Reliability and Resource Adequacy Study Review

Technical Conference

May 2023

newfoundland labrador hydro

OCCUPATIONAL HEALTH AND SAFETY WEEK

Desired Discussion Outcomes

Newfoundland and Labrador Hydro (“Hydro”) aims to add to the understanding:

I. Of the evolution of the Reliability and Resource Adequacy Study (“RRA”) in last 12 months.

II. That balancing cost, customer access to power, and reliability drives Hydro’s recommendations.

III. Of the recent materiality of provincial load growth:
   - Action is necessary to avoid impacts on access to power (e.g., load restrictions).

IV. That backup is required to maintain current level of reliability.
   - Holyrood is the only near-term option for backup.
   - Viable long-term solution determination and size required following further study.

V. New supply is seven to ten years away from time of approval.

Desired Discussion Outcomes (cont.)

Hydro aims to add to the understanding:

VI. That peak demand management is a priority.

VII. That the energy landscape is constantly changing.

- Decisions required in very near term based on best available information.
- Incremental decisions will be required over the coming years.
- Public Policy changes will require decisions.

VIII. Of need for clear and efficient approval process.

- Identification of knowledge gaps.

IX. Of the current system status.

X. That load growth will not necessarily increase rates.

XI. Of customer implications of decisions.

Agenda

- Introduction (Rob Collett)
- The Rapidly Changing Energy Landscape (Jennifer Williams)
- Providing Reliable Service (Rob Collett)
- Evaluating Needs and Supply Solutions (Gail Randell)
- Managing Customer Impacts (Kevin Fagan)
- Next Steps (Rob Collett)

Evolution of the RRA

- The 2018 filing of the RRA marked a significant change in Hydro's proposed new planning criteria (Volume I) and resource options (Volume III).
- Subsequent filings of expected reliability of the Labrador-Island Link ("LIL") and the condition of the Holyrood Thermal Generating Station ("Holyrood TGS").
- Net-zero goals and the resulting decarbonization has resulted in a higher load forecast than was contemplated in 2018.
- There are now two significant issues facing Hydro:
    i. New asset integration and reliability impacts; and
    ii. Load growth requirements associated with decarbonization.

THE RAPIDLY CHANGING ENERGY LANDSCAPE

Outcomes

- ***Understanding of the recent materiality of provincial load growth.***
- ***Understanding of need for clear and efficient process.***
- ***Understanding that peak demand management is a priority.***
- ***Understanding that the energy landscape is constantly changing.***

Our Shared Electricity Future: Principles

- Next utility recommendations will be:
  - Publicly reviewed.
  - Least cost consistent with reliable service.
  - In consideration of regulations, including potential federal Clean Energy Regulations.
- Recommendation and decision process must:
  - Operate timely to meet customer demand so as to not restrict growth.
  - Consider various scenarios and alternatives.

Public Policy Changes Impacting Utility Planning

Federal and Provincial Climate Change Policy

- Requirement for net-zero electricity demand is occurring quickly, and outside of control of the utility.
- **Canadian Law (2021):** *Canadian Net-Zero Emissions Accountability Act*
  - Actions now in place to drive a net-zero economy in just 27 years.
- Government of Newfoundland and Labrador's commitment to achieving net zero by 2050 will be supported by:
  - Infrastructure developments to increase renewable hydroelectricity;
  - Legislative actions; and
  - Program funding to enable:
    - electrification of government buildings and private sector facilities;
    - increased electric vehicle penetration; and
    - residential fuel switching from fuel oil to electricity.

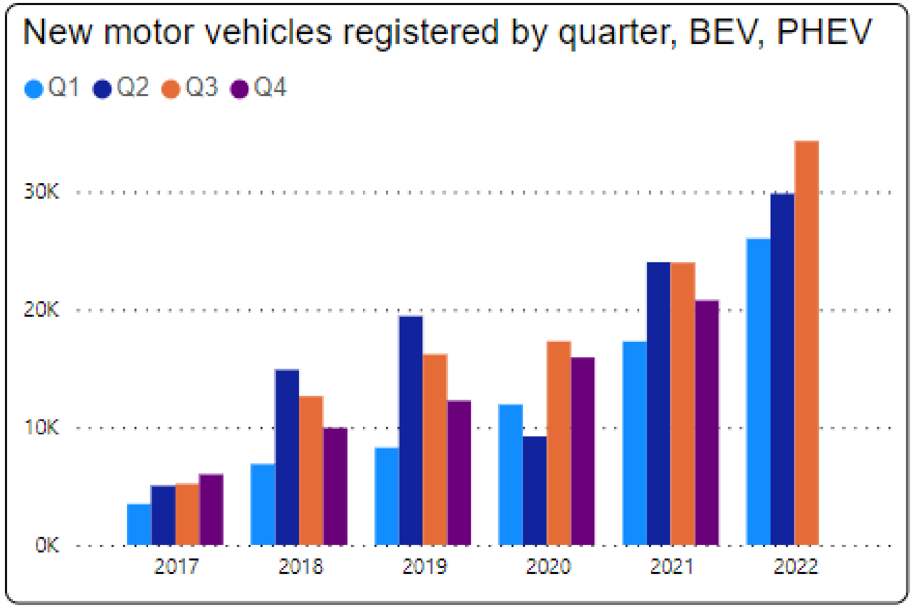
Associated Electricity Sector Implications

