All our energy.
All the time.

MARITIME ELECTRIC
A FORTIS COMPANY

July 6, 2022

Island Regulatory and Appeals Commission
PO Box 577
Charlottetown PE C1A 7L1

Dear Commissioners:

Please find enclosed five copies of Maritime Electric's 2023 Capital Budget Application ("Capital Budget" or "Application").

The Capital Budget has been developed in accordance with the requirements of the Company's Capital Expenditure Justification Criteria and related Commission Order UE-17-03. In addition, as requested in the Commission's June 7, 2021 letter of direction concerning filing requirements for annual capital budget applications, the Application includes:

i. A summary of historical and current electricity rates, and a forecast of the impact that the proposed 2023 Capital Budget will have on electricity rates (Section 3.3);
ii. A breakdown of proposed capital expenditures by Investment Classification in Section 3.4 with supporting information in Appendix E;
iii. System reliability trends and benchmarking (to other Atlantic Canadian electric utilities) information in Section 3.5 a to c and Confidential Appendix N-1;
iv. Identification of the feeders with the highest average annual outage hours over the past 10 years based on SAIDI reliability data, and the rationale for the 2023 capital projects that will improve reliability performance on three of these feeders (Sections 3.5 d and e); and
v. A summary of actual and forecast capital expenditures for the period 2014 to 2027, with breakdown to the major budget category level (i.e., Generation, Distribution, Transmission and Corporate), provided as Appendix A.

If you have questions or require additional information concerning any aspect of the 2023 Capital Budget Application, please do not hesitate to contact me at 902-629-3641.

Yours truly,

MARITIME ELECTRIC

Gloria Crockett

Gloria Crockett, CPA, CA
Manager, Regulatory and
Financial Planning

GCC20
Attachments

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C A N A D A

PROVINCE OF PRINCE EDWARD ISLAND

BEFORE THE ISLAND REGULATORY
AND APPEALS COMMISSION

IN THE MATTER of Section 17(1) of the *Electric Power Act* (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving the 2023 Capital Budget and for certain approvals incidental to such an order.

APPLICATION AND EVIDENCE
OF
MARITIME ELECTRIC COMPANY, LIMITED

July 6, 2022

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APPENDICES

CONFIDENTIAL INFORMATION FILED SEPARATELY

Legend of Abbreviations	
AACE	American Association of Cost Estimating
API	American Petroleum Institute
Application	2023 Capital Budget Application
Atlantic Utilities	Atlantic Canadian Electric Utilities
BCC	Backup Control Centre
BGHJ	BGHJ Architects
BGS	Borden Generating Station
CEJC	Capital Expenditure Justification Criteria
CGS	Charlottetown Generating Station
CIS	Customer Information and Billing System
Commission	Island Regulatory and Appeals Commission
Company	Maritime Electric Company, Limited
COVID-19	COVID-19 Pandemic
CSA	Canadian Standards Association
CT1	Combustion Turbine #1
CT2	Combustion Turbine #2
CT3	Combustion Turbine #3
CTGS	Charlottetown Thermal Generating Station
DAMP	Distribution Asset Management Program
ECC	Energy Control Centre
EPA	Energy Purchase Agreement
FERC	Federal Energy Regulatory Commission
Fortis	Fortis Inc.
ft	feet
GAAP	Generally Accepted Accounting Principles
GEC	Capitalized General Expense
GIS	Geographic Information System
HSE	Health, Safety and Environmental
IAS	International Accounting Standard
IDC	Interest During Construction
IEEE	Institute of Electrical and Electronics Engineers
IRAC	Island Regulatory and Appeals Commission

Legend of Abbreviations	
ISP	Integrated System Plan
IT	Information Technology
km	kilometre
kV	kilovolt
kWh	kilowatt hour
LED	Light Emitting Diode
Maritime Electric	Maritime Electric Company, Limited
MED	Major Event Day
MVA	megavolt ampere
MW	megawatt
O&M	Operation and Maintenance
OATT	Open Access Transmission Tariff
OT	Operations Technology
PCB	Polychlorinated Biphenyl
PEI	Prince Edward Island
PEIEC	Prince Edward Island Energy Corporation
PHEV	Plug-in Hybrid Electric Vehicle
Point Lepreau	Point Lepreau Nuclear Generating Station
ppm	parts per million
RF	Radio Frequency
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCBR	Supplemental Capital Budget Request
Surveyor	Engineering and T&D Utility Person
USofA	Uniform System of Accounts
VCC	Virtual Contact Centre
WACC	Weighted Average Cost of Capital
WCWF	West Cape Wind Farm
WRSC	West Royalty Service Centre

1.0 APPLICATION

C A N A D A

PROVINCE OF PRINCE EDWARD ISLAND

BEFORE THE ISLAND REGULATORY
AND APPEALS COMMISSION

IN THE MATTER of Section 17(1) of the *Electric Power Act* (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving the 2023 Capital Budget and for certain approvals incidental to such an order.

Introduction

1. Maritime Electric Company, Limited ("Maritime Electric" or the "Company") is a Corporation incorporated under the laws of Canada with its head or registered office at Charlottetown and carries on a business as a public utility subject to the *Electric Power Act* engaged in the production, purchase, transmission, distribution and sale of electricity within Prince Edward Island ("PEI").

Application

2. Maritime Electric hereby applies for an order of the Island Regulatory and Appeals Commission ("IRAC" or the "Commission") approving the capital budget for the year 2023 as outlined in the attached evidence.

3. The proposals contained in this Application represent a just and reasonable balance of the interests of Maritime Electric and those of its customers and will, if approved, allow the Company to perform necessary capital additions and improvements at a cost that is, in all circumstances, reasonable.

Procedure

4. Filed hereto is the Affidavit of Jason C. Roberts, Angus S. Orford, Enrique A. Riveroll and T. Michelle Francis which contains the evidence on which Maritime Electric relies in this Application.

