

September 17, 2021

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

Attention: Ms. Cheryl Blundon
Director of Corporate Services & Board Secretary

Dear Ms. Blundon:

Re: 2022 Capital Budget Application

Please find enclosed nine copies and one original of Revision 1 of Newfoundland and Labrador Hydro's ("Hydro") 2022 Capital Budget Application ("Application").

Following submission of the Application on August 2, 2021, Hydro became aware of the following items requiring correction which are provided in Revision 1 of the Application:

- Hydro's planned specifically assigned expenditures for 2022–2026 (Volume 1, Schedule 1: 2022 Capital Projects Overview Table 1 at p. 19); and
- Hydro's 2023 revenue requirement impact resulting from proposed 2022 projects (Volume 1, Schedule 1: 2022 Capital Projects Overview at p. 20).

The Application will be posted on Hydro's website at www.nlhydro.com in the coming days.

Hydro trusts that you will find the enclosed to be in order and satisfactory. Should you have any questions or comments about any of the enclosed, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO



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

Encl.

cc: **Newfoundland Power**
Dominic J. Foley

Consumer Advocate

Dennis M. Browne, Q.C., Browne Fitzgerald Morgan & Avis

Industrial Customer Group

Paul L. Coxworthy, Stewart McKelvey

ecc: **Board of Commissioners of Public Utilities**

Jacqui H. Glynn
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Consumer Advocate

Stephen F. Fitzgerald, Browne Fitzgerald Morgan & Avis
Sarah G. Fitzgerald, Browne Fitzgerald Morgan & Avis
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Bernard M. Coffey, Q.C.

Industrial Customer Group

Denis J. Fleming, Cox & Palmer
Dean A. Porter, Poole Althouse

Labrador Interconnected Group

Senwung F. Luk, Olthuis Kleer Townshend LLP
Julia K.G. Brown, Olthuis Kleer Townshend LLP

Revision History

Revision	Date	Location	Reason
1	17-Sep-21	Vol I. Sch. 1, Table 1, at p. 19	Planned specifically assigned expenditures for Tacora, North Atlantic Refinery Limited, and Marathon Gold were erroneously omitted. Table revised to include planned specifically assigned expenditures for these customers.
1	17-Sep-21	Vol I. Sch. 1, at p. 20/5 and 6	2023 revenue requirement impacts were erroneously calculated. Corrected 2023 revenue requirements.



2022 Capital Budget Application

Original Submission: July 31, 2021

Revision 1: September 17, 2021



An application to the Board of Commissioners of Public Utilities

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IN THE MATTER OF the *Public Utilities Act*, RSNL 1990, (“*Act*”); and

IN THE MATTER OF an application by Newfoundland and Labrador Hydro (“*Hydro*”) for an Order approving: (i) its 2022 capital budget pursuant to Section 41(1) of the *Act*, (ii) its 2022 capital purchases and construction projects in excess of \$50,000 pursuant to Section 41(3)(a) of the *Act*, and (iii) for an Order pursuant to Section 78 of the *Act* fixing and determining its average rate base for 2020.

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*, is a public utility within the meaning of the *Act* and is subject to the provisions of the *Electrical Power Control Act, 1994*.

B. Application

2. All information in this application is prepared in accordance with the guidelines and conditions outlined in Order No. P.U. 7(2002–2003), the Capital Budget Application Guidelines issued October 29, 2007, and the Board’s correspondence dated February 18, 2021 which confirmed the interim requirements implemented for the 2021 Capital Budget Application would remain in place for the 2022 Capital Budget Application.
3. Volume I to this application contains Schedules 1 to 5, including the 2022 Capital Budget Overview, Five-Year Capital Plan (2022–2026), Holyrood Thermal Generating Station Overview – Future Operation and Capital Expenditure Requirements, 2021 Capital Expenditures Overview, and 2020 Average Rate Base.

4. Schedule 1 to this application provides an overview and necessary supporting information for Hydro's 2022 Capital Budget Application request of amount of \$84.7 million. This amount includes projects newly proposed for 2022, expenditures for 2022 related to previously-approved projects, and estimated distribution upgrades and service extensions of approximately \$0.3 million for which Hydro anticipates requesting contributions in aid of construction from customers. All contributions to be recovered from customers shall be calculated in accordance with the relevant policies as approved by the Board.
5. The 2022 Capital Budget Application request for approval does not include other planned 2022 expenditures related to supplemental applications currently before the Board or anticipated to be filed with the Board in 2022.
6. Schedule 1: 2022 Capital Budget Overview provides:
 - (i) An overview of Hydro's capital investment strategy and the capital budget proposed for 2022;
 - (ii) Confirmation that no new leases in excess of \$5,000 per year are proposed for 2022;
 - (iii) A summary of the revenue requirement impact of Hydro's proposed 2022 Capital Budget Application;
 - (iv) Hydro's 2022 Capital Budget financial schedules with projects listed by asset class (Appendix A) and single- and multi-year projects (Appendix B); and
 - (v) A list of the proposed 2022 construction projects and capital purchases segmented by materiality (Appendices C, D, and E).
7. Schedule 2: Five-Year Capital Plan (2022–2026) provides an overview of Hydro's investment strategy and associated planned capital work for the period 2022–2026, as well as a summary of Hydro's actual and projected capital expenditures for the period 2017–2026 (Appendix B).
8. Schedule 3: Holyrood Thermal Generating Station Overview – Future Operation and Capital Expenditure Requirements provides an overview of future operating and capital requirements for the Holyrood Thermal Generating Station, as well as the Ten-Year Operating and Maintenance Plan.

9. Schedule 4: 2021 Capital Expenditures Overview summarizes 2021 capital expenditures year-to-date June 30, 2021 and provides explanations for reportable variances between the approved budget and the forecasted total budget.
10. Schedule 5: 2020 Average Rate Base sets out Hydro's proposed 2020 rate base of \$2,310,559,000.
11. Volume II to this application contains Schedules 6 to 8. These Schedules contain evidentiary information to support the proposed 2022 construction projects and capital purchases segmented by materiality, i.e., over \$50,000 but less than \$200,000 (Schedule 6), over \$200,000 but less than \$500,000 (Schedule 7), and over \$500,000 (Schedule 8).

C. Reason for Approval

12. The proposed capital expenditures for 2022 as set out in this application are required to allow Hydro to continue to provide to its customers service and facilities which are reasonably safe, adequate and reliable as required by Section 37 of the *Act*.

D. Newfoundland and Labrador Hydro's Request

13. Hydro requests that the Board make an Order as follows:
 - (i) Approving \$84,714,000 of Hydro's 2022 capital budget as set out in Appendix A of Schedule 1, 2022 Capital Budget Overview, pursuant to Section 41(1) of the *Act*;
 - (ii) Approving Hydro's 2022 capital purchases and construction projects in excess of \$50,000 as set out in Appendices C, D, and E to Schedule 1, 2022 Capital Budget Overview, pursuant to Section 41(3) of the *Act*; and
 - (iii) Fixing and determining Hydro's average rate base for 2020 in the amount of \$2,310,559,000 as set out in Schedule 5, pursuant to Section 78 of the *Act*.

E. Communications

14. 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 July 2021.

NEWFOUNDLAND AND LABRADOR HYDRO



Shirley A. Walsh
Counsel for the Applicant
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Affidavit

IN THE MATTER OF the *Public Utilities Act*, RSNL 1990, ("*Act*"); and

IN THE MATTER OF an application by Newfoundland and Labrador Hydro ("*Hydro*") for an Order approving: (i) its 2022 capital budget pursuant to Section 41(1) of the *Act*, (ii) its 2022 capital purchases and construction projects in excess of \$50,000 pursuant to Section 41(3)(a) of the *Act*, and (iii) for an Order pursuant to Section 78 of the *Act* fixing and determining its average rate base for 2020.

AFFIDAVIT

I, Robert Collett, of St. John's in the Province of Newfoundland and Labrador, make oath and say as follows:

1. I am Vice President, Engineering & Technology for Newfoundland and Labrador Hydro, the applicant named in the attached application.
2. I have read and understand the foregoing application.
3. To the best of my knowledge, information, and belief, all of the matters, facts, and things set out in this application are true.

SWORN at St. John's in the)
Province of Newfoundland and)
Labrador this 31st day of July)
2021, before me:)



Barrister – Newfoundland and Labrador



Robert Collett, P. Eng.



2022 Capital Budget Application

2022 Capital Budget Overview

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1.0 Introduction

Newfoundland and Labrador Hydro's ("Hydro") capital investment philosophy is founded in its obligation to invest responsibly in the electrical system to the benefit of its customers. Hydro is committed to investing in capital in a manner which meets its obligation to provide reliable service at the lowest possible cost.¹ In its aim to balance the provision of reliable service with cost management, Hydro focuses on sound utility asset management practices, condition-based investments (versus age-based investments) where appropriate, and operational and system requirements. Hydro also seeks to engage with stakeholders and customers to inform its capital investment considerations.

Hydro has applied these practices, particularly in recent years, to work toward reduced investment to the minimum capital level prudent so as to not compromise customer reliability, safety, or the environment. Hydro also continues to refine its budgeting and integrated planning processes to support the efficient execution of its capital plans.

Hydro's 2022 Capital Budget Application ("CBA") requests approval for \$84.7 million of capital investment, of which approximately 51% relates to continuation of projects that were previously approved to commence prior to 2022 and approximately 49% relates to new projects. Recognizing other investment requirements for 2022,² Hydro has taken deliberate actions to achieve a lower level of requested investment in its 2022 application, as compared to prior years; further detail on Hydro's efforts to manage its capital spend is included in Section 3.2 of this report.

As outlined in the Five-Year Capital Plan (2022–2026), the total planned 2022 capital spend to be recovered through customer rates is \$102.9 million; this amount does not include the \$12.3 million in fully contributed transmission capital related to the specifically assigned assets for the Valentine Gold Interconnection project,³ and \$1.5 million in fully contributed terminal station asset renewal expenditures specifically assigned to the Iron Ore Company of Canada ("IOC") which is proposed within the Terminal Station Refurbishment and Modernization (2022–2023) project in the 2022 CBA.

¹ In accordance with the *Hydro Corporation Act, 2007*; the *Electrical Power Control Act, 1994*; and the *Public Utilities Act, RSNL 1990*.

² Such as the "Long-Term Supply for Southern Labrador – Phase 1," Newfoundland and Labrador Hydro, July 16, 2021; "Application for Purchase of a Diesel Generating Unit – Ramea," Newfoundland and Labrador Hydro, July 28, 2021; and capital related to phase 1 of the Bay D'Espoir Penstocks Life Extension anticipated to be filed in early 2022.

³ "Valentine Gold Interconnection," Newfoundland and Labrador Hydro, June 29, 2021.

This 2022 Capital Budget Overview report generally discusses the Capital Plan proposed for 2022, which is primarily driven by the following:

- Refurbishment required to support the reliable operation of aging assets;⁴
- Extension of the service life of the Holyrood Thermal Generating Station (“Holyrood TGS”);⁵
- Accommodation of load growth in Labrador West; and
- Legislative compliance (i.e., safety and environmental).

Appendices A through E of this report provide schedules which present Hydro’s 2022 Capital Budget of \$84.7 million by asset class, single- and multi-year projects, and by project materiality. Appendix F provides a listing of projects and associated definition, classification, and investment classification.

2.0 2021 Capital Plan Execution

Throughout 2021, Hydro’s Business Continuity Plans have remained in effect in response to the continuing COVID-19 pandemic.⁶ The execution of Hydro’s 2021 Capital Plan has been impacted by supply chain disruptions and travel restrictions on external consultants/technicians; however, the overall impact is anticipated to be minimal with the majority of capital projects expected to be completed prior to year-end. Hydro is closely monitoring the execution of its 2021 Capital Plan and, similar to 2020, is prioritizing projects that are required to ensure reliable service for the 2021–2022 winter operating season. Consistent with prior years, capital projects approved in Hydro’s 2021 CBA but not completed in 2021 will be carried over into 2022. Such projects will be reflected in Hydro’s 2021 Capital Expenditures and Carryover Report.⁷

Schedule 4 of the 2022 CBA contains the 2021 Capital Expenditures Overview Report as of June 30, 2021, which details forecast expenditures and variances.

⁴ The majority of Hydro’s installed assets, including the hydroelectric installation at Bay d’Espoir, the Holyrood Thermal Generating Station, the Stephenville Gas Turbine, the Hardwoods Gas Turbine, and much of Hydro’s transmission and distribution systems, are more than 40–50 years old.

⁵ “The Liberty Consulting Group Eighth Quarterly Monitoring Report on the Integration of Power Supply Facilities to the Island Interconnected System – Monthly Update,” Newfoundland and Labrador Hydro, September 28, 2020.

⁶ Hydro’s Pandemic Plan and Business Continuity Plan were implemented in the first quarter of 2020.

⁷ Due to be filed with the Board on March 1, 2022.

3.0 2022 Plan Considerations

3.1 Project Evaluation

3.1.1 Project Deferral

Prior to proposing capital projects for inclusion in the CBA, consideration is given to whether the investment can be deferred in light of the condition of the asset and its criticality to the system. Where deferral of a project is determined to be low risk, deferral is selected in an effort to balance the cost impact to customers with level of reliability required.

A number of the capital projects proposed are required to address safety concerns or to comply with regulatory and legislative requirements; therefore, deferral is not appropriate. For example, federal legislation requires polychlorinated biphenyls (“PCB”) within Hydro’s transformers to be removed by 2025.⁸ To defer such projects to future years would place Hydro behind schedule and at risk of not meeting legislative requirements. Additionally, deferral is not appropriate for projects that are required due to load growth as it would compromise Hydro’s ability to meet its peak load requirements and ensure reliable service (e.g., Mary’s Harbour Voltage Conversion and Service Conductor Upgrades projects in the 2022 CBA).

As part of its assessment of alternatives, Hydro considered deferral for each project contained in the 2022 CBA and has documented in the specific project proposals the reason(s) for deferral not being the preferred option.

3.1.2 Project Proposals

Maintaining Hydro’s systems in reliable operating condition requires planned maintenance, rehabilitation of existing assets, and replacement of assets that have reached the end of their useful lives. Replacement of assets may also occur to reduce life cycle costs, improve operational characteristics, increase capacity for load growth, address violations of reliability criteria, improve productivity, and/or increase efficiency.

⁸ The *Canadian Environmental Protection Act, 1999* PCB Regulations (SOR/2008-273) prohibits the release of PCBs in the environment.

In determining whether a capital proposal is appropriate, Hydro gives consideration to:

- System performance and reliability criteria;
- Hydro's long-term asset management strategy;
- Regulatory and legislative compliance;
- Load growth and system planning criteria;
- Hydro's experience with the assets, including the condition and performance of the assets;
- Ongoing operating and maintenance costs;
- Opportunities for cost efficiencies; and
- Changes to operating conditions.

For those projects that relate to replacement of assets, Hydro bases such decisions on three broad categories of replacement criteria, as follows:

- 1) Time and Condition Based: hours of operation and condition, for example, diesel generators (100,000 hours of operation for 1,800 rpm units) and vehicles (combination of years and operating hours for some classes);
- 2) Condition Based: in-situ condition of the assets, for example, decay in transmission line wood poles; and
- 3) Technical Assessment Based: an evaluation of reliability, performance, condition, costs, and other factors, such as the inspection of fuel tanks and subsequent upgrade where required.

3.2 Reassessment of Planned Capital Expenditures

Prior to filing the 2020 CBA in 2019,⁹ Hydro renewed its commitment to invest prudently and manage costs within the capital budgeting process. Hydro realigned projects based on the condition of the assets, enabling adjustment to the time frames associated with project execution such that, in some instances, projects are proposed to be completed at later times than previously assessed. The result is a better balancing of capital investment with customer expectations for cost management and reliability. This investment philosophy continues to be reflected in the 2022 CBA.

⁹ "2020 Capital Budget Application," Newfoundland and Labrador Hydro, August 1, 2019.

Hydro has taken additional steps in preparing its 2022 CBA to balance the level of capital investment requested in light of other requests either currently before the Board of Commissioners of Public Utilities (“Board”) or anticipated in 2022; these include:

- A thorough review of its previously approved multi-year projects to identify opportunities for budget refinement. As a result of this review, prior-year, multi-year projects with expenditures in 2022 were reduced by \$6.9 million; \$0.9 million of this reduction has been reforecast to 2023 while the remainder has been eliminated from the budget. Appendix G contains a list of the projects and revised budgets;
- A reduction in investment levels for 2022 related to light-duty vehicles, roads, and buildings to allow for a more thorough review of required investments in these areas. Hydro anticipates a return to more normal levels of expenditures in these areas in its 2023 CBA following its internal review.

4.0 2022 Capital Budget

The 2022 capital budget contains 73 projects, 56 of which are new projects,¹⁰ as outlined in Appendix A. The total planned capital expenditure for which Hydro is seeking approval in its 2022 CBA, including new and previously-approved projects, is \$84.7 million.¹¹ Hydro’s total planned 2022 capital spend to be recovered through customer rates is \$102.9 million which includes the Long-Term Supply Solution for Southern Labrador – Phase 1 project (\$15.8 million in 2022),¹² Purchase of a Diesel Generating Unit for Ramea project (\$2.0 million in 2022),¹³ and phase 1 of the Bay d’Espoir Penstock Life Extension project (\$1.9 million in 2022),¹⁴ this amount does not include \$12.3 million in fully contributed transmission capital related to the specifically assigned assets for the Valentine Gold Interconnection project,¹⁵ and \$1.5 million in fully contributed terminal station asset renewal expenditures specifically assigned to the

¹⁰ Including projects less than \$50,000.

¹¹ The 2022 CBA also includes 2022 front end engineering and design expenditures, which is necessary to support the development of proposals, on a number of projects. Hydro will not capitalize such costs related to a project if the project does not receive Board approval.

¹² “Long-Term Supply for Southern Labrador – Phase 1,” Newfoundland and Labrador Hydro, on July 16, 2021.

¹³ “Purchase of a Diesel Generating Unit – Ramea” Newfoundland and Labrador Hydro, on July 28, 2021.

¹⁴ Anticipated to be filed with the Board in early 2022, upon completion of analysis and front-end engineering design work. Hydro outlined the steps to developing a Life Extension Plan in its correspondence “2019 Failure of Bay d’Espoir Penstock 1 and Plan Regarding Penstock Life Extension,” Newfoundland and Labrador Hydro, June 3, 2020.

¹⁵ “Valentine Gold Interconnection,” Newfoundland and Labrador Hydro, June 29, 2021.

1 IOC. Hydro's total planned 2022 capital expenditures are reflected in the five-year plan included in this
2 CBA.

3 Figure 1 shows the 2022 Capital Budget Summary by major area. The majority of 2022 expenditures are
4 in the area of transmission and rural operations, primarily a reflection of projects to accommodate load
5 growth and reliable operation in Labrador West and upgrades for the future retirement of the
6 Stephenville Gas Turbine, in addition to the continuation of Hydro's asset renewal programs. As noted in
7 Section 3.2, General Properties expenditures have been reduced in 2022 as Hydro completes a review of
8 light-duty vehicle investments which are contained in category.

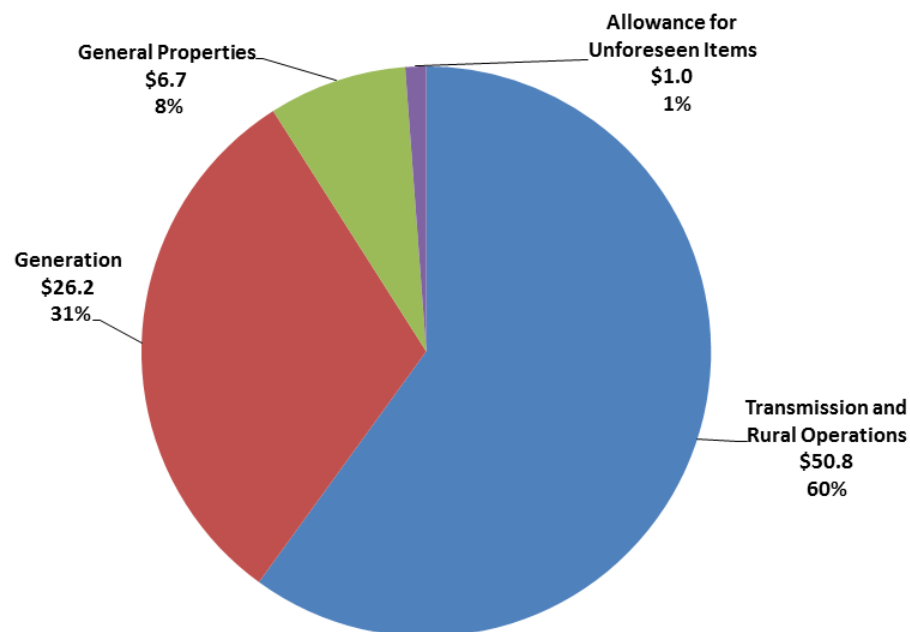


Figure 1: 2022 Capital Budget Summary (\$ millions)

9 In 2020, the Board commissioned Midgard Consulting Incorporated ("Midgard") to review and provide
10 recommendations for the revision of the Capital Budget Application Guidelines. In its report,¹⁶ Midgard
11 recommended segmentation of capital projects by investment classification to allow for identification of
12 the primary drivers for capital investment. While consideration of proposed changes to the Capital

¹⁶ "Newfoundland and Labrador Board of Commissioners of Public Utilities – Capital Budget Application – Guideline Review," Midgard Consulting Incorporated, revised October 29, 2020 (originally filed August 26, 2020).

Budget Application Guidelines is still ongoing, Hydro has included a segmentation of its capital projects according to the categories identified by Midgard.

Figure 2 shows the 2022 Capital Budget Summary by investment classification. The majority of Hydro's expenditures relate to asset renewal, reflective of both the age of Hydro's assets as well as the mix of asset type, and system growth investment which is primarily related to substation and terminal station investment in Labrador West.

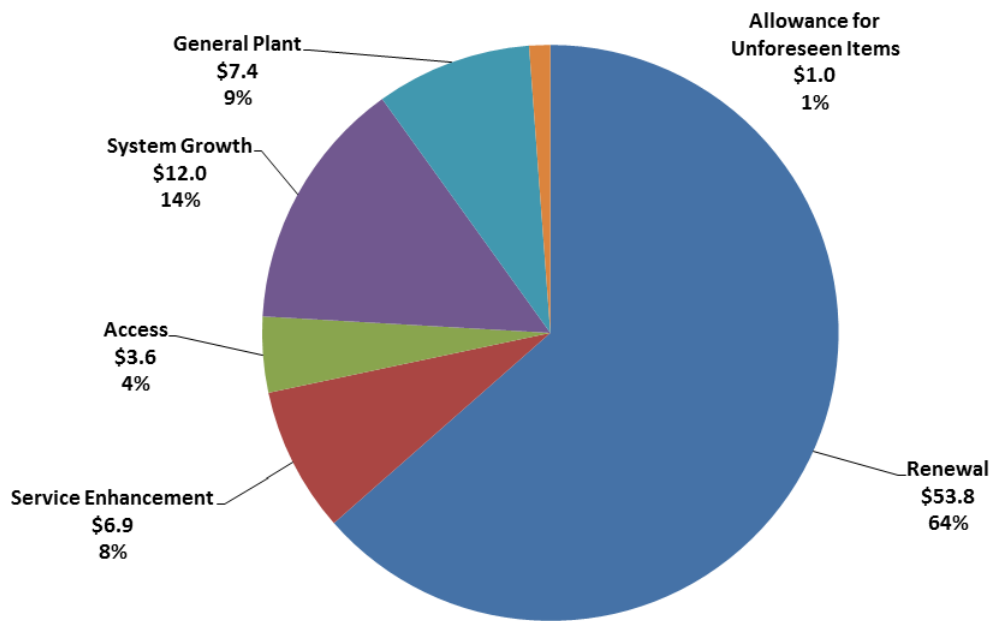


Figure 2: 2022 Capital Budget Summary by Investment Classification (\$ millions)

4.1 Generation

Throughout the province, Hydro provides electricity through a mix of hydroelectric, thermal, and gas turbine generation as well as power purchases. The planned generation expenditures of \$26.2 million account for 31% of Hydro's overall 2022 CBA. Further detail on the generation expenditures breakdown is shown in Figure 3 and the five-year¹⁷ historical average capital expenditures for generation are shown in Figure 4.

¹⁷ 2016–2020.

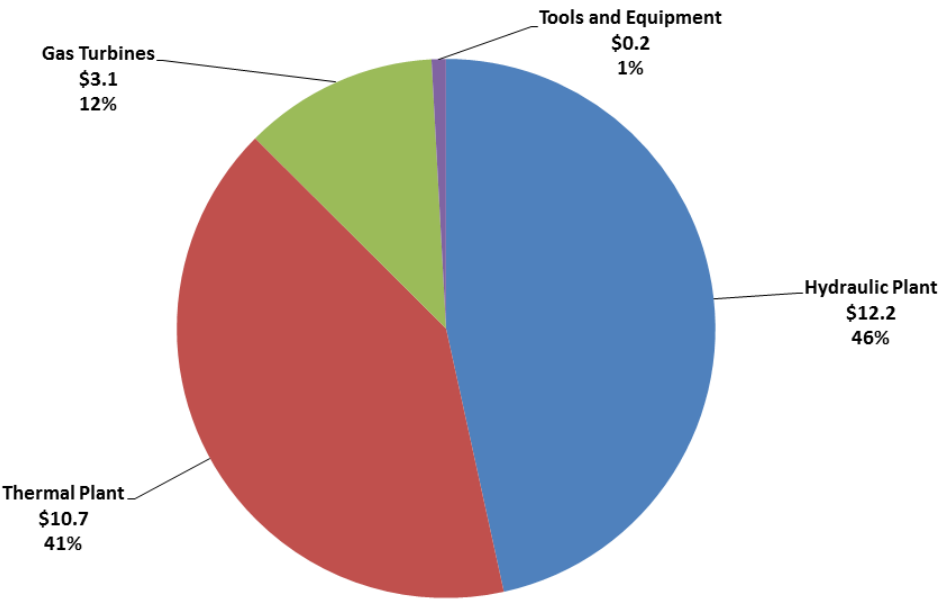


Figure 3: 2022 Capital Budget for Generation (\$ millions)

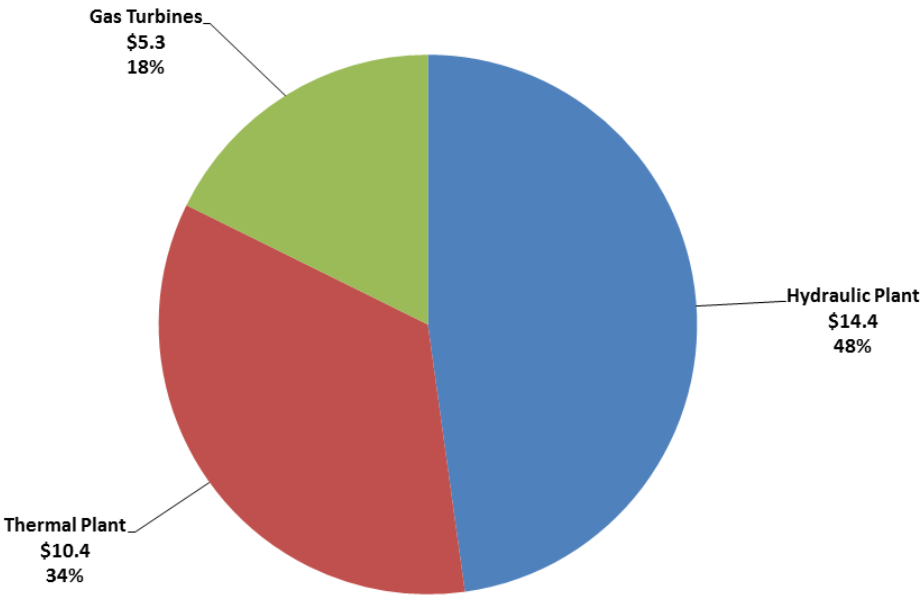


Figure 4: Five-Year Historical Average Capital Expenditures for Generation (2016–2020) (\$ millions)

4.1.1 Hydraulic Plant

The planned 2022 capital expenditures for hydraulic plant (\$12.2 million) has decreased compared to the average over the past five years (\$14.4 million).

The decrease in hydraulic plant expenditures relative to the 2016–2020 five-year average is primarily due to the inclusion of major refurbishment work in the five-year average, including major overhauls of Bay d’Espoir Units 1–6, refurbishment of the Bay d’Espoir Unit 7 turbine, and the refurbishment of the Hinds Lake Unit 1 rotor. Hydro’s 2022 hydraulic capital expenditures are less than that reflected in the 2021 CBA five-year plan (2021–2025) primarily due to the deferral of the refurbishment of the Bay d’Espoir intake structures to align with future major outages.¹⁸

Included in the 2022 CBA is \$5.0 million related to year two of the 2021–2022 Hydraulic Generation Refurbishment and Modernization project originally approved in the 2021 CBA and \$3.0 million related to year one of the new 2022–2023 Hydraulic Generation Refurbishment and Modernization project. The 2022 CBA also includes \$1.0 million for Hydraulic Generation In-Service Failures and \$3.2 million for year two of the four-year project to refurbish the Ebbegunbaeg Control Structure.

Hydro is currently assessing the life extension requirements of the Bay d’Espoir Penstocks.¹⁹ Following completion of Hydro’s analysis and front-end engineering design work, Hydro will confirm the timing and magnitude of work required and present an application outlining the proposed project strategy and cost to the Board for review and approval. Hydro expects to file a supplemental application for approval of this work to the Board in 2022.

4.1.2 Holyrood Thermal Plant

2022 planned capital expenditures for the Holyrood TGS (\$10.7 million) has marginally increased compared to the five-year²⁰ historical average (\$10.4 million) and has increased relative to that which was reflected for 2022 in the prior year five-year²¹ capital plan (\$5.5 million).

¹⁸ As outlined in “Cancellation of Previously Approved Capital Projects at Bay d’Espoir,” Newfoundland and Labrador Hydro, February 26, 2021.

¹⁹ As communicated to the Board in correspondence dated June 3, 2020.

²⁰ 2016–2020.

²¹ 2021–2025.

