

PLANNING FOR TODAY, TOMORROW, AND THE FUTURE.



2019 UPDATE

RELIABILITY & RESOURCE PLANNING: 2019 UPDATE

In 2018, Hydro completed a Reliability and Resource Adequacy Study, filed with the Board of Commissioners of Public Utilities (Board) the same year. The Study addresses our long-term approach to providing continued least-cost, reliable service for our customers. To meet customer needs, the plan considered a range of possible scenarios over a ten-year planning horizon—covering the period from 2020 through 2029.

At that time, Hydro also committed to provide the Board and stakeholders with annual updates on forecast system reliability. Hydro has proposed to file a comprehensive analysis, similar to the 2018 Study, every three years. Annual updates will be provided in the years between comprehensive reviews.

THIS YEAR'S RELIABILITY & RESOURCE ADEQUACY STUDY UPDATE FOCUSES ON THE FOLLOWING KEY CONSIDERATIONS:

1. Changes in load forecast;
2. The near-term reliability of the electricity system through the transition to Muskrat Falls being fully in-service; and,
3. Refinement of results based on recommendations made by the Liberty Consulting Group in their review of the 2018 study.



LIBERTY'S REVIEW OF THE 2018 RELIABILITY & RESOURCE ADEQUACY STUDY

Liberty was engaged by the Board to review Hydro's 2018 Study. Hydro participated in a number of face-to-face meetings, teleconferences, and provided responses to Liberty's questions throughout this process. Liberty delivered its report to the Board in August 2019; the report contained 13 recommendations, which Hydro has addressed in the 2019 update.

"Hydro performed its analysis using sound methods and tools. It applied criteria and assumptions generally appropriate in developing a robust range of supply alternatives."

- Liberty Report



ISLAND INTERCONNECTED SYSTEM

The Island Interconnected System is the interconnected portion of the Island electrical system. It is characterized by large hydroelectric generation capability located off the Avalon Peninsula, and the bulk 230 kV transmission system extending from Stephenville in the west to St. John's in the east. In 2018, the system became interconnected to North America for the first time via the Labrador-Island Link, (which connects us to the Labrador Interconnected System), and the Maritime Link, (which connects us to Nova Scotia).



LABRADOR INTERCONNECTED SYSTEM

The Labrador Interconnected System is the interconnected portion of the Labrador electrical system. Central to the system is large, hydroelectric generation capability from Churchill Falls and transmission to the two major customer centres in Labrador East and Labrador West. It is connected to the Island Interconnected System via the Labrador-Island Link. The system is also connected to the North American grid via the 735 kV AC transmission lines from Churchill Falls to Quebec.



FACTORS IMPACTING LOAD FORECAST

ELECTRICITY RATES & GROWTH IN LABRADOR

Since the 2018 study was completed, two developments have changed Hydro’s baseline demand forecast for electricity requirements:

1. On the island, the Provincial Government announced additional details about their commitment to rate mitigation (to keep rates at 13.5¢/kWh).
2. In Labrador, Tacora Resources established mining operations.

These changes have increased Hydro’s forecast requirements from those identified in 2018. As also observed at that time, the amount of electricity customers are projected to use depends heavily on the retail rate for electricity.

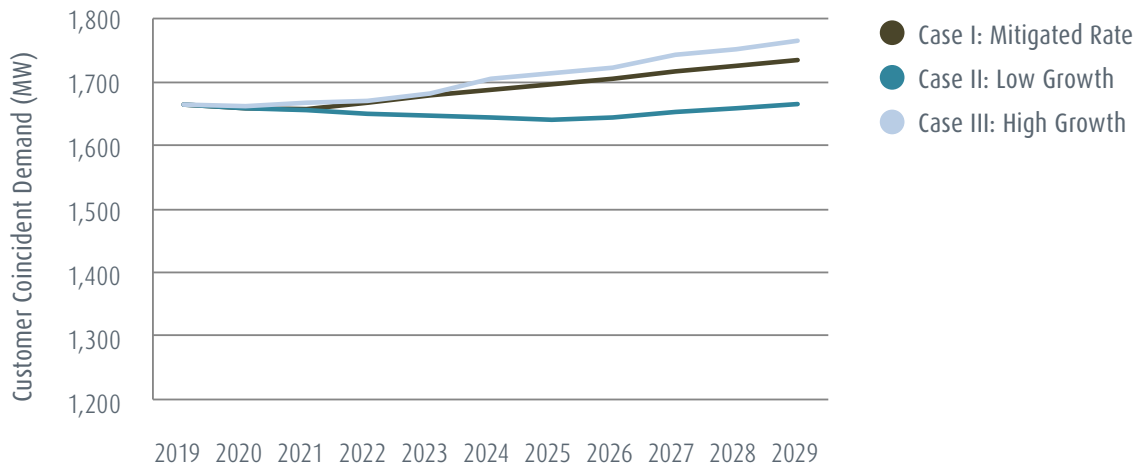
Customer requirements are sensitive to retail electricity rates and the underlying provincial economics. In this year’s study, varying these parameters can cause a difference of approximately 100 MW between the cases studied, as shown in the charts below.