Dated at Charlottetown, Province of Prince Edward Island, this 6th day of July, 2022.

D. Spencer Campbell, Q. C.

STEWART MCKELVEY
65 Grafton Street, PO Box 2140
Charlottetown PE C1A 8B9
Telephone: (902) 629-4549
Facsimile: (902) 892-2485
Solicitors for Maritime Electric Company, Limited

2.0 AFFIDAVIT

C A N A D A

PROVINCE OF PRINCE EDWARD ISLAND

BEFORE THE ISLAND REGULATORY
AND APPEALS COMMISSION

IN THE MATTER of Section 17(1) of the *Electric Power Act* (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving the 2023 Capital Budget and for certain approvals incidental to such an order.

AFFIDAVIT

We, Jason Christopher Roberts of Suffolk, Angus Sumner Orford of Charlottetown, Enrique Alfonso Riveroll of New Dominion and T. Michelle Francis of Emyvale, in Queens County, Province of Prince Edward Island, MAKE OATH AND SAY AS FOLLOWS:

1. We are the President and Chief Executive Officer, Vice-President, Corporate Planning and Energy Supply, Vice-President, Customer Service and Vice-President, Finance and Chief Financial Officer of Maritime Electric respectively and, as such, have personal knowledge of the matters deposed to herein, except where noted, in which case we rely upon the information of others and in which case we verily believe such information to be true.

2. Maritime Electric is a public utility subject to the provisions of the *Electric Power Act* engaged in the production, purchase, transmission, distribution and sale of electricity within Prince Edward Island.

3. We prepared or supervised the preparation of the evidence and to the best of our knowledge the evidence is true in substance and in fact. A copy of the evidence is attached to this, our Affidavit, and is collectively known as Exhibit "A", contained in Sections 3 through 9 inclusive and Appendices A through M inclusive.

4. Section 10 contains a proposed Order of the Commission based on the Company's Application.

SWORN TO SEVERALLY at
Charlottetown, Province of Prince Edward Island,
the 6th day of July, 2022.
Before me:

Jason C. Roberts

T. Michelle Francis

Angus S. Orford

Enrique A. Riveroll

A Commissioner for taking Affidavits
in the Supreme Court of Prince Edward Island.

3.0 INTRODUCTION

3.1 Corporate Profile

Maritime Electric owns and operates a fully integrated system providing for the purchase, generation, transmission, distribution and sale of electricity throughout PEI. The Company's head office is located in Charlottetown with generating facilities in Charlottetown and Borden-Carleton.

Maritime Electric is the primary electric utility on PEI delivering approximately 90 per cent of the electricity supplied in the province. To meet customers' energy demand and supply requirements, the Company has contractual entitlement to capacity and energy from NB Power's Point Lepreau Nuclear Generating Station ("Point Lepreau") and an agreement for the purchase of capacity and system energy from NB Power delivered via four submarine cables owned by the Province of PEI. Through various contracts with the PEI Energy Corporation, the Company purchases the capacity and energy from 92.5 megawatts ("MW") of wind generation on PEI.

Maritime Electric is a public utility subject to PEI's *Electric Power Act*. As a public utility, the Company is subject to regulatory oversight and approvals of IRAC, which has jurisdiction to regulate public utilities under the *Electric Power Act* and the *Island Regulatory and Appeals Commission Act.*

3.2 Overview of Evidence

Under Section 17 (1) of the *Electric Power Act*, every public utility is required to submit to the Commission, for its approval, an annual capital budget of proposed improvements or additions to its property. This is the evidence in support of Maritime Electric's 2023 Capital Budget Application ("Application"). In preparing this evidence, the Company used the Capital Expenditure Justification Criteria ("CEJC") filed on April 10, 2018 and updated on November 22, 2019. Accordingly, for each proposed capital project, the evidence will indicate whether the project is considered mandatory, recurring, justifiable or work support services. Also, Section 3.4 provides the 2023 Capital Budget according to the Investment Classifications proposed by the Commission in a letter of direction dated June 7, 2021.

This Application has been developed to address a range of system and business requirements that support the Company's ability to fulfil its obligation as a public utility under Section 3a of the *Electric Power Act* which states:

> "Every public utility shall:
>
> (a) Furnish at all times such reasonably safe and adequate service and facilities for services as changing conditions require;"

Capital investment in the electrical system, and the facilities and equipment that support the operation of the system, is an annually recurring necessity for the Company to comply with this obligation. Through capital investment, the Company is able to serve existing and new customers, modify the system as necessary to meet customer demand, replace or upgrade aged, deteriorated or obsolete assets in a structured manner, improve system performance through design and technology enhancements, and ensure that the work support services to meet business and regulatory requirements are in place and adequate.

It is important that the Company strategically allocates the annual capital investment to meet the needs across the primary system categories of the Application (i.e., Generation, Distribution, Transmission and Corporate). This is accomplished using structured planning resources such as the Integrated System Plan ("ISP") and the Distribution Asset Management Program ("DAMP") as outlined in Section 3.6a, as well as information collected through operations (e.g., inspection programs), and projects designed to identify and assess equipment or system deficiencies (e.g., engineering studies, cybersecurity reviews, etc.).

The Company's capital investments are also dictated by some mandatory activities as a result of legislation or regulatory direction. These are often to address safety or environmental issues, but orders of the Commission can also result in mandatory capital investments.

Appendix A outlines the Company's actual and proposed capital expenditures from 2014 to 2027.

Table 1 outlines the proposed capital expenditures for 2023.

