Appendix V

Email to NCC - May 31, 2023

Email to Southern Labrador Towns - May 31, 2023

Cover Letter, Legal Application, Revision History and Schedule 2 for Revised Application

From: Deanne Fisher/NLHydro
To: ageorge@bwbllp.ca, executiveasst@nunatukavut.ca, jcooke@bwbllp.ca, trussell@nunatukavut.ca, SLMacLeod@bwbllp.ca, andy@nunacor.com, communications@nunatukavut.ca, grussell@nunatukavut.ca, neil@nunacor.com, dpoole@nunatukavut.ca, rfoley@nunatukavut.ca, Shirley Walsh/NLHydro@NLHYDRO
Date: 05/31/2023 12:05 PM
Subject: Hydro's application

Folks,

As per our meeting on Monday, attached you will find Hydro's revised application of Newfoundland and Labrador Hydro's Long-Term Supply for Southern Labrador Application for distribution to the NunatuKavut Community Council. The revised portions include:

- Cover Letter for the Revised Application;
- Revision History, which details all changes between the Original Application and the Revised Application;
- Legal Application for the Revised Application; and
- Schedule 2 for the Revised Application

We have also included the link to the PUB's website for additional documentation related to this application that was previously filed and will still form part of this proceeding. Due to the large file size, we cannot send all documents via email. The Original Application can be found on the Board of Commissioners of Public Utilities Site HERE and the full proceeding HERE. The application will be filed with the PUB later today.

Once the PUB has finalized NCC's intervenor application, the NCC will be copied on any correspondence/documentation between the PUB, Hydro, other Intervenors and the Consumer Advocate as part of this regulatory filing.


Final_NLH_LT Supply S. Lab_Cover Letter_Rev 1.pdf

Final_NLH_LT Supply S. Lab_Revision History_Rev 1.pdf

Final_NLH_LT Supply S. Lab_Legal Application_Rev 1.pdf

Final_NLH_LT Supply S. Lab_Sch 2_Rev 1.pdf

Please reach out if you have any issues accessing any of the the information.

Thanks
Deanne

Deanne Fisher
Director, Public Affairs and Customer Service
Regulatory and Stakeholder Engagement
Newfoundland & Labrador Hydro
t. 709 733-5299 | **c.** 709 697-3418
e. DeanneFisher@nlh.nl.ca | **w.** www.nlhydro.com

From:	Deanne Fisher/NLHydro
To:	stlewisadmin@nf.aibn.com
Cc:	Sara J Sullivan/NLHydro@NLHYDRO, Krista Fowler/NLHydro@NLHYDRO
Date:	05/31/2023 03:46 PM
Subject:	Re: Update from NL Hydro re: supply for Southern Labrador

Hello Mayor Poole, Town Councillors and Staff,

As per our meetings in May, we are following up to provide you all with a copy of Hydro's revised application of Newfoundland and Labrador Hydro's Long-Term Supply for Southern Labrador Application. The revised portions include:

- Cover Letter for the Revised Application;
- Revision History, which details all changes between the Original Application and the Revised Application;
- Legal Application for the Revised Application; and
- Schedule 2 for the Revised Application

We have also included the link to the PUB's website for additional documentation related to this application that was previously filed and will still form part of this proceeding. Due to the large file size, we cannot send all documents via email. The Original Application can be found on the Board of Commissioners of Public Utilities Site HERE and the full proceeding HERE. The application will be filed with the PUB later today.

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Deanne Fisher
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e. DeanneFisher@nlh.nl.ca | **w.** www.nlhydro.com

From: Deanne Fisher/NLHydro
To: maryshbr@nf.aibn.com
Date: 05/31/2023 03:53 PM
Subject: Re: Update from NL Hydro re: supply for Southern Labrador

Hello Mayor Rumbolt, Town Councillors and Staff,

As per our meetings in May, we are following up to provide you all with a copy of Hydro's revised application of Newfoundland and Labrador Hydro 's Long-Term Supply for Southern Labrador Application. The revised portions include:

- Cover Letter for the Revised Application;
- Revision History, which details all changes between the Original Application and the Revised Application;
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- Schedule 2 for the Revised Application

We have also included the link to the PUB 's website for additional documentation related to this application that was previously filed and will still form part of this proceeding . Due to the large file size, we cannot send all documents via email. The Original Application can be found on the Board of Commissioners of Public Utilities Site HERE and the full proceeding HERE. The application will be filed with the PUB later today.

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Thanks
Deanne

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From:	Deanne Fisher/NLHydro
To:	porthopesimpson@nf.aibn.com
Date:	05/31/2023 03:54 PM
Subject:	Re: Update from NL Hydro re: supply for Southern Labrador

Hello Mayor Margaret Burden, Town Councillors and Staff,

As per our meetings in May, we are following up to provide you all with a copy of Hydro's revised application of Newfoundland and Labrador Hydro's Long-Term Supply for Southern Labrador Application. The revised portions include:

- Cover Letter for the Revised Application;
- Revision History, which details all changes between the Original Application and the Revised Application;
- Legal Application for the Revised Application; and
- Schedule 2 for the Revised Application

We have also included the link to the PUB's website for additional documentation related to this application that was previously filed and will still form part of this proceeding. Due to the large file size, we cannot send all documents via email. The Original Application can be found on the Board of Commissioners of Public Utilities Site HERE and the full proceeding HERE. The application will be filed with the PUB later today.

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Thanks
Deanne

Deanne Fisher
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e. DeanneFisher@nlh.nl.ca | **w.** www.nlhydro.com

From: Deanne Fisher/NLHydro
To: ctown@nf.aibn.com
Date: 05/31/2023 03:52 PM
Subject: Update on Hydro's Application to the PUB for Southern Labrador

Good afternoon Mayor Oram, Stewart, Town Councillors and Staff,

I'm following up today with an update on Hydro's revised application for Long-Term Supply for Southern Labrador Application. Attached is a copy of the revised application for your information. The revised portions include:

- Cover Letter for the Revised Application;
- Revision History, which details all changes between the Original Application and the Revised Application;
- Legal Application for the Revised Application; and
- Schedule 2 for the Revised Application

We have also included the link to the PUB's website for additional documentation related to this application that was previously filed and will still form part of this proceeding. Due to the large file size, we cannot send all documents via email. The Original Application can be found on the Board of Commissioners of Public Utilities Site HERE and the full proceeding HERE. As committed, the application was filed with the PUB today.

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Please reach out if you have any issues accessing any of the the information.

Thanks
Deanne

Deanne Fisher
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newfoundland labrador hydro

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May 31, 2023

Board of Commissioners of Public Utilities
Prince Charles Building
120 Torbay Road, P.O. Box 21040
St. John's, NL A1A 5B2

Attention: Cheryl Blundon
Director of Corporate Services & Board Secretary

Re: Long-Term Supply for Southern Labrador – Revision 1

Please find enclosed Newfoundland and Labrador Hydro's ("Hydro") revised application for approval of the construction of Hydro's long-term supply plan for southern Labrador pursuant to Section 41(3) of the *Public Utilities Act*.[1]

Hydro proposes to proceed with the regional diesel generating station with immediate interconnection of all four systems, instead of the phased approach proposed in Hydro's original application.[2] Hydro believes this proposal meets Hydro's mandate to provide power at the lowest possible cost, consistent with reliable service, and does so in an environmentally responsible manner.

The proposed project has a total budget of $86.4 million with completion estimated for 2027. Hydro notes that this is an aggressive timeline and that certain aspects of the schedule, such as the regulatory and environmental assessment approval, are outside of Hydro's control. However, Hydro is committed to bringing reliable service to Charlottetown and the other communities in southern Labrador as expeditiously as possible.

Revisions to the application have been shaded grey for ease of reference.

Should you have any questions, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO

Shirley A. Walsh
Senior Legal Counsel, Regulatory
SAW/sk

Encl.

