



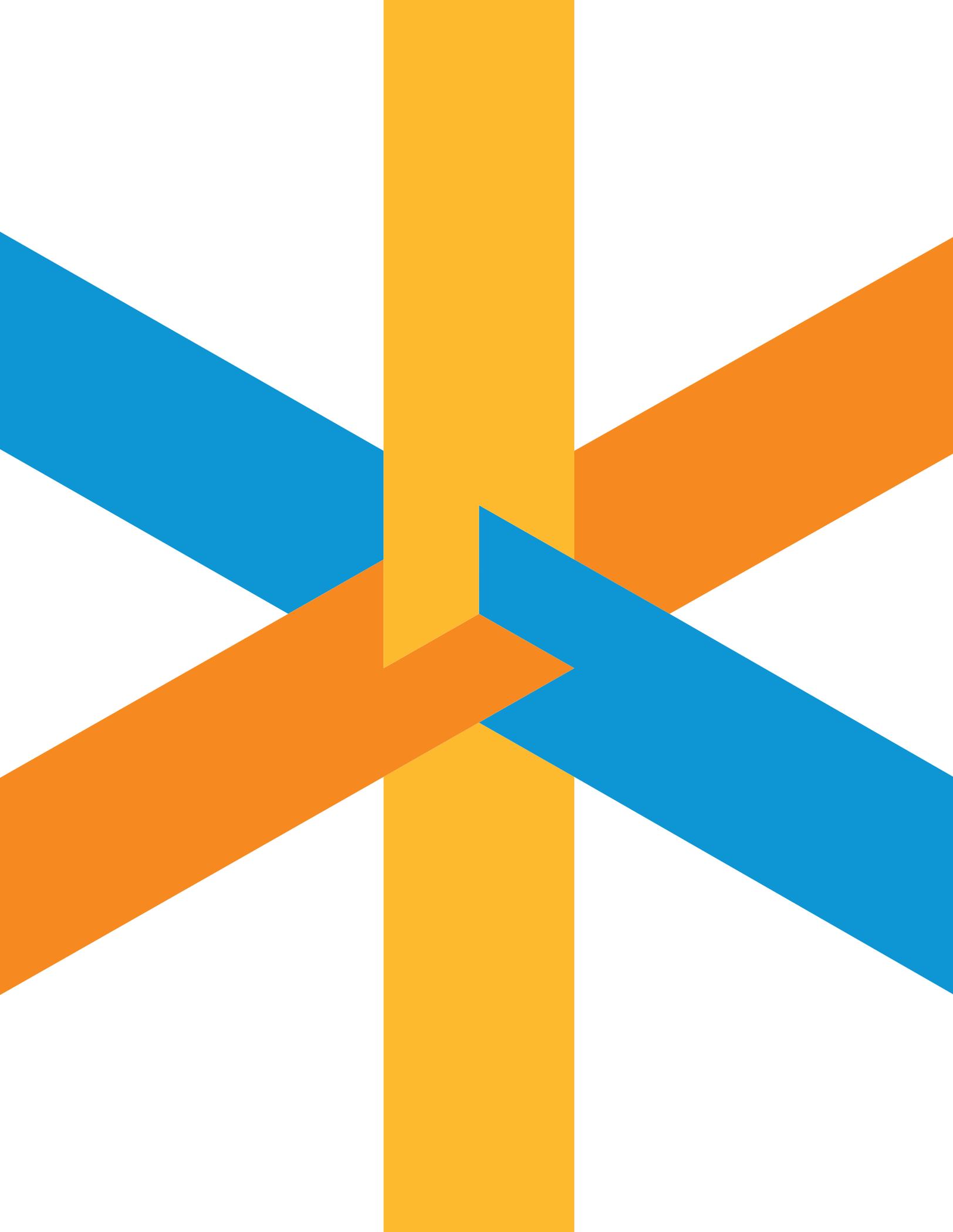
Reliability is the core of ISO New England's mission, fulfilled by three interconnected and interdependent responsibilities.

Overseeing the day-to-day **operation** of New England's electric power generation and transmission system

Managing comprehensive regional power **system planning**



Developing and administering the region's competitive **wholesale electricity markets**



Preface

Each year, ISO New England publishes the *Wholesale Markets Project Plan (WMPP)*, which describes the key market initiatives underway and planned for the upcoming three years to ensure an efficient and reliable electricity system in New England.

The ISO publishes updates to the WMPP throughout the year to communicate changes and advancements on the scope and status of initiatives and to identify new efforts. The quarterly updates are available on ISO New England's website.¹

About the Wholesale Markets Project Plan Structure

This project plan is organized into two main sections:

- **Market Assessments** identify areas the ISO is evaluating to better understand a problem to determine whether market design changes are warranted and, if so, how the changes would be organized into market design projects. The schedules for working with stakeholders and project effective dates are not defined for market assessments.
- **Market Design Projects** have a well-defined scope that the ISO believes warrant a revision to the relevant governing document and that it plans to propose to stakeholders for consideration and discussion. The project plan includes the estimated timing for initiating the stakeholder process and effective dates.

Larger projects often start as a market assessment and, if the ISO determines changes are required, can become one or many market design projects. Some market design projects do not start as a market assessment because they are small projects or have a well-defined scope when initially identified.

