



## NPCC 2009 New England Annual Interim Review of Resource Adequacy

ISO New England Inc.

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## 1.0 EXECUTIVE SUMMARY

This report is ISO New England’s (ISO-NE) 2009 Annual Interim Assessment of its 2008 Comprehensive Review of Resource Adequacy covering the time period of 2009 through 2013. This assessment is conducted to comply with the Reliability Assessment Program (RAP) as established by the Northeast Power Coordinating Council (NPCC). This assessment follows the resource adequacy review guidelines as outlined in the NPCC B-8 Document “Guidelines for Area Review of Resource Adequacy.”<sup>1</sup>

Results of this interim resource adequacy assessment show that New England will comply with the NPCC resource adequacy reliability criterion under both the reference and the high demand forecasts. Tables E1 and E2 summarize the Loss of Load Expectation for the study years for the demand forecast scenarios simulated.

**Table E1 Reference Demand Forecast**

<b>Year</b>	<b>2008 Comprehensive Review (Days/Year)</b>	<b>2009 Interim Review (Days/Year)</b>
<b>2010</b>	0.027	0.033
<b>2011</b>	0.032	0.000
<b>2012</b>	0.045	0.001
<b>2013</b>	0.060	0.001

**Table E2 High Demand Forecast**

<b>Year</b>	<b>2008 Comprehensive Review (Days/Year)</b>	<b>2009 Interim Review (Days/Year)</b>
<b>2010</b>	0.037	0.038
<b>2011</b>	0.049	0.000
<b>2012</b>	0.080	0.001
<b>2013</b>	0.123	0.003

On June 16, 2006, the Federal Energy Regulatory Commission (FERC) approved a Settlement Agreement<sup>2</sup> (SA) creating a newly designed Forward Capacity Market<sup>3</sup> (FCM) in New England. The FCM establishes competitive auctions for capacity resources, both supply and demand-side, which are held three years ahead of their anticipated need. The annual Forward Capacity Auctions (FCA) use a descending clock process for the auctions. There are also annual Reconfiguration Auctions (RA) two years, one year, and just prior to the Commitment Period.<sup>4</sup> All qualified capacity

<sup>1</sup> <http://www.npcc.org/documents/regStandards/Guide.aspx>

<sup>2</sup> [http://www.iso-ne.com/regulatory/ferc/filings/2006/mar/er03-563-000\\_030\\_055\\_3-7-06\\_corrected.pdf](http://www.iso-ne.com/regulatory/ferc/filings/2006/mar/er03-563-000_030_055_3-7-06_corrected.pdf)

<sup>3</sup> For a copy of the market rules, please reference: [http://www.iso-ne.com/regulatory/tariff/sect\\_3/v6\\_eff-1-9-08\\_mr1\\_sect\\_13\\_and\\_14.pdf](http://www.iso-ne.com/regulatory/tariff/sect_3/v6_eff-1-9-08_mr1_sect_13_and_14.pdf)

<sup>4</sup> A FCM Commitment Period runs from June 1 of one year to May 31<sup>st</sup> of the next year.

resources<sup>5</sup> (existing, new, and imports) may offer or bid into the capacity auction. One hundred percent of the Installed Capacity Requirement (ICR) will be procured by ISO New England to satisfy resource adequacy reliability requirements. Capacity cleared in an FCA will be entitled to receive market-based capacity payments.

The first FCA for the 2010/2011 capability year successfully concluded on February 6, 2008. At the beginning of the auction, a total of 38,105 MW of capacity had been submitted, well above the Installed Capacity Requirement of 32,305 MW. The FCM auction selected 34,352 MW, which cleared at the floor price of \$4.50/kW-mo, an excess of 2,047 MW. After proration and the second annual reconfiguration auction, there are 32,800 MW of resources assuming capacity obligations for the 2010/2011 commitment period.

The second FCA for the 2011/2012 capability year successfully concluded on December 10, 2008. A total of 42,777 MW of capacity participated within the auction. The FCM auction cleared at the minimum price of \$3.60/kW-month with an excess supply of 4,755 MW above the Installed Capacity Requirement of 32,528 MW.