- Societal shifts towards net-zero energy sources have been dramatic and are having major impacts on electricity grids and utilities are having to balance substantial growth at significant speed in planning for the future. National goals have been set for a net-zero economy by 2050.
    - Newfoundland and Labrador's grid is highly renewable (more than 90% in 2022). The major risk is being ready for the transition of the economy to electricity and that requires net-zero sources.
    - Canadian Electricity Association: "Under net zero, Canada will reduce its reliance on fossil fuels by mid-century. However, by government's own estimation, to do so <u>*Canada will need two to three times the amount of electricity it produces now to decarbonize other sectors of the economy (emphasis added)*</u>. Furthermore, the government wants the electricity sector to be net zero by the end of 2035." (2022)
- Electricity system planning processes <u>must</u> evolve to meet the accelerating electricity demands and established targets. All Canadian utilities, including Hydro, are working to navigate the uncertainty and plan system additions to respond to the government policy requirements expectations on climate change.
- Newfoundland and Labrador must take a first step in resource additions to meet this load growth.

Why not wait until all provincial reliability uncertainties are determined to make a decision on the next load growth source?

Electric Vehicles Sales in Canada

- Current electric vehicle ("EV") adoption rates across Canada:
  - Newfoundland and Labrador – 4.4%[1]
  - Canadian Average – 7.7%
  - Québec – 11.8%
  - British Columbia – 15.6%
- While EV adoption in Newfoundland and Labrador currently lags in the national context, this is an issue of timing.
  - **Not a question of *if* Hydro will be required to serve this load but *when.***