WMPP and Strategic Planning

The ISO and New England stakeholders launched the Strategic Planning Initiative in 2010 to identify upcoming challenges to the continued reliable and efficient operation of the electricity system in New England.² The following risks facing the electric power system and wholesale markets were defined:

1. **Resource Performance and Flexibility**—the uncertain amounts, unclear performance, and operational challenges of using demand resources and less-responsive and limited supply resources and the need to increase system flexibility
2. **Increased Reliance on Natural-Gas-Fired Capacity**—the reliance on natural-gas-only resources because the gas supply and infrastructure system may not be sufficient to meet power system needs when seasonal demand is high or when the system is stressed in other ways or facing natural gas supply and transportation system contingencies
3. **Retirement of Generators**—economic and policy factors that could lead to the exit of a substantial portion of older fossil-fuel capacity
4. **Integration of a Greater Level of Variable Resources**—the need for a steady increase in reserves, regulation, and ramping capabilities as more intermittent resources, primarily renewable energy resources, are added to the system over the next several years
5. **Alignment of Markets with Planning**—the need to better align the timing and analysis of wholesale market procurements with transmission planning processes to allow for meeting reliability needs through market resources or backstop transmission solutions

Many of the challenges and associated recommendations will be addressed through market assessments and market design projects identified in this WMPP. To highlight the projects associated with specific strategic planning risks, WMPP tables include “SP” and the associated risk number(s), identified above, after the market assessment or market design project title (e.g., *Market Design Project Name*^{SP 1,2}).

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Overview of New England's Wholesale Electricity Markets

ISO New England is the not-for-profit corporation responsible for overseeing and administering New England's interrelated suite of competitive wholesale electricity markets. These markets work together to ensure the constant availability of electricity for the region's 14 million residents. More than 500 companies participate in these markets, buying and selling approximately \$8 billion of electric power and related products annually.

The products traded in New England's wholesale electricity markets comprise three major categories:

Energy Markets for buying and selling wholesale electric power

- **Day-Ahead Energy Market**—allows market participants to secure prices for electric energy the day before delivery and to hedge against price fluctuations that occur in real time
- **Real-Time Energy Market**—balances the dispatch of generation and demand resources to meet the instantaneous demand for electricity throughout New England
- **Financial Transmission Rights (FTRs)**—enable market participants to hedge against the cost of transmission network congestion

Capacity Market for ensuring long-term system reliability

- **Forward Capacity Market (FCM)**—ensures the system has sufficient resources to meet the future demand for electricity by holding auctions that send appropriate price signals to attract new investment and maintain existing resources

Ancillary Services for ensuring short-term system reliability

- **Regulation Market**—compensates resources that the ISO instructs to increase or decrease output moment-by-moment to balance the system frequency
- **Forward Reserve Market (FRM)**—compensates resources for keeping operable capacity available to provide electric energy within 10 or 30 minutes, which assures the New England system is able to withstand adverse events such as unexpected outages
- **Real-Time Reserve Pricing**—compensates resources for operating in a ready-to-respond state to supply electric energy or reduce demand in real time if needed to preserve system reliability
- **Voltage Support**—compensates resources for maintaining voltage-control capability, which allows system operators to maintain transmission voltages within acceptable limits
- **Black-Start Capability**—compensates specific power plants at key locations for their capability to restart the transmission system following a blackout

Developing Competitive Wholesale Markets

In the late 1990s, New England restructured its electric power industry to create a transparent marketplace that would introduce competition and bring about efficiencies in the way electricity had been bought, sold, generated, transmitted, and used for more than 70 years. The goals were to provide electricity at competitive prices and to establish wholesale markets to guide investment in new resources that would ensure a reliable electricity system across the region.

Good Market Design Yields Robust Markets

For these goals to be realized, markets need to be well designed so that they produce transparent, accurate prices for electric power and related products. Markets also need to be designed so that they attract many buyers and sellers. Markets are more competitive when they are guided by clear, understandable rules that enable low-cost participation by any potential participant.

In wholesale electricity markets, transparent and competitive prices signal when power is available in ample supply—and when and where it is expensive—to meet New England's power demand. This provides the economic incentive for buyers and sellers to develop more cost-effective ways of producing and delivering electricity, to invest in new resources and technologies, and to manage electricity use.

Robust Markets Yield Positive Outcomes

The ISO works collaboratively with market participants, state regulators, and other government officials and groups to construct a comprehensive market design that yields transparent, competitive price signals and ensures a level playing field for a large and diverse mix of participants. In a relatively short time, New England's suite of competitive energy, capacity, and ancillary services markets has facilitated the development of a power grid that is reliable, efficient, and environmentally sound. The marketplace has grown steadily, with the number of participants increasing from 200 buyers and sellers in 2000 to more than 500 today.

The Power System's Building Blocks

- A full complement of **competitive markets** that provide transparent price signals for investment in resources
- An **independent grid operator** that ensures all power producers compete on a level playing field for the opportunity to serve New England's electricity demand
- A transparent **planning** process that identifies infrastructure options and other alternatives to ensure the long-term reliability of the New England power grid

To learn more about New England's power grid, regional challenges and opportunities, and initiatives underway to address the power grid's needs over the coming decade, see the *Regional System Plan* available at ISO New England's website, www.iso-ne.com.

Since their inception in 1999, ISO New England's markets have accomplished the following:

- Attracted investment in close to 15,000 megawatts (MW) of **new, efficient, low-carbon-emitting power generation facilities**, with another approximately 5,000 MW proposed. This ensures that the grid operates reliably and that adequate supply is available to meet demand. Because private firms and not public utilities make this investment, consumers are shielded from the investment risks they had been exposed to under the prior system. In competitive markets, power plants are paid for performance and therefore have incentives to operate efficiently, contributing to the grid's overall reliability and controlling power costs.
- Attracted investment in **demand resources, such as load management, distributed generation, and energy-efficiency** projects, which have increased from 100 MW in 2003 to 1,850 MW in 2013. This translates into thousands of individual demand assets integrated into the power system. Over 2,500 MW of demand resources are expected to be available by 2016. This is a significant increase from the 100 MW of demand resources that existed in 2003. These resources help stabilize wholesale prices and contribute to system reliability during periods of peak demand, lessen the need to build expensive new infrastructure, and help achieve environmental goals.
- Enabled the development of **resources that run on renewable and low-carbon-emitting fuels**, thereby helping market participants respond to state and federal environmental policy goals. Currently, investors are proposing over 2,000 MW of renewable resources (mostly wind) throughout New England.
- Stimulated **technological innovations that are modernizing the power grid**. These "smart grid" projects create a more efficient, responsive, and reliable system that can incorporate greater amounts of price-sensitive demand, new technologies such as electric vehicles, and an expanding array of alternative energy sources.
- Complemented the regional planning process's guidance of the largest **expansion of transmission infrastructure** in New England since the 1970s. Approximately \$5.5 billion in transmission investment has occurred across the six New England states from 2002 to 2013, and another \$5.4 billion is planned over the next four years to meet reliability requirements, improve the economic performance of the system, and position the region to integrate renewable resources and alternative technologies. Enabling electricity to move more efficiently within and between regions provides greater access to low-cost suppliers, improves market competition, reduces

transmission congestion costs and line losses (both components of market prices), and reduces the need for costly reliability provisions with specific power plants.

Overall, the markets are working as designed, producing competitive prices that accurately reflect suppliers' costs of delivering power to meet consumers' real-time demand. Because approximately 43% of the region's power plants use natural gas to generate electricity, day-to-day volatility in wholesale electricity prices mirrors fluctuations in the price of this fuel. The close link between fuel costs and wholesale electricity prices illustrates that **wholesale markets are efficient and competitive** because changes in the cost of key production inputs are rapidly reflected in wholesale electricity prices.

Robust Markets Are Continuously Refined and Enhanced

The power grid and the challenges the industry faces are dynamic and complex. Accordingly, the markets must evolve to stay in step with technological and resource advancements and government policies that affect the power system. In addition, the markets are continuously assessed and the market rules, procedures, and software refined to enhance transparency and efficiency. These enhancements continue to expand the options and incentives for market participation.

ISO New England engages regional stakeholders in formal processes that strive to achieve consensus before initiating changes to the market design. In addition to the formal process, the ISO participates in stakeholder working groups, hosts numerous meetings, and offers many lines of communication to build a common understanding of the key issues facing the region's energy future. Obtaining stakeholder input early in the market-design process results in the timely delivery of market initiatives and facilitates approval by the Federal Energy Regulatory Commission (FERC), the regulatory agency that oversees New England's wholesale electricity markets.

Success through Collaboration

New England's wholesale electricity markets have proved successful over the past decade in large part because the process used to develop the markets is highly collaborative and transparent. ISO New England works with numerous stakeholders representing a wide variety of constituencies, technologies, and interests to put together comprehensive market solutions that will yield the best possible results for the region. These stakeholders include the New England Power Pool (NEPOOL), the voluntary association of the participants in New England's wholesale electricity marketplace; state regulators, including those who form the New England Conference of Public Utilities Commissioners (NECPUC); state and federal legislators, attorneys general, and consumer and environmental advocates, including members of the Consumer Liaison Group (CLG); and the six governors, primarily through the New England Governors' Conference (NEG) and New England States Committee on Electricity (NESCOE).

Market Assessments

This section summarizes the current scope, schedule, and status of market assessments.

- Market Assessments in **bold** indicate a new assessment since the previous WMPP.
- *Italicized text* indicates a change from the previous WMPP.
- Starred (“*”) names indicate that the assessment description has been substantially modified from the previous WMPP.
- Assessments marked with “SP” are associated with New England’s strategic planning discussions.

Summary of Existing Market Assessments (Listed Alphabetically)

Market Assessment	Related Market Design Projects
Alternative Technology Energy and Reserve Market Pilot	
Electric Power and Natural Gas Sector Coordination ^{SP 2}	
Energy Market Congestion Pricing at External Nodes	<ul style="list-style-type: none"> ■ Coordinated Transaction Scheduling (CTS)
*Energy Market Pricing Enhancements ^{SP 1}	
Forward Capacity Market (FCM) and Interconnection Rights ^{SP 3,5}	
FCM Assessment ^{SP 1,2,3,5}	<ul style="list-style-type: none"> ■ FCM Performance Incentives ■ Treatment of Resources Retained for Reliability ■ Capacity Zone Modeling
FCM Noncommercial Financial Assurance, Commercial Operation, and Termination	<ul style="list-style-type: none"> ■ FCM Noncommercial Capacity Financial Assurance
Integration of Intermittent Resources ^{SP 4}	<ul style="list-style-type: none"> ■ Wind Forecasting and Dispatch
Interregional Coordination with New York Independent System Operator (NYISO)	<ul style="list-style-type: none"> ■ Coordinated Transaction Scheduling (CTS) ■ CTS: Self-Funding Tariff
Operating Reserve Requirement Analysis ^{SP 1}	
Price-Responsive Demand: Reserve Market	
Pricing Demand-Resource Activation	<ul style="list-style-type: none"> ■ Price-Responsive Demand (PRD): Energy Market Integration (Order 745)
Privately Financed Transmission Projects	

The market assessment descriptions below are ordered alphabetically.

Alternative Technology Energy and Reserve Market Pilot

The ISO is evaluating a pilot program to assess whether new technologies (including demand response) that follow dispatch instructions for the energy market can provide real-time operating reserve. This program also will help the ISO evaluate and improve communication and monitoring systems needed for dispatching small, dispersed resources in the real-time energy and reserve markets.

