



QUÉBEC BALANCING AUTHORITY AREA

**2009 INTERIM REVIEW
OF
RESOURCE ADEQUACY
FOR
QUÉBEC BALANCING AUTHORITY AREA**

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1. Executive Summary

This Québec Balancing Authority Area (« Québec Area ») 2009 Interim Review of Resource Adequacy ("2009 Interim Review") covers the period between November 2009 and October 2013. The planning year corresponds to a hydraulic cycle beginning in November and ending in October of the following year. It is conducted to comply with the Reliability Assessment Program established by the Northeast Power Coordinating Council (NPCC) and the resource adequacy review guidelines as outlined in the NPCC B-8 Document "Guidelines for Area Review of Resource Adequacy".

2009 Interim Review underlines the changes in assumptions that have been made since the 2008 Comprehensive Review and assesses the impact of these changes on the reliability of the Québec Control Area.

Results of this 2009 Interim Review show that the Québec Area complies with the NPCC resource adequacy reliability criterion under base case conditions. Under the high case load forecast, Québec Area needs an additional capacity purchase of 500 MW in 2011-2012 and 750 MW in 2012-2013 to comply with the NPCC criterion.

2. Introduction

This 2009 Interim Review is the first update of the 2008 Comprehensive Review of Resource Adequacy approved in March 2009. The major assumptions of this 2009 Interim Review are consistent with the second progress report of Hydro-Québec Distribution (HQD) 2008-2017 Procurement Plan filed with the Québec Energy Board in October 2009¹.

3. Assumption Changes

3.1 Demand forecast

Base Case Demand Scenario

The observed internal peak load for the 2008-2009 winter period was 37,230 MW whereas the 2008 Comprehensive Review forecast was 37,099 MW. This was a new all-time record for internal demand in Québec. This is due to a short but sharp cold spell, culminating on January 16th. Montréal temperature at the time of peak was -26°C (-11°F) and wind speed was about 11 km/hour (7 mph). A public appeal to reduce load estimated at 600 MW was called for January 15 and 16 and 1,858 MW of load management (Interruptible load) was used. Sales to

¹ :For the second progress report of the Procurement Plan of HQD see:
http://www.regie-energie.qc.ca/EtatApproHQD/Etat%20d'avancement_2009.pdf

neighbouring Areas were about 550 MW and imports were in the order of 1,530 MW. The remainder of winter 2008-2009 experienced close to normal temperatures and internal demand values were also close to projected values.

The peak load forecast for the Québec Area for 2009-2010 through 2012-2013 has decreased as compared to the forecast presented in the 2008 Comprehensive Review. The average growth rate has gone down to 0.9 % from 1.5% in the 2008 Comprehensive Review. The loss of certain industrial loads such as aluminum smelters, chemical industry and paper mills explains these lower forecasts. Also, the load forecast decrease is caused by the general economic slowdown.

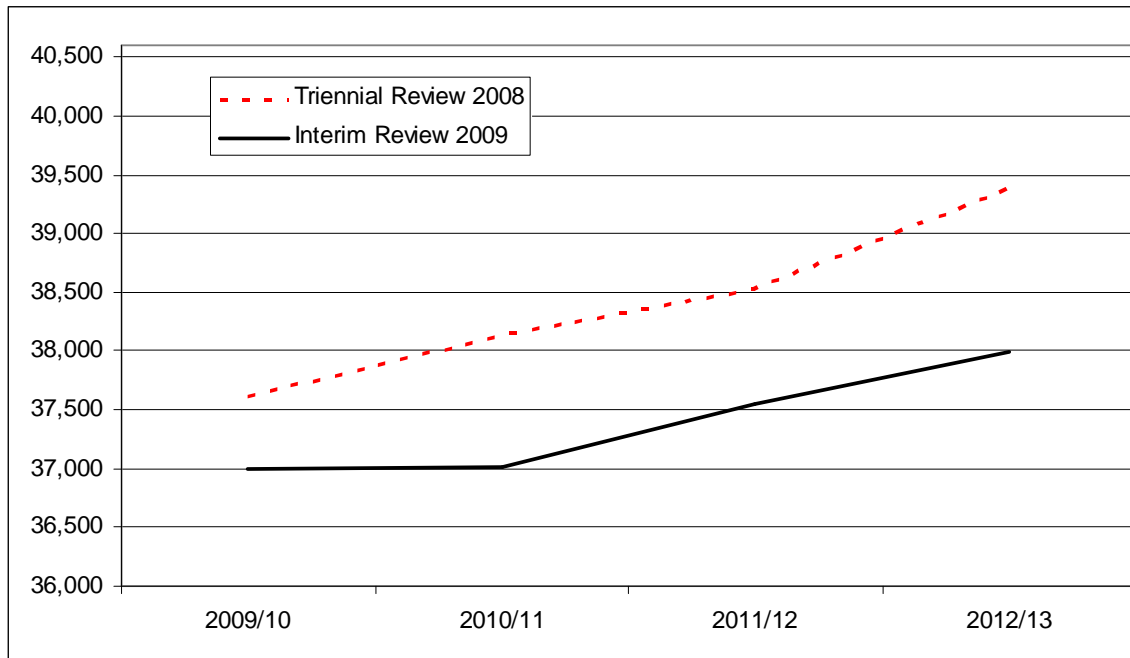
For the 2009-2010 winter period, internal peak load is expected to reach 37,003 MW, a decrease of 617 MW when compared to 2008 Comprehensive Review forecast.

