PLANNING FOR TODAY, TOMORROW, AND THE FUTURE.

2022 UPDATE

newfoundland labrador hydro

Hydro is the people's utility that you can count on—providing safe, cost-conscious, reliable electricity while harnessing sustainable energy opportunities to benefit the people of Newfoundland and Labrador.

THE POWER OF PLANNING

In 2018, Newfoundland and Labrador Hydro (Hydro) completed a Reliability and Resource Adequacy Study (2018 Filing), filed with the Board of Commissioners of Public Utilities (Board) the same year. The 2018 Filing addresses our long-term approach to providing continued reliable service for our customers. This resource planning process provides an in-depth analysis of how much electricity customers will need over the next ten years. We also consider which assets should be maintained and if new assets are required to ensure we have the right energy mix to meet those demands.

In 2019, Hydro completed an update to the 2018 Filing. The 2022 Update is a complement to the 2018 Filing and 2019 Update. It provides additional detail on matters Hydro has continued to investigate, responses to findings and recommendations made by the Labrador Island Link Reliability assessment and the Holyrood Thermal Generation Station Assessment. To meet customer needs, we have completed a resource plan considering a range of possible scenarios over a ten-year planning horizon—covering the period from 2023 through 2032.

We are also planning during a time when the industry is undergoing massive change. The dramatic societal shift towards cleaner, sustainable energy sources is having major impacts on electricity grids and utilities planning for the future. Utilities are having to balance unprecedented growth at unprecedented speed.

WHAT'S NEW IN 2022

Hydro is undertaking this planning process at a time when our province's electricity grid is on the verge of significant transformation—integrating the Lower Churchill Project assets while preparing to respond to a rapidly changing energy landscape. While continuing to provide least-cost, reliable service for our customers, Hydro must consider:

1. How will we meet Canada's goal of a net-zero electricity sector by 2035?
2. How will the Labrador-Island Link operate post-commissioning?
3. How will we meet load growth and demand for electrification?

Given the pace of change in the energy landscape, Hydro will undertake careful planning while making incremental decisions to ensure we adapt to the ever-changing environment. Long-term solutions will evolve as uncertainties become clearer over time. Recommendations put forward in the 2022 Update use current assumptions to provide incremental solutions that will be updated every year.

Throughout this process, we will use available, up-to-date information to make evidence-based recommendations that honour our commitment to climate change action and to meeting the expectations of society and the federal government.