Electric Power and Natural Gas Sector Coordination

On a number of occasions over the past 10 years, New England has faced challenging operating conditions associated with, in part, the availability of the region's gas-fired generating capacity (e.g., 2004 "cold snap," 2009 Sable Island outage, January 2011 cold weather). These challenging operating conditions were linked to disruptions in the natural gas supply or transportation infrastructure (or both), natural gas market conditions, or natural gas availability for power generation on very cold winter days (i.e., peak cold-snap conditions) when the demand for natural gas was high.

The ISO is working closely with its stakeholders and the gas industry to improve the coordination between the electric power and natural gas industries to mitigate the operational risks associated with these types of events.

Energy Market Congestion Pricing at External Nodes

As noted in the filing on External Transaction Net Commitment-Period Compensation (NCPC) changes, the ISO does not set a congestion component in the locational marginal price (LMP) at an external interface.³ Instead, the ISO charges users of the external interface a different NCPC charge. As a consequence, the true cost of buying or selling power across an external interface is not transparent to market participants and cannot be hedged easily.

To address this issue, the ISO is assessing modifications to enable congestion pricing at external interfaces. This will improve price transparency and more closely align the calculation of LMPs at external interfaces with the ISO's standard congestion-pricing design. Ancillary benefits include improving the ability of price signals to lay a necessary foundation for coordinated energy flows and congestion management with New England's neighbors.

Energy Market Pricing Enhancements

The ISO is evaluating changes to real-time pricing calculations to better reflect the costs of dispatching resources in certain situations. The ISO is evaluating an improved pricing algorithm for fast-start units. The ISO is also assessing improved methodologies for incorporating into real-time prices the cost of slow-ramping generation units, as well as costs incurred to redispatch the system when necessary to satisfy steep load ramps during the operating day.

FCM and Interconnection Rights

Delist bids, nonprice retirement requests, resource repowering plans, and other resource modifications can have an impact on resources' interconnection rights and associated electric energy and capacity values. Initial steps of this market assessment will include a review of all existing mechanisms by which interconnections and associated rights can be modified and how the interconnection process coordinates with the FCM.

FCM Assessment

The ISO will evaluate three key areas of the FCM to address identified strategic risks:

1. **Core Capacity Product Definition and Performance Incentives/Consequences**, involving an improved definition of capacity products, the creation of appropriate performance requirements and incentives, and consequences for failing to perform
2. **System Operational Needs**, involving the identification of system operational needs (such as resource flexibility) and the translation of these needs into additional product specifications with appropriate delivery incentives and consequences
3. **Locational Reliability Requirements**, involving the specification of system locational requirements and market constructs to induce locational responses (this was identified as a separate market assessment in a prior version of the *WMPP* and has been merged in the broader scope of the FCM assessment activity)

FCM Noncommercial Financial Assurance, Commercial Operation, and Termination

Per *Market Rule 1*, the ISO was obligated to reconsider the financial assurance requirements for noncommercial resources that acquired an obligation in the Forward Capacity Market no later than February 2013.⁴ As part of this assessment, the ISO evaluated the rules for both commercial-operation determination and resource termination. The ISO also evaluated financial assurance requirements for resources that do not clear in the Forward Capacity Auction (FCA) but acquire an obligation through a reconfiguration auction or bilateral transaction. The ISO is evaluating additional changes to conform the FCM rules to the revised Financial Assurance Policy.

Integration of Intermittent Resources

The ISO is assessing potential modifications to the energy market rules and requirements that may be necessary to accommodate greater quantities of intermittent resources, such as wind power generation. Elements under evaluation include commitment requirements, energy price formation, and the effect of intermittent resources on the capacity, reserve, and regulation markets.

Interregional Coordination with NYISO

ISO New England and the New York ISO are committed to creating a broader regional market and improving the efficiency of electricity trade between regions. In 2010, the two ISOs commenced a joint project to evaluate the economic and operating performance of energy flows across their interconnected transmission network. The project's two central objectives are to improve the economics of using the transmission ties between the regions and to leverage the regions' capabilities to minimize congestion.

This long-term project has two phases. Phase I, the *Coordinated Transaction Scheduling* project, seeks to improve the economic coordination between the two regions' electricity markets. Phase II will focus on coordinated congestion management and network modeling.

Operating Reserve Requirement Analysis

The ISO is evaluating the requirements for real-time operating reserve and the appropriate quantities of 10-minute nonspinning reserve and 30-minute operating reserve to procure in the Forward Reserve Market. The ISO is reviewing the reserve requirements under a variety of operating conditions, including situations when the ISO is required to commit supplemental or replacement reserve resulting from unusually large contingency exposures.

Price-Responsive Demand: Reserve Market

The design proposed under *Price-Responsive Demand: Full Integration into the Energy Market* provides the ability for demand-response resources to participate directly in the energy market similar to other supply resources.⁵ The ISO is evaluating modifications to the rules to allow demand-response resources that participate in the energy market to also provide reserve similar to other supply resources. The ISO will propose any changes to be effective for June 2017.

Pricing Demand-Resource Activation

A significant number of demand resources are serving as capacity in the FCM. If the ISO faces a capacity deficiency during the operating day, it can call on these resources to reduce power demand in New England.⁶ However, most of these resources are not dispatched in the ISO's energy-market clearing process. The ISO is proposing changes as part of the Price-Responsive Demand: Energy Market Integration project that allows demand response to set market-clearing prices that better reflect the costs of activating these resources in the Day-Ahead and Real-Time Energy Markets.

Privately Financed Transmission Projects

The ISO is evaluating operational and market impacts specific to new, privately financed transmission projects. Unlike most transmission projects, these projects are not proposed as regional transmission solutions in response to a "needs assessment" pursuant to Attachment K of the *Open Access Transmission Tariff* (OATT), and consequently, their treatment may not be adequately specified in the OATT.⁷ This assessment will review the integration of these transmission projects and may identify recommendations in several areas, including interconnection queue procedures to improve study certainty, interconnection rights, external interfaces created by these projects, and associated market rule changes.