For the following years of this review, load forecasts have decreased as shown in Table 1 and Figure 1, below.

Table 1 – Base Case Scenario of Peak Load Forecast (MW)

Winter Peak	Triennial Review 2008	Interim Review 2009	Difference
2009/10	37,620	37,003	-617
2010/11	38,130	37,005	-1,125
2011/12	38,527	37,552	-975
2012/13	39,375	37,993	-1,382
Average growth rate	1.5%	0.9%	

Figure 1



Load forecast uncertainty is derived from load sensitivity to weather conditions and the evolution of economic and demographic parameters affecting load demand in the study period. In this Interim Review, load forecast uncertainty remains the same for the current year. It is revised upward for the two next years and reduced for the last year of the revision horizon. Table 2 presents a comparison of load forecast uncertainty between the present Interim Review and the last Comprehensive Review.

Table 2 – Comparison of Load Forecast Uncertainty (%)

Review of Resource Adequacy	Current year	+1 year	+2 years	+3 years
Triennial Review 2008	4.7%	5.0%	5.4%	5.9%
Interim Review 2009	4.7%	5.2%	5.5%	5.8%

High case scenario of demand

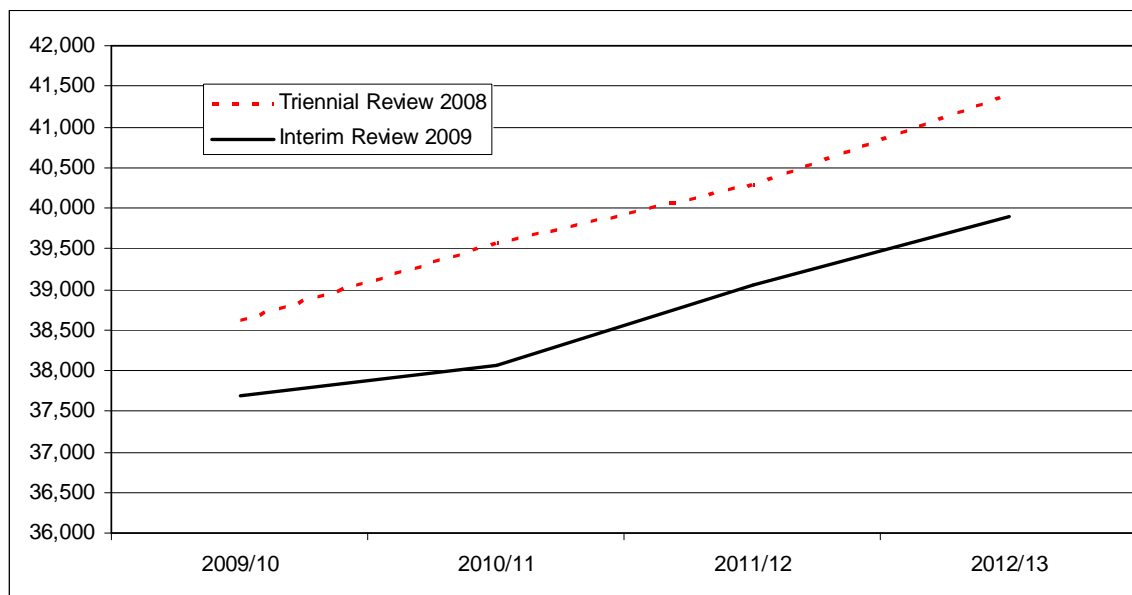
Compared to the 2008 Comprehensive Review, the high demand scenario has been revised downward by about 900 MW to 1,500 MW. This follows the downward revision of the base case forecast.

The Load Forecast Uncertainty for the High Load Forecast is affected by weather conditions only. The load sensitivity to weather conditions (4.3% for one standard deviation) remains the same as is in the 2008 Comprehensive Review.