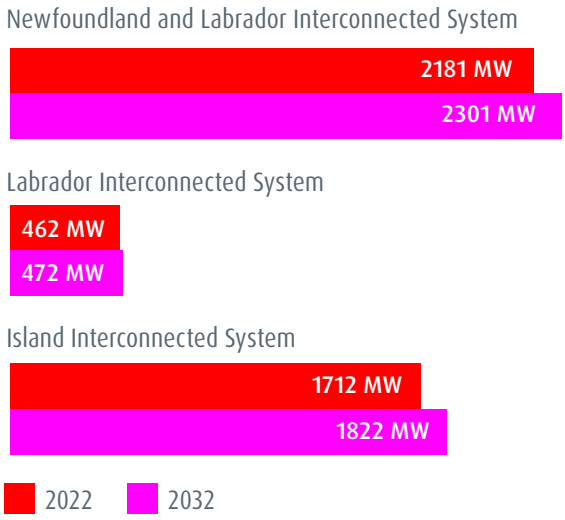
PROVINCIAL INTERCONNECTED SYSTEM

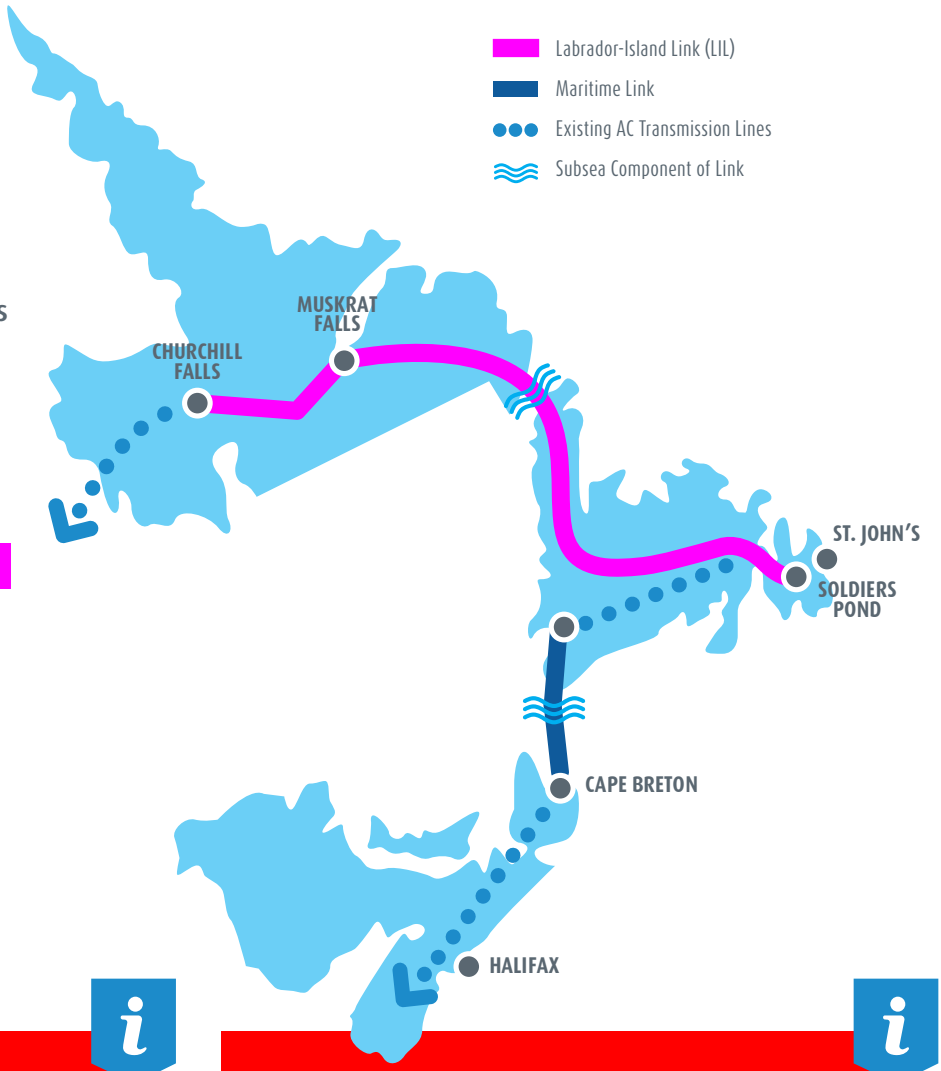
We assess and plan for capacity and energy on a provincial basis, as compared to planning for separate systems. We plan for ten years out to meet current customer demand, as well as the demand for new confirmed customers. While there are many potential customers exploring development in our province, as new requests for interconnection are confirmed, we will update our plans accordingly.

CUSTOMER DEMAND REQUIREMENTS

The current base forecast is expected to grow by 120 MW in the next decade. This forecast does not include potential customer loads not yet confirmed.

Hydro will reexamine system requirements should the base case experience higher load growth.





LABRADOR INTERCONNECTED SYSTEM

The Churchill Falls Generating Station provides energy to the two major customer centres in Labrador East and Labrador West, as well as many homes across eastern North America. The Labrador Interconnected System is connected to the Island Interconnected System via the Labrador-Island Link. The system is also connected to the North American Grid via 735 kV transmission lines from Churchill Falls to Québec.

ISLAND INTERCONNECTED SYSTEM

Most of the energy on the Island comes from hydroelectric generation capability located off the Avalon Peninsula and the bulk 230 kV transmission system extending from Stephenville to St. John's. The system became interconnected to North America for the first time in 2017 via the Maritime Link (which connects to Nova Scotia) and again in 2018 via the Labrador-Island Link (which connects to the Labrador Interconnected System).

REPORT SUMMARY

ASSESSING LIL RELIABILITY

Once the Labrador-Island Link (LIL) is commissioned and existing thermal assets are retired, the island portion of the province will rely heavily on electricity from Muskrat Falls. As part of this planning process, Hydro has worked to understand the implications of LIL reliability to the Island Interconnected System.

To validate Hydro's approach to planning and how LIL should be considered, Hydro worked with third-party consultants that helped inform our planning assumptions, analysis, and processes when considering various scenarios regarding LIL's availability. Consultants recommended Hydro prepare a broad range of scenarios given the level of uncertainty regarding LIL's reliability and the possibility of prolonged outages.

OUR ANALYSIS

We have been listening to customers and stakeholders. Together we want to understand how proposed decisions impact our system and customers.

Following industry best practice, we applied a rigorous modelling process to predict potential impacts. Three separate analyses were performed to assess the impact of LIL reliability on the Interconnected System.

As all utilities do, we examined many factors to determine possible outcomes and associated generation needs required for a series of scenarios. For example, we considered system conditions such as the status of other generation and transmission assets. Since demand on our system is largely driven by weather conditions, we also considered timing of a potential longer LIL outage during a period of extreme weather conditions.

Among the many scenarios we analyzed, we considered an outage of up to six weeks during winter. We examined this scenario to clearly understand the impacts and ensure we are prepared to deliver reliable service when our customers need it most.

Peak demand on the coldest day of the year typically reaches 1800 MW.