ELECTRICAL DEMAND (MW)
the maximum amount of electrical energy that is being consumed at a given time.

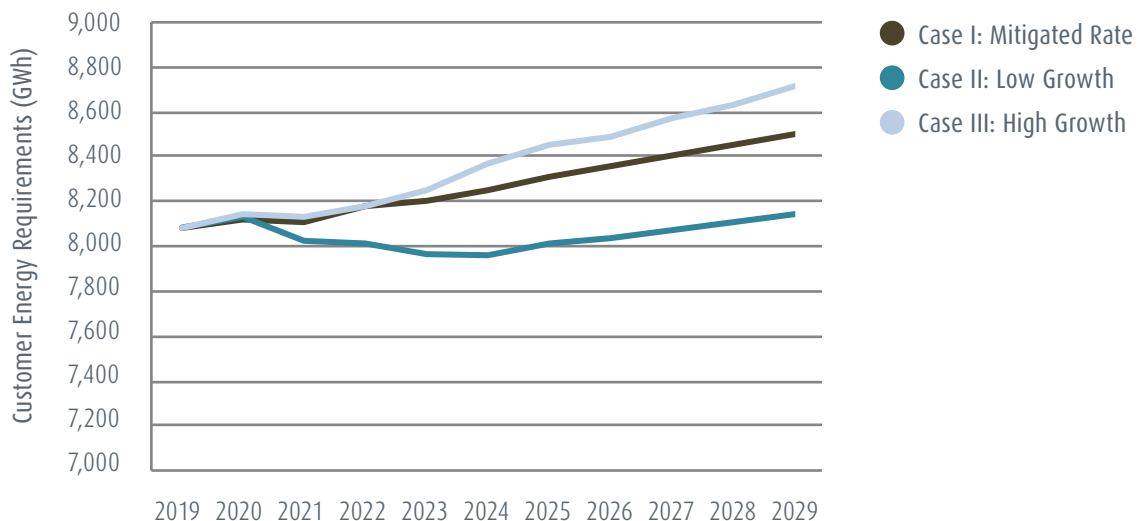
ANNUAL PEAK DEMAND FORECAST (MW)
the highest amount of electricity forecast to be used at one time for the year.

ANNUAL ENERGY FORECAST (GWh)
a forecast of how much electricity is expected to be used in an entire year.

Island Interconnected System Forecast Annual Peak Demand Analysis



Island Interconnected System Forecast Customer Energy Requirements



NEAR-TERM RESOURCE ADEQUACY

We are focused on our ability to meet our customers' requirements in the near term (in the next 1 to 5 years). Our assessment takes an in-depth view of system risks and mitigating measures to ensure we can reliably meet the needs of our customers through the transition to fully reliable service from Muskrat Falls and retirement of the Holyrood plant.

FOR 2019, THERE ARE TWO KEY FOCUS AREAS WHEN DISCUSSING NEAR-TERM RESOURCE ADEQUACY:

1. AVAILABILITY OF THE TRANSMISSION LINE FROM MUSKRAT FALLS

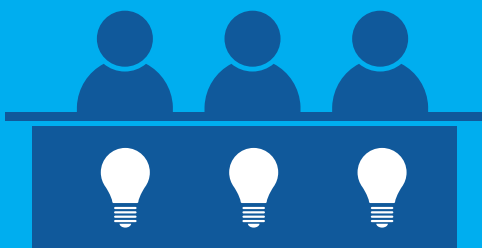
The availability of the Labrador-Island Link (LIL) continues to be an important factor toward increasing the reliability of our system. Software issues have delayed the ability of the LIL to bring power from Labrador to the island. While we are working closely with Nalcor Energy to resolve these issues, this year's report contains detailed analysis on the reliability of the system if the LIL is further delayed.