[1] *Public Utilities Act*, RSNL 1990, c P-47, s41(3).
[2] "Long-Term Supply for Southern Labrador – Phase 1," Newfoundland and Labrador Hydro, July 16, 2021.

ecc:

Board of Commissioners of Public Utilities
Jacqui H. Glynn
PUB Official Email

Labrador Interconnected Group
Senwung F. Luk, Olthuis Kleer Townshend LLP
Nicholas E. Kennedy, Olthuis Kleer Townshend LLP

Newfoundland Power Inc.
Dominic J. Foley
Lindsay S.A. Hollett
Regulatory Email

Island Industrial Customer Group
Paul L. Coxworthy, Stewart McKelvey
Denis J. Fleming, Cox & Palmer
Dean A. Porter, Poole Althouse

Consumer Advocate
Dennis M. Browne, KC, Browne Fitzgerald Morgan & Avis
Stephen F. Fitzgerald, Browne Fitzgerald Morgan & Avis
Sarah G. Fitzgerald, Browne Fitzgerald Morgan & Avis
Bernice Bailey, Browne Fitzgerald Morgan & Avis

IN THE MATTER OF the *Electrical Power Control Act, 1994, RSNL 1994*, Chapter E-5.1 ("*EPCA*") and the *Public Utilities Act*, *RSNL 1990*, Chapter P-47 ("*Act*"), and regulations thereunder

IN THE MATTER OF an application by Newfoundland and Labrador Hydro ("Hydro") for an order approving the construction of [] Hydro's long-term supply plan for southern Labrador, pursuant to Section 41(3) of the *Act*.

To: The Board of Commissioners of Public Utilities ("Board")

THE APPLICATION OF HYDRO STATES THAT:

A. Background

1. Hydro is a corporation continued and existing under the *Hydro Corporation Act, 2007*,[1] is a public utility within the meaning of the *Act*, and is subject to the provisions of the *EPCA*.

2. Since the early 2000s, Hydro has studied the long-term supply options for certain communities in southern Labrador. In particular, Hydro has examined the possibility of interconnection due to the potential for reductions in operating and maintenance costs and improved reliability in the region.

3. There are six neighbouring communities in southern Labrador that are currently supplied by four separate isolated diesel systems: (a) Charlottetown and Pinsent's Arm, (b) Mary's Harbour and Lodge Bay, (c) Port Hope Simpson, and (d) St. Lewis ("Southern Labrador Communities").

4. Hydro's consideration of the possibility of interconnection of the Southern Labrador Communities has been expedited due to an October 2019 fire at the Charlottetown Diesel Generating Station that left it inoperable. Customers previously served by the Charlottetown Diesel Generating Station were then served by three mobile gensets,[ ] a temporary configuration that is considered an interim solution. Since that time, there have been further complications with the service configuration in Charlottetown; a long-term solution is required

[1] *Hydro Corporation Act, 2007*, SNL 2007 c H-17.

to address reliability, safety, and environmental concerns associated with the long-term use of mobile generation in a prime power application.

B. Application

5. A number of options were considered as part of Hydro's evaluation of potential long-term solutions, including (a) the addition of infrastructure to improve reliability for the continued operation of the mobile gensets, (b) the direct replacement of the Charlottetown Diesel Generating Station, [ ] (c) the interconnection of the Southern Labrador Communities with supply provided by a single regional diesel generating station in Port Hope Simpson, and (d) interconnection to the Labrador Interconnected System.

6. Schedule 1 to this application provides an overview of Hydro's planned approach to long-term supply for southern Labrador at the time of filing its application "Long-Term Supply for Southern Labrador – Phase 1" ("Original Application") in July 2021.[2] The economic and technical assessment of the various alternatives that were considered to address the long-term firm supply needs for the Southern Labrador Communities is provided in Attachment 1 to Schedule 1.

7. Hydro [ ] considered the potential role of renewable energy resources in its isolated systems. To date, renewable energy technologies, with the exception of hydro generation with reservoir storage, present challenges that limit their viability as primary sources of capacity in isolated systems. While renewable energy sources in their current state are not viable for the provision of firm capacity, these sources can be used to provide energy on an isolated system, reducing the energy required from diesel generation and thereby reducing operating costs such as diesel fuel consumption.

8. The alternatives [ ] considered by Hydro, and discussed in Schedule 1, included provisions for future infrastructure required to integrate renewable sources. Alternatives involving the interconnection of multiple isolated systems are expected to further facilitate the integration of renewable energy in the future, as such systems are better suited to absorb fluctuations in supply that are commonly experienced from renewable generation, allowing for a greater penetration of renewable energy on the system.

[2] "Long-Term Supply for Southern Labrador – Phase 1," Newfoundland and Labrador Hydro, July 16, 2021.

9. Hydro's initial analysis determined that a phased approach to interconnection with a single regional diesel generating station in Port Hope Simpson is the least-cost option. That proposed long-term solution was to be phased in over an approximate 20-year period to align with the replacement schedule of the existing assets. Phase 1 of the originally proposed solution included the construction of a regional diesel generating station in Port Hope Simpson with four diesel gensets and the construction of 50 kilometres of 25 kV distribution line to connect the existing Charlottetown Distribution System. The estimated cost for Phase 1, at the time of filing the Original Application, was $1.1 million in 2021, $15.8 million in 2022, $20.3 million in 2023, and $12.7 million in 2024, for a total of $49.9 million.

10. The future phases to interconnect the communities of Mary's Harbour (including Lodge Bay, which is served on the Mary's Harbour Distribution System) in 2030 and St. Lewis in 2045 were estimated to cost an additional $15.2 million and $7.5 million, respectively. [ ]

11. In correspondence from the Board on April 7, 2022[3] and May 16, 2022,[4] Hydro was requested to provide additional information and analysis to supplement the information that had been filed with its Original Application. The Board also required Hydro to engage an independent expert to assist in the analysis of the options and approach for the provision of service in southern Labrador. Hydro selected Midgard Consulting Inc. ("Midgard") to carry out this analysis. Hydro received the, "Southern Labrador Communities - Integrated Resource Plan," ("Midgard IRP")[5] on March 28, 2023; the report was filed with the Board on March 31, 2023.

12. Midgard's analysis largely confirmed the conclusions of Hydro's study, as detailed in Schedule 1. Midgard recommended proceeding with the construction of a regional diesel generating station and interconnection of the communities of southern Labrador.

13. Midgard's recommendation differed from Hydro's original proposal in that Midgard suggested full, immediate interconnection of all six communities instead of using a phased approach, as

[3] "Newfoundland and Labrador Hydro - 2021 Capital Budget Supplemental Application Approval of the Construction of Phase 1 of Hydro's Long-term Supply Plan for Southern Labrador - To NLH - Further Information Required Before Schedule is Resumed," Board of Commissioners of Public Utilities, April 7, 2022.
[4] "Newfoundland and Labrador Hydro - 2021 Capital Budget Supplemental Application Approval of the Construction of Phase 1 of Hydro's Long-term Supply Plan for Southern Labrador – Response to Hydro's Letter dated April 26, 2022," Board of Commissioners of Public Utilities, May 16, 2022.
[5] "Southern Labrador Communities - Integrated Resource Plan," Midgard Consulting Inc., March 28, 2023.

well as the design of the regional diesel generating station with N-1 reliability, rather than designing conservatively with N-2 reliability, as initially proposed by Hydro. Hydro's review of the Midgard IRP and recommendations is detailed in Schedule 2 to this Revised Application.[6]

14. Hydro has accepted the recommendations provided in the Midgard IRP and as a result Hydro is revising its proposal regarding the provision of service to the Southern Labrador Communities. Hydro proposes to proceed with the regional diesel generating station to an N-1 planning standard with immediate interconnection of all four systems, instead of the phased approach proposed in Hydro's Original Application.

15. Hydro's Original Application provided an estimated cost for the proposed construction of Phase 1 totalling $49.9 million. The additional stages had an estimated cost, at the time of filing of the Original Application, of $22.7 million; the original total cost of all phases was an estimated $72.6 million. The current estimate, including the additional distribution infrastructure and the fourth genset associated with the advancement of the full interconnection of all Southern Labrador Communities, is $86.4 million; the increase is primarily due to inflationary pressures on the cost of labour and materials as well as increases in material lead times resulting in a longer project duration and interest period during construction.

16. Hydro's acceptance of Midgard's recommendations has no net impact on the proposed design of the regional diesel generating station. While the scope change from N-2 to N-1 redundancy results in one less unit required for the generating station, it is counteracted by the additional unit required for the immediate connection of all communities, originally planned for Phase 2, maintaining the initial design plan of four diesel units.