Table 1 Proposed 2023 Capital Expenditures			
4.0	**Generation**		
	4.1	Charlottetown Generating Station – Buildings and Site Services	$ 113,000
	4.2	Charlottetown Generating Station – Turbine Generator	349,000
	4.3	Borden-Carleton Generating Station – Buildings and Site Services	136,000
	4.4	Borden-Carleton Generating Station – Turbine Generators	942,000
			1,540,000
5.0	**Distribution**		
	5.1	Replacements Due to Storms, Collisions, Fire and Road Alterations	1,840,000
	5.2	Distribution Transformers	9,327,000
	5.3	Services and Street Lighting	5,650,000
	5.4	Line Extensions	3,439,000
	5.5	Line Rebuilds	5,330,000
	5.6	System Meters	656,000
	5.7	Distribution Equipment	1,477,000
	5.8	Transportation Equipment	1,258,000
			28,977,000
6.0	**Transmission**		
	6.1	Substation Projects	13,807,000
	6.2	Transmission Projects	2,018,000
			15,825,000
7.0	**Corporate**		
	7.1	Corporate Services	1,338,000
	7.2	Information Technology	2,125,000
			3,463,000
Sub-total			$ 49,805,000
8.0	**Capitalized General Expense**		730,000
9.0	**Interest During Construction**		680,000
Less: Customer Contributions			(750,000)
TOTAL			**$ 50,465,000**

Figure 1 shows the proposed 2023 capital expenditures by origin.

Figure 1
Proposed 2023 Capital Expenditures by Origin

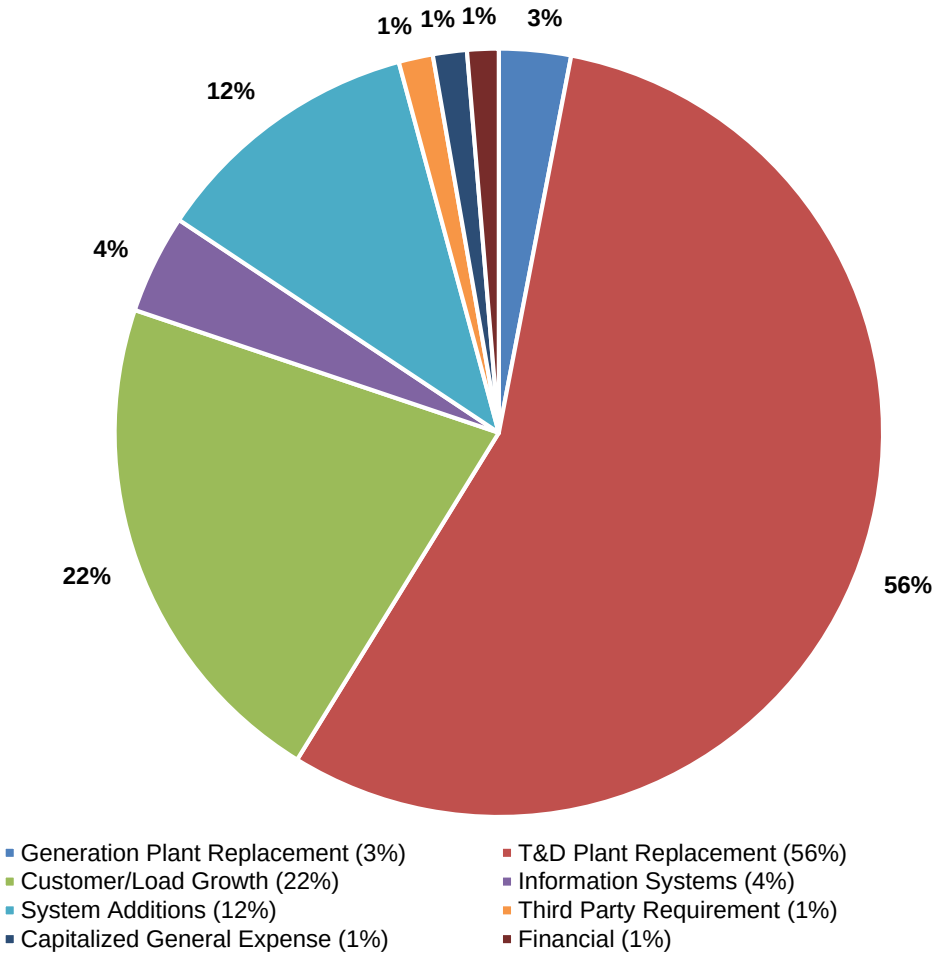
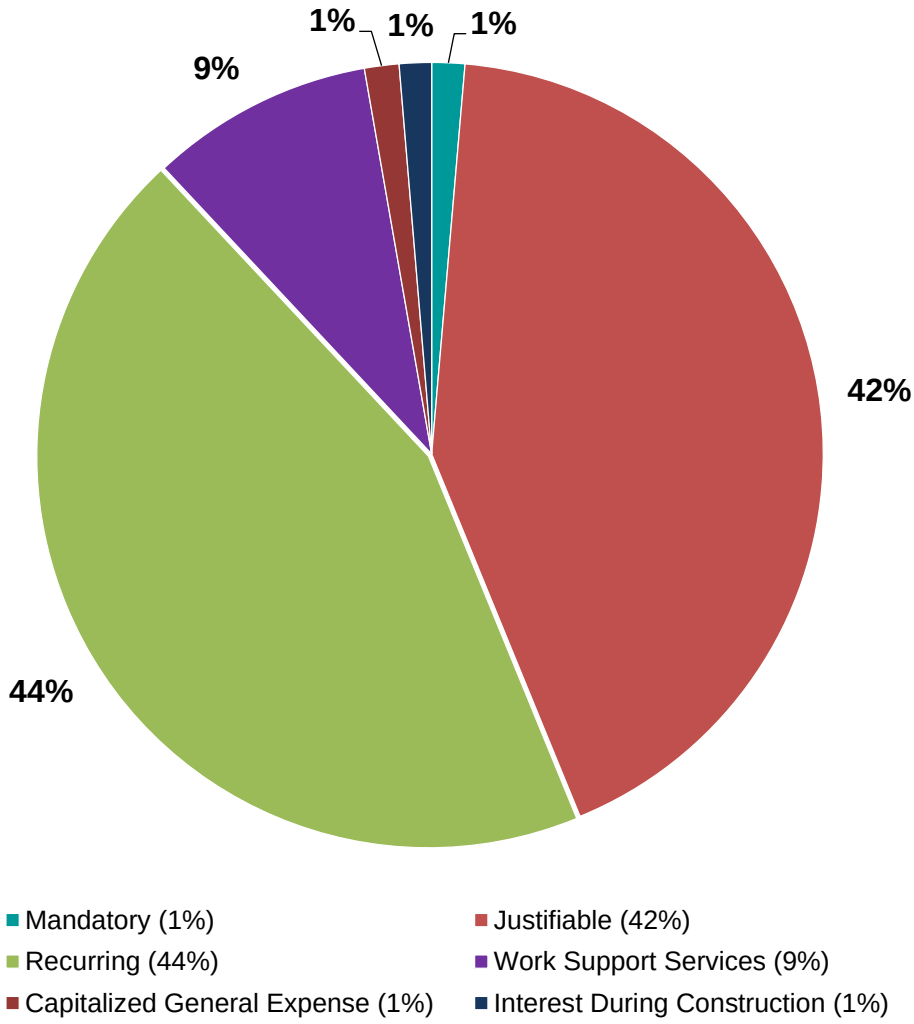


