

August 2, 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 Newfoundland and Labrador Hydro's ("Hydro") 2022 Capital Budget Application ("Application"), filed in accordance with the guidelines and conditions for capital budget proposals outlined by the Board of Commissioners of Public Utilities ("Board") 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. Through this Application, Hydro is seeking approval of \$84,714,000 in capital expenditures. Hydro is also seeking approval of its 2020 average rate base in the amount of \$2,310,559,000.

The Application will be posted on Hydro's website at [www.nlhydro.com](http://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**



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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**

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PUB Official Email

**Newfoundland Power**

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Dean A. Porter, Poole Althouse

**Labrador Interconnected Group**

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



# 2022 Capital Budget Application

**July 31, 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**



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Shirley A. Walsh  
Counsel for the Applicant  
Newfoundland and Labrador Hydro,  
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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.<sup>1</sup> 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,<sup>2</sup> 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,<sup>3</sup> 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.

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

<sup>2</sup> 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.

<sup>3</sup> "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;<sup>4</sup>
- Extension of the service life of the Holyrood Thermal Generating Station (“Holyrood TGS”);<sup>5</sup>
- 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.<sup>6</sup> 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.<sup>7</sup>

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

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<sup>4</sup> 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.

<sup>5</sup> “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.

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

<sup>7</sup> 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.<sup>8</sup> 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.

<sup>8</sup> 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,<sup>9</sup> 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.

<sup>9</sup> “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,<sup>10</sup> 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.<sup>11</sup> 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),<sup>12</sup> Purchase of a Diesel Generating Unit for Ramea project (\$2.0 million in 2022),<sup>13</sup> and phase 1 of the Bay d’Espoir Penstock Life Extension project (\$1.9 million in 2022),<sup>14</sup> 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,<sup>15</sup> and \$1.5 million in fully contributed terminal station asset renewal expenditures specifically assigned to the

<sup>10</sup> Including projects less than \$50,000.

<sup>11</sup> 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.

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

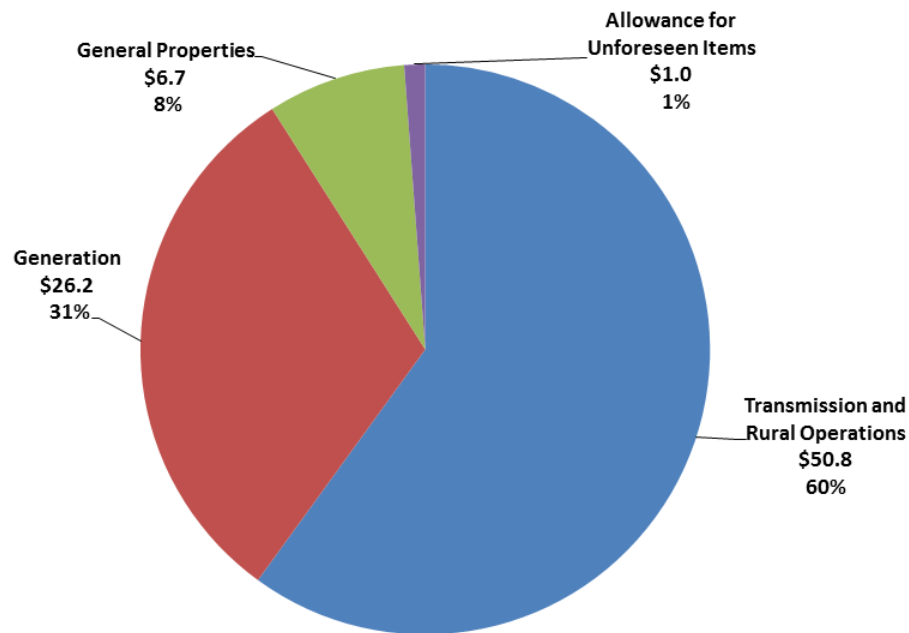
<sup>13</sup> “Purchase of a Diesel Generating Unit – Ramea” Newfoundland and Labrador Hydro, on July 28, 2021.

<sup>14</sup> 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.

<sup>15</sup> “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.



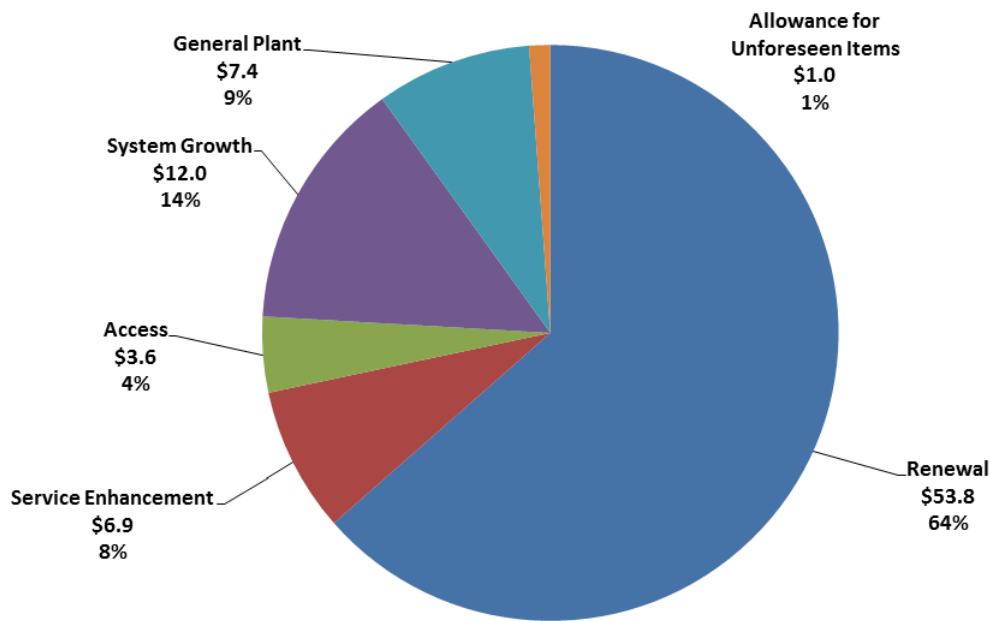
**Figure 1: 2022 Capital Budget Summary (\$ millions)**

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,<sup>16</sup> 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

<sup>16</sup> "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-year<sup>17</sup> historical average capital expenditures for generation are shown in Figure 4.

<sup>17</sup> 2016–2020.

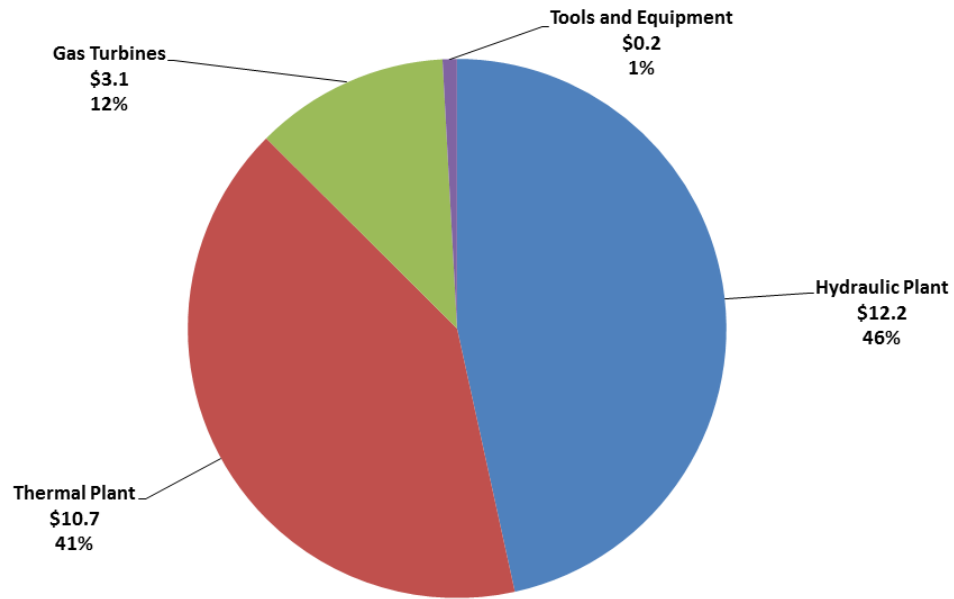


Figure 3: 2022 Capital Budget for Generation (\$ millions)

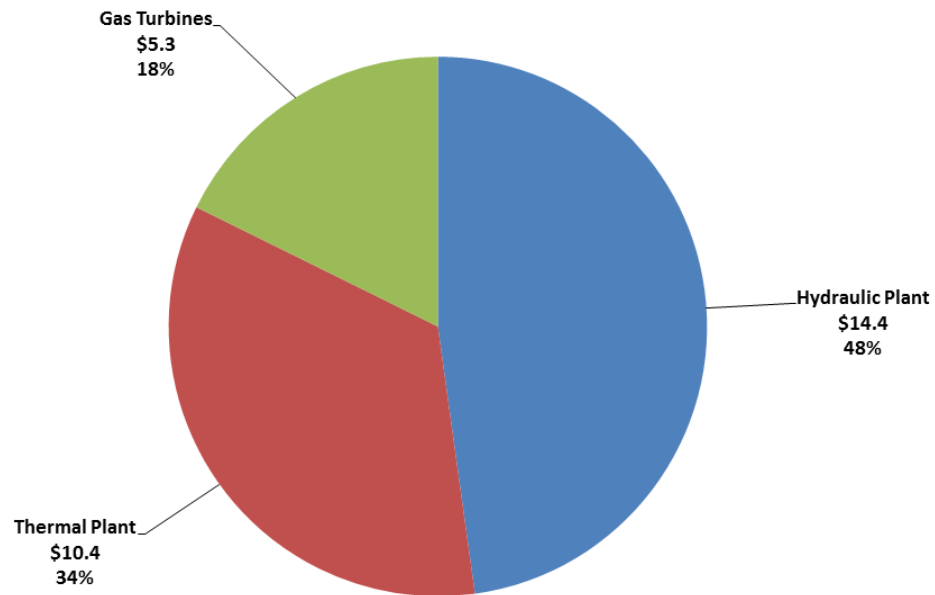


Figure 4: Five-Year Historical Average Capital Expenditures for Generation (2016–2020) (\$ millions)

#### 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.<sup>18</sup>

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.<sup>19</sup> 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-year<sup>20</sup> historical average (\$10.4 million) and has increased relative to that which was reflected for 2022 in the prior year five-year<sup>21</sup> capital plan (\$5.5 million).