17. Additionally, maintaining the initial design plan for the regional diesel generating station with six engine bays will ensure sufficient footprint to accommodate future load growth and allow for N-2 redundancy if deemed necessary. While the provision of an extra engine bay to accommodate N-2 redundancy has an incremental cost of approximately $500,000, this is significantly less than the cost of expanding the building footprint in the event that an additional

[6] "Long-Term Supply for Southern Labrador," Newfoundland and Labrador Hydro, rev. May 31, 2023 (originally filed as "Long-Term Supply for Southern Labrador – Phase 1" on July 16, 2021), ("Revised Application").

engine bay is required. This additional footprint could also be utilized for equipment to support the integration of renewable energy or storage technologies in the future.

18. The detailed scope of the revised proposal is provided in Section 4 of Schedule 2 to this Revised Application, including the project schedule indicating estimated completion in 2027. Hydro notes that this is an aggressive timeline, which is necessary to bring reliable service to Charlottetown and the other Southern Labrador Communities as expeditiously as possible.

C. Reasons for Approval

19. The revised proposal for the interconnection of the Southern Labrador Communities, based on Midgard's analysis and Hydro's review of same, is the least-cost option to provide reliable service to those communities, while also being environmentally responsible. Midgard's conclusions, noted by Hydro at Section 3.7.1 of Schedule 2, reference the passage of time since the prior analysis and the resultant reduction in any cost benefit attributable to deferral of the costs related to the planned replacement of the Mary's Harbour Diesel Generating Station. Midgard's report also discusses the impact of increased forecast diesel costs, in favouring scenarios with higher efficiency and increased renewable procurement, which a regional diesel generating station would provide. Additionally, Midgard noted that the fully interconnected system configuration facilitates increased penetration of incremental renewable energy resources. Hydro agrees with Midgard's analysis and believes that Midgard's recommendation is consistent with Hydro's legislated mandate to provide reliable service at least-cost, in an environmentally responsible manner.

20. The Midgard IRP highlighted several benefits of interconnecting the communities to a regional diesel generating facility, including operational savings due to reduced fuel consumption, improved system reliability, reduced capital costs, and greater potential for renewable penetration. Midgard noted that completing the interconnected system in full, instead of in stages, would allow for greater penetration of renewable energy, and therefore greater opportunity to offset diesel fuel usage.

21. Midgard's cost-benefit analysis considered both direct costs, such as capital investments and operational expenses, and indirect costs, such as environmental impacts and potential economic benefits. Midgard also carried out a sensitivity analysis considering the impacts of ten variables,

including carbon and diesel fuel costs. The resulting analysis suggested that the upfront capital costs of interconnecting the four systems and six communities will be offset by operational savings over a 25-year period, which is consistent with Hydro's Original Application and the analysis detailed in Schedule 2.

22. As noted in Midgard's IRP, their study period was 25 years and indicated that the full immediate interconnection provides savings compared to a long-term mobile option or a community-based diesel generating station of $16.3 million and $24.1 million, respectively.

23. The proposed full interconnection, as compared to [] continued isolated systems operation, results in an incremental increase in revenue requirement in 2030 but is anticipated to generate revenue requirement savings [] from 2035 onwards.

24. The reliability assessment completed by Hydro determined that a large interconnection would increase the overall system reliability compared to the status quo or to a scenario where each community is supplied by its own individual diesel generating station. This assessment is supported by the findings detailed in the Midgard IRP. It was also concluded that a solution involving the interconnection of Charlottetown, Mary's Harbour, (including Lodge Bay, which is served on the Mary's Harbour Distribution System), Port Hope Simpson, and St. Lewis provides increased flexibility for more renewable energy penetration, therefore providing more potential to offset fuel consumption in the future. This potential was initially discussed in Schedule 1 to the Original Application and was also noted in the Midgard IRP. Indeed, Midgard noted that proceeding with the full interconnection may enable greater renewable penetration sooner than phased interconnection.

D. Hydro's Request

25. Hydro requests that the Board make an Order pursuant to Section 41(3) of the *Act* approving the capital expenditures of $1,834,700 in 2023; $17,811,700 in 2024; $40,116,300 in 2025; $23,327,400 in 2026; and $3,304,100 in 2027 for the construction of [ ] Hydro's long-term supply plan for southern Labrador.

E. Communications

26. Communications with respect to this application should be forwarded to Shirley A. Walsh, Senior Legal Counsel, Regulatory for Hydro.

DATED at St. John's in the province of Newfoundland and Labrador this 31st day of May, 2023.

NEWFOUNDLAND AND LABRADOR HYDRO

Shirley A. Walsh
Counsel for the Applicant
Newfoundland and Labrador Hydro,
500 Columbus Drive, P.O. Box 12400
St. John's, NL A1B 4K7

Revision History

Revision No.	Revision Date	Location	Reason
1	31-May-2023	Legal Application, p. 1, Style of Cause	Updated to reflect revisions made to the application's request.
1	31-May-2023	Legal Application, para. 1, including f.n. 1	Added citation.
1	31-May-2023	Legal Application, para. 3	Update to clarify the number of communities supplied by the proposed project.
1	31-May-2023	Legal Application, para. 4	Updated to reflect past tense and reflect evidence discussed in Schedule 2.
1	31-May-2023	Legal Application, para. 5	Updated to reflect additional options considered as part of the revised application.
1	31-May-2023	Legal Application, para. 6, including f.n. 2.	Updated to reflect past tense.
1	31-May-2023	Legal Application, para. 7	Removed "also."
1	31-May-2023	Legal Application, para. 8	Updated to reflect past tense.
1	31-May-2023	Legal Application, para. 9	Updated to reflect past tense.
1	31-May-2023	Legal Application, para. 10	Updated to reflect past tense. Removal of language no longer relevant to the revised application.
1	31-May-2023	Legal Application, para. 11, including f.n. 3, 4, and 5.	Added to reflect history of proceeding.
1	31-May-2023	Legal Application, para. 12	Added to reflect evidence discussed in Schedule 2.
1	31-May-2023	Legal Application, para. 13, including f.n. 6.	Added to reflect evidence discussed in Schedule 2.
1	31-May-2023	Legal Application, para. 14	Added to reflect evidence discussed in Schedule 2.
1	31-May-2023	Legal Application, para. 15	Added to reflect evidence discussed in Schedule 2.
1	31-May-2023	Legal Application, para. 16	Added to reflect evidence discussed in Schedule 2.
1	31-May-2023	Legal Application, para. 17	Added to reflect evidence discussed in Schedule 2.
1	31-May-2023	Legal Application, para. 18	Added to reflect evidence discussed in Schedule 2.
1	31-May-2023	Legal Application, para. 19	Added to reflect evidence discussed in Schedule 2.
1	31-May-2023	Legal Application, para. 20	Added to reflect evidence discussed in Schedule 2.
1	31-May-2023	Legal Application, para. 21	Added to reflect evidence discussed in Schedule 2.
1	31-May-2023	Legal Application, para. 22	Added to reflect evidence discussed in Schedule 2.
1	31-May-2023	Legal Application, para. 23	Updated to reflect evidence discussed in Schedule 2.
1	31-May-2023	Legal Application, para. 24	Updated to reflect evidence discussed in Schedule 2.
1	31-May-2023	Legal Application, para. 25	Updated to reflect evidence discussed in Schedule 2.
1	31-May-2023	Schedule 2	Schedule 2 added to application package as evidence supporting the revised application.
1	31-May-2023	Affidavit, Style of Cause	Updated to reflect revisions made to the application's request.

Long-Term Supply for Southern Labrador

Evidence Supporting the Revised Application

Executive Summary

On July 16, 2021, Newfoundland and Labrador Hydro ("Hydro") filed its application for approval of Phase 1 of Hydro's long-term supply plan for southern Labrador ("Original Application").[1] The Phase 1 proposal included the construction of a regional diesel generating station in Port Hope Simpson and distribution infrastructure to interconnect the communities of Port Hope Simpson, Charlottetown, and Pinsent's Arm. Phases 2 and 3 of Hydro's long-term plan supply plan for southern Labrador would see the interconnection of the communities of Mary's Harbour (including Lodge Bay, which is served on the Mary's Harbour Distribution System) and St. Lewis, respectively, coinciding with the expected retirement dates for the diesel generating stations located in those communities in 2030 and 2045. Upon completion in 2045, Hydro's long-term supply plan for southern Labrador would see the interconnection of four systems through the construction of the regional diesel generating station, meeting Hydro's mandate to provide safe, least-cost, environmentally responsible, and reliable power to these six communities.