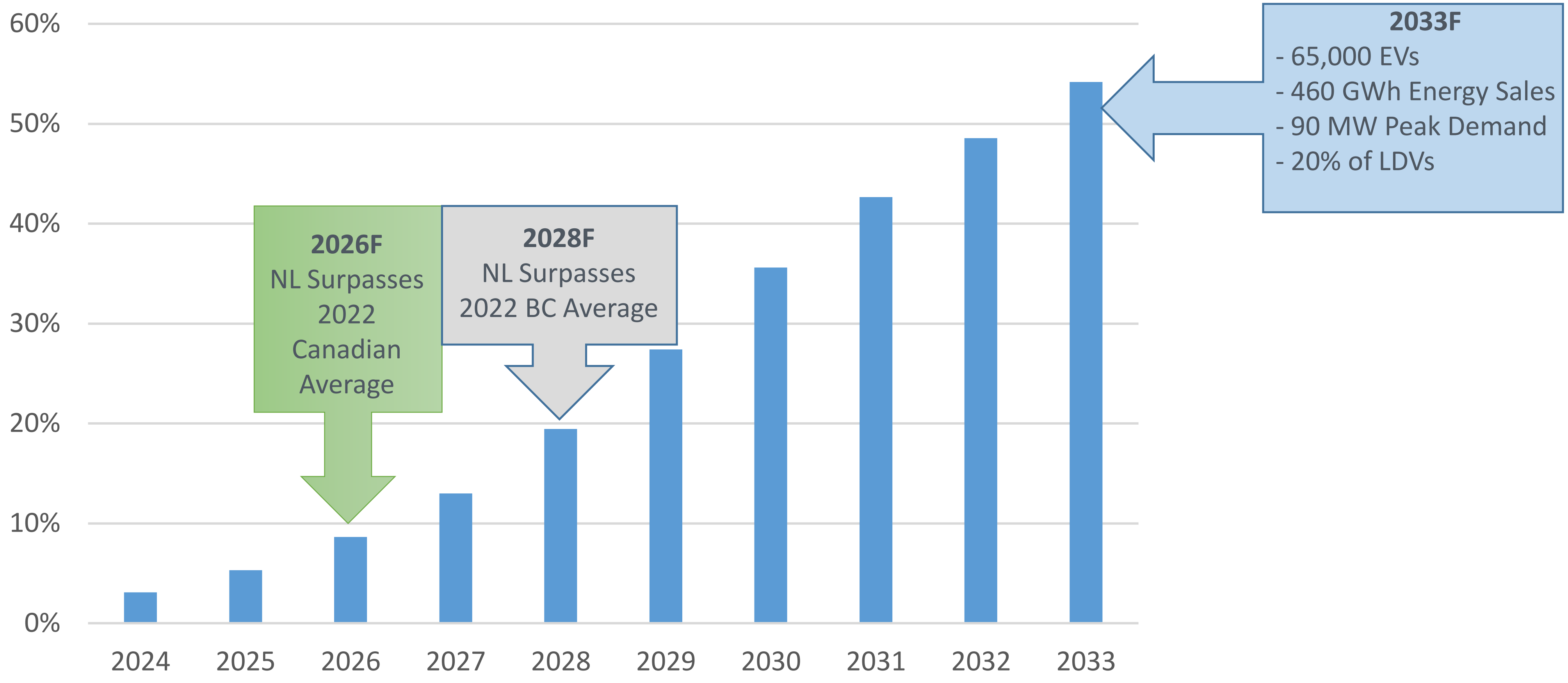


[1] Newfoundland and Labrador vehicle registration data does not differentiate between plug-in and mild hybrids.

Electric Vehicle Growth Factors

- In December 2022, the Government of Canada released proposed regulations for sale of zero emission light-duty vehicles ("LDVs"):
    - 2026: 20%
    - 2030: 60%
    - **2035: 100%**
- Neighbour influence:
    - Biden 2030 goal of 50% of all new vehicle sales in the USA must be electric.
    - Canada's federal government indicated their budget influenced by USA *Inflation Reduction Act*.
- EV adoption is affected by price. Research indicates that EVs will reach price parity with gasoline powered vehicles within several years, if not sooner in some markets and for some vehicles.
- Growth also affected by supply availability – this is being alleviated.
- EV rebate program is extended for an additional $3 million, and gasoline prices remain high.

Newfoundland and Labrador EV Sales % Forecast



Oil to Electric Conversions

- Initial rebate programming:
  - Year 1: 100 homes
  - Year 2: 1,650 homes
  - Combined estimated impact: 10 MW
- New program announced:
  - Support for conversion of another 10,000 homes over four years.
  - Early estimates that this will result in at least 60 MW of new demand once all implemented. Will come incrementally.
  - 30,000 home conversions remain possible.

Resulting Impacts that Require Urgent Action

- There is currently no zero-emission supply available to meet this significant growth arising from EVs and oil to electric conversions.
- Increased electrification = increased electricity demand from EVs and home heating.
- Other baseline provincial load growth is also occurring.
- Significant load growth started now and will be significantly up by 2032 for Newfoundland and Labrador – up to 10% increase over current provincial demand.
  - 2022 Update: Estimated to be 135 MW (86 MW peak demand).
  - 2023 Estimate: 80 MW of additional demand.
- Total new supply on peak required by 2032: **170 MW**

Time is Needed to Respond to Customer Demand

- Decisions are required in the very near future for load growth, and this is independent of LIL reliability assessment.
- The focus on electrification will continue and likely accelerate beyond what is in estimates, further increasing urgency and injecting risk of not being able to supply load when required.
  - Impacting customers access to power, economic opportunities and ability to meet climate goals.
- Hydro is working to advance towards a decision point on what is required for system supply for load growth reasons.
- In Labrador currently, customers interested in load more than 200 kW are prevented from connecting due to system limitations.

Time is Needed to Respond to Customer Demand (cont’d)

- We can prevent lack of access to supply from happening by making a decision in the near term and starting the expansion.
- An expedited regulatory process may be required for the near term regarding supply requirements once the application is filed. This is due to many years needed to commission solutions after a decision.
- Waiting will put us further behind in being able to accept new load. Residential, commercial, and industrial customers will be impacted and will not have access to power they need.
- Subsequent decisions for additional load growth requirements and reliability needs will continue to be analyzed and recommended.

Reliability Decisions Associated with LIL

- LIL reliability decisions and backup options are part of the incremental solutions needed for the province and can occur in parallel to a load growth decision.
- To respond to load growth and reliability requirements, multiple decisions on various solutions will be required over the next 10–15 years.
- Incremental decisions will utilize new information obtained each year based on load growth expectations, evolving policy information and asset reliability experience and will factor into subsequent decisions.
- Multiple different solutions will be examined and utilized, including renewables and demand management. At the meter, demand management solutions should accelerate in research and development as a resource consideration.

Reliability Decisions Associated with LIL (cont'd)

- Even if LIL was functioning perfectly and had availability in exceedance of 99%, capacity over the LIL is fully allocated. Significant capacity is required to meet forecasted load growth.
- Solutions to back up the LIL in the event of a major outage are not the same solutions as those needed for a 10% load growth requirement which is a high-load factor zero-emission solution.