The analysis considered the potential ranges for the frequency and duration of outages. The outcome was that load growth, combined with currently planned thermal asset retirements, demonstrates a gap in the ability to supply customers in the scenario where a longer outage occurs during peak times in the middle of a cold winter. In order to close the gap between demand and supply in such a scenario, Hydro will be recommending some actions to ensure reliable supply.

** A detailed analysis, is presented in the comprehensive 2022 Update.*

INSIGHT:

WE NEED TO ENSURE WE HAVE ADEQUATE BACKUP GENERATION, UNTIL NEW SOURCES OF GENERATION CAN BE PLANNED, APPROVED, CONSTRUCTED, AND COMMISSIONED.

Hydro has conducted its analysis consistent with best practices observed across the industry while attempting to manage significant uncertainty. Like many utilities, Hydro must develop strategies to enable the decarbonization of generation assets and address societal decarbonizing impacts on load requirements.

RECOMMENDATIONS

EXPANDED CAPACITY

We must ensure we have the capacity to reliably serve customers and begin to prepare for supplying new customers. New generation will be needed before we can discontinue use of the Holyrood Thermal Generating Station, but this process takes time. A reasonable time frame from decision to commissioning for a new asset is roughly five to eight years, or longer, depending on the type, size, supply, and location of the supply.

The Bay d'Espoir Hydroelectric Generating Station is the largest hydroelectric facility on the Island. Its seven units add 613 MW of capacity to our system. Future expansion had been a consideration at the time of its construction, which would now enable a new unit to be added in an efficient and cost-conscious manner.

As such, Hydro is proposing to review an expansion of firm supply on the Island with primary consideration given to an expansion at the Bay d'Espoir Hydroelectric Generating Station as this was previously identified as the next best resource for the Island. The construction of an additional unit would provide 154 MW of incremental capacity and support the retirement of the Holyrood Thermal Generating Station.

THE FUTURE OF HOLYROOD

The Holyrood Thermal Generating Station has played an important role in the Island electrical system for almost 50 years. Hydro has continued to invest in the facility to ensure reliable service until LIL is commissioned.

Hydro is recommending that the Holyrood Thermal Generating Station, as well as Hardwoods Gas Turbine, remain available as backup generation in the event of a prolonged outage of the Labrador Island Link and until long term sources have been reviewed, approved, and constructed. The use of the thermal units would largely depend on the performance of LIL and system conditions. Continued capital and operating investments would be required to ensure the availability of the units, however every effort would be made to minimize operational costs.

AN ITERATIVE PROCESS

Utility planning is never finished. 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 recommendations in the 2022 Update are the next steps toward planning for the future, which may result in additional resources in order to meet various demands such as conversion from oil heating and gas-powered vehicles in an effort to reduce carbon emissions. Long term capacity requirements arising from reliability or load growth needs are still contingent on evolving factors.

As all utilities do, we will continue to assess load growth, asset performance, and demand for energy and capacity on a regular basis. Following this iterative process, we will continue to make evidence-based decisions on future additional supply sources that are right for our province and customers.

WHAT'S NEXT FOR THE INDUSTRY?

Electricity Canada has published that Canada will need 121 TWh of new supply just to replace carbon-based sources of electricity by 2035. This is equivalent to adding about four Churchill Falls or 25 Muskrat Falls.

That 121 TWh is based on current loads. Climate change action requires other industries to decarbonize and move to clean electricity sources. This means the current whole electricity sector will need to grow by a factor of 2 or 3, or more.

As such, electricity system planning processes must evolve to meet these changes and demands. All Canadian utilities, including Hydro, are working to navigate the uncertainty and plan system additions to affect the government policy expectations on climate change.

Our work continues to advance our understanding of this changing landscape and the implications for additional supply recommendations for our province. A review of the following will be included in the 2023 Update expected next Fall:

1. Outcomes of the Labrador Network Additions Policy
2. Impact of electrification, including industrial decarbonization efforts
3. Impact of the evolving wind energy sector
4. Improved understanding of the clean electricity standard
5. Operational data on LIL performance

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 improve system reliability, this can impact rates. Hydro is committed to reviewing such impacts through the transparent process set by the Board and through engagement with customers and stakeholders.

LOOKING AHEAD

The 2022 Update is intended to provide additional information to complement the Board's view of the Reliability and Resource Adequacy Study. We remain committed to working with the Board to determine the appropriate balance of investment cost and system reliability. Hydro will be seeking review of these recommendations with the Regulator in a transparent and public process.

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

Hydro expects to launch a customer engagement initiative in 2023, focused on determining the value of additional reliability to customers. This builds on our engagement activities in 2018 and will help shape Hydro's future strategy for investments in the system.

As we continue working with stakeholders to advance our resource plans, and as we gain clarity on many of the uncertainties we face, we will continue to refine and evolve our long-term plans.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