b>Wholesale market costs</b>																					
<b>Energy (LMPs)<sup>(c)</sup></b>	\$12,085	8.4	\$5,884	4.3	\$7,284	5.2	\$6,695	4.9	\$5,193	3.9	\$8,009	6.0	\$9,079	6.9	\$5,910	4.5	\$4,130	3.2	\$4,498	3.5	
<b>Ancillaries<sup>(d)</sup></b>	\$366	0.3	\$190	0.1	\$164	0.1	\$39	0.0	\$56	0.0	\$152	0.1	\$331	0.3	\$210	0.2	\$146	0.1	\$127	0.1	
<b>Capacity<sup>(e)</sup></b>	\$1,505	1.1	\$1,768	1.3	\$1,647	1.2	\$1,345	1.0	\$1,182	0.9	\$1,039	0.8	\$1,056	0.8	\$1,110	0.8	\$1,160	0.9	\$2,244	1.8	
<b>Subtotal</b>	\$13,956	9.8	\$7,842	5.8	\$9,095	6.5	\$8,079	5.9	\$6,431	4.8	\$9,200	6.9	\$10,466	8.0	\$7,229	5.5	\$5,437	4.2	\$6,869	5.4	
<b>Transmission charges<sup>(f)</sup></b>	\$869	0.6	\$1,115	0.8	\$1,417	1.0	\$1,368	1.0	\$1,493	1.1	\$1,822	1.4	\$1,828	1.4	\$1,964	1.5	\$2,081	1.6	\$2,199	1.7	
<b>RTO costs<sup>(g)</sup></b>	\$124	0.1	\$116	0.1	\$145	0.1	\$130	0.1	\$139	0.1	\$167	0.1	\$165	0.1	\$165	0.1	\$180	0.1	\$193	0.2	
<b>Total</b>	\$14,949	10.5	\$9,073	6.7	\$10,657	7.6	\$9,577	7.0	\$8,063	6.0	\$11,189	8.4	\$12,459	9.5	\$9,358	7.1	\$7,698	5.9	\$9,261	7.3	

(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 and do not reflect actual charge methodologies.

(b) **The wholesale values for 2017 are preliminary and subject to reconciliation.**

(c) Energy values are derived from wholesale market pricing, and represent the results of the Day-Ahead Energy Market plus deviations from the Day-Ahead Energy Market reflected in the Real-Time Energy Market.

(d) 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.

(e) Capacity charges are those associated with the transitional Installed Capacity (ICAP) Market through May 2010 and the Forward Capacity Market (FCM) from June 2010 forward.

(f) Transmission charges reflect the collection of transmission owners' revenue requirements and tariff-based reliability services, including black-start capability, voltage support, and FCM reliability. In 2017, the cost of payments made to these generators for reliability services under the ISO's tariff was \$35.4 million. Transmission charge totals for years 2010 forward reflect the refund of Schedule 1 TOUT charges to regional network load.

(g) RTO costs are the costs to run and operate ISO New England and are based on actual collections, as determined under Section IV of the *ISO New England Inc. Transmission, Markets, and Services Tariff*.

Total 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 power system planning process; and provide market monitoring oversight of participant behavior and in-depth market analysis and reporting. Between 2008 and 2017, the ISO's annual costs have ranged from \$116 million to \$193 million.

Market participants that purchase electricity from the wholesale market for their own use or to supply to retail customers pay wholesale electricity costs. 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 2017, 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 2017 yields a rate of 7.3 ¢/kWh. Wholesale values for 2017 are preliminary and subject to reconciliation.