Figure 2 shows the proposed 2023 capital expenditures, before customer contributions, by CEJC classification.

Figure 2
Proposed 2023 Capital Expenditures by CEJC Classification



An expanded breakdown of proposed 2023 capital expenditures by CEJC classification is provided in Appendix B.

A map of the current electric grid showing the major supply system components and the location of the proposed 2023 capital expenditures is provided as Appendix C. Some expenditures involving work throughout the province cannot be assigned to one location and are therefore not shown on the map. This applies to Sections 5.1, 5.2, 5.3, 5.4a, 5.5b-c, 5.6, 5.7, 5.8, 6.1f, 6.1i, 6.2a-b, 7.1a, 7.1c and 7.2a-g of this Application.

3.3 Estimated Impact on Rate Base, Revenue Requirement and Customer Rates

In accordance with the CEJC, this section provides an estimate of the impact of the proposed 2023 Capital Budget on rate base, revenue requirement and customer rates.

The proposed 2023 capital expenditures of $50.5 million is $10.4 million higher than the 2022 Capital Budget approved by Commission Order UE21-16. Table 2 provides an estimate of the impact of the proposed 2023 Capital Budget on the Company's forecast 2023 rate base.

Table 2
Estimated Impact on 2023 Year End Rate Base

Estimated Impact on Rate Base (000s)	A	$47,788
2023 Forecast Year End Rate Base (000s)	B	$482,142
Percentage of 2023 Forecast Year End Rate Base	C = A/B	9.91%

The supporting calculations for Table 2 can be found on page 3 of Appendix D.

The proposed 2023 Capital Budget will increase the Company's revenue requirement by the incremental depreciation expense, cost of capital and income tax charges associated with the projects. Table 3 provides an estimate of the increase in revenue requirement from the proposed 2023 Capital Budget over the Company's forecast 2023 revenue requirement.

Table 3
Estimated Increase on 2023 Revenue Requirement

Estimated Impact on Annual Revenue Requirement (000s)	A	$5,186
2023 Forecast Revenue Requirement (000s)	B	$249,256
Percentage Increase in 2023 Forecast Revenue Requirement	C = A/B	2.08%

The supporting calculations for Table 3 can be found on page 4 of Appendix D. It should be noted that the estimated revenue requirement does not consider potential higher revenues from customer growth projects or the long-term benefit of a fully justified capital expenditure program on minimizing aggregate costs and consequently, revenue requirement.

If approved, the estimated increase in revenue requirement will be recovered from customers through the proposed rates, tolls and charges for electric service. Table 4 shows the estimated impact on revenue requirement expressed as a rate per kilowatt hour ("kWh").

Table 4 **Estimated Revenue Requirement Expressed as a Rate per kWh**		
Estimated Impact on Revenue Requirement (000s)	A	$5,186
2023 Forecast Sales (GWh)	B	1,391,749
Increase in Revenue Requirement ($/kWh)	C = A/B	$0.00373

The supporting calculations for Table 4 can be found on page 5 of Appendix D.

Using the rate per kWh calculated above, Table 5 provides an estimate of the increase in annual cost for electric service for the typical customer in each of Maritime Electric's rate classes based on a benchmark energy consumption.

Table 5 **Estimated Cost Increase by Customer Class**	
Annual Cost Increase for a Residential Customer, before tax[1]	$29.09
Annual Cost Increase for a General Service Customer, before tax[2]	$447.60
% Increase in Annual Cost for Rural Residential Customer	1.86%
% Increase in Annual Cost for Urban Residential Customer	1.90%
% Increase in Annual Cost for General Service Customer	1.83%