The increase in proposed expenditure for 2022 is primarily related to the inclusion of projects required to support the continued reliable operation of the Holyrood TGS as a generating facility until March 31, 2023.²² As Hydro had previously planned to retire the Holyrood TGS as a generating facility on March 31, 2022 and lower levels of production were anticipated during 2020 and 2021, this work was not reflected in the 2021 CBA. Hydro committed to the extension to support the provision of safe, reliable service for customers while the Muskrat Falls Project assets are brought online and proven reliable. As such, in its 2022 CBA, Hydro is proposing \$7.1 million in steam generation-related projects which include an overhaul of Holyrood TGS Unit 3 turbine valves (\$3.6 million), a boiler condition assessment and miscellaneous upgrades program (\$3.0 million), and major pumps overhaul (\$0.5 million). In addition, planned 2022 capital expenditures include \$3.6 million in expenditures associated with the continued operation of the Holyrood TGS as a synchronous condenser, and thermal in-service failures. Based on the age and condition of the Holyrood TGS assets, as well as Hydro's historical experience with these assets, the proposed projects are required to support the extension of the Holyrood TGS as a reliable generating facility.

Further information related to the current operational outlook and schedule for the Holyrood TGS, Hydro's maintenance strategy for this facility, 2022 projects proposed related to the Holyrood TGS, and the 2022–2026 capital expenditure outlook is provided in the Holyrood Thermal Generating Station Overview – Future Operation and Capital Expenditure Requirements.²³

4.1.3 Gas Turbines

2022 planned capital expenditures for gas turbines (\$3.1 million) has decreased compared to the five-year²⁴ historical average (\$5.3 million) and is consistent with the 2022 amount reflected in the prior year five-year²⁵ capital plan (\$3.3 million).

The decrease in expenditures relative to the prior year five-year capital plan is primarily driven by higher five-year average costs due primarily to the inclusion of major work at the Holyrood Combustion Turbine, including the Increase Fuel and Water Treatment System Capacity project and Turbine Hot Gas Path Inspection and Overhaul project.

²² "The Liberty Consulting Group Eighth Quarterly Monitoring Report on the Integration of Power Supply Facilities to the Island Interconnected System – Monthly Update," Newfoundland and Labrador Hydro, September 28, 2020.

²³ "2022 Capital Budget Application," Newfoundland and Labrador Hydro, August 2, 2021, vol. I, sch. 3.

²⁴ 2016–2020.

²⁵ 2021–2025.

Planned expenditures in 2022 include four projects for the Happy Valley Gas Turbine: installation of infrared scanning ports (\$0.04 million); replacement of fuel oil, lube oil, and glycol pumps (approved in the 2021 CBA, \$0.2 million in 2022); replacement of the voltage regulator (approved in the 2021 CBA, \$0.2 million in 2022); and compressed air system upgrades (approved in the 2021 CBA, \$0.07 million in 2022).

Planned expenditures in 2022 also include two projects for the Holyrood Combustion Turbine: combustor inspection (approved in the 2020 CBA, \$2.4 million in 2022) and replacement of control systems (\$0.1 million).

There are no proposed capital projects for either the Hardwoods or Stephenville Gas Turbines in the 2022 CBA or in the five-year capital plan; Hydro plans to retire both of these units in 2023.

4.2 Transmission and Rural Operations

Hydro owns and operates 23 diesel generating stations²⁶ throughout Newfoundland and Labrador, 18 of which are isolated rural diesel generating stations. Hydro owns and operates approximately 4,400 kilometres of transmission lines and 69 high voltage terminal stations at voltage classes of 230, 138, and 69/66 kV. In addition, Hydro owns and operates approximately 3,400 kilometres of distribution lines, principally in rural Newfoundland and Labrador.

Expenditures related to Transmission and Rural Operations (“TRO”) account for 60% of overall planned capital expenditures for 2022, totaling \$51 million. Hydro’s level of planned 2022 TRO expenditures are primarily driven by terminal station projects to accommodate load growth in Labrador West and for upgrades for the future retirement of the Stephenville Gas Turbine, in addition to the continuation of Hydro’s Terminal Station Refurbishment and Modernization and Upgrade Circuit Breaker Programs. Although not materially impacting Hydro’s 2022 capital expenditures, Hydro is also proposing a multi-year metering system replacement project to improve service quality, provide operating cost savings, and ensure Hydro is meeting its obligation to provide accurate billing. Figure 5 shows the division of the 2022 Capital Budget for TRO and Figure 6 provides the five-year²⁷ historical average expenditures for this area.

²⁶ Including Natuashish, which Hydro operates but does not own.

²⁷ 2016–2020.

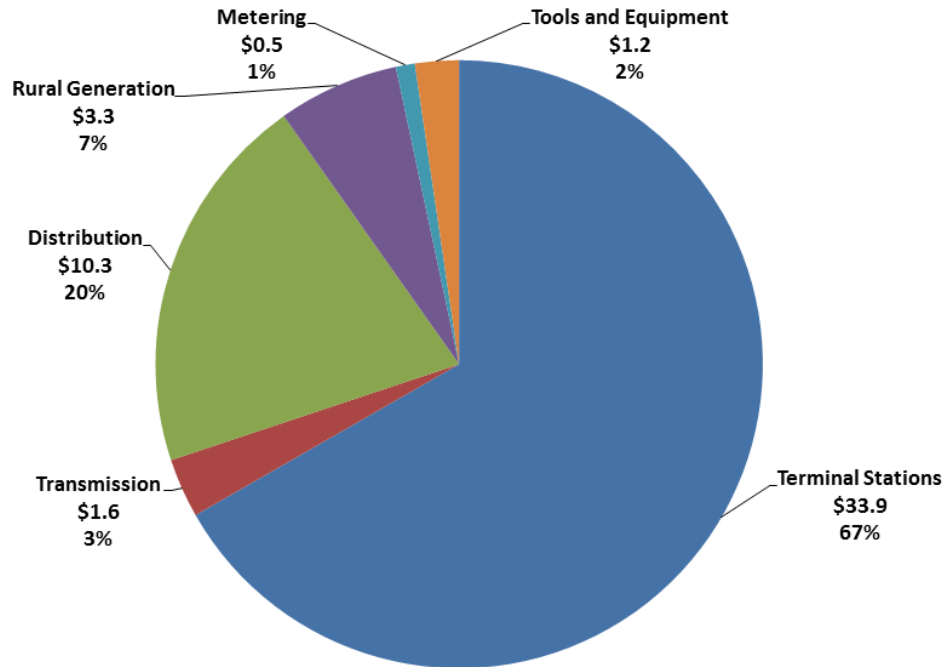


Figure 5: 2022 Capital Budget for Transmission and Rural Operations (\$ millions)

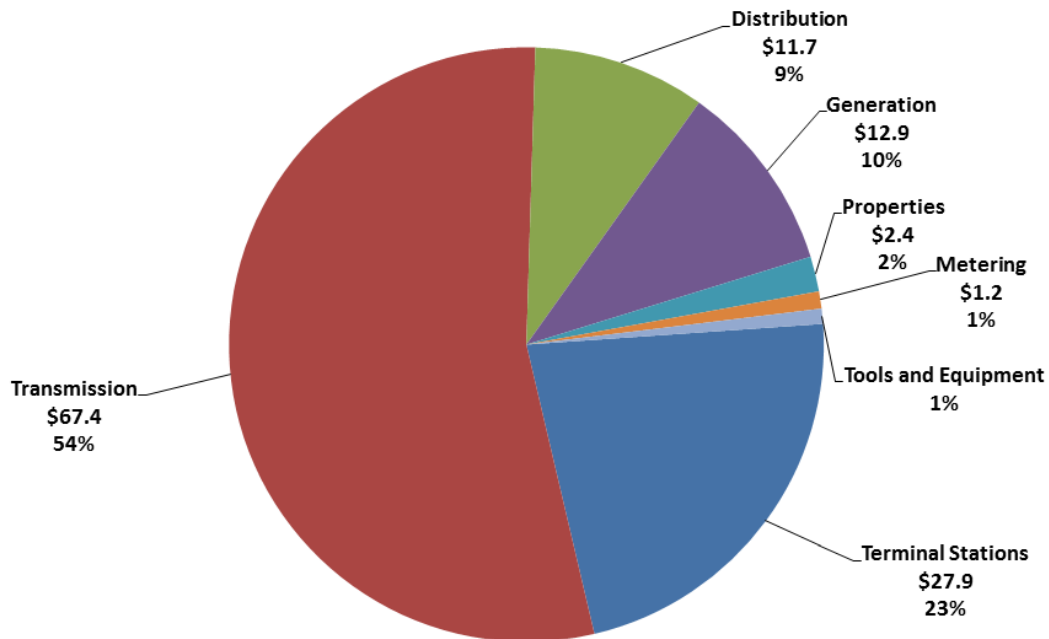


Figure 6: Five-Year Historical Average Capital Expenditures for Transmission and Rural Operations (2016–2020)

4.2.1 Transmission

Planned 2022 transmission expenditures (\$1.6 million)²⁸ are materially lower than the five-year²⁹ historical average (\$67.4 million) and lower than the 2022 amount reflected in the prior year five-year³⁰ capital plan (\$2.7 million). The average was elevated in recent years due to the construction of the TL 267 and TL 266 transmission lines. Expenditures in 2022 are related to the Wood Pole Line Management (“WPLM”) Program. In 2022, only poles and hardware deemed as requiring immediate attention will be replaced or refurbished under the WPLM program. Required refurbishment identified in 2021 inspections will be scheduled for 2023. This is to introduce a one-year gap between inspections and the refurbishment activities that are identified. This “gap year” will allow for better planning and more accurate cost estimating going forward. This approach has resulted in a reduction in 2022 WPLM expenditures relative to the prior year five-year plan.

4.2.2 Terminal Stations

The planned capital expenditures for terminal stations (\$33.9 million) is higher than the five-year historical average³¹ (\$27.9 million) and lower than that which was reflected for 2022 in the prior year five-year³² capital plan (\$42.6 million).

The reduction in Hydro’s planned 2022 capital expenditures relative to those reflected in the 2021 CBA five-year³³ plan is primarily a reflection of the reassessment of prior approved multi-year projects as described in Section 3.2. These efforts have resulted in a total 2022 terminal stations budget reduction of \$5.2 million, compared to that included in the 2021 CBA. The projects impacted include the 2021 Terminal Station Refurbishment and Modernization, 2021 Upgrade Circuit Breakers, Upgrades for the Future Retirement of the Stephenville Gas Turbine, and Wabush Substation Upgrades projects, as detailed in Appendix G. Additionally, following careful consideration of asset condition and system requirements, Hydro has deferred a total of \$1.4 million related to the 2022 Terminal Station Refurbishment and Modernization project, installation of fire barriers in the Bay d’Espoir Terminal

²⁸ Does not include the Valentine Gold Interconnection project, filed with the Board on June 29, 2021, which, if approved, will be fully contributed by the customer.

²⁹ 2016–2020.

³⁰ 2022–2026.

³¹ 2016–2020.

³² 2021–2025.

³³ 2021–2025.

Station, and a major inspection of Synchronous Condenser 2 in the Wabush Terminal Station. Risks and impacts were considered when deferring these projects.

Many of Hydro's terminal stations were constructed in the 1960s with expected useful lives at that time in the range of 40–50 years. Refurbishment and general upgrades are necessary to support Hydro's ability to provide reliable service. The 2022 CBA includes the continuation of programs to upgrade of circuit breakers (\$6.4 million), terminal station refurbishment and modernization (\$10.1 million),³⁴ and terminal station in-service failures (\$0.9 million).

4.2.3 Rural Generation

Hydro has 23 diesel generating stations, 18 of which are remote electrical systems along the coasts of Labrador and on the island of Newfoundland. Providing service to customers in these communities requires that the fuel storage, diesel generating units, facilities, and distribution systems all be kept in safe, reliable, and environmentally responsible working order.

The planned capital expenditure for rural generation (\$3.3 million) is below the historical five-year average (\$12.9 million) and that reflected in the prior year five-year³⁵ capital plan (\$14.7 million). 2022 planned expenditures are below that of the historical average as a result of a reduction in diesel genset replacement and overhaul expenditures planned for 2022, and the inclusion of diesel plant automation and oil containment projects in the historical five-year average. The variance in the 2022 expenditures as compared to the prior year five-year plan also reflects the exclusion of the Long-Term Supply Solution for Southern Labrador – Phase 1, as this project was filed separately with the Board.³⁶

Planned expenditures for 2022 include: continuation of the multi-year project to replace a diesel generator unit in Nain (\$0.3 million), as well as new projects that include: the replacement of diesel generating units in St. Lewis and L'Anse-au-Loup (\$0.7 million), replacement of fuel storage tanks and upgrade of the service conductor in Mary's Harbour (\$0.8 million), overhauls of diesel units (\$1.4 million), and installation of fire protection in the Ramea Diesel Generating Station (\$0.1 million).

³⁴ Including \$5.7 million related to the 2021 portion of the two-year project approved in Hydro's 2020 CBA.

³⁵ 2021–2025.

³⁶ "Long-Term Supply for Southern Labrador – Phase 1," Newfoundland and Labrador Hydro, July 16, 2021.

4.2.4 Distribution

The planned capital expenditure for rural distribution (\$10.3 million) is lower than the historical five-year³⁷ historical average (\$11.7 million) and relatively consistent with that reflected in the prior year five-year capital plan³⁸ (\$10.5 million).

Hydro provides service to residential and general service customers on the Island and Labrador Interconnected Systems. Projects have been included in the 2022 CBA that are intended to ensure that distribution lines and equipment that require replacement due to asset condition are replaced prior to failure, thereby reducing the probability of service interruptions to customers.

The 2022 distribution related expenditures include the in-service failures, miscellaneous upgrades, and continuation of Hydro's street light modernization project (\$3.8 million).

The 2022 CBA also includes a project for the provision of service extensions (\$3.6 million) to address service requests throughout the service area, as well as projects to addresses Hydro's worst-performing feeders (\$1.7 million), with one additional feeder planned for refurbishment in the 2022–2023 project.

4.3 General Properties

Expenditures related to General Properties account for 8% of the overall expenditures for 2022, totalling \$6.7 million. 2022 expenditures are primarily driven by technology investments related to core IT/OT³⁹ infrastructure upgrades and new short-term load forecasting software. Investments related to transportation are lower than the five-year historical average due to an intentional limiting of light-duty vehicles in 2022 as Hydro reviews its light-duty vehicle needs; a return to a more normal level of investment in light-duty vehicles is expected in 2023. Figure 7 and Figure 8 show the breakdown of the General Properties capital budget for 2022 and the previous five-year average, respectively.

³⁷ 2016–2020.

³⁸ 2021–2025.

³⁹ Information Technology/Operational Technology ("IT/OT").

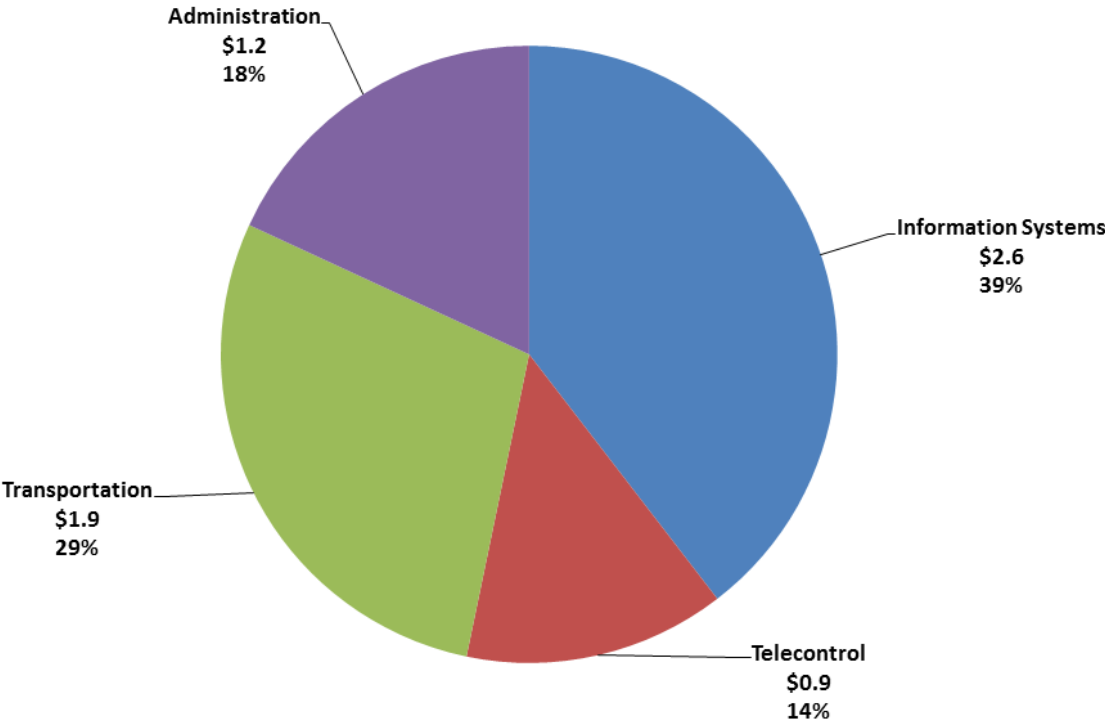


Figure 7: 2022 Capital Budget for General Properties

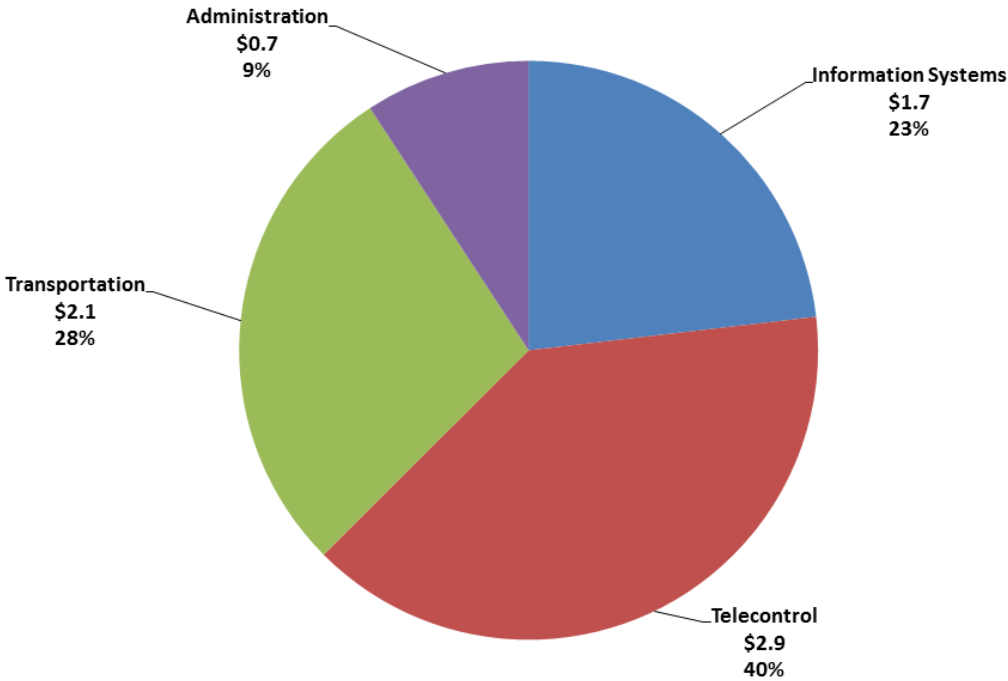


Figure 8: Five-Year Historical Average Capital Expenditures for General Properties (2016–2020)

4.3.1 Information Systems

Hydro's planned 2022 capital expenditures for information systems (\$2.6 million) is higher than the historical five-year⁴⁰ average (\$1.7 million) and higher than that reflected in the prior year five-year capital plan⁴¹ (\$2.0 million).

The increase relative to the prior five-year capital plan is primarily due to the inclusion of a project to replace Hydro's short-term load forecasting software (\$0.4 million) and increases to the budget to upgrade core IT/OT infrastructure (\$0.3 million). The Information Systems proposals are directed towards maintaining Hydro's computing capacity and associated infrastructure, ensuring that it remains current and reliable. Projects include upgrades to the software applications used throughout Hydro (\$0.6 million), refresh of cybersecurity software (\$0.2 million), the purchase of personal computers (\$0.5 million) and peripheral infrastructure (\$0.2 million), and upgrades to Hydro's Energy Management System and Hydro Command Centre (\$0.3 million and \$0.1 million, respectively).

4.3.2 Transportation

Hydro's planned 2022 capital expenditures for transportation (\$1.9 million) is marginally less than the historical five-year⁴² historical average (\$2.1 million) and lower than that reflected in the prior year five-year capital plan⁴³ (\$2.7 million).

Hydro's 2022 CBA includes the replacement of light- and heavy-duty vehicles (\$1.9 million). Hydro's 2022–2024 project to replace light- and heavy-duty vehicles includes the replacement of eight heavy-duty vehicles and four light-duty vehicles, including the purchase of two fully electric vehicles.

As part of its review of its capital proposals, Hydro identified light-duty fleet vehicles as an area of opportunity for potential savings in 2022. Hydro is materially reducing its proposed light-duty vehicle purchases for 2022 (as compared to prior years) and intends to undertake a review of its light-duty vehicle fleet management strategy to determine whether its current practices optimize the value of its fleet. Hydro acknowledges that this reduced level of investment in the light-duty fleet likely cannot be sustained in the long-term and will use the results of its review to develop future proposals which will reflect a level of spend that appropriately balances fleet safety and reliability with cost. Hydro does not

⁴⁰ 2016–2020.

⁴¹ 2021–2025.

⁴² 2016–2020.

⁴³ 2021–2025.

believe that this temporary deviation from its typical replacement schedule will negatively impact reliability as replacements for the vehicles which are being deferred can be rented in the short-term if required.

4.3.3 Telecontrol

Operating an integrated electrical system requires reliable communication systems across Hydro's province-wide facilities, both to control equipment and to support employee communications, many of whom work in remote locations. The 2022 CBA proposals in this area include replacement of battery banks and chargers (\$0.2 million), upgrade of remote terminal units (\$0.2 million), and ongoing replacement or refurbishment programs for such items as microwave antenna radomes (\$0.2 million) and network communications equipment (\$0.2 million), and site facilities and other tools and equipment that are part of the communications infrastructure (\$0.1 million). Hydro has deferred the \$2.0 million project to replace various VHF⁴⁴ mobile radio systems to 2023 as Hydro continues to review its current and future required functionality; there are no reliability impacts anticipated as a result of this deferral as a month-by-month option for extension of the existing contract is available.

4.3.4 Administration

The 2022 CBA proposes projects which are required for the administration of Hydro's business, including continuation of the project for the replacement of the backup power system transfer switches and associated hardware at Hydro Place (\$0.9 million), as well as the removal of various safety hazards (\$0.2 million) and the purchase of office equipment (\$0.1 million).

4.4 Specifically Assigned Assets for Industrial Customers

A portion of Hydro's asset base is specifically assigned to industrial customers on the Island and in Labrador.

Hydro's 2022–2023 Terminal Station Refurbishment and Modernization project includes the replacement of Breaker B3L4 (\$818 thousand total, \$100 thousand in 2022) and L4 protective relays (\$188 thousand total, \$82 thousand in 2022) in the Wabush Terminal Station ("WABTS"), in addition to the replacement of Wabush Terminal Station breakers B3L3 and B4L6-1, Line 3 and Line 5 protection, and Disconnect B4L6 included in Hydro's approved 2021–2022 Terminal Station Refurbishment

⁴⁴ Very high frequency ("VHF").

- 1 Project.⁴⁵ As these assets function to provide service solely to IOC, these expenditures will be specifically
 2 assigned to IOC. The total estimated cost in 2022 is \$1.5 million.⁴⁶
- 3 Specifically assigned expenditures within Hydro's five-year plan (2022-2026) are detailed in Table 1:

Table 1: Specifically Assigned Capital Work (2022–2026)

Customer	Specifically Assigned Work	Project
IOC	Breaker, B3L3, WABTS	Terminal Station Refurbishment and Modernization (2021–2022)
IOC	L3 Protection, IOC 3	Terminal Station Refurbishment and Modernization (2021–2022)
IOC	Breaker, B4L5B, WABTS	Terminal Station Refurbishment and Modernization (2021–2022)
IOC	L5 Primary Protection, IOC 5 a/b	Terminal Station Refurbishment and Modernization (2021–2022)
IOC	Disconnect, B4L6-1	Terminal Station Refurbishment and Modernization (2021–2022)
IOC	WABTS B3L4 Replacement	Upgrade Circuit Breakers (2022–2023)
IOC	WABTS L4 Protection Relay Replacement	Replace Protective Relays – Various (2022–2023)
IOC	WABTS B3L5A Replacement	Upgrade Circuit Breakers (2023–2024)
IOC	WABTS B3L1 Replacement	Upgrade Circuit Breakers (2023–2024)
IOC	WABTS L1 Protection Relay Replacement	Replace Protective Relays – Various (2023–2024)
IOC	WABTS B3L5a Breaker Fail Protection Upgrade	Upgrade Circuit Breakers (2023–2024)
IOC	WABTS B4L6 Replacement	Upgrade Circuit Breakers (2026–2027)
NARL	CBC T1 X0 bushing replacement	Upgrade Power Transformers (2023–2024)
NARL	CBC T2 X0 bushing replacement	Upgrade Power Transformers (2023–2024)
NARL	CBC T1 protection relay replacement	Replace Protective Relays - Various (2026–2027)
NARL	CBC T2 protection relay replacement	Replace Protective Relays - Various (2026–2027)
Tacora	WABTS B4L34-1 (formerly 34B15) replacement	Replace Disconnects (2025–2026)
Tacora	WABTS B4L34 replacement	Upgrade Circuit Breakers (2025–2026)
Tacora	WABTS B4L35 replacement	Upgrade Circuit Breakers (2026–2027)
Marathon Gold	Valentine Gold Interconnection	Valentine Gold Interconnection (2021–2023)

⁴⁵ Recovery of specifically assigned Terminal Station Refurbishment and Modernization (2021–2022) project expenditures approved in Board Order P.U. 19(2021).

⁴⁶ Following approval of the 2022 CBA, Hydro will submit an application for approval of a contribution from the customer for the expenditures related to those assets that solely serve the customer.

4.5 Leasing Costs

There are no capital leasing costs contained in the 2022 CBA.

4.6 Revenue Requirement Impact

On a *pro forma* basis, Hydro's 2022 and 2023 revenue requirement is estimated to increase by approximately \$2 million and \$6 million,⁴⁷ respectively, as a result of the capital projects proposed for 2022. Such a revenue requirement increase would represent an increase of 0.4% and 1.0% in 2022 and 2023, respectively, relative to Hydro's 2019 Test Year. This excludes depreciation of Holyrood accelerated assets, which will be addressed through the proposals in Hydro's 2021 Supply Cost Accounting Application.⁴⁸

This *pro forma* estimate is comprised of return on rate base and depreciation. It does not reflect potential reductions in operating and maintenance charges (e.g., changes related to technology such as the conversion to LED⁴⁹ streetlights where savings are expected to be realized).

5.0 General

5.1 Project Prioritization and Ranking

An overall ranking of 2022 projects is included as Appendix H. Hydro's prioritization process includes two primary steps—an initial review of proposed projects to critically evaluate scope and need, followed by a prioritization of projects through Hydro's matrix model. The matrix model scores projects according to prescribed categories with assignment of values based on a judgement of confidence level or probability of the chosen scoring. It has been Hydro's experience that the prioritization matrix confirms Hydro's initial assessment that the projects which have moved forward from the first level of review are necessary and prudent expenditures.

5.2 Projects by Definition and Classification

Table 2 and Table 3 list the 2022 capital expenditures related to projects proposed within the 2022 CBA as well as previously approved multi-year projects with expenditures in 2022 by definition and classification, respectively.

⁴⁷ These amounts do not reflect any reduction which may occur as a result of asset retirements.

⁴⁸ "Supply Cost Accounting Application," Newfoundland and Labrador Hydro, July 29, 2021.

⁴⁹ Light-emitting diode ("LED").

Table 2: Projects by Definition (\$000)

Type	Number	Capital Expenditure
Clustered	9	24,133.4
Pooled	32	44,735.2
Other	32	14,845.4
Total	73	83,714.0⁵⁰

Table 3: Projects by Classification (\$000)

Type	Number	Capital Expenditure
Normal	69	76,198.3
Justifiable	4	7,515.7
Mandatory	0	0
Total	73	83,714.0⁵¹

⁵⁰ Excludes Allowance for Unforeseen Items amount of \$1 million.

⁵¹ Excludes Allowance for Unforeseen Items amount of \$1 million.