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

<sup>19</sup> As communicated to the Board in correspondence dated June 3, 2020.

<sup>20</sup> 2016–2020.

<sup>21</sup> 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.<sup>22</sup> 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.<sup>23</sup>

#### 4.1.3 Gas Turbines

2022 planned capital expenditures for gas turbines (\$3.1 million) has decreased compared to the five-year<sup>24</sup> historical average (\$5.3 million) and is consistent with the 2022 amount reflected in the prior year five-year<sup>25</sup> 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.

<sup>22</sup> "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.

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

<sup>24</sup> 2016–2020.

<sup>25</sup> 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 stations<sup>26</sup> 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-year<sup>27</sup> historical average expenditures for this area.

<sup>26</sup> Including Natuashish, which Hydro operates but does not own.

<sup>27</sup> 2016–2020.

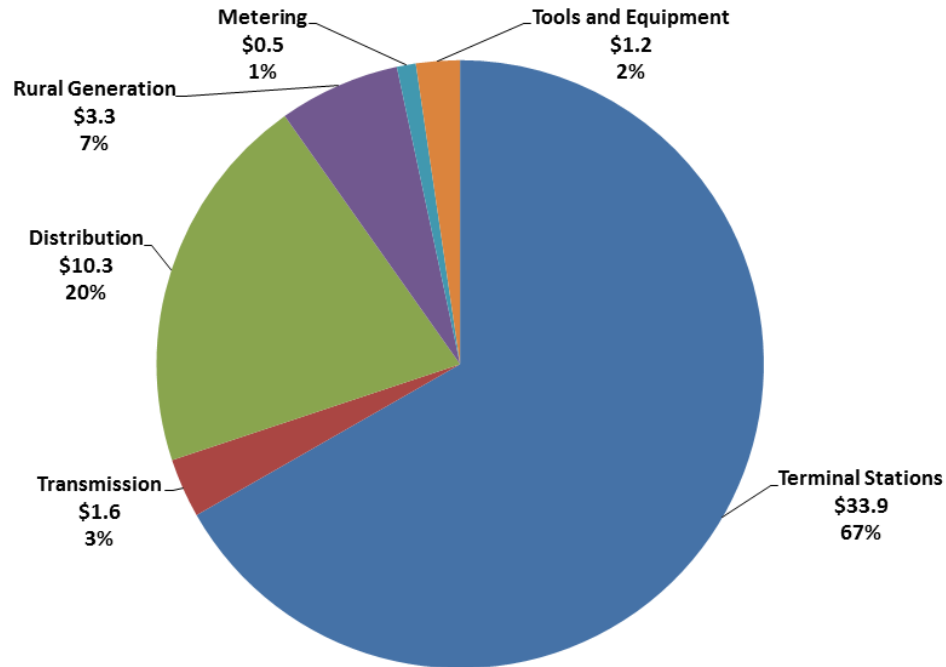


Figure 5: 2022 Capital Budget for Transmission and Rural Operations (\$ millions)

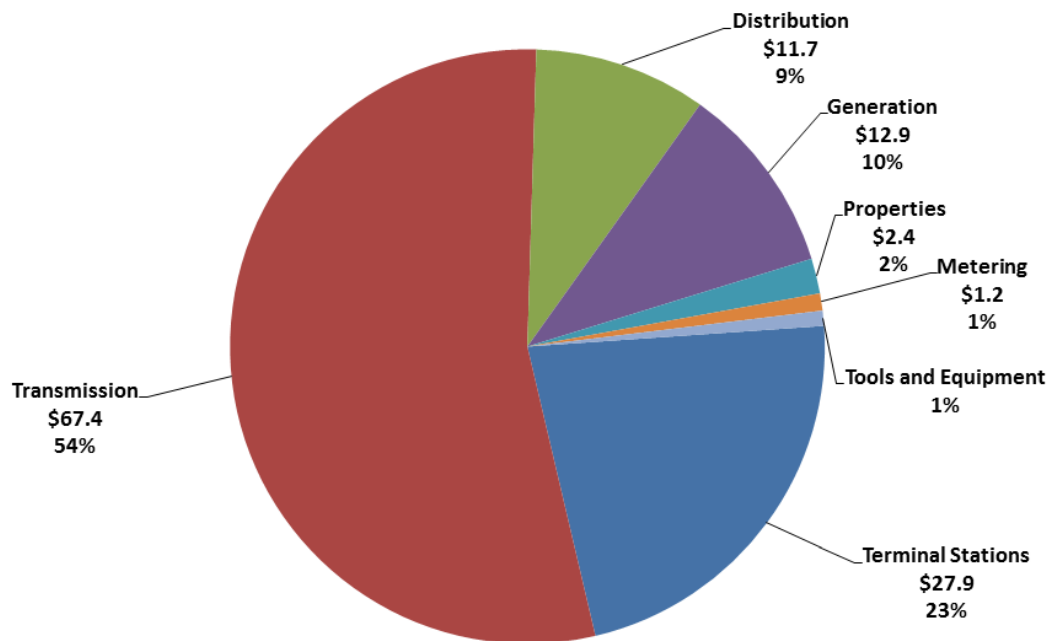


Figure 6: Five-Year Historical Average Capital Expenditures for Transmission and Rural Operations (2016–2020)



#### 4.2.1 Transmission

Planned 2022 transmission expenditures (\$1.6 million)<sup>28</sup> are materially lower than the five-year<sup>29</sup> historical average (\$67.4 million) and lower than the 2022 amount reflected in the prior year five-year<sup>30</sup> 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 average<sup>31</sup> (\$27.9 million) and lower than that which was reflected for 2022 in the prior year five-year<sup>32</sup> capital plan (\$42.6 million).

The reduction in Hydro’s planned 2022 capital expenditures relative to those reflected in the 2021 CBA five-year<sup>33</sup> 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

<sup>28</sup> 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.

<sup>29</sup> 2016–2020.

<sup>30</sup> 2022–2026.

<sup>31</sup> 2016–2020.

<sup>32</sup> 2021–2025.

<sup>33</sup> 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),<sup>34</sup> 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-year<sup>35</sup> 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.<sup>36</sup>

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).

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

<sup>35</sup> 2021–2025.

<sup>36</sup> "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-year<sup>37</sup> historical average (\$11.7 million) and relatively consistent with that reflected in the prior year five-year capital plan<sup>38</sup> (\$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/OT<sup>39</sup> 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.

<sup>37</sup> 2016–2020.

<sup>38</sup> 2021–2025.

<sup>39</sup> Information Technology/Operational Technology ("IT/OT").