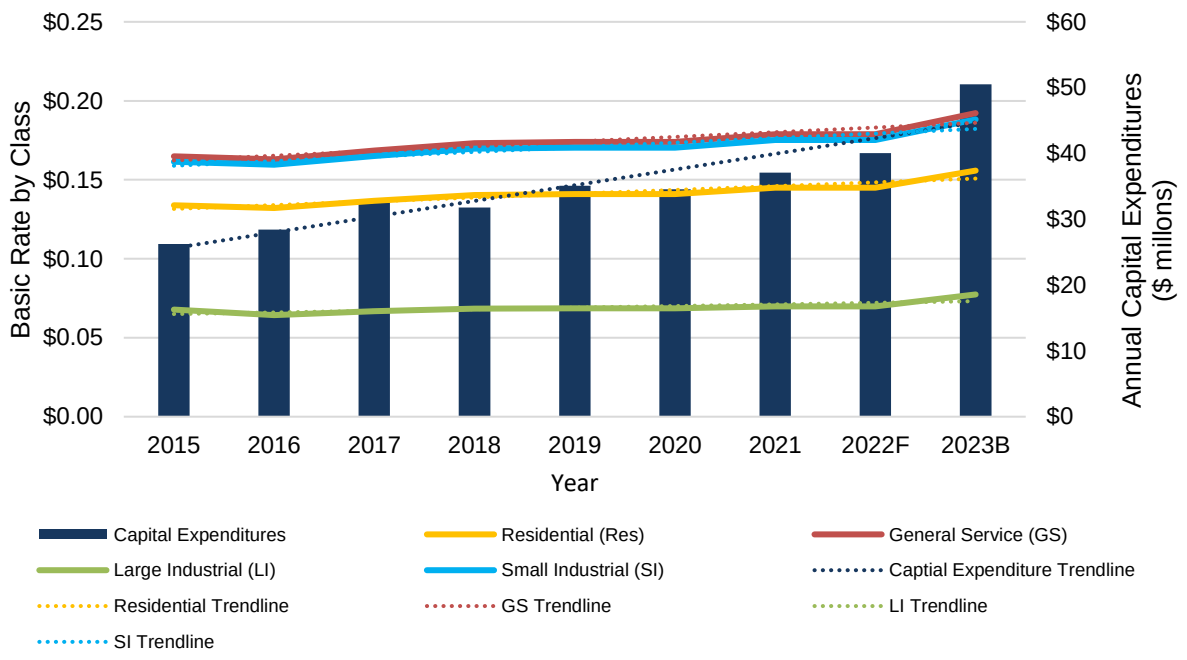
The supporting calculations for Table 5 can be found on page 5 of Appendix D.

Revenue requirement is the amount of revenue required from customers to cover the utility's cost of serving those customers, which includes operating costs, depreciation, financing charges, incomes taxes and the allowed return for the shareholder. Approved customer basic rates are set to recover the Company's forecast revenue requirement based on the forecast of customers' energy and demand.

[1] Based on a benchmark consumption of 650 kWh per month.
[2] Based on a benchmark consumption of 10,000 kWh per month and demand of 50 kW per month.

Figure 3 shows the actual historical capital expenditures since 2015, forecast expenditures for 2022 based on the approved 2022 Capital Budget, and the 2023 Capital Budget as proposed in this Application. Figure 3 also shows the energy charge per kWh over the same period for the four largest customer classes.[3]

Figure 3
Capital Expenditure and Basic Rates by Class



As shown by the capital expenditure trendline in Figure 3, the Company's capital investment has increased since 2015. Many factors influence customer rates and the relationship between a utility's investment in capital and customer rates is complex. The most direct impact of capital investment on rates is annual depreciation expense. However, additional revenue from increased sales driven by customer growth, and reduced maintenance costs resulting from capital upgrades, help to temper that rate impact. As such, the slope of the trendlines for customer basic rates over the same period are significantly less than the capital expenditure trendline.

[3] For customer classes with multiple energy rate blocks, only the first rate block is shown in Figure 3.

A fully justified capital expenditure program combined with efficient operations will minimize revenue requirement and provide the least cost electricity to ratepayers.

3.4 Capital Budget by Investment Classification

In a letter of direction to Maritime Electric on June 7, 2021, the Commission provided the Company with Investment Classifications to organize the projects and expenditures proposed in future capital budget applications. The Investment Classifications as identified and described in the letter of direction are repeated in Table 6.

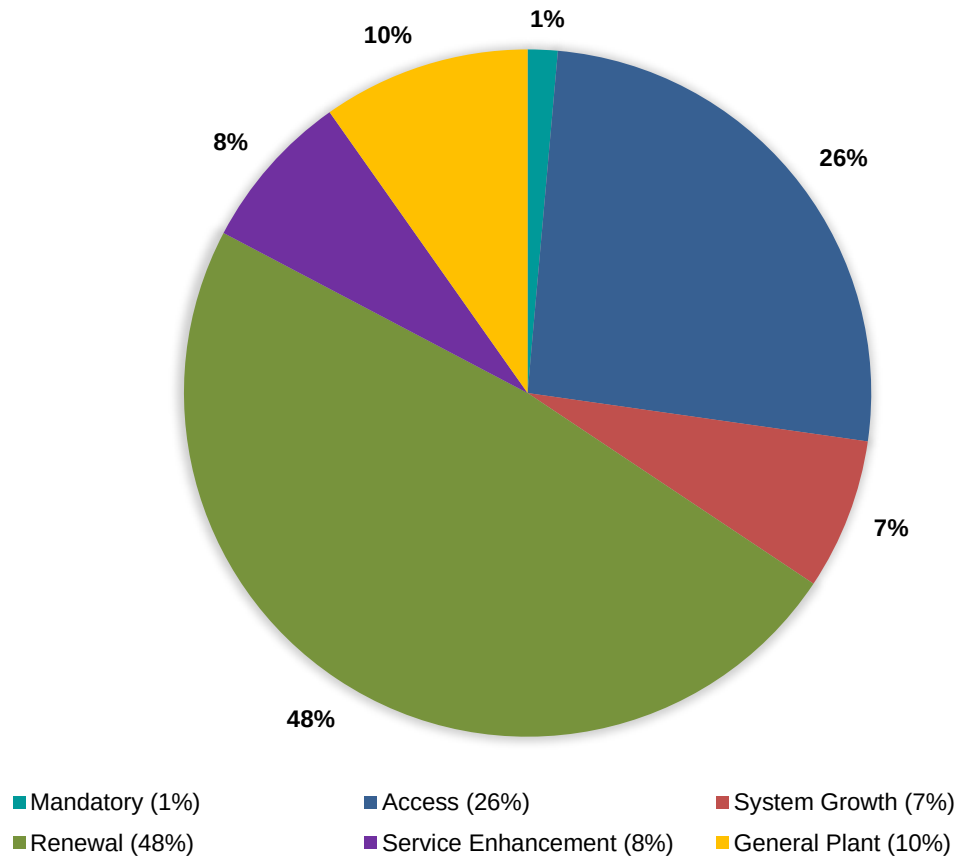
Table 6
Investment Classification Descriptions