Market Design Projects

This section summarizes the current scope, schedule, and status of open projects.

- Market Design Projects in **bold** indicate a new project since the previous WMPP.
- *Italicized text* indicates a change from the previous WMPP.
- Starred (“*”) dates indicate a delay in the schedule from the previous WMPP.
- Starred (“*”) project names indicate that the project description has been substantially modified from the previous WMPP.
- Projects marked with “SP” are associated with New England’s strategic planning discussions.

Summary of Market Design Projects (Listed Alphabetically)

Market Design Project	Estimated Start of Stakeholder Process ^(a)	Estimated Earliest Effective Date	Design Status ^(b)
Capacity Zone Modeling	N/A	Q2 2014	Pending FERC filing
CTS: Self-Funding Tariff	2014	2015	In development
Demand-Response: Asset Auditing and FCM Financial Assurance	N/A	Q1 2014	Pending FERC action on filing ER14-581-000 (December 9, 2013)
Demand-Response Baseline and Outages	N/A	2014	Pending FERC action on filing ER14-727-000 (December 20, 2013)
Dispatchable Asset-Related Demand (DARD) Pump Intertemporal Parameters	2014	2015	In assessment
Energy Market Offer Flexibility: Conforming Rules	Q2 2014	Q4 2014	In assessment
Energy Market Offer Flexibility: Self-Funding Tariff	Underway	Q2 2014	In development
FCM Cost Allocation and Load Reconstitution	TBD	TBD	Deferred
FCM Noncommercial Capacity Financial Assurance	Phase 1: N/A	June 2014	Pending FERC action on filing ER14-525-000 (December 4, 2013)
	Phase 2: 2014		In assessment

Market Design Project	Estimated Start of Stakeholder Process ^(a)	Estimated Earliest Effective Date	Design Status ^(b)
FCM Performance Incentives ^{SP 1,2,3}	N/A	June 2014	Pending FERC action on filing ER14-1050-000 ER14-1050-001 (January 17, 2014)
FCM Performance Incentives: Financial Assurance	N/A	2018	Pending FERC action on filing ER14-1050-000 ER14-1050-001 (January 17, 2014)
FCM Sloped Demand Curve	Underway	FCA #9 (February 2015)	In development
*NCPC Cost Allocation	Underway	Q4 2014	In assessment
NCPC Payments ^{SP 1}	N/A	Q4 2014	Pending FERC action on filing ER14-1147-000 (January 24, 2014)
NCPC Payments: Appendix A	N/A	Q4 2014	Pending FERC action on filing ER14-1147-000 (January 24, 2014)
Nonprice Retirement Request Timeline	Underway	Q2 2014	In development
Price-Responsive Demand: Energy and Reserves	2014	June 1, 2017	In assessment
Real-Time Reserve and Pumped Storage	Underway	*Q2 2014	In development
Regulation Market: Improved Resource Modeling and Automatic Generation Control (AGC) Dispatch Coordination	Underway	Q2 2014	In development
Subhourly Real-Time Settlement ^{SP 1}	Underway	2015	In assessment
Third-Party Clearing of Financial Transmission Rights (FTRs)	Underway	November 2015	In development
Treatment of Resources Retained For Reliability	Underway	Q2 2014	In development
Wind Forecasting and Dispatch ^{SP 4}	Underway	Phase 1: Q2 2013 Phase 2: TBD	Complete In development

(a) This date indicates when the ISO expects to present a formal proposal to stakeholder committee(s). Some projects may involve discussion with committees before becoming a formal ISO proposal.

(b) The design status of “in assessment” means that the ISO is evaluating potential solutions; “in development” means that the ISO is preparing or has presented a proposal to stakeholder committee(s); “deferred” means that the ISO is no longer actively evaluating solutions or developing a proposal for the stakeholder committees on the project; “pending FERC filing” means that the ISO has gone through the stakeholder process but has not yet filed the change with the Federal Energy Regulatory Commission; “pending FERC action on filing” means that the ISO is awaiting a FERC ruling on a proposed set of tariff changes; and “complete” means that the development process is finished.

The project descriptions below are ordered alphabetically.

Capacity Zone Modeling

In response to FERC's order of May 31, 2013, the ISO and stakeholders are evaluating the best way to determine the appropriate number of and boundaries for zones modeled in future Forward Capacity Auctions.⁸ In particular, the stakeholder process will consider the criteria to be used in establishing zones and the evolution of zones as system conditions changes.

CTS: Self-Funding Tariff

As part of the design for interregional coordination with NYISO, the ISO is proposing to eliminate specific transaction unit and volumetric charges assessed through the ISO's *Self-Funding Tariff* on external transactions at certain interfaces between New York and New England.⁹

DARD Pump Intertemporal Parameters

The ISO is assessing adding intertemporal parameters for DARD pumps to provide improvements to the commitment and operation for pumping.

Demand Response: Asset Auditing and FCM Financial Assurance

The ISO is proposing to add to the existing commercial auditing value of a demand-response asset any incremental capability increase resulting from an audit of a new asset.¹⁰ This new value will be an improved input into the calculation of FCM financial-assurance release for demand response.

Demand-Response Baseline and Outages

As part of the Price-Responsive Demand: Full Integration Capacity Market Changes project, the ISO proposed crediting in the FCM as being available the demand-response assets on a forced reduction (e.g., power outage) or a scheduled reduction (e.g., maintenance) that is not capable of interrupting its load during a shortage event (because the load already is interrupted).¹¹ This proposal did not modify the baseline computation.