Appendix A

2022 Capital Budget by Asset Class

Newfoundland and Labrador Hydro
2022 Capital Budget Application
2022 Capital Budget Overview
(\$000)

	Expended to 2021	2022	Future Years	Total
Generation	15,468.9	26,236.8	12,917.1	54,622.8
Transmission and Rural Operations	19,488.6	50,825.6	38,545.0	108,859.2
General Proprties	1,518.2	6,651.6	2,912.8	11,082.6
Allowance for Unforeseen Items	-	1,000.0	-	1,000.0
Total Capital Budget	36,475.7	84,714.0	54,374.9	175,564.6

Newfoundland and Labrador Hydro
2022 Capital Budget Application
Summary by Category
(\$000)

	Expended to			Total
	2021	2022	Future Years	
Generation				
Gas Turbines	3,488.7	3,063.7	66.6	6,619.0
Hydraulic Plant	9,806.4	12,214.5	10,933.7	32,954.6
Thermal Plant	2,173.8	10,732.8	1,916.8	14,823.4
Tools and Equipment	-	225.8	-	225.8
Total Generation	15,468.9	26,236.8	12,917.1	54,622.8
General Properties				
Transportation	1,320.9	1,904.1	2,912.8	6,137.8
Administration	197.3	1,205.2	-	1,402.5
Information Systems	-	2,630.4	-	2,630.4
Telecontrol	-	911.9	-	911.9
Total General Properties	1,518.2	6,651.6	2,912.8	11,082.6
Transmission and Rural Operations				
Transmission	-	1,603.5	-	1,603.5
Distribution	318.9	10,321.5	3,601.0	14,241.4
Metering	-	515.6	4,860.2	5,375.8
Tools and Equipment	-	1,186.1	2,071.1	3,257.2
Terminal Stations	16,609.1	33,917.7	21,681.2	72,208.0
Generation	2,560.6	3,281.2	6,331.5	12,173.3
Total Transmission and Rural Operations	19,488.6	50,825.6	38,545.0	108,859.2
Total Allowance for Unforeseen Items	-	1,000.0	-	1,000.0
Total Capital Budget	36,475.7	84,714.0	54,374.9	175,564.6

Newfoundland and Labrador Hydro
2022 Capital Budget Application
Detailed Breakdown
(\$000)

	Expended to 2021	2022	Future Years	Total
Generation				
Gas Turbines				
Install Infrared Scanning Ports - Happy Valley Gas Turbine	-	39.6	25.6	65.2
Perform Combustor Inspection - Holyrood Gas Turbine	3,046.1	2,427.4	-	5,473.5
Replace Voltage Regulator - Happy Valley Gas Turbine	131.3	211.0	-	342.3
Upgrade Compressed Air System - Happy Valley Gas Turbine	76.6	69.2	-	145.8
Replace Fuel Oil, Lube Oil, and Glycol Pumps - Happy Valley Gas Turbine	234.7	170.5	-	405.2
Control System Replacement - Holyrood Gas Turbine	-	146.0	41.0	187.0
Total Gas Turbines	3,488.7	3,063.7	66.6	6,619.0
Hydraulic Plant				
Hydraulic Generation Refurbishment and Modernization (2021-2022)	6,569.6	5,005.6	-	11,575.2
Hydraulic Generation Refurbishment and Modernization (2022-2023)	-	2,970.6	3,788.9	6,759.5
Refurbish Ebbegunbaeg Control Structure	3,236.8	3,238.3	7,144.8	13,619.9
Hydraulic Generation In-Service Failures (2022)	-	1,000.0	-	1,000.0
Total Hydraulic Plant	9,806.4	12,214.5	10,933.7	32,954.6
Thermal Plant				
Thermal In-Service Failures (2022)	-	2,000.0	-	2,000.0
Upgrade Waste Water Equalization System - Holyrood	1,813.4	547.7	-	2,361.1
Upgrade Distributed Control System Hardware - Holyrood	360.4	368.2	-	728.6
Boiler Condition Assessment and Miscellaneous Upgrades - Holyrood	-	3,014.2	-	3,014.2
Air Receivers Condition Assessment and Upgrades - Holyrood	-	336.5	-	336.5
Turbine Valve Overhaul Unit 3 - Holyrood	-	3,623.5	-	3,623.5
Major Pumps Overhaul - Holyrood	-	491.3	-	491.3
Unit 3 Generator Components Condition Assessment and Miscellaneous Upgrades	-	153.0	338.8	491.8
Replace Underground Fire Water Distribution System - Holyrood	-	128.3	1578	1,706.3
Upgrade Wastewater Treatment Plant 600 V Variable Frequency Drives - Holyrood	-	70.1	-	70.1
Total Thermal Plant	2,173.8	10,732.8	1,916.8	14,823.4
Tools and Equipment				
Purchase Tools and Equipment Less than \$50,000 (2022) - Gas Turbine	-	19.6	-	19.6
Purchase Tools and Equipment Less than \$50,000 (2022) - Hydraulic Plants	-	187.3	-	187.3
Purchase Tools and Equipment Less than \$50,000 (2022) - Thermal Plants	-	18.9	-	18.9
Total Tools and Equipment	-	225.8	-	225.8
Total Generation	15,468.9	26,236.8	12,917.1	54,622.8

Newfoundland and Labrador Hydro
2022 Capital Budget Application
Detailed Breakdown
(\$000)

	Expended to 2021	2022	Future Years	Total
General Properties				
Transportation				
Replace Light- and Heavy-Duty Vehicles (2021-2022)	1,320.9	1,335.1	-	2,656.0
Replace Light- and Heavy-Duty Vehicles (2022-2024)	-	569.0	2,912.8	3,481.8
Total Transportation	1,320.9	1,904.1	2,912.8	6,137.8
Administration				
Purchase Office Equipment Less Than \$50,000 (2022)	-	67.1	-	67.1
Replace Transfer Switches and Associated Hardware - Hydro Place	197.3	938.5	-	1,135.8
Remove Safety Hazards (2022) - Various	-	199.6	-	199.6
Total Administration	197.3	1,205.2	-	1,402.5
Information Systems				
Replacement of Short-Term Load Forecasting Software	-	439.5	-	439.5
Upgrade Energy Management System (2022) - Hydro Place	-	292.6	-	292.6
Purchase Personal Computers (2022) - Hydro Place	-	477.1	-	477.1
Replace Peripheral Infrastructure (2022) - Hydro Place	-	193.2	-	193.2
Upgrade Core IT/OT Infrastructure (2022) - Hydro Place	-	308.2	-	308.2
Perform Software Upgrades and Minor Enhancements (2022) - Hydro Place	-	621.7	-	621.7
Refresh Cyber Security Infrastructure (2022) - Hydro Place	-	221.7	-	221.7
Hydro Command Centre Upgrade (2022) - Hydro Place	-	76.4	-	76.4
Total Information Systems	-	2,630.4	-	2,630.4
Telecontrol				
Replace Radomes (2022) - Various	-	179.9	-	179.9
Upgrade Site Facilities (2022) - Various	-	49.6	-	49.6
Replace Network Communications Equipment (2022)	-	193.0	-	193.0
Upgrade Remote Terminal Units (2022) - Various	-	171.1	-	171.1
Replace Mobile Devices	-	49.7	-	49.7
Purchase Tools and Equipment Less than \$50,000 (2022)	-	42.0	-	42.0
Replace Battery Banks and Chargers (2022) - Various	-	226.6	-	226.6
Total Telecontrol	-	911.9	-	911.9
Total General Properties	1,518.2	6,651.6	2,912.8	11,082.6

Newfoundland and Labrador Hydro
2022 Capital Budget Application
Detailed Breakdown
(\$000)

	Expended to 2021	2022	Future Years	Total
Transmission and Rural Operations				
Transmission				
Wood Pole Line Management Program (2022)	-	1,603.5	-	1,603.5
Total Transmission	-	1,603.5	-	1,603.5
Distribution				
Additions for Load (2022) - Distribution System - Mary's Harbour Voltage Conversion	-	550.6	524.6	1,075.2
Provide Service Extensions (2022) - Various	-	3,627.2	-	3,627.2
Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights (2022) - Var	-	3,826.7	-	3,826.7
Upgrade of Worst-Performing Distribution Feeders (2021-2022)	318.9	805.6	-	1,124.5
Upgrade of Worst-Performing Distribution Feeders (2022-2023)	-	850.0	1,922.9	2,772.9
Labrador City L22 Voltage Conversion (2022-2023)	-	486.8	1,004.4	1,491.2
Install Recloser Remote Control (2022-2023) - Various	-	174.6	149.1	323.7
Total Distribution	318.9	10,321.5	3,601.0	14,241.4
Metering				
Replace Metering System	-	515.6	4,860.2	5,375.8
Total Metering	-	515.6	4,860.2	5,375.8
Tools and Equipment				
Purchase 85' Material Handler Aerial Device on Track Unit	-	20.4	1,333.5	1,353.9
Purchase 46' Material Handler Aerial Device on Track Unit	-	20.4	737.6	758.0
Purchase Tools and Equipment Less than \$50,000 (2022) - Central Region	-	193.9	-	193.9
Purchase Tools and Equipment Less than \$50,000 (2022) - Northern Region	-	134.6	-	134.6
Purchase Tools and Equipment Less than \$50,000 (2022) - Labrador Region	-	121.8	-	121.8
Replace Light-Duty Mobile Equipment (2022) - Various	-	695.0	-	695.0
Total Tools and Equipment	-	1,186.1	2,071.1	3,257.2
Terminal Stations				
Terminal Station Refurbishment and Modernization (2021-2022)	6,171.6	6,957.3	-	13,128.9
Terminal Station Refurbishment and Modernization (2022-2023)	-	3,111.9	6,109.7	9,221.6
Upgrades for Future Retirement of Stephenville Gas Turbine	1,530.3	5,344.5	-	6,874.8
Wabush Terminal Station Upgrades	2,301.7	4,935.5	4,335.7	11,572.9
Additions for Load - Wabush Substation Upgrades	1,186.7	6,253.0	3,053.7	10,493.4
Terminal Station In-Service Failures (2022)	-	900.0	-	900.0
Upgrade Circuit Breakers (2021-2022) - Various	5,418.8	4,293.6	820.3	10,532.7
Upgrade Circuit Breakers (2022-2023) - Various	-	2,121.9	7,361.8	9,483.7
Total Terminal Stations	16,609.1	33,917.7	21,681.2	72,208.0
Generation				
Diesel Genset Replacements (2021-2022)	2,560.6	286.2	-	2,846.8
Overhaul Diesel Units (2022) - Various	-	1,360.5	-	1,360.5
Upgrade Fuel Storage Tanks (2022) - Mary's Harbour	-	499.1	-	499.1
Additions for Load (2022) - Mary's Harbour Service Conductor	-	307.8	51.3	359.1
Install Fire Protection in Diesel Plants (2022-2023) - Ramea	-	90.7	1,838.1	1,928.8
Diesel Genset Replacement Unit 2039 - St. Lewis	-	397.0	1,718.7	2,115.7
Diesel Genset Replacement Unit 2012 - L'Anse-Au-Loup	-	339.9	2,723.4	3,063.3
Total Generation	2,560.6	3,281.2	6,331.5	12,173.3
Total Transmission and Rural Operations	19,488.6	50,825.6	38,545.0	108,859.2
Total Allowance for Unforeseen Items	-	1,000.0	-	1,000.0
Total Capital Budget	36,475.7	84,714.0	54,374.9	175,564.6



Appendix B

2022 Capital Budget by Single- and Multi-Year Projects

Newfoundland and Labrador Hydro
2022 Capital Budget Application
Multi-Year Projects Separated
(\$000)

	2022
SINGLE YEAR	
Generation	10,722.9
Transmission and Rural Operations	12,962.3
General Properties	3,667.7
Allowance for Unforeseen Events	1,000.0
Total Projects Under \$50,000	179.8
	28,532.7
MULTI YEAR (2022 Expenditures)	
Multi-Year Projects Commencing in 2020	2,427.4
Multi-Year Projects Commencing in 2021	40,759.8
Multi-Year Projects Commencing in 2022	12,994.1
	56,181.3
Total Capital Budget	84,714.0

Newfoundland and Labrador Hydro
2022 Capital Budget Application
Single-Year Projects Over \$50,000
(\$000)

Generation**Hydraulic Plant**

Hydraulic Generation In-Service Failures (2022)	1,000.0
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Total Hydraulic Plant	1,000.0
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Thermal Plant

Thermal In-Service Failures (2022)	2,000.0
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Boiler Condition Assessment and Miscellaneous Upgrades - Holyrood	3,014.2
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Air Receivers Condition Assessment and Upgrades - Holyrood	336.5
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Turbine Valve Overhaul Unit 3 - Holyrood	3,623.5
--	---------

Major Pumps Overhaul - Holyrood	491.3
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Upgrade Wastewater Treatment Plant 600 V Variable Frequency Drives - Holyrood	70.1
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Total Thermal Plant	9,535.6
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Tools and Equipment

Purchase Tools and Equipment Less than \$50,000 (2022) - Hydraulic Plants	187.3
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Total Tools and Equipment	187.3
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Total Generation

	10,722.9
--	-----------------

General Properties**Administration**

Purchase Office Equipment Less Than \$50,000 (2022)	67.1
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Remove Safety Hazards (2022) - Various	199.6
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Total Administration	266.7
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Information Systems

Replacement of Short-Term Load Forecasting Software	439.5
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Upgrade Energy Management System (2022) - Hydro Place	292.6
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Purchase Personal Computers (2022) - Hydro Place	477.1
--	-------

Replace Peripheral Infrastructure (2022) - Hydro Place	193.2
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Upgrade Core IT/OT Infrastructure (2022) - Hydro Place	308.2
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Perform Software Upgrades and Minor Enhancements (2022) - Hydro Place	621.7
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Refresh Cyber Security Infrastructure (2022) - Hydro Place	221.7
--	-------

Hydro Command Centre Upgrade (2022) - Hydro Place	76.4
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Total Information Systems	2,630.4
----------------------------------	----------------

Telecontrol

Replace Radomes (2022) - Various	179.9
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Replace Network Communications Equipment (2022)	193.0
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Upgrade Remote Terminal Units (2022) - Various	171.1
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Replace Battery Banks and Chargers (2022) - Various	226.6
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Total Telecontrol	770.6
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Total General Properties

	3,667.7
--	----------------

Newfoundland and Labrador Hydro
2022 Capital Budget Application
Single-Year Projects Over \$50,000
(\$000)

Transmission and Rural Operations**Transmission**

Wood Pole Line Management Program (2022)	1,603.5
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Total Transmission	1,603.5
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Distribution

Provide Service Extensions (2022) - Various	3,627.2
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Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights (2022) - Various	3,826.7
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Total Distribution	7,453.9
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Tools and Equipment

Purchase Tools and Equipment Less than \$50,000 (2022) - Central Region	193.9
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Purchase Tools and Equipment Less than \$50,000 (2022) - Northern Region	134.6
--	-------

Purchase Tools and Equipment Less than \$50,000 (2022) - Labrador Region	121.8
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Replace Light-Duty Mobile Equipment (2022) - Various	695.0
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Total Tools and Equipment	1,145.3
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Terminal Stations

Terminal Station In-Service Failures (2022)	900.0
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Total Terminal Stations	900.0
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Generation

Overhaul Diesel Units (2022) - Various	1,360.5
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Upgrade Fuel Storage Tanks (2022) - Mary's Harbour	499.1
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Total Generation	1,859.6
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Total Transmission and Rural Operations	12,962.3
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Total Allowance for Unforeseen Items	1,000.0
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Total Capital Budget	28,352.9
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Newfoundland and Labrador Hydro
2022 Capital Budget Application
Multi-Year Projects Over \$50,000
(\$000)

	Expended to				Total
	2021	2022	2023	2024	
Multi-Year Projects Commencing in 2020					
Generation					
Perform Combustor Inspection - Holyrood Gas Turbine	3,046.1	2,427.4	-	-	5,473.5
Generation Total	3,046.1	2,427.4	-	-	5,473.5
Total Multi-Year Projects Commencing in 2020	3,046.1	2,427.4	-	-	5,473.5
Multi-Year Projects Commencing in 2021					
Generation					
Hydraulic Generation Refurbishment and Modernization (2021-2022)	6,569.6	5,005.6	-	-	11,575.2
Replace Voltage Regulator - Happy Valley Gas Turbine	131.3	211.0	-	-	342.3
Upgrade Compressed Air System - Happy Valley Gas Turbine	76.6	69.2	-	-	145.8
Refurbish Ebbegunbaeg Control Structure	3,236.8	3,238.3	3,470.1	3,674.7	13,619.9
Upgrade Waste Water Equalization System - Holyrood	1,813.4	547.7	-	-	2,361.1
Upgrade Distributed Control System Hardware - Holyrood	360.4	368.2	-	-	728.6
Replace Fuel Oil, Lube Oil, and Glycol Pumps - Happy Valley Gas Turbine	234.7	170.5	-	-	405.2
Generation Total	12,422.8	9,610.5	3,470.1	3,674.7	29,178.1
General Properties					
Replace Transfer Switches and Associated Hardware - Hydro Place	197.3	938.5	-	-	1,135.8
Replace Light- and Heavy-Duty Vehicles (2021-2022)	1,320.9	1,335.1	-	-	2,656.0
General Properties Total	1,518.2	2,273.6	-	-	3,791.8
Transmission and Rural Operations					
Diesel Genset Replacements (2021-2022)	2,560.6	286.2	-	-	2,846.8
Terminal Station Refurbishment and Modernization (2021-2022)	6,171.6	6,957.3	-	-	13,128.9
Upgrades for Future Retirement of Stephenville Gas Turbine	1,530.3	5,344.5	-	-	6,874.8
Wabush Terminal Station Upgrades	2,301.7	4,935.5	4,335.7	-	11,572.9
Additions for Load - Wabush Substation Upgrades	1,186.7	6,253.0	3,053.7	-	10,493.4
Upgrade Circuit Breakers (2021-2022) - Various	5,418.8	4,293.6	820.3	-	10,532.7
Upgrade of Worst-Performing Distribution Feeders (2021-2022)	318.9	805.6	-	-	1,124.5
Transmission and Rural Operations Total	19,488.6	28,875.7	8,209.7	-	56,574.0
Total Multi-Year Projects Commencing in 2021	33,429.6	40,759.8	11,679.8	3,674.7	89,543.9

Newfoundland and Labrador Hydro
2022 Capital Budget Application
Multi-Year Projects Over \$50,000
(\$000)

	Expended to				Total
	2021	2022	2023	2024	
Multi-Year Projects Commencing in 2022					
Generation					
Hydraulic Generation Refurbishment and Modernization (2022-2023)	-	2,970.6	3,788.9	-	6,759.5
Install Infrared Scanning Ports - Happy Valley Gas Turbine	-	39.6	25.6	-	65.2
Unit 3 Generator Components Condition Assessment and Miscellaneous Upgrades	-	153.0	338.8	-	491.8
Replace Underground Fire Water Distribution System - Holyrood	-	128.3	1,578.0	-	1,706.3
Control System Replacement - Holyrood Gas Turbine	-	146.0	41.0	-	187.0
Generation Total	-	3,437.5	5,772.3	-	9,209.8
General Properties					
Replace Light- and Heavy-Duty Vehicles (2022-2024)	-	569.0	593.2	2,319.6	3,481.8
General Properties Total	-	569.0	593.2	2,319.6	3,481.8
Transmission and Rural Operations					
Purchase 85' Material Handler Aerial Device on Track Unit	-	20.4	1,265.7	67.8	1,353.9
Terminal Station Refurbishment and Modernization (2022-2023)	-	3,111.9	6,109.7	-	9,221.6
Purchase 46' Material Handler Aerial Device on Track Unit	-	20.4	698.8	38.8	758.0
Replace Metering System	-	515.6	3,865.6	994.6	5,375.8
Additions for Load (2022) - Distribution System - Mary's Harbour Voltage Conversion	-	550.6	524.6	-	1,075.2
Additions for Load (2022) - Mary's Harbour Service Conductor	-	307.8	51.3	-	359.1
Install Fire Protection in Diesel Plants (2022-2023) - Ramea	-	90.7	1,838.1	-	1,928.8
Upgrade Circuit Breakers (2022-2023) - Various	-	2,121.9	7,361.8	-	9,483.7
Upgrade of Worst-Performing Distribution Feeders (2022-2023)	-	850.0	1,922.9	-	2,772.9
Labrador City L22 Voltage Conversion (2022-2023)	-	486.8	1,004.4	-	1,491.2
Diesel Genset Replacement Unit 2039 - St. Lewis	-	397.0	1,583.8	134.9	2,115.7
Diesel Genset Replacement Unit 2012 - L'Anse-Au-Loup	-	339.9	2,513.2	210.2	3,063.3
Install Recloser Remote Control (2022-2023) - Various	-	174.6	149.1	-	323.7
Transmission and Rural Operations Total	-	8,987.6	28,889.0	1,446.3	39,322.9
Total Multi-Year Projects Commencing in 2022					
	-	12,994.1	35,254.5	3,765.9	52,014.5
Total Capital Projects					
	36,475.7	56,181.3	46,934.3	7,440.6	147,031.9



Appendix C

2022 Capital Budget by Project Materiality – Projects over \$50,000 but less than \$200,000

Newfoundland and Labrador Hydro
2022 Capital Budget Application
Projects over \$50,000 but less than \$200,000
(\$000)

	Expended to 2021	2022	Future Years	Total	Page Reference
Generation					
Install Infrared Scanning Ports - Happy Valley Gas Turbine	-	39.6	25.6	65.2	Schedule 6, Page 1
Purchase Tools and Equipment Less than \$50,000 (2022) - Hydraulic Plants	-	187.3	-	187.3	
Upgrade Compressed Air System - Happy Valley Gas Turbine	76.6	69.2	-	145.8	
Upgrade Wastewater Treatment Plant 600 V Variable Frequency Drives - Holyrood	-	70.1	-	70.1	Schedule 6, Page 5
Control System Replacement - Holyrood Gas Turbine	-	146.0	41.0	187.0	Schedule 6, Page 9
Total Generation	76.6	512.2	66.6	655.4	
General Properties					
Purchase Office Equipment Less Than \$50,000 (2022)	-	67.1	-	67.1	
Replace Radomes (2022) - Various	-	179.9	-	179.9	Schedule 6, Page 15
Replace Network Communications Equipment (2022)	-	193.0	-	193.0	Schedule 6, Page 27
Upgrade Remote Terminal Units (2022) - Various	-	171.1	-	171.1	Schedule 6, Page 32
Remove Safety Hazards (2022) - Various	-	199.6	-	199.6	Schedule 6, Page 38
Replace Peripheral Infrastructure (2022) - Hydro Place	-	193.2	-	193.2	Schedule 6, Page 41
Hydro Command Centre Upgrade (2022) - Hydro Place	-	76.4	-	76.4	Schedule 6, Page 45
Total General Properties	-	1,080.3	-	1,080.3	
Transmission and Rural Operations					
Purchase Tools and Equipment Less than \$50,000 (2022) - Central Region	-	193.9	-	193.9	
Purchase Tools and Equipment Less than \$50,000 (2022) - Northern Region	-	134.6	-	134.6	
Purchase Tools and Equipment Less than \$50,000 (2022) - Labrador Region	-	121.8	-	121.8	
Total Transmission and Rural Operations	-	450.3	-	450.3	
Total Capital Projects	76.6	2,042.8	66.6	2,186.0	



Appendix D

2022 Capital Budget by Project Materiality – Projects over \$200,000 but less than \$500,000

Newfoundland and Labrador Hydro
2022 Capital Budget Application
Projects over \$200,000 but less than \$500,000
(\$000)

	Expended to 2021	2022	Future Years	Total	Page Reference
Generation					
Replace Voltage Regulator - Happy Valley Gas Turbine	131.3	211.0	-	342.3	
Replace Fuel Oil, Lube Oil, and Glycol Pumps - Happy Valley Gas Turbine	234.7	170.5	-	405.2	
Air Receivers Condition Assessment and Upgrades - Holyrood	-	336.5	-	336.5	Schedule 7, Page 1
Major Pumps Overhaul - Holyrood	-	491.3	-	491.3	Schedule 7, Page 6
Unit 3 Generator Components Condition Assessment and Miscellaneous Upgrades	-	153.0	338.8	491.8	Schedule 7, Page 12
Total Generation	366.0	1,362.3	338.8	2,067.1	
General Properties					
Replacement of Short-Term Load Forecasting Software	-	439.5	-	439.5	Schedule 7, Page 18
Upgrade Energy Management System (2022) - Hydro Place	-	292.6	-	292.6	Schedule 7, Page 27
Purchase Personal Computers (2022) - Hydro Place	-	477.1	-	477.1	Schedule 7, Page 31
Upgrade Core IT/OT Infrastructure (2022) - Hydro Place	-	308.2	-	308.2	Schedule 7, Page 35
Refresh Cyber Security Infrastructure (2022) - Hydro Place	-	221.7	-	221.7	Schedule 7, Page 39
Replace Battery Banks and Chargers (2022) - Various	-	226.6	-	226.6	Schedule 7, Page 43
Total General Properties	-	1,965.7	-	1,965.7	
Transmission and Rural Operations					
Upgrade Fuel Storage Tanks (2022) - Mary's Harbour	-	499.1	-	499.1	Schedule 7, Page 60
Additions for Load (2022) - Mary's Harbour Service Conductor	-	307.8	51.3	359.1	Schedule 7, Page 66
Install Recloser Remote Control (2022-2023) - Various	-	174.6	149.1	323.7	Schedule 7, Page 49
Total Transmission and Rural Operations	-	981.5	200.4	1,181.9	
Total Capital Projects	366.0	4,309.5	539.2	5,214.7	



Appendix E

2022 Capital Budget by Project Materiality – Projects over \$500,000

Newfoundland and Labrador Hydro
2022 Capital Budget Application
Projects over \$500,000
(\$000)

	Expended to		2022	Future Years	Total	Page Reference
	2021					
Generation						
Hydraulic Generation Refurbishment and Modernization (2021-2022)	6,569.6	5,005.6	-	11,575.2		
Hydraulic Generation Refurbishment and Modernization (2022-2023)	-	2,970.6	3,788.9	6,759.5	Schedule 8, Tab 1	
Perform Combustor Inspection - Holyrood Gas Turbine	3,046.1	2,427.4	-	5,473.5		
Thermal In-Service Failures (2022)	-	2,000.0	-	2,000.0	Schedule 8, Tab 2	
Refurbish Ebbegunbaeg Control Structure	3,236.8	3,238.3	7,144.8	13,619.9		
Hydraulic Generation In-Service Failures (2022)	-	1,000.0	-	1,000.0	Schedule 8, Tab 3	
Upgrade Waste Water Equalization System - Holyrood	1,813.4	547.7	-	2,361.1		
Upgrade Distributed Control System Hardware - Holyrood	360.4	368.2	-	728.6		
Boiler Condition Assessment and Miscellaneous Upgrades - Holyrood	-	3,014.2	-	3,014.2	Schedule 8, Tab 4	
Turbine Valve Overhaul Unit 3 - Holyrood	-	3,623.5	-	3,623.5	Schedule 8, Tab 5	
Replace Underground Fire Water Distribution System - Holyrood	-	128.3	1,578.0	1,706.3	Schedule 8, Tab 6	
Total Generation	15,026.3	24,323.8	12,511.7	51,861.8		
General Properties						
Replace Transfer Switches and Associated Hardware - Hydro Place	197.3	938.5	-	1,135.8		
Replace Light- and Heavy-Duty Vehicles (2021-2022)	1,320.9	1,335.1	-	2,656.0		
Replace Light- and Heavy-Duty Vehicles (2022-2024)	-	569.0	2,912.8	3,481.8	Schedule 8, Tab 7	
Perform Software Upgrades and Minor Enhancements (2022) - Hydro Place	-	621.7	-	621.7	Schedule 8, Tab 8	
Total General Properties	1,518.2	3,464.3	2,912.8	7,895.3		

Newfoundland and Labrador Hydro
2022 Capital Budget Application
Projects over \$500,000
(\$000)

	Expended to		2022	Future Years	Total	Page Reference
	2021					
Transmission and Rural Operations						
Diesel Genset Replacements (2021-2022)	2,560.6		286.2	-	2,846.8	
Purchase 85' Material Handler Aerial Device on Track Unit	-		20.4	1,333.5	1,353.9	Schedule 8, Tab 9
Terminal Station Refurbishment and Modernization (2021-2022)	6,171.6		6,957.3	-	13,128.9	
Terminal Station Refurbishment and Modernization (2022-2023)	-		3,111.9	6,109.7	9,221.6	Schedule 8, Tab 10
Upgrades for Future Retirement of Stephenville Gas Turbine	1,530.3		5,344.5	-	6,874.8	
Wabush Terminal Station Upgrades	2,301.7		4,935.5	4,335.7	11,572.9	
Additions for Load - Wabush Substation Upgrades	1,186.7		6,253.0	3,053.7	10,493.4	
Terminal Station In-Service Failures (2022)	-		900.0	-	900.0	Schedule 8, Tab 11
Wood Pole Line Management Program (2022)	-		1,603.5	-	1,603.5	Schedule 8, Tab 12
Overhaul Diesel Units (2022) - Various	-		1,360.5	-	1,360.5	Schedule 8, Tab 13
Purchase 46' Material Handler Aerial Device on Track Unit	-		20.4	737.6	758.0	Schedule 8, Tab 14
Replace Metering System	-		515.6	4,860.2	5,375.8	Schedule 8, Tab 15
Additions for Load (2022) - Distribution System - Mary's Harbour Voltage Conversion	-		550.6	524.6	1,075.2	Schedule 8, Tab 16
Install Fire Protection in Diesel Plants (2022-2023) - Ramea	-		90.7	1,838.1	1,928.8	Schedule 8, Tab 17
Upgrade Circuit Breakers (2021-2022) - Various	5,418.8		4,293.6	820.3	10,532.7	
Upgrade Circuit Breakers (2022-2023) - Various	-		2,121.9	7,361.8	9,483.7	Schedule 8, Tab 18
Provide Service Extensions (2022) - Various	-		3,627.2	-	3,627.2	Schedule 8, Tab 19
Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights (2022) - Various	-		3,826.7	-	3,826.7	Schedule 8, Tab 20
Upgrade of Worst-Performing Distribution Feeders (2021-2022)	318.9		805.6	-	1,124.5	
Upgrade of Worst-Performing Distribution Feeders (2022-2023)	-		850.0	1,922.9	2,772.9	Schedule 8, Tab 21
Labrador City L22 Voltage Conversion (2022-2023)	-		486.8	1,004.4	1,491.2	Schedule 8, Tab 22
Diesel Genset Replacement Unit 2039 - St. Lewis	-		397.0	1,718.7	2,115.7	Schedule 8, Tab 23
Diesel Genset Replacement Unit 2012 - L'Anse-Au-Loup	-		339.9	2,723.4	3,063.3	Schedule 8, Tab 24
Replace Light-Duty Mobile Equipment (2022) - Various	-		695.0	-	695.0	Schedule 8, Tab 25
Total Transmission and Rural Operations	19,488.6		49,393.8	38,344.6	107,227.0	
Total Allowance for Unforeseen Items						
	-		1,000.0	-	1,000.0	
Total Capital Projects	36,033.1		78,181.9	53,769.1	167,984.1	



Appendix F

Project Definitions, Classifications, and Investment Classifications

Newfoundland and Labrador Hydro
2022 Capital Budget Application
Project Definitions, Classifications, and Investment Classificaitons

	Definition	Classification	Investment Classification
Generation			
Hydraulic Plant			
Hydraulic Generation Refurbishment and Modernization (2021-2022)	Pooled	Normal Capital	Renewal
Refurbish Ebbegunbaeg Control Structure	Clustered	Normal Capital	Renewal
Hydraulic Generation Refurbishment and Modernization (2022-2023)	Pooled	Normal Capital	Renewal
Hydraulic Generation In-Service Failures (2022)	Pooled	Normal Capital	Renewal
Thermal Plant			
Upgrade Waste Water Equalization System - Holyrood	Other	Normal Capital	Renewal
Upgrade Distributed Control System Hardware - Holyrood	Other	Normal Capital	Renewal
Replace Underground Fire Water Distribution System - Holyrood	Other	Normal Capital	General Plant
Unit 3 Generator Components Condition Assessment and Miscellaneous Upgrades	Clustered	Normal Capital	Renewal
Thermal In-Service Failures (2022)	Pooled	Normal Capital	Renewal
Upgrade Wastewater Treatment Plant 600 V Variable Frequency Drives - Holyrood	Other	Normal Capital	Renewal
Air Receivers Condition Assessment and Upgrades - Holyrood	Clustered	Normal Capital	Renewal
Boiler Condition Assessment and Miscellaneous Upgrades - Holyrood	Clustered	Normal Capital	Renewal
Turbine Valve Overhaul Unit 3 - Holyrood	Other	Normal Capital	Renewal
Major Pumps Overhaul - Holyrood	Other	Normal Capital	Renewal
Gas Turbines			
Replace Fuel Oil, Lube Oil, and Glycol Pumps - Happy Valley Gas Turbine	Other	Normal Capital	Renewal
Perform Combustor Inspection - Holyrood Gas Turbine	Other	Normal Capital	Renewal
Replace Voltage Regulator - Happy Valley Gas Turbine	Other	Normal Capital	Renewal
Upgrade Compressed Air System - Happy Valley Gas Turbine	Other	Normal Capital	Renewal
Install Infrared Scanning Ports - Happy Valley Gas Turbine	Other	Normal Capital	Service Enhancement
Control System Replacement - Holyrood Gas Turbine	Other	Normal Capital	Renewal
Tools and Equipment			
Purchase Tools and Equipment Less than \$50,000 (2022) - Hydraulic Plants	Pooled	Normal Capital	General Plant
Purchase Tools and Equipment Less than \$50,000 (2022) - Thermal Plants	Pooled	Normal Capital	General Plant
Purchase Tools and Equipment Less than \$50,000 (2022) - Gas Turbine	Pooled	Normal Capital	General Plant

