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March 31, 2023

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

Attention: Cheryl Blundon
Director of Corporate Services & Board Secretary

Re: Capital Expenditures and Carryover Report for the Year Ended December 31, 2022

Enclosed please find Newfoundland and Labrador Hydro's ("Hydro") Capital Expenditures and Carryover Report for the Year Ended December 31, 2022.

This report is filed pursuant correspondence from the Board of Commissioners of Public Utilities on February 13, 2023 and in compliance with Section 41 of the *Public Utilities Act*[1] and provides information on Hydro's capital expenditures for all projects proposed and approved as part of the "2022 Capital Budget Application."[2] As noted within the report, information is also provided on capital expenditures related to additional supplemental capital budgets approved by the Board. As per the Capital Budget Application Guidelines,3 the report provides details and explanations regarding the reportable variances between budgeted and actual expenditures for projects with expenditures in the 2022 calendar year. It also provides a listing of funds carried over to future years and specific details regarding the execution of the Remove Safety Hazards (2022) – Various, the Perform Software Upgrades and Minor Enhancements project, the Boiler Condition Assessment and Miscellaneous Upgrades – Holyrood project, and various In-Service Failures projects.

Should you have any questions, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO

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

Encl.

[1] *Public Utilities Act*, RSNL 1900, s 41.
[2] "2022 Capital Budget Application," Newfoundland and Labrador Hydro, rev. September 17, 2021 (originally filed August 2, 2021).
[3] "Capital Budget Application Guidelines," Board of Commissioners of Public Utilities, rev. October 2007 (originally issued June 2, 2005).

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Capital Expenditures and Carryover Report

For the Period Ended December 31, 2022

March 31, 2023

A report to the Board of Commissioners of Public Utilities

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Appendix A: Financial Schedules

1.0 Overview

This report outlines Newfoundland and Labrador Hydro's ("Hydro") capital expenditures and reportable variances for 2022 and project carryovers to 2023 and beyond. In 2022, Hydro's business continuity plans and protocols, implemented in response to the COVID-19 pandemic in 2020, continued to ensure Hydro was able to safely execute essential work through 2022.

1.1 Expenditures

Hydro's 2022 capital expenditures totaled $103.4 million. Expenditures to maintain Hydro's hydraulic generation equipment and infrastructure across the province totalled $15.5 million. The thermal generation equipment and infrastructure at the Holyrood Thermal Generating Station ("Holyrood TGS") required expenditures totalling $15.2 million,[1] including $2.5 million to overhaul the Unit 3 turbine and valves, and $3.9 million on Boiler Condition Assessment and Miscellaneous Upgrades. Invested capital for terminal station infrastructure totalled $25.6 million,[2] including $10.9 million in the Terminal Station Refurbishment and Modernization projects. $12.4 million[3] was invested in Hydro's distribution systems in 2022, including $9.2 million in service extensions and distribution system upgrades.

Included in Hydro's total capital expenditures of $103.4 million was unplanned additional work totaling approximately $20.1 million.[4] This included $0.8 million in emergency work which was completed using Hydro's Allowance for Unforeseen Items Account, $2.9 million of which was completed under the scope of supplemental projects approved in 2022, $8.2 million completed in previously-approved supplemental projects, and a net $6.1 million increase in work to address in-service failures.[5]

Of the $20.1 million of unplanned additional work, approximately $3.1 million was related to the Holyrood TGS, which, at the time of filing Hydro's "2022 Capital Budget Application,"[6] was expected to

[1] Includes supplemental and unforeseen expenditures.
[2] Includes supplemental and unforeseen expenditures. Excludes terminal station work associated with Valentine Gold Interconnection Project.
[3] Includes supplemental and unforeseen expenditures.
[4] "Unplanned work" consists of scope exceeding in-service failure budgets, additional scope completed under the Boiler Condition and Miscellaneous Upgrades Program – Holyrood, the Perform Software Minor Enhancements program, new and previously-approved supplemental expenditures, and allowance for unforeseen expenditures.
[5] Includes expenditures completed under the Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights program.
[6] "2022 Capital Budget Application," Newfoundland and Labrador Hydro, rev. September 19, 2021 (originally filed August 2, 2021).

be maintained as a generating facility until March 31, 2023. The subsequent extension of Holyrood TGS as a generating facility required Hydro to invest additional capital to support its ability to provide reliable service.

1.2 Expenditures Compared to Approved Budget

Actual expenditures in Hydro's overall capital program for 2022 were approximately 25.1% below budget or $34.7 million. The primary drivers of Hydro's under-expenditure in 2022 were strategic deferral of work and global supply chain constraints. As a result, Hydro will carryover approximately $40.0 million of work into 2023 and beyond.[7,8]

1.2.1 Strategic Deferral of 2022 Work

Hydro chose to strategically defer $15.3 million of capital work. Hydro believes that re-evaluating and confirming the requirement for investment prior to work execution and deferring certain capital work if appropriate is consistent with its legislated obligation to provide reliable service at the lowest possible cost to customers. An example of a strategic deferral is the deferral of the Holyrood Gas Turbine combustor inspection, as the unit had not reached the number of equivalent starts Hydro deems necessary to warrant such inspection. Additionally, Hydro deferred capital expenditures to align with the decision to defer the decommissioning of the Stephenville Gas Turbine to 2024.

1.2.2 Supply Chain Constraints in 2022

Approximately $13.6 million of Hydro's carryover relates to ongoing global supply chain issues. In particular, much of Hydro's planned vehicle, light-duty mobile equipment and terminal station equipment continues to experience delivery delays.

[7] Additional information regarding analysis of the variance is included in Section 5.0.
[8] $27.7 million is associated with the carryover of work within multi-year projects continuing in 2023 and $14.3 million is associated with the carryover of projects that were planned to be completed in 2022. This was partially offset by $2.0 million in work advanced within multi-year projects.

2.0 Capital Expenditures and Variance Summary

Appendix A, Table A-1 provides a summary of capital expenditures related to projects that were active in 2022, with associated expenditures broken out annually for the periods 2018–2022 (expenditures) and 2023 and beyond (forecast). A breakdown of the variance summary by asset type is presented in Table 1.

Table 1: Total Capital Variance Summary by Asset Type ($000)[9]

Asset Type	Board-Approved Budget	Total Project Forecast[10]	Variance
Hydraulic	49,972	52,652	2,680
Thermal	15,191	16,551	1,360
Gas Turbines	19,627	15,530	(4,096)
Terminal Stations	113,077	100,187	(12,890)
Transmission	21,582	24,680	3,098
Distribution	14,040	16,402	2,361
Rural Generation	19,986	20,248	262
Properties	-	-	-
Metering	5,876	5,876	-
Rural Systems Tools and Equipment	3,807	3,935	128
Information Systems	3,792	3,468	(324)
Telecontrol	912	819	(93)
Transportation	9,647	11,197	1,550
Administrative	2,139	2,486	347
Allowance for Unforeseen	1,402	2,450	1,048
Supplemental Projects	33,973	34,131	158
Projects Less Than $50,000	272	189	(83)

[9] Numbers may not add due to rounding.
[10] As in previous years, total project forecast includes both actuals and forecast where projects continue beyond 2022.

3.0 Capital Expenditures by Category

Appendix A, Tables A-2 to A-15 present Hydro's capital expenditures by category including:

- Hydraulic Generation;
- Thermal Generation;
- Gas Turbine Generation;
- Terminal Stations;
- Transmission;
- Distribution;
- Rural Generation;
- Properties;
- Metering;
- Tools and Equipment;
- Information Systems;
- Telecontrol;
- Transportation;
- Administration;
- Allowance for Unforeseen Items;
- Supplemental Capital Projects; and
- Projects less than $50,000.

4.0 Variance Explanations

As per the Capital Budget Guidelines[11] set forth by the Board of Commissioners of Public Utilities ("Board"), Hydro is required to report on actual capital expenditure variances which exceed the approved total project budget by more than 10% and $100,000.[12] Hydro has also included variance explanations[13] if the 2022 project expenditures[14] exceeded the approved 2022 budget by more than 10% and $100,000. It is important to note that in many instances, initial project budget estimates are based on historical costs, and the extent of the work scope to be performed can only be determined during the project execution, after proper assessments are completed.

The projects are ordered and numbered in the sections below based upon the order they appear in the tables found in Appendix A.

4.1 Hydraulic Generation Projects (Appendix A, Table A-2)

4.1.1 Hydraulic Generation Refurbishment and Modernization (2022–2023)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	2,970.6	2,664.6	(306.0)
Project	6,759.5	7,534.1	774.6

This is a two-year project (2022–2023) that commenced in 2022. The project scope includes replacement or refurbishment of failing or failed assets at several hydraulic generating facilities. The variance in 2022 project expenditures is attributed to:

- Refurbishment of Burnt Dam Spillway Bay 2: The original project estimate included an allowance for early construction work in 2022. During detailed project planning, it was determined that all

[11] The Board issued provisional Capital Budget Guidelines on December 20, 2021, for use in 2022 for the 2023 Capital Budget Applications and related matters. This filing is prepared pursuant to the Capital Budget Application Guidelines, approved by the Board in October, 2007.
[12] "Capital Budget Application Guidelines," The Board of Commissioners of Public Utilities, rev. October 2007 (originally issued June 2, 2005), sec. C, at p. 11.
[13] Minor discrepancies in the numbers presented in the tables are due to rounding.
[14] In the tables throughout section 4.0, where projects closed in 2022, expenditures represent actuals, and where projects continue beyond 2022, expenditures represent total forecast.

construction could be completed in one season, minimizing construction resource mobilization costs. All of the planned construction is now scheduled for 2023.

- Replacement of Cat Arm Generator Surface Air Coolers: The original project estimate included procurement of the coolers in 2022 and installation in 2023. The coolers were ordered in 2022, but will not be delivered until 2023. The construction remains planned for 2023.
- Installation of a Safety Boom at the Upper Salmon Intake Canal: The original project estimate included the procurement and installation of a safety boom at the Upper Salmon Intake Canal in 2022. This scope was removed from the project for further review. Hydro is reviewing if an ice boom is required at this location and, if so, the ice boom can also serve as a public safety boom. Installation of an ice boom, if required, or a public safety boom will form part of a future budget application.

The variance in 2022 expenditures was partially offset by an over-expenditure for the overhaul of Unit 6 at the Bay d'Espoir Hydroelectric Generating Station, completed in 2022. More refurbishment work was required than anticipated at the time of budget estimate preparation, for the turbine runner and various components of the generator rotor.

The variance in overall project forecast is primarily attributed to the additional refurbishment work required for Bay d'Espoir Unit 6, as described above. The variance is also associated with the draft tube deck substructure condition assessment at the Bay d'Espoir Hydro-electric Generating Station. There were additional construction costs associated with a requirement to schedule the in-water inspections in stages, necessitated by unforeseen challenges in taking the Bay d'Espoir generating units offline so that inspection work could be completed safely. In addition, the work was impacted by a forest fire in Central Newfoundland that resulted in the closure of the Bay d'Espoir Highway. Construction resources responsible for the underwater portion of the inspection were unable to travel to the project site which resulted in standby costs. Construction resources already mobilized to site were stranded in the Bay d'Espoir area until the highway reopened which also resulted in standby costs. The generation outages necessary to complete the underwater portion of the inspection could not be rescheduled within 2022 and the remaining work has been rescheduled to 2023.

4.1.2 Hydraulic Generation In-Service Failures (2022)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	1,000	1,425.8	425.8

This was a one-year project (2022) that was completed in 2022. The budget estimate for the project was based on prediction of the amount of work required to address in-service failures using historical data and engineering judgement. The variance in 2022 and overall project expenditures is attributed to the actual number of failures incurred. A detailed list of work executed under this project in found in Section 10.0.

4.1.3 Hydraulic Generation Refurbishment and Modernization (2021–2022)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	8,011.2	6,567.5	(1443.7)
Project	11,575.1	10,319.2	(1255.9)

This is a two-year project (2021–2022) that commenced in 2021 and has carried over into 2023. The project scope includes replacement or refurbishment of failing or failed assets at several hydraulic generating facilities. Most of the project work scopes were completed in 2021 and 2022 as planned. Two scopes of work representing less than one percent of the overall project budget were carried over for completion in 2023:

- The planned replacement of annunciator components for Bay d'Espoir Powerhouse 1 commenced but could not be completed in 2022 due to a diminished resource pool for the required technical construction resources as a result of vacancies and impacts of the COVID-19 pandemic.
- The planned replacement of annunciator components for Hinds Lake Hydro-electric Generating Station commenced but could not be completed in 2022 due to issues with compatibility requirements of equipment.

The variances in 2022 and overall project forecast are primarily associated with the diesel generator replacement at Burnt Dam Spillway completed in 2022. In 2021, improvements at the Victoria Control Structure resulted in the availability of a 50 kW diesel generator with a low number of operating hours on the unit. That existing unit was able to meet the project requirements at Burnt Dam Spillway and was installed at a lower cost compared to budget estimate to purchase and install a new generator.

The variance in 2022 expenditures is also associated with Unit 6 stator rewind at the Bay d'Espoir Generating Station completed in 2022. Contract award pricing for the rewind was less than the original budget estimate.

4.1.4 Hydraulic Generation Refurbishment and Modernization (2020–2021)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	16,830.2	19,601.4	2,771.3

This was a two-year project (2020–2021) that carried over and was completed in 2022. The project scope included replacement or refurbishment of failing or failed assets at several hydraulic generating facilities. The variance in overall project expenditures is primarily attributed to the additional project expenditures that were necessary for the Unit 5 generator stator rewind at the Bay d'Espoir Hydroelectric Generating Facility completed in 2021. Greater than anticipated effort was required for the stator bar removal and stator cleaning. Due to the existence of a compound injected into the stator core slots in the 1970s, removal of stator bars was difficult and the selected cleaning method was not entirely effective and had to be supplemented with time-consuming manual cleaning.[15] Furthermore, there were additional expenditures associated with a localized COVID-19 outbreak that led to a pause in construction activity and a gradual return to work with direction from Public Health as well as reassembly of the unit taking longer than anticipated.

[15] Injection as recommended by Original Equipment Manufacturer at that time.

4.2 Thermal Generation Projects (Appendix A, Table A-3)

4.2.1 Thermal In-Service Failures (2022)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	2,000.0	2,893.8	893.8

This was a one year project (2022) that was completed in 2022. The budget for the project was based on prediction of the amount of work required to address in-service failures using historical data and engineering judgement. The variance in 2022 and overall project expenditures is attributed to the actual number of failures incurred. A detailed list of work executed under this project in found in Section 11.0.

4.2.2 Major Pumps Overhaul – Holyrood

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	491.3	907.7	416.4

This was a one year project (2022) that was completed in 2022. The project scope was to overhaul the Unit 1 north vacuum pump, the Unit 1 west cooling water pump, and the Unit 3 east cooling water pump. The variance in 2022 and overall project expenditures is attributed to the extent of the pump refurbishment work.. The original project budget was based on historical pump overhaul costs. The extent of the pumps overhaul can only be determined after the pumps are removed from service and disassembled for inspection, during the project execution. In this case, the extent of required refurbishment following disassembly of the pumps was more than originally estimated.

In addition, expediting costs were incurred to ensure that the refurbishment work was completed and the pumps returned to service within the 2022 generation unit outage schedules.

4.2.3 Turbine Valves Overhaul Unit 3 – Holyrood

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	3,623.5	2,485.6	(1,137.9)

This was a one year project (2022) that was completed in 2022. The project scope was to overhaul the Unit 3 turbine valves. The variance in 2022 and overall project expenditures is attributed to the extent of

the valve refurbishment work. The original project budget was based on historical valve overhaul costs. The extent of the valve overhaul can only be determined after the valves are removed from service and disassembled for inspection, during the project execution. In this case, the extent of required refurbishment following disassembly of the valves was less than originally estimated.

4.2.4 Air Receivers Condition Assessment and Upgrades – Holyrood

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	336.5	192.4	(144.1)

This was a one year project (2022) that was completed in 2022. The project scope was to complete an assessment and refurbishment of air receiver storage tanks, dryer system, associated piping, and valves on the plant compressed air system that provides air for instrumentation and general service. The variance in 2022 and overall project expenditures is attributed to the extent of compressed air components refurbishment following the assessments, which was less than anticipated at the time of the original budget estimate.

4.2.5 Boiler Condition Assessment and Miscellaneous Upgrades – Holyrood

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	3014.2	3,899.4	885.2

This is a one year project (2022) that was completed in 2022. The project scope was to perform a Level 2 condition assessment on the internal components of the boilers and associated high energy piping to determine what refurbishment or replacements are required prior to the 2022-2023 winter operating season. The project also included completion of miscellaneous upgrades identified in the 2021 condition assessment and the completion of required interventions identified during the 2022 assessment work that were necessary to support the safe and reliable operation through the 2022-2023 winter operating season. The variance in 2022 and overall project expenditures was attributed to the extent of the boiler refurbishment work. Upon disassembly and assessment of the boilers, the level of necessary refurbishment was greater than anticipated at the time of the original budget estimate. A summary of activities completed that were not originally anticipated in the project scope are included in Section 12.0.

4.2.6 Upgrade Distributed Control System Hardware – Holyrood

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	557.0	351.7	(205.2)

This is a two-year project (2021-2022) that has carried over into 2023. The project scope is to replace the distributed control system hardware such as processors, servers, computer stations and network switches for the Unit 3 synchronous condenser, station service, and the waste water treatment plant systems at the Holyrood Thermal Generating Station. The variance in 2022 expenditures is attributed to a global microchip shortage related to the COVID-19 pandemic, delaying factory assembly of the new distributed control system components. The project scope related to the water treatment plant was completed as planned in 2022. However, the vendor advised that the delivery of some components for upgrades on the Unit 3 synchronous condenser and station service were delayed due to the global microchip shortage and were not received in time for 2022 installation. The factory acceptance testing and component delivery are now complete and the remainder of the project scope is expected to be completed in 2023.

4.2.7 Upgrade Waste Water Equalization System – Holyrood

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	2,192.9	2,500.7	307.9
Project	2,361.1	2,669.0	307.9

This is a two-year project (2021-2022) that was completed in 2022. The project scope was to refurbish the wastewater equalization system. The variance in 2022 and overall project expenditures is attributed to contract pricing that was higher than the original budget estimate and longer construction duration than was originally estimated.

4.2.8 Upgrade Uninterruptible Power Supply 3 and 4 – Holyrood

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	348.7	512.7	164.1

This was a one-year project (2020) that carried over and was completed in 2022. The project scope was to upgrade uninterruptible power supply 3 and 4 at the Holyrood Thermal Generating Station and included replacement of the existing cabinets due to obsolescence. There were procurement challenges in 2020 related to the COVID-19 pandemic, which resulted in delivery of materials being delayed to 2021. Construction commenced in 2021 but could not be completed as the necessary concurrent outage to all three generating units at Holyrood was not available in the required duration to facilitate the work. The necessary outage was available in 2022 and the work was completed. The variance in overall project expenditures is attributed to increased equipment preservation, engineering and interest during construction costs associated with the project delays. In addition, internal project management, engineering and construction labor costs in 2022 were greater than anticipated at the time of the original budget estimate. Additional time was required for field verification of existing electrical circuits to ensure that they were correctly transferred over to the new uninterruptible power supply cabinets.