Table 3 – Comparison of High Load Forecast Annual Peak Load (in MW)

Winter Peak	Triennial Review 2008	Interim Review 2009	Difference
2009/10	38,613	37,696	-917
2010/11	39,561	38,072	-1,489
2011/12	40,280	39,053	-1,227
2012/13	41,404	39,889	-1,515
Average growth rate	2.35%	1.90%	

Figure 2



3.2 Resources

The total net planned resources presented in this Interim Review are lower than those forecasted in the 2008 Comprehensive Review. For the next two years, the planned resources are between 800 and 900 MW lower and for the last two years of this assessment, planned resources are about 200 MW lower.

Planned resources for the 2009-2010 winter peak are 41,833 MW. Resources are planned to reach 44,059 MW for the 2012-2013 winter peak, representing an increase of 2,176 MW.

Chute Allard (62 MW) and Rapides des Coeurs (76 MW) hydro units are now producing as planned in the 2008 Comprehensive Review. EM-1 A (768 MW) and La Sarcelle (150 MW) hydro units will be in service as announced last year with some slight variations. For the winter period 2011-2012 only, EM-1 A represents a gain of 235 MW and a loss of 50 MW for La Sarcelle.

For the winter period 2009-2010, one unit (440 MW) at the SM-3 hydro plant will be out of service until late January 2010. One unit (150 MW) at the Tracy thermal plant will be out of service for the whole period and will be back in service late 2010.

There are two interruptible programs in Québec. One is managed by Hydro-Québec Production (HQP) and the other by Hydro-Québec Distribution (HQD). The HQP program is reduced from 515 MW to 500 MW for the entire review period. Regarding the HQD program, before each winter peak period based on its short term planning, the required interruptible program capacity is evaluated. For the 2009-2010 winter peak period, a capacity of 850 MW has been retained. For the remainder of the period, the capacity potential of this program is restored back to 1,000 MW.

Hydro-Québec Production's purchase of 200 MW from New Brunswick is no longer included among the planned resources.

The 547 MW natural gas unit operated by TransCanada Energy (TCE) at Bécancour (under contract with HQD) has been mothballed for the last two years due to an important load decrease. On July 2, 2009, HQD and TCE filed an agreement to the Québec Energy Board to renew the temporary shutdown for 2010 with possible renewals for future years. According to HQD's long term planning, Bécancour unit is not required to meet the current electricity needs of Québec. Thus, Bécancour is not retained for the period covered by this review.

Purchases from Churchill Falls hydro plant are reduced from 4,930 MW to 4,765 MW for the entire review period.

Short term purchases/reserves sharing are set to 1,000 MW for the entire review. For the 2009-2010 winter peak period only, it represents an increase of 600 MW over last year Comprehensive Review. For the remainder of the analysis period, the short term purchases/reserves sharing are identical to the values presented in the last Comprehensive Review.

For planning purpose, short term capacity purchases are assumed to come primarily from New York Control Area. Massena interconnection transfer capacity (1,000 MW) is designated by Hydro-Québec Distribution to meet its resource requirement during winter peak period. Even with the new

interconnection between Québec and Ontario (1,250 MW), no additional reserves sharing is included in this Québec 2009 Interim Review.

Table 4 – Total Net Planned Resources (in MW)

Winter Peak	Triennial Review 2008	Interim Review 2009	Difference
2009/10	42,726	41,833	-893
2010/11	43,336	42,499	-837
2011/12	43,158	42,948	-210
2012/13	44,238	44,059	-179

Wind Power Capacity

In this interim review, an evaluation of wind power capacity contribution is introduced. A portion of installed capacity is under contract with Hydro-Québec Production and is still de-rated by 100% as it was in earlier reviews since no evaluation of capacity contribution has been performed yet. All other wind farms are under contract with Hydro-Québec Distribution. A study regarding that issue has been filed to the Québec Energy Board². Simulations have shown that a 70 % de-rate factor can be safely used. This result is applied to installed capacity contracted by Hydro-Québec Distribution in order to obtain values presented in the right column of Table 5 below.

In previous assessments, the entire wind capacity on the system was de-rated by 100 %.

² http://www.regie-energie.qc.ca/audiences/EtatApproHQD/Rapport_Contribution%20en%20puissance%20.pdf

Table 5 – Total Wind Power Capacity (in MW)

Winter Peak	Wind Installed Capacity		Capacity Credit Interim 2009
	HQP ¹	HQD ²	
2009/10	210	447	134
2010/11	210	470	141
2011/12	210	1,203	361
2012/13	210	1,930	579

¹: Completely de-rated in this review.

²: Capacity credit equals to 30 % of installed capacity.