On April 7, 2022[2] and May 16, 2022,[3] the Board of Commissioners of Public Utilities ("Board") provided correspondence to Hydro with respect to the Original Application. In its correspondence, the Board requested that Hydro provide additional information and analysis to supplement the information that had been filed. The correspondence also stated that Hydro should engage an independent expert to assist in the analysis of the options and approach for the provision of service in southern Labrador.[4] Hydro selected Midgard Consulting Inc. ("Midgard") to carry out this analysis. The "Southern Labrador Communities – Integrated Resource Plan" ("Midgard IRP") was filed with the Board on March 31, 2023.[5]

As described in the Midgard IRP, Midgard's analysis largely confirmed Hydro's conclusions provided within the Original Application, with the recommendation to proceed with the construction of a regional

[1] "Long-Term Supply for Southern Labrador – Phase 1," Newfoundland and Labrador Hydro, July 16, 2021.
[2] "Newfoundland and Labrador Hydro - 2021 Capital Budget Supplemental Application Approval of the Construction of Phase 1 of Hydro's Long-term Supply Plan for Southern Labrador - To NLH - Further Information Required Before Schedule is Resumed," Board of Commissioners of Public Utilities, April 7, 2022.
[3] "Newfoundland and Labrador Hydro - 2021 Capital Budget Supplemental Application Approval of the Construction of Phase 1 of Hydro's Long-term Supply Plan for Southern Labrador – Response to Hydro's Letter dated April 26, 2022," Board of Commissioners of Public Utilities, May 16, 2022.
[4] "Newfoundland and Labrador Hydro - 2021 Capital Budget Supplemental Application Approval of the Construction of Phase 1 of Hydro's Long-term Supply Plan for Southern Labrador - To NLH - Further Information Required Before Schedule is Resumed," Board of Commissioners of Public Utilities, April 7, 2022.
[5] "Southern Labrador Communities - Integrated Resource Plan," Midgard Consulting Inc., March 28, 2023.

diesel generating station and interconnection of the communities of southern Labrador—Charlottetown, Pinsent's Arm, Mary's Harbour, Lodge Bay, Port Hope Simpson, and St. Lewis ("Southern Labrador Communities"). Midgard's recommendation differed from the proposal put forth in Hydro's Original Application in suggesting full, immediate interconnection of all six communities instead of using a phased approach. Another difference is the recommendation to design the regional diesel generating station with N-1 reliability, rather than designing conservatively with N-2 reliability as initially proposed by Hydro.[6] An N-1 reliability design is consistent with Hydro's planning standards for its other isolated systems and is consistent with good utility practice.

Hydro generally agreed with Midgard's recommendations and has adjusted the project scope, estimated cost, and schedule accordingly. The revised total project cost is $86.4 million, reflecting increases from Hydro's original proposal due to escalation and the additional distribution infrastructure. As a result of increased equipment lead times, the estimated duration of the project has increased from three to four years, with the regional diesel generating station and full interconnection expected to enter service in 2027, assuming project approval in the fall of 2023. Hydro will seek all opportunities to advance work whenever practical.

Hydro believes a regional diesel generating station that interconnects the Southern Labrador Communities is the appropriate least-cost solution to providing safe and reliable service to those communities, based on the acceptance of Midgard's recommendations and the subsequent updates to the project scope, estimated cost, and schedule. This evidence provided as Schedule 2, presents the revised long-term supply plan for southern Labrador based on the acceptance of Midgard's recommendations and includes the regional diesel generating station as well as the advanced timeframe for construction of additional distribution lines for full interconnection of all communities.

[6] N-1 redundancy refers to the capacity to support full system load with the largest generating unit out of service. N-2 redundancy refers to the ability to serve full system load with the two largest generating units out of service.

Contents

1.0 Introduction

Hydro filed its Original Application for approval of the construction of Phase 1 of its long-term supply plan for southern Labrador on July 16, 2021. Hydro proposed the construction of a regional diesel generating station located in Port Hope Simpson and distribution infrastructure to interconnect the communities of Port Hope Simpson, Charlottetown, and Pinsent's Arm. Phases 2 and 3 of Hydro's long-term supply plan for southern Labrador would see the interconnection of the communities of Mary's Harbour (including Lodge Bay, which is served on the Mary's Harbour Distribution System) and St. Lewis, respectively, coinciding with the expected retirement dates for the diesel generating stations located in those communities in 2030 and 2045.

The Board's subsequent correspondence, on April 7, 2022 and May 16, 2022, requested that Hydro provide additional information and analysis to supplement the information provided in the Original Application and stated that Hydro should engage an independent expert to assist in the analysis of the options and approach for the provision of service in southern Labrador. On June 22, 2022, Hydro met with Board staff to review the scope of work Hydro proposed would form the basis of a request for proposal ("RFP") to identify and retain a consultant to carry out the independent analysis requested by the Board. Hydro subsequently issued the RFP and selected Midgard to carry out this analysis.

On March 28, 2023, Hydro received the Midgard IRP, which largely confirmed the conclusions of Hydro's study.[7] The Midgard IRP recommended to proceed with the construction of a regional diesel generating station and interconnection of the Southern Labrador Communities, based on the conclusion that interconnection is the most cost-effective and reliable solution for the provision of service to these communities. As described in the Midgard IRP, six recommendations were provided by Midgard for consideration, including:

1) The least-cost alternative for Hydro to reliably serve the region is to proceed with the regional diesel generating station to an N-1 planning standard with immediate interconnection of all four systems, upgraded to 25 kV, instead of the phased approach proposed in the Original Application.

[7] "Long-Term Supply for Southern Labrador – Phase 1," Newfoundland and Labrador Hydro, July 16, 2021, sch. 1.

2) Hydro should minimize future reliance on mobile gensets to supply base load energy and capacity.[8]

3) Hydro should design the regional diesel generating station with N-1 redundancy, instead of N-2 as proposed in the Original Application.

4) Hydro should continue to support and procure incremental low-cost renewable energy through power purchase agreement ("PPA") partnerships with community and Indigenous partners.

5) Hydro should study opportunities for further customer demand management, such as the conversion of resistive electric heat to high-efficiency heat pumps.

6) While renewable energy technologies are not currently technically or economically feasible for the provision of firm capacity, it is recommended that Hydro evaluate new technologies as diesel units come due for replacement.[9]

Following its review of the Midgard IRP, Hydro accepted the recommendations provided. Schedule 2 provides an overview of the proposed recommendations, support for Hydro's acceptance of Midgard's recommendations, and details changes in the project scope, estimated cost, and schedule since the Original Application.

Since 2021, Hydro has experienced cost pressures and increased equipment lead times due to heightened inflation and global supply chain constraints; the associated impacts on project cost and schedule are discussed and reflected herein.

2.0 Background

2.1 Original Application

Hydro's Original Application sought approval for the construction of Phase 1 of Hydro's long-term supply plan for southern Labrador at an estimated cost of $49.9 million. The scope of Phase 1 of the long-term supply plan, planned for commissioning in 2024, included:

- The construction of a regional diesel generating station in Port Hope Simpson;

[8] An engine coupled with an electric generator is referred to as a "genset."
[9] Installed capacity refers to the total installed generation capacity whereas firm capacity refers to the total installed capacity without the largest unit in service.

- The construction of 53 kilometres of 25 kV distribution lines interconnecting the communities of Port Hope Simpson, Charlottetown, and Pinsent's Arm to the regional diesel generating station; and
- 25 kV voltage conversion of the Port Hope Simpson and Charlottetown Distribution Systems, the latter of which serves the communities of Charlottetown and Pinsent's Arm.

The scope of Phase 2, planned for commissioning in 2030 at an estimated cost of $15.2 million, included:

- The addition of one 1,800 kW genset at the regional diesel generating station in Port Hope Simpson;
- The construction of an additional 50 kilometres of 25 kV distribution line interconnecting the communities of Mary's Harbour and Lodge Bay; and
- 25 kV voltage conversion of the Mary's Harbour Distribution System, which serves the communities of Mary's Harbour and Lodge Bay.