Including forced or scheduled demand reductions in the meter data of a demand-response asset may result in an underestimation of the calculated baseline of the demand-response asset's actual load on the days following the forced or scheduled demand reduction. The ISO is evaluating excluding meter data from the baseline computation of demand-response assets for days with forced or scheduled demand reductions.

Energy Market Offer Flexibility: Conforming Rules

The ISO has identified some additional areas to evaluate that may support the hourly offers structure as proposed in the *Energy Market Offer Flexibility* design. These include Forward Reserve Market timing requirements and a review of defined terms to ensure consistency throughout the tariff.

Energy Market Offer Flexibility: Self-Funding Tariff

As part of the *Energy Market Offer Flexibility* market design project, the ISO is required to make conforming changes to the *Self-Funding Tariff* to clarify the impacts of hourly offers and intraday reoffers on the transaction-unit determination.

FCM Cost Allocation and Load Reconstitution

The ISO is evaluating modifications to the methodology for allocating FCM costs associated with meeting the Installed Capacity Requirement (ICR). The current methodology for allocating costs is based on a single peak hour of the summer. However, analyses show that the ICR value is sensitive to consumption behavior in multiple summer hours. The ISO is examining ways to better connect capacity costs to consumption behavior by allocating capacity costs to hours that have the greatest impact on the ICR.

This project also will include a discussion of load reconstitution, which involves increasing the projected load of a particular end-use consumer or group of end-use consumers by the amount for which they are compensated for demand response in the wholesale electricity markets.

FCM Noncommercial Capacity Financial Assurance

The ISO submitted to FERC changes to the Financial Assurance Policy.¹² These changes would replace the current FCM financial assurance requirements for noncommercial resources (which are based on the fixed \$5.74/kW-month price that replaced the cost of new entry [CONE]) with a requirement that provides sufficient incentive to deliver the cleared project while not placing undue burden on project financing and development cash flows. The ISO is also considering a mechanism to collect additional financial assurance if a resource fails to meet development milestones. Phase 2 of this project will be to conform the FCM rules to the changes in the Financial Assurance Policy.

FCM Performance Incentives

The ISO is evaluating replacing the existing FCM shortage-event penalty structure with a new pay-for-performance mechanism. This mechanism is intended to create strong financial incentives for all capacity suppliers, without exception, to maximize performance and availability during scarcity conditions (i.e., during operating reserve deficiencies). The objective is to ensure that supply resources face appropriate market-based incentives and have the financial capability to undertake cost-effective investments that improve resource performance and system reliability.

FCM Performance Incentives: Financial Assurance

The FCM Performance Incentive proposal introduces a mechanism that changes the financial obligations for resources with capacity supply obligations. The ISO is evaluating financial assurance changes to introduce new requirements to collateralize these obligations.

FCM Sloped Demand Curve

The ISO will propose a specific demand curve for the region's capacity market. This project will include subregional demand curves specific to constrained zones and the calculation of demand-curve parameters.

NCPC Cost Allocation

The ISO is assessing whether to continue to allocate real-time NCPC costs to virtual transactions and other types of real-time deviations from schedules established in the Day-Ahead Energy Market. This project includes evaluating the extent to which virtual transactions' and other resources'

real-time deviations affect real-time NCPC costs and whether the current real-time NCPC cost-allocation methodology accurately reflects how NCPC costs are incurred. The ISO is currently planning to implement these changes in two phases, with the first phase to be in place before the end of 2014 and focused on increasing incentives for load to bid into the Day-Ahead Energy Market. Stakeholder discussions for the second phase would begin no earlier than 2015.

NCPC Payments

As part of the *Energy Market Offer Flexibility* market design project, the ISO is required to make conforming changes to the NCPC payment rules to complement the ability of participants to modify their offers throughout the operating day.

NCPC Payments: Appendix A

The ISO has identified some changes to the Appendix A mitigation rules to support the NCPC payment rules that result from the *Energy Market Offer Flexibility* design.

Nonprice Retirement Request Timeline

The ISO is evaluating changes to the nonprice retirement request submission timeline so that in cases where a nonprice retirement request is retained for reliability, the reliability reviews and participant decisions can be completed before the FCA.

Price-Responsive Demand: Energy and Reserves

The ISO is currently evaluating updates to the price-responsive demand market rules to incorporate changes to the energy market design (*NCPC Payment* rules) and Regulation Market design (Order 755) and to define how demand response provides real-time reserves and participates in the Forward Reserve Market.¹³

Real-Time Reserve and Pumped Storage

Currently, pumped storage hydroelectric facilities that self-schedule in pumping mode are not treated as providing operating reserve. This has occasionally resulted in reserve shortages, with attendant energy and reserve price spikes during off-peak hours lasting until either fast-start resources come on line or the pump operators cancel their self-schedule (or both). The ISO is proposing changes to enable the modeling of real-time operating reserve provided by self-scheduled pumps and to allow these resources to be compensated at the real-time reserve price for providing this reserve.

Regulation Market: Improved Resource Modeling and AGC Dispatch Coordination

The ISO has identified an improved approach to integrating generators and alternative-technology regulation resources (ATRRs) in the automatic generation control dispatch. In addition, the Regulation Market settlement must be changed to conform to the *Energy Market Offer Flexibility* changes, and the modeling of ATRRs that meet certain requirements must be clarified.

Subhourly Real-Time Settlement

All the real-time markets (energy, reserve, and regulation) are settled hourly, even though the ISO calculates real-time LMPs every five minutes. Existing settlement rules can result in an inconsistency between the average hourly LMP-based compensation and how the resource performed on a five-minute basis, especially for resources able to respond quickly to changing system conditions. The ISO is evaluating subhourly settlement of the real-time markets for, at a minimum, generation resources, external transactions, dispatchable asset-related demand resources, and demand-response resources.