Newfoundland and Labrador Hydro
2022 Capital Budget Application
Project Definitions, Classifications, and Investment Classificaitons

	Definition	Classification	Investment Classification
Transmission and Rural Operations			
Terminal Stations			
Terminal Station Refurbishment and Modernization (2021-2022)	Pooled	Normal Capital	Renewal
Upgrade Circuit Breakers (2021-2022) - Various	Pooled	Normal Capital	Renewal
Upgrades for Future Retirement of Stephenville Gas Turbine	Clustered	Justifiable	Service Enhancement
Wabush Terminal Station Upgrades	Clustered	Normal Capital	System Growth
Additions for Load - Wabush Substation Upgrades	Clustered	Normal Capital	System Growth
Terminal Station Refurbishment and Modernization (2022-2023)	Pooled	Normal Capital	Renewal
Terminal Station In-Service Failures (2022)	Pooled	Normal Capital	Renewal
Upgrade Circuit Breakers (2022-2023) - Various	Pooled	Normal Capital	Renewal
Transmission			
Wood Pole Line Management Program (2022)	Pooled	Normal Capital	Renewal
Distribution			
Provide Service Extensions (2022) - Various	Pooled	Normal Capital	Access
Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights (2022) - Various	Pooled	Normal Capital	Renewal
Upgrade of Worst-Performing Distribution Feeders (2021-2022)	Pooled	Justifiable	Renewal
Upgrade of Worst-Performing Distribution Feeders (2022-2023)	Other	Justifiable	Renewal
Additions for Load (2022) - Distribution System - Mary's Harbour Voltage Conversion	Clustered	Normal Capital	System Growth
Install Recloser Remote Control (2022-2023) - Various	Pooled	Normal Capital	Service Enhancement
Labrador City L22 Voltage Conversion (2022-2023)	Other	Normal Capital	Service Enhancement
Generation			
Diesel Genset Replacements (2021-2022)	Other	Normal Capital	Renewal
Diesel Genset Replacement Unit 2039 - St. Lewis	Other	Normal Capital	Renewal
Diesel Genset Replacement Unit 2012 - L'Anse-Au-Loup	Other	Normal Capital	Renewal
Upgrade Fuel Storage Tanks (2022) - Mary's Harbour	Other	Normal Capital	Renewal
Overhaul Diesel Units (2022) - Various	Pooled	Normal Capital	Renewal
Install Fire Protection in Diesel Plants (2022-2023) - Ramea	Other	Normal Capital	Service Enhancement
Additions for Load (2022) - Mary's Harbour Service Conductor	Clustered	Normal Capital	System Growth
Metering			
Replace Metering System	Other	Justifiable	Service Enhancement
Tools and Equipment			
Purchase Tools and Equipment Less than \$50,000 (2022) - Central Region	Pooled	Normal Capital	General Plant
Purchase Tools and Equipment Less than \$50,000 (2022) - Northern Region	Pooled	Normal Capital	General Plant
Purchase Tools and Equipment Less than \$50,000 (2022) - Labrador Region	Pooled	Normal Capital	General Plant
Replace Light-Duty Mobile Equipment (2022) - Various	Pooled	Normal Capital	General Plant
Purchase 85' Material Handler Aerial Device on Track Unit	Other	Normal Capital	General Plant
Purchase 46' Material Handler Aerial Device on Track Unit	Other	Normal Capital	General Plant

Newfoundland and Labrador Hydro
2022 Capital Budget Application
Project Definitions, Classifications, and Investment Classificaitons

	Definition	Classification	Investment Classification
General Properties			
Information Systems - Software Applications			
Upgrade Energy Management System (2022) - Hydro Place	Other	Normal Capital	General Plant
Perform Software Upgrades and Minor Enhancements (2022) - Hydro Place	Pooled	Normal Capital	General Plant
Refresh Cyber Security Infrastructure (2022) - Hydro Place	Other	Normal Capital	General Plant
Hydro Command Centre Upgrade (2022) - Hydro Place	Other	Normal Capital	General Plant
Replacement of Short-Term Load Forecasting Software	Other	Normal Capital	General Plant
Information Systems - Computer Operations			
Purchase Personal Computers (2022) - Hydro Place	Other	Normal Capital	General Plant
Replace Peripheral Infrastructure (2022) - Hydro Place	Other	Normal Capital	General Plant
Upgrade Core IT/OT Infrastructure (2022) - Hydro Place	Other	Normal Capital	General Plant
Telecontrol - Network Services			
Purchase Tools and Equipment Less than \$50,000 (2022)	Pooled	Normal Capital	General Plant
Replace Battery Banks and Chargers (2022) - Various	Pooled	Normal Capital	Renewal
Replace Network Communications Equipment (2022)	Pooled	Normal Capital	General Plant
Upgrade Site Facilities (2022) - Various	Other	Normal Capital	General Plant
Replace Radomes (2022) - Various	Pooled	Normal Capital	Renewal
Upgrade Remote Terminal Units (2022) - Various	Pooled	Normal Capital	Renewal
Replace Mobile Devices	Other	Normal Capital	General Plant
Transportation			
Replace Light- and Heavy-Duty Vehicles (2021-2022)	Pooled	Normal Capital	General Plant
Replace Light- and Heavy-Duty Vehicles (2022-2024)	Pooled	Normal Capital	General Plant
Administration			
Replace Transfer Switches and Associated Hardware - Hydro Place	Other	Normal Capital	General Plant
Purchase Office Equipment Less Than \$50,000 (2022)	Pooled	Normal Capital	General Plant
Remove Safety Hazards (2022) - Various	Pooled	Normal Capital	Service Enhancement
Total General Properties			



Appendix G

Prior Approved Multi-Year Project Reassessment

Table G-1: Prior Approved Multi-Year Project Reassessment (\$000)

Project Description	2022 Budget	2023 Budget	Total Budget	2022 Revised Budget	2023 Revised Budget	Total Revised Budget
Hydraulic Generation Refurbishment and Modernization (2021-2022)						
Refurbish Generator Stator – Unit 6 - BDE ⁵²	5,203.5	-	9,160.9	3,703.5	-	7,660.9
Terminal Station Refurbishment and Modernization (2021-2022)						
Install Fire Suppression- MDR ⁵³ (2021–2022)	556.0	-	656.2	428.8	-	529.0
Replace Station Lighting - STB ⁵⁴ (2021–2022)	231.8	-	278.9	134.3	-	181.4
Standalone						
Upgrade Circuit Breakers - Various (2021–2022)	6,113.9	-	11,532.7	4,293.6	820.30	10,532.7
Upgrades for the Future Retirement of the Stephenville Gas Turbine ⁵⁵	8,389.5	-	9919.8	5,344.5	-	6,874.8
Additions for Load – Wabush Substation (2021–2023)	6,365.1	2,942.0	10,493.4	6,253.0	3,053.70	10,493.0
Diesel Genset Replacements - NAN ⁵⁶	525.0	-	3085.0	286.2	-	2,846.2

⁵² Bay d’Espoir Hydroelectric Generating Facility (“BDE”).

⁵³ Massey Drive Terminal Station (“MDR”).

⁵⁴ Stony Brook Terminal Station (“STB”).

⁵⁵ Bottom Brook Terminal Station (“BBK”).

⁵⁶ Nain Diesel Generating Station (“NAN”).

Appendix H

Project Prioritization

Prioritization Explanations

Table H-1 shows the ranking of Hydro's 2022 capital projects. Rank 1 indicates the projects of the highest importance. Projects that received the same score through the prioritization process have the same ranking. The five projects that are classified as Rank 1 are considered high-priority projects that are required to address safety or system load issues. Please note that the non-prioritized projects ranked "*" in the table are the continuation of multi-year projects.

Table H-1: Project Prioritization

Project Description	Cost (\$000)	Rank	Cumulative Project Cost (\$000)
Multi-Year Projects Previously Approved	43,187.2	*	43,187.2
TRO Service Extensions and Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights	7,453.9	*	50,641.1
Transportation	569.0	*	51,210.1
Tools and Equipment	1,521.0	*	52,731.1
Allowance for Unforeseen Items	1,000.0	*	53,731.1
Upgrade Circuit Breakers (2022-2023) - Various	2,121.9	1	55,853.0
Additions for Load (2022) – Distribution System – Mary's Harbour Voltage Conversion	550.6	1	56,403.6
Additions for Load (2022) – Mary's Harbour Service Conductor	307.8	1	56,711.4
Remove Safety Hazards (2022) – Various	199.6	1	56,911.0
Hydraulic Generation Refurbishment and Modernization (2022–2023)	2,970.6	2	59,881.6
Terminal Station Refurbishment and Modernization (2022–2023)	3,111.9	2	62,993.5
Thermal In-Service Failures (2022)	2,000.0	3	64,993.5
Terminal Station In-Service Failures (2022)	900.0	3	65,893.5
Hydraulic Generation In-Service Failures (2022)	1,000.0	3	66,893.5
Upgrade Fuel Storage Tanks (2022) - Mary's Harbour	499.1	4	67,392.6
Boiler Condition Assessment and Miscellaneous Upgrades – Holyrood	3,014.2	5	70,406.8
Overhaul Diesel Units (2022) – Various	1,360.5	6	71,767.3
Turbine Valve Overhaul Unit 3 – Holyrood	3,623.5	7	75,390.8
Diesel Genset Replacements (2022–2023)	736.9	8	76,127.7
Major Pumps Overhaul – Holyrood	491.3	9	76,619.0
Control System Replacement – Holyrood Gas Turbine	146.0	10	76,765.0
Wood Pole Line Management Program (2022)	1,603.5	11	78,368.5
Install Recloser Remote Control (2022–2023) - Various	174.6	12	78,543.1
Unit 3 Generator Components Condition Assessment and Miscellaneous Upgrades	153.0	13	78,696.1

Project Description	Cost (\$000)	Rank	Cumulative Project Cost (\$000)
Install Fire Protection in Diesel Plants (2022–2023) – Ramea	90.7	14	78,786.8
Labrador City L22 Voltage Conversion (2022–2023)	486.8	15	79,273.6
Upgrade of Worst-Performing Distribution Feeders (2022–2023)	850.0	16	80,123.6
Air Receivers Condition Assessment and Upgrades – Holyrood	336.5	17	80,460.1
Upgrade Wastewater Treatment Plant 600 V Variable Frequency Drives - Holyrood	70.1	18	80,530.2
Replace Underground Fire Water Distribution System - Holyrood	128.3	19	80,658.5
Replace Metering System	515.6	20	81,174.1
Computer Technology System Support	2,630.4	21	83,804.5
Install Infrared Scanning Ports – Happy Valley Gas Turbine	39.6	22	83,844.1
Network Services Infrastructure System Support	43,187.2	23	84,714.0

- 1 Table H-2 presents the prioritization criteria and the assigned weights used for the 2022 CBA.

Table H-2: Prioritization Criteria and Weight Factors

Criteria	Factors	Factor Weights
1 Work Classification (Maximum Weight = 85)	Normal	5
	Justifiable: Payback (70)	15
	Justifiable: Payback (40)	45
	Justifiable: Payback (10)	85
2 NPV ⁵⁷ (Maximum Weight = 85)	NPV (\$0)	0
	NPV (< \$100,000)	5
	NPV (< \$500,000)	15
	NPV (< \$1,000,000)	45
	NPV (> \$1,000,000)	85
3 Goal 1: Safety (Maximum Weight = 100)	Minor	10
	Treatment	50
	Lost Time	80
	Disability	100
4 Goal 2: Environment (Maximum Weight = 100)	None	10
	Minor	50
	Moderate	80
	Significant	100
5 Goals 3–5: Alignment (Maximum Weight = 65)	None	15
	Maps but no Documentation	40
	Maps but with Documentation	65

⁵⁷ Net present value (“NPV”).

Criteria	Factors	Factor Weights
6 Schedule Risk (Maximum Weight = 65)	External and Internal Conflicts	10
	Externals Affecting Completion	20
	No External but Internal Conflicts	40
	No Conflicts	65
7 Continue Service to Customers (Maximum Weight = 70)	Can	20
	Can but with High Costs	50
	Cannot	70
8 Number of Customers Impacted (Maximum Weight = 70)	<100	10
	<1000	30
	<10,000	50
	>10,000	70
9 System Impact: Critical to . . . (Maximum Weight = 90)	None Specific	5
	System with Standby Unit	50
	Plant or Station	70
	Entire System	90
10 Impact Intensity (Maximum Weight = 90)	Minor	4
	Moderate	40
	Significant	70
	High	90
11 Loss Type: Loss of . . . (Maximum Weight = 90)	No Type	5
	Equipment	40
	Facility	50
	Production	70
	Customer Delivery	90
12 Loss Mitigation (Maximum Weight = 90)	Redundant Unit	30
	Back-up Option	60
	Nothing	90
13 Percent Improvement in Five-Year Average SAIDI ⁵⁸ or SAIFI ⁵⁹ (Maximum Weight = 50)	% SAIDI or SAIFI (0)	0
	% SAIDI or SAIFI (< 1)	10
	% SAIDI or SAIFI (< 2)	15
	% SAIDI or SAIFI (< 3)	30
	% SAIDI or SAIFI (> 3)	50
14 Estimated Project Cost Range (Maximum Weight = 50)	N.R.P. ⁶⁰	0
	Cost (> \$1,000,000)	5
	Cost (\$500,000 to \$1,000,000)	15
	Cost (\$200,000 to \$500,000)	30
	Cost (< \$200,000)	50

⁵⁸ System Average Interruption Duration Index ("SAIDI").

⁵⁹ System Average Interruption Frequency Index ("SAIFI").

⁶⁰ Non-reliability project ("N.R.P").

Level 1

Immediate High-Priority Projects

Extreme Safety

The project is required to prevent an incident that could cause a fatality or correct a condition that otherwise left unattended may lead to a fatality.

Mandatory

A capital expenditure that Hydro is obliged to carry out as a result of legislation, Board Order, environmental or safety risk.

Load Driven

The project is needed to meet load requirements determined by Hydro's latest load forecasts. Without the project, Hydro's firm load and/or reliability criteria will be compromised.

Level 2

Work Classification

Normal

A capital expenditure which is required based on an identified need or historical patterns of repair and replacement.

Justifiable

A capital expenditure which is justified based on a positive cost savings for Hydro. A cost-benefit analysis is required for the project.

Payback (70)

A cost-benefit analysis indicates that the payback period for the project is within 70% of the anticipated life of the project.

Payback (40)

A cost-benefit analysis indicates that the payback period for the project is within 40% of the anticipated life of the project.

Payback (10)

A cost-benefit analysis indicates that the payback period for the project is within 10% of the anticipated life of the project.

Net Present Value

NPV (\$0)

The capital proposal generates \$0 cost savings to Hydro.

NPV (< \$100,000)

A cost-benefit analysis indicates that the capital proposal generates a positive cost savings of less than \$100,000 for Hydro.

NPV (< \$500,000)

A cost-benefit analysis indicates that the capital proposal generates a positive cost savings of less than \$500,000 for Hydro.

NPV (< \$1,000,000)

A cost-benefit analysis indicates that the capital proposal generates a positive cost savings of less than \$1,000,000 for Hydro.

NPV (> \$1,000,000)

A cost-benefit analysis indicates that the capital proposal generates a positive cost savings of more than \$1,000,000 for Hydro.

Goal 1: Safety

Minor

The project has no or minor safety issues that are insignificant in impact.

Treatment

The project is required to prevent an incident or correct a condition that otherwise left unattended may result in the need for medical treatment.

Lost Time

The project is required to prevent an incident or correct a condition that otherwise left unattended may result in worker(s) incurring lost time for a short duration.

Disability

The project is required to prevent an incident or correct a condition that otherwise left unattended may result in worker(s) incurring long-time leave due to inability to continue working on the job.

Goal 2: Environment

None

The project has no environmental issues.

Minor

The project is required to prevent an incident or correct a condition that otherwise left unattended may result in an environmental impact that:

- Is irreversible within 2 years; and/or
- Will cost more than \$10,000 to mitigate; and/or
- Has aspects observed on Hydro's property (at point of impact); and/or
- Is perceived as in conflict with specific individuals in the local community.

Moderate

The project is required to prevent an incident or correct a condition that otherwise left unattended may result in an environmental impact that:

- Is irreversible within 4 years; and/or
- Will cost more than \$25,000 to mitigate; and/or
- Has aspects observed within a 1 kilometre radius of Hydro's property (from point of impact); and/or
- Is perceived as in conflict with the local community or other industries.

Significant

The project is required to prevent an incident or correct a condition that otherwise left unattended may result in an environmental impact that:

- Is irreversible within the foreseeable future; and/or
- Will cost more than \$50,000 to mitigate and/or
- Has aspects observed at more than 5 kilometre radius of Hydro's property (from point of impact); and/or
- Is perceived as in conflict with the local community and the general public and other industries.

Goals 3–5 Alignment

None

This project does not align with or support any department or corporate goals or objectives.

Maps but no Documentation

This project does align with or support a department or corporate goal or objective but no documentation exists to describe how it maps to the goal or objective.

Maps but with Documentation

This project does align with or support a department or corporate goal or objective and there is documentation that clearly describes how.

Schedule Risk

Externals and Internal Conflicts

The project has external (to Hydro) dependencies that affect the completion of the project on time and on budget and has major interfaces with other internal initiatives. Examples of external dependencies are: non-Hydro projects that interfere with Hydro proceeding with its project, unavailability of external contractors, etc.

Externals Affecting Completion

The project has only external dependencies that affect the completion of the project on time and on budget.

No Externals but Internal Conflicts

The project conflicts with other internal initiatives that affect the completion of the project on time and on budget.

No Conflicts

The project will not encounter any external or internal conflicts that affect its completion.

Continue Service to Customers

Can

Service to customers can continue whether or not this project proceeds. Customers can be defined as either internal or external to Hydro.

Can but with High Costs

Service to customers can continue whether or not this project proceeds but a delay in the project will result in Hydro incurring costs. Customers can be defined as either internal or external to Hydro.

Cannot

Service to customers cannot continue without this project. Customers can be defined as either internal or external to Hydro.

Customers Impacted

<100

The project will impact up to 100 customers.

< 1,000

The project will impact up to 1,000 customers.

< 10,000

The project will impact up to 10,000 customers.

> 10,000

The project will impact more than 10,000 customers.

System Impact: Critical to . . .

None Specific

The project is not critical to any particular system.

System with Standby Unit

The project is critical to a system that has a standby unit which could be used to maintain operation or support continued service in the event of failure.

Plant or Station

The project is critical to the proper operation of a generating plant or a terminal station.

Entire System

The project is critical to ensure the reliable operation of the Hydro system.

Impact Intensity

Minor

If this project does not proceed, the repair time is ***less than half*** the Maximum Acceptable Downtime (“MAD”) of 830 MWh of unsupplied energy or 2 days (whichever comes first).

Moderate

If this project does not proceed, the repair time is ***greater than the half but less than 90%*** of the MAD of 830 MWh of unsupplied energy or 2 days (whichever is comes first).

Significant

If this project does not proceed, the repair time is ***within plus or minus 10%*** of the MAD of 830 MWh of unsupplied energy or 2 days (whichever is comes first).

High

If this project does not proceed, the repair time ***exceeds by more than 10%*** the MAD of 830 MWh of unsupplied energy or 2 days (whichever is comes first).

Loss Type: Loss of . . .

No Type

If the project does not proceed, no loss is expected.

Equipment

If the project does not proceed, there exists a risk of the loss of some equipment.

Facility

If the project does not proceed, there exists a risk of the loss of a facility.

Production

If the project does not proceed, there exists a risk of the loss of production at a Hydro generating plant.

Customer Delivery

If the project does not proceed, there exists a risk of being unable to deliver power to Hydro customer(s).

Loss Mitigation

Redundant Unit

If the project does not proceed the expected loss will be mitigated by a redundant unit present on the system.

Back-Up Option

If the project does not proceed the expected loss will be mitigated by a back-up option which ensures that service continues.

Nothing

This project is required because there is no available means to mitigate the expected loss.

Percent Improvement in Five-Year Average SAIDI or SAIFI

% SAIDI or SAIFI (0)

This project will have no effect on SAIDI or SAIFI. All non-reliability projects will receive this rating.

% SAIDI or SAIFI (<1)

This project is expected to improve the SAIDI or SAIFI factor by less than 1%.

% SAIDI or SAIFI (<2)

This project is expected to improve the SAIDI or SAIFI factor by less than 2% but greater than 5% is implied.

% SAIDI or SAIFI (<3)

This project is expected to improve the SAIDI or SAIFI factor by less than 3% but greater than 10% is implied.

% SAIDI or SAIFI (>3)

This project is expected to improve the SAIDI or SAIFI factor by at least 3%.

Estimated Project Cost Range

Non-Reliability Project

This project is a N.R.P.

Cost (> \$1,000,000)

The cost of the project is estimated to be more than \$1,000,000.

Cost (\$500,000–\$1,000,000)

The cost of the project is estimated to be between \$500,000 and \$1,000,000.

Cost (\$200,000–\$500,000)

The cost of the project is estimated to be between \$200,000 and \$500,000.

Cost (< \$200,000)

The cost of the project is estimated to be less than \$200,000.

Probability

Not Likely

The risk of the impact is very low if the project does not proceed. It would be surprising that there is an impact.

Low Likelihood

The risk of the impact is low if the project does not proceed. There is about 30% chance of the impact in the proposal year. It's less likely to happen than not.

Likely

The risk of the impact is possible if the project does not proceed. There is about 50% chance of the impact in the proposal year. It's as likely to happen as not.

Highly Likely

The risk of the impact is considerable if the project does not proceed. There is about 75% chance of the impact in the proposal year. It's more likely to happen than not.

Near Certain

The risk of the impact is almost certain if the project does not proceed. There is more than 90% chance of the impact in the proposal year. It would be surprising if the impact did not occur.

Confidence Level

Low

The confidence in the assessment of the impact is low. There are some uncertainties that could significantly change the assessment. The projects risks are not well defined.

Medium

The confidence in the assessment of the impact is uncertain but most likely correct. There are some uncertainties that might moderately change the assessment. The project risks are defined but with some uncertainty.

High

The confidence in the assessment of the impact is very high. The uncertainties will not measurably change the assessment. The project risks are well defined and well controlled.\



2022 Capital Budget Application

Five-Year Capital Plan (2022–2026)



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Appendix A: Five-Year Capital Plan

Appendix B: Capital Expenditures 2017–2026

1.0 Introduction

In Board Order No. P.U. 30(2007), the Board of Commissioners of Public Utilities (“Board”) directed Newfoundland and Labrador Hydro (“Hydro”) to file a five-year capital expenditure plan. The Board indicated the plan should focus on strategic spending priorities and identify shifts in spending priorities over the five-year period, the circumstances contributing to these shifts, and alternative approaches under consideration.

Hydro’s five-year capital plan includes details on the costs and timing of forecast asset replacements and refurbishments. The five-year plan is revised considering evolving asset management practices, asset condition information, operational and system requirements, as well as operating environment factors. As such, Hydro’s 2022–2026 capital plan reflects the capital investments necessary to maintain infrastructure and provide safe, reliable, least-cost electricity for customers, while aiming to balance cost and reliability.

2.0 Five-Year Plan Overview

Hydro’s five-year plan reflects investment of approximately \$604 million in plant and equipment over the 2022–2026 period; \$585 million is related to expenditures to be recovered through customer rates, while \$19 million is related to transmission investments assets with up front contributions (i.e., specifically assigned assets) from Industrial customers. The average total annual capital expenditure is approximately \$121 million. The average annual capital expenditure to be recovered through customer rates is approximately \$117 million.

Over the period 2016–2020, the average annual capital expenditure was \$183 million,¹ primarily due to the construction of transmission lines TL 267 and TL 266. Excluding these, the average annual spend was approximately \$120 million. While the projects identified for the 2022–2026 period are primarily required for sustaining capital, the 2022–2026 capital plan also reflects expenditures related to capital upgrades required to accommodate growth in Labrador West (\$19 million), interconnection of the communities of southern Labrador (\$50 million),² life extension work at the Bay d’Espoir Penstocks (\$63

¹ Includes expenditures related to specifically assigned assets.

² “Long-Term Supply for Southern Labrador – Phase 1,” Newfoundland and Labrador Hydro, July 16, 2021.

million)³, fully contributed work for the Valentine Gold Interconnection project (\$12 million),⁴ and renewal of assets specifically assigned to industrial customers (\$7 million).⁵

3.0 Investment Drivers

Overall, capital expenditures in the five-year plan primarily reflect:

- Asset Renewal (\$398 million): Driven primarily by Hydro’s terminal station refurbishment and modernization, upgrade circuit breaker, hydraulic refurbishment and modernization, wood pole line management, and diesel unit replacement programs, which are required for the reliable operation of aging assets;⁶
- Service Enhancements (\$83 million): Driven primarily by the interconnection of southern Labrador communities, upgrades for the future retirement of the Stephenville Gas Turbine, upgrades to Hydro’s metering system, and upgrades to TL 202 and Wabush L23/L24;
- General Plant (\$66 million): Driven primarily by the requirement to install plant heating at the Holyrood Thermal Generating Station (“Holyrood TGS”) following the transition to a synchronous condensing facility, along with renewal of Hydro’s information systems, transportation, and telecontrol assets;
- Access (\$31 million): Driven primarily by the fully contributed Valentine Gold Interconnection project; and
- System Growth (\$25 million): Driven primarily by projects to accommodate load growth in Labrador West.

Hydro has assessed all proposed projects with respect to the criticality and condition of the assets and has determined that, based on current operating conditions, deferring the work beyond this time frame

³ Capital investment requirement for Bay d’Espoir penstocks is based on a preliminary estimate. Hydro currently has work ongoing to finalize the penstock life extension plan and investment requirements will be further refined through that process. Hydro expects to file a related supplemental for phase 1 of this project with the Board in 2022, with phase 2 planned to commence in 2025.

⁴ “Valentine Gold Interconnection,” Newfoundland and Labrador Hydro, June 29, 2021.

⁵ Planned specifically assigned expenditures are included in the Terminal Station Refurbishment and Modernization and Upgrade Circuit Breaker Programs.

⁶ The majority of Hydro’s installed assets, including the hydroelectric installation at Bay d’Espoir, the Holyrood Thermal Generating Station, the Stephenville Gas Turbine, the Hardwoods Gas Turbine, and much of Hydro’s transmission and distribution systems, are more than 40–50 years old.

would present an unacceptable level of risk to the system. Hydro has planned the identified projects with a view to balancing capital expenditures with customer reliability, safety, and/or the environment.

4.0 Generation

The requirement to invest sustaining capital in generation facilities increased several years ago as parts of Hydro’s generating facilities approached or surpassed their normal expected service lives. Primary drivers for these projects are the end of service lives for equipment, deterioration causing reductions in reliability or performance, the availability of more efficient technology, and considerations for safety. Hydro’s 2022–2026 Capital Plan includes \$214.0 million for work related to Hydro’s generation assets.

4.1 Hydraulic

The condition of some key components of Hydro’s hydraulic facilities, including auxiliary systems and equipment as well as the water control structures, have deteriorated and some have reached the end of their service lives. Capital investment is required in these areas to ensure the safe, reliable operation of the system. The 2022–2026 Capital Plan includes the continuation of the Hydraulic Generation Refurbishment and Modernization project, which consolidates program-based projects into a single project, ensuring that equipment is replaced or refurbished in a planned approach. It also includes the In-Service Failures Program, which is an allotment of funds to be used in the event that immediate refurbishment or replacement must be completed due to the occurrence of an actual failure, the identification of an incipient failure, or determination of faster than anticipated equipment deterioration.⁷

4.1.1 Bay d’Espoir Penstock Refurbishment

On September 22, 2019, Penstock 1 experienced a failure along a previously refurbished longitudinal weld, approximately 30 metres downstream from previous failures.⁸ Repairs were completed and the penstock was returned to service. Following the 2019 failure, Hydro commissioned SNC Lavalin to complete an investigation into the cause of the failure of Penstock 1, including a review and validation of

⁷ Work will not be completed under this program if it is more appropriate for it to be executed as unforeseen or through a capital budget supplemental project.

⁸ “Bay d’Espoir Penstock Failure and Analysis,” Newfoundland and Labrador Hydro, November 12, 2019.

the engineering content of previous reports⁹ on the Bay d’Espoir penstocks. Hatch Limited was also engaged to provide the opportunity for incorporation, where appropriate, of SNC Lavalin’s findings into its previously issued report.¹⁰

Following receipt of the consultants’ reports, Hydro completed a review of the findings and developed a process to assess the life extension of the penstock.¹¹ Work is ongoing to finalize a life extension plan for the penstocks. Hydro expects to have its front-end engineering design work completed in November 2021, following which a proposed execution strategy will be finalized. A supplementary capital application for this project is anticipated to be filed in 2022.

Hydro has included \$63 million in capital investment for the period 2022–2026 to reflect a phased life extension plan for the Bay d’Espoir penstocks. This estimate is preliminary and will be refined through the current work ongoing; as a preliminary indication of expected cost, Hydro has included the estimated level of expenditure in its five-year capital plan. The timing of hydraulic generation expenditures is set to align with the major outages associated with future penstock life extension work, including planned work for the refurbishment of Bay d’Espoir intake gate and surge tank #1, now planned for 2024.

Hydro continues to carry out annual inspections on the Bay d’Espoir penstocks as part of its monitoring program. Hydro’s 2021 inspections revealed further cracking on Penstock 1, while Penstock 2 did not contain any cracks.