The scope of Phase 3, planned for commissioning in 2045 at an estimated cost of $7.5 million, included:

- The construction of a 30 kilometre distribution line interconnecting the St. Lewis Distribution System to the regional diesel generating station in Port Hope Simpson; and
- 25 kV voltage conversion of the St. Lewis Distribution System.

The proposed regional diesel generating station would be designed with six engine bays,[10] four of which would be in use in Phase 1 and the fifth utilized for the addition of one genset in Phase 2. The sixth engine bay would be reserved to accommodate potential future load growth.

Hydro's analysis included the proposed phased approach to interconnection, as well as an alternative that would see the full interconnection of the four southern Labrador systems at once. Hydro's analysis determined that these alternatives were equivalent from a net present value perspective. Hydro opted to propose the phased interconnection to allow for flexibility in the timing of future phases. Table 1 outlines the interconnection costs by phase from the Original Application.

[10] The engine bay is the space inside the diesel generating station reserved for the installation of a genset.

Table 1: 2021 Interconnection Costs by Phase ($ Millions)

Project Phase	In-Service Year	Capital Costs (2021 Estimate)
Phase 1	2024	49.9
Phase 2	2030	15.2
Phase 3	2045	7.5
	Total	**72.6**

In its analysis, Hydro assessed the expected reliability impacts of the studied alternatives for each system. Based on this analysis, Hydro proposed that the regional diesel generating station be designed to an N-2 reliability standard, to ensure that the interconnected system would provide the same or better reliability than the status quo. Hydro estimated that N-2 redundancy would provide an 18% improvement in both all-cause unavailability and a reduction in expected unserved energy.[11]

3.0 The Midgard IRP

Midgard made a number of findings and recommendations that relate to the concerns outlined by the Board. A summary of these findings and recommendations follows.

3.1 Analysis of Alternatives

Midgard evaluated numerous alternative long-term supply solutions for southern Labrador. It considered the viability of ten different resource technologies, the practicality of using Battery Energy Storage Systems as a source of firm capacity, and numerous detailed alternatives based on eight base scenarios and multiple sub-variations to account for different reliability criteria, development timing, and other factors. The scenarios aimed to satisfy three supply criteria—capacity, energy, and reliable backup. The alternatives that were considered ranged from refurbishing existing stations and maintaining isolated community services to constructing new regional generating stations (thermal or hydraulic) with full interconnections and voltage conversions or interconnection with the Labrador Interconnected System.

Midgard acknowledged that intermittent renewable energy sources, such as wind and solar generation, might be viable for the provision of energy; however, to provide firm capacity, intermittent resources must be paired with energy storage with the capacity to supply the system for several days in the event of low renewable generation. Regarding the future cost-effectiveness of Battery Energy Storage

[11] All-cause unavailability refers to unavailability caused by generation- or distribution-related outages.

Systems, Midgard concluded that renewable energy sources with sufficient battery storage to provide firm capacity remains cost-prohibitive at this time. The Midgard IRP indicated that based on the most optimistic projections, battery prices may drop by up to 70% over the next 25 years, with the largest price drops expected in the next 10 years being approximately 55%. Despite these potential price reductions, Midgard concluded that it is unlikely for renewable systems with Battery Energy Storage Systems to become cost-competitive with thermal generation systems within the next decade.

The Midgard IRP highlighted several benefits of interconnecting the Southern Labrador Communities to a regional generating station, including operational savings due to reduced fuel consumption, improved system reliability, reduced capital costs, and greater potential for renewable penetration. Midgard noted that the interconnected system would allow for greater penetration of renewable energy and therefore greater opportunity to offset diesel fuel usage. Midgard also found that proceeding with the full interconnection, rather than phased interconnection, is more cost-effective and will likely enable greater renewable penetration sooner.

Midgard noted that the use of diesel gensets in Hydro's proposed approach is consistent with practices in other similar jurisdictions across Canada. Diesel generation remains a common solution for remote communities due to its reliability, ease of installation, and cost-effectiveness. Midgard's analysis of similar jurisdictions provides context for the proposed approach and supports its suitability for the southern Labrador system.

Midgard conducted a cost-benefit analysis considering both direct costs, such as capital investments and operational expenses, and indirect costs, such as environmental impacts and potential economic benefits. Midgard also carried out a sensitivity analysis considering the impacts of ten variables, including carbon and diesel fuel costs. Midgard's analysis suggested that the upfront capital costs of interconnecting the four systems and six communities would be offset by operational savings over a 25-year period, which is consistent with Hydro's Original Application.

3.2 Requirement for Backup Generation

Midgard's assessment emphasized the importance of maintaining reliable backup generation to ensure the continuous supply of electricity for the Southern Labrador Communities should regional or community-based renewable energy solutions advance or a larger interconnection to the Labrador Interconnected System come to fruition. Regardless of the alternative chosen, Midgard notes that a

dependable capacity resource, such as diesel gensets, is required to provide capacity and energy during emergencies or periods of high demand.

3.3 Reliability

Based on its findings, Midgard noted that an N-2 planning standard provides marginal benefits in overall customer reliability and may not warrant the additional cost.[12] Midgard recommends immediate construction of a regional diesel generating station to an N-1 planning standard, interconnecting all four systems and upgrading to 25 kV service in each community.

3.4 Integration of Renewables

Midgard recommends that Hydro pursue PPAs, particularly through partnerships with Indigenous stakeholders, to integrate renewable energy sources into the system. This approach will help offset diesel fuel usage, reduce greenhouse gas emissions, and provide potential economic benefits to the communities. By considering a different amount of displaced energy (25% to 50%) from renewables depending on the scenario, Midgard acknowledges the role of renewable energy in enhancing the overall sustainability of fossil fuel alternatives. Midgard emphasizes the importance of Indigenous and community involvement in renewable energy projects and recommends that Hydro actively support and engage Indigenous groups in the procurement of renewable energy supplies. This approach aligns with federal policies that favor Indigenous-led development of renewable energy projects, contributing to the growth of Indigenous communities and fostering a more inclusive energy sector.

3.5 Demand-Side Management

Midgard assessed the viability of demand-side management ("DSM") for load reduction in southern Labrador. It concluded that, while there may be opportunities for further demand reduction, DSM is unlikely to be effective in eliminating the need for additional firm capacity in southern Labrador, as Hydro has already availed of most opportunities to incentivize energy efficiency and manage customer demand. Midgard notes that by interconnecting multiple communities with non-concurrent peak loads, Hydro will be able to avail of many of the benefits typically achieved through DSM. Midgard notes that DSM may improve the ability to accommodate load growth. Midgard does note that there may be limited potential for load reduction through conversion from resistive electric heat to heat pumps;

[12] Expected unserved energy for N-1 planning criteria is estimated to be 33 MWh, or 0.2% of energy served, compared to 18 MWh for N-2 redundancy.

however, Midgard notes that care must be taken to not incentivize conversion from other fuel sources to electric heating.

Midgard's recommendation is that Hydro undertakes further study in this regard.

3.6 Alternative Fuels

Midgard assessed options such as compressed natural gas, liquefied natural gas, biodiesel, and hydrogen. It concluded that these alternatives are not currently cost-effective for the southern Labrador diesel generation systems. Midgard also noted that alternative fuels might present technical or logistical challenges, such as cold weather performance, that preclude their use at this time. However, Midgard notes that Hydro should continue to monitor developments in these areas as emerging technologies may become more favorable in the future. Hydro notes that a regional diesel generating station would not preclude it from availing of alternative fuels, should they become technically and economically feasible in the future.

3.7 Recommendations

The recommendations made by Midgard for Hydro's consideration follow.

3.7.1 Proceed with Regional Diesel Generating Station and Advance Full Interconnection

Midgard determined that interconnection of the Southern Labrador Communities with a regional diesel generating station is the least-cost alternative to reliably serve the region. Midgard concluded that immediate interconnection is lower cost, on a cumulative present worth basis, than the originally proposed phased interconnection for the following reasons:

1. Time has passed since the prior analysis was completed and the planned replacement of the MSH[13] plant is closer than when initially modelled. This reduces any cost benefit attributable to deferral of those costs.
2. Further unplanned deterioration of the plant at MSH necessitates material capital spending to extend the life of that facility through to 2030.