Recommended Action

- Increased demand is racing toward us.
- Projects that deliver necessary amounts of capacity will take up to ten years from recommendation to commissioning. Decisions will be required in the near term.
- To ensure customers are not prevented from accessing power, we have to make swift decisions on accepting the load growth forecast and choosing a solution to address it.
- Reliability assessments and associated decisions will continue to evolve incrementally.

Discussion

PROVIDING RELIABLE SERVICE

Outcomes

- ***Understanding that balancing cost, access to power, and reliability drives Hydro's recommendations***
- ***Understanding that backup is required to maintain current level of reliability***
- ***Understanding the current system status***

Lower Churchill Project Status

- LIL testing completed on April 8, 2023.
  - Included 700 MW Pole Trip Tests and 675 MW heat runs.
- LIL assets released for operation by the Newfoundland and Labrador System Operator on April 13, 2023.
- Formal external commissioning certificates issued on April 14, 2023.
- LIL will be operated with a 700 MW limit for the coming months.
- Controlled 900 MW test to be executed prior to operation above 700 MW.
  - To be performed in cold weather conditions during the winter of 2023–2024.
- Project costs to be finalized in coming months.

Lower Churchill Project – Near-Term Operation

- System Operation:
  - Spinning reserve of 206 MW to withstand loss of largest generator.
  - Following a trip, interchanges with neighbouring jurisdictions must be rebalanced.
- Loss of a LIL Pole
  - Pole compensation and runbacks of the Maritime Link.
  - Backup generation started to meet capacity shortfall.
- Loss of the LIL Bipole
  - Runback of the Maritime Link.
  - Backup generation started to meet capacity shortfall, as available.
- Holyrood TGS and gas turbines online/available in the near term to minimize customer interruptions.

LIL Reliability

- Based on Hydro's review and through consultation with Daymark, it is reasonable to assume a LIL Forced Outage Rate ("FOR") of up to 10%.
  - The LIL FOR was originally assumed to be 0.0114%.
- LIL reliability considerations:
  - Overhead Line;
  - Software;
  - Hardware; and
  - Synchronous Condensers.

Holyrood Operation and Reliability

- Derated Adjusted Utilization Forced Outage Probability (“DAUFOP”) based on historical performance.
  - Baseline - 20% (based on historical average)
  - Sensitivity - 34% (based on 2021 performance)

- Holyrood as a backup unit:
  - Average start time: 2–3 days
  - Reduced recall times would require upgrades ($10.6 - $17.3 million)
  - Failed start rate of approximately 50%
  - Average restoration time following unsuccessful start: 3 days

Island Consideration

- Primary reliability drivers are the LIL and Holyrood
  - LIL: capacity, FOR up to 10%.
  - Holyrood: DAUFOP of 20%, Sensitivity of 34%.
- Hydro's Loss of Load Hour ("LOLH") criterion:
  - Not more than 2.8 hours per year.
- Planning Scenarios:

LIL FOR	Holyrood DAUFOP	Criteria Violation?
5%	20%	No
5%	34%	Borderline
10%	20%	No
10%	34%	Yes

Labrador Considerations

- Labrador West
  - Available Transmission Capacity: 385 MW
  - Peak Load: 385 MW (Industrial Customers curtailed over peak)
- Labrador East
  - Available Transmission Capacity: 150 MW
  - Peak Load: 80 MW
- Likely load increase: 330 MW
- System Impact Studies are underway.
- Possibility of further significant industrial development.

Wind, Hydrogen, and Self Supply

- Hydro is participating in government-led process for hydrogen/wind development.
  - Electrical system requirements have been made available to proponents to outline technical requirements to ensure reliable operation.
  - Review process of proposals is ongoing.
- Requirement that electrical transmission system upgrades to enable developments be funded by proponents.
- Self-supply options are limited by legislation. Government can exempt proponents at its discretion.
- Net metering has 5 MW provincial limit; approximately 700 kW to date.