Third-Party Clearing of Financial Transmission Rights

The ISO is adopting a third-party clearing for FTRs to minimize market participant exposure to an FTR default loss. The ISO will continue to administer the FTR auction under the design, but FTR awards will be converted to contracts on an external commodity exchange, which will bear the entire default risk. The exchange will also provide a platform for secondary market trading.

Treatment of Resources Retained For Reliability

Despite a resource owner's intent to exit from the Forward Capacity Auction, some delist bids and retirement requests are retained for local reliability needs "out-of-rate." The ISO is evaluating a revised construct to remove the impact of these out-of-rate bids and retirement requests on the Forward Capacity Auction clearing prices.

Wind Forecasting and Dispatch

The New England Wind Integration Study found that a critical factor for the successful integration of wind resources into the region's electricity grid is accurate, detailed wind power forecasts.¹⁴ These forecasts provide system operators with situational awareness during significant weather events. This project will identify the following:

- Wind power forecasting products that integrate well with existing operational practices
- Appropriate changes in operating procedures, data requirements, and dispatch rules to make efficient use of wind resources while ensuring reliable system operation
- Transitional changes to prevent wind resources from requesting to be dispatched until appropriate systems are in place to properly dispatch these resources

Completed Market Design Projects

This section summarizes projects the ISO has completed, either by modifying the design and tariff or by determining that no further action is required. Project descriptions provide a high-level overview of the final scope of any changes. Additional information is available in the online WMPP at www.iso-ne.com/wmpp, and descriptions of closed WMPP design projects are available at www.iso-ne.com/wmppclosed.

Summary of Completed Market Design Projects (Listed Alphabetically)

Market Design Project	Estimated Earliest Effective Date	Docket No. (Filing Date)	Design Status ^(a)
Coordinated Transaction Scheduling	2015	ER12-1155-000 (February 24, 2012)	Changes to ISO manuals required
Energy Market Offer Flexibility ^{SP 2, 4}	December 3, 2014	ER13-1877-000 (July 1, 2013)	Changes to ISO manuals required
Price-Responsive Demand: Energy Market Integration (Order 745) ^{SP 1}	June 2017	ER12-1627-000 (April 26, 2012)	Changes to ISO manuals required
Regulation Market (Order 755) Compliance	October 1, 2014	ER12-1643-003 (August 5, 2013)	Changes to ISO manuals required

(a) The design status of “changes to ISO manuals required” means that the ISO has completed the tariff changes, and conforming the ISO manuals still is required or is in progress; “complete” means that the development process is finished; “no action taken” means that the ISO has assessed the item and determined that no additional work is required; “merged with other project” means that the ISO did not pursue this as a separate proposal and included the scope with another project.

The project descriptions below are ordered alphabetically.

Coordinated Transaction Scheduling

ISO New England and the New York ISO are committed to creating a broader regional market and improving the efficiency of electricity trade between the regions. In 2011, stakeholders for the regions supported an enhanced scheduling process, the Coordinated Transaction Scheduling design, which modified the real-time external transaction submittal and scheduling process at the New York/New England AC interfaces.¹⁵

Energy Market Offer Flexibility

The ISO evaluated changes to the design of the energy market. These changes permit dispatchable resources to submit hourly energy offers into the Day-Ahead Energy Market and to modify the commitment cost components (start-up and no-load costs) and the incremental energy-offer component of supply offers during the operating day. The ISO also evaluated the self-scheduling rules in the context of the intraday reoffer changes and the ability for resources to submit negative-priced offers into the market.¹⁶

Price-Responsive Demand: Energy Market Integration (Order 745)

On March 15, 2011, FERC issued Order 745, *Compensation of Demand Response in Organized Markets*, which requires organized wholesale energy markets to pay demand-response providers the market price for electric energy for reducing consumption below expected levels, when doing so lowers costs to loads and helps balance supply and demand.¹⁷

Two sets of changes to the market rules were implemented to meet the obligations of Order 745. First, to meet the immediate requirements of Order 745 (i.e., transition), the ISO implemented modifications to its existing demand-response programs in a relatively short timeframe. Second, the ISO modified rules based on the requirements outlined in Order 745 to allow for the full integration of demand response into the energy markets.

Regulation Market (Order 755) Compliance

On November 8, 2012, FERC rejected the ISO's April 30, 2012, filing to comply with its Order 755, *Frequency Regulation Compensation in Organized Wholesale Power Markets*.¹⁸ The ISO submitted a compliance filing in February 2013.¹⁹ The ISO prepared further compliance in response to FERC's June 20, 2013, order requiring clarification that market participants may include intertemporal opportunity costs in their regulation capacity offer price and requiring an explanation of how such costs would be verified.^{20,21}

Acronyms

Acronym	Term
AC	alternating current
CLG	Consumer Liaison Group
CSO	capacity supply obligation
CTS	Coordinated Transaction Scheduling
DARD	dispatchable asset-related demand
FCA	Forward Capacity Auction
FCM	Forward Capacity Market
FERC	Federal Energy Regulatory Commission
FRM	Forward Reserve Market
FTR	Financial Transmission Right
ICR	Installed Capacity Requirement
ISO	ISO New England
LMP	locational marginal price
MW	megawatt
NCPC	Net Commitment-Period Compensation
NECPUC	New England Conference of Public Utilities Commissioners
NEGC	New England Governors' Conference
NEPOOL	New England Power Pool
NESCOE	New England States Committee on Electricity
NYISO	New York Independent System Operator
NY/NE	New York/New England
OATT	Open Access Transmission Tariff
OOM	out-of-market
SP	strategic planning
TMNSR	10-minute nonspinning reserve
TMOR	30-minute operating reserve
Q	quarter
WMPP	Wholesale Markets Project Plan