2. HOLYROOD THERMAL GENERATING STATION

Holyrood has played an important role in the Island electrical system for almost 50 years. The plant continues to be critical to system reliability until Muskrat Falls Generating Station and the LIL have proven to be reliable. Hydro continues to invest prudently in Holyrood to ensure that the plant remains reliable and has developed contingency plans that could support an additional one to two years of operation, if required.

HAVE FEEDBACK?

Join Hydro's Electricity Feedback Panel:
electricityfeedbacknl.com



LONG-TERM RELIABILITY

Electricity rates are a concern for Newfoundlanders and Labradorians, and it is our responsibility to ensure the right balance between reliability and the cost of those investments for customers. While there are always options available to increase system reliability, these projects come at a cost, and can place additional pressure on electricity rates.

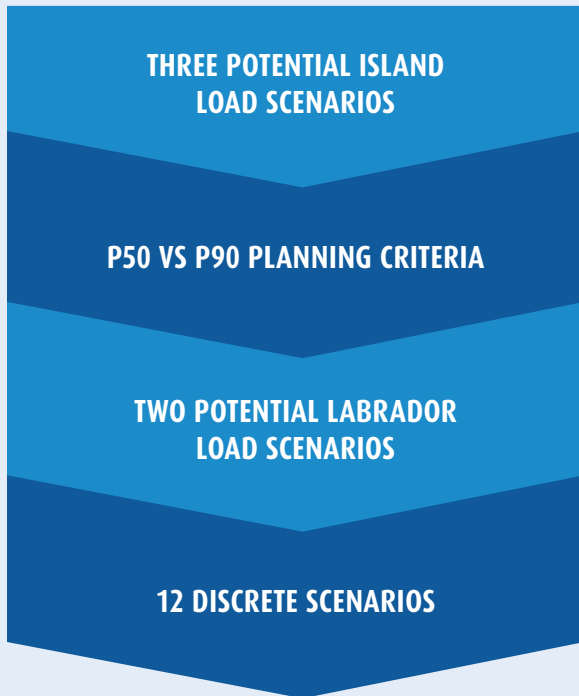
We value the importance of seeking customer input for consideration and decision making purposes. Customer input, along with analysis and evidence, help us make informed decisions about the future of electricity in our province.

Following our previous engagement from the 2018 Study, Hydro expects to launch a customer engagement initiative in 2020 focused on determining the value of additional reliability to customers. This work will be used to help shape Hydro's future strategy for investments in the system.



CONSIDERED SCENARIOS

Hydro examined 12 different cases as part of this year’s update to the Reliability & Resource Adequacy Study. Hydro analyzed each case individually to determine which additional resources would be required in each scenario.



FORECAST PROBABILITIES

A probabilistic forecast is based on the likelihood that an event will occur.



P50 FORECAST

In a P50 forecast, the actual peak demand is expected to be below the forecast number 50% of the time and above 50% of the time (i.e. the average forecast).

P90 FORECAST

In a P90 forecast, the actual peak demand is expected to be below the forecast number 90% of the time and above the forecast 10% of the time.

RESULTS

Similar to results of our 2018 analysis, Hydro is not forecasting an energy shortfall through 2029. However, based on our updated analysis, capacity shortfalls are forecast to occur in the study period, in half of the 12 scenarios considered.

The change from 2018 results is being driven by higher electricity requirements on the island, supported by lower projected electricity rates, and higher electricity requirements in Labrador, driven by increased mining activity.

Hydro has proposed to add resources when the P50 forecast identifies a requirement. Requirements for additional capacity are advanced when the P90 forecast is considered. We remain committed to working with the Board to determine the appropriate balance of investment cost and system reliability, based on these scenarios.

Capacity shortfalls requiring additional resources, within the study period, are summarized in the following table:

Island Load Case	P50 vs P90	Labrador Load Case	Year of Resource Requirements
Case I: Mitigated Rate	P90	Labrador Expected	2026
		Labrador Industrial Growth	2025
Case III: High Growth	P50	Labrador Expected	2029
		Labrador Industrial Growth	2028
	P90	Labrador Expected	2024
		Labrador Industrial Growth	2024

LOOKING AHEAD

As the utility responsible for generating the majority of the electricity for our province, it is critical that we are looking ahead and planning for tomorrow as much as today. The current update is intended to provide additional information to complement the Board’s review of the Reliability & Resource Adequacy Study. We will continue to work with stakeholders and the Board through this process to determine which scenarios strike the appropriate balance of system reliability and cost.