4.3 Gas Turbine Generation Projects (Appendix A, Table A-4)

4.3.1 Construct Lube Oil Cooler Hood and Containment System – Holyrood Gas Turbine

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	108.2	351.6	243.4
Project	318.8	562.2	243.4

This was a one-year project (2021) that commenced in 2021 and was carried over and completed in 2022. The project scope was to install a new lube oil cooler hood and containment system for the Holyrood Gas Turbine. The construction was originally scheduled for October 2021, during a three-week planned outage of the gas turbine. The outage was delayed and subsequently cancelled in 2021 due to system loads and the requirement for extended outages for other generating units, to facilitate work that was deemed more critical. The work was rescheduled and completed during gas turbine outages in the spring and fall of 2022. The variances in 2022 and overall project expenditures are attributed to the

procurement and construction contract costs exceeding the original budget estimates and additional costs associated with rescheduling the work.

4.3.2 Replace Fuel Oil, Lube Coil, and Glycol Pumps – Happy Valley Gas Turbine

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	175.4	293.8	118.4

This was a two-year project (2021–2022) that commenced in 2021 and was completed in 2022. The project scope is to replace the existing fuel oil, lube oil, and glycol pumps and motors. A variance in 2021 expenditures was attributed to lower vendor pricing compared to the original budget estimates for the supply of the new pumps. The variance in 2022 expenditures is attributed to construction costs exceeding the original budget estimates. These variances offset and the overall project was completed within 1% of the approved budget.

4.3.3 Perform Combustor Inspection – Holyrood Gas Turbine

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	5,399.2	2,367.5	(3,031.7)

This is a two-year project (2020–2021) that commenced in 2020 and is carrying over to 2023. The project scope is to complete a combustor inspection and overhaul for the Holyrood Gas Turbine. The variance in 2022 expenditures is attributed to a change in required timing of the project. The combustor inspection frequency is based on the number of gas turbine equivalent starts, with the next inspection due at 1,120 lifetime equivalent starts. At the time of the budget proposal, it was projected this number of equivalent starts would be accumulated in 2021. The equivalent starts threshold was not reached in 2022, and the project schedule has been extended to 2023. Hydro will continue to update the projected equivalent start projections to determine if further change to the project schedule is warranted.

4.3.4 Increase Fuel and Water Treatment System Capacity – Holyrood Gas Turbine

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	11,842.6	7,625.5	(4,217.1)

This was a two-year project (2018–2019) that commenced in 2018 and was carried over and completed in 2022. The project scope was 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. Work that was related to the automation of the fuel transfer system was completed in 2020. Work that was related to the secondary containment liner was also completed in 2020 but did not meet the 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 locations of leaks could not be identified and it was concluded that replacement of the complete liner is necessary to achieve an acceptable permeability rate.[16] This work was tendered and awarded to a contractor in 2021, and construction was completed in 2022. Final acceptance criteria for the secondary containment liner were met.

The variance in overall project expenditures is attributed to lower than estimated contract prices for the fuel tank construction completed in 2019. 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 ("CBA").[17] In lieu of estimates from the contractor, Hydro used cost data from the original plant construction. This under expenditure was partially offset by additional expenditures associated with replacing the secondary containment liner in 2022.

[16] As it could not be determined if the condition was pre-existing, Hydro and the contractor shared the cost of the work scope.
[17] "2018 Capital Budget Application," Newfoundland and Labrador Hydro, rev. October 3, 2017 (originally filed July 27, 2017).

4.4 Terminal Stations Projects (Appendix A, Table A-5)

4.4.1 Terminal Station In-Service Failures (2022)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	900.0	3,626.1	2,726.1

This was a one-year project (2022) that was completed in 2022. The budget for the project was based on prediction of the amount of work required to address in-service failures using historical data and engineering judgement. The variance in 2022 and overall project expenditures is attributed to the actual number of failures incurred. A detailed list of work executed under this project is found in Section 9.0.

4.4.2 Upgrade Circuit Breakers (2022-2023) - Various

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	2,121.9	117.4	(2,004.5)
Project	9,483.7	6,398.0	(3,085.7)

This is a two-year project (2022-2023) that commenced in 2022. The project scope includes several circuit breaker replacements and refurbishments at a number of terminal stations.

The variance in 2022 expenditures is attributed to:

- Work being completed for less than the budget estimate, primarily as a result of the use of internal construction forces rather than contractors for most of the work; and
- The rescheduling of one breaker replacement in Bay d'Espoir from 2022 to 2023 as a result of supplier delivery delay.

The variance in overall project forecast is attributed to work being completed for less than the budget estimate, primarily as a result of the use of internal construction forces rather than contractors for most of the work.

The following scope adjustment was implemented for this project:

- The planned replacement of Wabush circuit breaker B3SS1 in 2023 was substituted with the replacement of Wabush circuit breaker B4T5 in 2023, to better align with other project activities

at this location. The replacement of B3SS1 circuit breaker will be completed as part of a future circuit breaker replacement program.

4.4.3 Terminal Station Refurbishment and Modernization (2022-2023)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	3,111.9	2,168.7	(943.2)

This is a two-year project (2022–2023) that commenced in 2022. The project includes a number of consolidated program-type projects across several sites. The variance in 2022 expenditures is primarily associated with the capital programs for: protection, control and monitoring systems; and the replacement of disconnect switches. The variance is primarily attributed to:

- A high volume of work across all projects for the technical resources required to complete the design and procurement of several protection and control systems, leading to delays for lower priority work;
- Increased equipment lead time, delaying receipt of the equipment from 2022 to early 2023; and
- Diversion of design resources to emergency work.

The following scope adjustment was implemented for this project:

- The protection upgrade for Western Avalon Terminal Station Transformer T2 was transferred into this project from the 2019-2020 Terminal Station Refurbishment and Modernization Project.

4.4.4 Upgrade Circuit Breakers (2021-2022) - Various

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	6,349.3	4,818.6	(1,530.7)
Project	10,532.7	7,697.0	(2,835.7)

This is a three-year project (2021–2023) that commenced in 2021.[18] The project scope includes several circuit breaker replacements and refurbishments at a number of terminal stations.

The variances in 2022 and overall project expenditures are attributed to work being completed for less than the budget estimate, primarily as a result of the use of internal construction forces rather than contractors for most of the work.

The following scope adjustment was implemented for this project:

- The planned replacement of Wabush circuit breaker B4L5B was substituted with the replacement of Wabush circuit breaker B3L1, to align with customer requirements. The replacement of B4L5B will be completed as part of a future circuit breaker replacement program.

4.4.5 Upgrades for Future Retirement of Stephenville Gas Turbine

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	6,723.0	1,060.9	(5,662.2)

This is a two-year project (2021–2022) that commenced in 2021 and is expected to carry over into 2024. The project scope includes a number of upgrades to the Bottom Brook and Stephenville Terminal Stations to minimize the risk of customer outages due to a transformer or transmission line failure, following the decommissioning of the Stephenville Gas Turbine. The variance in 2022 expenditures is attributed to the rescheduling of construction work at Bottom Brook Terminal Station to 2023 and at Stephenville Terminal Station to 2024, to align with the decision to defer the decommissioning of the Stephenville Gas Turbine to 2024.[19]

[18] This project was originally proposed as a two-year project (2021–2022) as part of the 2021 Capital Budget Application. The project schedule was then updated and approved as a three-year project (2021–2023) as part of the 2022 Capital Budget Application.
[19] Reliability and Resource Adequacy Study – 2022 Update, NL Hydro, October 3, 2022.

4.4.6 Additions for Load – Wabush Substation Upgrades

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	7,139.1	2,299.4	(4,839.7)
Project	9,333.8	10,694.1	1,360.3

This is a four-year project (2021–2024) that commenced in 2021.[20] The project scope includes a number of equipment replacements and upgrades to ensure a reliable supply to the Wabush Substation customers.

The variance in 2022 expenditures is attributed to:

- Following the completion of surveying, geotechnical work and engineering design in 2021, the project execution plan changed, resulting in the yard construction being rescheduled to 2022 and the installation of the control building and associated equipment into 2023; and
- Two disconnect replacements were rescheduled from 2022 to 2023 to be executed at the same time as other related outage work in 2023.

The variance in overall project forecast is attributed to:

- The requirement for installation of oil containment systems for the new transformer pads to mitigate the environmental risk, which was not included in the original budget estimate;
- Civil yard extension costs that exceed the original budget estimate; and
- Contract pricing for the control building fabrication that exceeds the original estimate.

4.4.7 Wabush Terminal Station Upgrades

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	6,443.2	1,843.2	4,600.0

[20] Project originally approved as three-year project (2021-2024), and re-budgeted as a four-year project in the 2022 Capital Budget Application.

This is a four-year project (2021–2024) that commenced in 2021.[21] The project scope includes the replacement of Transformers T4 and T5 and the addition of a new capacitor bank to support Hydro's ability to provide firm supply for customers in accordance with the criteria established for the transmission system in western Labrador.

The variance in 2022 expenditures is attributed to:

- The rescheduling of a power transformer replacement from 2022 to 2024, due to delays in the procurement of the transformer;
- Late delivery of core steel to the supplier's factory;
- Delay in delivery of the capacitor bank to early 2023; and
- Delay in completing the civil yard expansion to the summer of 2023.

The following scope adjustments were implemented for this project:

- The differential protection upgrade for the Wabush Line L2 was transferred into this project from the 2020-2021 Terminal Station Refurbishment and Modernization project;
- The protection upgrades for the Wabush Lines L1 and L3 were transferred into this project from the 2021-2022 Terminal Station Refurbishment and Modernization project; and
- The differential protection upgrades for the Wabush Lines L34 and L35 were transferred into this project from the Wabush L34 and L35 Protective Relays project.

4.4.8 Terminal Station Refurbishment and Modernization (2021-2022)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	8,824.5	7,432.3	(1,392.2)
Project	13,128.9	11,657.1	(1,471.8)

This is a two-year project (2021–2022) that has carried over into 2023. The project includes a number of consolidated program-type projects across several sites. All projects were closed in 2022 except for the

[21] Project originally approved as three-year project (2021-2024), and re-budgeted as a four-year project in the 2022 Capital Budget Application.

project to install a fire protection system at Massey Drive Terminal Station, which has carried over into 2023.

The variance in 2022 expenditures is primarily associated with the capital programs for: power transformers; protection, control and monitoring systems; fire protection system and grounding systems. The 2022 variance is primarily attributed to:

- Cancellation of some scope items, following a review of updated asset condition information indicating that the work was not immediately required;
- Lower than estimated cost for engineering and procurement for several protective relay replacements;
- Carryover of the installation of a fire protection system at Massey Drive Terminal Station to 2023, as the equipment required for installation was destroyed by a fire at the supplier's distribution center;
- Removal of grounding upgrades at Rattle Brook Terminal Station from the project scope, as those assets were confirmed to be not owned by Hydro; and
- Completion of work for less than the original budget estimates for several scopes of work.

The variance in overall project forecast is primarily associated with the capital programs for power transformers and grounding systems. The overall project variance is attributed to completion of work for less than the original budget estimates for several scopes of work. The variance in overall project expenditures was partially offset by increased costs associated with the addition of disconnect switch and instrument transformer replacement scopes at several terminal stations, as described above for the 2022 variance.

The 2022 and overall project variances were partially offset by increased costs associated with the capital programs for protection, control and monitoring systems; disconnect switches; and instrument transformers. This offset is primarily attributed to:

- Completion of data alarm management work at the Oxen Pond Terminal Station at costs higher the original budget estimates; and

- Addition of disconnect switch replacement scope at the Churchill Falls Terminal Station and instrument transformer replacement scope at several terminal stations to this project, transferred from previous projects.

The following scope adjustments were implemented for this project:

- The planned protection upgrade for Wabush Terminal Station Line 5 was substituted with the protection upgrade for Wabush Terminal Station Line 1, to align with the customer's protection upgrade program.
- The following scope items were cancelled following a review of updated asset condition information indicating that the work was not immediately required:
    - Oil processing for a transformer at the Cat Arm Hydroelectric Generating Station Terminal Station;
    - Oil processing for a transformer at the Grand Falls Frequency Converter Terminal Station; and
    - Bushing replacement for a transformer at Muskrat Falls Terminal Station.
- The following scope items were transferred into this project from previous projects:
    - Transformer upgrades at various sites;
    - Churchill Falls instrument transformer replacements;
    - Bay d'Espoir Transformer T6 radiator replacement;
    - Insulator replacements at Happy Valley and Churchill Falls Terminal Stations; and
    - Disconnect switch replacements at Churchill Falls and Sunnyside Terminal Stations.
- The following scope items could not be completed in 2022 and were transferred from this project to applicable programs in 2023:
    - The breaker failure protection upgrades at Oxen Pond and Massey Drive Terminal Stations, due to technical resource unavailability and outage unavailability;
    - Protective relay replacements for Wabush Terminal Station Line 1 and Line 3, due to the manufacturer's recall of some protective relays;

- Disconnect switch replacements at Churchill Falls and Wabush Terminal Stations, due to outage unavailability;
- Instrument Transformer replacements for Indian River Terminal Station Breaker B1L63 and Western Avalon Terminal Station Breaker B4T3, due to long lead times for the new equipment; and
- Instrument Transformer replacements for Springdale Terminal Station Transformer T1, due to delays in securing Measurements Canada approval of the required metering ratio.

4.4.9 Replace Transformer T7 - Holyrood Terminal Station

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	1,767.3	557.9	(1,209.4)
Project	2,678.1	3,712.6	1,034.5

This is a one-year project (2020) that has carried over into 2023. The project scope is to replace the Holyrood Transformer T7 with a transformer to be removed from the Churchill Falls Switchyard and complete associated civil, protection and control upgrades. Removal of the old Holyrood T7 and its foundation, and installation of a new concrete pad and oil containment system, were completed in 2020. The transport of the Churchill Falls transformer to Holyrood and the remaining construction activity at Holyrood has carried over into 2023.

The variance in 2022 expenditures is attributed to rescheduling the remaining project scope to 2023. As a result of Hydro's decision to maintain Transmission Line L1301 as a backup for the Muskrat Falls – Happy Valley Interconnection for the winter of 2020–2021, Churchill Falls Transformer T31 was not available in 2020 to replace Holyrood T7 as planned by Hydro and approved by the Board. In 2020, Hydro performed an analysis of the resulting risk and confirmed that there would be low risk to customers as a result of this deferral. Hydro advised Newfoundland Power Inc. ("Newfoundland Power") of this decision. In 2021, as a consequence of the further deferral of the Muskrat Falls – Happy Valley Interconnection, the Churchill Falls Transformer T31 again was not available to replace Holyrood T7. As Hydro intended to continue to maintain L1301 as a backup supply for the 2021–2022 winter season, T31 remained in Churchill Falls. In 2022, the transport of the transformer from Churchill Falls to Holyrood could not proceed due to logistical issues related to the size of the transformer and its transportation

route. The proposed route by the contractor included the Marine Atlantic ferry service from North Sydney, NS to Port Aux Basques, NL. The contractor had based their proposal on the Hydro-supplied manufacturer's as-built drawing for the maximum height of the transformer. The transportation sub-contractor discovered at site that the transformer height exceeded that shown on the as-built drawing and the transformer could not be transported on the ferry. After investigating several other options for transporting the transformer in the fall of 2022, it was decided to delay to a more favourable time of year in 2023 and allow further investigation of more economical options.

The variance in overall project forecast is attributed to higher than originally estimated transformer transportation costs. As noted, Hydro is investigating more economical transport options in 2023.

4.4.10 Terminal Station Refurbishment and Modernization (2020-2021) – Various Sites

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	415.6	141.4	(274.3)
Project	9,397.2	8,161.3	(1,236.0)

This was a two-year project (2020–2021) that carried over and was completed in 2022. The project included a number of consolidated program-type projects across several sites and a focused refurbishment at Wabush Terminal Station.

The variance in 2022 expenditures is primarily associated with the capital program for monitoring systems and is attributed to completion of the Happy Valley Terminal Station digital fault recorder installation for less than the original budget estimate.

The variance in overall project expenditures is primarily associated with the capital program for the refurbishment of the Wabush Terminal Station and is attributed to work that was completed in 2020 and 2021 for less than the original budget estimates, and the cancellation and transfer of some project scope items.

The following scope adjustments were implemented for this project:

- The following scope items were transferred into this project from previous projects:
    - St. Anthony Diesel Plant breaker failure protection upgrade; and

- Wabush Terminal Station circuit breaker 46-22 and Line L2 protection upgrade.

- The following scope item could not be completed in 2022 and was transferred from this project to another project:
  - Wabush Line L2 differential line protection upgrade, transferred into Upgrade Terminal Station – Wabush project to re-align timing with a customer protection upgrade project that was rescheduled to 2023.

- The following scope items were cancelled following review of updated asset condition information indicating that the work was not immediately required:
  - Insulator replacements at the Churchill Falls and Roddickton Terminal Stations; and
  - Major refurbishment of transformers at the Hampden and Jackson's Arm Terminal Stations.

4.4.11 Terminal Station Refurbishment & Modernization (2019-2020) – Various Sites

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	920.5	1,120.0	199.4
Project	29,952.9	20,439.1	(9,513.8)

This was a two-year project (2019–2020) that carried over and was completed in 2022. The project included a number of consolidated program-type projects across several sites and a focused refurbishment at the Wabush Terminal Station.

The variance in 2022 expenditures is associated with the capital program for protection control and monitoring systems and is attributed to completion of protection upgrades with costs exceeding the budget estimate.

The variance in overall project expenditures is primarily associated with the capital programs for the refurbishment of power transformers, the Wabush Terminal Station, protection control and monitoring systems, and disconnect switch replacements. The variance is primarily attributed to the following:

- Work completed at the Wabush Terminal Station for less than the original budget estimates;

- Protection upgrades and disconnect switch replacements completed for less than the original budget estimates; and
- The cancellation or transfer of some project scope items.

The following scope adjustments were implemented for this project:

- The following scope items were transferred from this project to applicable programs in 2023:
  - Transformer upgrades at various sites;
  - Hardwoods Bus B7 and several Churchill Falls instrument transformer replacements;
  - Insulator replacements at the Happy Valley and Churchill Falls Terminal Stations;
  - Disconnect switch replacements at the Sunnyside Terminal Station; and
  - Protection upgrade for Western Avalon Terminal Station Transformers T2.
- The following scope items were cancelled following review of updated asset condition information indicating that the work was not immediately required:
  - Transformer bushing replacements at the Churchill Falls, Stephenville, Hawke's Bay, Granite Canal, and Hardwoods Terminal Stations;
  - Instrument transformer replacements at Holyrood Bus B6, Hardwoods Transformer T3, and L'Anse-au-Loup;
  - Installation of a moisture reduction system for Bay d'Espoir Transformer T1; and
  - Insulator replacements at Churchill Falls.

4.5 Transmission Projects (Appendix A, Table A-6)

4.5.1 Wood Pole Line Management Program (2022)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	1,603.5	1,986.5	383.0

This was a one-year project (2022) that was completed in 2022. This is an annual project for execution of Hydro's Wood Pole Line Management Program. The scope of the project was inspection, refurbishment

or replacement of line components, including poles, structures, hardware, and conductors for several transmission lines. The variance in 2022 and overall project expenditures is primarily attributed to an additional 300 pole inspections completed on Transmission Line TL 201. This additional scope will be discussed in the Wood Pole Line Management Summary Report which Hydro expects to file with the Board in Q2 2023. In addition, higher than anticipated costs were incurred on several lines for the replacement of wood pole line components.

4.5.2 Muskrat Falls to Happy Valley Interconnection

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	1,374.0	2,232.1	858.1
Project	19,978.5	22,693.8	2,715.3

This was a two-year project (2019-2020) that carried over and was completed in 2022. The project scope was to complete upgrades at Muskrat Falls Terminal Station 2 and Happy Valley Terminal Station and construct a transmission line to interconnect the two stations.