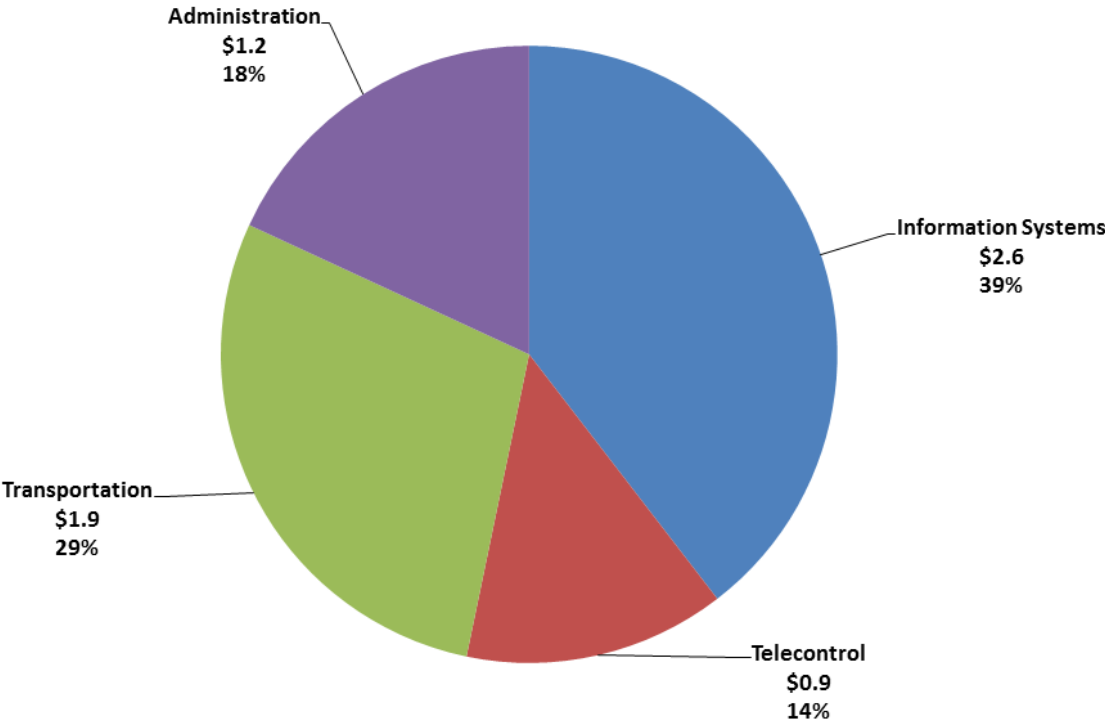


Figure 7: 2022 Capital Budget for General Properties

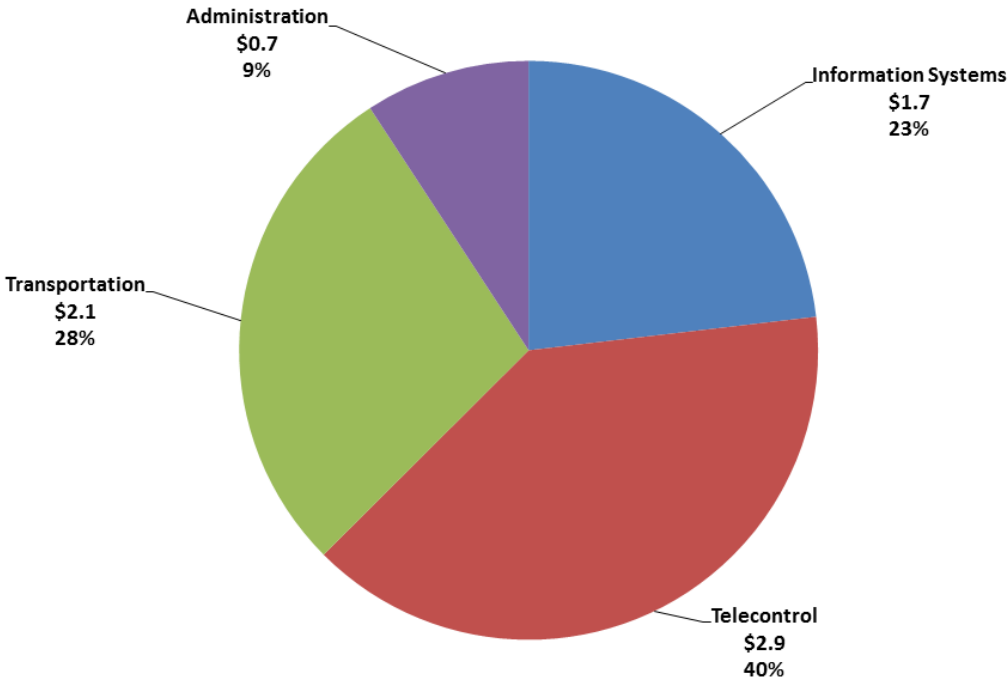


Figure 8: Five-Year Historical Average Capital Expenditures for General Properties (2016–2020)

### 4.3.1 Information Systems

Hydro's planned 2022 capital expenditures for information systems (\$2.6 million) is higher than the historical five-year<sup>40</sup> average (\$1.7 million) and higher than that reflected in the prior year five-year capital plan<sup>41</sup> (\$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-year<sup>42</sup> historical average (\$2.1 million) and lower than that reflected in the prior year five-year capital plan<sup>43</sup> (\$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

<sup>40</sup> 2016–2020.

<sup>41</sup> 2021–2025.

<sup>42</sup> 2016–2020.

<sup>43</sup> 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 VHF<sup>44</sup> 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

<sup>44</sup> Very high frequency ("VHF").

- 1 Project.<sup>45</sup> 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.<sup>46</sup>
- 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)

#### 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 \$8 million,<sup>47</sup> respectively, as a result of the capital projects proposed for 2022. Such a revenue requirement increase would represent an increase of 0.4% and 1.2% in 2022 and

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

<sup>46</sup> 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.

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

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.<sup>48</sup>

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 LED<sup>49</sup> 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.

**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
<b>Total</b>	<b>73</b>	<b>83,714.0<sup>50</sup></b>

<sup>48</sup> "Supply Cost Accounting Application," Newfoundland and Labrador Hydro, July 29, 2021.

<sup>49</sup> Light-emitting diode ("LED").

<sup>50</sup> Excludes Allowance for Unforeseen Items amount of \$1 million.



Table 3: Projects by Classification (\$000)

Type	Number	Capital Expenditure
Normal	69	76,198.3
Justifiable	4	7,515.7
Mandatory	0	0
<b>Total</b>	<b>73</b>	<b>83,714.0</b> <sup>51</sup>

<sup>51</sup> 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
<b>Total Capital Budget</b>	<b>36,475.7</b>	<b>84,714.0</b>	<b>54,374.9</b>	<b>175,564.6</b>

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

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

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

	Expended to 2021	2022	Future Years	Total
<b>Generation</b>				
<b>Gas Turbines</b>				
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
<b>Total Gas Turbines</b>	<b>3,488.7</b>	<b>3,063.7</b>	<b>66.6</b>	<b>6,619.0</b>
<b>Hydraulic Plant</b>				
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
<b>Total Hydraulic Plant</b>	<b>9,806.4</b>	<b>12,214.5</b>	<b>10,933.7</b>	<b>32,954.6</b>
<b>Thermal Plant</b>				
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
<b>Total Thermal Plant</b>	<b>2,173.8</b>	<b>10,732.8</b>	<b>1,916.8</b>	<b>14,823.4</b>
<b>Tools and Equipment</b>				
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
<b>Total Tools and Equipment</b>	<b>-</b>	<b>225.8</b>	<b>-</b>	<b>225.8</b>
<b>Total Generation</b>	<b>15,468.9</b>	<b>26,236.8</b>	<b>12,917.1</b>	<b>54,622.8</b>

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

	Expended to 2021	2022	Future Years	Total
<b>General Properties</b>				
<b>Transportation</b>				
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
<b>Total Transportation</b>	<b>1,320.9</b>	<b>1,904.1</b>	<b>2,912.8</b>	<b>6,137.8</b>
<b>Administration</b>				
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
<b>Total Administration</b>	<b>197.3</b>	<b>1,205.2</b>	<b>-</b>	<b>1,402.5</b>
<b>Information Systems</b>				
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
<b>Total Information Systems</b>	<b>-</b>	<b>2,630.4</b>	<b>-</b>	<b>2,630.4</b>
<b>Telecontrol</b>				
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
<b>Total Telecontrol</b>	<b>-</b>	<b>911.9</b>	<b>-</b>	<b>911.9</b>
<b>Total General Properties</b>	<b>1,518.2</b>	<b>6,651.6</b>	<b>2,912.8</b>	<b>11,082.6</b>



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

	Expended to 2021	2022	Future Years	Total
<b>Transmission and Rural Operations</b>				
<b>Transmission</b>				
Wood Pole Line Management Program (2022)	-	1,603.5	-	1,603.5
<b>Total Transmission</b>	-	1,603.5	-	1,603.5
<b>Distribution</b>				
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
<b>Total Distribution</b>	318.9	10,321.5	3,601.0	14,241.4
<b>Metering</b>				
Replace Metering System	-	515.6	4,860.2	5,375.8
<b>Total Metering</b>	-	515.6	4,860.2	5,375.8
<b>Tools and Equipment</b>				
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
<b>Total Tools and Equipment</b>	-	1,186.1	2,071.1	3,257.2
<b>Terminal Stations</b>				
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
<b>Total Terminal Stations</b>	16,609.1	33,917.7	21,681.2	72,208.0
<b>Generation</b>				
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
<b>Total Generation</b>	2,560.6	3,281.2	6,331.5	12,173.3
<b>Total Transmission and Rural Operations</b>	19,488.6	50,825.6	38,545.0	108,859.2
<b>Total Allowance for Unforeseen Items</b>	-	1,000.0	-	1,000.0
<b>Total Capital Budget</b>	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)

	<b>2022</b>
<b>SINGLE YEAR</b>	
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
	<b>28,532.7</b>
<b>MULTI YEAR (2022 Expenditures)</b>	
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
	<b>56,181.3</b>
<b>Total Capital Budget</b>	<b>84,714.0</b>

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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<b>Total Hydraulic Plant</b>	<b>1,000.0</b>
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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
--	-------

Turbine Valve Overhaul Unit 3 - Holyrood	3,623.5
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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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<b>Total Thermal Plant</b>	<b>9,535.6</b>
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**Tools and Equipment**

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

	<b>10,722.9</b>
--	-----------------

**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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<b>Total Administration</b>	<b>266.7</b>
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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
---	-------

Purchase Personal Computers (2022) - Hydro Place	477.1
--	-------

Replace Peripheral Infrastructure (2022) - Hydro Place	193.2
--	-------

Upgrade Core IT/OT Infrastructure (2022) - Hydro Place	308.2
--	-------

Perform Software Upgrades and Minor Enhancements (2022) - Hydro Place	621.7
---	-------

Refresh Cyber Security Infrastructure (2022) - Hydro Place	221.7
--	-------

Hydro Command Centre Upgrade (2022) - Hydro Place	76.4
---	------

<b>Total Information Systems</b>	<b>2,630.4</b>
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**Telecontrol**

Replace Radomes (2022) - Various	179.9
----------------------------------	-------

Replace Network Communications Equipment (2022)	193.0
---	-------

Upgrade Remote Terminal Units (2022) - Various	171.1
--	-------

Replace Battery Banks and Chargers (2022) - Various	226.6
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<b>Total Telecontrol</b>	<b>770.6</b>
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**Total General Properties**

	<b>3,667.7</b>
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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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<b>Total Transmission</b>	<b>1,603.5</b>
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**Distribution**

Provide Service Extensions (2022) - Various	3,627.2
---	---------

Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights (2022) - Various	3,826.7
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<b>Total Distribution</b>	<b>7,453.9</b>
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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
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Purchase Tools and Equipment Less than \$50,000 (2022) - Labrador Region	121.8
--	-------

Replace Light-Duty Mobile Equipment (2022) - Various	695.0
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<b>Total Tools and Equipment</b>	<b>1,145.3</b>
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**Terminal Stations**

Terminal Station In-Service Failures (2022)	900.0
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<b>Total Terminal Stations</b>	<b>900.0</b>
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**Generation**

