

NPCC
2013 Québec Balancing Authority Area
Interim Review of
Resource Adequacy

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1. EXECUTIVE SUMMARY

The Québec Balancing Authority Area submits this assessment of resource adequacy to comply with the Reliability Assessment Program established by the Northeast Power Coordinating Council (NPCC). The guidelines for the review are specified in the NPCC Regional Reliability Reference Directory #1, Appendix D “*Guidelines for Area Review of Resource Adequacy*” (Adopted in December 1, 2009).

This 2013 Interim Review of Resource Adequacy covers the study period from winter 2013/2014 through winter 2015/2016. Assumption changes regarding facility and system conditions, generation resources availability, demand and electricity sector regulations, since the last Comprehensive Review and their impacts on the overall reliability of the Québec electricity system are highlighted therein.

The demand forecast has been revised downward since the last Comprehensive Review due mainly to a decrease in the expected load from the industrial sector. Planned resources have also been revised downward due to major unit retirements.

Results of this Interim Review show that the loss of load expectation (LOLE) for the Québec area is below the NPCC reliability criterion of not more than 0.1 day per year for all years of this assessment under the base case scenario. For the high case scenario of demand forecast, the area would need additional capacity for both 2013/2014 and 2015/2016 winter peak periods.

Table 1 - Summary of LOLE Results

Winter Peak	Base case scenario (days/year)	High case scenario (days/year)
2013 / 2014	0.073	0.139
2014 / 2015	0.043	0.076
2015 / 2016	0.082	0.155

2. INTRODUCTION

This 2013 Interim Review is the second update of the 2011 Québec Balancing Authority Area Comprehensive Review of Resource Adequacy approved by the Reliability Coordinating Committee (RCC) in November 2011. The present review covers the period between November 2013 and October 2016. The Québec Area is a winter peaking area with the peak demand occurring generally in January. Major assumptions of this review are consistent with the Hydro-Québec Distribution (HQD) 2014-2023 Supply Plan which was filed with the Québec Energy Board on November 1st, 2013¹.

3. ASSUMPTION CHANGES

3.1 Base Case Demand Forecast

The Québec area's internal peak demand forecast over the period of this review has decreased compared to the forecast presented in the 2011 Comprehensive Review. This reduction in the load is mainly attributed to a decrease in the expected load in the industrial sector.

Table 2 below compares the peak demand forecast between the two reviews.

Table 2 - Base Case Demand Forecast Comparison (MW)

Base case Scenario			
Winter Peak	2011 Comprehensive Review	2013 Interim Review	Difference
2013 / 2014	38,660	38,465	-196
2014 / 2015	39,149	38,070	-1 079
2015 / 2016	39,313	38,779	-534
Average Growth Rate	0.8%	0.4%	

¹http://publicsde.regie-energie.qc.ca/projets/232/DocPrj/R-3864-2013-B-0005-Demande-Piece-2013_11_01.pdf

3.1.1 Load Forecast Uncertainty

Load forecast uncertainty is derived from the load sensitivity to weather conditions and the variation of economic and demographic variables affecting the demand forecast. In this Interim Review, load forecast uncertainty has been revised downward compared to what was used in the last Comprehensive Review. This reduction mostly reflects economic uncertainty revisions.

Table 3 - Load Forecast Uncertainty between the two Reviews

Ressource Adequacy Review	Current year	1 year ahead	2 years ahead
2013 Interim Review	4.3%	4.4%	4.7%
2011 Comprehensive Review	4.3%	4.6%	4.9%
Difference	-	-0.2%	-0.2%

3.2 High Case Demand Forecast

In this review, the high case demand forecast level is set to 1.3 standard deviations of economic uncertainty over the base case scenario. The load uncertainty considered in the simulation of the high case scenario is limited to weather conditions.

Table 4 - High Case Demand Forecast Comparison (MW)

High case Scenario			
Winter Peak	2011 Comprehensive Review	2013 Interim Review	Difference
2013 / 2014	39,856	39,326	-530
2014 / 2015	40,674	39,097	-1,577
2015 / 2016	41,312	39,981	-1,331
Average Growth Rate	1.8%	0.8%	

3.3 PLANNED RESOURCES

In this review, planned resources are consistent with the most recent available capacity data updates in the area. Planned resources have been reviewed downward since the last Comprehensive Review due to major unit retirements².