The variance in 2022 expenditures is associated with the relocation of the 50 MVA transformer from Muskrat Falls Terminal Station 3 to Happy Valley Terminal Station. Additional expenditures were incurred for this work as a result of schedule and work flow interruption caused by emergency work related to the failure of Bay d'Espoir T5, which diverted the transformer relocation contractor away from this project prior to work being completed. The transformer relocation contractor left the site in July 2022 and returned to complete the work in Happy Valley in September 2022. This interruption in work progress extended the overall project schedule and impacted the work flow and efforts of other contract work. The protection, control, and commissioning contractor's work schedule was impacted, which resulted in multiple additional trips to complete their scope. The schedule delay also pushed the work into the same window as other planned work in the Happy Valley Terminal Station, which further impeded progress.

The variance in overall project expenditures is attributed to the additional costs in 2022 as described above and additional costs incurred in 2021 associated with the replacement of the Bus 12 and Bus 14 bus conductors at the Happy Valley Terminal Station. During detailed design, a requirement was identified to increase the bus conductor size to accommodate a higher current rating after the Muskrat

Falls – Happy Valley Interconnection is complete. The review showed that existing B11 and B13 conductors were sized adequately, however B12 and B14 bus conductors required replacement. Also contributing to the variance, the project management and construction management costs were greater than anticipated at the time of the original budget estimate as a result of the extension of the project schedule and to accommodate the additional work and required equipment outages.

4.6 Distribution Projects (Appendix A, Table A-7)

4.6.1 Install Recloser Remote Control (2022–2023) - Various

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	174.6	37.8	(136.8)
Project	323.7	223.7	(100.0)

This is a two-year project (2022-2023) that commenced in 2022. The project scope is to install one recloser remote control at the Coney Arm Terminal Station and two recloser remote controls at the Jackson's Arm Terminal Station. During detailed project planning for the Coney Arm scope of work, it was determined that the work would result in significantly lower benefits than were expected at the time of the project proposal. The installation of recloser remote control is no longer justified at Coney Arm and that scope of work was canceled. The work at Jackson's Arm remains justified and is expected to be completed in 2023. The variances in 2022 and overall project forecast are attributed to the cancelled scope of work for Coney Arm.

4.6.2 Labrador City L22 Voltage Conversion (2022–2023)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	486.8	99.1	(387.7)

This is a two-year project (2022–2023) that commenced in 2022. The project scope is to convert Line L22 to a 25 kV line supplied from the Vanier Terminal Station and includes the replacement of existing pad-mounted transformers and high-voltage cables serving the Labrador Mall. The variance in 2022 expenditures is attributed to a delay in the delivery of the pad-mount transformers, which were originally expected to arrive in 2022. Global material shortages in the fabrication of the transformers have delayed delivery until 2023.

4.6.3 Upgrade of Worst-Performing Distribution Feeders (2021–2022)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	795.9	1,513.3	717.4
Project	1,124.5	1,841.9	717.4

This was a two-year project (2021–2022) that was completed in 2022. The project scope was to upgrade distribution feeders located in the Farewell Head distribution system. The variance in 2022 and overall project expenditures is primarily attributed to procurement and construction scheduling challenges. Global procurement challenges had an impact on both material costs and delivery times of insulators. A delay in receiving new insulators resulted in a three-month break in execution, necessitating an additional mobilization of line crews and extending the overall project execution schedule. In addition, construction took longer than originally expected as a result of challenges in scheduling the work to minimize impact on customers. A larger work force was mobilized in efforts to maximum scope completion while keep daily outages to approximately six hours. Other issues such as additional right-of-way improvements required near Fogo resulted in additional costs and construction delays.

4.6.4 Provide Service Extensions (2022) - Various

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	3,627.2	4,459.1	831.9

This is an annual project to provide service extensions to customers. The budget is based on historical data from each region. The annual and project variance is due to a higher number of service extension requests than forecasted, particularly in isolated regions of Labrador.

4.6.5 Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights (2022) - Various

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	3,826.7	4,714.6	887.9

This is an annual project to address in-service failures of distribution equipment and complete upgrades to maintain reliable service to customers. The budget is based on historical cost data for each region.

The LED streetlight modernization effort is also executed within this project. The project variance is due to higher than forecasted costs which included extensive refurbishment requirements following a major ice event in December 2021 impacting the community of Red Bay, Labrador.

4.7 Rural Generation Projects (Appendix A, Table A-8)

4.7.1 Overhaul Diesel Units (2022) – Various

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	1,360.5	1,216.9	(143.6)

This was a one-year project (2022) that was completed in 2022. This is an annual project to overhaul diesel engines based on Hydro's established criteria. The variance in 2022 and overall project expenditures is primarily associated with the planned overhaul of a unit at the Nain Diesel Generating Station. It was determined that engine replacement was a lower cost alternative than engine overhaul, and the engine was replaced in 2022.

Also contributing to the variance, the overhauls of diesel engines at Norman's Bay, Mary's Harbour and Paradise River were deferred to future year(s). The units at Norman's Bay and Mary's Harbour did not accumulate 20,000 operating hours in 2022, which normally triggers the requirement for an overhaul for this type of unit. A decision was made to operate the unit at Paradise River beyond 20,000 operating hours into 2023, considering that the risk of an in-service failure can be tolerated since it is rare that more than one engine is required to operate at the same time. The plant has two additional installed engines and would not be in violation of operating criteria if one fails. A replacement unit was procured and delivered to site in 2022 as a spare should the existing unit fail or other conditions necessitate the replacement.

4.7.2 Install Fire Protection in Diesel Plants (2022-2023) – Ramea

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	1,928.8	1,578.8	(350.0)

This is a two-year project (2022-2023) that commenced in 2022. The project scope is to install an automatic hybrid nitrogen-water fire suppression system at the Ramea Diesel Generating Station. The

variance in overall project forecast is attributed to reduction in the required size of the system. The size reduction was possible following a review of a new standard released in 2021.[22] This standard allows for a minimum system discharge time of five minutes, compared to a discharge time of ten minutes that was assumed at the time of the budget estimate preparation. With this change, less nitrogen cylinders are required and the planned storage building to contain the cylinders is no longer required.

4.7.3 Additions for Load (2022) - Mary's Harbour Service Conductor

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	307.8	123.0	(184.8)
Project	359.1	211.0	(148.1)

This is a two-year project (2022-2023) that commenced in 2022. The project scope is to increase the capacity of the service conductor to address the load growth occurring in Mary's Harbour due to a new seafood processing plant. The variance in 2022 expenditures is attributed to the construction activity, most of which was originally planned for 2022, carrying over to 2023. The work can only be completed during a full plant outage, which could not be scheduled in 2022 due to issues coordinating a customer outage.

The variance in overall project forecast is attributed to an expected reduction in the required scope of work. During project planning, it was determined that the new cable could be ran in the existing conduit, and the planned conduit replacement would not be necessary. As well, the purchase price of the new service conductor cable was less than the original budget estimate. However, during a subsequent constructability review, it was determined that the effort involved to replace the cable is greater than estimated, due to congestion of other cables in the conduit. This, combined with the possibility of having to secure temporary generation to allow the work to proceed without customer impact, may lead to additional costs. Hydro is reassessing the justification for this project before proceeding in 2023.

4.7.4 Upgrade Fuel Storage Tanks (2022) - Mary's Harbour

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	499.1	622.7	123.6

[22] National Fire Protection Association 770: Standard on Hybrid (Water and Inert Gas) Fire-Extinguishing Systems.

This was a one year project (2022) that was completed in 2022. The project scope was to supply and install three new 60,000 litre horizontal fuel storage tanks and associated fuel piping at the Mary's Harbour Diesel Generating Station. The variance in 2022 and overall project expenditures is attributed to contract prices for the storage tank supply and the on-site construction that were higher than the original budget estimates.

4.7.5 Diesel Genset Replacement Unit 2039 - St. Lewis

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	397.0	238.7	(158.3)

This is a three year project (2022-2024) that commenced in 2022. The project scope is to replace Unit 2039 at the St. Lewis Diesel Generating Station with a new 365 kW, 1,800 rpm diesel genset and replacement or upgrade of associated equipment. The variance in 2022 expenditures is attributed to a late start to the engineering design and longer than normal lead times for material originally expected to be received in 2022. The overall project in-service date is not expected to be impacted by these delays.

4.7.6 Diesel Genset Replacement Unit 2012 - L'Anse-Au-Loup

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	339.9	170.3	(169.6)

This is a three-year project (2022-2024) that commenced in 2022. The project scope is to replace Unit 2012 at the L'Anse Au Loup Diesel Generating Station with a new 1500 kW, 1,800 rpm genset and replacement or upgrade of associated equipment. The variance in 2022 expenditures is attributed to a late start to the engineering design and longer than normal lead times for material originally expected to be received in 2022. The overall project in-service date is not expected to be impacted by these delays; however, a longer than normal delivery period for the genset may result in this project carrying into 2025.

4.7.7 Replace Powerhouse Roofing System – L'Anse-Au-Loup and St. Anthony

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	857.6	963.0	105.4

This is a two-year project (2020–2021) that has carried over into 2023. The project scope is to replace the roofing systems and install permanent rooftop fall protection systems for the St. Anthony and L'Anse au Loup Diesel Generating Stations. The construction activities originally planned for 2021 carried over to 2022 when the contractor was unable to procure roof panels in time for installation in 2021 due to manufacturer delays. The construction was substantially completed in 2022 and has carried over into 2023 for the contractor to complete the installation of the fall protection system for St. Anthony and to address some deficiencies with the roofing systems at both St. Anthony and L'Anse au Loup.

In the 2021 Capital Expenditures and Carryover report[23] and in the 2022 Capital Expenditures Overview of the 2023 Capital Budget Application,[24] it was stated that a variance was expected in the overall forecast, attributed to the contract pricing for the work being less than anticipated at the time of the original budget estimate. That forecasted under-expenditure is now expected to be offset by additional labour costs associated with the construction taking longer than originally expected. The original schedule provided by the contractor indicated the work would take approximately 10 weeks to complete. Construction management costs were estimated using that timeframe. After the work started, it became evident that the schedule was optimistic, and work actually took much longer to complete. This increase in construction duration resulted in corresponding increased construction management costs. The variance in 2022 expenditures is attributed to these additional costs. The project is now expected to be completed within 10% of the original budget.

4.7.8 Diesel Genset Replacements (2019–2020)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	299.4	515.9	216.5
Project	3,947.4	4,163.9	216.5

[23] Capital Expenditures and Carryover Report for the Year Ended December 31, 2021 – Revision 1, NL Hydro, March 8, 2022.
[24] Schedule 4 "2022 Capital Expenditures Overview", 2023 Capital Budget Application, NL Hydro, July 13, 2022.

This is a two-year project (2019–2020) that carried over and was completed in 2022. The project scope was to increase the generation capacity of the Cartwright Diesel Generating Station and to replace a genset that had reached end-of-life. Work originally planned for 2020 carried over to allow engineering and construction resources to focus on higher priority work during the COVID-19 pandemic, specifically the diesel genset replacements at Makkovik and Mary's Harbour. At Cartwright, an overhaul of an existing diesel genset was completed in 2020 to bolster plant reliability through the winter of 2020–2021. Most of the project scope was subsequently completed in 2021, including replacement of the genset to provide the required capacity to the community. A portion of the remaining plant automation work was carried over and completed in 2022 due to internal protection and control resources in 2021 being dedicated to higher priority work.

The variance in 2022 expenditures is attributed to the final plant automation work requiring more effort than previously expected, as a result of unforeseen conditions on site, the implementation of COVID-19 planning and protocols, and inefficiencies associated with resources being involved in higher priority projects.

4.7.9 Replace Automation Equipment – St. Anthony

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	146.0	414.3	268.3
Project	1,873.3	2,516.4	643.1

This is a two-year project (2018–2019) that carried over and was completed in 2022. The project scope was to replace the automation equipment at the St. Anthony Diesel Generating Station. The engineering, procurement and construction were substantially completed in 2019, and the automation programming and commissioning carried over to 2020 due to the requirement to divert resources to support work in Charlottetown following the diesel plant fire in late 2019. Some of the automation work was completed in early 2020; however, restrictions during the early stages of the COVID-19 pandemic resulted in the demobilization of technical resources from site. Those technical resources were then dedicated to higher priority work for the remainder of 2020. The effects of the COVID-19 pandemic in early 2021 once again impacted this work, and technical resources were dedicated to higher priority work for the remainder of 2021. The remaining automation work was completed in 2022.

The variances in 2022 and overall project expenditures are attributed to the construction and commissioning effort being more than in 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;
- The requirement to divert resources to support work in Charlottetown following the diesel plant fire in late 2019; and
- The starting and stopping of work due to the COVID-19 pandemic.

4.8 Properties Projects (Appendix A, Table A-9)

There are no reportable variances under Properties Projects.

4.9 Metering Projects (Appendix A, Table A-10)

4.9.1 Replace Metering System

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	515.6	2,264.4	1,748.8

This is a three-year project (2022–2024) that commenced in 2022. The project scope includes the replacement of 31,306 electricity usage meters. The variance in 2022 expenditures is attributed to earlier than expected delivery of those meters. New meters were ordered in 2022 with delivery originally expected in 2023; however, 88% of the meters were received in 2022. Meter installation commenced in 2023.

4.10 Tools and Equipment Projects (Appendix A, Table A-11)

There are no reportable variances under Tools and Equipment Projects.

4.11 Information Systems Projects (Appendix A, Table A-12)

4.11.1 Refresh Cyber Security Infrastructure (2022) – Hydro Place

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	221.7	333.4	111.7

This was a one year project that commenced and was completed in 2022. The project scope involves the replacement, addition, and upgrade of software and information/operational technology hardware components related to Hydro's Energy Management System (EMS) cyber security systems and managed environments. To ensure that Hydro has a reliable and secure environment to support EMS information system operations, cyber security components are analyzed annually to identify components that require upgrade, expansion, refresh, additional licensing or replacement. The variance in expenditures is attributed to an accounting error which resulted in some costs being double counted. This error was discovered in 2023; a direct reduction to the value of the asset was implemented to correct for the double counting.

4.11.2 Perform Software Upgrades and Minor Enhancements (2022) – Hydro Place

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	621.7	493.7	(128.0)

This was a one year project that commenced and was completed in 2022. This is an annual project to upgrade software applications to maintain Hydro's supervisory control and data acquisition system, as well as applications that support Hydro lines of business such as customer service, drafting, and transmission and rural operations.

The variance in expenditures is attributed to the deferral of the Planned System Equipment Outage System enhancement. This system is an in-house built IBM Notes application/database used to track and manage planned equipment outages. The enhancement work was deferred as the required timing for this work had changed. At the time of the budget proposal preparation, IBM Notes was planned to be replaced in the near term and, as such, this application/database needed to be redesigned for another platform. The timing of IBM Notes replacement is now under review and this scope of work may form part of a future capital budget application. This deferred scope was partially off-set by unforeseen upgrades and enhancements to software applications that were required in 2022, as detailed in Section 8.0.

4.11.3 Purchase Hydro Personal Computers (2021) – Hydro Place

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	446.6	324.9	(121.6)
Project	905.4	783.8	(121.6)

This is a one year project that was completed in 2022. Fewer devices than expected were required under this project, including two rugged laptops no longer required.

4.12 Telecontrol Projects (Appendix A, Table A-13)

4.12.1 Replace Network Communications Equipment (2022)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	193.0	73.4	(119.6)

This is a one year project that commenced in 2022 and has carried over to 2023. The project scope includes the replacement of wireless access points that are end-of-life and nearing end-of-support from the vendor. The variance in 2022 expenditures is attributed to a delay in receiving the new equipment. The wireless access points were ordered in February 2022 with delivery originally expected in 2022. After award, the vendor informed Hydro about a delivery delay associated with the global microchip shortage. The equipment was received in January 2023 and installation is expected to be completed in 2023.

4.12.2 Upgrade Remote Terminal Units (2022) - Various

Variance Type: Scope Change

This was a one-year project (2022) that was completed in 2022. The project scope was to replace six remote terminal units at terminal stations located at Indian River, Springdale, Deer Lake Power, Grandy Lake, Cow Head, and Upper Salmon. During project planning, it was decided to defer the replacements for Indian River and Springdale to 2023 to be completed at the same time as other planned communications work at those locations. To maintain program pacing, the planned replacements for Come By Chance and Stony Brook were advanced from 2023 to 2022. Remote terminal units were replaced at Come By Chance, Stony Brook and Upper Salmon in 2022. Hydro experienced communications engineering resource challenges in 2022 with a high volume of work and vacancy due

to retirement. This led to the deferral of remote terminal unit replacements for Grandy Brook, Deer Lake Power, and Cow Head. These replacements will be completed as part of the 2023 Upgrade Remote Terminal Units program.

4.12.3 Replace Radomes (2022) - Various

Variance Type: Scope Change

This was a one-year project (2022) that was completed in 2022. The project scope was to replace ten microwave antenna radomes at various locations in Hydro's microwave radio system. The radome replacements were not completed as originally planned, as Hydro modified its radome strategy following a review of industry practices and internal risk assessment. Rather than replace radomes based on vendors' recommendations of useful life, condition-based monitoring will be used via Hydro's specialist contractor engaged to conduct annual tower inspections and via Hydro's staff performing annual site inspections. Based on this change in strategy, the project scope was changed to supply radomes as capital spares. The procurement of spare radomes was completed in 2022. No radomes were identified through inspections in 2022 as requiring replacement.

4.13 Transportation Projects (Appendix A, Table A-14)

4.13.1 Replace Light- and Heavy-Duty Vehicles (2022-2024)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	569.0	125.6	(443.4)

This is a three-year project (2022–2024) that commenced in 2022. The project scope is to procure four light-duty vehicles and eight heavy-duty vehicles. The purchase of light-duty vehicles includes two fully electric vehicles, which were received in 2022. The variance in 2022 expenditures is attributed to less vehicles being received in 2022 than originally expected.

4.13.2 Replace Light- and Heavy-Duty Vehicles (2021-2022)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	2,574.6	1,220.5	(1,354.2)
Project	2,656.1	3,316.1	660.0

This is a two-year project (2021–2022) that has carried over into 2023. The project scope is to procure 26 light-duty vehicles and 6 heavy-duty vehicles. The variance in 2022 expenditures is attributed to the delay in receipt of the heavy duty vehicles, which are now expected in 2023. The variance in overall project forecast is attributed to cost escalations from vehicle manufacturers due to global supply chain impacts.

4.13.3 Replace Light- and Heavy-Duty Vehicles (2020-2021) - Various

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	2,546.4	1,964.7	(581.7)
Project	3,208.9	4,099.1	890.2

This is a two-year project (2020-2021) that has carried over into 2023. The project scope is to procure 29 light-duty vehicles and 10 heavy-duty vehicles. The variance in 2022 expenditures is attributed to the delay in receipt of the heavy duty vehicles, which are now expected in 2023. The variance in overall project forecast is attributed to cost escalations from vehicle manufacturers due to ongoing global supply chain impacts.

4.14 Administrative (Appendix A, Table A-14)

4.14.1 Replace Transfer Switches and Associated Hardware – Hydro Place

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	1,028.2	79.2	(949.0)
Project	1,135.9	1,285.9	150.0

This is a two-year project (2021–2022) that has carried over into 2023. The project scope is to replace automatic transfer switches and associated hardware at Hydro Place. The variance in 2022 expenditures is attributed to the construction being rescheduled to 2023, as the manufacturer of the key equipment package required additional time to deliver the customized 600 V switchgear due to global supply chain challenges. The variance in overall project forecast is attributed to procurement and construction costs, which are expected to exceed the original budget estimate. An arc-flash energy review of the detailed design identified a requirement to upgrade four circuit breakers, which was not included in the original

budget estimate. There also has been a price escalation of industrial goods due to global supply chain challenges since preparation of the original budget estimate.