Overhaul Diesel Units (2022) - Various	1,360.5
--	---------

Upgrade Fuel Storage Tanks (2022) - Mary's Harbour	499.1
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<b>Total Generation</b>	<b>1,859.6</b>
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<b>Total Transmission and Rural Operations</b>	<b>12,962.3</b>
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<b>Total Allowance for Unforeseen Items</b>	<b>1,000.0</b>
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<b>Total Capital Budget</b>	<b>28,352.9</b>
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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	
<b>Multi-Year Projects Commencing in 2022</b>					
<b>Generation</b>					
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
<b>Generation Total</b>	-	<b>3,437.5</b>	<b>5,772.3</b>	-	<b>9,209.8</b>
<b>General Properties</b>					
Replace Light- and Heavy-Duty Vehicles (2022-2024)	-	569.0	593.2	2,319.6	3,481.8
<b>General Properties Total</b>	-	<b>569.0</b>	<b>593.2</b>	<b>2,319.6</b>	<b>3,481.8</b>
<b>Transmission and Rural Operations</b>					
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
<b>Transmission and Rural Operations Total</b>	-	<b>8,987.6</b>	<b>28,889.0</b>	<b>1,446.3</b>	<b>39,322.9</b>
<b>Total Multi-Year Projects Commencing in 2022</b>					
	-	<b>12,994.1</b>	<b>35,254.5</b>	<b>3,765.9</b>	<b>52,014.5</b>
<b>Total Capital Projects</b>					
	<b>36,475.7</b>	<b>56,181.3</b>	<b>46,934.3</b>	<b>7,440.6</b>	<b>147,031.9</b>





## 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
<b>Generation</b>					
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
<b>Total Generation</b>	<b>76.6</b>	<b>512.2</b>	<b>66.6</b>	<b>655.4</b>	
<b>General Properties</b>					
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
<b>Total General Properties</b>	<b>-</b>	<b>1,080.3</b>	<b>-</b>	<b>1,080.3</b>	
<b>Transmission and Rural Operations</b>					
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	
<b>Total Transmission and Rural Operations</b>	<b>-</b>	<b>450.3</b>	<b>-</b>	<b>450.3</b>	
<b>Total Capital Projects</b>	<b>76.6</b>	<b>2,042.8</b>	<b>66.6</b>	<b>2,186.0</b>	





## 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
<b>Generation</b>					
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
<b>Total Generation</b>	<b>366.0</b>	<b>1,362.3</b>	<b>338.8</b>	<b>2,067.1</b>	
<b>General Properties</b>					
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
<b>Total General Properties</b>	<b>-</b>	<b>1,965.7</b>	<b>-</b>	<b>1,965.7</b>	
<b>Transmission and Rural Operations</b>					
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
<b>Total Transmission and Rural Operations</b>	<b>-</b>	<b>981.5</b>	<b>200.4</b>	<b>1,181.9</b>	
<b>Total Capital Projects</b>	<b>366.0</b>	<b>4,309.5</b>	<b>539.2</b>	<b>5,214.7</b>	





## 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					
<b>Generation</b>						
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	
<b>Total Generation</b>	<b>15,026.3</b>	<b>24,323.8</b>	<b>12,511.7</b>	<b>51,861.8</b>		
<b>General Properties</b>						
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	
<b>Total General Properties</b>	<b>1,518.2</b>	<b>3,464.3</b>	<b>2,912.8</b>	<b>7,895.3</b>		

Newfoundland and Labrador Hydro  
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Projects over \$500,000  
(\$000)

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



## 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
<b>Generation</b>			
<b>Hydraulic Plant</b>			
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
<b>Thermal Plant</b>			
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
<b>Gas Turbines</b>			
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
<b>Tools and Equipment</b>			
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
<b>Transmission and Rural Operations</b>			
<b>Terminal Stations</b>			
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
<b>Transmission</b>			
Wood Pole Line Management Program (2022)	Pooled	Normal Capital	Renewal
<b>Distribution</b>			
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
<b>Generation</b>			
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
<b>Metering</b>			
Replace Metering System	Other	Justifiable	Service Enhancement
<b>Tools and Equipment</b>			
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  
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Project Definitions, Classifications, and Investment Classificaitons

	Definition	Classification	Investment Classification
<b>General Properties</b>			
<b>Information Systems - Software Applications</b>			
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
<b>Information Systems - Computer Operations</b>			
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
<b>Telecontrol - Network Services</b>			
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
<b>Transportation</b>			
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
<b>Administration</b>			
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
<b>Total General Properties</b>			





## 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
<b>Hydraulic Generation Refurbishment and Modernization (2021-2022)</b>						
Refurbish Generator Stator – Unit 6 - BDE <sup>52</sup>	5,203.5	-	9,160.9	3,703.5	-	7,660.9
<b>Terminal Station Refurbishment and Modernization (2021-2022)</b>						
Install Fire Suppression- MDR <sup>53</sup> (2021–2022)	556.0	-	656.2	428.8	-	529.0
Replace Station Lighting - STB <sup>54</sup> (2021–2022)	231.8	-	278.9	134.3	-	181.4
<b>Standalone</b>						
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 <sup>55</sup>	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 <sup>56</sup>	525.0	-	3085.0	286.2	-	2,846.2

<sup>52</sup> Bay d’Espoir Hydroelectric Generating Facility (“BDE”).

<sup>53</sup> Massey Drive Terminal Station (“MDR”).

<sup>54</sup> Stony Brook Terminal Station (“STB”).

<sup>55</sup> Bottom Brook Terminal Station (“BBK”).

<sup>56</sup> 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 <sup>57</sup> (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

<sup>57</sup> 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 <sup>58</sup> or SAIFI <sup>59</sup> (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. <sup>60</sup>	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

<sup>58</sup> System Average Interruption Duration Index ("SAIDI").

<sup>59</sup> System Average Interruption Frequency Index ("SAIFI").

<sup>60</sup> 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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## 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,<sup>1</sup> 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),<sup>2</sup> life extension work at the Bay d’Espoir Penstocks (\$63

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<sup>1</sup> Includes expenditures related to specifically assigned assets.

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

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

### 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;<sup>6</sup>
- 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

<sup>3</sup> 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.

<sup>4</sup> “Valentine Gold Interconnection,” Newfoundland and Labrador Hydro, June 29, 2021.

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

<sup>6</sup> 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.<sup>7</sup>

#### 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.<sup>8</sup> 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

<sup>7</sup> 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.

<sup>8</sup> "Bay d'Espoir Penstock Failure and Analysis," Newfoundland and Labrador Hydro, November 12, 2019.

the engineering content of previous reports<sup>9</sup> 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.<sup>10</sup>

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.<sup>11</sup> 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, 2023<sup>12</sup> to ensure reliable service for customers while the Muskrat Falls Project assets are brought online and proven reliable. Capital investment related to the generation

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<sup>9</sup> “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.

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

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

<sup>12</sup> “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.<sup>13</sup> 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.<sup>14</sup>

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<sup>13</sup> 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.

<sup>14</sup> “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.<sup>15</sup>

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 project<sup>16</sup> (\$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

<sup>15</sup> 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.

<sup>16</sup> “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 LED<sup>17</sup> 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,

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<sup>17</sup> 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 million<sup>18</sup> 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

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<sup>18</sup> 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)

Expenditure 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
<b>Total Capital Plan</b>	<b>41,317.1</b>	<b>116,726.2</b>	<b>123,478.7</b>	<b>156,870.7</b>	<b>98,159.9</b>	<b>113,299.5</b>	<b>649,852.1</b>

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

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

	Expended to						Total
	2021	2022	2023	2024	2025	2026	
<b>Generation</b>							
<b>Gas Turbines</b>							
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
<b>Total Gas Turbines</b>	<b>3,488.7</b>	<b>3,063.7</b>	<b>391.6</b>	<b>1,425.0</b>	<b>475.0</b>	<b>11,025.0</b>	<b>19,869.0</b>
<b>Hydraulic Plant</b>							
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
<b>Total Hydraulic Plant</b>	<b>9,806.4</b>	<b>14,114.5</b>	<b>26,122.0</b>	<b>67,028.9</b>	<b>23,303.9</b>	<b>27,663.0</b>	<b>168,038.7</b>

Newfoundland and Labrador Hydro  
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(\$000)

	Expended to						Total
	2021	2022	2023	2024	2025	2026	
<b>Thermal Plant</b>							
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
<b>Total Thermal Plant</b>	<b>2,173.8</b>	<b>10,732.8</b>	<b>5,090.7</b>	<b>9,467.7</b>	<b>10,149.2</b>	<b>3,527.1</b>	<b>41,141.3</b>

Expenditure Category	2021	2022	2023	2024	2025	2026	Total
<b>Tools and Equipment</b>							
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
<b>Total Tools and Equipment</b>	-	<b>225.8</b>	<b>60.9</b>	<b>59.2</b>	<b>59.6</b>	<b>60.6</b>	<b>466.1</b>
<b>Total Generation</b>	<b>15,468.9</b>	<b>28,136.8</b>	<b>31,665.2</b>	<b>77,980.8</b>	<b>33,987.7</b>	<b>42,275.7</b>	<b>229,515.1</b>
<b>General Properties</b>							
<b>Transportation</b>							
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
<b>Total Transportation</b>	<b>1,320.9</b>	<b>1,904.1</b>	<b>2,373.2</b>	<b>5,522.6</b>	<b>3,482.0</b>	<b>3,700.0</b>	<b>18,302.8</b>
<b>Administration</b>							
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
<b>Total Administration</b>	<b>197.3</b>	<b>1,205.2</b>	<b>284.8</b>	<b>286.2</b>	<b>887.3</b>	<b>288.0</b>	<b>3,148.8</b>

Newfoundland and Labrador Hydro  
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(\$000)

	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

Newfoundland and Labrador Hydro  
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(\$000)