4.2 Thermal

The Holyrood TGS is currently a critical part of the Island Interconnected System and is required to provide safe and reliable electricity. Hydro has committed to having the Holyrood TGS fully available for generation until March 31, 2023¹² to ensure reliable service for customers while the Muskrat Falls Project assets are brought online and proven reliable. Capital investment related to the generation

⁹ “Bay d’Espoir Penstock 1 Refurbishment,” Newfoundland and Labrador Hydro, January 9, 2017; “Bay d’Espoir Penstock 1 Emergency Refurbishment,” Newfoundland and Labrador Hydro, January 19, 2018; “Bay d’Espoir Penstock 3 Emergency Refurbishment,” Newfoundland and Labrador Hydro, August 2, 2018; “Bay d’Espoir Level II Condition Assessment of Penstocks No. 1, 2, and 3,” Hatch Limited, December 17, 2018; “Condition Assessment and Refurbishment Options for Penstocks No. 1, 2 and 3,” Hatch Limited, March 29, 2019; and “Penstock No.’s 1, 2 and 3 Life Extension Options,” Hatch Limited, July 30, 2019.

¹⁰ “Penstock No.’s 1, 2 and 3 Life Extension Options,” Hatch Limited, July 30, 2019.

¹¹ 2019 Failure of Bay d’Espoir Penstock 1 and Plan Regarding Life Extension,” Newfoundland and Labrador Hydro, June 3, 2020.

¹² “The Liberty Consulting Group Eighth Quarterly Monitoring Report on the Integration of Power Supply Facilities to the Island Interconnected System – Monthly Update,” Newfoundland and Labrador Hydro, September 28, 2020.

function of the Holyrood TGS is necessary to support system reliability. The 2022–2026 capital plan reflects capital work required both for generation (steam) and synchronous condenser (post steam) operations; the five-year plan reflects generation-related investment for 2022 only given the current retirement date of March 31, 2023. Further detail on the operational outlook and 2022–2026 capital expenditure requirements for the Holyrood TGS is found in Schedule 3, Holyrood Thermal Generating Station Overview – Future Operation and Capital Expenditure Requirements.

4.3 Gas Turbines

Hydro’s gas turbine assets are relied upon to provide stand-by and spinning reserve power and to function as synchronous condensers (with the exception of the Holyrood Gas Turbine) to support voltage control. These facilities accumulate fewer operating hours than other generation sources; however, they are critical to system reliability as they are crucial sources of electricity during system peaks or for other system component planned and unplanned outages. Capital investment planned for 2022–2026 related to the gas turbines is primarily related to inspections at the Holyrood Gas Turbine which are scheduled to occur in 2022 and 2026.

The Holyrood Gas Turbine combustor inspection, originally scheduled to take place in 2021, is now scheduled to take place in 2022.¹³ A major inspection at the Holyrood Gas Turbine is slated for execution in 2026. The timing of the major inspection may shift depending on the number of equivalent starts or equivalent base hours.

In addition to the inspection projects, there are planned expenditures related to upgrades to the rotor at the Holyrood Gas Turbine in 2026, inspection of the Holyrood Gas Turbine fuel storage in 2024, and a number of smaller planned expenditures related to sustaining capital.

There are no capital proposals in the five-year plan for the other gas turbines. The Hardwoods and Stephenville Gas Turbines are slated to be retired on the same schedule as the Holyrood TGS.¹⁴

¹³ The timing of the combustor inspection and overhaul is dependent on the number of equivalent starts of the combustion turbine. The Holyrood Combustion Turbine is forecast to reach the threshold for inspection and overhaul in 2022.

¹⁴ “Near-Term Reliability Report,” Newfoundland and Labrador Hydro, May 17, 2021.

5.0 Transmission and Rural Operations

Hydro’s 2022–2026 Capital Plan includes \$349.6 million for work related to Hydro’s Transmission and Rural Operations assets. Primary drivers for these projects are the end of service lives for equipment, deterioration causing reductions in reliability or performance, and additions required to accommodate load growth in Labrador West.

5.1 Terminal Stations

Capital investment is required in Hydro’s terminal stations to ensure the safe, reliable operation of the system. The 2022–2026 capital plan includes the continuation of the Terminal Station Refurbishment and Modernization project and the Upgrade Circuit Breakers project in all years of the plan. It also includes the In-Service Failures Program in all years, which is an allotment of funds to be used in the event that immediate refurbishment or replacement must be completed due to the occurrence of an actual failure, the identification of an incipient failure, or determination of faster than anticipated equipment deterioration.¹⁵

The 2022–2026 capital plan also includes plans to accommodate load growth in Labrador West, plans for replacement of the Wabush Substation Transformers T4 and T6, inspections of synchronous condensers at Wabush Terminal Station, installation of fire barriers at Bay d’Espoir Hydroelectric Generating Facility, and projects to install spill containment and replace station service and switchgear.

5.2 Transmission

The five-year transmission capital plan reflects \$34.9 million in expenditures, consisting of the Wood Pole Line Management (“WPLM”) Program (\$12.4 million), Upgrade Work on Wabush L23/L24 and TL 202 (\$10.1 million), and a fully contributed project for the Valentine Gold Interconnection project¹⁶ (\$12.3 million).

The WPLM Program is a critical component of Hydro’s asset management strategy for its wooden transmission poles. Over the five-year plan period, the WPLM Program averages \$2.5 million in expenditures annually. The WPLM Program is based on a structured, periodic assessment of the wood transmission poles and facilitates replacement in advance of failure while extracting the maximum

¹⁵ Work will not be completed under this program if it is more appropriate for it to be executed as unforeseen or through a capital budget supplemental project.

¹⁶ “Valentine Gold Interconnection,” Newfoundland and Labrador Hydro, June 29, 2021.

possible reliable life from each pole and component. The five-year plan also includes approximately \$10.1 million in investment related to expected upgrades to steel-tower transmission lines L23/L24 and TL 202. The investment is slated for the 2025 and 2026 time frames based on currently known deficiencies. Further assessment is required to understand the nature and scope of the work necessary.

5.3 Distribution

The majority of the \$68.3 million in distribution system expenditures for the next five years consist of service extensions, upgrades to distribution systems, distribution line replacement focused on worst-performing feeders, and a project to address load growth in Mary's Harbour.

Hydro's 2022–2026 capital plan includes expenditures related to the retirement of the remaining mercury vapour and high pressure sodium street lights in Hydro's system, which began in 2021. These street lights will be replaced with LED¹⁷ street lights. LED street lights require less maintenance, are more energy efficient, and provide more reliable and better quality lighting for customers, thus supporting the provision of least-cost reliable service to customers. Over the plan's five-year period, Hydro plans to invest approximately \$2.6 million related to this work.

5.4 Rural Generation

The five-year capital spend of \$100.3 million related to rural generation is largely impacted by the inclusion of projected expenditures for the interconnection of certain communities in southern Labrador. The remaining proposed expenditures are primarily focused on the overhaul and replacement of infrastructure required to ensure reliability for Hydro's isolated electrical systems, which are primarily supplied with electricity by diesel generating units. At each isolated system, Hydro has a typical installation of between three and five individual generating units.

Hydro's diesel generating units have the shortest lives of all its generating assets, requiring overhaul after 20,000 hours for 1,800 rpm units and 30,000 hours for 1,200 rpm units. Replacement of the diesel generating units typically occurs after approximately 100,000 hours of operation for 1,800 rpm units and 120,000 hours for 1,200 rpm units. As such, Hydro's capital investment plan for its diesel generating stations has an ongoing requirement for refurbishment or replacement. In addition, Hydro is continuing the installation of diesel plant fire protection, where appropriate. Projects for the inspection,

¹⁷ Light-emitting diode ("LED").

replacement, and upgrade of diesel generating station infrastructure and auxiliary systems are included over the coming five years.

5.4.1 Long-Term Supply for Labrador South

On July 16, 2021, Hydro filed a supplemental application for a four-year project to interconnect communities in southern Labrador, to be supplied by a single diesel generating station in Port Hope Simpson. Hydro has studied the interconnection of these communities since the early 2000s. This project serves as the long-term solution for the replacement of the Charlottetown Diesel Generating Station and provides an opportunity to reduce long-term capital and operating costs, improve reliability, and allow for increased future penetration of renewable energy sources in the region. Hydro's 2022–2026 capital plan includes \$48.8 million¹⁸ related to this project.

6.0 General Properties

General Properties includes items such as vehicles, facilities, and information systems infrastructure. These assets typically require replacement or refurbishment due to deterioration, age, and obsolescence. Hydro's 2022–2026 capital plan includes \$39.9 million related to General Properties.

6.1 Information Systems

Obsolete technology and aging hardware are the primary drivers of the \$12.5 million investment for Information Systems over the five-year plan period. Hydro's information systems provide the data required to effectively manage and control the activities of the business. Projects in this category include personal computer and software replacements, as well as upgrades to Hydro's cybersecurity software, upgrades to Hydro's Energy Management System, and replacement of the short-term load forecasting software.

6.2 Telecontrol

Obsolete technology and aging hardware are the most significant contributors to the five-year plan of \$7.4 million for telecontrol assets. Hydro's communications network is vital to the operation and control of the power systems. Communications must be reliable and rapid to protect and control the generation, transmission, and distribution equipment. The five-year plan contains expenditures in the form of several programs to replace battery banks and chargers, refurbish microwave sites, replace

¹⁸ Total project cost is \$49.9 million with expenditures commencing in 2021.

radomes, and replace obsolete radio equipment. A large quantity of battery banks and chargers associated with the Granite Canal Hydroelectric Generating Station and Hydro’s microwave network entered service in the early 2000s and are due for replacement in 2023 and 2024, resulting in higher levels of expenditures for replacement of battery banks and chargers in 2023 and 2024.

6.3 Transportation

The five-year plan includes \$17.0 million of investment related to light- and heavy-duty vehicles and electric vehicle charging stations for fleet purposes. Typically, in each capital budget application, Hydro has proposed a two-year plan for transportation investments. However, the project commencing in 2022 spans a three-year period to reflect the supply chain disruptions being experienced globally and the expected longer time frame required to procure vehicles. As a result, Hydro anticipates that its 2022–2024, 2023–2024, and 2024–2025 light- and heavy-duty vehicle replacement projects will overlap, resulting in higher transportation-related expenditures in 2024.

As part of its review of its capital proposals, Hydro identified light-duty fleet vehicles as an area of opportunity for potential savings in 2022. Hydro is materially reducing its proposed light-duty vehicle purchases in 2022 relative to that of prior years and intends to undertake a review of its light-duty vehicle fleet management strategy to determine whether its current practices optimize the value of its fleet. Hydro acknowledges that this reduced level of investment in the light-duty fleet likely cannot be sustained in the long term and will use the results of its review to develop future proposals which will reflect a level of spend that appropriately balances fleet safety and reliability with cost. As such, Hydro’s planned transportation-related expenditures for 2023–2026 are subject to change following this review.

Hydro’s vehicles and mobile equipment must continue to be both safe and reliable. Hydro operates a diversified and dispersed fleet of mobile equipment throughout the province that is required to operate and maintain our facilities in sometimes challenging and harsh physical environments. Hydro selects, operates, and maintains this equipment in a manner designed to achieve the least life cycle cost and replacements are scheduled in accordance with criteria previously submitted to the Board.

6.4 Administration

The five-year plan includes \$3.0 million of investment related to building infrastructure and auxiliary systems, office equipment, and safety-related expenditures. 2022 includes the completion of the multi-year project to replace transfer switches in the power backup system located at Hydro Place, while the

remaining planned expenditures for 2022–2026 are primarily driven by Hydro’s annual project to remove safety hazards.

7.0 Conclusion

Hydro’s five-year plan reflects investment of approximately \$604 million in plant and equipment over the 2022–2026 period; \$585 million is related to expenditures to be recovered through customer rates, while \$19 million is related to transmission investments assets with up front contributions (i.e., specifically assigned assets) from industrial customers.

Capital expenditures in the five-year plan are primarily driven by investments in:

- Asset renewal;
- Service Enhancements;
- General Plan;
- Access; and
- System Growth

Hydro has planned and identified projects with a view to balancing capital expenditures with customer reliability, safety, and/or the environment.



Appendix A

Five-Year Capital Plan

Newfoundland and Labrador Hydro
2022 Capital Budget Application
Five-Year Capital Plan
(\$000)

	Expended to 2021	2022	2023	2024	2025	2026	Total
Generation	15,468.9	28,136.8	31,665.2	77,980.8	33,987.7	42,275.7	229,515.1
General Properties	1,518.2	6,651.6	8,075.0	10,169.7	7,616.2	7,369.9	41,400.6
Transmission and Rural Operations	24,330.0	80,937.8	82,738.5	67,720.2	55,556.0	62,653.9	373,936.3
Allowance for Unforeseen Items	-	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	5,000.0
Total Capital Plan	41,317.1	116,726.2	123,478.7	156,870.7	98,159.9	113,299.5	649,852.1

Newfoundland and Labrador Hydro
2022 Capital Budget Application
Five-Year Capital Plan
(\$000)

	Expended to					Total
	2021	2022	2023	2024	2025	
Generation						
Gas Turbines	3,488.7	3,063.7	391.6	1,425.0	475.0	19,869.0
Hydraulic Plant	9,806.4	14,114.5	26,122.0	67,028.9	23,303.9	168,038.7
Thermal Plant	2,173.8	10,732.8	5,090.7	9,467.7	10,149.2	41,141.3
Tools and Equipment	-	225.8	60.9	59.2	59.6	466.1
Total Generation	15,468.9	28,136.8	31,665.2	77,980.8	33,987.7	229,515.1
General Properties						
Transportation	1,320.9	1,904.1	2,373.2	5,522.6	3,482.0	18,302.8
Administration	197.3	1,205.2	284.8	286.2	887.3	3,148.8
Information Systems	-	2,630.4	2,261.0	2,333.0	2,590.0	12,539.4
Telecontrol	-	911.9	3,156.0	2,027.9	656.9	7,409.6
Total General Properties	1,518.2	6,651.6	8,075.0	10,169.7	7,616.2	41,400.6
Transmission and Rural Operations						
Transmission	3,479.3	13,885.2	2,814.2	2,289.1	7,884.4	38,335.2
Distribution	318.9	10,321.5	12,488.5	12,934.1	16,042.4	68,585.7
Properties	-	-	1,162.3	3,274.8	1,184.0	6,801.1
Metering	-	515.6	3,965.6	1,094.6	100.0	5,775.8
Tools and Equipment	-	1,186.1	3,319.5	2,215.6	2,026.0	10,710.2
Terminal Stations	16,609.1	33,917.7	28,238.3	25,189.6	19,019.2	139,521.4
Generation	3,922.7	21,111.7	30,750.1	20,722.4	9,300.0	104,206.9
Total Transmission and Rural Operations	24,330.0	80,937.8	82,738.5	67,720.2	55,556.0	373,936.3
Allowance for Unforeseen Items						
Allowance for Unforeseen Items	-	1,000.0	1,000.0	1,000.0	1,000.0	5,000.0
Total Allowance for Unforeseen Items	-	1,000.0	1,000.0	1,000.0	1,000.0	5,000.0
Total Capital Plan	41,317.1	116,726.2	123,478.7	156,870.7	98,159.9	649,852.1

	Expended to						Total
	2021	2022	2023	2024	2025	2026	
Generation							
Gas Turbines							
Perform Combustor Inspection - Holyrood Gas Turbine	3,046.1	2,427.4	-	-	-	-	5,473.5
Replace Fuel Oil, Lube Oil, and Glycol Pumps - Happy Valley Gas Turbine	234.7	170.5	-	-	-	-	405.2
Replace Voltage Regulator - Happy Valley Gas Turbine	131.3	211.0	-	-	-	-	342.3
Upgrade Compressed Air System - Happy Valley Gas Turbine	76.6	69.2	-	-	-	-	145.8
Control System Replacement - Holyrood Gas Turbine	-	146.0	41.0	-	-	-	187.0
Install Infrared Scanning Ports - Happy Valley Gas Turbine	-	39.6	25.6	-	-	-	65.2
Gas Turbine In-Service Failures (2023)	-	-	250.0	-	-	-	250.0
Replace Demister - Happy Valley Gas Turbine	-	-	50.0	-	-	-	50.0
Install Heated Spare Parts and Lube Oil Storage - Happy Valley Gas Turbine	-	-	25.0	50.0	-	-	75.0
Inspect Fuel Tank - Holyrood Gas Turbine	-	-	-	1,000.0	-	-	1,000.0
Gas Turbine In-Service Failures (2024)	-	-	-	375.0	-	-	375.0
Gas Turbine In-Service Failures (2025)	-	-	-	-	375.0	-	375.0
Inspect Fuel Tanks - Happy Valley Gas Turbine	-	-	-	-	100.0	500.0	600.0
Gas Turbine Major Inspection - Holyrood Gas Turbine	-	-	-	-	-	7,500.0	7,500.0
Upgrade Rotor - Holyrood Gas Turbine	-	-	-	-	-	2,000.0	2,000.0
Refurbish Air Intake	-	-	-	-	-	600.0	600.0
Gas Turbine In-Service Failures (2026)	-	-	-	-	-	375.0	375.0
Replace Glycol Cooler Coil - Happy Valley Gas Turbine	-	-	-	-	-	50.0	50.0
Total Gas Turbines	3,488.7	3,063.7	391.6	1,425.0	475.0	11,025.0	19,869.0
Hydraulic Plant							
Hydraulic Generation Refurbishment and Modernization (2021-2022)	6,569.6	5,005.6	-	-	-	-	11,575.2
Refurbish Ebbegunbaeg Control Structure	3,236.8	3,238.3	3,470.1	3,674.7	-	-	13,619.9
Hydraulic Generation Refurbishment and Modernization (2022-2023)	-	2,970.6	3,788.9	-	-	-	6,759.5
Penstock Life Extension - Phase 1 (2022-2024)	-	1,900.0	8,200.0	42,700.0	-	-	52,800.0
Hydraulic Generation In-Service Failures (2022)	-	1,000.0	-	-	-	-	1,000.0
Hydraulic Generation Refurbishment and Modernization (2023-2024)	-	-	8,813.0	9,395.0	4,045.0	45.0	22,298.0
Hydraulic Generation In-Service Failures (2023)	-	-	1,250.0	-	-	-	1,250.0
Replace Controllers - Granite Canal	-	-	500.0	500.0	500.0	200.0	1,700.0
Refurbish CD4 Rip Rap - Cat Arm	-	-	100.0	500.0	-	-	600.0
Hydraulic Generation Refurbishment and Modernization (2024-2025)	-	-	-	5,481.1	3,350.0	-	8,831.1
Bay d'Espoir Intake Gate 1 Refurbishment	-	-	-	2,071.2	-	-	2,071.2
Bay d'Espoir Surge Tank 1 Refurbishment	-	-	-	1,456.9	-	-	1,456.9
Hydraulic Generation In-Service Failures (2024)	-	-	-	1,250.0	-	-	1,250.0
Hydraulic Generation Refurbishment and Modernization (2025-2026)	-	-	-	-	12,258.9	1,320.0	13,578.9
Penstock Life Extension - Phase 2 (2025-2027)	-	-	-	-	1,900.0	8,200.0	10,100.0
Hydraulic Generation In-Service Failures (2025)	-	-	-	-	1,250.0	-	1,250.0
Hydraulic Generation Refurbishment and Modernization (2026-2027)	-	-	-	-	-	13,339.2	13,339.2
Bay d'Espoir Intake Gate 2 Refurbishment	-	-	-	-	-	1,958.8	1,958.8
Refurbish Hydraulic Structures	-	-	-	-	-	1,350.0	1,350.0
Hydraulic Generation In-Service Failures (2026)	-	-	-	-	-	1,250.0	1,250.0
Total Hydraulic Plant	9,806.4	14,114.5	26,122.0	67,028.9	23,303.9	27,663.0	168,038.7

Newfoundland and Labrador Hydro
2022 Capital Budget Application
Five-Year Capital Plan
(\$000)

	Expended to						Total
	2021	2022	2023	2024	2025	2026	
Thermal Plant							
Upgrade Waste Water Equalization System - Holyrood	1,813.4	547.7	-	-	-	-	2,361.1
Upgrade Distributed Control System Hardware - Holyrood	360.4	368.2	-	-	-	-	728.6
Turbine Valve Overhaul Unit 3 - Holyrood	-	3,623.5	-	-	-	-	3,623.5
Boiler Condition Assessment and Miscellaneous Upgrades - Holyrood	-	3,014.2	-	-	-	-	3,014.2
Thermal In-Service Failures (2022)	-	2,000.0	-	-	-	-	2,000.0
Major Pumps Overhaul - Holyrood	-	491.3	-	-	-	-	491.3
Air Receivers Condition Assessment and Upgrades - Holyrood	-	336.5	-	-	-	-	336.5
Unit 3 Generator Components Condition Assessment and Miscellaneous Upgrades	-	153.0	338.8	-	-	-	491.8
Replace Underground Fire Water Distribution System - Holyrood	-	128.3	1,578.0	-	-	-	1,706.3
Upgrade Wastewater Treatment Plant 600 V Variable Frequency Drives - Holyrood	-	70.1	-	-	-	-	70.1
Refurbish Stack Coating - Holyrood	-	-	900.0	-	-	-	900.0
Thermal In-Service Failures (2023)	-	-	750.0	-	-	-	750.0
Refurbish Stage II Cooling Water Pumphouse - Holyrood	-	-	670.0	400.0	-	-	1,070.0
Replace Stage II Electrical Distribution Equipment - Holyrood	-	-	298.9	4,966.8	-	-	5,265.7
Install New Oil Systems Unit 3 - Holyrood	-	-	255.0	765.9	-	-	1,020.9
Replace Stage I 4160 V ac Breakers - Holyrood	-	-	200.0	700.0	-	-	900.0
Upgrade Bio-Green Sewage System - Holyrood	-	-	100.0	100.0	-	-	200.0
Upgrade Water Treatment Plant - Holyrood	-	-	-	1,000.0	-	-	1,000.0
Thermal In-Service Failures (2024)	-	-	-	750.0	-	-	750.0
Install Plant Heating - Holyrood	-	-	-	519.1	6,954.0	-	7,473.1
Upgrade Ambient Monitoring Stations - Holyrood	-	-	-	150.0	150.0	-	300.0
Inspect and Upgrade Light Oil System - Holyrood	-	-	-	100.0	900.0	-	1,000.0
Install Energy Efficient High Bay Lighting - Holyrood	-	-	-	15.9	609.2	-	625.1
Thermal In-Service Failures (2025)	-	-	-	-	750.0	-	750.0
Outbuilding Upgrades Including Main Warehouse and Training Centre	-	-	-	-	450.0	-	450.0
Upgrade Vibration Monitoring Equipment Unit 3 Generator	-	-	-	-	336.0	-	336.0
Replace Parts of U3 - 129 VDC Battery Chargers, Batteries, Panels, Breakers	-	-	-	-	-	2,177.1	2,177.1
Thermal In-Service Failures (2026)	-	-	-	-	-	750.0	750.0
Upgrade Cranes and Hoists - Holyrood	-	-	-	-	-	500.0	500.0
Synchronous Condenser Building Upgrades	-	-	-	-	-	100.0	100.0
Total Thermal Plant	2,173.8	10,732.8	5,090.7	9,467.7	10,149.2	3,527.1	41,141.3

Expenditure Category	2021	2022	2023	2024	2025	2026	Total
Tools and Equipment							
Purchase Tools and Equipment Less than \$50,000 (2022) - Hydraulic Plants	-	187.3	-	-	-	-	187.3
Purchase Tools and Equipment Less than \$50,000 (2022) - Gas Turbine	-	19.6	-	-	-	-	19.6
Purchase Tools and Equipment Less than \$50,000 (2022) - Thermal Plants	-	18.9	-	-	-	-	18.9
Purchase Tools and Equipment Less than \$50,000 (2023) - Hydraulic Plants	-	-	22.4	-	-	-	22.4
Purchase Tools and Equipment Less than \$50,000 (2023) - Gas Turbine	-	-	19.6	-	-	-	19.6
Purchase Tools and Equipment Less than \$50,000 (2023) - Thermal Plants	-	-	18.9	-	-	-	18.9
Purchase Tools and Equipment Less than \$50,000 (2024) - Hydraulic Plants	-	-	-	22.8	-	-	22.8
Purchase Tools and Equipment Less than \$50,000 (2024) - Gas Turbine	-	-	-	19.6	-	-	19.6
Purchase Tools and Equipment Less than \$50,000 (2024) - Thermal Plants	-	-	-	16.8	-	-	16.8
Purchase Tools and Equipment Less than \$50,000 (2025) - Hydraulic Plants	-	-	-	-	22.8	-	22.8
Purchase Tools and Equipment Less than \$50,000 (2025) - Gas Turbines	-	-	-	-	19.6	-	19.6
Purchase Tools and Equipment Less than \$50,000 (2025) - Thermal Plants	-	-	-	-	17.2	-	17.2
Purchase Tools and Equipment Less than \$50,000 (2026) - Hydraulic Plants	-	-	-	-	-	23.4	23.4
Purchase Tools and Equipment Less than \$50,000 (2026) - Gas Turbines	-	-	-	-	-	19.6	19.6
Purchase Tools and Equipment Less than \$50,000 (2026) - Thermal Plants	-	-	-	-	-	17.6	17.6
Total Tools and Equipment	-	225.8	60.9	59.2	59.6	60.6	466.1
Total Generation	15,468.9	28,136.8	31,665.2	77,980.8	33,987.7	42,275.7	229,515.1
General Properties							
Transportation							
Replace Light- and Heavy-Duty Vehicles (2021-2022)	1,320.9	1,335.1	-	-	-	-	2,656.0
Replace Light- and Heavy-Duty Vehicles (2022-2024)	-	569.0	593.2	2,319.6	-	-	3,481.8
Replace Light- and Heavy-Duty Vehicles (2023-2024)	-	-	1,780.0	1,793.0	-	-	3,573.0
Replace Light- and Heavy-Duty Vehicles (2024-2025)	-	-	-	1,410.0	1,888.0	-	3,298.0
Replace Light- and Heavy-Duty Vehicles (2025-2026)	-	-	-	-	1,594.0	1,755.0	3,349.0
Replace Light- and Heavy-Duty Vehicles (2026-2027)	-	-	-	-	-	1,945.0	1,945.0
Total Transportation	1,320.9	1,904.1	2,373.2	5,522.6	3,482.0	3,700.0	18,302.8
Administration							
Replace Transfer Switches and Associated Hardware - Hydro Place	197.3	938.5	-	-	-	-	1,135.8
Remove Safety Hazards (2022) - Various	-	199.6	-	-	-	-	199.6
Purchase Office Equipment Less Than \$50,000 (2022)	-	67.1	-	-	-	-	67.1
Remove Safety Hazards (2023) - Various	-	-	220.0	-	-	-	220.0
Purchase Office Equipment Less Than \$50,000 (2023)	-	-	64.8	-	-	-	64.8
Remove Safety Hazards (2024) - Various	-	-	-	220.0	-	-	220.0
Purchase Office Equipment Less Than \$50,000 (2024)	-	-	-	66.2	-	-	66.2
Replace/Upgrade Fire Suppression System	-	-	-	-	500.0	-	500.0
Remove Safety Hazards (2025) - Various	-	-	-	-	220.0	-	220.0
Upgrade Septic System	-	-	-	-	100.0	-	100.0
Purchase Office Equipment Less Than \$50,000 (2025)	-	-	-	-	67.3	-	67.3
Remove Safety Hazards (2026) - Various	-	-	-	-	-	220.0	220.0
Purchase Office Equipment Less Than \$50,000 (2026)	-	-	-	-	-	68.0	68.0
Total Administration	197.3	1,205.2	284.8	286.2	887.3	288.0	3,148.8

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	Expended to						Total
	2021	2022	2023	2024	2025	2026	
Information Systems							
Perform Software Upgrades and Minor Enhancements (2022) - Hydro Place	-	621.7	-	-	-	-	621.7
Purchase Personal Computers (2022) - Hydro Place	-	477.1	-	-	-	-	477.1
Replacement of Short-Term Load Forecasting Software	-	439.5	-	-	-	-	439.5
Upgrade Core IT/OT Infrastructure (2022) - Hydro Place	-	308.2	-	-	-	-	308.2
Upgrade Energy Management System (2022) - Hydro Place	-	292.6	-	-	-	-	292.6
Refresh Cyber Security Infrastructure (2022) - Hydro Place	-	221.7	-	-	-	-	221.7
Replace Peripheral Infrastructure (2022) - Hydro Place	-	193.2	-	-	-	-	193.2
Hydro Command Centre Upgrade (2022) - Hydro Place	-	76.4	-	-	-	-	76.4
Perform Software Upgrades and Minor Enhancements (2023) - Hydro Place	-	-	675.0	-	-	-	675.0
Upgrade Core IT/OT Infrastructure (2023) - Hydro Place	-	-	375.0	-	-	-	375.0
Refresh Cyber Security Infrastructure (2023) - Hydro Place	-	-	310.0	-	-	-	310.0
Upgrade Energy Management System (2023) - Hydro Place	-	-	307.0	-	-	-	307.0
Purchase Personal Computers (2023) - Hydro Place	-	-	241.0	-	-	-	241.0
Hydro Fleet Devices (2023)	-	-	196.0	-	-	-	196.0
Replace Peripheral Infrastructure (2023) - Hydro Place	-	-	157.0	-	-	-	157.0
Perform Software Upgrades and Minor Enhancements (2024) - Hydro Place	-	-	-	625.0	-	-	625.0
Purchase Personal Computers (2024) - Hydro Place	-	-	-	542.0	-	-	542.0
Upgrade Core IT/OT Infrastructure (2024) - Hydro Place	-	-	-	375.0	-	-	375.0
Upgrade Energy Management System (2024) - Hydro Place	-	-	-	322.0	-	-	322.0
Refresh Cyber Security Infrastructure (2024) - Hydro Place	-	-	-	250.0	-	-	250.0
Replace Peripheral Infrastructure (2024) - Hydro Place	-	-	-	219.0	-	-	219.0
Purchase Personal Computers (2025) - Hydro Place	-	-	-	-	750.0	-	750.0
Perform Software Upgrades and Minor Enhancements (2025) - Hydro Place	-	-	-	-	705.0	-	705.0
Upgrade Core IT/OT Infrastructure (2025) - Hydro Place	-	-	-	-	375.0	-	375.0
Upgrade Energy Management System (2025) - Hydro Place	-	-	-	-	338.0	-	338.0
Refresh Cyber Security Infrastructure (2025) - Hydro Place	-	-	-	-	225.0	-	225.0
Replace Peripheral Infrastructure (2025) - Hydro Place	-	-	-	-	197.0	-	197.0
Purchase Personal Computers (2026) - Hydro Place	-	-	-	-	-	850.0	850.0
Perform Software Upgrades and Minor Enhancements (2026) - Hydro Place	-	-	-	-	-	625.0	625.0
Upgrade Core IT/OT Infrastructure (2026) - Hydro Place	-	-	-	-	-	375.0	375.0
Upgrade Energy Management System (2026) - Hydro Place	-	-	-	-	-	355.0	355.0
Refresh Cyber Security Infrastructure (2026) - Hydro Place	-	-	-	-	-	322.0	322.0
Replace Peripheral Infrastructure (2026) - Hydro Place	-	-	-	-	-	198.0	198.0
Total Information Systems		2,630.4	2,261.0	2,333.0	2,590.0	2,725.0	12,539.4