4.14.2 Replace Elevator Motors and Control Equipment - Hydro Place

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	76.8	256.3	179.6
Project	736.7	960.7	224.0

This is a two year project (2021-2022) that has carried over into 2023. The project scope is to replace motors and control equipment for the two elevators at Hydro Place. The construction work was completed late in 2022 following delays by the contractor, including strike action by the unionized labour. One of the two elevators was tested, certified and released for service in 2022. The final testing and certification of the second elevator carried over for completion in early 2023.

The variances in 2022 and overall project forecast are attributed to additional elevator equipment upgrades, necessitated by updated building code requirements that were not known during budget preparation.

4.15 Allowance for Unforeseen Items (Appendix A, Table A-15)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	1402.1	800.9	(601.3)

The Allowance for Unforeseen Items is an annual $1.0 million allotment that permits Hydro to act expeditiously to deal with events affecting the electrical system that cannot wait for specific approval of the Board.

Costs totalling $402,100 were incurred in 2022 in relation to the work required to complete capital work to restore TL219 and TL203 following storm damage in February 2022. Hydro subsequently received approval to replenish the Allowance for Unforeseen Items Account in Board Order No. P.U. 9(2022).

On November 19, 2021, Hydro notified the Board of a required Allowance for Unforeseen project related to the failure of the T2 power transformer at the Holyrood TGS. A portion of this scope carried forward into 2022, at a cost of $398,700.

4.16 Supplemental Projects (Appendix A, Table A-15)

4.16.1 Replace Diesel Plant Roof - Makkovik

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	634.0	810.5	176.5

This is a two year project (2022-2023) that commenced in 2022. The project scope is to replace the roof on the original section of the Makkovik Diesel Generating Station. The variance in overall project forecast is attributed the contract pricing exceeding the original budget estimate, in part due to increases in steel prices.

4.16.2 Last Stage Blades – Holyrood

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	18.3	164.5	146.3

This is a two-year project (2022-2023) that commenced in 2022. The project scope is to procure one set of turbine last stage blades to be held as spares that can be used for either Unit 1 or Unit 2 turbines at the Holyrood TGS. The variance in 2022 project expenditures is attributed to the vendor requiring a down payment when the order was placed in 2022 that was not anticipated at the time of the original budget estimate. The blades are expected to be received in 2023.

4.16.3 Rotor Rim Shrinking and Stator Recentering at the Upper Salmon Hydroelectric Generating Station

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	959.4	722.9	(236.5)

This is a two-year project (2022-2023) that commenced in 2022. The project scope is to refurbish the generating unit rotor and stator assemblies at the Upper Salmon Hydroelectric Generating Station, and

includes inspection and refurbishment of the powerhouse overhead crane to facilitate the generator rotor removal. The variance in 2022 expenditures is attributed a delay in the completion of the crane inspection and refurbishment due to challenges with the external consultant that was retained for the work and challenges scheduling the work during periods that the crane was not required. The powerhouse crane inspection and refurbishment work is now expected to be completed in the first quarter of 2023 and the generator refurbishment work is expected to be completed in 2023 as originally planned.

4.16.4 Anaconda Mine-reroute

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	230.4	0.0	(230.4)

This was a one-year (2022) project that was cancelled. The project scope was to relocate a distribution line for Anaconda Mine. The project was to be fully contributed by the customer but was canceled by the customer prior to work commencing.

4.16.5 Holyrood Tank 1 Refurbishment

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	1,195.0	1,030.6	(164.4)

This is a two-year project (2022-2023) that commenced in 2022. The project scope is to complete internal cleaning, API 653 inspection, and refurbishment of fuel oil storage Tank 1 at Holyrood.[25] The variance in 2022 project expenditures is attributed to engineering labor and contractor costs related to the tank cleaning and inspection being less than anticipated at the time of the original budget estimate. Tank refurbishment work is expected to be completed in 2023.

[25] Project originally intended to refurbish tank 2. Hydro notified the Board on September 26, 2022 of its intention to refurbish tank 1 to achieve cost savings. The Board approved the change in Board Order P.U. 30 (2022).

4.16.6 Capital Expenditures Necessary to Address Supply in Charlottetown and Pinsent's Arm, Labrador

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	1,269.8	205.6	(1,064.2)

This is a two-year project that commenced in 2022. The scope of this project is to perform upgrades to improve reliability of service for the communities of Charlottetown and Pinsent's Arm, Labrador. The variance in 2022 expenditures is attributed to most of the project activity carrying into 2023, as a result of project approval not being achieved until November 2022. Following project approval, it was not possible to complete the project construction by year end 2022 without impacting reliability in L'Anse Au Loup. The work is now scheduled in 2023 when winter loads in Charlottetown and L'Anse Au Loup decrease to a level that will allow for unit outages to complete installations without impacting generation and reliability.

4.16.7 Valentine Gold Interconnection

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	15,166.9	6,178.9	(8,988.0)

This is a three-year project (2021–2023) that commenced in 2021. The project scope is to establish an interconnection for the Valentine Gold Mine Project at the Star Lake Terminal Station. The variance in 2022 expenditures is attributed to a longer than anticipated environmental assessment process, which resulted a delay in the start of construction activities. Additional environmental submission requirements, beyond what was originally contemplated, were required by the Government of Newfoundland and Labrador. Environmental release was granted on June 20, 2022 for this project. Delayed federal environmental release of the Valentine Gold Mine Project and a corresponding construction hold request from Marathon Gold delayed the start of transmission line construction until October 2022. Also, due to longer than typical delivery times for the cables required for the Star Lake Terminal Station extension, that construction has been delayed from 2022 until the Fall of 2023.

4.16.8 Replace Unit 2047 Ramea (2021)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	2,269.5	216.1	(2,053.4)

This is a three year project (2021-2023) that commenced in 2021 and continued in 2022. The project scope is to replace a genset and upgrade associated mechanical, electrical, protection and control equipment at the Ramea Diesel Generating Station. The variance in 2022 expenditures is primarily attributed to a delay in delivery of the new genset from 2022 to 2023. Gensets are typically delivered six to eight months from receipt of order, but the vendor for this order advised that delivery is expected in 14 to 15 months. This delay eliminated the possibility of installing the genset and associated equipment in 2022 as originally planned. As stated in the project budget proposal, to mitigate the plant reliability risks until a new genset can be procured, Hydro has installed a retired engine from Cartwright, which will serve as emergency use only and will allow Hydro to carry out planned maintenance on the other units during the winter operating season without requiring customer outages. If further reliability issues are encountered, Hydro could make use of an available spare genset a Bishop's Falls or could rent a mobile unit.

4.16.9 Phase 2 – Electric Vehicle Charging Network

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	1,522.5	1,785.1	262.6
Project	1,581.5	1,844.1	262.6

This is a two-year project (2021–2022) that was completed in 2022. The project scope was to extend Hydro's public electric vehicle charging network, including the installation of six charging stations on the Great Northern Peninsula and three charging stations in Labrador. The variance in 2022 and overall project expenditures is attributed to higher than anticipated construction costs, particularly for the three sites in Labrador.

5.0 Capital Budget Versus Actual Expenditures 2013–2022

Table 2 provides a summary of Hydro's capital budget variances for the years 2013–2022.

Table 2: Capital Budgets/Expenditures 2013–2021

Year	Budget ($000)	Actual Expenditures ($000)	Variance ($000)	Variance (%)
2013	116,373	84,755	(31,618)	(27.2)
2014	280,601	204,728	(75,873)	(27.0)
2015	311,177	125,119	(186,058)	(59.8)
2016	350,601	203,941	(146,660)	(41.8)
2017	340,501	340,741	240	0.1
2018	213,050	156,985	(56,065)	(26.3)
2019	164,194	126,575	(37,619)	(22.9)
2020	134,752	87,555	(47,197)	(35.0)
2021	136,304	113,492	(22,812)	(16.7)
2022	138,136	103,408	(34,728)	(25.1)

In 2022, actual expenditures were below budget in Hydro's overall capital program by $34.7 million (25.1%), as shown in Table 2. The following four capital projects were the main contributors to the variance.[26]

1) Variance 4.16.7: Valentine Gold Interconnection (-$9.0 million);

2) Variance 4.4.5: Upgrades for Future Retirement of Stephenville Gas Turbine (-$5.7 million);

3) Variance 4.4.6: Additions for Load – Wabush Substation Upgrades (-$4.8 million); and

4) Variance 4.4.7: Wabush Terminal Station Upgrades (-$4.6 million).

Hydro completed an analysis of 2022 projects and expenditures to determine the contributions to the overall variance from the approved capital budget. The results of Hydro's analysis are summarized in Chart 1 and discussed below.

[26] The overall actual expenditures would have been 7.7% below budget had there been no variances for these four projects.

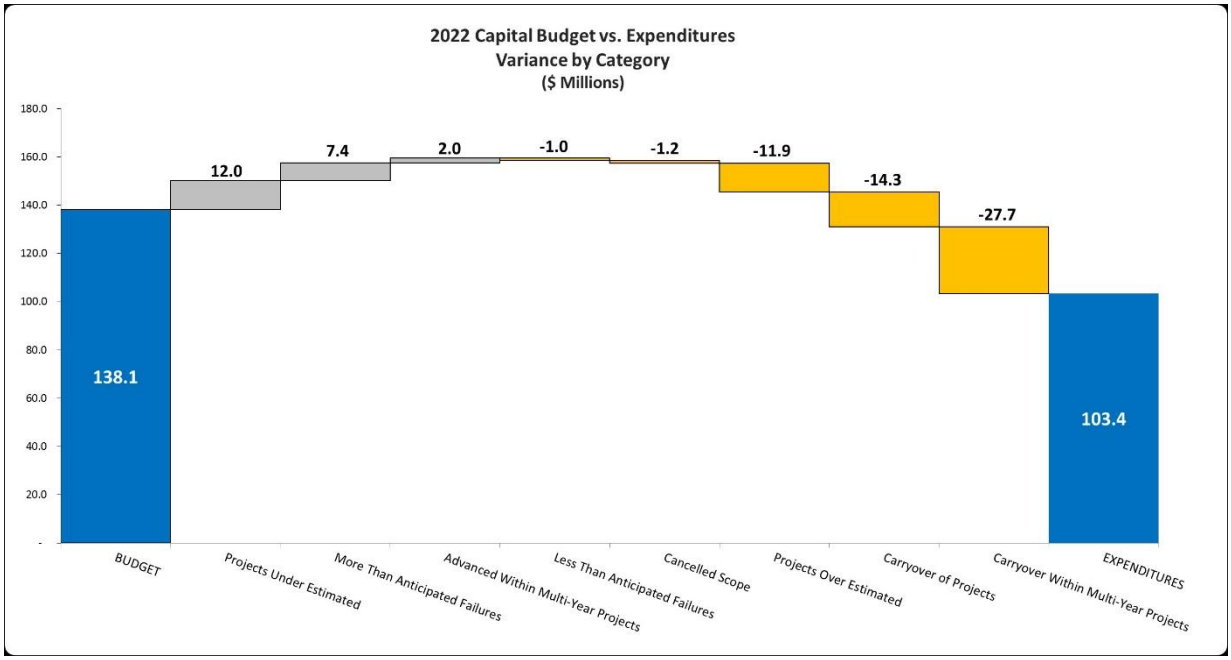

Chart 1: Analysis of 2022 Projects Expenditures

Carryover of Work to Future Years

The primary driver of the 2022 under expenditures was carryover of project work to future years. The net carryover is $40.0 million, of which $27.7 million is associated with carryover of work within multi-year projects continuing in 2023 and $14.3 million is associated with carryover of projects that were planned to be completed in 2022, partially offset by $2.0 million in project work that was advanced within multi-year projects and completed in 2022. Three main themes related to carryover were identified: strategic deferral of work, supply chain challenges, and later than anticipated project approvals for capital projects.

1) **Strategic Deferral of Work**. When appropriate, Hydro made strategic decisions to carry over work to future years based on updated asset condition information, updated electrical system planning requirements, or improved project execution plans within multi-year projects. The projects with the most material scopes of work that were strategically carried over from 2022 to future years were:

   - Variance 4.4.6: Additions for Load – Wabush Substation Upgrades;
   - Variance 4.4.5: Upgrades for Future Retirement of Stephenville Gas Turbine;

- Variance 4.3.3: Perform Combustor Inspection – Holyrood Gas Turbine; and
- Variance 4.1.1: Hydraulic Generation Refurbishment and Modernization (2022–2023), scope related to the refurbishment of Burnt Dam Spillway Bay 2.

2) **Supply Chain Challenges**. Supply chain challenges resulted in delayed delivery of new equipment that prevented Hydro from advancing construction and placing new assets in service for some capital projects in 2022. The projects with the most material carry over of expenditures due to delayed delivery of equipment were:

- Variance 4.4.7: Wabush Terminal Station Upgrades;
- Variance 4.16.8: Replace Unit 2047 Ramea (2021);
- Variance 4.13.2: Replace Light- and Heavy Duty Vehicles (2021-2022);
- Variance 4.13.3: Replace Light- and Heavy Duty Vehicles (2020-2021) - Various;
- Variance 4.14.1: Replace Transfer Switches and Associated Hardware - Hydro Place;
- Variance 4.13.1: Replace Light- and Heavy Duty Vehicles (2022-2024);
- Variance 4.6.2: Labrador City L22 Voltage Conversion (2022-2023);
- Variance 4.4.8: Terminal Station Refurbishment and Modernization (2021-2022), scope related to the installation of a fire protection system at Massey Drive; and
- Variance 4.4.3: Terminal Station Refurbishment and Modernization (2022-2023), scope related to the replacement of surface air coolers at Cat Arm.

3) **Later than Anticipated Project Approvals.** Delayed release from environmental assessment lead to later than anticipated project start of the Valentine Gold Interconnection project, as detailed in section 4.16.7. Projects Estimates

Capital project work completed in 2022 for less than the original budget estimate accounted for approximately $11.9 million of under-expenditure and work completed in 2022 for more than the original budget estimate accounted for approximately $12.0 million in over-expenditure, for a net over-expenditure associated with estimates of $0.1 million. Hydro experienced a significant improvement in the variances between project expenditures and the original budget estimates for work completed in

2021 and 2022 in comparison to previous years. Due to an intentional effort to improve Hydro's capital project estimates, including a specific emphasis on refining contingency estimates,[27] project estimates were not a material contributor to Hydro's overall under-expenditure in 2022.

Projects Based on Failures and Condition Assessments

Some projects have unknown scopes of work at the time of budget estimate preparation, including: the in-service failures projects for Hydraulic Generation, Thermal Generation, Terminals Stations and Distribution Systems; projects that utilize the Allowance for Unforeseen account; and several projects that involve taking assets out of service for condition assessment to determine the extent of refurbishment required. For these projects, estimates are typically based on historical cost experience and engineering judgement. In 2022, projects of this nature with expenditures in excess of the estimate accounted for $7.4 million in over-expenditures, and projects of this nature with less expenditures than estimated accounted for $1.0 million in under-expenditures, for a net over-expenditure of $6.4 million. The most material projects in this category with over-expenditures were:

- Variance 4.4.1: Terminals Stations In-Service Failures (2022);
- Variance 4.6.5: Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights (2022) - Various;
- Variance 4.2.5: Boiler Condition Assessment and Miscellaneous Upgrades – Holyrood;
- Variance 4.2.1: Thermal In-Service Failures (2022);
- Variance 4.1.2: Hydraulic Generation In-Service Failures (2022);
- Variance 4.2.2: Major Pumps Overhaul - Holyrood;
- Allowance for Unforeseen Items: Replace Holyrood Thermal Generating Station T2;
- Variance 4.5.1: Wood Pole Line Management Program (2022); and
- Variance 4.1.1: Hydraulic Generation Refurbishment and Modernization (2022-2023), scope related to the overhaul of Bay d'Espoir Unit 6.

[27] For projects that commenced in 2019 or earlier, contingency was typically estimated at 20% and was not required in many cases. Average contingency was reduced to approximately 10% in the estimates for projects that started in 2020, 2021 and 2022 and has generally been reflecting a more accurate representation of the overall contingency required upon work execution.

Cancelled Scope of Work

Following approval of the Board, projects may be cancelled in whole or in part if new information or conditions impact the original project justification. Cancelled scopes of work accounted for $1.2 million in 2022 under-expenditures. The projects with the most material cancelled scopes of work were:

- Variance 4.4.6: Additions for Load – Wabush Substation Upgrades, in which a portion of the scope was cancelled; and
- Variance 4.16.4: Anaconda Mine-reroute, in which the whole project was cancelled.

Continual Improvement

Hydro continues to review its capital budget planning and execution methodologies and use its expenditures analysis to identify opportunities which may contribute to reduced capital expenditure variances in future years. Given that the primary driver of under-expenditure in 2021 and 2022 was carryover of work to future years, Hydro intends to continue scrutiny of its project schedules prior to submission of project proposals, with an emphasis on confirming the following:

- That the planned in-service dates for projects align with best available asset condition and system planning information;
- That project schedules include adequate time for the regulatory review process;
- That project schedules include adequate time for the procurement of long-lead equipment; and
- That project schedules reflect a realistic level of procurement and construction activity in the first year of multi-year projects.

6.0 Carryover Report

As discussed in Section 5.0, Hydro's 2022 carryover was primarily driven by strategic deferral decisions, supply chain challenges, and project approval timing. Table 3 provides a summary listing of the carryovers for projects continuing from 2022.