	Expended to						Total
	2021	2022	2023	2024	2025	2026	
<b>Telecontrol</b>							
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
<b>Total Telecontrol</b>	-	<b>911.9</b>	<b>3,156.0</b>	<b>2,027.9</b>	<b>656.9</b>	<b>656.9</b>	<b>7,409.6</b>
<b>Total General Properties</b>	<b>1,518.2</b>	<b>6,651.6</b>	<b>8,075.0</b>	<b>10,169.7</b>	<b>7,616.2</b>	<b>7,369.9</b>	<b>41,400.6</b>



Newfoundland and Labrador Hydro  
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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



Expended to	2021	2022	2023	2024	2025	2026	Total
<b>Properties</b>							
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
<b>Total Properties</b>	-	-	<b>1,162.3</b>	<b>3,274.8</b>	<b>1,184.0</b>	<b>1,180.0</b>	<b>6,801.1</b>
<b>Metering</b>							
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
<b>Total Metering</b>	-	<b>515.6</b>	<b>3,965.6</b>	<b>1,094.6</b>	<b>100.0</b>	<b>100.0</b>	<b>5,775.8</b>

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	Expended to						Total
	2021	2022	2023	2024	2025	2026	
<b>Tools and Equipment</b>							
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
<b>Total Tools and Equipment</b>	-	<b>1,186.1</b>	<b>3,319.5</b>	<b>2,215.6</b>	<b>2,026.0</b>	<b>1,963.0</b>	<b>10,710.2</b>

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Expended to	2021	2022	2023	2024	2025	2026	Total
<b>Terminal Stations</b>							
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
<b>Total Terminal Stations</b>	<b>16,609.1</b>	<b>33,917.7</b>	<b>28,238.3</b>	<b>25,189.6</b>	<b>19,019.2</b>	<b>16,547.5</b>	<b>139,521.4</b>

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	Expended to						Total
	2021	2022	2023	2024	2025	2026	
<b>Generation</b>							
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
<b>Total Generation</b>	<b>3,922.7</b>	<b>21,111.7</b>	<b>30,750.1</b>	<b>20,722.4</b>	<b>9,300.0</b>	<b>18,400.0</b>	<b>104,206.9</b>
<b>Total Transmission and Rural Operations</b>	<b>24,330.0</b>	<b>80,937.8</b>	<b>82,738.5</b>	<b>67,720.2</b>	<b>55,556.0</b>	<b>62,653.9</b>	<b>373,936.3</b>
<b>Total Allowance for Unforeseen Items</b>	<b>-</b>	<b>1,000.0</b>	<b>1,000.0</b>	<b>1,000.0</b>	<b>1,000.0</b>	<b>1,000.0</b>	<b>5,000.0</b>
<b>Total Capital Plan</b>	<b>41,317.1</b>	<b>116,726.2</b>	<b>123,478.7</b>	<b>156,870.7</b>	<b>98,159.9</b>	<b>113,299.5</b>	<b>649,852.1</b>



## Appendix B

### Capital Expenditures 2017–2026



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	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:<sup>1</sup>

- 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).<sup>2</sup>

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<sup>1</sup> Board Order No. P.U. 5(2012), at p. 14.

<sup>2</sup> 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, 2023<sup>3</sup> 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.<sup>4</sup>

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.

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<sup>3</sup> 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.

<sup>4</sup> 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.<sup>5</sup>

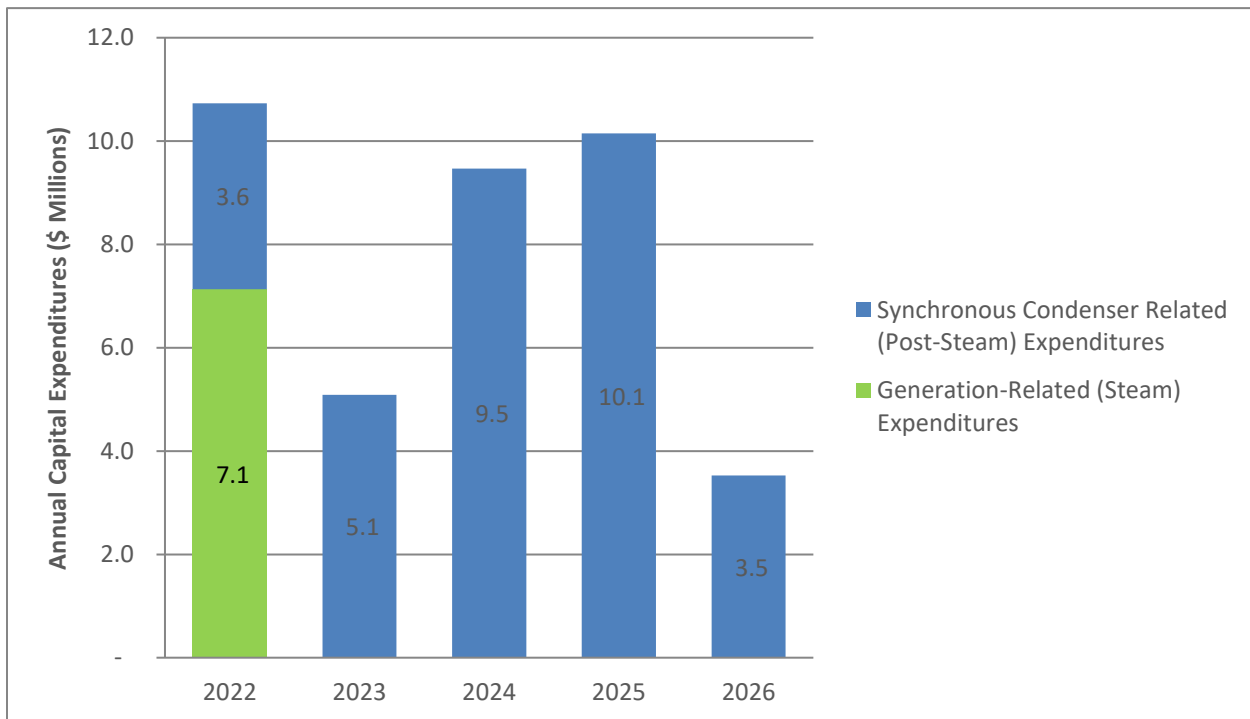
8 Until such time as the Muskrat Falls Project assets are reliably in service, the Holyrood TGS is necessary  
9 to meet both winter peak demand and annual energy requirements. As the Labrador-Island Link is  
10 brought online and placed in service, production at the Holyrood TGS is expected to be substantially  
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

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<sup>5</sup> 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.<sup>6</sup>

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)<sup>7,8</sup>**

<sup>6</sup> 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.

<sup>7</sup> 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.

<sup>8</sup> 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**

	<b>Project (Project Totals)</b>	<b>Scope Summary</b>	<b>Proposal Location</b>
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

	<b>Project (Project Totals)</b>	<b>Scope Summary</b>	<b>Proposal Location</b>
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 <sup>9</sup> 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

<sup>9</sup> American Society of Mechanical Engineers.

	<b>Project (Project Totals)</b>	<b>Scope Summary</b>	<b>Proposal Location</b>
Synchronous Condenser Related	Thermal In-Service Failures (2022) <sup>10</sup> \$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,<sup>11</sup> 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

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

<sup>11</sup> "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**

<b>Project</b>	<b>Alternatives Considered</b>	<b>Proposal</b>
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 <sup>12</sup>	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

<sup>12</sup> 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.<sup>13</sup> 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 2021<sup>14</sup> 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.<sup>15</sup> The identified and expected system equipment maintenance (“SEM”) expenditures for the years 2022–2031, inclusive, are provided in Appendix B to this report.

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<sup>13</sup> Stacks are currently planned to be dismantled in 2025.

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

<sup>15</sup> 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.<sup>16</sup> Actual operation will vary based on the operating requirements of the Holyrood  
21 TGS, the results of inspections, and assessments of changing equipment conditions.

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<sup>16</sup> 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 Expenditures<sup>1</sup>**  
(\$000)

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
<b>Generating Units</b>										
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
<b>Generating Units Total</b>	<b>3,991.0</b>	<b>227.0</b>	<b>232.7</b>	<b>238.5</b>	<b>244.5</b>	<b>250.6</b>	<b>256.8</b>	<b>263.3</b>	<b>269.8</b>	<b>276.6</b>
<b>Common Equipment</b>										
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
<b>Common Equipment Total</b>	<b>1,785.0</b>	<b>659.0</b>	<b>675.5</b>	<b>692.4</b>	<b>709.7</b>	<b>727.4</b>	<b>745.6</b>	<b>764.2</b>	<b>783.3</b>	<b>802.9</b>
<b>Environmental</b>										
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
<b>Environmental Total</b>	<b>432.0</b>	<b>236.0</b>	<b>241.9</b>	<b>397.9</b>	<b>254.1</b>	<b>260.5</b>	<b>267.0</b>	<b>443.7</b>	<b>280.5</b>	<b>287.5</b>
<b>Grant Total</b>	<b>6,208.0</b>	<b>1,122.0</b>	<b>1,150.1</b>	<b>1,328.8</b>	<b>1,208.3</b>	<b>1,238.5</b>	<b>1,269.4</b>	<b>1,471.2</b>	<b>1,333.7</b>	<b>1,367.0</b>

<sup>1</sup> 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**

	<b>Original Budget (\$000)</b>	<b>Forecast to Completion (\$000)</b>	<b>Variance (\$000)</b>
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**

	<b>Original Budget (\$000)</b>	<b>Forecast to Completion (\$000)</b>	<b>Variance (\$000)</b>
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**

	<b>Original Budget (\$000)</b>	<b>Forecast to Completion (\$000)</b>	<b>Variance (\$000)</b>
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.

