

NPCC
2018 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 Appendix D of the NPCC Regional Reliability Reference Directory #1, “*Guidelines for Area Review of Resource Adequacy*”.

This 2018 Interim Review of Resource Adequacy covers the study period from winter 2018-2019 through winter 2021-2022. Changes in assumptions since the last Comprehensive Review, and the impact of these changes on the overall reliability of the Québec electricity system, are highlighted herein.

The internal demand forecast has been revised upward since the last Comprehensive Review due mainly to an increase in the residential and the commercial sectors sales. Planned resources have been revised downward due to an adjustment in the capacity target of a new demand response program and to a reduction in some interruptible load programs.

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 the assessment, in the base case scenario. For the high scenario, the area would need some additional capacity for the last two years of this assessment to comply with the NPCC criterion.

Table 1 - Summary of LOLE Results

Winter Peak	Base case scenario (days / year)	High case scenario (days / year)
2018-2019	0.000	0.011
2019-2020	0.006	0.048
2020-2021	0.068	0.140
2021-2022	0.075	0.289

2. INTRODUCTION

This Interim Review is the first update of the 2017 Québec Balancing Authority Area Comprehensive Review of Resource Adequacy approved by the Reliability Coordinating Committee (RCC) in December 2017. This review covers the period from November 2018 through October 2022. The Québec Area is a winter peaking system with the peak load generally occurring in January. Major assumptions of this review are consistent with the second update of the Hydro-Québec Distribution 2017-2026 Supply Plan, which will be filed with the Québec Energy Board on November 1st, 2018.

3. ASSUMPTION CHANGES

3.1 Base Case Demand Forecast

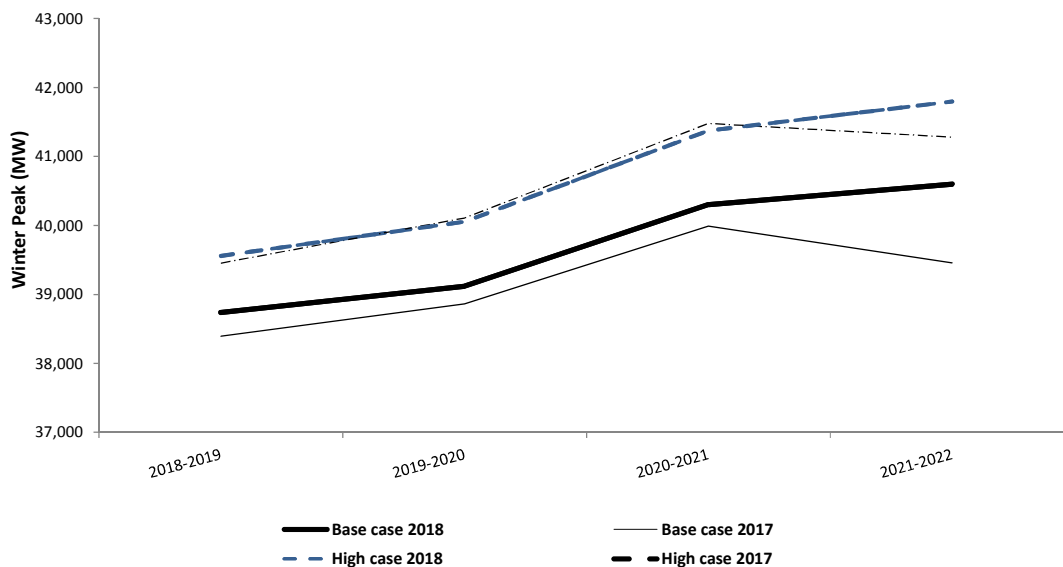
The Québec Area peak load forecast over the period of this review has increased in comparison to the load forecast presented in the 2017 Comprehensive Review. This growth in the load forecast is mainly attributed to an increase in sales to the residential and the commercial sectors. Table 2 below compares the peak load forecast between the two reviews.

Table 2 - Base Case Load Forecast Comparison (MW)

Base Case Scenario			
Winter Peak	2018 Interim Review	2017 Comprehensive Review	Difference
2018-2019	38,740	38,391	349
2019-2020	39,120	38,862	258
2020-2021	40,304	39,988	316
2021-2022	40,601	39,456 ¹	1,145
Average Growth Rate	1.6%	0.9%	

¹ : Does not include any commitment on the New England Forward Capacity Market.

Fig.1 Comparison of Demand Forecasts



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 load. In this review, load forecast uncertainty has been revised downward in comparison to what was used in the last Comprehensive Review.