Table 3: 2022 Carryover Report for the Year Ending December 31, 2022 ($000)[28]

Project Name	Category	Board-Approved Budget Carried Over Projects	Revised Planned Capital Expenditure Carried Over Projects	Total Actual Expenditures Carried Over Projects	Carryover Amount	Original Completion Year
Rplc Network Comms EQ 2022	Telecontrol	193.0	193.0	73.4	119.6	2022
USL Rotor Rim Shrinking (Supp)	Supplemental	-	959.4	722.9	236.5	2023
Refurb Ebbegunbaeg Ctrl Struct	Hydraulic	3,238.3	4,278.7	4,301.5	(22.9)	2022
HRD-Upgrd Dist.Control System	Thermal	368.2	557.0	351.7	205.2	2022
Unit 3 Gen. Comp Cond Asst	Thermal	153.0	140.2	210.0	(69.8)	2023
Lt Stage Blades Holyrood Supp	Supplemental	-	18.3	164.5	(146.3)	2023
Upgrd Tur Ctrl Sys Unit 2 SUPP	Supplemental	-	235.9	150.7	85.2	2023
Replace Underground Fire Water	Thermal	128.3	128.3	115.2	13.1	2023
HRD SUPP Rpl Tank Farm Undgrd	Supplemental	-	83.5	27.9	55.6	2023
HRD SUPP Day Tank Refurb	Supplemental	-	89.4	39.8	49.6	2023
HRD SUPP Refurb Tank 1 (2022)	Supplemental	-	1,195.0	1,030.6	164.4	2023
Replace Metering System	Metering	515.6	515.6	2,264.4	(1,748.8)	2024
Replace Transformer T7 - HRD	Terminal Stations	-	2,801.9	557.9	2,244.0	2020
Valentine Gold Interconnection	Supplemental	-	15,167.0	6,411.0	8,756.0	2023
Upgrade Circuit Breakers 21/22	Terminal Stations	4,293.6	4,279.0	4,818.6	(539.6)	2022
Upgrd Retire SVLGT-BBK T4	Terminal Stations	5,344.5	6,723.0	1,060.9	5,662.2	2022
Upgrade Circuit Breakers 22/23	Terminal Stations	2,121.9	(963.8)	117.4	(1,081.2)	2023
Replace Unit 2047 Ramea (2021)	Supplemental	-	2,269.5	216.1	2,053.4	2023
Instll Fire Prtct Diesel RAM	Rural Gen	90.7	(259.3)	76.9	(336.2)	2023
HRD GT-Combustor Inpection	Gas Turbines	2,427.4	5,399.2	2,367.5	3,031.7	2022
Holyrood GT Control Systems Up	Gas Turbines	146.0	146.0	70.8	75.2	2023
RplcLight&HwyDty Vehicles -VAR	Transportation	-	3,436.4	1,964.7	1,471.7	2021
Rplc Vehicles&Aerial Devices	Transportation	1,335.1	3,234.6	1,220.5	2,014.2	2022
L2 Chargers for Electric Veh.	Transportation	-	105.7	33.1	72.5	2021
Purchase 46 ft Category B	Transportation	20.4	20.4	13.2	7.2	2024
Purchase 85' Material Handler	Tools and Equipment	20.4	20.4	22.4	(2.0)	2024
Replace Light- Duty Mobile Equ	Tools and Equipment	695.0	695.0	614.7	80.3	2022
Replace Vehicles and Aerial	Transportation	569.0	569.0	125.6	443.4	2024
Replace Tracks - V7271 <50k	Supplemental	-	48.3	-	48.3	2022
Install Recloser Remote Contro	Distribution	174.6	74.6	37.8	36.8	2023
Upgrade Distribution Feeders	Distribution	850.0	850.0	861.8	(11.8)	2023
WAB Substation Ugrde-M23	Terminal Stations	6,253.0	8,499.4	2,299.4	6,200.1	2023
WAB Terminal Station Upgrd-M23	Terminal Stations	4,935.5	6,443.2	1,843.2	4,600.0	2023
IOC SCADA Data Link	Supplemental	-	28.2	1.9	26.4	2022
Lab City L22Voltage Conversion	Distribution	486.8	486.8	99.1	387.7	2023
NAN-Diesel Genset Replac-21/22	Rural Gen	286.2	1,168.0	1,036.3	131.7	2022
Rplc Diesel Plant RF MAK SUPP	Supplemental	-	353.3	95.7	257.6	2023
Add Load 22 - MSH SER CON	Rural Gen	307.8	159.7	123.0	36.7	2023
Diesel Genset Rplc Unit STL	Rural Gen	397.0	397.0	238.7	158.3	2024
Diesel Genset RplcUnit2012 LAL	Rural Gen	339.9	339.9	170.3	169.6	2024
CHT Winterize Unit 2102 SUPP	Supplemental	-	1,269.8	205.6	1,064.2	2023
Rplc Diesel Plant Roof-LAL,STA	Rural Gen	-	1,093.9	963.0	130.9	2021
Replace Elevator Motors HYP	Administrative	-	300.8	256.3	44.4	2021
HYP-Rplc Transfer Switches/Hrd	Administrative	938.5	1,178.2	79.2	1,099.0	2022
Upgr Energy MGMT System 22	Information Systems	292.6	292.6	249.6	43.0	2022
Command Center Upgrade	Information Systems	76.4	76.4	14.5	61.9	2022
Install Infrared Scanning Port	Gas Turbines	39.6	39.6	17.2	22.4	2023
Hydraulic Generation Refurbishment and Modernization (2021-2022)		261.6	503.4	391.9	111.5	2022
Hydraulic Generation Refurbishment and Modernization (2022-2023)		1,745.9	2,010.6	929.9	1,080.7	2022-2023
Terminal Station Refurbishment and Modernization (2021-2022)		428.8	499.9	178.5	321.4	2022
Terminal Station Refurbishment and Modernization (2022-2023)		2,411.0	2,632.2	1,556.6	1,075.5	2023
Total Carryover to 2023 and Beyond					**39,990.8**	
Less CIACs:						
Valentine Gold Intercon CIAC	CIAC	-	(12,085.0)	(9,015.7)	(3,069.3)	2023
IOC SCADA Data Link - CIAC	CIAC	-	(28.2)	-	(28.2)	2023
Total Carryover to 2023 and Beyond Net of CIACs					**36,893.3**	

[28] The Board-Approved Budget, Revised Planned Capital Expenditure and Total Actual Expenditures listed are in relation to the component of the project that is being carried over. In instances in which a project has subsets of work (e.g. refurbishment and modernization at various sites) then only the portion of the project that has been carried over has been listed.

7.0 Remove Safety Hazards (2022) - Various

In Board Order No. P.U. 38(2010) related to Hydro's 2011 Capital Budget Application, the Board directed Hydro to include in its annual report on capital expenditures an explanation on each project that was undertaken for the Remove Safety Hazards project, setting out the safety hazard that was identified, the location, the steps taken to address the issue, and the amount of the expenditure. Table 4 outlines the projects undertaken in 2022.

Total Approved Budget: **$199,600**

Total Expenditure: **$170,500**

Table 4: Remove Safety Hazards

Project Title and Location	Expenditure ($000)[29]	Safety Hazard Identified	Project Scope[30]
Replace Pedestrian Exit Doors Holyrood TGS	68.9	Eight plant exit doors exhibited severe corrosion, had failed hardware, frequently jammed and were difficult to open/close.	New doors, jambs and hardware were installed, with materials selected in compliance with the current building code.
Upgrade Ventilation Systems for Chemical Storage Areas Holyrood TGS	38.0	The ventilation systems for chemical storage areas in the Chemical Storage Building and Pipe Shop Building were determined to be inadequate for reliable expulsion of airborne contaminants, which can cause irritation to mucus membranes and the respiratory tract.	New ventilation systems were designed and materials ordered in 2022. Construction is planned as part of the 2023 Remove Safety Hazards Project.
Projects Under $50,000	63.6		

8.0 Perform Software Upgrades and Minor Enhancements

In its 2022 Capital Budget Application, Hydro committed to providing a summary of unforeseen work executed under the Perform Software Upgrades and Minor Enhancements project in this report. Table 5 provides a summary of such work.

Total Approved Budget: **$621,700**

Total Expenditure: **$493,700**

[29] The numbers provided in this table may not add to the decimal due to rounding.
[30] Details are provided for project scopes greater than $50,000.

Table 5: Unforeseen Software Upgrades and Enhancement Scope

Project	Expenditure ($000)	Project Scope and Justification[31]
Equipment Status Monitoring System Software Upgrade	148.1	Hydro utilizes an Equipment Status Monitoring System when equipment is isolated to safely perform work in accordance with Hydro's Work Protection Code. Through vendor consultation, a requirement was identified to upgrade the software for this system to move off of a platform that was becoming obsolete. The work commenced in 2022 and is planned to be completed as part of the 2023 Software Upgrades and Minor Enhancements project.
Vibration Monitoring System Software Upgrade	123.4	The vibration monitoring system software for the generating units at Holyrood TGS was not functioning as intended. The latest version of the software was implemented to restore functionality.
Projects Under $50,000	82.8	

9.0 Terminal Station In-Service Failure

Hydro has committed to providing a summary of activities completed under the Terminal Station In-Service Failures project. Table 6 outlines 2022 expenditures under this project.

Total Approved Budget: **$900,000**

Total Expenditure: **$3,626,100**

Table 6: Terminal Station In-Service Failures

Project Title and Location	Expenditure ($000)[32]	Failure Identified[33]	Project Scope
Transformer Refurbishment to Restore as a Spare for Hydraulic Generating Unit Transformers Bay d'Espoir	1,565.4	The spare transformer suitable for nine generating unit transformers (Bay d'Espoir T1-T7, Granite Canal T1, and Upper Salmon T1) was installed as Bay d'Espoir Transformer T5, following a failure on July 3, 2022, leaving these transformers without an available spare.	To restore availability of a spare transformer for the nine generating units, Hydro evaluated two alternatives: (1) procure a new spare transformer; and (2) refurbish the failed transformer. Refurbishment was determined to be technically feasible, lower cost, and could be completed in a shorter timeframe. Refurbishment

[31] Details are provided for project scopes greater than $50,000.
[32] The numbers provided in this table may not add to the decimal due to rounding.
[33] Details are provided for project scopes greater than $50,000.

Project Title and Location	Expenditure ($000)[32]	Failure Identified[33]	Project Scope
			of the failed transformer commenced in 2022 and is expected to be completed as part of the 2023 Terminal Station In-Service Failures Project.
Transformer T5 Replacement Bay d'Espoir	1,307.9	Transformer T5 for Bay d'Espoir Generating Unit 5 failed in service on July 3, 2022. A transformer bushing failed catastrophically, breaking into pieces which fell into the transformer. This failure removed 85 MVA of generation capacity from the Island Interconnected System.	Bay d'Espoir Transformer T5 was replaced with an available spare that was stored at Upper Salmon.
Transformer T1 Oil Remediation Holyrood	346.3	The oil in Transformer T1 contained excessive corrosive sulfur, which increased the risk of premature failure of the transformer. Corrosive sulfur was first identified in this transformer oil in 2016 and a corrosion passivator was added to the transformer oil in 2017 to mitigate the corrosion. Concerns were raised on the Transformer T1 oil quality when Transformer T2 failed and corrosive sulfur was determined to be a potential cause of failure. Using 2022 oil test results in conjunction with Doble's Corrosive Sulfur Testing Flowchart, it was determined that the T1 transformer oil required remediation.	Transformer T1 oil was remediated.
Transformer T7 Bushing Replacement Wabush Terminal Station	119.7	A transformer bushing failed on Transformer T7 on May 10, 2022, resulting in a forced outage to the transformer. Smoke was observed emitting from the bushing and the transformer was de-energized for inspection. It was determined that oil was leaking from the top terminal of the bushing, likely caused by corrosion of the bushing at the sealed joint. The failed bushing was unsuitable for repair due to the extent of the corrosion.	The failed bushing for Transformer T7 was replaced.
Synchronous Condensers 1 and 2 Spare	98.3	The spare Synchronous Condensers 1 and 2 bearings were deteriorated such that overhaul was required for them to be suitable for service. These spare bearings	The Synchronous Condensers 1 and 2 spare bearings were overhauled.

Project Title and Location	Expenditure ($000)[32]	Failure Identified[33]	Project Scope
Bearings Overhaul Wabush Terminal Station		were formerly in service and they deteriorated while in service.	
Replacement of Power Transformer Protective Devices Various Locations	82.3	Inspections of power transformer protective devices revealed that 15 of the devices had failed or were at risk of imminent failure due to: (1) deteriorated dielectric insulation, which could cause a false operation; or (2) moisture ingress, which results in electrical contact corrosion and the devices not operating reliably.	Fifteen power transformer protective devices were replaced.
Procure Spare Iso-phase Bus Duct Kits Holyrood	46.8	The spare transformer suitable for Holyrood generating unit Transformers T1, T2, and T3 was installed as Transformer T2 as part of a project completed under the 2021 Allowance for Unforeseen budget,[34] leaving the transformers without an available spare.	To restore availability of a spare transformer for the three Holyrood generating units, Hydro evaluated two alternatives: (1) procure a new spare transformer; and (2) procure iso-phase bus duct kits to allow the spare transformer stored at Upper Salmon to be utilized as a spare for Holyrood T1, T2 and T3. The iso-phase bus duct kits were determined to be technically feasible, lower cost, and could be completed in a shorter timeframe. Hydro commenced procurement of the iso-phase bus duct kits in 2022 and then paused procurement when the spare transformer at Upper Salmon was required to be installed at Bay d'Espoir as Transformer T5. The overall transformer spares plan is being reviewed. Should it be

[34] Hydro notified the Board of this AFU expenditure on November 19, 2021.

Project Title and Location	Expenditure ($000)[32]	Failure Identified[33]	Project Scope
			determined that the iso-phase bus duct kits are still required, procurement will resume as part of the 2023 In Service Failures Project.
Procure Spare Transformer Walsh River and Labrador City Landfill Substations	1.5	The spare transformer suitable for Walsh River Substation Transformer T1 and Labrador City Landfill Substation Transformer T1 was used in June 2021 following a failure of the transformer at the Labrador City Landfill Substation, leaving the two transformers without an available spare.	To restore availability of a spare transformer for Walsh River Substation T1 and Labrador City Landfill Substation T1, a new transformer was ordered in 2022 and is expected to be received as part of the 2023 In Service Failures Project.
Projects Under $50,000	58.1		

10.0 Hydraulic In-Service Failures

Hydro has committed to providing a summary of activities completed under the Hydraulic Generation In-Service Failures project. Table 7 outlines 2022 expenditures under this project.

Total Approved Budget: **$1,000,000**

Total Expenditure: **$1,425,800**

Table 7: Hydraulic In-Service Failures

Project Title and Location	Expenditure ($000)[35]	Failure Identified[36]	Project Scope
Unit 2 Draft Tube Access Platform Refurbishment Cat Arm	573.7	The platform used to access the turbine runner and nozzles, for inspection and maintenance activities, had eroded and corroded. A significant portion of the steel support structure had failed.	A more robust draft tube access platform and support structure was designed and installed.
Turbine Runner Overhaul Granite Canal	316.5	A turbine inspection revealed cavitation damage on the runner. The inspection results were compared to historical data and it was concluded that the cavitation damage was accelerating and refurbishment was necessary to prevent further deterioration and risk of an unplanned unit outage.	Welding repair was completed on the turbine runner to remove the cavitation damage. Trunnion seals were replaced due to their proximity to the welding, which subjected them to high temperatures.
Gate Stoplogs Overhaul Salmon River Spillway	166.7	An inspection of the stoplogs identified that the rubber seals and steel retaining bars had deteriorated and required replacement. In this condition, the stoplogs were unable to achieve an adequate seal and provide a safe work area downstream where work is performed.	The rubber seals and steel retaining bars for the stoplogs were replaced.
Generator Bearing Cooler Replacement Granite Canal	90.4	In April 2022, generator bearing high- oil-level and water-in-oil alarms were triggered on the generating unit, indicating that a water leak had occurred in a bearing oil cooler, contaminating the generator bearing lubrication oil system. Subsequent pressure testing of the four bearing oil coolers indicated that one cooler had failed.	The failed bearing cooler was replaced with an available spare. Due to water contamination, the oil pot was drained, cleaned, flushed, and filled with new oil.
Generator Rotor Pole Refurbishment Upper Salmon	60.8	In November 2021, the generating unit tripped while operating at near full load. Upon investigation, it was determined that the unit had experienced a rotor ground fault during the trip event and that Pole #9 had failed.	Rotor Pole #9 was replaced with an available spare as part of the 2021 In-Service Failures project ($133.3). The failed rotor pole was refurbished and returned to inventory in 2022 ($60.8).

[35] The numbers provided in this table may not add to the decimal due to rounding.

[36] Details are provided for project scopes greater than $50,000.

Project Title and Location	Expenditure ($000)[35]	Failure Identified[36]	Project Scope
Generator Surface Air Cooler Replacement Granite Canal	60.8	In May 2022, water was observed running down the wall of the turbine pit. Subsequent inspections revealed a leaking generator surface air cooler.	The leaking surface air cooler was replaced with an available spare.
Fire Pump 1 Replacement Hinds Lake	45.2	Fire Pump 1 supplies water for fire fighting as a backup to water supplied from the generating unit's cooling water system. The pump failed and is no longer manufactured or supported by the OEM and spare parts can not be procured.	A new fire pump was ordered and received as part of the 2021 In-Service Failures project ($15.9) and was installed in 2022 ($45.2).
Spare T2 Transformer Procurement Upper Salmon Intake Structure	12.7	A review of critical spares identified that a spare T2 transformer was required at the Upper Salmon Intake Structure to allow fast responsive action to future failures of long lead time equipment.	A new transformer was ordered and the concrete pad and oil containment system was constructed in 2020, as part of the 2020 In-Service Failures project. The new transformer was received and installed in 2021, as part of the 2021 In-Service Failures project, but failed commissioning tests. Hydro is working with the manufacturer to resolve the equipment issue. Resolution and completion of this work is expected in 2023 as part of the 2023 In-Service Failures project.
Projects Under $50,000	98.9		

11.0 Thermal In-Service Failures

Hydro has committed to providing a summary of activities completed under the Thermal Generation In-Service Failures project. Table 8 outlines 2022 expenditures under this project.

Total Approved Budget: **$2,000,000**

Total Expenditure: **$2,893,800**

Table 8: Thermal In-Service Failures

Project Title and Location	Expenditure ($000)[37]	Failure Identified[38]	Project Scope
Replace Units 1, 2 and 3 Fuel Oil Heater Tubes	571.3	During the annual unit outages, the east and west fuel oil heaters servicing each generating unit are pressure tested to detect leaks and plugs are installed on any leaking tubes. Due to the high volume of leaks that have been detected and plugged in recent years, additional failures and tube plugging would reduce heater performance to a level where it would be necessary to operate both the east and west fuel oil heaters simultaneously to achieve full generation capacity. This eliminates the design redundancy of the fuel oil system and increases the risk of forced unit outages or unit deratings, should additional tube leaks occur.	Heater tubes were replaced in the east fuel oil heaters servicing Units 1, 2, and 3 due to the higher number of leaks and plugged tubes on the east fuel oil heaters as compared to the west fuel oil heaters. This eliminates the need to need to run both east and west fuel oil heaters at the same time during unit operation.
Replace Failed Jetty Bumper Timbers	510.1	A drone inspection completed on the marine terminal concrete gravity fenders revealed failure of the wooden bumper timbers on Fenders 1, 5, 6 and 8.	Wooden timbers were replaced on Fenders 1, 5, 6 and 8.
Restore Marine Terminal Boardwalk	357.1	During an overhaul of Capstan 3 gearbox, a number of structural failures were identified on the marine terminal's wooden boardwalk. The boardwalk is the only access to the capstans for maintenance and tanker fuel oil deliveries, and the failures had left the structure unsafe for transporting essential tools and equipment.	A structural assessment and upgrades were completed on the boardwalk to restore the structural integrity and enable safe access to the capstans.
Refurbish Fuel Storage Tank 2, 3 and 4 Staircases	179.6	A condition assessment completed on the spiral access staircases on Tanks 2, 3, and 4 identified a number of components that had deteriorated beyond acceptable condition and required replacement in order to enable safe access to the tanks.	In 2022, the deteriorated components on the staircases for Tanks 2, 3, and 4 were replaced and sandblasted, and initial protective coatings were applied. The final coating will be applied as part of the 2023 Thermal Generation In-Service Failures project.

[37] The numbers provided in this table may not add to the decimal due to rounding.

[38] Details are provided for project scopes greater than $50,000.