[13] Mary's Harbour ("MSH").

3. Increased forecast diesel costs favour scenarios with higher efficiency, such as a regional plant, and increased renewable procurement. The fully interconnected system configuration facilitates increased penetration of incremental renewable energy resources.[14]

Following a review of Midgard's analysis, Hydro accepts Midgard's recommendation to advance the interconnection of all four systems in southern Labrador and to construct a regional diesel generating station. Hydro notes that Midgard's recommendation is consistent with Hydro's legislated mandate to provide reliable service at least-cost, in an environmentally responsible manner. Hydro also notes that the Government of Canada has engaged stakeholders as part of its process to develop the forthcoming Clean Electricity Regulations; through this engagement, the Government of Canada has acknowledged that available technologies do not enable the transition to fully renewable power systems in isolated communities and these systems are therefore expected to be exempt from the standard. The regional diesel generating station provides base-load power to ensure reliable service while enabling the integration of intermittent renewable resources or the interconnection to the Labrador Interconnected System, should such an interconnection become viable in the future. Any potential additional execution risk associated with undertaking the regional interconnection at this time will be offset by the economic benefits associated with interconnection.

3.7.2 Minimize Future Reliance on Mobile Gensets for Base Load

Midgard notes that mobile gensets are not suitable for permanent base-load application, given their lower reliability than fixed diesel generating units, and recommends that Hydro not rely on mobile gensets as a planning resource for base load. Hydro accepts Midgard's recommendation, noting that following the construction of the regional diesel generating station, it would no longer rely on mobile gensets to supply base load in Charlottetown or Mary's Harbour. Customers previously served by the Charlottetown Diesel Generating Station are currently served by mobile gensets—a temporary configuration and interim solution due to an October 2019 fire that left the Charlottetown Diesel Generating Station inoperable.

3.7.3 Design Regional Diesel Generating Station for N-1 Reliability

Midgard analyzed the expected benefits of designing the regional diesel generating station to an N-2 standard rather than N-1, Hydro's standard redundancy criteria for diesel generating stations. Midgard

[14] "Southern Labrador Communities - Integrated Resource Plan," Midgard Consulting Inc., March 28, 2023,sec. 7.4, p. 85/3–10.

notes that, while N-2 provides marginal reliability benefits, it is Midgard's opinion that the marginal improvement in reliability does not merit the cost required to achieve this standard. Therefore, Midgard recommends that Hydro design the regional diesel generating station with N-1 redundancy, with reference to the suggestion that Hydro's mobile diesel unit fleet could be utilized to provide redundancy in the event of a unit failure at the regional diesel generating station.

Hydro has accepted Midgard's recommendations regarding generating unit redundancy and has revised the design of the regional diesel generating station to N-1 redundancy. Hydro decided to retain the regional diesel generating station footprint as originally proposed, with the additional engine bay available to establish N-2 redundancy if required. This approach ensures that the regional diesel generating station meets standard redundancy criteria while providing the option for N-2 redundancy if necessary in the future. Hydro will monitor the reliability of the interconnected system to determine if N-2 redundancy is required to ensure reliable service.

3.7.4 Support and Procure Incremental Low-Cost Renewable Energy

Midgard recommends that Hydro continue to support and procure incremental low-cost renewable energy through PPAs with community and Indigenous partners to offset diesel fuel usage therefore reducing emissions and costs. Midgard notes that Hydro's existing approach to PPA partnerships is likely to provide favourable economics for such community-led projects, made even more economically viable through newly announced federal programs.[15]

Hydro notes that Midgard's recommendations regarding the support and procurement of low-cost renewable energy is consistent with Hydro's current practices and has been successfully implemented on other isolated systems. Hydro is committed to continuing to work with its community and Indigenous partners to support the development of renewable energy sources and maximize the penetration of renewable energy on the interconnected system.

[15] "Budget 2023: A Made-in-Canada Plan: Strong Middle Class, Affordable Economy, Healthy Future," Government of Canada, March 28, 2023.

3.7.5 Consider a Deeper Study of Customer Demand Management

Midgard notes that while Hydro has availed of most of the opportunities to manage customer demand and incentivize energy efficiency, Hydro should continue to study opportunities for further customer demand management, such as the conversion of resistive electric heat to high-efficiency heat pumps.

Hydro notes that since 2021, it has implemented pilot programs assessing the viability of cold-climate heat pumps and shifted energy technology for demand management. These ongoing pilot programs will provide Hydro with the data to inform a decision regarding the broader implementation of the programs. Additionally, Hydro will continue to work with community stakeholders to explore the use of alternative fuels, such as wood heat, to offset electricity usage on isolated systems. Hydro is also exploring other DSM initiatives for future consideration, such as commercial energy audits.

3.7.6 Evaluate New Technologies

Midgard notes that while renewable energy technologies are not currently technically or economically feasible for the provision of firm capacity, Hydro should evaluate new technologies as diesel units come due for replacement.

Hydro has accepted this recommendation and will evaluate available technologies as diesel units come due for replacement. Hydro notes that the construction of the regional diesel generating station does not preclude it from availing of new technologies in the future.

4.0 Project Description

Following Hydro's review of the recommendations provided by Midgard, impacts to the project scope, cost estimate, and schedule provided in Hydro's Original Application are summarized in Table 2.

Table 2: Key Revisions between Original Application and Revised Application

Application	Interconnection	Redundancy	Cost ($ Millions)	Schedule Closeout
Original (2021)	Phased Approach	N-2	49.9 (Phase 1)	Fourth Quarter 2024 (Phase 1)
Revised (2023)	Full	N-1	86.4 (Full)	Third Quarter 2027 (Full)

4.1 Impact to Project Scope

4.1.1 Regional Diesel Generating Station

Hydro's Original Application for Phase 1 of its long-term supply plan for southern Labrador included the construction of a regional diesel generating station designed with N-2 redundancy. In Phase 1, Hydro proposed to equip this generating station with four diesel units and would have two additional engine bays—one for an additional unit to be installed in Phase 2 and the other to accommodate load growth. Hydro's acceptance of Midgard's recommendations has no net impact on the design of the regional diesel generating station.

The new regional diesel generating station will be constructed on land owned by Hydro adjacent to the existing diesel generating station in Port Hope Simpson. The site will contain a fuel storage area, powerhouse, switchyard, laydown area, septic system, water well, access roads, and a perimeter fence. The fuel storage area will include two 80,000 L and two 60,000 L double-walled horizontal tanks (total storage 280,000 L).[16] The powerhouse will be a single-story building of steel and concrete construction, with a mezzanine housing the control room, office, kitchenette, and washrooms. The ground floor will contain the engine hall, electrical/motor control center room, battery room, mechanical room, fire suppression room, and fuel storage room. The building will have fire and sound separations between the engine room, battery room, fuel storage room, and other areas; the building will mainly be heated by a heat recovery system from the generating units. The control room/office area and electrical/motor control center room will be cooled with split system air conditioning units and the engine room will be cooled with mechanical ventilation. An overhead crane will be located in the engine hall to support maintenance activities. Generating units will have remote radiators and exhaust stacks.

The 25 kV substation yard in Port Hope Simpson will include two 5 MVA 25 kV/4.16 kV transformers, oil containment, a wood pole structure supporting reclosers, motorized disconnect switches, a 25 kV tension bus, yard lighting, and a 300 kVA 25-0.6 kV station service transformer bank. Unit switchgear, remote unit protection and control panels, black start panel, uninterruptible power supply, battery chargers, and arc-rated motor control centers will be located within the electrical room. Power cables

[16] The two 60,000 L tanks are existing tanks that were recently installed at the Charlottetown Diesel Generating Station and will be relocated for use at Port Hope Simpson.

from the generating units to switchgear will be in floor trenches, will travel overhead from the switchgear to the exterior powerhouse wall, and will continue to each transformer in trenches.