Discussion

EVALUATING NEEDS AND SUPPLY SOLUTIONS

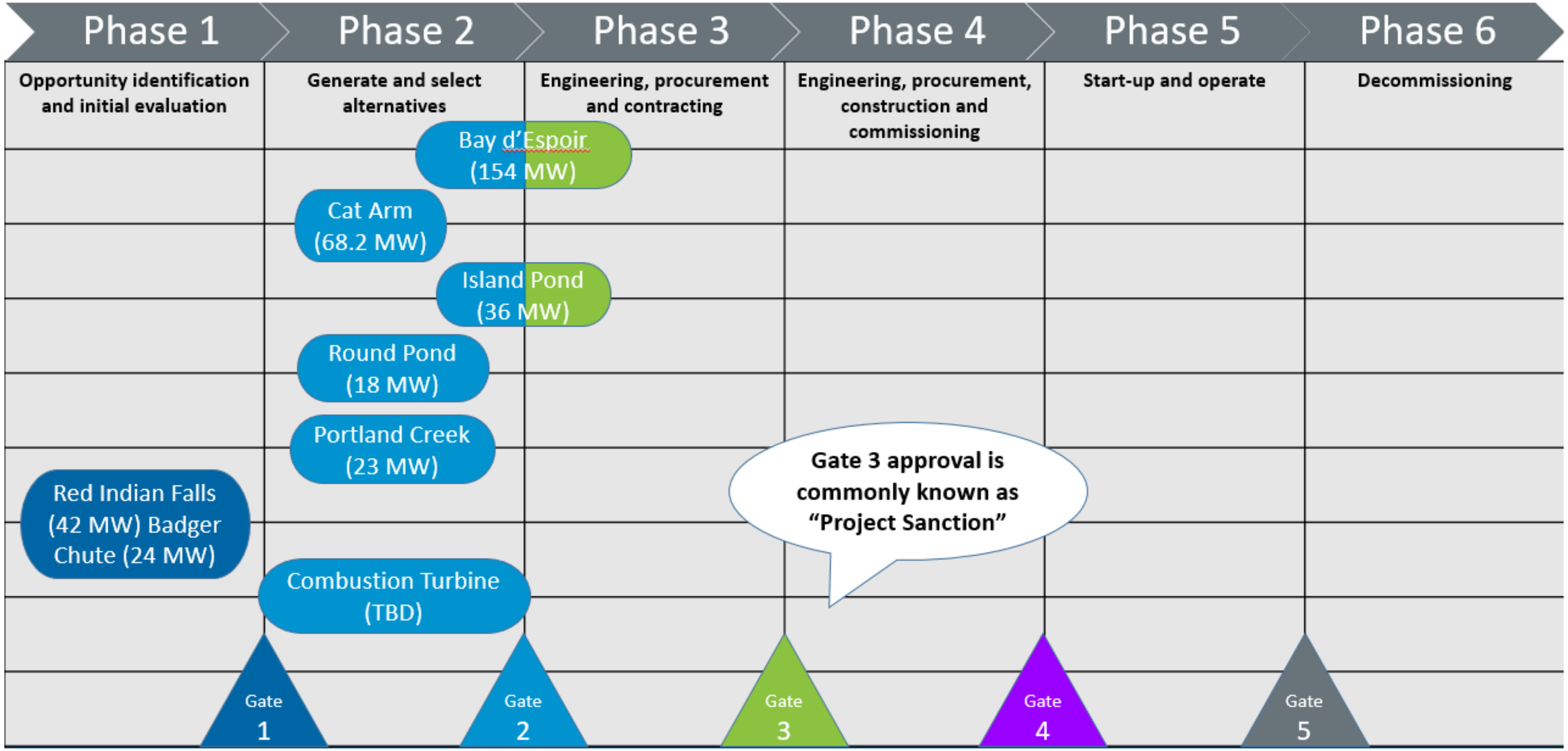
Outcomes

- ***Understanding that balancing cost, access to power, and reliability drives Hydro's recommendations***
- ***Understanding that ANY new supply is seven to ten years away from time of approval***

New Resource Options

- Hydro is currently studying many Island resource options to be included in the next update of Hydro's resource plan with particular focus on Bay d'Espoir Unit 8 and combustion turbine options on the Avalon.
- New resource projects will be developed using good project management practices and follow industry standard guidelines to ensure well informed decision making and consistency when using multiple consultants.
- An overall schedule for all studies feeding the resource plan has been developed and is managed by one project manager.

Project Maturity Analysis



- SNC-Lavalin assessed the maturity of new hydro generation projects currently considered in Hydro's Resource Plan based on standard project management practices.
- A new combustion turbine project for the Avalon is considered to be in Phase 2.

Bay d'Espoir Unit 8

- Hydro has decided to complete all necessary planning and engineering for Phase 3 of project development for Bay d'Espoir Unit 8.
- This decision was based on Hydro's current analysis showing capacity additions required by 2032 and Bay d'Espoir Unit 8 as the historical least-cost, renewable resource expansion option at an existing site.
- Key considerations in Phase 3 of this project are engineering optimization, civil field studies, transmission studies and lessons learned.
- Bay d'Espoir Unit 8 may take up to ten years for approval, construction and commissioning.
- Although Hydro is urgently working on the Bay d'Espoir Unit 8 and other studies, it is unlikely that a comprehensive Project Sanction decision support package for Bay d'Espoir Unit 8 will be complete and reviewed by a third party in 2023. Hydro is working with a consultant to develop an updated schedule.