Project Title and Location	Expenditure ($000)[37]	Failure Identified[38]	Project Scope
Replace Unit 3 Turbine Steam Seal Regulator Piping	163.2	Inspection of the Unit 3 turbine steam seal regulator piping and supports revealed extensive corrosion on some sections of the piping system.	Corroded sections of the steam seal regulator piping and supports were replaced.
Replace Powerhouse Roof Drains on Level 9 and 11	147.9	The powerhouse roof drains located on Levels 9 and 11 had deteriorated beyond repair and were no longer functional. The leaky roof drains allowed water to enter the powerhouse creating unsafe working conditions and increased the likelihood of equipment failure.	The Level 11 roof drain was replaced in 2022. Replacement of the Level 9 roof drain commenced in 2022 and will be completed as part of the 2023 Thermal Generation In-Service Failures project.
Replace Unit 3 Boiler Flame Scanners	132.6	The Unit 3 boiler has nine flame scanners in operation and failures occurred on three flame scanners in 2022. These original boiler flame scanners are obsolete and spares are no longer available.	All nine boiler flame scanners were replaced on Unit 3 with new model flame scanners.
Replace Boiler Stack 2 Continuous Emissions Monitoring (CEM) System Bundle	121.2	The Unit 2 boiler stack CEM system bundle heat tracing failed while in operation in 2022. The CEM bundle is required to ensure continued monitoring of stack emissions as required under the plant's operating permit.	The CEM system bundle was replaced.
Replace Unit 2 Turbine Bearing Oil Deflectors	112.7	In 2021, Unit 2 experienced an oil leak on a turbine bearing which caused a fire during start-up following the annual unit outage. Attempts to correct the leak were unsuccessful. Upon further investigations and review with the original equipment manufacturer, it was determined that the oil deflectors required replacement due to the clearances being out of tolerance.	The Unit 2 turbine bearing oil deflectors were replaced in 2022.

Project Title and Location	Expenditure ($000)[37]	Failure Identified[38]	Project Scope
Replace or Overhaul Units 1, 2 and 3 Cold Reheat Emergency Attemperator Valves	102.0	In October 2021, a water hammer event occurred in the cold reheat line during start-up of Unit 1 which resulted in significant movement of the piping and a forced outage of the unit. The movement resulted in damage to portions of pipe insulation, pipe hangers, and structural beams supporting the piping. Refurbishment was completed in 2021 and the unit was safely returned to service. A root cause investigation determined that the water hammer event on Unit 1 was caused by leaking valves on the emergency attemperator spray system. The system was then isolated and removed from service. Further testing on Units 2 and 3 confirmed that the emergency attemperator spray system valves were also leaking.	In 2022, the Units 1 and 2 emergency attemperator system manual isolation valves and the Unit 3 emergency attemperator system control valve were replaced. In addition, overhauls were completed on the Unit 3 emergency attemperator system manual isolation valve and the Units 1 and 2 emergency attemperator system control valves.
Replace Unit 1 High Pressure (HP) Drain Pump	71.4	In 2022, the Unit 1 HP drain pump developed a leak while in service. Attempts to repair the pump were unsuccessful. Upon investigation, it was determined that the pump is not rated for the operating conditions and will continue to fail if not replaced with a suitable pump.	A new Unit 1 HP drain pump that is suitable for the operating conditions was procured in 2022 and will be installed as part of the 2023 Thermal Generation In-Service Failures project.
Overhaul Unit 3 Sootblower Pressure Reducing Valve	61.5	Unit 3 boiler has multiple sootblower units at various elevations throughout the boiler that blow steam on the boiler tubes to remove fouling accumulated during operation to optimize thermal efficiency. Each sootblower has a pressure reducing valve that regulates the steam pressure while cleaning the boiler tubes. In 2022, a Unit 3 boiler sootblower experienced an issue with a pressure reducing valve that required intervention.	The Unit 3 sootblower pressure reducing valve was refurbished.

Project Title and Location	Expenditure ($000)[37]	Failure Identified[38]	Project Scope
Overhaul Unit 1 East Boiler Feed Pump Motor	61.2	The Unit 1 east boiler feedwater pump motor experienced a ground fault during operation that caused a fire in the motor terminal box and damage to cables. The motor rotor and stator electrical windings were contaminated by the fire which reduced the winding insulation rating to a level where the motor could no longer be operated.	The motor was disassembled, cleaned and inspected, and a coating was applied to the rotor and stator windings to restore the insulation to the original specification.
Replace Compressor Number 2 Aftercooler Tube Bundle	56.1	Air Compressor #2 is a component of the plant compressed air system that supplies air to Units 1 and 2 instrument and service air receiver tanks. In 2022, a number of leaks were discovered on the air compressor aftercooler tube bundle that prevented operation of the air compressor.	The aftercooler tube bundle was procured in 2022 and replaced in 2023 under the 2023 Thermal In-Service Failures project.
Replace Stage 2 General Service Cooling Water (GSCW) Heat Exchanger Tube Bundles	51.0	In 2021, the performance of the Stage 2 GSCW east and west heat exchangers were found to be deteriorated to a point that the system, while still fully operational, no longer provided 100% redundancy as intended in the original design. Any further deterioration or failure of a tube bundle would lead to a derating of Unit 3.	Replacement GSCW tube bundles were procured in 2021 and the east heat exchanger tube bundle was replaced in 2021. The west heat exchanger tube bundle could not be replaced in 2021, as a safe work environment could not be achieved due to a leaking isolation valve. In 2022, the leaking isolation valve was replaced but was still leaking. The west GSCW heat exchanger tube bundle was then replaced in 2023 during a Unit 3 outage under the 2023 Thermal In-service Failures project.

Project Title and Location	Expenditure ($000)[37]	Failure Identified[38]	Project Scope
Replace Unit 3 South Vacuum Pump	10.2	In 2022, the Unit 3 condenser south vacuum pump was operating with high mechanical vibration levels caused by internal deterioration due to the years of service. Disassembly and inspection confirmed that the pump could not be returned to original equipment manufacturer specifications and replacement was required.	A replacement pump was ordered in 2022 and will be installed during the planned 2023 annual Unit 3 outage under the 2023 Thermal In-service Failures project.
Projects Under $50,000	184.6		

12.0 Boiler Condition Assessment and Miscellaneous Upgrades – Holyrood

In the capital budget application for the Holyrood Boiler Condition Assessment and Miscellaneous Upgrades project, approved as part of Hydro's 2022 Capital Budget Application, Hydro listed all known components requiring replacement or refurbishment prior to the 2022–2023 winter operating season and indicated that it was possible that additional components may be identified as requiring replacement or refurbishment during the 2022 condition assessment. For those additional components that were material in dollar value and met capitalization criteria, Hydro proposed to communicate these items to the Board in this 2022 Capital Expenditures and Carryover Report. The condition assessments were completed on Units 1, 2, and 3 in 2022 and Table 9 provides a summary of the additional components that required replacement or refurbishment prior to the 2022–2023 winter operating season.

Total Approved Budget: **$3,014,200**

Total Expenditure: **$3,899,400**

Table 9: Boiler Condition Assessment and Miscellaneous Upgrades – Holyrood TGS

Scope Title	Expenditure ($000)	Scope of Work and Justification[39]
Unit 3 Stack Breeching Air Heater Gas Outlet Hoppers	339.4	During the 2022 Unit 3 planned outage, inspection of the Unit 3 stack breeching air heater gas outlet hoppers revealed significant deterioration of the refractory lining. The extent of the deterioration was too extensive to allow for patching of the refractory system. Replacement of the refractory linings on all four hoppers was completed in 2022 to ensure safe and reliable operation during the 2022-2023 operating season.
Unit 3 Boiler Air Foil Reference Line Replacement	319.9	The Unit 3 boiler air foil reference lines measure air flow through the boiler combustion air supply duct to the windbox. During the 2022 Unit 3 planned outage, inspection and testing of the air foil reference lines revealed excess fouling resulting in reduced air flow in the lines. Cleaning of the lines was attempted but was unable to resolve the fouling issue. Blockages in the reference lines will cause erroneous unit efficiency and opacity readings during unit operation. The lines were replaced during the 2022 planned Unit 3 outage.
Unit 3 Boiler Upper Reheater Tube Erosion Shields Installation	122.6	During the 2022 planned Unit 3 outage, inspection of the boiler upper reheater section leading edge tubes revealed that the tube bends are subject to wall thickness loss caused by erosion during operation. Erosion shields were installed over the bends to mitigate further erosion, based on a recommendation from the boiler service contractor.
Unit 3 Air Heater Reference Line Replacement	59.7	The Unit 3 air heater reference lines are cleaned annually to remove ash buildup during operation. Corrosion and resultant roughness of the piping has been causing the lines to foul prematurely during operation. The reference are required to measure air heater fouling while the unit is in operation and, if they are not operational, it prevents effective air heater washing while the unit is in service, leading to reduced life of the air heater baskets and reduced boiler efficiency. The reference lines were replaced in 2022.

[39] Details are provided for project scopes greater than $50,000.

Appendix A

Financial Schedules

Table A-1: 2022 Capital Expenditures By Year [1]
($000)

	Capital Budget [2]										Actual Expenditure and Forecast											
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F	H-D
Summary	2017	2018	2019	2020	2021	Carryover to 2022	Original 2022	Revised 2022	2023 and Beyond	Total	2017	2018	2019	2020	2021	2022	2023 and Beyond	Carryover to 2023 and Beyond	Total	Project Variance	Annual Variance
2022 Projects	-	-	-	-	-	-	46,353.1	46,353.1	47,622.1	**93,975.2**	-	-	-	-	-	45,901.9	47,622.1	2,403.1	**95,927.2**	1,952.0	(451.2)
2021 Projects	-	-	-	-	41,788.2	21,666.0	55,223.7	76,889.7	14,899.6	**111,911.5**	-	-	-	-	20,423.4	45,776.2	14,899.6	30,664.9	**111,764.0**	(147.5)	(31,113.6)
2020 Projects	-	-	-	16,221.6	22,857.0	9,144.0	2,427.4	11,571.4	-	**41,506.0**	-	-	-	10,517.1	20,979.0	6,946.1	-	6,922.8	**45,365.0**	3,859.0	(4,625.3)
2019 Projects	-	-	24,310.0	29,875.7	-	2,608.1	-	2,608.1	-	**54,185.7**	-	-	18,712.8	16,716.9	8,291.9	3,881.8	-	-	**47,603.3**	(6,582.4)	1,273.6
2018 Projects	-	9,137.3	4,578.6	-	-	713.7	-	713.7	-	**13,715.9**	-	2,710.9	5,354.6	993.0	181.1	902.2	-	-	**10,141.9**	(3,574.0)	188.5
2017 Projects	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grand Total	**-**	**9,137.3**	**28,888.6**	**46,097.3**	**64,645.3**	**34,131.8**	**104,004.2**	**138,136.0**	**62,521.7**	**315,294.4**	**-**	**2,710.9**	**24,067.5**	**28,226.9**	**49,875.4**	**103,408.2**	**62,521.7**	**39,990.8**	**310,801.4**	**(4,493.0)**	**(34,727.9)**

2022 Capital Budget Approved by Board Order No. P.U. 37(2021)	84,163.4	
New Project Approved by Board Order No. P.U. 27(2021)	12,281.7	
New Project Approved by Board Order No. P.U. 28(2021)	2,010.8	
New Project Approved by Board Order No. P.U. 30(2021)	171.4	
Allowance for Unforeseen Top-up Approved by Board Order No. P.U. 9(2022)	402.1	
New Project Approved by Board Order No. P.U. 12(2022)	176.8	
New Project Approved by Board Order No. P.U. 14(2022)	-	[3]
New Project Approved by Board Order No. P.U. 17(2022)	18.3	
New Project Approved by Board Order No. P.U. 18(2022)	959.4	
New Project Approved by Board Order No. P.U. 24(2022)	-	[4]
New Project Approved by Board Order No. P.U. 26(2022)	443.8	
New Project Approved by Board Order No. P.U. 28(2022)	230.4	[5]
New Project Approved by Board Order No. P.U. 30(2022)	1,603.8	[4]
New Project Approved by Board Order No. P.U. 32(2022)	1,269.8	
2022 New Projects under $50,000 Approved by Hydro	272.5	
Total Approved Capital Budget Before Carryovers	104,004.2	
Carryover Projects 2021 to 2022	34,131.8	[6]
Total Approved Capital Budget	**138,136.0**	
Less:		
Carryover CIACs[7]	(889.8)	[6]
Supplemental CIACs	(14,445.6)	
Total Approved Capital Budget Net of CIACs	**122,800.6**	

[1] Numbers may not add due to rounding.

[2] Annual budgets previous to 2022 pertain to projects that have expenditures in 2022.

[3] The capital expenditure for Mary's Harbour Diesel Generating Station was approved in 2022 but the spend is projected to commence in 2023.

[4] In Board Order No. P.U. 30(2022) it was approved that Board Order No. P.U. 24(2022) would be modified to include the refurbishment of Tank 1, rather than Tank 2 at the Holyrood Thermal Generating Station.

[5] The project to relocate a distribution line and for the contribution by Anaconda Mine which was approved in Board Order No. P.U. 28(2022) was subsequently cancelled.

[6] The 2022 carryover is $33.242 million net of CIACs of $0.890 million ($34.132 - $0.890 = $33.242).

[7] Contribution in Aid of Construction ("CIAC").

Table A-2: 2022 Capital Expenditures By Category[1]
($000)

	Capital Budget										Actual Expenditure and Forecast												
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Hydraulic Generation Projects	**2017**	**2018**	**2019**	**2020**	**2021**	**Carryover to 2022**	**Original 2022**	**Revised 2022**	**2023 and Beyond**	**Total**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023 and Beyond**	**Carryover to 2023 and Beyond**	**Total**	**Project Variance**	**Project Variance**	**Annual Variance**	**Annual Variance**
2022 Projects																							
Hydraulic Generation Refurbishment and Modernization (2022-2023)	-	-	-	-	-	-	2,970.6	2,970.6	3,788.9	**6,759.5**	-	-	-	-	-	2,664.6	3,788.9	1,080.7	**7,534.1**	774.6	11.46%	(306.0)	-10.30%
Hydraulic Generation In-Service Failures (2022)	-	-	-	-	-	-	1,000.0	1,000.0	-	**1,000.0**	-	-	-	-	-	1,425.8	-	-	**1,425.8**	425.8	42.58%	425.8	42.58%
Purchase Tools and Equipment Less than $50,000 (2022) - Hydraulic Plants	-	-	-	-	-	-	187.3	187.3	-	**187.3**	-	-	-	-	-	151.9	-	-	**151.9**	(35.4)	-18.90%	(35.4)	-18.90%
2021 Projects										-													
Refurbish Ebbegunbaeg Control Structure	-	-	-	-	3,236.8	1,040.4	3,238.3	4,278.7	7,144.8	**13,619.9**	-	-	-	-	2,196.4	4,301.5	7,144.8	(22.9)	**13,619.9**	-	0.00%	22.9	0.53%
Hydraulic Generation Refurbishment and Modernization (2021-2022)	-	-	-	-	6,569.5	3,005.6	5,005.6	8,011.2	-	**11,575.1**	-	-	-	-	3,640.2	6,567.5	-	111.5	**10,319.2**	(1,255.9)	-10.85%	(1,443.7)	-18.02%
2020 Projects										-													
Hydraulic Generation Refurbishment and Modernization (2020-2021)	-	-	-	6,580.3	10,249.9	263.6	-	263.6	-	**16,830.2**	-	-	-	7,363.0	11,900.4	338.0	-	-	**19,601.4**	2,771.3	16.47%	74.4	28.23%
Total Hydraulic Generation Projects	**-**	**-**	**-**	**6,580.3**	**20,056.3**	**4,309.6**	**12,401.8**	**16,711.4**	**10,933.7**	**49,972.0**	-	-	-	**7,363.0**	**17,737.1**	**15,449.2**	**10,933.7**	**1,169.3**	**52,652.4**	**2,680.3**		**(1,262.1)**	

[1] Numbers may not add due to rounding.

Table A-3: 2022 Capital Expenditures By Category [1]
($000)

	Capital Budget										Actual Expenditure and Forecast												
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Thermal Generation Projects	**2017**	**2018**	**2019**	**2020**	**2021**	**Carryover to 2022**	**Original 2022**	**Revised 2022**	**2023 and Beyond**	**Total**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023 and Beyond**	**Carryover to 2023 and Beyond**	**Total**	**Project Variance**	**Project Variance**	**Annual Variance**	**Annual Variance**
2022 Projects																							
Thermal In-Service Failures (2022)	-	-	-	-	-	-	2,000.0	2,000.0	-	**2,000.0**	-	-	-	-	-	2,893.8	-	-	**2,893.8**	893.8	44.69%	893.8	44.69%
Major Pumps Overhaul - Holyrood	-	-	-	-	-	-	491.3	491.3	-	**491.3**	-	-	-	-	-	907.7	-	-	**907.7**	416.4	84.76%	416.4	84.76%
Unit 3 Generator Components Condition Assessment and Miscellaneous Upgrades	-	-	-	-	-	-	153.0	153.0	338.8	**491.8**	-	-	-	-	-	210.0	338.8	(69.8)	**479.0**	(12.8)	-2.61%	57.0	37.22%
Turbine Valve Overhaul Unit 3 - Holyrood	-	-	-	-	-	-	3,623.5	3,623.5	-	**3,623.5**	-	-	-	-	-	2,485.6	-	-	**2,485.6**	(1,137.9)	-31.40%	(1,137.9)	-31.40%
Upgrade Wastewater Treatment Plant 600 V Variable Frequency Drives - Holyrood	-	-	-	-	-	-	70.1	70.1	-	**70.1**	-	-	-	-	-	58.2	-	-	**58.2**	(11.9)	-16.97%	(11.9)	-16.97%
Air Receivers Condition Assessment and Upgrades - Holyrood	-	-	-	-	-	-	336.5	336.5	-	**336.5**	-	-	-	-	-	192.4	-	-	**192.4**	(144.1)	-42.83%	(144.1)	-42.83%
Boiler Condition Assessment and Miscellaneous Upgrades - Holyrood	-	-	-	-	-	-	3,014.2	3,014.2	-	**3,014.2**	-	-	-	-	-	3,899.4	-	-	**3,899.4**	885.2	29.37%	885.2	29.37%
Replace Underground Fire Water Distribution System - Holyrood	-	-	-	-	-	-	128.3	128.3	1,578.0	**1,706.3**	-	-	-	-	-	115.2	1,578.0	13.1	**1,706.3**	-	0.00%	(13.1)	-10.23%
Purchase Tools and Equipment Less than $50,000 (2022) - Thermal Plants	-	-	-	-	-	-	18.9	18.9	-	**18.9**	-	-	-	-	-	18.5	-	-	**18.5**	(0.4)	-2.08%	(0.4)	-2.08%
2021 Projects																							
Upgrade Distributed Control System Hardware - Holyrood	-	-	-	-	360.4	188.8	368.2	557.0	-	**728.6**	-	-	-	-	171.6	351.7	-	205.2	**728.6**	-	0.00%	(205.2)	-36.85%
Upgrade Waste Water Equalization System - Holyrood	-	-	-	-	1,813.4	1,645.2	547.7	2,192.9	-	**2,361.1**	-	-	-	-	168.2	2,500.7	-	-	**2,669.0**	307.9	13.04%	307.9	14.04%
2020 Projects																							
Upgrade Uninterruptible Power Supply 3 and 4 - Holyrood	-	-	-	348.7	-	67.7	-	67.7	-	**348.7**	-	-	-	283.2	97.1	132.4	-	-	**512.7**	164.1	47.06%	64.7	95.56%
Total Thermal Generation Projects	**-**	**-**	**-**	**348.7**	**2,173.8**	**1,901.7**	**10,751.7**	**12,653.4**	**1,916.8**	**15,191.0**	**-**	**-**	**-**	**283.2**	**436.9**	**13,765.5**	**1,916.8**	**148.6**	**16,551.1**	**1,360.1**		**1,112.2**	

[1] Numbers may not add due to rounding.