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	2021	2022	2023	2024	2025	2026	
Telecontrol							
Replace Battery Banks and Chargers (2022) - Various	-	226.6	-	-	-	-	226.6
Replace Network Communications Equipment (2022)	-	193.0	-	-	-	-	193.0
Replace Radomes (2022) - Various	-	179.9	-	-	-	-	179.9
Upgrade Remote Terminal Units (2022) - Various	-	171.1	-	-	-	-	171.1
Replace Mobile Devices	-	49.7	-	-	-	-	49.7
Upgrade Site Facilities (2022) - Various	-	49.6	-	-	-	-	49.6
Purchase Tools and Equipment Less than \$50,000 (2022)	-	42.0	-	-	-	-	42.0
Replace VHF Mobile Radio System - Various	-	-	2,000.0	-	-	-	2,000.0
Replace Battery Banks and Chargers (2023) - Various	-	-	508.3	-	-	-	508.3
Replace Network Communications Equipment (2023)	-	-	180.0	-	-	-	180.0
Replace Radomes (2023) - Various	-	-	180.0	-	-	-	180.0
Upgrade Remote Terminal Units (2023) - Various	-	-	100.0	-	-	-	100.0
Replace Power Line Carrier (2023-2024)	-	-	90.0	950.0	-	-	1,040.0
Purchase Tools and Equipment Less than \$50,000 (2023)	-	-	49.7	-	-	-	49.7
Upgrade Site Facilities (2023) - Various	-	-	48.0	-	-	-	48.0
Replace Battery Banks and Chargers (2024) - Various	-	-	-	520.0	-	-	520.0
Replace Radomes (2024) - Various	-	-	-	180.0	-	-	180.0
Replace Network Communications Equipment (2024)	-	-	-	180.0	-	-	180.0
Upgrade Remote Terminal Units (2024) - Various	-	-	-	100.0	-	-	100.0
Purchase Tools and Equipment Less than \$50,000 (2024)	-	-	-	49.9	-	-	49.9
Upgrade Site Facilities (2024) - Various	-	-	-	48.0	-	-	48.0
Replace Battery Banks and Chargers (2025) - Various	-	-	-	-	199.0	-	199.0
Replace Network Communications Equipment (2025)	-	-	-	-	180.0	-	180.0
Replace Radomes (2025) - Various	-	-	-	-	180.0	-	180.0
Purchase Tools and Equipment Less than \$50,000 (2025)	-	-	-	-	49.9	-	49.9
Upgrade Site Facilities (2025) - Various	-	-	-	-	48.0	-	48.0
Replace Battery Banks and Chargers (2026) - Various	-	-	-	-	-	199.0	199.0
Replace Network Communications Equipment (2026)	-	-	-	-	-	180.0	180.0
Replace Radomes (2026) - Various	-	-	-	-	-	180.0	180.0
Purchase Tools and Equipment Less than \$50,000 (2026)	-	-	-	-	-	49.9	49.9
Upgrade Site Facilities (2026) - Various	-	-	-	-	-	48.0	48.0
Total Telecontrol	-	911.9	3,156.0	2,027.9	656.9	656.9	7,409.6
Total General Properties	1,518.2	6,651.6	8,075.0	10,169.7	7,616.2	7,369.9	41,400.6

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	Expended to						Total
	2021	2022	2023	2024	2025	2026	
Transmission and Rural Operations							
Transmission							
Valentine Gold Interconnection	3,479.3	12,281.7	53.7	-	-	-	15,814.7
Wood Pole Line Management Program (2022)	-	1,603.5	-	-	-	-	1,603.5
Wood Pole Line Management Program (2023)	-	-	2,760.5	-	-	-	2,760.5
Wood Pole Line Management Program (2024)	-	-	-	2,289.1	-	-	2,289.1
Upgrade Work L 23 and L 24 - Labrador	-	-	-	-	5,000.0	-	5,000.0
Wood Pole Line Management Program (2025)	-	-	-	-	2,884.4	-	2,884.4
Upgrade Work TL 202	-	-	-	-	-	5,142.0	5,142.0
Wood Pole Line Management Program (2026)	-	-	-	-	-	2,841.0	2,841.0
Total Transmission	3,479.3	13,885.2	2,814.2	2,289.1	7,884.4	7,983.0	38,335.2
Distribution							
Upgrade of Worst-Performing Distribution Feeders (2021-2022)	318.9	805.6	-	-	-	-	1,124.5
Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights (2022) - Various	-	3,826.7	-	-	-	-	3,826.7
Provide Service Extensions (2022) - Various	-	3,627.2	-	-	-	-	3,627.2
Upgrade of Worst-Performing Distribution Feeders (2022-2023)	-	850.0	1,922.9	-	-	-	2,772.9
Additions for Load (2022) - Distribution System - Mary's Harbour Voltage Conversion	-	550.6	524.6	-	-	-	1,075.2
Labrador City L22 Voltage Conversion (2022-2023)	-	486.8	1,004.4	-	-	-	1,491.2
Install Recloser Remote Control (2022-2023) - Various	-	174.6	149.1	-	-	-	323.7
Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights (2023) - Various	-	-	3,826.7	-	-	-	3,826.7
Provide Service Extensions All Regions (2023) - Various	-	-	3,627.2	-	-	-	3,627.2
Upgrade of Worst-Performing Distribution Feeders (2023-2024)	-	-	908.6	4,216.6	-	-	5,125.2
Additions for Load (2023) - Distribution System	-	-	500.0	-	-	-	500.0
Install Recloser Remote Control (2023-2024) - Various	-	-	25.0	270.0	-	-	295.0
Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights (2024) - Various	-	-	-	3,826.7	-	-	3,826.7
Provide Service Extensions All Regions (2024) - Various	-	-	-	3,627.2	-	-	3,627.2
Additions for Load (2024) - Distribution System	-	-	-	500.0	-	-	500.0
Upgrade of Worst-Performing Distribution Feeders (2024-2025)	-	-	-	468.5	6,750.0	-	7,218.5
Install Recloser Remote Control (2024-2025) - Various	-	-	-	25.0	270.0	-	295.0
Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights (2025) - Various	-	-	-	-	3,826.7	-	3,826.7
Provide Service Extensions All Regions (2025) - Various	-	-	-	-	3,627.2	-	3,627.2
Additions for Load (2025) - Distribution System	-	-	-	-	1,000.0	-	1,000.0
Upgrade of Worst-Performing Distribution Feeders (2025-2026)	-	-	-	-	468.5	6,750.0	7,218.5
Implement Geographical Information System - Various	-	-	-	-	100.0	100.0	200.0
Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights (2026) - Various	-	-	-	-	-	3,826.7	3,826.7
Provide Service Extensions All Regions (2026) - Various	-	-	-	-	-	3,627.2	3,627.2
Additions for Load (2026) - Distribution System	-	-	-	-	-	1,000.0	1,000.0
Replace Reclosers (8 Three-Phase Units)	-	-	-	-	-	708.0	708.0
Upgrade of Worst-Performing Distribution Feeders (2026-2027)	-	-	-	-	-	468.5	468.5
Total Distribution	318.9	10,321.5	12,488.5	12,934.1	16,042.4	16,480.4	68,585.7

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	Expended to						Total
	2021	2022	2023	2024	2025	2026	
Properties							
Upgrade Line Depots (2023-2024) - Various	-	-	409.4	658.6	-	-	1,068.0
Replace Firewater System - Bishop's Falls	-	-	300.0	-	-	-	300.0
Refurbish Diesel Shop Building - Bishop's Falls	-	-	207.5	924.9	-	-	1,132.4
Upgrade Line Depots - Bay d'Espoir	-	-	141.0	1,001.3	-	-	1,142.3
Upgrade HVAC System - Bishop's Falls	-	-	104.4	-	-	-	104.4
Upgrade Line Depots (2024-2025) - Various	-	-	-	420.0	670.0	-	1,090.0
Resurface Parking Lots and Roads - Bishop's Falls	-	-	-	150.0	-	-	150.0
Upgrade Property - St. Anthony	-	-	-	120.0	-	-	120.0
Upgrade Property - Bishop's Falls, Whitbourne	-	-	-	-	250.0	-	250.0
Construct Storage Building (2025-2026) - Springdale	-	-	-	-	135.0	730.0	865.0
Upgrade Outside Property - Deer Lake	-	-	-	-	129.0	-	129.0
Upgrade Property - Postville, Stephenville, Happy Valley	-	-	-	-	-	300.0	300.0
Replace Sewage System - Bishop's Falls	-	-	-	-	-	150.0	150.0
Total Properties	-	-	1,162.3	3,274.8	1,184.0	1,180.0	6,801.1
Metering							
Replace Metering System	-	515.6	3,865.6	994.6	-	-	5,375.8
Purchase Meters and Metering Equipment (2023)	-	-	100.0	-	-	-	100.0
Purchase Meters and Metering Equipment (2024)	-	-	-	100.0	-	-	100.0
Purchase Meters and Metering Equipment (2025)	-	-	-	-	100.0	-	100.0
Purchase Meters and Metering Equipment (2026)	-	-	-	-	-	100.0	100.0
Total Metering	-	515.6	3,965.6	1,094.6	100.0	100.0	5,775.8

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	Expended to						Total
	2021	2022	2023	2024	2025	2026	
Tools and Equipment							
Replace Light-Duty Mobile Equipment (2022) - Various	-	695.0	-	-	-	-	695.0
Purchase Tools and Equipment Less than \$50,000 (2022) - Central Region	-	193.9	-	-	-	-	193.9
Purchase Tools and Equipment Less than \$50,000 (2022) - Northern Region	-	134.6	-	-	-	-	134.6
Purchase Tools and Equipment Less than \$50,000 (2022) - Labrador Region	-	121.8	-	-	-	-	121.8
Purchase 85' Material Handler Aerial Device on Track Unit	-	20.4	1,265.7	67.8	-	-	1,353.9
Purchase 46' Material Handler Aerial Device on Track Unit	-	20.4	698.8	38.8	-	-	758.0
Replace Light-Duty Mobile Equipment (2023) - Various	-	-	663.0	-	-	-	663.0
Replace Back Hoe Unit No. 9813 - Holyrood	-	-	242.0	-	-	-	242.0
Purchase Tools and Equipment Less than \$50,000 (2023) - Central Region	-	-	195.0	-	-	-	195.0
Purchase Tools and Equipment Less than \$50,000 (2023) - Northern Region	-	-	135.0	-	-	-	135.0
Purchase Tools and Equipment Less than \$50,000 (2023) - Labrador Region	-	-	120.0	-	-	-	120.0
Replace Light-Duty Mobile Equipment (2024) - Various	-	-	-	655.0	-	-	655.0
Replace V9829 Grader - Bay d'Espoir	-	-	-	604.0	-	-	604.0
Replace V7066 Happy Valley Track Unit Knuckle Boom with Dump	-	-	-	400.0	-	-	400.0
Purchase Tools and Equipment Less than \$50,000 (2024) - Central Region	-	-	-	195.0	-	-	195.0
Purchase Tools and Equipment Less than \$50,000 (2024) - Northern Region	-	-	-	135.0	-	-	135.0
Purchase Tools and Equipment Less than \$50,000 (2024) - Labrador Region	-	-	-	120.0	-	-	120.0
Replace Light-Duty Mobile Equipment (2025) - Various	-	-	-	-	623.0	-	623.0
Replace V9832 Front-End Loader - Bay d'Espoir	-	-	-	-	467.0	-	467.0
Replace V7162 Track Unit with Dump - Whitbourne	-	-	-	-	408.0	-	408.0
Purchase Tools and Equipment Less than \$50,000 (2025) - Central Region	-	-	-	-	180.0	-	180.0
Replace V7063 Excavator Happy Valley (8 Ton)	-	-	-	-	128.0	-	128.0
Purchase Tools and Equipment Less than \$50,000 (2025) - Northern Region	-	-	-	-	120.0	-	120.0
Purchase Tools and Equipment Less than \$50,000 (2025) - Labrador Region	-	-	-	-	100.0	-	100.0
Replace Light-Duty Mobile Equipment (2026) - Various	-	-	-	-	-	603.0	603.0
Replace V7205 Track Unit with Dump - Bishop's Falls	-	-	-	-	-	416.0	416.0
Replace V7267 Track Crew Cab - Bishop's Falls	-	-	-	-	-	416.0	416.0
Purchase Tools and Equipment Less than \$50,000 (2026) - Central Region	-	-	-	-	-	180.0	180.0
Replace V7064 Excavator Springdale (8 Ton)	-	-	-	-	-	128.0	128.0
Purchase Tools and Equipment Less than \$50,000 (2026) - Northern Region	-	-	-	-	-	120.0	120.0
Purchase Tools and Equipment Less than \$50,000 (2026) - Labrador Region	-	-	-	-	-	100.0	100.0
Total Tools and Equipment	-	1,186.1	3,319.5	2,215.6	2,026.0	1,963.0	10,710.2

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	Expended to						Total
	2021	2022	2023	2024	2025	2026	
Terminal Stations							
Terminal Station Refurbishment and Modernization (2021-2022)	6,171.6	6,957.3	-	-	-	-	13,128.9
Upgrade Circuit Breakers (2021-2022) - Various	5,418.8	4,293.6	820.3	-	-	-	10,532.7
Wabush Terminal Station Upgrades	2,301.7	4,935.5	4,335.7	-	-	-	11,572.9
Upgrades for Future Retirement of Stephenville Gas Turbine	1,530.3	5,344.5	-	-	-	-	6,874.8
Additions for Load - Wabush Substation Upgrades	1,186.7	6,253.0	3,053.7	-	-	-	10,493.4
Terminal Station Refurbishment and Modernization (2022-2023)	-	3,111.9	6,109.7	-	-	-	9,221.6
Upgrade Circuit Breakers (2022-2023) - Various	-	2,121.9	7,361.8	-	-	-	9,483.7
Terminal Station In-Service Failures (2022)	-	900.0	-	-	-	-	900.0
Terminal Station Refurbishment and Modernization (2023-2024)	-	-	3,450.7	10,859.6	-	-	14,310.3
Upgrade Circuit Breakers (2023-2024) - Various	-	-	1,323.0	5,197.0	-	-	6,520.0
Terminal Station In-Service Failures (2023)	-	-	1,000.0	-	-	-	1,000.0
Synchronous Condenser 2 Major Inspection - Wabush Terminal Station (2023)	-	-	273.0	-	-	-	273.0
Install Fire Barriers Between T10 & T12 and T10 & T11 - Bay d'Espoir	-	-	220.4	1,108.6	-	-	1,329.0
Replace Power Transformers T4 & T6 - Wabush Substation	-	-	200.0	2,000.0	-	-	2,200.0
Install Oil Spill Containment - Cat Arm T1S	-	-	50.0	150.0	-	-	200.0
Synchronous Condenser 1 Major Inspection (2023-2024) - Wabush Terminal Station	-	-	40.0	240.0	-	-	280.0
Terminal Station Refurbishment and Modernization (2024-2025)	-	-	-	3,697.3	8,810.8	-	12,508.1
Terminal Station In-Service Failures (2024)	-	-	-	1,000.0	-	-	1,000.0
Upgrade Circuit Breakers (2024-2025) - Various	-	-	-	882.3	3,020.1	-	3,902.4
Construct Fire Separation Walls between Transformers - Happy Valley	-	-	-	54.8	773.9	-	828.7
Terminal Station Refurbishment and Modernization (2025-2026)	-	-	-	-	3,480.4	6,939.9	10,420.3
Upgrade Circuit Breakers (2025-2026) - Various	-	-	-	-	1,504.9	3,169.6	4,674.5
Terminal Station In-Service Failures (2025)	-	-	-	-	1,000.0	-	1,000.0
Upgrade Station Access Road - Buchans, Western Avalon, Sunnyside, Deer Lake	-	-	-	-	200.0	-	200.0
Install New Station Service Feed - Berry Hill	-	-	-	-	50.0	150.0	200.0
Replace Switchgear - Grand Falls Terminal Station	-	-	-	-	50.0	300.0	350.0
Replace Switchgear - Wabush Terminal Station Synchronous Condenser 1 & 2	-	-	-	-	50.0	700.0	750.0
Synchronous Condenser 2 Major Inspection - Wabush Terminal Station (2025-2026)	-	-	-	-	40.0	240.0	280.0
Install Fire Barriers between T1, T2 and T3 & the Substation - Massey Drive	-	-	-	-	39.1	731.5	770.6
Terminal Station Refurbishment and Modernization (2026-2027)	-	-	-	-	-	2,420.7	2,420.7
Terminal Station In-Service Failures (2026)	-	-	-	-	-	1,000.0	1,000.0
Upgrade Circuit Breakers (2026-2027) - Various	-	-	-	-	-	855.8	855.8
Synchronous Condenser 1 Major Inspection (2026-2027) - Wabush Terminal Station	-	-	-	-	-	40.0	40.0
Total Terminal Stations	16,609.1	33,917.7	28,238.3	25,189.6	19,019.2	16,547.5	139,521.4

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	Expended to						Total
	2021	2022	2023	2024	2025	2026	
Generation							
Diesel Genset Replacements (2021-2022)	2,560.6	286.2	-	-	-	-	2,846.8
Long-Term Supply for Southern Labrador - Phase 1	1,054.4	15,819.7	20,333.4	12,677.3	-	-	49,884.8
Replace Unit 2047 - Ramea	307.7	2,010.8	118.3	-	-	-	2,436.8
Overhaul Diesel Units (2022) - Various	-	1,360.5	-	-	-	-	1,360.5
Upgrade Fuel Storage Tanks (2022) - Mary's Harbour	-	499.1	-	-	-	-	499.1
Diesel Genset Replacement Unit 2039 - St. Lewis	-	397.0	1,583.8	134.9	-	-	2,115.7
Diesel Genset Replacement Unit 2012 - L'Anse-Au-Loup	-	339.9	2,513.2	210.2	-	-	3,063.3
Additions for Load (2022) - Mary's Harbour Service Conductor	-	307.8	51.3	-	-	-	359.1
Install Fire Protection in Diesel Plants (2022-2023) - Ramea	-	90.7	1,838.1	-	-	-	1,928.8
Overhaul Diesel Units (2023) - Various	-	-	2,000.0	-	-	-	2,000.0
Inspect Fuel Storage Tanks (2023) - Various	-	-	600.0	-	-	-	600.0
Additions for Load Growth - Isolated Generation Stations (2023) - Various	-	-	500.0	-	-	-	500.0
Purchase Accommodations Trailer - Makkovik, Cartwright	-	-	500.0	1,000.0	500.0	-	2,000.0
Diesel Genset Replacement Unit 2056 - St. Brendan's	-	-	400.0	-	-	-	400.0
Diesel Genset Replacement Unit 2053 - Hopedale	-	-	200.0	1,800.0	-	-	2,000.0
Upgrade Building Exterior - Postville	-	-	112.0	500.0	-	-	612.0
Overhaul Diesel Units (2024) - Various	-	-	-	2,500.0	-	-	2,500.0
Inspect Fuel Storage Tanks (2024) - Various	-	-	-	600.0	-	-	600.0
Additions for Load Growth - Isolated Generation Stations (2024) - Various	-	-	-	500.0	-	-	500.0
Diesel Genset Replacement Unit 2085 - Nain	-	-	-	500.0	2,500.0	-	3,000.0
Diesel Genset Replacement Unit 3033 - Makkovik	-	-	-	200.0	1,800.0	-	2,000.0
Replace Diesel Plant Roof - Makkovik	-	-	-	100.0	200.0	-	300.0
Overhaul Diesel Units (2025) - Various	-	-	-	-	2,000.0	-	2,000.0
Diesel Plant Replacement - Paradise River	-	-	-	-	1,000.0	9,000.0	10,000.0
Inspect Fuel Storage Tanks (2025) - Various	-	-	-	-	600.0	-	600.0
Additions for Load Growth - Isolated Generation Stations (2025) - Various	-	-	-	-	500.0	-	500.0
Diesel Genset Replacement Unit 2067 - Grey River	-	-	-	-	200.0	1,400.0	1,600.0
Diesel Genset Replacements (2026-2027)	-	-	-	-	-	4,600.0	4,600.0
Overhaul Diesel Units (2026) - Various	-	-	-	-	-	2,250.0	2,250.0
Inspect Fuel Storage Tanks (2026) - Various	-	-	-	-	-	650.0	650.0
Additions for Load Growth - Isolated Generation Stations (2026) - Various	-	-	-	-	-	500.0	500.0
Total Generation	3,922.7	21,111.7	30,750.1	20,722.4	9,300.0	18,400.0	104,206.9
Total Transmission and Rural Operations	24,330.0	80,937.8	82,738.5	67,720.2	55,556.0	62,653.9	373,936.3
Total Allowance for Unforeseen Items	-	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	5,000.0
Total Capital Plan	41,317.1	116,726.2	123,478.7	156,870.7	98,159.9	113,299.5	649,852.1



Appendix B

Capital Expenditures 2017–2026

Newfoundland and Labrador Hydro
2022 Capital Budget Application
Capital Expenditures 2017–2026
(\$000)

	Actuals				Budget					
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Generation	39,101.5	59,756.8	38,087.2	25,125.5	50,966.0	28,364.5	31,892.9	78,208.5	34,215.4	42,503.4
Transmission and Rural Operations	293,203.1	90,300.3	78,348.1	57,575.9	48,897.5	81,667.5	83,468.2	68,449.8	56,285.7	63,383.6
General Properties	8,436.3	6,928.0	10,139.7	4,854.0	7,588.8	6,694.2	8,117.6	10,212.3	7,658.8	7,412.5
Total Capital Expenditures	340,740.8	156,985.1	126,575.0	87,555.4	107,452.3	116,726.2	123,478.7	156,870.7	98,159.9	113,299.5



2022 Capital Budget Application

Holyrood Thermal Generating Station Overview – Future Operation and Capital Expenditure Requirements

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Appendix B: Ten-Year System Equipment Maintenance Expenditures

1.0 Background

In Order No P.U. 5(2012), the Board of Commissioners of Public Utilities (“Board”) directed Newfoundland and Labrador Hydro (“Hydro”) to file, in conjunction with its 2013 Capital Budget Application, an overview in relation to the proposed capital expenditures for the Holyrood Thermal Generating Station (“Holyrood TGS”). The Board required the overview to include the following:¹

- An updated outlook regarding anticipated changes in the role of the Holyrood TGS on the system;
- An updated schedule of anticipated changes in the Holyrood TGS operations that may reasonably be expected to have an impact on capital expenditure requirements;
- A summary description of all proposed Holyrood TGS capital projects, including an explanation of how such projects relate to one another and whether such projects may be impacted by decisions yet to be taken regarding the Holyrood TGS's role on the system;
- A summary guide to all internal and external reports filed in support of the capital expenditure proposals, summarizing alternatives considered, and recommendations made; and
- An explanation of the necessity of all proposed capital expenditures in the context of the anticipated changes in the Holyrood TGS operations.

In subsequent Board Orders in relation to Hydro’s annual capital budget applications, the Board required Hydro update and file the Holyrood TGS Overview report with future capital budgets. In compliance with the Board’s direction in Order No. P.U. 2(2021), this report contains the update to the future capital expenditure requirements for the Holyrood TGS. Additionally, this report provides Hydro’s ten-year plan of maintenance expenditures for the Holyrood TGS in accordance with Order No. P. U. 14(2004).²

¹ Board Order No. P.U. 5(2012), at p. 14.

² Board Order No. P.U. 14(2004) at p.166.

2.0 Introduction

The Holyrood TGS is currently a critical part of the Island Interconnected System and is being maintained to be fully available either online in generation mode or in standby mode until March 31, 2023³ while the Muskrat Falls Project assets are brought online and proven reliable. After such time, Unit 3 will continue to operate as a synchronous condenser, while Units 1 and 2 are scheduled to be shut down and decommissioned.⁴

With three oil-fired generating units providing an installed capacity of 490 MW, the Holyrood TGS represents approximately one third of Hydro's Island Interconnected System generating capacity and approximately one quarter of the total Island Interconnected System capacity, when included with all other customer-owned generation. Units 1 and 2 were commissioned in 1970 and 1971, respectively, and Unit 3 in 1979. Units 1 and 2 were originally designed to produce 150 MW each and were upgraded to 170 MW in 1988 and 1989, respectively. Unit 3 retains its original configuration and is rated at 150 MW. In 1986, Unit 3 was retrofitted with synchronous condensing capability to provide voltage support on the eastern area of the Island Interconnected System during periods when power generation from this unit is not required.

³ As communicated in "The Liberty Consulting Group Eighth Quarterly Monitoring Report on the Integration of Power Supply Facilities to the Island Interconnected System – Monthly Update," Newfoundland and Labrador Hydro, September 28, 2020.

⁴ The systems to be decommissioned once generation is no longer required include the fuel storage and delivery system (including the tank farm and day tank); the boilers, including air systems and emission monitoring systems; the feedwater and condensate systems, including the deaerator systems; and the marine terminal. The systems required for synchronous condenser operation post steam include Unit 3 synchronous condenser specific equipment, including the unit generator and exciter, and auxiliary systems including electrical, controls, cooling water, fire protection, etc.



Figure 1: Holyrood Thermal Generating Station

1 The three major components of the thermal generating process are the boiler, turbine, and generator,
2 with supporting systems such as fuel storage and delivery, controls, and cooling and feed water supply
3 systems. Through combustion of No. 6 heavy fuel oil, the power boiler provides high-energy steam to
4 the turbine. The turbine is directly coupled to the generator and provides the rotating energy necessary
5 for the generator to produce rated output power on the Island Interconnected System. The generator
6 itself is pressurized and cooled by hydrogen gas to provide maximum efficiency both in heat transfer and
7 reduced windage losses.⁵

8 Until such time as the Muskrat Falls Project assets are reliably in service, the Holyrood TGS is necessary
9 to meet both winter peak demand and annual energy requirements. As the Labrador-Island Link is
10 brought online and placed in service, production at the Holyrood TGS is expected to be substantially
11 lower than in the recent past. Despite this expected lower level of production, as well as the planned
12 retirement of the facility in the near term, a level of continuing generation-related capital investment is
13 required to support Hydro's commitment to have the Holyrood TGS fully available for generation until
14 its retirement date. Hydro is cognizant of the cost impact to customers of such investment and

⁵ Windage losses refer to the losses sustained by a machine due to the resistance offered by air to the rotation of the shaft. Windage losses occur in electric rotating machines such as motors and generators.

continues to diligently review all proposed investment to ensure the most appropriate balance between cost and reliability. Should the successful integration and demonstrated reliability of the Muskrat Falls Project assets occur prior to March 31, 2023 and/or Hydro obtain clear evidence with respect to the in-service date of the Muskrat Falls Project assets prior to the execution of the proposed 2022 capital projects, careful consideration will be given to the necessity of executing the full scope of generation-related capital projects.⁶

Hydro's Five-Year Capital Plan (2022–2026) includes total planned expenditures for the Holyrood TGS of \$39.0 million. The projects included in the plan beyond 2022 are required for synchronous condenser (i.e., post-steam) operation. The total generation-related (i.e., steam-related) expenditures and synchronous condenser-related expenditures are presented in Figure 2.

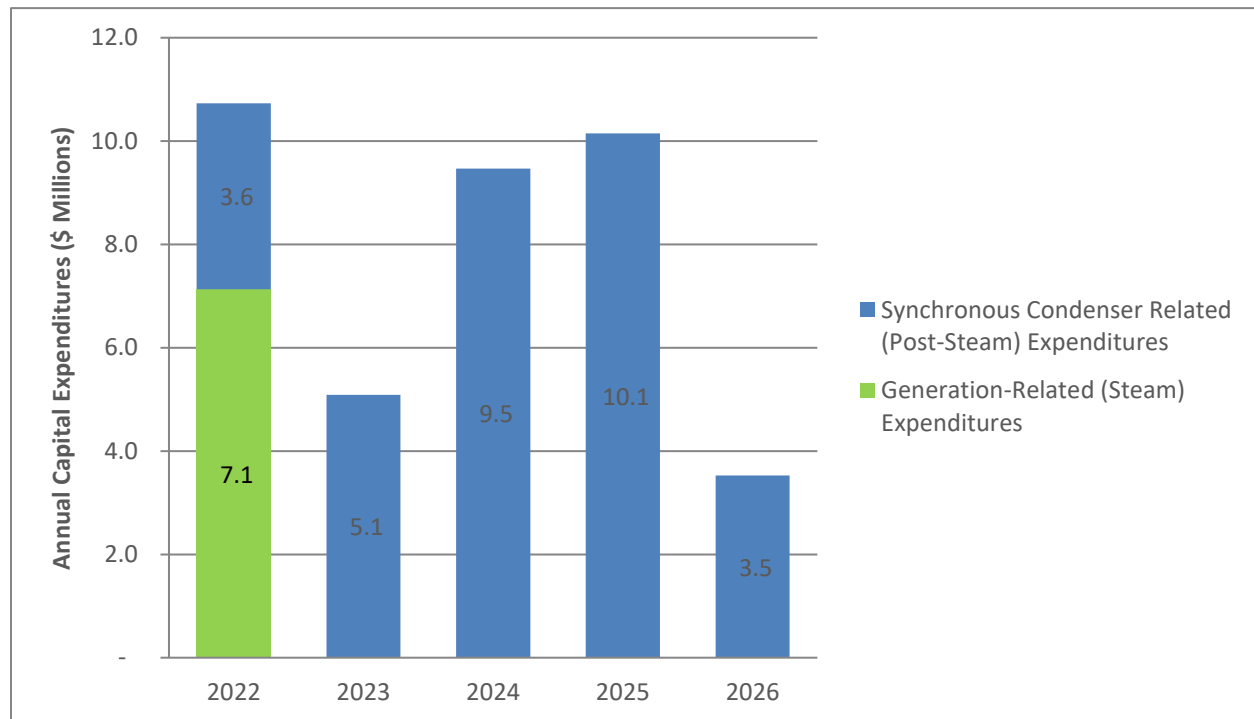


Figure 2: Holyrood TGS Capital Expenditures 2022 to 2026 (\$ millions)^{7,8}

⁶ Where work may have already commenced on the proposed 2022 capital projects, Hydro will consider options for reducing the remaining portion(s) of the project scope and, thus, capital costs as appropriate and technically feasible.