New Combustion Turbine on the Avalon

- Additional information is required before a combustion turbine option can be selected to proceed to the next phase of project development.
- A study is ongoing (planned for completion June 2023) to analyze fuel requirements, site suitability, and provide updated cost estimates and schedule for three capacity options (150 MW, 300 MW and 450 MW).
- Key considerations are renewable fuels, the proposed Clean Energy Regulations as well as fuel availability and logistics which can be challenging for large thermal back up facilities when natural gas is not available.
- A combustion turbine project would probably take seven years for approval, construction and commissioning.

Clean Energy Regulations

- The proposed Clean Electricity Regulations are expected to be published in the *Canada Gazette, Part I*, in the coming months followed by a public comment period.
- New regulations will apply to all new fossil fuel burning generators above a small megawatt threshold offering electricity for sale to a regulated electricity system.
  - Exemption for diesel isolated systems.
- Key points that Hydro is seeking more information on:
  - Has there been any consideration for jurisdictions without natural gas as a fuel option?
  - Clarification on the definition of emergency backup.
  - More information on “fleet averaging approaches”.

Ongoing Studies

- Further study of resource options already in Hydro's Resource Plan
  - Bay d'Espoir Unit 8
  - Combustion Turbine
  - Batteries
- New studies for 2023
  - Pumped Storage
  - Potential Capacity from Existing Units
  - New Island Hydroelectric Resource Options
  - High Level Long-Term Decarbonization Plan
- Transmission studies
- Wind and Island hydroelectric resources options (except Bay d'Espoir Unit 8) will be included but no additional studies are planned at this time.

Labrador Supply

- Mining industry looking to expand operations and decarbonize industrial processes. System impact studies via the Network Additions Policy are ongoing for projected mining load additions in Labrador West.
- New generation sources to serve the Labrador Interconnected System may also be required.
- New generation sources being considered in Labrador include:
  - Churchill Falls Powerhouse 2 – 1,100 MW; and
  - Churchill Falls runner upgrades – 500 MW.
- It may be appropriate to use some energy supply from the Muskrat Falls Hydroelectric Generating Facility; however, this is under review.

Hydro’s Resource Plan

- We have entered a time of rapidly changing information for the electric utility industry with government policy driving innovation and investment. Hydro’s Resource Plan will include the best available information at the time.
- Hydro will continue to consider:
  - Schedule;
  - Costs;
  - Operating Characteristics;
  - Reliability Benefits;
  - Energy Costs; and
  - Environmental Consequences.
- Hydro will continue to work with their consultant, Daymark Consulting LLC, to ensure its long-term planning is consistent with good utility practice.
- Any application to build will include a fulsome comparison of resource options and will consider costs associated with the potential reduction in generation, capital costs and maintenance costs at Holyrood TGS.

Discussion

MANAGING CUSTOMER IMPACTS

Outcomes

- *Understanding that peak load management must be a priority*
- *Understanding that new generation to supply Island load growth need not materially increase rates*
- *Understanding cost implications of Holyrood TGS extension*
- *Understanding rate mitigation process in the short term*

Customer Engagement on Reliability

- Hydro conducts regular and ongoing research and engagement with customers in order to seek their views and opinions and inform its recommendations and decision making.
- These research activities are consistent with industry and utility best practice and include items such as:
  - Annual customer satisfaction surveys;
  - Bi-annual research related to the drivers of customer satisfaction and trust;
  - Ongoing social and traditional media analysis; and
  - Digital engagement research.
- Hydro continues to evaluate cost implications prior to making final recommendations with respect to reliability targets.
- When doing so, Hydro considers the findings of its overall research program; however, it also specifically conducts a tailored digital engagement program related to customers views of cost vs. reliability.
- Hydro will also engage the Consumer Advocate, Newfoundland Power Inc., Labrador Interconnected Group and Island Industrial Customers in the ongoing process.

Load Growth and Rate Minimization

- New generation builds to supply will not necessarily mean higher customer rates or increased rate mitigation.
- Adverse customer rate impacts can be minimized or avoided through the use of effective peak demand management.
  - Unmanaged EV charging estimated to increase peak demand by 125 MW by 2033.
  - Through the use of smart chargers, Hydro is forecasting 90 MW increase in peak demand.
- Effective peak demand management can contribute to a higher % increase in energy usage than the % increase in peak demand (i.e., higher system load factor).
- Achieving higher system load factor in this manner can limit the change in customer rates as a result of:

  (i) the fixed costs of new generation being shared over increased kWh; and

  (ii) Increased revenues to offset the increased costs.