Investment Classification	Description
Mandatory	Investments that are prescribed by a governing body, such as the Provincial Government or the Commission.
Access	Investments modifying (including asset relocations) the Company's electrical system that the Company is obligated to perform to provide a customer or group of customers with access to electric service.
System Growth	Investments that are modifications to the Company's system to meet forecast changes in customer electricity resource requirements.
Renewal	Investments replacing and/or refurbishing system assets on a like for like basis to extend their service life, and thereby maintain the ability to provide customers with their current electric services.
Service Enhancement	Investments that are modifications to the Company's system to meet system operations requirements in a more efficient and/or effective manner.
General Plant	Investments in the Company's assets that are not part of its generation, transmission and distribution system, including land and buildings, tools and equipment, and electronic devices and software used to support day to day business and operations activities.

Figure 4 shows the percentage breakdown of the 2023 Capital Budget by Investment Classification, which is provided in detail in Appendix E. While the Investment Classifications appear similar to the Capital Expenditures by Origin categories shown in Figure 1 of Section 3.2, direct comparison should not be made for some categories as the methodology used to assign a capital budget item to an Investment Classification or Expenditure by Origin category is materially different. For example, the Customer Load Growth category of Capital Expenditures by Origin includes a significant portion of new service connection costs (also including associated transformers and meter equipment)

whereas those same costs are included in the Access category of Investment Classifications.

Figure 4
2023 Capital Expenditures by Investment Classification



Proposed expenditures in each of the Investment Classifications are driven by capital projects, programs and activities in the underlying Generation, Distribution, Transmission and Corporate categories and are discussed as follows.

Mandatory

Planned expenditures in the Mandatory classification represent approximately 1 per cent of the 2023 Capital Budget. There is one Mandatory project in the Distribution category, which involves removing electrical equipment from service that contains polychlorinated biphenyl ("PCB") at a concentration above 50 parts per million ("ppm"), as required by Federal Government legislation. In the Transmission category, the substation oil contaminant program is classified as Mandatory, as its objective is to comply with the PEI *Environmental Protection Act* by preventing the discharge of a contaminant into the environment.

Access

Planned expenditures in the Access classification represent approximately 26 per cent of the 2023 Capital Budget and are primarily driven from the Distribution category. Access activities tend to be related to:

i. Customer requested work (e.g., service connections requiring transformers and meters, street and area lighting, and customer driven line extensions); and
ii. Third party requirements (e.g., system modifications to accommodate road alterations and make-ready work for communication companies).

While the direction of the Commission is to classify each capital project or expenditure into one of the Investment Classifications, an exception has been made for distribution transformers and system meters. For distribution transformers, a portion of the proposed budget is allocated to the Mandatory classification, as it will be used to remove and replace transformers containing PCB. The remaining balance of the distribution transformers and the system meters budgets, are proportionally allocated to the Access and Renewal classifications in accordance with the forecast transformer and meter quantities planned for addition or replacement. These exceptions were made to more accurately reflect actual expenditures on transformers and meters, whereas the same multi-classification allocation cannot be done for other budget items without subjective estimation. For distribution transformers, the budget allocation is 6 per cent Mandatory, 47 per cent

Access and 47 per cent Renewal. For system meters 64 per cent of the budget is allocated to Access and 36 per cent is allocated to Renewal.

System Growth

Planned expenditures in the System Growth classification represent approximately 7 per cent of the 2023 Capital Budget, with three projects in the Transmission category, all associated with the proposed Tignish substation.

Renewal

Planned expenditures in the Renewal classification represent approximately 48 per cent of the 2023 Capital Budget, distributed across the Generation, Distribution, and Transmission categories. In Generation, renewal projects are required to ensure that the Company's three combustion turbines are ready to operate when required. In Distribution, Renewal expenditures are associated with replacements due to storms, fires and collisions, polemount and padmount transformer replacements, distribution line rebuilds, distribution line/equipment refurbishment and replacement programs, and system meters. In Transmission, renewal projects represent the majority of the project and program work proposed to rebuild, refurbish, and modernize substation facilities and transmission line assets to current operating and safety standards.

Service Enhancement

Planned expenditures in the Service Enhancement classification represent approximately 8 per cent of the 2023 Capital Budget, all associated with the proposed Woodstock switching station project.

General Plant

Planned expenditures in the General Plant classification represent approximately 10 per cent of the 2023 Capital Budget, distributed across the Generation, Distribution and Corporate categories. In Generation, general plant projects are required to upgrade and replace various building and facility components that are necessary to support generation at that station. In Distribution, general plant expenditures are proposed to provide the tools and equipment required by operations personnel, as well as the transportation equipment

required across all departments. All projects in the Corporate category (i.e., all Corporate Services and Information Technology projects) fall within the General Plant classification.

3.5 System Reliability Performance and Improvement

a. System Average Interruption Duration Index

The only metric used by Maritime Electric for measuring its reliability performance is system average interruption duration index ("SAIDI"), which reflects the average outage time to the customer over a period of one year.[4] There are two SAIDI indices commonly used by utilities: (i) SAIDI (All In) measures reliability performance using outage data collected under all operating conditions; and (ii) SAIDI (MED Excluded) normalizes the outage data by removing significant outage events to reflect reliability performance under normal operating conditions (i.e., blue sky days). When a significant outage event that meets the criteria of a major event day ("MED") occurs, the customer outage time associated with that event is not included in the resulting SAIDI (MED Excluded). SAIDI (MED Excluded) was developed by the Institute of Electrical and Electronics Engineers ("IEEE") to address large outage data variances caused by major system disturbances that if otherwise included, would make it difficult to track changes to the reliability performance of the electricity supply system under normal operating conditions.