The third FCA for the 2012/2013 capability year successfully concluded on October 6, 2009. More than 40,995 MW of resources from new and existing demand- and supply-side resources competed to provide the 31,965 MW of capacity needed for system reliability. The FCM auction settled at the minimum floor price established for this auction at \$2.95 per kW-month, with 4,487 MW of excess supply remaining.

The fourth FCA for the 2013/2014 capability year is scheduled to be held in August 2010.

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<sup>5</sup> In accordance to ISO New England Forward Capacity Market rules, each resource must qualify as either a New or Existing Capacity Resource (including Generating Capacity, Import Capacity and Demand Resources) in order to participate in the FCA. In the qualification process, the ISO will determine a summer Qualified Capacity for each existing resource. For each New Resource, the ISO will evaluate the Qualification Package submitted by the project sponsor to determine if the New Resource is accepted for participating in the auction, taking into consideration its interconnection impact on the system, and whether the milestones in the Critical Path Schedule are reasonable and likely to be met.

## **2.0 INTRODUCTION**

This is the first update of the New England's 2008 Comprehensive Review of Resource Adequacy, which was approved by NPCC in November 2008. Since the approval of the 2008 Comprehensive Review, ISO New England has conducted additional comprehensive resource adequacy assessments as part of its Regional System Planning (RSP) process. The major assumptions of this interim review are consistent with those used for the most recent RSP, RSP 2009<sup>6</sup>.

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<sup>6</sup> [http://www.iso-ne.com/trans/rsp/2009/rsp09\\_final.pdf](http://www.iso-ne.com/trans/rsp/2009/rsp09_final.pdf)

## 3.0 ASSUMPTION CHANGES

### 3.1. RESOURCE

For the year 2010, the resource assumptions for the 2008 Comprehensive Review were based on the resource set that cleared in the 2010 FCA. Since then, some resources have chosen to prorate down their capacity obligation in accordance with market rules<sup>7</sup>. Also an Annual Reconfiguration Auction (ARA) was conducted, in which some resources have either shed or picked-up capacity obligations. This interim review reflects the resources that assumed capacity obligation after the reconfiguration auction.

For the years 2011 and beyond, the existing resources that had been qualified for the 2011 FCA were used in the 2008 Comprehensive Review since the FCA for 2011/12 had not yet been conducted at the time the assessment was conducted. In this interim review, the resources that cleared in the 2011 FCA are used to model the 2011 system as the auction has occurred. For the year 2012 and beyond, the existing resources that had been qualified for the 2012 FCA are used.

**Table 1 - Resources Assumptions Comparison (Summer Ratings)**

Year	2008 Comprehensive Review (MW)	2009 Interim Review (MW)	Difference (MW)	Comments
2010	34,033	32,800	-1,233	Due to proration and 2 <sup>nd</sup> annual reconfiguration.
2011	34,756	37,020	2,264	More new resources cleared in the FCA.
2012	34,756	37,059	2,303	More resource qualified for the auction.
2013	34,756	37,059	2,303	More resource qualified for the auction.

### 3.2. LOAD

Tables 2 and 3 compare the New England peak demand forecasts for this interim review and the 2008 Comprehensive Review. The differences are mainly a result of the updated peak demand and energy forecast methodology, used to refine the forecast process, which includes impacts from both the regional economy and weather.

<sup>7</sup> In the event that the Capacity Clearing Price Collar (Floor) condition is reached in the FCA, two proration options are available for the Lead Participants of Resources with a Capacity Supply Obligation: 1) maintain the full Capacity Supply Obligation with a reduced Payment Rate (Price Proration); 2) receive a reduced Capacity Supply Obligation with the full Capacity Clearing Price (MW Proration). Resources requesting MW proration are subject to a reliability review, which will result in the approval or rejection of the full reduction. If a resource's MW proration election is rejected for reliability, the resource retains its default Price Proration. The proration election chosen by resources will not have an effect on the total amount of money paid by load and received by a resource.

As shown in Tables 2 and 3, both reference and high demand forecasts in 2009 are lower than those from the previous year, 2008. The current economic recession dominates the changes in the annual and seasonal peak demand forecasts. The economic analysis used by the ISO-NE shows the New England economy starting to decline in mid-2008. It also forecasts the recession to reach its low-point in late 2009 and the economic recovery to begin in 2010.