3.3 Transfer Limits

TransÉnergie's (The Québec transmission operator) transfer capabilities of Quebec's transmission system are slightly different from those presented in the 2008 Comprehensive Review. These differences have no impact on the Area's reliability. The actual and planned transmission system should be more than adequate to deliver all the resources to the loads.

The Manicouagan – Québec Centre transfer limit is down slightly because the latest transmission studies have shown that a load flow limit can now be seen on this sub-system.

The Baie James – Québec Centre and Québec Centre – Montréal limits are estimated to go up by about 300 MW each due to a system upgrade in 2011-2012. This project was included in the NPCC Comprehensive Review Assessment of the Québec Transmission System for 2012.

3.4 Major Changes in the Market

On October 29, 2009 the Government of New Brunswick and Government of Québec (the "Parties") signed a Memorandum of Understanding (MOU) whereby Hydro Québec would acquire substantially all of the assets of NB Power. On January 20, 2010 the Parties announced an energy agreement (the "Agreement") that included some changes from the MOU, including that NB Power will retain its ownership of the transmission and distribution assets, and the New Brunswick System Operator will continue to operate as an arm's length agency.

The scheduled closing date for the transaction is on or about March 31, 2010 ³.

³ A copy of the MOU is available at : <http://www.lowerratesnb.ca>

Table 6 – Québec Internal Transfer Capacities (in MW)

Sub area		Triennial	Interim
Sending	Receiving	Review 2008	Review 2009
Churchill Falls	Manicouagan	5,200	5,200
Manicouagan	Québec Centre	11,750	11,700
Québec Centre	Montréal	17,750	18,000
Baie James	Québec Centre	13,800	14,100
Baie James	Nicolet	2,250	2,250
Nicolet	Montréal	2,138	2,138

4. Results

The Québec Area uses the Loss of Load Expectation (LOLE) approach in determining resource requirements with a criterion of 0.1 day per year.

4.1 Base Case Demand Scenario

For each year of the review period, the Loss of Load Expectation is well under 0.1 day per year. Results shown in Tables 7 and 8 indicate that the Québec Area complies with the NPCC criterion under the Base Load Forecast for the entire period covered by this Review.

Table 7 – Comparison of Planned and Required Reserves (Base Case)

Winter Period	Planned Reserve (MW) ¹		LOLE (Days/year)		Required Reserve (MW)	
	Triennial Review 2008	Interim Review 2009	Triennial Review 2008	Interim Review 2009	Triennial Review 2008	Interim Review 2009
2009/10	5,106	4,830	0.038	0.025	3,902	3,347
2010/11	5,206	5,494	0.051	0.034	4,106	3,999
2011/12	4,631	5,396	0.088	0.032	4,381	4,151
2012/13	4,863	6,066	0.080	0.030	4,588	4,478

¹ : Difference between planned capacity and peak demand.

Table 8 – Planned and Required Reserves (in %) (Base Case)

Winter Period	Planned Reserve (%) ²		Required Reserve (%)	
	Triennial Review 2008	Interim Review 2009	Triennial Review 2008	Interim Review 2009
2009/10	13.6%	13.1%	10.4%	9.3%
2010/11	13.7%	14.9%	10.8%	10.8%
2011/12	12.0%	14.4%	11.4%	11.1%
2012/13	12.4%	16.0%	11.7%	11.8%

² : Difference between planned capacity and peak demand expressed as a percentage of peak demand.

4.2 High case scenario of demand

Results shown in Table 9 indicate that the Québec Area is in compliance for the first two years covered by this Interim Review. For the last two years of the Review, the Area needs to purchase 500 MW and 750 MW over the base case scenario to meet the criterion.

In this scenario, both residential and large Industry sectors are revised upward compared to the base scenario. This shows that in a context of economic recovery, Québec Area can respond simultaneously to the rise of residential and industrial demand.

Table 9 – Planned Resources, Annual Peak Loads, Planned Reserves and LOLE (High Case)

Winter Period	Planned Resources (MW)	Annual peak load (MW)	Planned Reserve		LOLE (Days/Year)	
			MW	(%)	Triennial Review 2008	Interim Review 2009
2009/10	41,833	37,696	4,137	10.97%	0.080	0.048
2010/11	42,500	38,072	4,428	11.63%	0.121	0.085
2011/12	42,948	39,053	3,895	9.97%	0.257	0.176
2012/13	44,059	39,889	4,170	10.45%	0.286	0.213

5. Conclusion

The Québec Balancing Authority Area meets the NPCC Resource Adequacy Criterion under the base case scenario of peak load forecast for the entire period covered by this Interim Review. For the high case scenario, it was shown that the Area meets the NPCC Resource Adequacy criterion for the first two years and needs to purchase 500 MW and 750 MW over the base case to fulfill the LOLE of 0.1 day per year for the last two years.