⁷ Included in the 2022 synchronous condenser-related expenditures category is \$2.0 million for thermal in-service failures. Depending on the failure type, a portion of the \$2.0 million could be attributed to generation-related expenditures.

⁸ Assumes that Hydro will be successful in extending environmental certification of fuel oil storage tank #4; if environmental certification is not extended, Hydro will propose a supplemental application for the refurbishment of tank #4.

3.0 Current Operational Outlook and Schedule

As previously stated, Hydro has committed to having the Holyrood TGS fully available for generation until March 31, 2023 to support the integration and reliable in-service of the Muskrat Falls Project assets.

Through the *Reliability and Resource Adequacy Study Review* proceeding, currently before the Board, Hydro is currently completing an assessment to determine the potential long-term viability of the Holyrood TGS as a backup facility, should it be required. The assessment is also considering the capital and operational requirements should there be a requirement for further extension of the Holyrood TGS on a more limited basis (e.g., two to six year period). This assessment is a proactive measure on Hydro's part to ensure it is fully informed should there be reason to contemplate either extension or backup use in the future. Hydro plans to file the results of this assessment with the Board in the first quarter of 2022.

4.0 Maintenance Strategy through to Decommissioning

Scheduled overhauls of plant equipment are continuing to support the safe operation and continued availability of assets for generation. Significant changes to Hydro's maintenance strategy between now and the planned retirement date are not anticipated at this time; however, should additional capital costs be identified, diligent consideration will be given to the expenditures prior to application to the Board. Changes in equipment refurbishment intervals may be considered depending on annual operating hours; extension beyond more typical time frames may be achieved in some instances, allowing Hydro to reduce cost while maintaining reliability.

During post-steam operations, assets with operational synchronous condenser requirements will continue to be optimally maintained. An overview of Hydro's maintenance philosophy for the Holyrood TGS assets is provided in Appendix A to this report.

5.0 Holyrood 2022 Capital Plan Summary

Planned 2022 capital expenditures for the Holyrood TGS include both generation-related and non-generation-related (i.e., synchronous-condenser mode) investments as previously outlined in Figure 2.

The 2022 capital project proposals (as outlined in Table 1, Table 2, and Table 3) were identified considering asset condition, equipment obsolescence, forecast production requirements, and Hydro's

- 1 commitment to have the Holyrood TGS fully available to March 31, 2023. The projects outlined within
- 2 reflect the necessary refurbishment and replacement projects to support the reliability of the Holyrood
- 3 TGS and provision of service to customers. In the event of unforeseen failure or unexpected as-found
- 4 condition, adjustments or additions may be required beyond the current plan.
- 5 Table 1 provides a summary description of the proposed 2022 capital projects for the Holyrood TGS.

Table 1: Holyrood TGS Projects Proposed in the 2022 Capital Budget Application

	Project (Project Totals)	Scope Summary	Proposal Location
Generation Related	Turbine Valve Overhaul Unit 3 (\$3.6 million)	This project is required to complete the scheduled three-year overhaul of the Unit 3 turbine valves. The last overhaul was completed in 2019 and deferral would present an unacceptable level of risk to reliability and safety. Regular overhauls are required to ensure continued safe and reliable operation. The valve overhaul will include disassembly, detailed measurement and inspection, replacement of components, reassembly and commissioning of the major valves including the stop valves, combined reheat valves, control valves, blowdown valve, and non-return valves. Overhaul of the valves is required for safe control and operation of the steam turbine.	Volume II, Schedule 8, Tab 5
Generation Related	Major Pumps Overhaul (\$0.5 million)	This project is required to complete an overhaul of the Unit 3 cooling water pump east, Unit 1 cooling water pump west, Unit 1 vacuum pump north. Regular overhauls of major pumps are required to ensure continued reliable operation.	Volume II, Schedule 7, p. 6
Generation Related	Boiler Condition Assessment and Miscellaneous Upgrades (\$3.0 million)	The project proposes to complete identified level 2 condition assessments and detailed inspections of high-pressure boiler components and high-energy piping components. The boilers and associated high-energy piping are exposed to multiple aggressive degradation mechanisms and require regular inspection to monitor deterioration rates and plan interventions. This work is essential to ensure safe and reliable operation of the boilers. The 2022 scope includes work that was identified through the 2021 assessment. Replacements and refurbishments identified through completion of the boiler work, such as the replacement of expansion joints, will be included in the scope.	Volume II, Schedule 8, Tab 4

	Project (Project Totals)	Scope Summary	Proposal Location
Synchronous Condenser Related	Air Receivers Condition Assessment and Upgrades (\$0.3 million)	This project is required to perform a detailed internal inspection and shell integrity analysis of the Unit 3 air receivers. The assessment is required to meet ASME ⁹ Boiler & Pressure Vessel Code to ensure safe and reliable operation. The condition assessment is also required to inform the rate at which corrosion is occurring; this information will be used to determine if and when upgrades/replacements should be planned.	Volume II, Schedule 7, p. 1
Synchronous Condenser Related	Replace Underground Fire Water Distribution System (\$1.7 million)	This project is required to replace the underground fire water distribution piping that supplies the powerhouse, on-site hydrants, Holyrood gas turbine, and out buildings. Only sections of the piping that are required for ongoing site and synchronous condenser operation are included in the scope. The piping is original, and is constructed from asbestos cement. Replacement is required because it has reached the end of its service life, as evidenced by frequent failures in the past five years. A failure of the piping while in service can impede the ability to fight a significant fire.	Volume II, Schedule 8, Tab 6
Synchronous Condenser Related	Upgrade Wastewater Treatment Plant 600 V Variable Frequency Drives (\$0.07 million)	The existing variable frequency drives in the Holyrood Wastewater Treatment Plant are obsolete. This project proposes the replacement of this equipment which is required to operate the Holyrood Wastewater Treatment Plant, which is required for long-term synchronous condenser operations.	Volume II, Schedule 6, p. 5
Synchronous Condenser Related	Unit 3 Generator Components Condition Assessment and Miscellaneous Upgrades (\$0.5 million)	This project proposes to complete an upgrade of the Unit 3 generator auxiliary components that are required for long-term synchronous condenser operation. This will include replacement of the potential transformers and level 2 condition assessments of the pony motor and clutch system that is used to run the generator up to synchronous speed, the turning gear system that is required to rotate the generator at low speed while off line, and the cooling system that is required to remove heat from the generator while operating.	Volume II, Schedule 7, p. 12

⁹ American Society of Mechanical Engineers.

	Project (Project Totals)	Scope Summary	Proposal Location
Synchronous Condenser Related	Thermal In-Service Failures (2022) ¹⁰ \$2.0 million	The purpose of this program is to allow completion of capital work due to failure of equipment or the recognition of an incipient failure that cannot wait for the next capital submission cycle. Previously, capital work of this nature required a supplemental submission for approval. This project also includes the purchase of critical capital spares to reduce downtime and increase availability should a failure of a key component occur.	Volume II, Schedule 8, Tab 2

1 In its 2020 Resource and Reliability Assessment update,¹¹ Hydro provided a list of Holyrood TGS projects
2 by year, which included projects to perform upgrades to bio-green sewage treatment system and install
3 energy-efficient high-bay lighting for 2022. Hydro has deferred these projects to 2023 and 2024,
4 respectively, to allow for further engineering and economic analysis to determine the scope and timing
5 of these projects.

6 Hydro is managing several deteriorating pieces of infrastructure, notably fuel oil storage tanks, with the
7 intention of reaching end-of-generation life with minimal refurbishment costs. To continue to minimize
8 the investment in assets that are not planned for long-term operation, Hydro has been working with
9 government to extend the operating life of the fuel oil storage tanks and has been successful in
10 extending two of the four tanks to March 31, 2023 or beyond. Hydro is working with a consultant and
11 government to extend the approval to operate fuel oil storage tank #4 beyond its current expiration at
12 the end of 2022. Based on Hydro's experience with extension of the environmental certification on the
13 Holyrood TGS fuel storage tanks, and the age and known condition of tank #4, Hydro expects it will
14 receive approval to extend the operation of tank #4 to March 31, 2023. Should Hydro be unsuccessful in
15 securing such an extension, a supplemental capital application will be necessary for the refurbishment
16 of tank #4. The costs associated with refurbishment of tank #4 are not currently included in Hydro's
17 2022-2026 planned capital expenditures. Tank #1 will expire at the end of 2021; Hydro has assessed the
18 operation of the facility with three tanks for the remainder of the operating period of the Holyrood TGS
19 as a generating facility, and does not intend to seek to extend the operation of tank #1. Based on

¹⁰ Depending on the failure type, a portion of the expenditures in this project could be attributed to generation-related expenditures.

¹¹ "Reliability and Resource Adequacy Study 2020 Update," Newfoundland and Labrador Hydro, November 18, 2020.

- 1 current operating assumptions, Hydro has no concerns with operation of three tanks for that period of
2 time.
- 3 There were no additional internal and external reports, outside of those contained in this 2022 Capital
4 Budget Application, filed in support of the capital expenditure proposals. Table 2 also summarizes the
5 alternatives considered and recommendations made.

Table 2: Reports Filed in Support of the 2022 Project Proposals

Project	Alternatives Considered	Proposal
Turbine Valve Overhaul Unit 3	Deferral	Complete the overhaul
Thermal In-Service Failures (2022)	There are no alternatives	Complete refurbishments/replacements as required
Major Pumps Overhaul	Deferral	Complete the overhaul
Air Receivers Condition Assessment and Upgrades	Deferral	Complete the assessment
Replace Underground Fire Water Distribution System	Deferral	Complete the upgrades
Upgrade Wastewater Treatment Plant 600 V Variable Frequency Drives	Deferral	Complete the overhaul
Unit 3 Generator Components Condition Assessment and Miscellaneous Upgrades	Deferral	Complete the replacements
Boiler Condition Assessment and Miscellaneous Upgrades	Deferral	Complete the assessment and upgrades

- 6 Table 3 outlines projects included by major system or subsystem and necessity to generation or
7 synchronous condenser operation.

Table 3: 2022 Project Necessity in the Context of Generation or Synchronous Condenser Operation

Major System or Subsystem	Project	Generation	Synchronous Condenser Operation
Fuel Storage and Delivery	No projects included	-	-
Feedwater and Condensate	Major Pumps Overhaul	Required	-
Boiler	Boiler Condition Assessment and Miscellaneous Upgrades	Required	-
Turbine Generator	Turbine Valve Overhaul Unit 3	Required	
Turbine Generator	Unit 3 Generator Components Condition Assessment and Miscellaneous Upgrades	Required	Required
Cooling Water Systems	Major Pumps Overhaul	Required	-
Buildings and Grounds	No projects included	-	-
Common Systems	Replace Underground Fire Water Distribution System	Required	Required
Common Systems	Upgrade Wastewater Treatment Plant 600 V Variable Frequency Drives	Required	Required
Common Systems	Air Receivers Condition Assessment and Miscellaneous Upgrades	Required	Required
Common Systems	Thermal In-Service Failures ¹²	Required	Required

6.0 Holyrood TGS 2022–2026 Capital Expenditures Outlook

Capital investment will be necessary throughout the period of 2022 to 2026 to ensure continued reliability of supply and maintenance of the level of service required in generation and synchronous condenser operations. Various types of investments and expenditures for the Holyrood TGS are anticipated, including refurbishment, upgrade or replacement of failed or obsolete equipment, and general plant infrastructure work.

Planned expenditures for the 2022–2026 capital plan period total \$39.0 million. The projects included in the plan beyond 2022 are required for post-steam operation. Details regarding the planned capital expenditures are in the Five-Year Capital Plan: 2022–2026, Appendix A.

In addition to the planned 2022 projects presented in Table 1, the 2022–2026 capital plan includes expenditures required to support the operation of the Holyrood TGS as a synchronous condensing

¹² Major system or subsystem is dependent on the type of failure.

facility. Primary drivers of investment in the five-year plan include renewal of the Stage I and II electrical distribution equipment, water treatment plant, and Unit 3 129 Vdc batteries, chargers, panels, and breakers, and Stage II cooling water pumphouse, as well as refurbishment of the stack coating to ensure integrity of the stacks until they are dismantled.¹³ In addition to asset renewal, the five-year capital plan includes the design and implementation of a plant heating solution for the Holyrood TGS, required following the end of steam generation at the Holyrood TGS. Hydro is assessing options for plant heating following the decommissioning of steam generating components; therefore, the timing and scope of this project is subject to change.

Non-critical assets will receive minimal attention and may be allowed to deteriorate where such action does not significantly increase risk to safe and reliable production. Assets with operational requirements beyond 2023 will continue to be optimally maintained with investment reflecting the continued operation requirement. Data will be collected from inspections, online monitoring, and formal condition assessments and used to determine the optimal work plan for the assets in light of the changing role of the Holyrood TGS.

6.1 Depreciation Impacts of Holyrood TGS Life Extension

The extension of the Holyrood TGS to March 31, 2023, in combination with additional capital required to ensure the asset is fully available for generation during that time frame, has created depreciation cost volatility. Hydro filed a proposal for a deferral account in July 2021¹⁴ to deal with the financial impacts associated with accelerated Holyrood TGS depreciation expenses and will put forward a proposal for recovery of these costs in its next general rate application.

7.0 Holyrood TGS 2022-2031 Operating Expenses

In Order No. P.U. 14(2004), the Board directed Hydro to file a ten-year plan of maintenance expenditures for the Holyrood TGS with its annual Capital Budget Application until otherwise directed by the Board.¹⁵ The identified and expected system equipment maintenance (“SEM”) expenditures for the years 2022–2031, inclusive, are provided in Appendix B to this report.

¹³ Stacks are currently planned to be dismantled in 2025.

¹⁴ “Supply Cost Accounting Application,” Newfoundland and Labrador Hydro, July 29, 2021.

¹⁵ Board Order No. P.U. 14(2004) at p.166.

1 A ten-year plan of SEM is difficult to accurately complete, particularly because the ten years will span
2 the period during which the role of the Holyrood TGS will change as a result of the in-service of the
3 Muskrat Falls Project assets. This change to the provincial electricity system will materially impact cost
4 and activity levels at the Holyrood TGS.

5 Additionally, the harsh operating environment, evolving production requirements, Muskrat Falls Project
6 in-service schedule, potential outcomes of the ongoing assessment to determine the potential longer
7 term viability of the Holyrood TGS, the shift to synchronous condensing operation, and the age of units
8 may trigger revision of the maintenance plan to address unforeseen events. The plan currently reflects
9 Hydro's commitment to have the Holyrood TGS fully available until March 31, 2023 and the continuation
10 of synchronous condenser function for Unit 3 after that time. Although expenses for major overhauls
11 are included in capital, some variability in the annual budget will remain as a result of the complexity of
12 numerous components and integrated systems that form a fossil fuel-fired thermal electric generating
13 system.

14 The SEM expenditures presented in Appendix B are based on the SEM budget developed for 2022 and
15 2023, which reflect Hydro's current operating forecast for the Holyrood TGS, retirements of Units 1 and
16 2, and the decommissioning of the steam components of Unit 3 as of March 31, 2023. Future years,
17 beyond 2023, are adjusted to reflect the Holyrood TGS' role in the Newfoundland and Labrador
18 Interconnected System using the best available information, including up-to-date maintenance tactics
19 and known restoration and inspection work, to establish a ten-year forecast of the maintenance projects
20 for the Holyrood TGS.¹⁶ Actual operation will vary based on the operating requirements of the Holyrood
21 TGS, the results of inspections, and assessments of changing equipment conditions.

¹⁶ In the attached ten-year maintenance plan, a single escalation factor of 2.5% per year has been used for 2022–2031 based on an average rate from Hydro's current corporate assumptions.



Appendix A

Holyrood Thermal Generating Station Asset Maintenance Philosophy

Maintenance Philosophy

Maintenance efforts aim to prevent functional failure and extend the operational life of assets, helping to minimize total asset life cycle cost. The type and amount of maintenance applied is dependent on the criticality of the asset and the impact of failure on service delivery. Hydro seeks to balance the cost of maintenance against the cost of failure and its impact on safe, reliable service when applying maintenance strategies and tactics. There are four main types or categories of maintenance undertaken at the Holyrood TGS: preventive maintenance, corrective maintenance, boiler overhauls, and operating projects.

Preventive Maintenance

Hydro continues to use up-to-date maintenance techniques and practices to maintain plant efficiency, availability, and reliability. These include preventive, predictive, and condition-based maintenance techniques, which are usually referred to by the overall term of “preventive maintenance.” The basic principle underlying this approach to maintenance is timely intervention to prevent imminent or catastrophic failure that may cause a substantial safety exposure, an extended unavailability of the unit or system, or an increase in cost.

Preventive maintenance comprises routine inspections, minor checks, and component replacement at specific time intervals to prevent failures that are known, or reasonably expected, to occur within a definable time or operating hour interval during the life of the equipment (e.g., generator brush wear, air and oil filter replacements). This also includes discarding equipment or components when it is less costly than repairing or refurbishing them.

Predictive maintenance involves routine testing of equipment to determine deterioration rates and initiating and carrying out repairs in a timely manner before a failure occurs (e.g., ultrasonic thickness checks on fluid lines to monitor erosion wear rates and non-destructive testing of boiler and turbine components to determine fatigue, wear or corrosion rates, and remaining life). Predictive maintenance items include such things as boiler and auxiliary equipment annual overhauls, wherein an assessment is made of components or subsystems that are only accessible during these overhauls.

There is also regular or continual monitoring of equipment operating parameters with a comparison of the results with optimum conditions to determine the most economic time to intervene and perform

remedial work that is intended to return the equipment to optimum performance levels (e.g., air heater washes, generator winding insulation condition, oil sampling and testing).

Since 2008, the Preventive Maintenance Program has been enhanced to include the extra costs associated with plant cleaning in areas where asbestos and heavy metals have been identified as potential health hazards.

Corrective Maintenance

In addition to the preventive maintenance techniques outlined, there are also corrective maintenance requirements. These include work performed to identify, isolate, and restore equipment, machines or systems to a level in which it can be operated safely and used for its intended purpose. The requirement of corrective maintenance may arise for various reasons including failure, wear and tear, and harsh environments such as humid or salt laden air. Examples of corrective maintenance include wear and tear on pumps, pipes, and valves in the main and auxiliary systems.

Boiler Overhauls

Boiler overhauls consist of the maintenance and refurbishment work required to ensure reliable boiler operation for the upcoming season. Boiler overhauls include packages of standard work, defined work, and as-found work. Standard work covers activities that are predictable and required on an annual basis due to normal operation, and wear and tear. Defined work represents planned, specific activities that do not normally occur on an annual basis and addresses issues identified from prior condition inspections and trending. As-found work covers unforeseen issues identified during an ongoing boiler overhaul. In some cases the nature of defined or as-found work meets the criteria for capitalization; in such cases it is not included in SEM.

Operating Projects

Operating projects are low-cost repairs and annual inspections that are required to return structures and equipment to their original or near original operability, to maintain structural integrity, improve efficiency, improve availability, and prevent or reduce environmental risks. Such projects include emissions monitoring and testing, and periodic basin cleaning in the Wastewater Treatment Plant.



Appendix B

Ten-Year System Equipment Maintenance Expenditures

Ten-Year System Equipment Maintenance Expenditures¹
(\$000)

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Generating Units										
Materials (inc. Boiler Overhauls)	490.0	68.0	69.7	71.4	73.2	75.1	76.9	78.9	80.8	82.9
Lubes, Chems, Gases	-	-	-	-	-	-	-	-	-	-
Contract Labour (inc. Boiler Overhauls)	3,501.0	159.0	163.0	167.0	171.2	175.5	179.9	184.4	189.0	193.7
Generating Units Total	3,991.0	227.0	232.7	238.5	244.5	250.6	256.8	263.3	269.8	276.6
Common Equipment										
Materials	480.0	240.0	246.0	252.2	258.5	264.9	271.5	278.3	285.3	292.4
Tools and Operating Supplies	20.0	12.0	12.3	12.6	12.9	13.2	13.6	13.9	14.3	14.6
Lubes, Chems, Gases	25.0	7.0	7.2	7.4	7.5	7.7	7.9	8.1	8.3	8.5
Contract Labour (Service Contracts)	1,260.0	400.0	410.0	420.3	430.8	441.5	452.6	463.9	475.5	487.4
Common Equipment Total	1,785.0	659.0	675.5	692.4	709.7	727.4	745.6	764.2	783.3	802.9
Environmental										
Materials	104.0	66.0	67.7	69.3	71.1	72.9	74.7	76.5	78.5	80.4
Tools and Operating Supplies	13.0	6.0	6.2	6.3	6.5	6.6	6.8	7.0	7.1	7.3
Lubes, Chems, Gases	247.0	145.0	148.6	152.3	156.1	160.1	164.1	168.2	172.4	176.7
Contract Labour (Service Contracts)	68.0	19.0	19.5	170.0	20.5	21.0	21.5	192.0	22.6	23.1
Environmental Total	432.0	236.0	241.9	397.9	254.1	260.5	267.0	443.7	280.5	287.5
Grant Total	6,208.0	1,122.0	1,150.1	1,328.8	1,208.3	1,238.5	1,269.4	1,471.2	1,333.7	1,367.0

¹ Numbers may not add due to rounding.



2022 Capital Budget Application

2021 Capital Expenditures Overview

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Appendix A: Capital Project Variance Summary

1.0 Variance Explanations

Explanations are provided below for projects for which overall expenditures, on a total project basis, have a forecasted variance of more than \$100,000 and 10% from the budgeted amount. As this is a mid-year report, variances are based on focused management and reforecasting efforts, and are subject to change throughout the year as the projects proceed. Actual variances at completion of each project will be discussed in the annual Capital Expenditures and Carryover Report when annual expenditures are final.

1.1 Hydraulic Generation Projects

1) Replace Exciter Controls Units 1 to 6 – Bay d’Espoir

	Original Budget (\$000)	Forecast to Completion (\$000)	Variance (\$000)
Project	3,347.0	2,344.7	(1,002.3)

This is a four-year project that commenced in 2017 and has carried over into 2021. The exciter controls replacement for five of the six Bay d’Espoir generating units were completed by the end of 2020. The work for Unit 6 could not be completed during the scheduled 2020 unit outage due to impacts associated with the early stages of the COVID-19 pandemic. At that time, there was uncertainty around the ability to complete work during the pandemic. Several safety considerations contributed to the decision to postpone the work, including challenges maintaining a safe working environment within the plant and concerns regarding mobilizing out of province resources into the Bay d’Espoir communities and the Bay d’Espoir Hydroelectric Generating Facility. Guidance on COVID-19 controls was evolving and a COVID-19 control plan had not yet been established. Several logistical challenges and risks to cost and schedule were identified including closure of all local accommodations and reduced productivity due to new COVID-19 controls. The work for Unit 6 has been rescheduled to 2021. The forecasted variance in overall project expenditures is attributed to the actual and forecast costs for the construction contract and engineering being less than originally estimated.

1.2 Gas Turbine Generation Projects

2) Increase Fuel and Water Treatment System Capacity – Holyrood Gas Turbine

	Original Budget (\$000)	Forecast to Completion (\$000)	Variance (\$000)
Project	11,842.6	7,705.2	(4,137.4)

This is a two-year project that commenced in 2018 and has carried over into 2021. The scope of work for this project is to expand the water treatment plant and install two new fuel storage tanks at the Holyrood Gas Turbine. In 2019, the water treatment plant expansion was completed and put into service. Also in 2019, construction was completed for the two new fuel storage tanks and they were placed in service with manual operation capability. The project carried over into 2020 to complete the automation of the fuel transfer system and complete secondary containment liner work that was hampered by inclement weather in 2019. The automation of the fuel transfer system work was completed in 2020. The secondary containment liner work was completed in 2020 as well but does not yet meet final acceptance criteria as the leakage rate measured in the dyke permeability test was higher than acceptable. The project carried over into 2021 for further investigation of the liner and resolution of the issue.

The forecasted variance in overall project expenditures is attributed to lower than estimated contract prices for the fuel tank construction. At the time of budget preparation, Hydro requested contractor budget pricing; however, the estimates were not received in time for inclusion in the project estimate prior to submission of the 2018 Capital Budget Application. In lieu of estimates from the contractor, Hydro used historical cost data from the original plant construction.

1.3 Terminal Stations Projects

3) Upgrade Circuit Breakers – Various Sites

	Original Budget (\$000)	Forecast to Completion (\$000)	Variance (\$000)
Project	50,900.5	44,561.7	(6,338.8)

This is a five-year project that commenced in 2016 and has been carried over into 2021. The project scope includes several breaker replacements and refurbishments at a number of terminal stations each year. In 2020, disruption of the annual work plan in the early stages of the COVID 19 pandemic led to a

shortened construction season. Remaining work was prioritized and the master outage schedule was revised. Of the nine breakers originally planned to be replaced in 2020, five were completed. Three breaker replacements were re-scheduled to 2021 as they no longer fit into the revised master outage schedule. One breaker replacement was cancelled as it is no longer required due to a planned reconfiguration of the Stephenville Terminal Station.

The forecasted variance in total project expenditure is primarily attributed to work being completed for less than the budget estimates and the elimination of five breakers from the project scope: one at Western Avalon Terminal Station in 2018, one at Bay d'Espoir Terminal Station 2 in 2018; one at Bay d'Espoir Terminal Station 2 in 2019 which was instead refurbished in 2020, one at Hardwoods Terminal Station in 2019 which was instead refurbished in 2020; and one at Stephenville Terminal Station in 2020, due to the planned reconfiguration of the station.

4) Terminal Station Refurbishment and Modernization – Various Sites

	Original Budget (\$000)	Forecast to Completion (\$000)	Variance (\$000)
Project	29,952.9	20,843.0	(9,109.9)

This is a two-year project that commenced in 2019 and has carried over to 2022 for a portion of the scope. It includes a number of consolidated program-type projects across several sites and a focused refurbishment at Wabush Terminal Station.

The variance in overall project expenditures plus forecast is attributed to the costs for materials and labour being less than originally estimated for several scope items, and some scopes of work cancelled or deferred to future projects.

The following scopes of work were cancelled following review of updated condition or system assessment information indicating that the work was not immediately required:

- Transformer bushing replacements at Churchill Falls, Stephenville, Hawke's Bay, Granite Canal and Hardwoods Terminal Stations;
- Hardwoods Transformer T3, and L'Anse Au Loup instrument transformers replacements;
- Installation of a moisture reduction system for Bay d'Espoir Transformer T1; and

- Insulator replacements at Churchill Falls.

The following scope items were deferred and transferred to the 2020–2021 Terminal Station Refurbishment and Modernization project, which has sufficient budget for this work:

- Transformer upgrades at various sites, including several tap changer upgrades requiring support from out-of-province contractors which could not be secured during the COVID 19 pandemic in 2020;
- Hardwoods Bus B7 and several Churchill Falls instrument transformer replacements due to late equipment deliveries and outage unavailability in 2020;
- Bay d’Espoir Transformer T6 radiator replacement due to outage unavailability in 2020;
- Insulator replacements at Happy Valley, due to last minute cancellation of the crane contractor who had double-booked;
- Insulator replacements at Churchill Falls due to outage unavailability; and
- Disconnect switch replacements at Sunnyside, due to COVID-19 constraints and outage unavailability.

1.4 Rural Generation Projects

5) Diesel Genset Replacements – Mary’s Harbour

	Original Budget (\$000)	Forecast to Completion (\$000)	Variance (\$000)
Project	3,900.7	3,148.8	(751.9)

This is a one-year project that commenced in 2020 and carried over to 2021. The project scope is to replace two diesel genset units and associated exhaust stacks, radiators, aftercoolers, switchgear, ventilation, protection, and controls necessary to facilitate the proper function of the new units at Mary’s Harbour Diesel Plant. This work was substantially completed in 2020 and the new gensets are in service. A portion of the work to update the automatic control system has carried over to 2021.

The variance in overall project expenditures plus forecast is primarily attributed to the electrical, protection, and controls scope of work being completed for less than the original budget estimates. Fewer construction resources were required to complete the work than originally estimated. Also, the

project was estimated with the assumption that contractors would be performing a portion of the work. Internal resources were available, resulting in less mobilization, travel, and contract management costs.

6) Replace Automation Equipment – St. Anthony

	Original Budget (\$000)	Forecast to Completion (\$000)	Variance (\$000)
Project	1,873.3	2,248.1	374.8

This is a two-year project that commenced in 2018 and has carried over into 2021. The engineering, procurement, and construction were substantially completed in 2019, and the automation programming and commissioning carried over. Some of the automation work was completed in early 2020. COVID-19 restrictions during the early stages of the pandemic resulted in the technical resources demobilizing from site. Those technical resources were then dedicated to higher priority work for the remainder of the year. The remainder of the automation work has been rescheduled to 2021.

The variance in overall project expenditures plus forecast is attributed to the construction effort being more than the original project estimate. Some of the protection and control equipment required upgrades that were not anticipated at the time of the budget estimate. Additional labour costs and mobilization and demobilization costs were incurred due to the failure of the existing switchgear for one of the gensets and the requirement to divert resources to support work in Charlottetown following the diesel plant fire in late 2019.

1.5 Transportation Projects

7) Replace Vehicles and Aerial Devices – Various Sites

	Original Budget (\$000)	Forecast to Completion (\$000)	Variance (\$000)
Project	1,843.0	2,146.0	303.0

This is a two-year project that has carried over into 2021. The variance in overall project expenditures plus forecast is attributed to actual market pricing for vehicles and aerial devices exceeding the original budget estimates.

2.0 Project Budget Updates

Hydro completed a review of the scope, schedule and cost estimates for multi-year projects continuing in 2022 that were approved as part of the 2021 Capital Budget Application. This review resulted in updated estimates for six projects. The 2022 portion of the budget for these projects are now less than originally presented in the 2021 Capital Budget Application. A summary of the original and updated cost estimates for these projects is provided below.

1) Hydraulic Generation Refurbishment and Modernization (2021–2022)

This is a two-year project that commenced in 2021. The overall budget estimate for this project has been reduced compared to the budget originally presented in the 2021 Capital Budget Application. The budget reduction is attributed to an updated estimate to complete the planned refurbishment of the Bay'd'Espoir Unit 6 generator stator. The contractor scope of work was tendered and awarded in 2021 for less than the original budget estimate.