The high demand forecast is based on a high economic forecast which drives the energy forecast and the energy forecast drives the peak forecast. The high energy forecast as a percentage of the reference forecast is about the same for this year and last year. But the peak to energy response changed: 1) the peak forecast is now less sensitive to changes in energy; and 2) high peak as a percentage of the reference forecast was not as big as last year. This results in the differences in the high forecast being larger than the differences in the reference forecast.

**Table 2 - Reference Peak Load Forecast Comparison**

<b>Year</b>	<b>2008 Comprehensive Review (MW)</b>	<b>2009 Interim Review (MW)</b>	<b>Difference (MW)</b>
<b>2010</b>	28,955	28,160	-795
<b>2011</b>	29,405	28,575	-830
<b>2012</b>	29,820	29,020	-800
<b>2013</b>	30,190	29,365	-825

**Table 3 - High Load Forecast Comparison**

<b>Year</b>	<b>2008 Comprehensive Review (MW)</b>	<b>2009 Interim Review (MW)</b>	<b>Difference (MW)</b>
<b>2010</b>	29,260	28,310	-950
<b>2011</b>	29,925	28,795	-1,130
<b>2012</b>	30,565	29,325	1,240
<b>2013</b>	31,155	29,750	-1,405

### 3.3. INTERFACE LIMITS

The sub-area representation and transmission interface limits for this Interim Review are consistent with those identified within New England's RSP09. Table 4 shows the transmission transfer limits used within both reviews, with respect to the major transmission interfaces. The differences in the limits are the result of topology changes within the in-service dates of recent transmission upgrades as well as system configurations.

**Table 4 - Major Transmission Interface Limits Assumed in the 2008 & 2009 Reviews (MW)**

<u>Interface</u>	<u>Limit assumed in 2008 Comprehensive Review (MW)</u>	<u>Limit assumed in 2009 Interim Review (MW)</u>
New Brunswick to New England	1,000	1,000
Orrington South	1,200	1,200
Surowiec South	1,150	1,150
Maine – NH	1,600	1,600
	1,575 (2011)	1,575 (2011)
	1,550 (2012)	1,550 (2012)
	1,525 (2013)	1,525 (2013)
North to South	2,700	2,700
Boston Import	4,900	4,900
SEMA Export	No Limit	No Limit
SEMA / RI Export	3,000	3,000
East to West	2,800	2,800
Connecticut Import	2,500	2,500
	3,600 (2013)	3,600 (2014)
Southwestern CT Import	3,650	3,200
Norwalk / Stamford Import	1,650	1,650
New York/New England (Summer/Winter)	1,400/1,700	1,400/1,875
HQII Import	1,400	1,400
Highgate Import	200	200
Cross Sound Cable	346	346

### 3.4. UNIT AVAILABILITY

Table 5 compares the average EFORd (weighted by unit size) assumptions used in this Interim Review with those used for the 2008 Comprehensive Review. Overall, the 2009 system weighted average EFORd has slightly improved as compared to the 2008 value.

**Table 5 - Change In Unit EFORd Assumptions – Weighted Averages**

<b>Unit Type</b>	<b>2008 Comprehensive Review EFORd (%)</b>	<b>2009 Interim Review EFORd (%)</b>
<b>Fossil</b>	7.56	8.0
<b>Combined Cycle</b>	5.17	4.8
<b>Diesel</b>	6.51	4.8
<b>Jet</b>	6.55	6.6
<b>Nuclear</b>	1.56	1.2
<b>Hydro</b>	1.65	1.5
<b>System</b>	<b>5.11</b>	<b>5.00</b>

### 3.5. FUEL SUPPLY DIVERSITY

New England’s power generation sector has had ongoing issues associated with the significant lack of fuel diversity, but actions have improved the reliability of the fuel supply and associated generator performance. Recent infrastructure enhancements to the regional natural gas systems should satisfy the needs of New England’s core space

heating and power generation markets for years to come. These improvements include new and expanded natural gas supply sources, pipelines, storage, and liquefied natural gas (LNG) facilities. The improvements in the natural gas system and the addition of dual-fuel electric power resources have reduced the historical concerns about electric power system reliability, stemming from the high dependence on gas-fired generation within New England.