While the scope change from N-2 to N-1 redundancy results in one less unit required for the regional diesel generating station, an additional unit is required for the immediate connection of all communities, which was originally planned for Phase 2. As a result, Hydro will maintain the initial design plan for the regional diesel generating station with six engine bays, to ensure sufficient footprint to accommodate future load growth, and to allow for N-2 redundancy if deemed necessary. While the provision of an extra engine bay to accommodate N-2 redundancy has an incremental cost of approximately $700,000, this is significantly less than the cost of expanding the building footprint in the event that an additional engine bay is required. Hydro notes that this additional footprint could also be utilized for equipment to support the integration of renewable energy or storage technologies in the future. The installed capacity for the regional diesel generating station will be approximately 6,300 kW, derived from four gensets of the following general sizes: (i) one 1,200 kW unit, (ii) one 1,500 kW unit, and (iii) two 1,800 kW units. This would translate into a firm capacity of 4,500 kW, which can accommodate the forecasted peak demand of all Southern Labrador Communities, as shown in Hydro's Original Application. Sizing of the gensets varied slightly since Hydro's Original Application based on updated information from Hydro's Long-Term Asset Planning group; however, this change does not account for a significant price increase.

4.1.2 Distribution Infrastructure

Hydro's Original Application included the construction of 53 kilometres of 25 kV distribution lines interconnecting the communities of Charlottetown, Pinsent's Arm, and Port Hope Simpson and 25 kV voltage conversion in those communities. There is no change to these proposed distribution lines. The 25 kV interconnection will include the construction of a new 25 kV distribution line, comprised of 477 aluminum-stranded conductors, along highway Routes 510 and 514 between Port Hope Simpson and Charlottetown. A short segment of 25 kV line will also be constructed to connect to the existing distribution system in Port Hope Simpson. In addition, a fibre optic line will be installed for communication purposes. Also included are 25 kV voltage conversions for the existing distribution systems in each community and the installation of a 200 A voltage regulator at the Charlottetown end of the 25 kV interconnection.

With Hydro's acceptance of Midgard's recommendation to advance the full interconnection of all communities, the project scope (originally planned for Phases 2 and 3) now also includes the construction of an additional 80 kilometres of 25 kV distribution lines interconnecting the communities of Mary's Harbour, Lodge Bay, and St. Lewis and 25 kV voltage conversion in those communities.

4.2 Impact to Project Cost Estimate

Hydro's Original Application sought approval of the construction of Phase 1 of its long-term supply plan for southern Labrador to be completed in 2024 at an estimated cost of $49.9 million. Since this time, escalation has resulted in an estimated cost increase for the original project scope of approximately $14.1 million. This cost increase is primarily due to inflationary pressures on the cost of labour and materials as well as increases in material lead times resulting in a longer project duration and interest period during construction.

The additional distribution infrastructure and the fourth genset associated with the advancement of the full interconnection of all Southern Labrador Communities results in a further cost increase of approximately $22.4 million, bringing the project total to $86.4 million, as outlined in Chart 1. Hydro's revised project estimate is provided in Table 3.

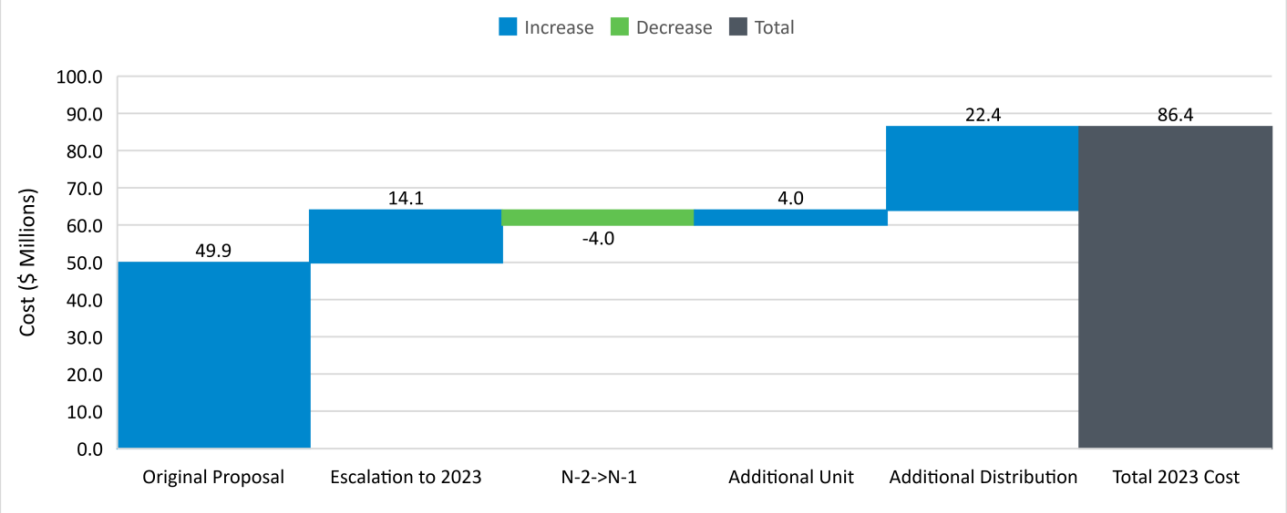

Chart 1: Cost Changes from 2021 Proposal to 2023

Table 3: Project Estimate ($000)[17]

Project Cost	Previous	2023	2024	2025	2026	2027	Total
Material Supply	0.0	2.1	1,728.3	15,700.4	13,065.7	1,042.4	31,538.7
Labour	0.0	1,053.7	1,868.9	1,959.3	702.7	414.0	5,998.5
Consultant	0.0	538.5	1,871.1	996.2	776.5	287.3	4,469.6
Contract Work	0.0	0.0	8,663.4	13,360.9	3,573.9	226.8	25,825.0
Other Direct Costs	0.0	73.0	1,161.6	2,232.0	606.2	119.5	4,192.3
Interest and Escalation	0.0	46.2	758.8	2,363.5	2,742.1	998.9	6,909.5
Contingency	0.0	121.2	1,759.6	3,504.0	1,860.5	215.2	7,460.5
Total	**0.0**	**1,834.7**	**17,811.7**	**40,116.3**	**23,327.4**	**3,304.1**	**86,394.2**

4.3 Revenue Requirement Impact

Hydro has forecasted the net impact of the selected alternative to its revenue requirement in comparison to the reconstruction of the Charlottetown Diesel Generating Station with continued operation as isolated systems. Compared to the isolated systems option, the interconnection of the Southern Labrador Communities is expected to generate an incremental revenue requirement increase of $2.3 million in 2030, due to higher upfront capital costs. As a result of decreased operating, maintenance, fuel, and sustaining capital costs, Hydro forecasts a reduction in net incremental revenue requirements of $1.1 million in 2035 and $6.2 million by 2050.[18] The incremental revenue requirement impacts for the interconnected system supplied by a regional diesel generating station compared to isolated systems served by individual plants are presented in Chart 2.

[17] Numbers may not add due to rounding.
[18] Hydro's insurance claim relating to the 2019 fire at the Charlottetown Diesel Generating Station is ongoing. Should this claim result in a payment to Hydro, such payment will be applied to reduce the revenue requirement associated with this project.