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

## 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	<b>11,532.7</b>
Revised Budget Estimate in 2022 Capital Budget Application	5,418.8	4,293.6	820.3	<b>10,532.7</b>
Actual Expenditure and Forecast, updated June 2021	4,412.1	5,300.4	820.3	<b>10,532.7</b>

## 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.

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

#### **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.



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

#### **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.

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

**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.

<b>Project Cost</b>	<b>2021 (approved)</b>	<b>2022</b>	<b>2023</b>	<b>Total</b>
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 Variance<sup>1</sup>**  
**2021 Overview**  
**(\$000)**

<b>Asset Type</b>	<b>Board Approved Budget</b>	<b>Total Project Expenditures and Forecast</b>	<b>Variance</b>
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)
<b>Total Capital Budget</b>	<b>330,791</b>	<b>302,596</b>	<b>(28,195)</b>

<sup>1</sup> Numbers may not add due to rounding.

**2021 Capital Expenditures By Year**  
**(\$'000)**

[illegible]

## 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	HH-D	
2016	2017	2018	2019	2020	Carryover to 2021	Original	2021	Revised 2021	2022 and Beyond	Total	Total	2016	2017	2018	2019	2020	2021	Forecast Jul-Dec 2021	2022 and Beyond	Total	Project Variance	Annual Variance
Hydraulic Generation Projects																						
2021 Projects																						
-	-	-	-	-	-	3,236.8	3,236.8	3,236.8	10,383.1	13,619.9	-	-	-	-	-	-	551.6	2,685.3	10,383.1	13,619.9	-	-
-	-	-	-	-	-	6,569.5	6,569.5	6,569.5	13,075.0	19,644.5	-	-	-	-	-	-	1,291.5	3,191.9	11,720.4	17,912.3	(1,354.7)	(2,686.2)
-	-	-	-	-	-	1,250.0	1,250.0	1,250.0	2,500.0	3,750.0	-	-	-	-	-	-	65.4	1,684.6	1,750.0	3,434.6	1,250.0	-
-	-	-	-	-	-	194.3	194.3	194.3	-	194.3	-	-	-	-	-	-	101.9	92.4	-	194.3	-	-
2020 Projects																						
-	-	-	-	6,580.3	72.1	10,249.9	10,322.0	-	16,830.2	-	16,830.2	-	-	-	-	7,563.0	2,337.0	8,339.4	-	18,139.4	1,309.2	454.3
2017 Projects																						
-	119.2	921.2	877.0	1,429.6	229.6	-	229.6	-	229.6	-	3,347.0	-	182.7	628.9	853.9	449.5	45.2	184.4	-	2,344.7	(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	-	-	-	182.7	628.9	853.9	7,412.5	4,392.5	15,777.9	17,620.1	47,268.6	(1,047.8)	(1,831.9)
Total Hydraulic Generation Projects																						

**2021 Capital Expenditures By Category  
(\$000)**

	Capital Budget										Actual Expenditure and Forecast										K-F Project Variance	HH-D Annual Variance
	A		B		C	D (B+C)		E	F (A+C+E)		G	H		I	J	K (G+H+J)						
	2016	2017	2018	2019	2020	Carryover to 2021	Original	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																						
Overhaul Unit 1 Turbine/ Valve - Holyrood	-	-	-	-	-	-	8,026.6	8,026.6	-	8,026.6	-	-	-	-	-	1,935.6	6,091.0	-	8,026.6	-		
Overhaul Unit 3 Generator - Holyrood	-	-	-	-	-	-	572.7	572.7	-	572.7	-	-	-	-	-	259.4	313.2	-	572.7	-		
Thermal In-Service Failure - Holyrood	-	-	-	-	-	-	2,000.0	2,000.0	-	2,000.0	-	-	-	-	-	1,333.9	666.1	-	2,000.0	-		
Overhaul Unit 3 Boiler Feed Pump - Holyrood	-	-	-	-	-	-	373.0	373.0	-	373.0	-	-	-	-	-	209.3	163.8	-	373.0	-		
Upgrade Distributed Control System - Holyrood	-	-	-	-	-	-	360.4	360.4	368.2	728.6	-	-	-	-	-	29.3	331.2	368.2	728.6	-		
Boiler Condition Assessment/Upgrade - Holyrood	-	-	-	-	-	-	3,000.0	3,000.0	-	3,000.0	-	-	-	-	-	1,628.9	1,371.1	-	3,000.0	-		
Upgrade Waste Water Equalization System - Holyrood	-	-	-	-	-	-	1,813.4	1,813.4	547.7	2,361.1	-	-	-	-	-	84.3	1,729.2	547.7	2,361.1	-		
Inspect Chemical Tanks - Holyrood	-	-	-	-	-	-	919.8	919.8	-	919.8	-	-	-	-	-	26.7	893.1	-	919.8	-		
Purchase eTools and Equipment Less than \$50,000	-	-	-	-	-	-	64.4	64.4	-	64.4	-	-	-	-	-	37.6	26.8	-	64.4	-		
2020 Projects																						
Rewind Unit 3 Stator - Holyrood	-	-	-	-	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	(10.0)		
Upgrade Uninterruptible Power Supply 3 & 4 - Holyrood	-	-	-	-	348.7	65.5	-	65.5	-	348.7	-	-	-	-	283.2	54.1	11.4	-	348.7	0.1		
Total Thermal Generation Projects																						
-	-	-	-	-	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		



**2022 Capital Budget Application**  
**2021 Capital Expenditures Overview, Appendix A**

**2021 Capital Expenditures By Category**  
**(5000)**

Capital Budget										Actual Expenditure and Forecast																									
A		B		C		D (B-C)		E		F (A+C-E)		G		H		I		J		K (G+H+J)		K-F													
				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	
2016		2017		2018		2019		2020																											
Gas Turbine Generation Projects																																			
2021 Projects																																			
-	-	-	-	-	-	-	-	-	-	318.8	318.8	-	-	318.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	213.8	213.8	-	-	213.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	131.3	131.3	211.0	-	342.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	234.8	234.8	170.5	-	405.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	76.6	76.6	69.2	-	145.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2020 Projects																																			
-	-	-	-	-	-	-	-	-	546.1	538.5	2,500.0	3,038.5	2,400.0	5,446.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	37.8	(145.6)	575.0	429.4	-	612.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	264.6	(28.8)	2,377.9	2,349.1	-	2,642.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	1,097.6	1,021.6	-	1,021.6	-	1,097.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2018 Projects																																			
-	-	-	8,829.9	3,012.7	-	724.8	-	-	-	-	-	-	-	-	-	-	-	2,583.8	3,563.9	832.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	8,829.9	3,012.7	1,946.1	2,110.5	6,428.1	8,538.6	2,690.7	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)	-	-	-	-	-	-	-	-	-
Total Gas Turbine Generation Projects																																			

**2022 Capital Budget Application**  
**2021 Capital Expenditures Overview, Appendix A**

**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	Revised	2022 and Beyond	Total	2016	2017	2018	2019	2020	2021	Forecast Jul-Dec 2021	2022 and Beyond	Project Variance	Annual Variance	
Terminal Stations Projects																				
2021 Projects																				
-	-	-	-	-	-	1,800.0	1,800.0	-	1,800.0	-	-	-	-	-	132.6	1,667.4	-	-	1,800.0	
-	-	-	-	-	-	5,418.8	5,418.8	6,113.9	11,532.7	-	-	-	-	-	699.4	3,712.6	6,120.6	(1,000.0)	(1,006.7)	
-	-	-	-	-	-	1,530.3	1,530.3	8,389.5	9,919.8	-	-	-	-	-	67.4	330.9	6,476.5	(6,045.0)	(1,132.0)	
-	-	-	-	-	-	142.7	142.7	-	142.7	-	-	-	-	-	15.0	127.8	-	-	-	
-	-	-	-	-	-	1,186.7	1,186.7	9,306.7	10,493.4	-	-	-	-	-	138.1	1,048.6	9,306.7	-	-	
-	-	-	-	-	-	2,301.7	2,301.7	9,271.2	11,572.9	-	-	-	-	-	86.8	2,214.9	9,271.2	-	-	
-	-	-	-	-	-	6,171.6	6,171.6	7,182.0	13,353.6	-	-	-	-	-	988.2	5,163.2	6,967.4	(224.7)	(10.1)	
2020 Projects																				
-	-	-	-	2,678.1	2,017.5	-	2,017.5	-	2,678.1	-	-	-	-	660.6	247.2	1,770.3	-	(0.1)	-	
-	-	-	-	3,711.9	1,509.5	5,685.3	7,194.8	-	9,397.2	-	-	-	-	1,703.5	2,482.1	4,712.7	-	(498.9)	-	
2019 Projects																				
-	-	-	10,891.1	19,061.8	3,964.6	-	3,964.6	-	29,952.9	-	-	-	5,891.3	10,987.2	1,267.1	1,997.6	699.9	(9,109.9)	(699.9)	
2016 Projects																				
6,969.1	10,808.7	15,408.6	6,597.3	11,116.8	2,698.9	-	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	-	(6,338.8)	-	
6,969.1	10,808.7	15,408.6	17,488.4	36,568.7	10,190.5	24,237.1	34,427.6	40,263.3	151,743.9	5,599.5	8,877.8	15,184.2	13,792.9	17,650.8	7,803.5	23,775.4	38,842.3	(20,217.4)	(2,848.8)	