### 3.6. IMPACTS OF ENVIRONMENTAL EMISSION REGULATIONS

Only a few updates in environmental requirements have been made since RSP08 was published in the fourth quarter of 2008. After some legal challenges, the Clean Air Interstate Rule (CAIR) has been reinstated and it sets nitrogen oxide emissions caps during the ozone season for large fossil-fueled electricity generators in Connecticut and Massachusetts. Regional Greenhouse Gas Initiative (RGGI) is now in effect in New England as well as in New York, New Jersey, Maryland, and Delaware. Two auctions of RGGI CO<sub>2</sub> allowances were held in 2008 and two auctions were held in early 2009.

In April 2009, a U.S. Supreme Court decision clarified the criteria for Best Available Control Technology (BACT) for reducing the impacts on aquatic organisms from the cooling water intakes of large fossil-steam, generating plants. The decision allows the use of a benefit/cost ratio in evaluating the environmental impacts, but it is uncertain how EPA will apply this interpretation for future water permitting.

The total Renewable Portfolio Standards (RPS) and related Energy-Efficiency (EE) targets will increase to approximately 23.5% of New England's total projected energy use by 2016, and increase to 30.1% by 2020. State goals for new energy-efficiency programs make up about 11.1% of the 30.1%; the remainder is attributable to Renewable Portfolio Standards and related policies. The ISO recognizes the uncertainty of success for the renewable generation projects within the current interconnection queue. Based on assumptions, these projects would likely meet the incremental growth in the RPS classes for new renewables sometime between 2012 and 2016. New projects entering the interconnection queue or being planned, but not yet in the queue, small renewable projects behind the meter, or the purchase of Renewable Energy Credits/Certificates (REC)s from projects in neighboring regions could meet any market shortfalls. Alternatively, affected Load Serving Entities (LSE) can make Alternative Compliance Payments to the states' "Clean Energy Funds," which would then help finance new, regional renewable energy projects.

### 3.7. OTHERS

The interconnection benefits from neighboring Areas are considered in the LOLE assessments in both reviews. Since the 2008 Comprehensive Review, ISO-NE has conducted additional tie benefit studies to investigate the amount of tie reliability assistance New England can rely on from its neighbors for resource adequacy studies. Table 6 summarizes the tie benefit assumptions for these two reviews.



**Table 6 – Assumed Tie Benefits from Neighboring Areas (MW)**

<b>Year</b>	<b>2008 Comprehensive Review</b>	<b>2009 Interim Review</b>
<b>2010</b>	1,860	1,860
<b>2011</b>	1,800	1,800
<b>2012</b>	1,800	1,665
<b>2013</b>	1,800	1,665

Other assumptions for these two reviews are consistent with each other, or the impacts on the reliability results are negligible.

## 4.0 RESULTS

Tables 7 and 8 summarize the New England system Loss of Load Expectation (LOLE) results for the scenarios investigated within this Interim Review and those from the 2008 Comprehensive Review. The differences in the results of the two reliability reviews can be attributed to the differences in assumptions used for each review as previously outlined.

**Table 7 – LOLE Under Reference Demand Forecast**

<b>Year</b>	<b>2008 Comprehensive Review (Days/Year)</b>	<b>2009 Interim Review (Days/Year)</b>
<b>2010</b>	0.027	0.033
<b>2011</b>	0.032	0.000
<b>2012</b>	0.045	0.001
<b>2013</b>	0.060	0.001

**Table 8 – LOLE Under High Demand Forecast**

<b>Year</b>	<b>2008 Comprehensive Review (Days/Year)</b>	<b>2009 Interim Review (Days/Year)</b>
<b>2010</b>	0.037	0.038
<b>2011</b>	0.049	0.000
<b>2012</b>	0.080	0.001
<b>2013</b>	0.123	0.003

The LOLE results indicate that capacity resources that have been procured in the forward capacity auctions for 2010 to 2012 are adequate to satisfy reliability requirements. For 2013, the existing resources that are qualified to participate in the auction are more than the expected amount that ISO-NE will procure to meet its 1 day in 10 years disconnection of firm customers resource adequacy planning criterion for that year.

## **5.0 CONCLUSION**

Results of this Interim Review show that New England will comply with the NPCC resource adequacy reliability criterion under both the reference and the high demand forecasts.