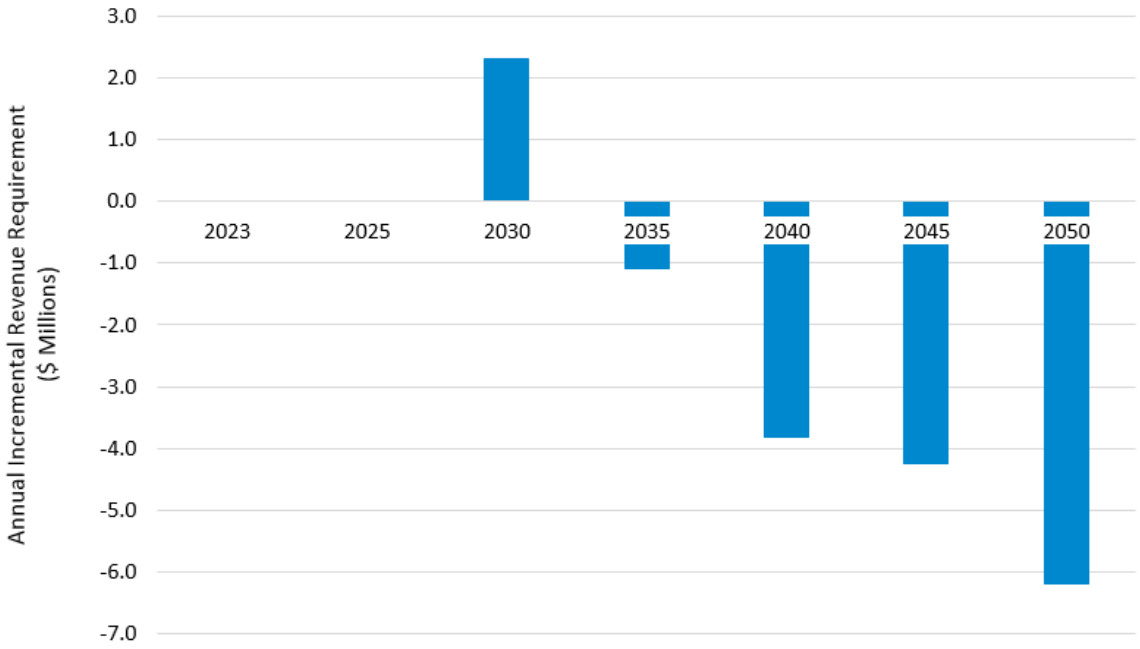

Chart 2: Incremental Revenue Requirements for Interconnection vs Isolated

Forecast rate impacts associated with changes in the incremental revenue requirements are presented in Table 4. The forecast is in comparison to the 2019 Test Year and assumes the incremental revenue requirements will be shared between Newfoundland Power Inc. and Rural Labrador Interconnected customers in the same proportion in which the rural deficit was allocated in the 2019 Cost of Service Study.[19]

Table 4: Forecast Incremental Rate Impacts (%)[20]

Impact on Revenue Requirement	2030	2035	2040	2045	2050
Newfoundland Power	0.3%	-0.2%	-0.6%	-0.6%	-0.9%
End Consumer[1]	0.2%	-0.1%	-0.4%	-0.4%	-0.6%
Labrador Interconnected	0.3%	-0.2%	-0.5%	-0.6%	-0.9%

[19] Newfoundland Power 96.1% and Rural Labrador Interconnected 3.9%.
[20] The forecast rate impact of the total project is approximately 1.5% for the end consumer on the Island Interconnect System and 2.0% for consumers on the Labrador Interconnected System. Assumes the average revenue to cost ratio for customers on the Labrador Isolated System in the 2019 Test Year is 24%, which represents their portion of costs recovered through rates.

The interconnection of the southern Labrador distribution systems and implementation of a regional diesel generating station is expected to facilitate the potential future integration and penetration of renewable energy versus an approach that features individual isolated systems. Should any such opportunities arise in the future, it is anticipated that such integration could produce further reduction in revenue requirements due to decreased fuel and maintenance costs.

4.4 Impact on Project Schedule

As a result of increased material lead times, the estimated duration of the project has increased from three to four years. Assuming project approval in the fall of 2023, Hydro estimates that the operation of the regional diesel generating station and full interconnection of all six communities will enter service in 2027.[21] Hydro understands the importance and urgency of this project and has therefore proposed an aggressive schedule for project execution. Hydro acknowledges that this schedule may be impacted by external factors, such as regulatory and environmental approval and equipment lead times; however, Hydro will make every reasonable effort to expedite project completion.

The anticipated project schedule is shown in Table 5.

Table 5: Project Schedule

Activity	Start Date	End Date
Planning:		
Front-end engineering and project approval	First Quarter 2020	Third Quarter 2023
Environmental assessment	Third Quarter 2023	Second Quarter 2024
Design:		
Detailed design of diesel generating station and distribution	Third Quarter 2023	Fourth Quarter 2024
Procurement:		
Major equipment and construction contracts	Third Quarter 2023	Second Quarter 2026
Construction:		
Regional diesel generating station and distribution	Second Quarter 2024	First Quarter 2027
Commissioning:		
Commissioning of equipment	Fourth Quarter 2026	Second Quarter 2027
Closeout:		
Contract and project closeout	Second Quarter 2027	Third Quarter 2027

[21] This schedule requires environmental approval by mid-2024. Hydro is investigating opportunities to initiate portions of the environmental assessment process as quickly as possible in order to meet this timeline.

5.0 Stakeholder Consultations

Following its receipt, Hydro shared the Midgard IRP with the Southern Labrador Communities and offered to meet to discuss the intended path forward. To date, Hydro has met with community representatives in Charlottetown and Pinsent's Arm as well as Mary's Harbour, Port Hope Simpson, and St. Lewis; the NunatuKavut Community Council ("NCC"); the Minister of Labrador Affairs; the Minister Responsible for Indigenous Affairs and Reconciliation; and the Member of the House of Assembly for the region. Hydro will continue to inform and consult with these stakeholders throughout the approval and execution process. Hydro is also committed to working with the NCC to ensure Hydro has met its Duty to Consult. Hydro has met with the NCC over the course of the regulatory process to share information. During these meetings, the NCC has expressed that they will not support the application based on the information provided and discussions to date.

Hydro will consult with the NCC as part of the Environmental Assessment process to address its stated concerns. These concerns include the integration of renewable sources in southern Labrador to ensure that the solution is environmentally responsible, as well as commercial considerations for the NCC relating to construction, ownership, and benefits associated with Hydro projects such as the proposed Southern Labrador Interconnection. Hydro is committed to working with the NCC to enable them to develop and maximize renewable sources of supply in southern Labrador. Hydro is also committed to supporting the advancement of NCC initiatives that align with Hydro's mandate to provide power at the lowest possible cost, in an environmentally responsible manner, consistent with reliable service.

Hydro notes that a number of other towns have expressed opposition to the use of diesel generation and would prefer solutions involving a transmission interconnection. Customers in these communities are concerned with isolated rates that are prohibitive to electricity-based home heating. They also expressed frustration that Island customers can avail of renewable generation from Labrador but they do not have this option. Further, they presented perspectives that a transmission interconnection would be the preferred solution from an environmental standpoint.

Both Hydro and Midgard have assessed the use of renewable energy sources for the provision of firm capacity on isolated systems and have each concluded that transmission connections to interconnected systems do not meet the criteria of least cost. Additionally, due to the distance (over 400 kilometres) of the line required to interconnect the Southern Labrador Communities with the Labrador Interconnected System, backup generation would be required in the form of diesel generation. Finally, renewable

energy resources with Battery Energy Storage Systems are technically and economically prohibitive and are expected to remain so for the foreseeable future. The use of diesel generation remains the only viable solution that is consistent with Hydro's legislated mandate. Full regional interconnection enables Hydro to ensure that power is being provided in an environmentally responsible manner in addition to least-cost, reliable service. While the regional diesel generating station and the firm capacity it provides is necessary to ensure reliable service for the region, Hydro is fully committed to fostering and supporting the development of renewable energy projects in the region to enable a reduction in diesel fuel usage in partnership with its community and Indigenous partners.

6.0 Conclusion

In July 2021, Hydro proposed Phase 1 of its long-term supply plan for southern Labrador, which included the construction of a regional diesel generating station and the interconnection of the communities of Charlottetown, Pinsent's Arm, and Port Hope Simpson, with the interconnection of Mary's Harbour (including Lodge Bay, which is served on the Mary's Harbour Distribution System) and St. Lewis to follow in Phases 2 and 3, respectively. In response to the Board's direction for Hydro to provide additional information and analysis to supplement the information that has been filed and engage an independent expert to assist in the analysis, Hydro selected Midgard to complete an independent assessment of Hydro's plan and develop an integrated resource plan for the region. The Midgard IRP recommended that Hydro proceed with its plan to construct a regional diesel generating station, albeit with scope changes to design with N-1 redundancy and advancement of the interconnection of Mary's Harbour and St. Lewis. Hydro has accepted Midgard's recommendations and has revised its project scope, estimated cost, and schedule accordingly to reflect the passage of time since its Original Application and its support of Midgard's recommendations.

Hydro believes its revised proposal to construct a regional diesel generating station and interconnect the Southern Labrador Communities meets Hydro's mandate to provide power at the lowest possible cost, in an environmentally responsible manner, consistent with reliable service.