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)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	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	2021			2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519	2520	2521	2522	2523	2524	2525	2526	2527	2528	2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542	2543	2544	2545	2546	2547	2548	2549	2550	2551	2552	2553	2554	2555	2556	2557	2558	2559	2560	2561	2562	2563	2564	2565	2566	2567	2568	2569	2570	2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584	2585	2586	2587	2588	2589	2590	2591	2592	2593	2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607	2608	2609	2610	2611	2612	2613	2614	2615	2616	2617	2618	2619	2620	2621	2622	2623	2624	2625	2626	2627	2628	2629	2630	2631	2632	2633	2634	2635	2636	2637	2638	2639	2640	2641	2642	2643	2644	2645	2646	2647	2648	2649	2650	2651	2652	2653	2654	2655	2656	2657	2658	2659	2660	2661	2662	2663	2664	2665	2666	2667	2668	2669	2670	2671	2672	2673	2674	2675	2676	2677	2678	2679	2680	2681	2682	2683	2684	2685	2686	2687	2688	2689	2690	2691	2692	2693	2694	2695	2696	2697	2698	2699	2700	2701	2702	2703	2704	2705	2706	2707	2708	2709	2710	2711	2712	2713	2714	2715	2716	2717	2718	2719	2720	2721	2722	2723	2724	2725	2726	2727	2728	2729	2730	2731	2732	2733	2734	2735	2736	2737	2738	2739	2740	2741	2742	2743	2744	2745	2746	2747	2748	2749	2750	2751	2752	2753	2754	2755	2756	2757	2758	2759	2760	2761	2762	2763	2764	2765	2766	2767	2768	2769	2770	2771	2772	2773	2774	2775	2776	2777	2778	2779	2780	2781	2782	2783	2784	2785	2786	2787	2788	2789	2790	2791	2792	2793	2794	2795	2796	2797	2798	2799	2800	2801	2802	2803	2804	2805	2806	2807	2808	2809	2810	2811	2812	2813	2814	2815	2816	2817	2818	2819	2820	2821	2822	2823	2824	2825	2826	2827	2828	2829	2830	2831	2832	2833	2834	2835	2836	2837	2838	2839	2840	2841	2842	2843	2844	2845	2846	2847	2848	2849	2850	2851	2852	2853	2854	2855	2856	2857	2858	2859	2860	2861	2862	2863	2864	2865	2866	2867	2868	2869	2870	2871	2872	2873	2874	2875	2876	2877	2878	2879	2880	2881	2882	2883	2884	2885	2886	2887	2888	2889	2890	2891	2892	2893	2894	2895	2896	2897	2898	2899	2900	2901	2902	2903	2904	2905	2906	2907	2908	2909	2910	2911	2912	2913	2914	2915	2916	2917	2918	2919	2920	2921	2922	2923	2924	2925	2926	2927	2928	2929	2930	2931	2932	2933	2934	2935	2936	2937	2938	2939	2940	2941	2942	2943	2944	2945	2946	2947	2948	2949	2950	2951	2952	2953	2954	2955	2956	2957	2958	2959	2960	2961	2962	2963	2964	2965	2966	2967	2968	2969	2970	2971	2972	2973	2974	2975	2976	2977	2978	2979	2980	2981	2982	2983	2984	2985	2986	2987	2988	2989	2990	2991	2992	2993	2994	2995	2996	2997	2998	2999	3000	3001	3002	3003	3004	3005	3006	3007	3008	3009	3010	3011	3012	3013	3014	3015	3016	3017	3018	3019	3020	3021	3022	3023	3024	3025	3026	3027	3028	3029	3030	3031	3032	3033	3034	3035	3036	3037	3038	3039	3040	3041	3042	3043	3044	3045	3046	3047	3048	3049	3050	3051	3052	3053	3054	3055	3056	3057	3058	3059	3060	3061	3062	3063	3064	3065	3066	3067	3068	3069	3070	3071	3072	3073	3074	3075	3076	3077	3078	3079	3080	3081	3082	3083	3084	3085	3086	3087	3088	3089	3090	3091	3092	3093	3094	3095	3096	3097	3098	3099	3100	3101	3102	3103	3104	3105	3106	3107	3108	3109	3110	3111	3112	3113	3114	3115	3116	3117	3118	3119	3120	3121	3122	3123	3124	3125	3126	3127	3128	3129	3130	3131	3132	3133	3134	3135	3136	3137	3138	3139	3140	3141	3142	3143	3144	3145	3146	3147	3148	3149	3150	3151	3152	3153	3154	3155	3156	3157	3158	3159	3160	3161	3162	3163	3164	3165	3166	3167	3168	3169	3170	3171	3172	3173	3174	3175	3176	3177	3178	3179	3180	3181	3182	3183	3184	3185	3186	3187	3188	3189	3190	3191	3192	3193	3194	3195	3196	3197	3198	3199	3200	3201	3202	3203	3204	3205	3206	3207	3208	3209	3210	3211	3212	3213	3214	3215	3216	3217	3218	3219	3220	3221	3222	3223	3224	3225	3226	3227	3228	3229	3230	3231	3232	3233	3234	3235	3236	3237	3238	3239	3240	3241	3242	3243	3244	3245	3246	3247	3248	3249	3250	3251	3252	3253	3254	3255	3256	3257	3258	3259	3260	3261	3262	3263	3264	3265	3266	3267	3268	3269	3270	3271	3272	3273	3274	3275	3276	3277	3278	3279	3280	3281	3282	3283	3284	3285	3286	3287	3288	3289	3290	3291	3292	3293	3294	3295	3296	3297	3298	3299	3300	3301	3302	3303	3304	3305	3306	3307	3308	3309	3310	3311	3312	3313	3314	3315	3316	3317	3318	3319	3320	3321	3322	3323	3324	3325	3326	3327	3328	3329	3330	3331	3332	3333	3334	3335	3336	3337	3338	3339	3340	3341	3342	3343	3344	3345	3346	3347	3348	3349	3350	3351

2021 Capital Expenditures By Category  
(\$000)

Capital Budget														Actual Expenditure and Forecast										K#	H#D
A		B		C		D (B+C)		F (A+C+D)						G	H				I	J	K (G+H+I)	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							
Distrubution Projects																									
2021 Projects																									
-	-	-	-	-	-	3,940.5	3,940.5	-	3,940.5	-	-	-	-	-	1,834.9	2,105.7	-	-	3,940.5	-	-				
Provide Service Extensions - All Areas																									
-	-	-	-	-	-	(2,000)	(2,000)	-	(2,000)	-	-	-	-	-	(67.0)	(133.0)	-	-	(200.0)	-	-				
Provide Service Extensions - All Areas - CIAC																									
-	-	-	-	-	-	3,893.6	3,893.6	-	3,893.6	-	-	-	-	-	2,431.0	1,462.5	-	-	3,893.6	-	-				
Upgrade Distribution Systems - All Areas																									
-	-	-	-	-	-	(900)	(900)	-	(900)	-	-	-	-	-	(114.7)	24.7	-	-	(90.0)	-	-				
Upgrade Distribution Systems - All Areas - CIAC																									
-	-	-	-	-	-	3,189	3,189	805.6	3,994.6	-	-	-	-	-	1,124.5	17.7	805.6	-	1,124.5	-	-				
Upgrade of Worst-Performing Distribution Feeders (2021-2022)																									
-	-	-	-	-	-	617.6	617.6	-	617.6	-	-	-	-	-	61.2	556.4	-	-	617.6	-	-				
Addition for Load Growth - Happy Valley 17																									
-	-	-	-	-	-	593.6	593.6	-	593.6	-	-	-	-	-	-	593.6	-	-	593.6	-	-				
Voltage Conversion - Labrador City L22																									
2020 Projects																									
-	-	-	-	-	-	3,155.1	3,136.8	-	3,257.8	-	-	-	-	121.0	1,999.3	1,137.5	-	-	3,257.8	(0.1)	-				
Distribution System Upgrades (2020-2021) - Various																									
-	-	-	-	-	-	71.3	37.6	185.3	222.9	-	-	-	-	33.7	116.9	106.0	-	-	256.7	0.0	-				
Install Recloser Remote Control (2020-2021) - Hampden and Upper Salmon																									
-	-	-	-	-	-	846.1	711.1	-	846.1	-	-	-	-	-	218.2	492.9	-	-	846.1	(0.0)	-				
Additions for Load - Distribution System - Makkovik and Hopetale																									
-	-	-	-	-	-	1,020.2	730.4	12,145.0	13,145.0	805.6	14,240.4	-	-	-	289.7	6,497.6	6,647.4	805.6	14,240.3	(0.1)	-				
Addition Distribution Projects																									

2021 Capital Expenditures By Category  
(5000)

	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+HH+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		
Rural Generation Projects																				
2021 Projects																				
Overhaul Diesel Units - Various	-	-	-	-	-	-	1,232.9	1,232.9	-	1,232.9	-	-	-	-	-	252.2	980.6	-	1,232.9	-
Diesel Genset Replacements (2021-2022)	-	-	-	-	-	-	2,560.6	2,560.6	525.0	3,085.6	-	-	-	-	-	107.7	2,243.6	495.4	2,846.8	(238.8)
Inspect Fuel Storage Tanks - Foxville	-	-	-	-	-	-	532.6	532.6	-	532.6	-	-	-	-	-	36.3	496.2	-	532.6	-
Replace Fuel Storage Tanks - PR	-	-	-	-	-	-	350.3	350.3	-	350.3	-	-	-	-	-	50.3	299.9	-	350.3	-
2020 Projects																				
Diesel Plant Ventilation Upgrade - Nain	-	-	-	-	162.7	66.6	690.4	757.0	-	853.1	-	-	-	-	96.1	149.1	607.8	-	853.1	(0.0)
Replace Automation Equipment - Rigolet	-	-	-	-	363.8	305.8	-	305.8	-	363.8	-	-	-	-	58.0	127.9	177.9	-	363.8	(0.0)
Diesel Genset Replacements - Mary's Harbour	-	-	-	-	3,900.7	349.8	-	349.8	-	3,900.7	-	-	-	-	2,799.0	480.6	(130.8)	-	3,148.8	(751.9)
Replace Powerhouse Roofing System - L'Anse Au Loup and St. Anthony	-	-	-	-	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
2019 Projects																				
Replace Human Machine Interface - Cartwright	-	-	-	306.9	-	56.7	-	56.7	-	306.9	-	-	-	152.9	97.3	22.1	34.6	-	306.9	0.0
Diesel Genset Replacements (2019-2020)	-	-	-	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)
2018 Projects																				
Diesel Genset Replacements - Makivik	-	-	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
Replace Automation Equipment - St. Anthony	-	-	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
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	7,670.9	3,098.0	7,667.4	495.4	26,002.1	234.3