Table 3 - Load Forecast Uncertainty between the two Reviews

The load forecast uncertainty of this review is lower in comparison to the load uncertainty in the last comprehensive review. The difference between the two reviews is explained by a lower economic forecast uncertainty. The weather uncertainty forecast remains unchanged.

Review of Resource Adequacy	Current year	+1 year	+2 years	+3 years
2018 Interim Review	4.3%	4.5%	4.6%	4.8%
2017 Comprehensive Review	4.7%	4.9%	5.1%	5.3%
Difference	-0.38%	-0.35%	-0.46%	-0.47%

3.2 High Case Demand Forecast

The high case load forecast levels presented in Table 4 have a 10% probability of being exceeded. When simulating LOLE for the high case scenario, the load forecast uncertainty is limited to weather conditions.

Table 4 - High Case Load Forecast Comparison (MW)

High Case Scenario			
Winter Peak	2018 Interim Review	2017 Comprehensive Review	Difference
2018-2019	39,558	39,453	105
2019-2020	40,055	40,107	-52
2020-2021	41,374	41,478	-104
2021-2022	41,798	41,279	519
Average Growth Rate	1.8%	1.5%	

3.3 PLANNED RESOURCES

In this review, planned resources are consistent with the most recent available capacity data updates for the area. Planned resources have been revised downward since the last Comprehensive Review. The differences in planned resources are mainly explained by a reduction in:

- the expected capacity of some interruptible load programs (about -70 MW);
- the new demand response program (-70 MW to -150 MW);
- available hydro capacity (-50 MW).

Table 5 - Planned Resources Comparison (MW)

Winter Peak	2018 Interim Review	2017 Comprehensive Review	Difference
2018-2019	45,904	45,980	-76
2019-2020	45,834	46,114	-279
2020-2021	46,214	46,431	-218
2021-2022	46,226	46,331	-105

4. LOLE RESULTS

4.1 Base Case Demand Scenario

Results shown in Table 6 indicate that the Québec Area will meet the NPCC resource adequacy criterion that requires a loss of load expectation value not more than 0.1 day per year (or one day per ten years) for all the years covered by this review. In comparison to the LOLE values of the last Comprehensive Review, these values are higher due to an increase in load forecast and a reduction in available resources compared to the last review.

Table 6 - Planned Reserve and LOLE Results

Winter Peak	Planned Reserve (MW)		LOLE (Day / year)	
	2018 Interim Review	2017 Comprehensive Review	2018 Interim Review	2017 Comprehensive Review
2018 / 2019	7,164	7,589	0.000	0.000
2019 / 2020	6,715	7,252	0.006	0.001
2020 / 2021	5,910	6,444	0.068	0.055
2021 / 2022	5,625	6,875	0.075	0.019

The Québec Balancing Authority Reference Reserve Margin is determined by using the NPCC resource adequacy LOLE criterion. For this review, results show that the

Required Reserve Margins of the Québec Area range from 12.8 percent for the 2018-2019 winter period to 13.1 percent for the winter 2021-2022 period. These Reference Reserve Margins are similar to those presented in the 2017 Comprehensive Review.

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

Winter Peak	Required Reserve (MW)		Reference Reserve (%)		LOLE (Days/year)
	2018 Interim Review	2017 Comprehensive Review	2018 Interim Review	2017 Comprehensive Review	
2018/2019	4,970	4,944	12.8%	12.9%	0.100
2019/2020	4,950	5,037	12.7%	13.0%	0.100
2020/2021	5,235	5,284	13.0%	13.2%	0.100
2021/2022	5,300	5,275	13.1%	13.4%	0.100

4.2 High Case Demand Scenario

Results shown in Table 8 indicate that in the high case demand scenario, the Québec Area would need additional capacity for the last two years of this assessment to comply with the NPCC criterion.

Table 8 – Planned reserve and LOLE - High Case Demand Forecast

Winter Peak	Planned Reserve (MW)		LOLE (Day / year)	
	2018 Interim Review	2017 Comprehensive Review	2018 Interim Review	2017 Comprehensive Review
2018/2019	6,189	6,526	0.011	0.003
2019/2020	5,770	6,006	0.048	0.027
2020/2021	4,831	4,954	0.140	0.109
2021/2022	4,418	5,052	0.289	0.095

5. CONCLUSION

The results of this review show that the Québec Balancing Authority Area will meet the NPCC resource adequacy LOLE (0.1days/year) for all the years of the review, in the base case scenario. In the high case scenario, the area would need additional capacity for the last two winter periods: 200 MW in 2021 and 600 MW in 2022.