Table A-4: 2022 Capital Expenditures By Category [1]
($000)

	Capital Budget										Actual Expenditure and Forecast												
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Gas Turbine Generation Projects	**2017**	**2018**	**2019**	**2020**	**2021**	**Carryover to 2022**	**Original 2022**	**Revised 2022**	**2023 and Beyond**	**Total**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023 and Beyond**	**Carryover to 2023 and Beyond**	**Total**	**Project Variance**	**Project Variance**	**Annual Variance**	**Annual Variance**
2022 Projects																							
Control System Replacement - Holyrood Gas Turbine	-	-	-	-	-	-	146.0	146.0	41.0	**187.0**	-	-	-	-	-	70.8	41.0	75.2	**187.0**	-	0.00%	(75.2)	-51.49%
Install Infrared Scanning Ports - Happy Valley Gas Turbine	-	-	-	-	-	-	39.6	39.6	25.6	**65.2**	-	-	-	-	-	17.2	25.6	22.4	**65.2**	-	0.00%	(22.4)	-56.46%
Purchase Tools and Equipment Less than $50,000 (2022) - Gas Turbine	-	-	-	-	-	-	19.6	19.6	-	**19.6**	-	-	-	-	-	20.0	-	-	**20.0**	0.4	2.19%	0.4	2.19%
2021 Projects																							
Construct Lube Oil Cooler Hood and Containment System - Holyrood Gas Turbine	-	-	-	-	318.8	108.2	-	108.2	-	**318.8**	-	-	-	-	210.6	351.6	-	-	**562.2**	243.4	76.35%	243.4	224.98%
Purchase Capital Spares - Gas Turbines (2021)	-	-	-	-	213.8	37.0	-	37.0	-	**213.8**	-	-	-	-	159.2	41.5	-	-	**200.8**	(13.0)	-6.08%	4.5	12.29%
Replace Voltage Regulator - Happy Valley Gas Turbine	-	-	-	-	131.3	78.3	211.0	289.3	-	**342.3**	-	-	-	-	53.0	230.2	-	-	**283.2**	(59.1)	-17.27%	(59.1)	-20.43%
Replace Fuel Oil, Lube Oil, and Glycol Pumps - Happy Valley Gas Turbine	-	-	-	-	234.8	4.9	170.5	175.4	-	**405.3**	-	-	-	-	111.3	293.8	-	-	**405.1**	(0.2)	-0.06%	118.4	67.51%
Upgrade Compressed Air System - Happy Valley Gas Turbine	-	-	-	-	76.6	34.8	69.2	104.0	-	**145.8**	-	-	-	-	41.8	144.8	-	-	**186.6**	40.8	27.97%	40.8	39.22%
2020 Projects																							
Perform Combustor Inspection - Holyrood Gas Turbine	-	-	-	546.1	2,500.0	2,971.8	2,427.4	5,399.2	-	**5,473.5**	-	-	-	35.0	39.3	2,367.5	-	3,031.7	**5,473.5**	(0.0)	0.00%	(3,031.7)	-56.15%
Install Partial Discharge Monitoring - Holyrood Gas Turbine	-	-	-	37.8	575.0	199.0	-	199.0	-	**612.7**	-	-	-	165.4	230.3	125.6	-	-	**521.3**	(91.4)	-14.92%	(73.4)	-36.90%
2018 Projects																							
Increase Fuel and Water Treatment System Capacity - Holyrood Gas Turbine	-	8,829.9	3,012.7	-	-	567.6	-	567.6	-	**11,842.6**	-	2,583.8	3,563.9	832.8	157.2	487.9	-	-	**7,625.5**	(4,217.1)	-35.61%	(79.8)	-14.05%
Total Gas Turbine Generation Projects	**-**	**8,829.9**	**3,012.7**	**583.9**	**4,050.2**	**4,001.7**	**3,083.3**	**7,085.0**	**66.6**	**19,626.6**	**-**	**2,583.8**	**3,563.9**	**1,033.2**	**1,002.7**	**4,151.0**	**66.6**	**3,129.2**	**15,530.4**	**(4,096.2)**		**(2,934.0)**	

[1] Numbers may not add due to rounding.

Table A-5: 2022 Capital Expenditures By Category [1]
($000)

	Capital Budget										Actual Expenditure and Forecast												
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Terminal Stations Projects	**2017**	**2018**	**2019**	**2020**	**2021**	**Carryover to 2022**	**Original 2022**	**Revised 2022**	**2023 and Beyond**	**Total**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023 and Beyond**	**Carryover to 2023 and Beyond**	**Total**	**Project Variance**	**Project Variance**	**Annual Variance**	**Annual Variance**
2022 Projects																							
Terminal Station In-Service Failures (2022)	-	-	-	-	-	-	900.0	900.0	-	**900.0**	-	-	-	-	-	3,626.1	-	-	**3,626.1**	2,726.1	302.90%	2,726.1	302.90%
Upgrade Circuit Breakers (2022-2023) - Various	-	-	-	-	-	-	2,121.9	2,121.9	7,361.8	**9,483.7**	-	-	-	-	-	117.4	7,361.8	(1,081.2)	**6,398.0**	(3,085.7)	-32.54%	(2,004.5)	-94.47%
Terminal Station Refurbishment and Modernization (2022-2023)	-	-	-	-	-	-	3,111.9	3,111.9	6,109.7	**9,221.6**	-	-	-	-	-	2,168.7	6,109.7	1,075.5	**9,354.0**	132.4	1.44%	(943.2)	-30.31%
2021 Projects																							
Upgrade Circuit Breakers (2021-2022) - Various	-	-	-	-	5,418.8	2,055.7	4,293.6	6,349.3	820.3	**10,532.7**	-	-	-	-	2,597.7	4,818.6	820.3	(539.6)	**7,697.0**	(2,835.7)	-26.92%	(1,530.7)	-24.11%
Upgrades for Future Retirement of Stephenville Gas Turbine	-	-	-	-	1,530.3	1,378.5	5,344.5	6,723.0	-	**6,874.8**	-	-	-	-	151.8	1,060.9	-	5,662.2	**6,874.8**	(0.0)	0.00%	(5,662.2)	-84.22%
Additions for Load - Wabush Substation Upgrades	-	-	-	-	1,186.7	886.1	6,253.0	7,139.1	1,894.1	**9,333.8**	-	-	-	-	300.6	2,299.4	1,894.1	6,200.1	**10,694.1**	1,360.3	14.57%	(4,839.7)	-67.79%
Wabush Terminal Station Upgrades	-	-	-	-	2,301.7	1,507.7	4,935.5	6,443.2	4,335.7	**11,572.9**	-	-	-	-	794.0	1,843.2	4,335.7	4,600.0	**11,572.9**	0.0	0.00%	(4,600.0)	-71.39%
Terminal Station Refurbishment and Modernization (2021-2022)	-	-	-	-	6,171.6	1,867.2	6,957.3	8,824.5	-	**13,128.9**	-	-	-	-	3,903.3	7,432.3	-	321.4	**11,657.1**	(1,471.8)	-11.21%	(1,392.2)	-15.78%
2020 Projects																							
Replace Transformer T7 - Holyrood Terminal Station	-	-	-	2,678.1	-	1,767.3	-	1,767.3	-	**2,678.1**	-	-	-	660.6	250.2	557.9	-	2,244.0	**3,712.6**	1,034.5	38.63%	(1,209.4)	-68.43%
Terminal Station Refurbishment and Modernization (2020-2021)- Various Sites	-	-	-	3,711.9	5,685.3	415.6	-	415.6	-	**9,397.2**	-	-	-	1,703.5	6,316.4	141.4	-	-	**8,161.3**	(1,236.0)	-13.15%	(274.3)	-65.98%
2019 Projects																							
Terminal Station Refurbishment and Modernization (2019-2020) - Various Sites	-	-	10,891.1	19,061.8	-	920.5	-	920.5	-	**29,952.9**	-	-	5,891.3	10,987.2	2,440.7	1,120.0	-	-	**20,439.1**	(9,513.8)	-31.76%	199.4	21.67%
Total Terminal Stations Projects	**-**	**-**	**10,891.1**	**25,451.9**	**22,294.4**	**10,798.7**	**33,917.7**	**44,716.4**	**20,521.6**	**113,076.7**	**-**	**-**	**5,891.3**	**13,351.3**	**16,754.7**	**25,185.8**	**20,521.6**	**18,482.4**	**100,187.0**	**(12,889.7)**		**(19,530.6)**	

[1] Numbers may not add due to rounding.

Table A-6: 2022 Capital Expenditures By Category[1]
($000)

	Capital Budget										Actual Expenditure and Forecast												
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Transmission Projects	**2017**	**2018**	**2019**	**2020**	**2021**	**Carryover to 2022**	**Original 2022**	**Revised 2022**	**2023 and Beyond**	**Total**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023 and Beyond**	**Carryover to 2023 and Beyond**	**Total**	**Project Variance**	**Project Variance**	**Annual Variance**	**Annual Variance**
2021 Projects																							
Wood Pole Line Management Program (2022)	-	-	-	-	-	-	1,603.5	1,603.5	-	**1,603.5**	-	-	-	-	-	1,986.5	-	-	**1,986.5**	383.0	23.88%	383.0	23.88%
2019 Projects																							
Muskrat Falls to Happy Valley Interconnection	-	-	12,586.4	7,392.1	-	1,374.0	-	1,374.0	-	**19,978.5**	-	-	12,528.5	4,659.8	3,273.4	2,232.1	-	-	**22,693.8**	2,715.3	13.59%	858.1	62.45%
Total Transmission Projects	**-**	**-**	**12,586.4**	**7,392.1**	**-**	**1,374.0**	**1,603.5**	**2,977.5**	**-**	**21,582.0**	**-**	**-**	**12,528.5**	**4,659.8**	**3,273.4**	**4,218.6**	**-**	**-**	**24,680.3**	**3,098.3**		**1,241.1**	

[1] Numbers may not add due to rounding.

Table A-7: 2022 Capital Expenditures By Category [1]
($000)

	Capital Budget										Actual Expenditure and Forecast												
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Distribution Projects	**2017**	**2018**	**2019**	**2020**	**2021**	**Carryover to 2022**	**Original 2022**	**Revised 2022**	**2023 and Beyond**	**Total**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023 and Beyond**	**Carryover to 2023 and Beyond**	**Total**	**Project Variance**	**Project Variance**	**Annual Variance**	**Annual Variance**
2022 Projects																							
Provide Service Extensions (2022) - Various	-	-	-	-	-	-	3,627.2	3,627.2	-	**3,627.2**	-	-	-	-	-	4,459.1	-	-	**4,459.1**	831.9	22.93%	831.9	22.93%
Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights (2022) - Various	-	-	-	-	-	-	3,826.7	3,826.7	-	**3,826.7**	-	-	-	-	-	4,714.6	-	-	**4,714.6**	887.9	23.20%	887.9	23.20%
Install Recloser Remote Control (2023-2023) - Various	-	-	-	-	-	-	174.6	174.6	149.1	**323.7**	-	-	-	-	-	37.8	149.1	36.8	**223.7**	(100.0)	-30.89%	(136.8)	-78.34%
Upgrade of Worst-Performing Distribution Feeders (2022-2023)	-	-	-	-	-	-	850.0	850.0	1,922.9	**2,772.9**	-	-	-	-	-	861.8	1,922.9	(11.8)	**2,772.9**	-	0.00%	11.8	1.39%
Labrador City L22 Voltage Conversion (2022-2023)	-	-	-	-	-	-	486.8	486.8	1,004.4	**1,491.2**	-	-	-	-	-	99.1	1,004.4	387.7	**1,491.2**	-	0.00%	(387.7)	-79.64%
2021 Projects																							
Upgrade of Worst-Performing Distribution Feeders (2021-2022)	-	-	-	-	318.9	(9.7)	805.6	795.9	-	**1,124.5**	-	-	-	-	328.6	1,513.3	-	-	**1,841.9**	717.4	63.80%	717.4	90.14%
Addition for Load Growth - Happy Valley Line 7	-	-	-	-	617.6	224.1	-	224.1	-	**617.6**	-	-	-	-	391.3	222.0	-	-	**613.3**	(4.3)	-0.70%	(2.2)	-0.97%
2020 Projects																							
Install Recloser Remote Control (2020-2021) - Hampden and Upper Salmon	-	-	-	71.3	185.3	9.3	-	9.3	-	**256.7**	-	-	-	33.7	213.7	37.6	-	-	**285.0**	28.4	11.05%	28.3	305.66%
Total Distribution Projects	**-**	**-**	**-**	**71.3**	**1,121.8**	**223.7**	**9,770.9**	**9,994.6**	**3,076.4**	**14,040.5**	**-**	**-**	**-**	**33.7**	**933.6**	**11,945.3**	**3,076.4**	**412.7**	**16,401.7**	**2,361.2**		**1,950.7**	

[1] Numbers may not add due to rounding.

Table A-8: 2022 Capital Expenditures By Category [1]
($000)

	Capital Budget										Actual Expenditure and Forecast												
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Rural Generation Projects	**2017**	**2018**	**2019**	**2020**	**2021**	**Carryover to 2022**	**Original 2022**	**Revised 2022**	**2023 and Beyond**	**Total**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023 and Beyond**	**Carryover to 2023 and Beyond**	**Total**	**Project Variance**	**Project Variance**	**Annual Variance**	**Annual Variance**
2022 Projects																							
Overhaul Diesel Units (2022) - Various	-	-	-	-	-	-	1,360.5	1,360.5	-	**1,360.5**	-	-	-	-	-	1,216.9	-	-	**1,216.9**	(143.6)	-10.55%	(143.6)	-10.55%
Install Fire Protection in Diesel Plants (2022-2023) - Ramea	-	-	-	-	-	-	90.7	90.7	1,838.1	**1,928.8**	-	-	-	-	-	76.9	1,838.1	(336.2)	**1,578.8**	(350.0)	-18.15%	(13.8)	-15.25%
Additions for Load (2022) - Mary's Harbour Service Conductor	-	-	-	-	-	-	307.8	307.8	51.3	**359.1**	-	-	-	-	-	123.0	51.3	36.7	**211.0**	(148.1)	-41.24%	(184.8)	-60.05%
Upgrade Fuel Storage Tanks (2022) - Mary's Harbour	-	-	-	-	-	-	499.1	499.1	-	**499.1**	-	-	-	-	-	622.7	-	-	**622.7**	123.6	24.76%	123.6	24.76%
Diesel Genset Replacement Unit 2039 - St. Lewis	-	-	-	-	-	-	397.0	397.0	1,718.7	**2,115.7**	-	-	-	-	-	238.7	1,718.7	158.3	**2,115.7**	-	0.00%	(158.3)	-39.87%
Diesel Genset Replacement Unit 2012 - L'Anse-Au-Loup	-	-	-	-	-	-	339.9	339.9	2,723.4	**3,063.3**	-	-	-	-	-	170.3	2,723.4	169.6	**3,063.3**	-	0.00%	(169.6)	-49.91%
2021 Projects																							
Diesel Genset Replacements (2021-2022)	-	-	-	-	2,560.6	756.8	286.2	1,043.0	-	**2,846.8**	-	-	-	-	1,503.8	1,036.3	-	131.7	**2,671.8**	(175.0)	-6.15%	(6.7)	-0.64%
2020 Projects																							
Replace Automation Equipment - Rigolet	-	-	-	363.8	-	(33.9)	-	(33.9)	-	**363.8**	-	-	-	58.0	339.7	61.7	-	-	**459.4**	95.6	26.29%	95.7	-281.80%
Replace Powerhouse Roofing System - L'Anse-Au-Loup and St. Anthony	-	-	-	125.3	1,195.8	857.6	-	857.6	-	**1,321.2**	-	-	-	121.6	105.8	963.0	-	130.9	**1,321.3**	0.2	0.01%	105.4	12.30%
2019 Projects																							
Replace Human Machine Interface - Cartwright	-	-	306.9	-	-	14.1	-	14.1	-	**306.9**	-	-	152.9	97.3	42.6	13.7	-	-	**306.5**	(0.4)	-0.13%	(0.4)	-2.95%
Diesel Genset Replacements (2019-2020)	-	-	525.6	3,421.8	-	299.4	-	299.4	-	**3,947.4**	-	-	140.2	972.6	2,535.2	515.9	-	-	**4,163.9**	216.5	5.48%	216.5	72.31%
2018 Projects																							
Replace Automation Equipment - St. Anthony	-	307.4	1,565.9	-	-	146.0	-	146.0	-	**1,873.3**	-	127.2	1,790.8	160.2	24.0	414.3	-	-	**2,516.4**	643.1	34.33%	268.3	183.73%
Total Rural Generation Projects	**-**	**307.4**	**2,398.4**	**3,910.9**	**3,756.4**	**2,040.0**	**3,281.2**	**5,321.2**	**6,331.5**	**19,985.8**	**-**	**127.2**	**2,083.8**	**1,409.8**	**4,551.0**	**5,453.3**	**6,331.5**	**291.1**	**20,247.8**	**261.9**		**132.2**	

[1] Numbers may not add due to rounding.

Table A-9: 2022 Capital Expenditures By Category [1]
($000)

	Capital Budget										Actual Expenditure and Forecast									
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F
Properties Projects	2017	2018	2019	2020	2021	Carryover to 2022	Original 2022	Revised 2022	2023 and Beyond	Total	2017	2018	2019	2020	2021	2022	2023 and Beyond	Carryover to 2023 and Beyond	Total	Project Variance
2022 Projects																				
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Properties Projects	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A-10: 2022 Capital Expenditures By Category[1]
($000)

	Capital Budget										Actual Expenditure and Forecast												
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Metering Projects	**2017**	**2018**	**2019**	**2020**	**2021**	**Carryover to 2022**	**Original 2022**	**Revised 2022**	**2023 and Beyond**	**Total**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023 and Beyond**	**Carryover to 2023 and Beyond**	**Total**	**Project Variance**	**Project Variance**	**Annual Variance**	**Annual Variance**
2021 Projects																							
Replace Metering System	-	-	-	-	-	-	515.6	515.6	5,360.2	**5,875.8**	-	-	-	-	-	2,264.4	5,360.2	(1,748.8)	**5,875.8**	-	0.00%	1,748.8	339.18%
Total Metering Projects	**-**	**-**	**-**	**-**	**-**	**-**	**515.6**	**515.6**	**5,360.2**	**5,875.8**	**-**	**-**	**-**	**-**	**-**	**2,264.4**	**5,360.2**	**(1,748.8)**	**5,875.8**	**-**		**1,748.8**	

[1] Numbers may not add due to rounding.

Table A-11: 2022 Capital Expenditures By Category[1]
($000)

	Capital Budget										Actual Expenditure and Forecast												
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Tools and Equipment	**2017**	**2018**	**2019**	**2020**	**2021**	**Carryover to 2022**	**Original 2022**	**Revised 2022**	**2023 and Beyond**	**Total**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023 and Beyond**	**Carryover to 2023 and Beyond**	**Total**	**Project Variance**	**Project Variance**	**Annual Variance**	**Annual Variance**
2022 Projects																							
Purchase 46' Material Handler Aerial Device on Track Unit	-	-	-	-	-	-	20.4	20.4	737.6	**758.0**	-	-	-	-	-	13.2	737.6	7.2	**758.0**	-	0.00%	(7.2)	-35.36%
Purchase 85' Material Handler Aerial Device on Track Unit	-	-	-	-	-	-	20.4	20.4	1,333.5	**1,353.9**	-	-	-	-	-	22.4	1,333.5	(2.0)	**1,353.9**	-	0.00%	2.0	9.79%
Replace Light-Duty Mobile Equipment (2022) - Various	-	-	-	-	-	-	695.0	695.0	-	**695.0**	-	-	-	-	-	614.7	-	80.3	**695.0**	-	0.00%	(80.3)	-11.55%
Tools and Equipment Less than $ 50,000	-	-	-	-	-	-	450.3	450.3	-	**450.3**	-	-	-	-	-	527.0	-	-	**527.0**	76.7	17.03%	76.7	17.03%
2021 Projects																							
Replace Light Duty Mobile Equipment - Various Sites	-	-	-	-	549.6	413.5	-	413.5	-	**549.6**	-	-	-	-	136.1	465.0	-	-	**601.1**	51.5	9.37%	51.5	12.45%
Total Tools and Equipment	**-**	**-**	**-**	**-**	**549.6**	**413.5**	**1,186.1**	**1,599.6**	**2,071.1**	**3,806.8**	**-**	**-**	**-**	**-**	**136.1**	**1,642.3**	**2,071.1**	**85.5**	**3,935.0**	**128.2**		**42.7**	

[1] Numbers may not add due to rounding.