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)					
	2016	2017	2018	2019	2020	2021	Original	Revised	2022 and Beyond	Total	2016	2017	2018	2019	2020	2021	Forecast Jul-Dec 2021	2022 and Beyond	Total	Project Variance	Annual Variance
Properties Projects	-	-	-	-	91.6	(6.6)	292.6	286.0	-	384.2	-	-	-	-	98.2	50.5	235.4	-	384.2	0.0	-
2020 Projects	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Upgrade Fire Suppression System - Bishop's Falls	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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																					
	A		B		C	D	E	F (A+C+E)	G		H		I	J	K (G+H+I)	K-F	H-I-D											
			2016	2017	2018	2019	2020	Carryover to 2021	Original	Revised	2022 and Beyond	Total	2016	2017	2018	2019	2020	2021	Jul-Dec 2021	2022 and Beyond	Total	Project Variance	Annual Variance					
			2016	2017	2018	2019	2020	2021	2022 and Beyond	Total	2016	2017	2018	2019	2020	2021	2022 and Beyond	Total	2016	2017	2018	2019	2020	2021	2022 and Beyond	Total	Project Variance	Annual Variance
Metering Projects			-	-	-	-	-	-	233.4	233.4	-	233.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2021 Projects			-	-	-	-	-	-	233.4	233.4	-	233.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Purchase Meters and Metering Equipment - Various			-	-	-	-	-	-	233.4	233.4	-	233.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metering Projects			-	-	-	-	-	-	233.4	233.4	-	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+J)			
																	Forecast				Total			
	2016	2017	2018	2019	2020	2021	Carryover to 2021	Original	Revised	2021 and Beyond	Total	2016	2017	2018	2019	2020	2021	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	Actual Expenditure and Forecast				Capital Budget				F (A+C+E)				
	2016	2017	2018	2019	2020	2021	2021	2021	2021	2021	2021	2021	2021
Information Systems Projects	Actual Expenditure and Forecast				Capital Budget				F (A+C+E)				
	2016	2017	2018	2019	2020	2021	2021	2021	2021	2021	2021	2021	2021
2021 Projects	-	-	-	-	-	-	-	-	-	-	-	-	-
Replace Personal Computers - Hydro Place	-	-	-	-	-	-	-	-	-	-	-	-	-
Replace Peripheral Infrastructure - Hydro Place	-	-	-	-	-	-	-	-	-	-	-	-	-
Upgrade Core IT Infrastructure - Hydro Place	-	-	-	-	-	-	-	-	-	-	-	-	-
Perform Minor Enhancements - Hydro Place	-	-	-	-	-	-	-	-	-	-	-	-	-
Upgrade Software Applications - Hydro Place	-	-	-	-	-	-	-	-	-	-	-	-	-
Upgrade Hydro ECC Wall Infrastructure - Hydro Place	-	-	-	-	-	-	-	-	-	-	-	-	-
2020 Projects	-	-	-	-	-	-	-	-	-	-	-	-	-
Upgrade Core IT Infrastructure - Hydro Place	-	-	-	-	-	-	-	-	-	-	-	-	-
Perform Minor Enhancements - Hydro Place	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Information Systems Projects	-	-	-	-	-	-	-	-	-	-	-	-	-

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																				
Replace Network Communications Equipment - Various																				
-	-	-	-	-	-	194.1	194.1	-	194.1	-	-	-	-	-	128.9	65.2	-	194.1	-	-
Upgrade Site Facilities - Various																				
-	-	-	-	-	-	48.9	48.9	-	48.9	-	-	-	-	-	19.7	29.2	-	48.9	-	-
Replace Radomes - Various																				
-	-	-	-	-	-	240.4	240.4	-	240.4	-	-	-	-	-	28.4	212.0	-	240.4	-	-
Purchase Tools and Equipment less than \$50,000																				
-	-	-	-	-	-	40.0	40.0	-	40.0	-	-	-	-	-	10.8	29.3	-	40.0	-	-
Upgrade Remote Terminal Units - Various																				
-	-	-	-	-	-	183.4	183.4	-	183.4	-	-	-	-	-	132.7	50.7	-	183.4	-	-
Replace Battery Banks and Chargers - Various																				
-	-	-	-	-	-	327.2	327.2	-	327.2	-	-	-	-	-	106.1	221.2	-	327.2	-	-
Total Telecontrol Projects																				
-	-	-	-	-	-	1,034.1	1,034.1	-	1,034.1	-	-	-	-	-	426.5	607.6	-	1,034.1	-	-

**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)				
	2016	2017	2018	2019	2020	2020 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												
Transportation																																
2021 Projects																																
Replace Light- and Heavy-Duty Vehicles (2021-2022)	-	-	-	-	-	-	-	1,321.0	1,321.0	1,335.1	2,656.1	-	-	-	-	-	-	4.4	1,316.5	1,335.1	2,656.1	-	-	-	-							
Level II Chargers for Electric Vehicles	-	-	-	-	-	-	-	299.8	299.8	-	299.8	-	-	-	-	-	-	21.2	278.6	-	299.8	-	-	-	-							
2020 Projects																																
Replace Light and Heavy Duty Vehicles (2020-2021) - Various	-	-	-	-	-	1,625.4	1,621.6	1,583.5	3,205.1	-	3,208.9	-	-	-	-	-	4.0	467.2	2,737.9	-	3,209.1	0.2	-	-	-							
2019 Projects																																
Replace Vehicles and Aerial Devices - Various Sites	-	-	-	1,248.1	594.9	(174.7)	-	(174.7)	-	1,843.0	-	-	-	-	1,385.0	632.7	151.1	(22.9)	-	2,146.0	303.0	303.0	-	-	-							
Total Transportation	-	-	-	1,248.1	2,220.3	1,446.9	3,204.3	4,651.2	1,335.1	8,007.8	-	-	-	-	1,385.0	636.7	643.9	4,310.2	1,335.1	8,311.0	303.2	303.0	-	-	-							
Actual Expenditure and Forecast																																
Administrative																																
2021 Projects																																
Remove Safety Hazards - Various	-	-	-	-	-	-	-	199.1	199.1	-	199.1	-	-	-	-	-	52.2	147.0	-	199.1	-	-	-	-	-							
Purchase Office Equipment	-	-	-	-	-	-	-	62.3	62.3	-	62.3	-	-	-	-	-	8.7	53.6	-	62.3	-	-	-	-	-							
Replace Transfer Switches and Associated Hardware - Hydro Place	-	-	-	-	-	-	-	197.4	197.4	938.5	1,135.9	-	-	-	-	-	38.9	158.5	938.5	1,135.9	-	-	-	-	-							
2020 Projects																																
Replace Elevator Motors and Control Equipment - Hydro Place	-	-	-	-	-	89.1	24.9	647.6	672.5	-	736.7	-	-	-	-	64.2	193.4	479.1	-	736.7	(0.0)	-	-	-	-							
Total Administrative	-	-	-	-	-	89.1	24.9	1,106.3	1,131.2	938.5	2,134.0	-	-	-	-	64.2	293.2	838.1	938.5	2,133.9	(0.0)	-	-	-	-							

2021 Capital Expenditures By Category (\$000)

Capital Budget										Actual Expenditure and Forecast										K+F		H+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	2021	Carryover to 2021	Original 2021	Revised 2021	2022 and Beyond	Total	2016	2017	2018	2019	2020	2021	2021	2022	2022	2022	2022	2022	Total	Total	Total	Total	
-	-	-	-	-	-	-	1,000.0	1,000.0	-	1,000.0	-	-	-	-	-	-	-	-	976.9	-	976.9	-	976.9	(23.1)	(23.1)		
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	108.0	23.1	-	131.1	131.1	131.1	(108.0)	(108.0)		
-	-	-	-	-	-	-	108.0	108.0	-	108.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Total Allowance for Unforeseen										1,108.0	-	-	1,080.0	1,080.0	-	-	-	-	-	-	-	-	-	-	-	-	-
2021 Projects																											
Contingency Fund																											
Engine Replacement - Port Hope/Simpson																											
Allowance for Unforeseen - Top U.P.U.17(2021)																											
2020 Projects																											
Construction and Installation of an Electric Vehicle FastTrack Network																											
Construction and Installation of an Electric Vehicle FastTrack Network - CIAC																											
Construction and Installation of an Electric Vehicle FastTrack Network - CIAC																											
Integrate Renewable PH2 - Mary's Harbour - CIAC																											
Wabush L34 and L35 Protective Relays																											
Wabush L34 and L35 Protective Relays - CIAC																											
Total Supplemental Projects Approved by Board																											
										259.4	241.1	793.0	1,014.1	-	1,052.4	-	-	-	-	-	-	-	-	-	-	-	-







# **2022 Capital Budget Application**

**2020 Average Rate Base**





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

	<b>2020</b>
Capital Assets - Return 4	2,708,003
Work in Progress <sup>1</sup>	24,988
	<u>2,732,991</u>
Deduct:	
Accumulated Depreciation - Return 6 <sup>2</sup>	523,797
Contributions in Aid of Construction - Return 7 <sup>1</sup>	<u>50,680</u>
Total Capital Assets	2,158,515
Deduct Items Excluded from Rate Base:	
Work in Progress <sup>1</sup>	(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><b>2,310,559</b></u></u>

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

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