Historical SAIDI Performance

Figure 5 provides the SAIDI (All In) and SAIDI (MED Excluded) experienced by Maritime Electric customers over the ten-year period 2012 to 2021. The SAIDI (MED Excluded) data includes externally caused outages,[5] which are typically infrequent, with only one occurrence between 2012 and 2021.[6] (Given the scope of impact of an externally caused outage, it would be common for it to be recorded as a MED.)

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[4] Maritime Electric collects data for reporting on another reliability metric concerning outage frequency, but it does not use that data for measuring its reliability performance, as discussed in Section 3.5b.

[5] An externally caused outage for Maritime Electric is an outage resulting from the loss of supply from NB Power.

[6] The period referenced includes a severe wind, snow and ice storm on November 29, 2018 that resulted in a loss of supply from NB Power for approximately 8.2 hours.

Figure 5
SAIDI Performance 2012 to 2021

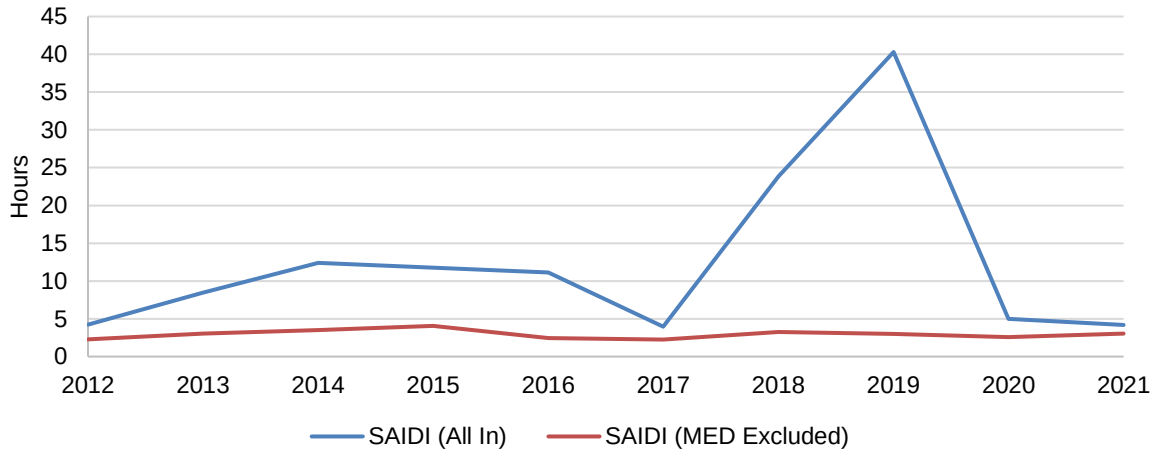


Figure 5 indicates that the Company's reliability as measured by SAIDI (MED Excluded) has been reasonably consistent over the past ten years, with the average duration of customer outage time ranging from 4.59 to 2.25 hours. This is a reflection of the Company's diligence in monitoring performance metrics and responding with the appropriate balance of operating controls and capital investments. Operating controls improve reliability through outage avoidance (e.g., live line work methods) and outage response (i.e., prompt and strategic to isolate problems quickly). Capital investments help to ensure that aged, deteriorated or overloaded components are replaced in a timely manner and provide for other system improvements that benefit customers over the life cycle of these investments.

Figure 5 also indicates that an increased frequency and severity of major storm events, demonstrated by SAIDI (All In), has exposed system deficiencies and highlights the importance of systematically identifying and replacing aged and deteriorated system components, as well as ensuring the electrical system is able to withstand the impact of major storm events.

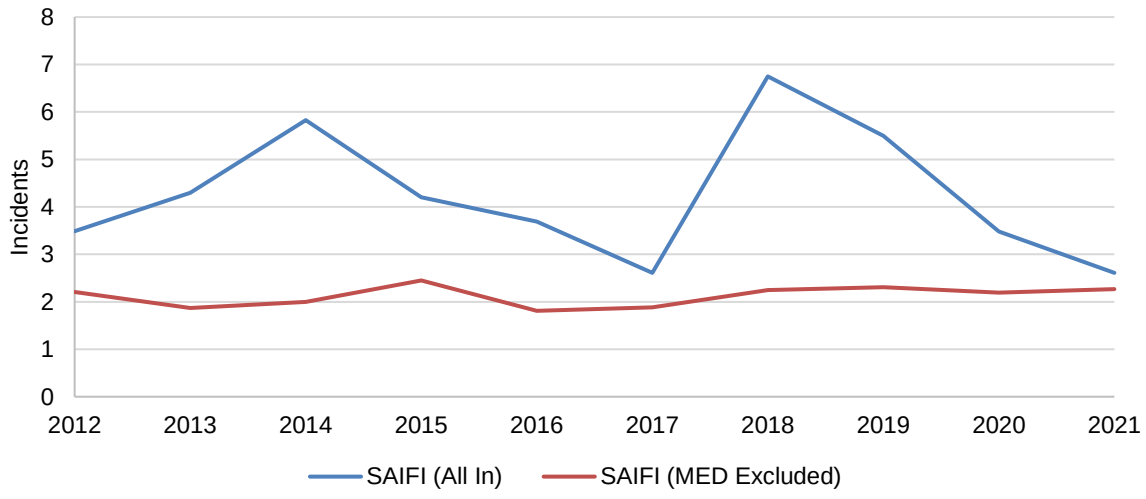
b. System Average Interruption Frequency Index

A second reliability performance metric is system average interruption frequency index ("SAIFI"). SAIFI reflects the number of interruptions to the average customer over a one year period. Similar to SAIDI, SAIFI can be reported for all operating conditions or with MEDs excluded. As previously indicated Maritime Electric only uses SAIDI for measuring reliability performance, but records both SAIDI and SAIFI data for reporting to Electricity Canada and the Commission.