Table A-12: 2022 Capital Expenditures By Category[1]
($000)

	Capital Budget										Actual Expenditure and Forecast												
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Information Systems Projects	**2017**	**2018**	**2019**	**2020**	**2021**	**Carryover to 2022**	**Original 2022**	**Revised 2022**	**2023 and Beyond**	**Total**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023 and Beyond**	**Carryover to 2023 and Beyond**	**Total**	**Project Variance**	**Project Variance**	**Annual Variance**	**Annual Variance**
2022 Projects																							
Purchase Personal Computers (2022) - Hydro Place	-	-	-	-	-	-	477.1	477.1	-	**477.1**	-	-	-	-	-	463.9	-	-	**463.9**	(13.2)	-2.76%	(13.2)	-2.76%
Replace Peripheral Infrastructure (2022) - Hydro Place	-	-	-	-	-	-	193.2	193.2	-	**193.2**	-	-	-	-	-	103.1	-	-	**103.1**	(90.1)	-46.65%	(90.1)	-46.65%
Upgrade Core IT/OT Infrastructure (2022) - Hydro Place	-	-	-	-	-	-	308.2	308.2	-	**308.2**	-	-	-	-	-	308.3	-	-	**308.3**	0.1	0.02%	0.1	0.02%
Refresh Cyber Security Infrastructure (2022) - Hydro Place	-	-	-	-	-	-	221.7	221.7	-	**221.7**	-	-	-	-	-	333.4	-	-	**333.4**	111.7	50.38%	111.7	50.38%
Perform Software Upgrades and Minor Enhancements (2022) - Hydro Place	-	-	-	-	-	-	621.7	621.7	-	**621.7**	-	-	-	-	-	493.7	-	-	**493.7**	(128.0)	-20.59%	(128.0)	-20.59%
Upgrade Energy Management System (2022) - Hydro Place	-	-	-	-	-	-	292.6	292.6	-	**292.6**	-	-	-	-	-	249.6	-	43.0	**292.6**	-	0.00%	(43.0)	-14.68%
Hydro Command Centre Upgrade (2022) - Hydro Place	-	-	-	-	-	-	76.4	76.4	-	**76.4**	-	-	-	-	-	14.5	-	61.9	**76.4**	-	0.00%	(61.9)	-81.08%
Replacement of Short-Term Load Forecasting Software	-	-	-	-	-	-	439.5	439.5	-	**439.5**	-	-	-	-	-	409.1	-	-	**409.1**	(30.4)	-6.91%	(30.4)	-6.91%
2021 Projects																							
Purchase Hydro Personal Computers (2021) - Hydro Place	-	-	-	-	905.4	446.6	-	446.6	-	**905.4**	-	-	-	-	458.9	324.9	-	-	**783.8**	(121.6)	-13.43%	(121.6)	-27.24%
Replace Peripheral Equipment (2021) - Hydro Place	-	-	-	-	256.4	66.6	-	66.6	-	**256.4**	-	-	-	-	138.4	65.4	-	-	**203.8**	(52.6)	-20.50%	(1.2)	-1.74%
Total Information Systems Projects	**-**	**-**	**-**	**-**	**1,161.8**	**513.2**	**2,630.4**	**3,143.6**	**-**	**3,792.2**	**-**	**-**	**-**	**-**	**597.3**	**2,765.9**	**-**	**104.9**	**3,468.1**	**(324.1)**		**(377.6)**	

[1] Numbers may not add due to rounding.

Table A-13: 2022 Capital Expenditures By Category [1]
($000)

	Capital Budget										Actual Expenditure and Forecast												
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Telecontrol Projects	2017	2018	2019	2020	2021	Carryover to 2022	Original 2022	Revised 2022	2023 and Beyond	Total	2017	2018	2019	2020	2021	2022	2023 and Beyond	Carryover to 2023 and Beyond	Total	Project Variance	Project Variance	Annual Variance	Annual Variance
2022 Projects																							
Upgrade Remote Terminal Units (2022) - Various	-	-	-	-	-	-	171.1	171.1	-	**171.1**	-	-	-	-	-	153.2	-	-	**153.2**	(17.9)	-10.48%	(17.9)	-10.48%
Replace Network Communications Equipment (2022)	-	-	-	-	-	-	193.0	193.0	-	**193.0**	-	-	-	-	-	73.4	-	119.6	**193.0**	-	0.00%	(119.6)	-61.97%
Upgrade Site Facilities (2022) - Various	-	-	-	-	-	-	49.6	49.6	-	**49.6**	-	-	-	-	-	50.3	-	-	**50.3**	0.7	1.42%	0.7	1.42%
Replace Battery Banks and Chargers (2022) - Various	-	-	-	-	-	-	226.6	226.6	-	**226.6**	-	-	-	-	-	192.7	-	-	**192.7**	(33.9)	-14.94%	(33.9)	-14.94%
Purchase Tools and Equipment Less than $50,000 (2022)	-	-	-	-	-	-	42.0	42.0	-	**42.0**	-	-	-	-	-	56.0	-	-	**56.0**	14.0	33.40%	14.0	33.40%
Replace Radomes (2022) - Various	-	-	-	-	-	-	179.9	179.9	-	**179.9**	-	-	-	-	-	124.7	-	-	**124.7**	(55.2)	-30.66%	(55.2)	-30.66%
Replace Mobile Devices	-	-	-	-	-	-	49.7	49.7	-	**49.7**	-	-	-	-	-	48.9	-	-	**48.9**	(0.8)	-1.63%	(0.8)	-1.63%
Total Telecontrol Projects	**-**	**-**	**-**	**-**	**-**	**-**	**911.9**	**911.9**	**-**	**911.9**	**-**	**-**	**-**	**-**	**-**	**699.3**	**-**	**119.6**	**818.9**	**(93.0)**		**(212.6)**	

[1] Numbers may not add due to rounding.

Table A-14: 2022 Capital Expenditures By Category[1]
($000)

	Capital Budget										Actual Expenditure and Forecast												
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Transportation	**2017**	**2018**	**2019**	**2020**	**2021**	**Carryover to 2022**	**Original 2022**	**Revised 2022**	**2023 and Beyond**	**Total**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023 and Beyond**	**Carryover to 2023 and Beyond**	**Total**	**Project Variance**	**Project Variance**	**Annual Variance**	**Annual Variance**
2022 Projects																							
Replace Light- and Heavy-Duty Vehicles (2022-2024)	-	-	-	-	-	-	569.0	569.0	2,912.8	**3,481.8**	-	-	-	-	-	125.6	2,912.8	443.4	**3,481.8**	-	0.00%	(443.4)	-77.93%
2021 Projects																							
Replace Light- and Heavy-Duty Vehicles (2021-2022)	-	-	-	-	1,321.0	1,239.5	1,335.1	2,574.6	-	**2,656.1**	-	-	-	-	81.4	1,220.5	-	2,014.2	**3,316.1**	660.0	24.85%	(1,354.2)	-52.60%
Level II Chargers for Electric Vehicles	-	-	-	-	299.8	105.7	-	105.7		**299.8**	-	-	-	-	194.1	33.1	-	72.5	**299.8**	-	0.00%	(72.5)	-68.64%
2020 Projects																							
Replace Light and Heavy Duty Vehicles (2020-2021) - Various	-	-	-	1,625.4	1,583.5	2,546.4	-	2,546.4	-	**3,208.9**	-	-	-	4.0	658.7	1,964.7	-	1,471.7	**4,099.1**	890.2	27.74%	(581.7)	-22.84%
Total Transportation	**-**	**-**	**-**	**1,625.4**	**3,204.3**	**3,891.6**	**1,904.1**	**5,795.7**	**2,912.8**	**9,646.6**	**-**	**-**	**-**	**4.0**	**934.2**	**3,343.9**	**2,912.8**	**4,001.8**	**11,196.8**	**1,550.2**		**(2,451.8)**	

	Capital Budget										Actual Expenditure and Forecast												
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Administrative	**2017**	**2018**	**2019**	**2020**	**2021**	**Carryover to 2022**	**Original 2022**	**Revised 2022**	**2023 and Beyond**	**Total**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023 and Beyond**	**Carryover to 2023 and Beyond**	**Total**	**Project Variance**	**Project Variance**	**Annual Variance**	**Annual Variance**
2022 Projects																							
Remove Safety Hazards (2022) - Various	-	-	-	-	-	-	199.6	199.6	-	**199.6**	-	-	-	-	-	170.6	-	-	**170.6**	(29.0)	-14.54%	(29.0)	-14.54%
Purchase Office Equipment Less Than $50,000 (2022)	-	-	-	-	-	-	67.1	67.1	-	**67.1**	-	-	-	-	-	68.8	-	-	**68.8**	1.7	2.57%	1.7	2.57%
2021 Projects																							
Replace Transfer Switches and Associated Hardware - Hydro Place	-	-	-	-	197.4	89.7	938.5	1,028.2	-	**1,135.9**	-	-	-	-	107.7	79.2	-	1,099.0	**1,285.9**	150.0	13.21%	(949.0)	-92.30%
2020 Projects																							
Replace Elevator Motors and Control Equipment - Hydro Place	-	-	-	89.1	647.6	76.8	-	76.8	-	**736.7**	-	-	-	64.2	595.7	256.3	-	44.4	**960.7**	224.0	30.40%	179.6	233.92%
Total Administrative	**-**	**-**	**-**	**89.1**	**845.0**	**166.5**	**1,205.2**	**1,371.7**	**-**	**2,139.3**	**-**	**-**	**-**	**64.2**	**703.4**	**574.9**	**-**	**1,143.5**	**2,486.0**	**346.7**		**(796.8)**	

[1] Numbers may not add due to rounding.

Table A-15: 2022 Capital Expenditures By Category [1,2,3]
($000)

	Capital Budget										Actual Expenditure and Forecast													
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Allowance For Unforeseen Items	**2017**	**2018**	**2019**	**2020**	**2021**	**Carryover to 2022**	**Original 2022**	**Revised 2022**	**2023 and Beyond**	**Total**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023 and Beyond**	**Carryover to 2023 and Beyond**	**Total**	**Project Variance**	**Project Variance**	**Annual Variance**	**Annual Variance**
2022 Projects																							
Contingency Fund	-	-	-	-	-	-	1,000.0	1,000.0	-	**1,000.0**	-	-	-	-	-	-	-	-	**-**	(1,000.0)	-100.00%	(1,000.0)	-100.00%
Emergency Transmission Line Repair	-	-	-	-	-	-	-	-	-	**-**	-	-	-	-	-	402.1	-	-	**402.1**	402.1	N/A	402.1	N/A
Allowance for Unforeseen - Top-Up P.U. 9(2022)	-	-	-	-	-	-	402.1	402.1	-	**402.1**	-	-	-	-	-	-	-	-	**-**	(402.1)	-100.00%	(402.1)	-100.00%
2021 Projects																							
Replace Holyrood Thermal Generating Station T2	-	-	-	-	-	-	-	-	-	**-**	-	-	-	-	1,649.1	398.7	-	-	**2,047.8**	2,047.8	N/A	398.7	N/A
Total Allowance For Unforeseen	**-**	**-**	**-**	**-**	**-**	**-**	**1,402.1**	**1,402.1**	**-**	**1,402.1**	**-**	**-**	**-**	**-**	**1,649.1**	**800.9**	**-**	**-**	**2,450.0**	**1,047.8**		**(601.3)**	

	Capital Budget										Actual Expenditure and Forecast													
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Supplemental Projects	**2017**	**2018**	**2019**	**2020**	**2021**	**Carryover to 2022**	**Original 2022**	**Revised 2022**	**2023 and Beyond**	**Total**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023 and Beyond**	**Carryover to 2023 and Beyond**	**Total**	**Project Variance**	**Project Variance**	**Annual Variance**	**Annual Variance**
2022 Projects																							
Replace Diesel Plant Roof - Makkovik	-	-	-	-	-	-	176.8	176.8	457.2	**634.0**	-	-	-	-	-	95.7	457.2	257.6	**810.5**	176.5	27.83%	(81.1)	-45.89%
Mary's Harbour (MSH) Engine Replacement	-	-	-	-	-	-	-	-	137.7	**137.7**	-	-	-	-	-	-	137.7	-	**137.7**	-	N/A	-	N/A
Last Stage Blades Holyrood	-	-	-	-	-	-	18.3	18.3	1,560.6	**1,578.9**	-	-	-	-	-	164.5	1,560.6	(146.3)	**1,578.9**	-	0.00%	146.3	801.22%
Rotor Rim Shrinking and Stator Recentering at the Upper Salmon Hydroelectric Generating Station	-	-	-	-	-	-	959.4	959.4	3,040.4	**3,999.8**	-	-	-	-	-	722.9	3,040.4	236.5	**3,999.8**	-	0.00%	(236.5)	-24.65%
Holyrood Replace Underground Tank Farm	-	-	-	-	-	-	83.5	83.5	1,330.5	**1,414.0**	-	-	-	-	-	27.9	1,330.5	55.6	**1,414.0**	-	0.00%	(55.6)	-66.62%
Holyrood Day Tank Refurbishment	-	-	-	-	-	-	89.4	89.4	707.8	**797.2**	-	-	-	-	-	39.8	707.8	49.6	**797.2**	-	0.00%	(49.6)	-55.45%
Upgrade Turbine Control System Unit 2	-	-	-	-	-	-	235.9	235.9	490.1	**726.0**	-	-	-	-	-	150.7	490.1	85.2	**726.0**	-	0.00%	(85.2)	-36.13%
Hampden New Line from TS	-	-	-	-	-	-	443.8	443.8	-	**443.8**	-	-	-	-	-	415.3	-	-	**415.3**	(28.5)	-6.42%	(28.5)	-6.42%
Anaconda Mine-reroute	-	-	-	-	-	-	230.4	230.4	-	**230.4**	-	-	-	-	-	-	-	-	**-**	(230.4)	-100.00%	(230.4)	-100.00%
Holyrood Tank 1 Refurbishment	-	-	-	-	-	-	1,195.0	1,195.0	857.1	**2,052.1**	-	-	-	-	-	1,030.6	857.1	164.4	**2,052.1**	-	0.00%	(164.4)	-13.75%
Capital Expenditures Necessary to Address Supply in Charlottetown and Pinsent's Arm, Labrador	-	-	-	-	-	-	1,269.8	1,269.8	44.9	**1,314.7**	-	-	-	-	-	205.6	44.9	1,064.2	**1,314.7**	-	0.00%	(1,064.2)	-83.81%
2021 Projects																							
Valentine Gold Interconnection	-	-	-	-	3,479.3	2,885.2	12,281.7	15,166.9	586.4	**16,347.4**	-	-	-	-	826.1	6,178.9	586.4	8,756.0	**16,347.5**	0.1	0.00%	(8,988.0)	-59.26%
Replace Unit 2047 Ramea (2021)	-	-	-	-	307.7	258.7	2,010.8	2,269.5	118.3	**2,436.8**	-	-	-	-	49.0	216.1	118.3	2,053.4	**2,436.8**	-	0.00%	(2,053.4)	-90.48%
Phase 2 - Electric Vechicle Charging Network	-	-	-	-	1,410.1	1,351.1	171.4	1,522.5	-	**1,581.5**	-	-	-	-	59.0	1,785.1	-	-	**1,844.1**	262.6	16.60%	262.6	17.25%
2020 Projects																							
Wabush L34 and L35 Protective Relays	-	-	-	43.7	234.6	2.9	-	2.9	-	**278.3**	-	-	-	24.7	231.7	(0.0)	-	-	**256.4**	(21.9)	-7.86%	(2.9)	-100.00%
Total Supplemental Projects Approved by PUB	**-**	**-**	**-**	**43.7**	**5,431.7**	**4,497.8**	**19,166.2**	**23,664.0**	**9,331.0**	**33,972.5**	**-**	**-**	**-**	**24.7**	**1,165.9**	**11,033.1**	**9,331.0**	**12,576.3**	**34,131.0**	**158.4**		**(12,630.9)**	

	Capital Budget										Actual Expenditure and Forecast													
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Projects Less than $50,000	**2017**	**2018**	**2019**	**2020**	**2021**	**Carryover to 2022**	**Original 2022**	**Revised 2022**	**2023 and Beyond**	**Total**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023 and Beyond**	**Carryover to 2023 and Beyond**	**Total**	**Project Variance**	**Project Variance**	**Annual Variance**	**Annual Variance**
2022 Projects																							
Francois 587 Generator Replacement	-	-	-	-	-	-	31.2	31.2	-	**31.2**	-	-	-	-	-	31.0	-	-	**31.0**	(0.2)	-0.72%	(0.2)	-0.72%
Holyrood Gas Turbine Fire Panel Replacement	-	-	-	-	-	-	41.2	41.2	-	**41.2**	-	-	-	-	-	31.3	-	-	**31.3**	(9.9)	-23.94%	(9.9)	-23.94%
IOC SCADA Data Link	-	-	-	-	-	-	28.2	28.2	-	**28.2**	-	-	-	-	-	1.9	-	26.4	**28.2**	-	0.00%	(26.4)	-93.38%
St. Brendans Roof Shingle Replacement	-	-	-	-	-	-	40.8	40.8	-	**40.8**	-	-	-	-	-	14.3	-	-	**14.3**	(26.5)	-64.94%	(26.5)	-64.94%
TL215 Guying Upgrades	-	-	-	-	-	-	49.3	49.3	-	**49.3**	-	-	-	-	-	15.6	-	-	**15.6**	(33.7)	-68.27%	(33.7)	-68.27%
TL215 - Emergency Transmission Line Repair	-	-	-	-	-	-	15.3	15.3	-	**15.3**	-	-	-	-	-	10.1	-	-	**10.1**	(5.2)	-33.81%	(5.2)	-33.81%
Replace Tracks - V7271	-	-	-	-	-	-	48.3	48.3	-	**48.3**	-	-	-	-	-	-	-	48.3	**48.3**	-	0.00%	(48.3)	-100.00%
Bay d'Espoir House 14 Purchase Furnishing	-	-	-	-	-	-	18.1	18.1	-	**18.1**	-	-	-	-	-	10.4	-	-	**10.4**	(7.7)	-42.58%	(7.7)	-42.58%
Total Projects Less than $50,000	**-**	**-**	**-**	**-**	**-**	**-**	**272.5**	**272.5**	**-**	**272.5**	**-**	**-**	**-**	**-**	**-**	**114.7**	**-**	**74.7**	**189.3**	**(83.1)**		**(157.8)**	

[1] Numbers may not add due to rounding.

[2] In Board Order No. P.U. 30(2022), the Board approved the refurbishment of the Day Tank and Tank 1, the replacement of the Tank Farm and the upgrade of Unit 2 Tubrine Control System.

[3] The project to relocate a distribution line and for the contribution by Anaconda Mine which was approved in Board Order No. P.U. 28(2022) was subsequently cancelled.