Notes

- 1 Updates are available at http://www.iso-ne.com/pubs/whlsle_mkt_pln/index.html.
- 2 Additional information on the strategic planning discussions is available at http://www.iso-ne.com/committees/comm_wkgrps/strategic_planning_discussion/materials/.
- 3 ISO New England Inc., *External Transaction NCPC*, Docket No. ER09-547-000 (January 15, 2009), http://www.iso-ne.com/regulatory/ferc/filings/2009/jan/er09-547-000_1-15-09_ext_trans_ncpc.pdf.
- 4 *ISO New England Market Rule 1, Standard Market Design*, Section III.13.1.9, "Financial Assurance" (November 3, 2013), http://www.iso-ne.com/regulatory/tariff/sect_3/index.html.
- 5 ISO New England Inc., *Order No. 745 Compliance Filing*, Docket No. ER11-4336-000 (August 19, 2011), http://www.iso-ne.com/regulatory/ferc/filings/2011/aug/er11_4336_000_prd_filing.pdf.
- 6 The ISO would follow Operating Procedure No. 4, *Action During a Capacity Deficiency* (December 9, 2011), http://www.iso-ne.com/rules_proceeds/operating/isone/op4/index.html.
- 7 *ISO New England Open Access Transmission Tariff*, Section II, Attachment K, "Regional System Planning Process" (2013), http://www.iso-ne.com/regulatory/tariff/sect_2/oatt/sect_ii.pdf.
- 8 FERC, *Order on Compliance Filing*, Docket No. ER12-953-002 (May 31, 2013), http://www.iso-ne.com/regulatory/ferc/orders/2013/may/er12-953-002_5-31-13_order_accept_fcm_compliance.pdf.
- 9 *ISO New England Self-Funding Tariff*, Section IV.A, "Recovery of ISO Administrative Expenses" (January 1, 2013), http://www.iso-ne.com/regulatory/tariff/sect_4/1-1-13_section_iva.pdf.
- 10 ISO New England Inc. and New England Power Pool, *Market Rule 1 Revisions Regarding Demand Resource Commercial Operation Auditing*, Docket No. ER14-581-000 (December 9, 2013), http://www.iso-ne.com/regulatory/ferc/filings/2013/dec/er14-581-000_12-9-13_dr_auditing.pdf.
- 11 ISO New England Inc. and New England Power Pool, *Demand Response Baseline Changes*, Docket No. ER14-727-000 (December 20, 2013), http://www.iso-ne.com/regulatory/ferc/filings/2013/dec/er14-727-000_drbaseline_chg_12-20-2013.pdf.
- 12 ISO New England Inc. and New England Power Pool, *Revisions to ISO New England Transmission, Markets, and Services Tariff Related to Financial Assurance for Noncommercial Capacity in the Forward Capacity Market*, Docket No. ER14-525-000 (December 4, 2013), http://www.iso-ne.com/regulatory/ferc/filings/2013/dec/er14-525-000_12-4-2013_fa_ncc_fcm.pdf.

- 13 FERC, *Frequency Regulation Compensation in Organized Wholesale Energy Markets*, Order No. 755, Docket No. RM11-7-000, AD10-11-000 (October 20, 2011), <http://www.ferc.gov/whats-new/comm-meet/2011/102011/E-28.pdf>.
- 14 GE Applications and Systems Engineering, *New England Wind Integration Study* (December 5, 2010), http://www.iso-ne.com/committees/comm_wkgrps/prtcpnts_comm/pac/reports/2010/newis_report.pdf.
- 15 ISO New England Inc., *Coordinated Transaction Scheduling*, Docket No. ER12-1155-000 (February 24, 2012), http://www.iso-ne.com/regulatory/ferc/filings/2012/feb/er12-1155-000_02-24-2012_cts_filing.pdf.
- 16 ISO New England Inc. and New England Power Pool, *Energy Market Offer Flexibility Changes*, Docket No. ER13-1877-000 (July 1, 2013), http://www.iso-ne.com/regulatory/ferc/filings/2013/jul/er13-1877-000_mkt_offer_flex_7-1-2013.pdf.
- 17 FERC, *Demand-Response Compensation in Organized Wholesale Energy Markets*, Order No. 745, Docket No. RM10-17-000 (March 15, 2011), http://www.iso-ne.com/regulatory/ferc/orders/2011/mar/rm10-17-000_3-15-000_demand_resp_order.pdf.
- 18 FERC, *Order on Compliance Filing*, Docket No. ER12-1643-000 (November 8, 2012), http://www.iso-ne.com/regulatory/ferc/orders/2012/nov/er12-1643-000_11-8-12_order_rejecting_order_755_filing.pdf, and FERC Order No. 755 (see note 13 above).
- 19 ISO New England Inc. and New England Power Pool, *Order No. 755 Regulation Market Compliance Changes*, Docket No. ER12-1643-001 (February 6, 2013), http://www.iso-ne.com/regulatory/ferc/filings/2013/feb/er12-1643-001_order_755_2-6-2013.pdf.
- 20 FERC, *Order RE: Regulation Market Order 755 Compliance*, Docket No. ER12-1643-001 (June 20, 2013), http://www.iso-ne.com/regulatory/ferc/orders/2013/jun/er12-1643-001_6-20-13_ordr_reg_mkt_ordr755_compliance.pdf.
- 21 ISO New England Inc. and New England Power Pool, *Order No. 755 Regulation Market Compliance Changes*, Docket No. ER12-1643-003 (August 5, 2013), http://www.iso-ne.com/regulatory/ferc/filings/2013/aug/er12-1643-003_order_755_compliance_8-5-2013.pdf.



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