The difference in planned resources between the two reviews is mainly explained by:

- The retirement of the La Citière oil G.S (280 MW)
- The retirement of the Gentilly-2 nuclear G.S which was previously expected to be refurbished from 2013 to 2014 (a decrease of 700 MW from the expected capacity after refurbishment)
- The mothballing period extension of the natural gas unit operated by TransCanada Energy (TCE) beyond the period covered by this review (547 MW)
- The Addition of interruptible load to the system (150 MW)
- The increase of Biomass capacity by 50 MW to 100 MW over the period of this review

Table 4 - Planned Resources Comparison

² The mothballed Tracy thermal unit (450 MW) was retired on March 2012. This change has no impact on the reliability assessment.

Winter Peak	2011 Comprehensive Review	2013 Interim Review	Difference
2013/14	43,029	43,125	96
2014/15	44,612	43,529	-1,084
2015/16	45,401	43,737	-1,664

3.4 TRANSMISSION AND INTERFACE LIMITS

Internal transfer capability assumptions are identical to those presented in the 2011 Comprehensive Review. External interfaces to the Québec system are not modeled.

Table 5 - Internal Interface Limits (MW)

Sub area		2013 Interim Review	
From	To	2013/14 winter peak period	2015/16 winter peak period
Churchill Falls	Manicouagan	5,200	5,200
Manicouagan	Québec Centre	12,100	12,900
Québec Centre	Montréal	20,250	22,290
Baie James	Québec Centre	15,050	15,050
Baie James	Nicolet (CC)	2,250	2,250
Nicolet (CC)	Montréal	2,138	2,138

4. LOLE RESULTS

4.1 Base Case Demand Scenario

Results shown in Table 6 below indicate that the Québec Area will meet the NPCC resource adequacy criterion for all the years covered by this review. In comparison to the LOLE values presented in the last Comprehensive Review, the LOLE value is lower in

the first year due to demand forecast decrease and higher in the last two years due to unit retirements.

Table 6 - Planned Reserve Margins and LOLE Results

Winter Peak	Planned Reserve (MW)		LOLE (Days / year)	
	2013 Interim Review	2011 Comprehensive Review	2013 Interim Review	2011 Comprehensive Review
2013 / 2014	4,660	4,369	0.073	0.079
2014 / 2015	5,458	5,463	0.043	0.034
2015 / 2016	4,959	6,088	0.082	0.021

The Québec Balancing Authority Required Reserve Margin is determined by using the NPCC resource adequacy criterion. For this review, results show that the Required Reserve Margins vary between 11 percent and 12 percent. These Required Reserve Margins are almost comparable to those presented in the last Comprehensive Review.

Table 7 - Required Reserve Margins at NPCC Criterion (LOLE = 0.1 days/year)

Winter Peak	2013 Interim Review Required Reserve		2011 Comprehensive Review Required Reserve		(Days/year)
	MW	%	MW	%	
2013/14	4,170	10.8%	4,059	10.5%	0.100
2014/15	4,407	11.6%	4,448	11.4%	0.100
2015/16	4,676	12.1%	4,805	12.2%	0.100

4.2 High Case Demand Scenario

Results shown in Table 8 indicate that under the high case demand scenario, the Québec area would need additional resources for both 2013/2014 and 2015/2016 winter peak periods to meet the NPCC criterion. Estimated amounts of additional resources are 250 MW and 300 MW for the 2013/2014 and 2015/2016 winter peaks respectively. These purchases could be achieved in neighboring markets.

Table 8 - LOLE under the High Case Demand Scenario

Winter Peak	Planned Resources (MW)	Annual peak load (MW)	LOLE (Days / year)	
			2013 Interim Review	2011 Comprehensive Review
2013 / 2014	43,125	39,326	0.139	0.161
2014 / 2015	43,529	39,097	0.076	0.080
2015 / 2016	43,737	39,981	0.155	0.076

5. CONCLUSION

The results of this review show that the Québec Balancing Authority Area will comply with the NPCC resource adequacy criterion for all years of this review under the base case demand forecast scenario. Under the high case scenario, the Québec area would need additional capacity of 250 MW and 300 MW for the 2013/2014 and 2015/2016 winter peak periods respectively.