The overall expenditures plus forecast for this project has been reduced to reflect the updated estimate for the refurbishment of the Bay'd'Espoir Unit 6 generator stator. This reduction has been partially offset by an expected over-expenditure for the condition assessment of the penstock at Paradise River Generating Station. The penstock condition assessment is expected to be completed in 2021 for more than the approved budget estimate. The over-expenditure is attributed to the need to install an access hatch in the trashracks to allow entry of a remotely operated vehicle ("ROV") for the inspection. The original plan was to remove trashracks to allow entry of the ROV, but it was determined that removing the trashracks would pose an unacceptable risk to the operation of the generating station.

Project Cost	2021 (approved)	2022	2023	Total
Original Budget Estimate in 2021 Capital Budget Application	6,569.6	6,505.5	0	13,075.1
Revised Budget Estimate in 2022 Capital Budget Application	6,569.6	5,005.6	0	11,575.2
Actual Expenditure and Forecast, updated June 2021	4,483.4	7,237.0	0	11,720.4

2) Upgrade Circuit Breakers (2021–2022) - Various

This project was originally submitted as a two-year project and is now planned to extend into 2023. The project scope includes the refurbishment or replacement of a number of circuit breakers in Hydro's terminals stations. During a review of asset condition in 2021, it was determined that the replacement of breaker B6L3 in Holyrood Terminal Station can be deferred to 2023 without significant reliability risk. The associated budget for this breaker replacement has been moved from 2022 to 2023.

The overall budget estimate for this project has been reduced compared to the budget originally presented in the 2021 Capital Budget Application. The budget reduction is attributed to an updated estimate to complete the planned scope of work, taking into account known costs and updated cost experience from similar projects.

Project Cost	2021 (approved)	2022	2023	Total
Original Budget Estimate in 2021 Capital Budget Application	5,418.8	6,113.9	0	11,532.7
Revised Budget Estimate in 2022 Capital Budget Application	5,418.8	4,293.6	820.3	10,532.7
Actual Expenditure and Forecast, updated June 2021	4,412.1	5,300.4	820.3	10,532.7

3) Upgrades for Future Retirement of Stephenville Gas Turbine

This is a two-year project that commenced in 2021. The overall budget estimate for this project has been reduced compared to the budget originally presented in the 2021 Capital Budget Application. The budget reduction is attributed to the cancellation of a portion of the project scope following an optimization of the engineering design of Bottom Brook Terminal Station. In addition to resulting in a lower cost project, the optimized design is expected to improve reliability and operability of the station. The following scope of work is no longer required at Bottom Brook Terminal Station:

- Procurement and installation of:
 - One, 230 kV, 1200 A circuit breaker;
 - One, 72.5 kV, 2000 A circuit breaker;

- Three, 72.5 kV, 1200 A disconnect switches;
- Power and control cables for the above listed equipment;
- Take off structures including overhead conductor; and
- Protection, control and communications upgrades for the above listed equipment.

The following additional scope of work has been incorporated into the project as part of the optimized design at Bottom Brook Terminal Station:

- Additional bus work, post insulators, and post insulator support structures required for the new tie-in location of Transformer T4;
- Line protection upgrade for Transmission Line TL214; and
- Protection upgrades for all four transformers.

Project Cost	2021 (approved)	2022	2023	Total
Original Budget Estimate in 2021 Capital Budget Application	1,530.3	8,389.5	0	9,919.8
Revised Budget Estimate in 2022 Capital Budget Application	1,530.3	5,344.5	0	6,874.8
Actual Expenditure and Forecast, updated June 2021	398.3	6,476.5	0	6,874.8

4) Additions for Load – Wabush Substation Upgrades

This is a three-year project (2021–2023) that commenced in 2021. A portion of the scope originally planned to be completed in 2022 is now planned to be completed in 2023, for a more efficient sequencing of the overall project work plan. Specifically the installation of two of the three 46 kV motor operated disconnect switches to be located between Bus B4 and the three transformers have been rescheduled and the associated budget has been moved from 2022 to 2023.

Project Cost	2021 (approved)	2022	2023	Total
Original Budget Estimate in 2021 Capital Budget Application	1,186.7	6,365.1	2,941.6	10,493.4
Revised Budget Estimate in 2022 Capital Budget Application	1,186.7	6,253.0	3,053.7	10,493.4
Actual Expenditure and Forecast, updated June 2021	1,186.7	6,253.0	3,053.7	10,493.4

5) Terminal Station Refurbishment and Modernization (2021–2022)

This is a two-year project that commenced in 2021. The overall budget estimate for this project has been reduced compared to the budget originally presented in the 2021 Capital Budget Application. The budget reduction is attributed to updated estimates for the installation of a fire suppression system at Massey Drive Terminal Station and the replacement of station lighting at Stony Brook Terminal Station. The revised estimates were based upon recent cost experience for similar projects.

Project Cost	2021 (approved)	2022	2023	Total
Original Budget Estimate in 2021 Capital Budget Application	6,171.6	7,182.0	0	13,353.6
Revised Budget Estimate in 2022 Capital Budget Application	6,171.6	6,957.3	0	13,128.9
Actual Expenditure and Forecast, updated June 2021	6,161.5	6,967.4	0	13,128.9

6) Diesel Genset Replacements (2021–2022)

This is a two-year project that commenced in 2021. The overall budget estimate for this project has been reduced compared to the budget originally presented in the 2021 Capital Budget Application. The budget reduction is attributed to an updated estimate to complete the planned scope of work. The supply of the new genset was tendered and awarded for less than the original budget estimate.

Project Cost	2021 (approved)	2022	2023	Total
Original Budget Estimate in 2021 Capital Budget Application	2,560.6	525.0	0	3,085.6
Revised Budget Estimate in 2022 Capital Budget Application	2,560.6	286.2	0	2,846.8
Actual Expenditure and Forecast, updated June 2021	2,351.4	495.4	0	2,846.8



Appendix A

Capital Project Variance Summary

Total Capital Project Variance¹
2021 Overview
(\$000)

Asset Type	Board Approved Budget	Total Project Expenditures and Forecast	Variance
Hydraulic	48,316	47,269	(1,048)
Thermal	25,340	25,340	-
Gas Turbines	23,067	18,805	(4,262)
Terminal Stations	151,744	131,526	(20,217)
Transmission	22,875	24,344	1,469
Distribution	14,240	14,240	-
Rural Generation	26,668	26,902	234
Properties	384	384	-
Metering	233	233	-
Rural Systems Tools and Equipment	2,045	2,067	22
Information Systems	2,445	2,485	40
Telecontrol	1,034	1,034	-
Transportation	8,008	8,311	303
Administrative	2,134	2,134	-
Allowance for Unforeseen	1,108	1,108	-
Supplemental Projects	1,052	1,052	-
Projects Approved for less than \$50,000	95	95	-
Forecast Adjustment	-	(4,735)	(4,735)
Total Capital Budget	330,791	302,596	(28,195)

¹ Numbers may not add due to rounding.

2021 Capital Expenditures By Year (\$'000)

Capital Budget										Actual Expenditure and Forecast									
A		B		C	D (B+C)		E	F (A+C+E)		G	H	I	J	K (G+H+I+J)	K-F	H+D			
2016	2017	2018	2020	Carryover to 2021	Original 2021	Revised 2021	2022 and Beyond	Total	2016	2017	2018	2019	2020	2021	Forecast Jul-Dec 2021	2022 and Beyond	Total	Project Variance	Annual Variance
Summary	-	-	-	-	73,646.5	73,646.5	62,121.7	135,769.2	-	-	-	-	-	17,537.2	51,665.1	60,703.7	129,906.0	(5,863.2)	(4,444.2)
2021 Projects	-	-	-	-	24,927.1	7,917.7	62,129.6	-	-	-	-	-	-	16,576.5	28,379.3	3,491.1	62,124.8	(7,338.3)	(6,630.0)
2020 Projects	-	-	-	25,556.1	30,470.6	9,471.4	-	56,028.7	-	-	-	-	-	3,790.3	6,752.8	6,999	48,690.4	(2,612.5)	1,071.7
2019 Projects	-	9,741.4	9,281.9	3,592.8	669.6	-	669.6	-	-	-	20,097.8	17,349.6	3,790.3	1,026.0	493.6	-	19,703.6	(2,612.5)	850.0
2018 Projects	-	119.2	921.2	877.0	1,479.6	229.6	229.6	-	-	182.7	628.9	853.9	449.5	45.2	184.4	-	2,344.7	(1,002.3)	-
2017 Projects	6,969.1	10,808.7	15,408.6	6,597.3	11,116.8	2,698.9	-	50,900.5	5,599.5	8,877.8	15,184.2	7,901.7	4,299.6	1,669.6	1,029.3	-	44,561.7	(6,338.8)	-
Forecast Adj.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(4,734.9)	-	(4,734.9)	(4,734.9)	(4,734.9)
Grand Total	6,969.1	10,927.9	26,071.2	42,314.3	71,536.9	20,987.2	108,449.0	129,436.3	64,522.7	330,791.1	5,599.5	9,060.5	20,109.2	38,382.4	43,034.1	37,746.3	64,894.7	(28,194.9)	(7,920.5)
2021 Capital Budget Approved by Board Order No. P.U. 11(2021)																			
New Project Approved by Board Order No. P.U. 25(2020)																			
165.1																			
New Project Approved by Board Order No. P.U. 25(2020)																			
(165.1)																			
New Project Approved by Board Order No. P.U. 26(2020)																			
215.6																			
New Project Approved by Board Order No. P.U. 26(2020)																			
(215.6)																			
Top-up Approved by Board Order No. P.U. 17(2021)																			
108.0																			
New Project Approved by Board Order No. P.U. 18(2021)																			
443.0																			
New Project Approved by Board Order No. P.U. 20(2021)																			
350.0																			
2021 New Projects under \$50,000 Approved by Hydro																			
95.1																			
Total Approved Capital Budget Before Carryovers																			
108,448.5																			
Carryover Projects 2020 to 2021																			
20,987.2																			
Total Approved Capital Budget																			
129,435.7																			

2021 Capital Expenditures By Category
(\$000)

Capital Budget												
Actual Expenditure and Forecast												
A	B	C	D (B+C)	E	F (A+C+E)	G	H	I	J	K (G+H+I)	K-F	H+D
2016	2017	2018	2019	2020	Carryover to 2021	Original 2021	Revised 2021	2022 and Beyond	Total	Forecast 2022 and Beyond	Project Variance	Annual Variance
Hydraulic Generation Projects												
2021 Projects												
-	-	-	-	-	-	3,236.8	3,236.8	10,383.1	13,619.9	10,383.1	-	-
-	-	-	-	-	-	6,569.5	6,569.5	6,569.5	13,075.0	3,191.5	(1,354.7)	(2,886.2)
-	-	-	-	-	-	1,250.0	1,250.0	-	1,250.0	65.4	-	-
-	-	-	-	-	-	194.3	194.3	-	194.3	92.4	-	-
2020 Projects												
-	-	-	-	6,580.3	72.1	10,249.9	10,322.0	-	16,830.2	7,363.0	1,309.2	454.3
2017 Projects												
-	119.2	921.2	877.0	1,429.6	229.6	-	229.6	-	3,347.0	45.2	(1,002.3)	-
-	119.2	921.2	877.0	8,009.9	301.7	21,500.6	21,802.3	16,888.6	48,316.4	15,777.9	(1,047.8)	(1,631.9)
Total Hydraulic Generation Projects												

2021 Capital Expenditures By Category
(\$000)

Capital Budget										Actual Expenditure and Forecast												K-F	H+D		
A		B		C		D (B+C)		E		F (A+C+E)		G		H				I		J		K (G+H+I)		Project Variance	Annual Variance
2016	2017	2018	2019	2020	Original to 2021	Carryover to 2021	Original 2021	Revised 2021	2022 and beyond	Total	2016	2017	2018	2019	2020	2021	Forecast Jul-Dec 2021	2022 and beyond	Total						
Thermal Generation Projects																									
2021 Projects																									
		-	-	-	-	-	-	8,026.6	8,026.6	-	8,026.6	-	-	-	-	-	1,935.6	6,091.0	-	-	8,026.6	-	-		
		-	-	-	-	-	-	572.7	572.7	-	572.7	-	-	-	-	-	259.4	313.2	-	-	572.7	-	-		
		-	-	-	-	-	-	2,000.0	2,000.0	-	2,000.0	-	-	-	-	-	1,333.9	666.1	-	-	2,000.0	-	-		
		-	-	-	-	-	-	373.0	373.0	-	373.0	-	-	-	-	-	209.3	163.8	-	-	373.0	-	-		
		-	-	-	-	-	-	360.4	360.4	368.2	728.6	-	-	-	-	-	29.3	331.2	368.2	-	728.6	-	-		
		-	-	-	-	-	-	3,000.0	3,000.0	-	3,000.0	-	-	-	-	-	1,628.9	1,371.1	-	-	3,000.0	-	-		
		-	-	-	-	-	-	1,813.4	1,813.4	547.7	2,361.1	-	-	-	-	-	84.3	1,729.2	547.7	-	2,361.1	-	-		
		-	-	-	-	-	-	919.8	919.8	-	919.8	-	-	-	-	-	26.7	893.1	-	-	919.8	-	-		
		-	-	-	-	-	-	64.4	64.4	-	64.4	-	-	-	-	-	37.6	26.8	-	-	64.4	-	-		
2020 Projects																									
		-	-	-	-	1,281.4	(950.0)	5,664.2	4,714.2	-	6,945.6	-	-	-	-	2,231.4	3,203.9	1,510.3	-	-	6,945.6	(0.0)	-		
		-	-	-	-	348.7	65.5	-	65.5	-	348.7	-	-	-	-	283.2	54.1	11.4	-	-	348.7	0.1	-		
		-	-	-	-	1,630.1	(884.5)	22,794.4	21,909.9	915.9	25,340.4	-	-	-	-	2,514.6	8,802.8	13,107.1	915.9	-	25,340.5	0.1	-		
Total Thermal Generation Projects																									

2022 Capital Budget Application
2021 Capital Expenditures Overview, Appendix A

2021 Capital Expenditures By Category
(5000)

Capital Budget										Actual Expenditure and Forecast												K#	H#-D
A		B			C	D (B+C)	E	F (A+C+E)		G	H			I	J	K (G+H+J)		Project Variance	Annual Variance				
2016	2017	2018	2019	2020	Carryover to 2021	Original 2021	Revised 2021	2022 and Beyond	Total	2016	2017	2018	2019	2020	2021	Forecast Jul-Dec 2021	Total						
Gas Turbine Generation Projects																							
2021 Projects																							
-	-	-	-	-	-	318.8	318.8	-	318.8	-	-	-	-	-	53.7	265.1	-	318.8	-				
-	-	-	-	-	-	213.8	213.8	-	213.8	-	-	-	-	-	-	-	-	213.8	-				
-	-	-	-	-	-	131.3	131.3	211.0	342.3	-	-	-	-	-	28.8	102.5	211.0	342.3	-				
-	-	-	-	-	-	234.8	234.8	170.5	405.3	-	-	-	-	-	65.6	169.2	170.5	405.3	-				
-	-	-	-	-	-	76.6	76.6	69.2	145.8	-	-	-	-	-	22.3	54.3	69.2	145.8	-				
2020 Projects																							
-	-	-	-	546.1	538.5	2,500.0	3,038.5	2,400.0	5,446.1	-	-	-	-	35.0	10.3	1,937.0	3,491.1	5,473.5	27.4				
-	-	-	-	37.8	(145.6)	575.0	429.4	-	612.7	-	-	-	-	165.4	181.3	248.0	-	594.8	(18.0)				
-	-	-	-	264.6	(28.8)	2,377.9	2,349.1	-	2,642.4	-	-	-	-	158.9	132.3	2,216.7	-	2,508.0	(134.5)				
-	-	-	-	1,097.6	1,021.6	-	1,021.6	-	1,097.6	-	-	-	-	76.0	617.7	403.9	-	1,097.6	0.0				
2018 Projects																							
-	-	8,829.9	3,012.7	-	724.8	-	724.8	-	11,842.6	-	-	2,583.8	3,563.9	832.8	77.0	647.8	-	7,705.2	(4,137.4)				
Total Gas Turbine Generation Projects																							
-	-	8,829.9	3,012.7	1,946.1	2,110.5	6,428.1	8,588.6	2,890.7	23,067.5	-	-	2,583.8	3,563.9	1,268.1	1,297.5	6,150.0	3,941.8	18,805.1	(4,262.4)				
																		(1,091.1)					

2022 Capital Budget Application
2021 Capital Expenditures Overview, Appendix A

2021 Capital Expenditures By Category
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Capital Budget										Actual Expenditure and Forecast																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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2016	2017	2018	2019	2020	2021	Carryover to 2021	Original	Revised	2022 and Beyond	Total	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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2021 Capital Expenditures by Category (\$'000)

Capital Budget										Actual Expenditure and Forecast									
A	B				C	D	E	F (A+C+E)		G	H				I	J	K (G+H+I+J)	L	M
2016	2017	2018	2019	2020	Carryover to 2021	Original	Revised 2021	2022 and Beyond	Total	2016	2017	2018	2019	2020	2021	2022 and Beyond	Total	Project Variance	Annual Variance
Transmission Projects																			
2021 Projects																			
-	-	-	-	-	-	2,896.9	2,896.9	-	2,896.9	-	-	-	-	-	941.2	1,955.8	-	2,896.9	-
Wood Pole Line Management Program- Various Sites																			
2019 Projects																			
-	-	-	12,586.4	7,392.1	2,790.2	-	2,790.2	-	19,978.5	-	-	-	12,528.5	4,659.8	1,481.3	2,777.5	-	21,447.1	1,468.6
Muskrat Falls to Happy Valley Interconnection																			
Total Transmission Projects																			
-	-	-	12,586.4	7,392.1	2,790.2	2,896.9	5,687.1	-	22,875.4	-	-	-	12,528.5	4,659.8	2,422.4	4,733.3	-	24,344.0	1,468.6

2021 Capital Expenditures By Category
(\$000)

Capital Budget										Actual Expenditure and Forecast																					
A		B		C		D (B+C)		E (A+C+E)		G		H		I		J		K (G+H+J)		K+F		H+D									
		Carryover to 2021		Original 2021		Revised 2021		Total		2016		2017		2018		2019		2020		2021		Forecast Jul-Dec 2021		2022 and Beyond		Total		Project Variance		Annual Variance	

2022 Capital Budget Application
2021 Capital Expenditures Overview, Appendix A

2021 Capital Expenditures By Category
(\$000)

	Capital Budget							Actual Expenditure and Forecast										K-F Project Variance	HH-D Annual Variance		
	A		B		C		D	E	F (A+C+E)		G		H		I	J	K (G+H+I+J)				
	2016	2017	2018	2019	2020	Carryover to 2021	Original 2021	Revised 2021	2022 and Beyond	Total	2016	2017	2018	2019	2020	2021				Forecast Jul- Dec 2021	2022 and Beyond
Rural Generation Projects																					
2021 Projects																					
	-	-	-	-	-	-	1,232.9	1,232.9	-	1,232.9	-	-	-	-	-	252.2	980.6	-	1,232.9	-	-
Overhaul Diesel Units - Various	-	-	-	-	-	-	2,560.6	2,560.6	525.0	3,085.6	-	-	-	-	-	107.7	2,243.6	495.4	2,846.8	(238.8)	(209.2)
Diesel Genset Replacements (2021-2022)	-	-	-	-	-	-	532.6	532.6	-	532.6	-	-	-	-	-	36.3	496.2	-	532.6	-	-
Inspect Fuel Storage Tanks - Foxville	-	-	-	-	-	-	350.3	350.3	-	350.3	-	-	-	-	-	50.3	299.9	-	350.3	-	-
Replace Fuel Storage Tanks - PR	-	-	-	-	-	-					-	-	-	-	-					-	-
2020 Projects																					
	-	-	-	-	162.7	66.6	690.4	757.0	-	853.1	-	-	-	-	96.1	149.1	607.8	-	853.1	(0.0)	-
Diesel Plant Ventilation Upgrade - Nain	-	-	-	-	363.8	305.8	-	305.8	-	363.8	-	-	-	-	58.0	127.9	177.9	-	363.8	(0.0)	-
Replace Automation Equipment - Rigolet	-	-	-	-	3,900.7	349.8	-	349.8	-	3,900.7	-	-	-	-	2,799.0	480.6	(130.8)	-	3,148.8	(751.9)	-
Diesel Genset Replacements - Mary's Harbour	-	-	-	-	125.3	3.9	1,195.8	1,199.7	-	1,321.2	-	-	-	-	121.6	53.9	1,145.8	-	1,321.3	0.2	-
Replace Powerhouse Roofing System - L'Anse au Loup and St. Anthony	-	-	-	-							-	-	-	-						-	-
2019 Projects																					
	-	-	-	306.9	-	56.7	-	56.7	-	306.9	-	-	-	152.9	97.3	22.1	34.6	-	306.9	0.0	0.0
Replace Human Machine Interface - Cartwright	-	-	-	525.6	3,421.8	2,834.6	-	2,834.6	-	3,947.4	-	-	-	140.2	972.6	868.7	1,965.9	-	3,947.4	(0.0)	-
Diesel Genset Replacements (2019-2020)	-	-	-								-	-	-	-						-	-
2018 Projects																					
	-	-	604.1	4,703.3	3,592.8	(225.2)	-	(225.2)	-	8,900.2	-	-	1,585.1	4,174.3	3,366.0	927.9	(303.1)	-	9,750.2	850.0	850.0
Diesel Genset Replacements - Makkovik	-	-	307.4	1,565.9	-	170.0	-	170.0	-	1,873.3	-	-	127.2	1,790.8	160.2	21.1	148.9	-	2,248.1	374.8	-
Replace Automation Equipment - St. Anthony	-	-									-	-	-	-	-	-	-	-		-	-
Total Rural Generation Projects	-	-	911.5	7,101.7	11,567.2	3,562.2	6,562.4	10,124.6	525.0	26,667.8	-	-	1,712.3	6,258.2	7,570.9	3,098.0	7,667.4	495.4	26,902.1	234.3	640.8

2021 Capital Expenditures By Category
(\$000)

	Capital Budget						Actual Expenditure and Forecast										K-F	HH-D				
	A	B			C	D	E	F (A+C+E)	G				H			I	J	K (G+H+I+J)	Project Variance	Annual Variance		
		2016	2017	2018	2019	2020	Carryover to 2021	Original 2021	Revised 2021	2022 and Beyond	Total	2016	2017	2018	2019	2020	2021	Forecast Jul-Dec 2021	2022 and Beyond	Total		
Properties Projects																						
2020 Projects																						
Upgrade Fire Suppression System - Bishop's Falls	-	-	-	-	-	91.6	(6.6)	292.6	286.0	-	384.2	-	-	-	-	98.2	50.5	235.4	-	384.2	0.0	-
Total Properties Projects	-	-	-	-	-	91.6	(6.6)	292.6	286.0	-	384.2	-	-	-	-	98.2	50.5	235.4	-	384.2	0.0	-

2021 Capital Expenditures By Category
(\$000)

	Capital Budget						Actual Expenditure and Forecast										K-F Project Variance	H+D Annual Variance						
	A		B			C		D		E		F (A+C+E)		G	H				I Forecast Jul-Dec 2021	J 2022 and Beyond	K (G+H+I+J)			
	2016	2017	2018	2019	2020	2021	Original to 2021	Carryover to 2021	Revised 2021	2022 and Beyond	Total	2016	2017		2018	2019						2020	2021	Total
Metering Projects																								
2021 Projects																								
Purchase Meters and Metering Equipment - Various		-	-	-	-	-	-	-	-	233.4	233.4	-	233.4	-	-	-	-	133.7	99.7	-	233.4	-	-	-
Total Metering Projects		-	-	-	-	-	-	-	-	233.4	233.4	-	233.4	-	-	-	-	133.7	99.7	-	233.4	-	-	-

2021 Capital Expenditures By Category
(\$000)

	Capital Budget										Actual Expenditure and Forecast										K-F Project Variance	H+D Annual Variance		
	A		B		C		D		E		F (A+C+E)		G		H		I		J				K (G+H+I+J)	
	2016	2017	2018	2019	2020	2021	Carryover to 2021	Original	Revised	2021 and Beyond	Total	2016	2017	2018	2019	2020	2021	Forecast Jul-Dec 2021	2022 and Beyond	Total				
Tools and Equipment																								
2021 Projects																								
Replace Light Duty Mobile Equipment - Various Sites																								
-	-	-	-	-	-	-	-	549.6	549.6	-	549.6	-	-	-	-	-	-	4.4	545.2	-	-	549.6	-	-
Replace Heavy Duty Off-Road Track Vehicle (V7601)																								
-	-	-	-	-	-	-	-	331.3	331.3	-	331.3	-	-	-	-	-	-	2.9	328.4	-	-	331.3	-	-
Purchase Backhoe - Wabush																								
-	-	-	-	-	-	-	-	179.3	179.3	-	179.3	-	-	-	-	-	-	2.0	177.3	-	-	179.3	-	-
Tools and Equipment Less than \$50,000																								
-	-	-	-	-	-	-	-	485.2	485.2	-	485.2	-	-	-	-	-	-	38.8	446.4	-	-	485.2	-	-
2020 Projects																								
Replace Light Duty Mobile Equipment - Various Sites																								
-	-	-	-	-	-	499.6	453.7	-	453.7	-	499.6	-	-	-	-	68.0	366.4	87.3	-	-	521.7	22.1	-	
Total Tools and Equipment																								
-	-	-	-	-	499.6	453.7	1,545.4	1,999.1	-	2,045.0	-	-	-	-	-	68.0	414.6	1,584.5	-	-	2,067.1	22.1	-	

2021 Capital Expenditures By Category
(\$'000)

Capital Budget												
A	Capital Budget				Actual Expenditure and Forecast							
	2016	2017	2018	2019	2020	2021	H	I	J	K (G+H+I+J)	K-F	H+D
	2016	2017	2018	2019	2020	2021	2021	Forecast Jul-Dec 2021	2022 and Beyond	Total	Project Variance	Annual Variance
Information Systems Projects												
2021 Projects												
Replace Personal Computers - Hydro Place	-	-	-	-	-	905.4	-	905.4	-	905.4	-	-
Replace Peripheral Infrastructure - Hydro Place	-	-	-	-	-	256.4	-	256.4	-	256.4	-	-
Upgrade Core IT Infrastructure - Hydro Place	-	-	-	-	-	262.8	-	262.8	-	262.8	-	-
Perform Minor Enhancements - Hydro Place	-	-	-	-	-	217.5	-	217.5	-	217.5	-	-
Upgrade Software Applications - Hydro Place	-	-	-	-	-	372.1	-	372.1	-	372.1	-	-
Upgrade Hydro ECC Wall Infrastructure - Hydro Place	-	-	-	-	-	188.5	-	188.5	-	188.5	-	-
2020 Projects												
Upgrade Core IT Infrastructure - Hydro Place	-	-	-	-	193.7	-	-	-	-	193.7	65.8	-
Perform Minor Enhancements - Hydro Place	-	-	-	-	49.0	26.2	26.2	0.1	(0.1)	22.8	(26.2)	(26.2)
Total Information Systems Projects	-	-	-	-	242.7	262	2,202.6	2,228.8	-	2,445.4	39.6	(26.2)

2021 Capital Expenditures By Category
(\$'000)

Capital Budget										Actual Expenditure and Forecast										
A	B					C	D	E	F (A+C+E)	G					H	I	J	K (G+H+J)	K-F	H+D
2016	2017	2018	2019	2020	Carryover to 2021	Original 2021	Revised 2021	2022 and Beyond	Total	2016	2017	2018	2019	2020	2021	Jul-Dec 2021	2022 and Beyond	Total	Project Variance	Annual Variance
Telecontrol Projects																				
2021 Projects																				
	-	-	-	-	-	194.1	194.1	-	194.1	-	-	-	-	-	128.9	65.2	-	194.1	-	-
	-	-	-	-	-	48.9	48.9	-	48.9	-	-	-	-	-	19.7	29.2	-	48.9	-	-
	-	-	-	-	-	240.4	240.4	-	240.4	-	-	-	-	-	28.4	212.0	-	240.4	-	-
	-	-	-	-	-	40.0	40.0	-	40.0	-	-	-	-	-	10.8	29.3	-	40.0	-	-
	-	-	-	-	-	183.4	183.4	-	183.4	-	-	-	-	-	132.7	50.7	-	183.4	-	-
	-	-	-	-	-	327.2	327.2	-	327.2	-	-	-	-	-	106.1	221.2	-	327.2	-	-
	-	-	-	-	-	1,034.1	1,034.1	-	1,034.1	-	-	-	-	-	426.5	607.6	-	1,034.1	-	-
Total Telecontrol Projects																				

2021 Capital Expenditures By Category
(\$'000)

[illegible]

	CapEx Budget						F (A+C+E)
	A	B		C	D	E	
	2016	2017	2018	2019	2020	Carryover to 2021	Original 2021
							Revised 2021
							2012 and Beyond
							Total
Projects Less than \$50,000							
2021 Projects							
St. Brendan's 578 Generator	-	-	-	-	-	46.9	46.9
Hydro - Mobile Devices	-	-	-	-	-	48.2	48.2
Total Projects Less than \$50,000	-	-	-	-	-	95.1	95.1
							95.1

[illegible]



2022 Capital Budget Application

2020 Average Rate Base

Table 1: Computation of Rate Base for the Year Ended December 31, 2020 (\$000)

	2020
Capital Assets - Return 4	2,708,003
Work in Progress ¹	24,988
	<u>2,732,991</u>
Deduct:	
Accumulated Depreciation - Return 6 ²	523,797
Contributions in Aid of Construction - Return 7 ¹	<u>50,680</u>
Total Capital Assets	2,158,515
Deduct Items Excluded from Rate Base:	
Work in Progress ¹	(24,988)
Asset Retirement Obligations (Net of Amortization)	<u>(768)</u>
Net Capital Assets	2,132,758
Net Capital Assets, Previous Year	<u>2,115,068</u>
Unadjusted Average Capital Assets	2,123,913
Deduct:	
Average Net Capital Assets Excluded from Rate Base	<u>(8,257)</u>
Average Capital Assets	2,115,656
Cash Working Capital Allowance - Return 8	1,409
Fuel Inventory - Return 10	54,075
Supplies Inventory - Return 10	38,438
Average Deferred Charges - Return 11	<u>100,981</u>
Average Rate Base at Year-End - Return 12	<u><u>2,310,559</u></u>

¹ Contributions of \$1.9 million (2019: \$5.9 million) are related to capital assets not in service have been net in work in progress.

² Accumulated amortization is net of the Retirement Asset Pool and Removal Provision. Please refer to Return 6 for further details.