Illustrative Example: Island Load Growth

Load growth: Within ten years, light-duty EV sales of approximately 460 GWh annually with 90 MW of additional peak demand. Residential conversions from oil to electric projected to increase annual electricity sales by 90 GWh assuming 60 MW of additional peak demand.

New Supply: Bay d'Espoir 8 would provide 154 MW of additional capacity to the system (no additional energy) at an estimated capital cost of $522 million ($2022). Reduced export sales would provide the energy supply for the additional load (estimated cost at 5 cents per kWh).

Customer Rate Impact: Projected impact is a slight reduction in rates.

- Increased revenue requirement from Newfoundland Power Inc. of approx. $75 million but *a unit cost decrease of 0.24 cents per kWh*.
- Decreased revenue requirement from Island Industrial Customers of $2.2 million and *a unit cost decrease of 0.29 cents per kWh*.
- Sensitivity: 20% increase in capital cost for Bay d'Espoir 8 would increase customer rates by approx. 0.1 cents per kWh.

Peak Demand Management and Rate Design

- Hydro expects to continue to rely on capacity assistance agreements/curtailable load to reliably serve customers.
  - Approximately 130 MW planned availability.
- Peak demand management will play an increased role to manage load growth.
  - E.g., smart charger capability to manage EV demand.
  - Managing impacts of oil to electric conversions.
- Wholesale and industrial rate designs to be modified in next General Rate Application ("GRA").
- Retail Rate Design Review and load research study planned by Newfoundland Power Inc.
  - May require transition to new metering technology.

Customer Rate Impacts – Holyrood TGS Extension

- Approximately $241 million Holyrood TGS Costs reflected in approved rates from previous GRA:
  - Fuel: $194.7 million;
  - Depreciation: $18.5 million;
  - O&M direct: $23.1 million; and
  - Return: $4.9 million.
- Holyrood TGS fuel costs in 2022 was $157 million.
  - $37 million in 2022 fuel savings credited to Supply Cost Variance Deferral Account.
- Government payment of $190.4 million to offset the 2022 year-end deferral account balance has effectively funded the Holyrood TGS fuel costs for the period November 2021 to December 2022.

Customer Rate Impacts – Holyrood TGS Fuel Costs

- Relative to fuel costs reflected in customer rates, approximately $1 billion in projected fuel cost savings from 2023 to 2030.
- Holyrood TGS fuel costs from 2024 to 2030 are projected to range between $40 million to $80 million depending upon the number of units required to operate at minimum load. Assumed $60 million per year.

Holyrood TGS No. 6 Fuel ($ millions)

	2019 TY	2023	2024	2025	2026	2027	2028	2029	2030
Fuel Cost	194.7	78	60	60	60	60	60	60	80
Test Year Cost Variance*		(117)	(135)	(135)	(135)	(135)	(135)	(135)	(115)
Forecast Fuel Savings 2023–2030									**(1,042)**

* Relative to 2019 Test Year.

Customer Rate Impacts: Holyrood Accelerated Depreciation

- Average depreciation expense up to 2030 is $0.7 million higher than reflected in customer rates.
- Approx. $110 million in steam-related capital investment assuming all three units operational until 2030.
- Material variability in annual accelerated depreciation expense (range $5.4 million to $38 million).
- Depreciation variability currently dealt with though deferral account to expire in 2023; extension beyond 2023 would provide benefit to customers and Hydro.

Holyrood TGS Steam-Related Costs ($ millions)

	2023	2024	2025	2026	2027	2028	2029	2030	Total	Average
Capital Investment	25.7	15.1	18.4	12.8	9.2	10.1	17.6	0.0	108.9	13.6
Depreciation Estimate	5.4	9.0	12.1	16.1	19.7	24.2	38	16.1	140.6	17.6
Test Year Depreciation										16.9

Rate Mitigation Status Update

- Supply Cost Variance Deferral Account reflects both supply cost variances and rate mitigation funding:
  - $190.4 million Government funding credited to Rate Mitigation Fund component of the deferral account.
  - Fuel cost savings credited to Holyrood TGS Fuel Cost Variance component.
  - Costs recovered through Project Cost Recovery rider in Utility Rate credited to Project Cost Recovery component (approx. $43 million per year).
  - Several other components reflecting items such as export revenues, transmission tariff revenues, etc.
  - Each component of the deferral account still maintains balances; future regulatory process for allocation of each component balance among customer classes.
- The Supply Cost Variance Deferral Account will continue to enable rate mitigation funding at least until conclusion of Hydro's next GRA.
- Most of the rate mitigation funding resulting from the agreement between the provincial and federal governments has not been available until the LIL was commissioned.
- With commissioning of LIL, next step is to finalize the details of the Rate Mitigation Plan.

Labrador Interconnected System Rates

- No decision yet to deviate from historic treatment of the Labrador Interconnected System as a separate system.
- To serve load growth, it may be appropriate to use some energy supply from the Muskrat Falls Hydroelectric Generating Facility. Legislation prevents costs of Muskrat Falls Project from being recovered from Labrador Interconnected System customers.
  - Any use of Muskrat Falls energy in Labrador to increase exports of Recapture Energy reflects the price of Recapture Energy.
  - If Muskrat Falls energy is required to supply the Labrador Interconnected System, the cost to be recovered from Labrador Interconnected System customers may need to be tied to market value of energy (subject to Board of Commissions of Public Utilities (“Board”) approval).
- New generation additions to serve the Labrador Interconnected System would require a review of the approach to pricing generation rates for Labrador Industrial customers. Government policy review would be required.
- With the cost of Recapture Energy being 0.2 cents per kWh, any new generation costs incurred to serve load growth on the Labrador Interconnected System will put upward pressure on customer rates.

Managing Customer Rate Impacts

Conclusions

- Peak demand management needs to be a priority.
- Customer rate impacts of adding generation to supply Island load growth need not have material impact on customer rates.
- The projected Holyrood TGS fuel costs are on average approximately $130 million per year lower than reflected in customer rates. This totals approximately $1 billion in fuel savings by 2030.
- The Supply Cost Variance Deferral Account will enable the provision of rate mitigation funding, at least until the next GRA is concluded.
- Additional generation supply for the Labrador Interconnected System will put upward pressure on rates.
- Government actions thus far on rate mitigation indicate no reason to anticipate customer rate shock for Island customers.

Discussion

NEXT STEPS

Outcomes

- ***Understanding of need for clear and efficient process***

Next Steps

- Holyrood Update with 2024 Capital Budget Application
- Near-Term Update in Spring and Fall 2023
- Next Resource Adequacy Update in 2024
- Supply Application in 2024
- Consultation with Board staff on RRA-related filing schedules to enable focus on resource plan development

Recommended Timeline

RRA Current Reporting Structure:

1. Near-Term Generation Adequacy Report
    - Provides a granular view of resource adequacy, focusing on monthly and annual LOLH and EUE reporting.
    - Results quantify how the loss of load changes based on system conditions rather than for comparison against a threshold (i.e., reserve margin).
    - Study period: 5 years
2. RRA Study
    - Assessment of supply adequacy under various potential future realities to ensure sufficient capacity and energy are available to meet customer and system requirements.
    - Determines appropriate timing of requirements for additional resources.
    - Study period: 10 years

To enable efficient advancement of RRA process, Hydro intends to file:

- Annually: Near-Term filing each year in October in advance of winter readiness
- Biennially: Resource Adequacy filings
    - Next year's to align with a supply application.
    - Subsequent years to be filed in November.

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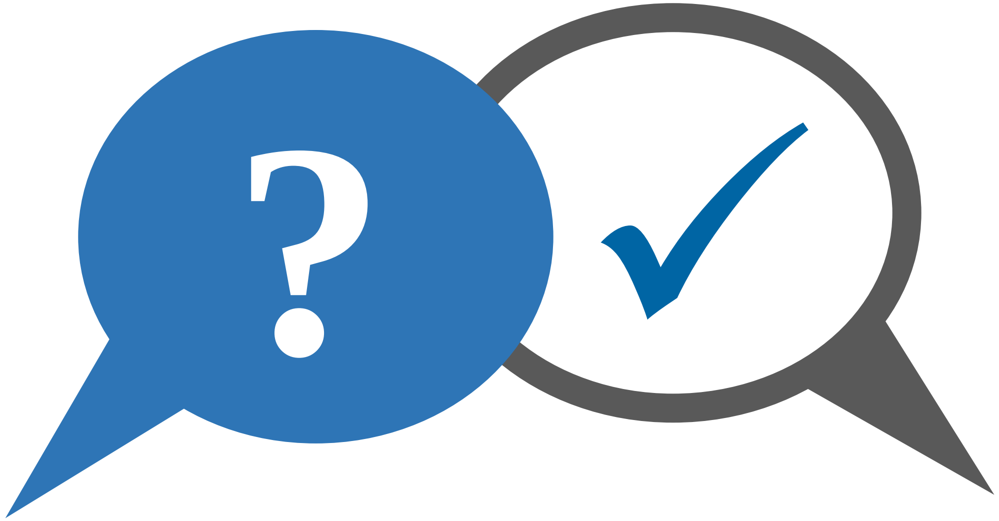

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