Historical SAIFI Performance

Figure 6 provides the SAIFI (All In) and the SAIFI (MED Excluded) as experienced by Maritime Electric customers from 2012 to 2021. As with SAIDI, externally caused outages are included in the SAIFI (MED excluded) data.

Figure 6
SAIFI Performance 2012 to 2021



Maritime Electric does not use SAIFI to measure its reliability performance because there are some deficiencies in the Company's historical SAIFI records due to limitations within the Company's outage management software. These deficiencies are more pronounced with the SAIFI (All In); however, it affects the SAIFI (MED Excluded) data as well. Future investment in the Company's outage

management software will be necessary to support the utilization of SAIFI as a reliability performance metric.

c. <u>Benchmarking Against Similar Utilities</u>

Maritime Electric's SAIDI and SAIFI performance compared to the average performance of other Atlantic Canadian electric utilities ("Atlantic Utilities"), for the period of 2012 to 2021, is provided in Confidential Appendix N-1, Figures 1 to 4.[7]

Maritime Electric monitors and measures reliability performance by comparing its reliability metrics with that of neighbouring Atlantic Utilities. The Company uses a moving average to assess any trends in a reliability data set. Over the last five years, the moving average of Maritime Electric's SAIDI (MED Excluded) and SAIFI (MED Excluded), as provided in Confidential Appendix N-1, Figures 5 and 6, have shown a trend of relative stability. This indicates that the Company's reliability performance under normal operating conditions is reasonable and that programs to address aged and/or deteriorated system components have been effective in achieving stable SAIDI (MED Excluded) reliability performance.

While the Company's SAIDI (MED Excluded) reliability performance has been stable over the last five years, the moving average of SAIDI (All In) and SAIFI (All In), as shown in Confidential Appendix N-1, Figures 7 and 8, have generally been above the Atlantic Utilities average. This indicates that major weather events, such as ice or wind storms and system outage events on large feeders with limited backup capabilities, are having a negative impact on reliability performance. In Maritime Electric's view, having a reliability performance result that is equal to, or better than, the Atlantic Utilities average is a reasonable indicator of service quality and is consistent with the Company's obligation under the *Electric Power Act* to at all times provide reasonably safe and adequate service as changing conditions require. With this in mind, the Company has been focusing its efforts on improving SAIDI (All In) reliability performance.

[7] Information on the reliability performance of other Atlantic Utilities was obtained through Electricity Canada and is confidential to Electricity Canada member utilities.

Looking forward, the Canadian Standards Association ("CSA") has identified that "ice, snow and wind loads are perceived as the highest, most prevalent climate risk to the electrical sector across Canada."[8] Maritime Electric along with other key stakeholders are engaged with CSA as it undertakes extensive research and consultation concerning climate-related risks, impacts and best practices relevant to the Canadian electricity sector. This, along with a climate change vulnerability assessment, to be completed in 2022, will be used to assess climate change risks and thereby guide the Company's efforts to proactively mitigate any threats to the reliability performance of the electrical system.

d. <u>Feeder Reliability Performance</u>

Maritime Electric regularly compares feeder reliability performance to help identify where distribution system improvements are needed. This is done by gathering distribution outage data for a given period, subtotalling the data by feeder, and sorting the feeders based on average annual SAIDI contribution. Results change regularly, as new data is being generated with every outage. Using this approach, the SAIDI and SAIFI for Maritime Electric's ten feeders with the highest average annual outage hours from 2012 to 2021 were calculated and are listed in Tables 7 and 8, respectively, which is also compared with Maritime Electric's average feeder reliability performance.

Outage hours resulting from transmission and substation outages are upstream of feeders and, as such, are not relevant when identifying where feeder improvements are needed. For this reason, outage hours resulting from transmission and substation outages are excluded from the feeder data in both tables.

Outage records for feeders that were subdivided over the ten-year review period have been adjusted, such that only the outages hours associated with the current feeder configuration are included. This adjustment enables Maritime Electric to

[8] CSA Cross Country Stakeholder Workshop Phase II Final Report.

better identify and target areas where distribution system improvements are required.

The feeders with the highest outage hours under all operating conditions are shown in Table 7.

Table 7
Feeders with Highest Outage Hours from 2012 to 2021 Under All Operating Conditions

Circuit	Feeder	Average Yearly SAIDI Contribution	Average Yearly SAIFI Contribution	Feeder Length (kilometres)	Customer Count
Irishtown	KN80400	0.382	0.088	169	2,296
Tignish West	AL00295	0.308	0.062	252	2,825
Cavendish	BG56300	0.296	0.030	57	1,375
Eldon-Belfast	VC01440	0.200	0.042	209	1,519
Wellington East	WL02088	0.187	0.032	122	1,531
Crapaud	AB33125	0.181	0.048	101	1,236
St. Andrews	WP12200	0.178	0.020	21	299
Bedeque	AB33127	0.168	0.053	168	1,965
Wellington West	WL02002	0.146	0.028	218	1,810
Pooles Corner	GT00670	0.136	0.034	172	1,318
Maritime Electric Average Feeder		**0.070**	**0.017**	**65**	**1,124**

The feeders with the highest outage hours excluding MEDs and externally caused outages are shown in Table 8.

Table 8 Feeders with Highest Outage Hours from 2012 to 2021 Excluding MEDs and Externally Caused Outages					
Circuit	**Feeder**	**Average Yearly SAIDI Contribution**	**Average Yearly SAIFI Contribution**	**Feeder Length (kilometres)**	**Customer Count**
Tignish West	AL00295	0.112	0.048	252	2,825
Crapaud	AB33125	0.090	0.033	101	1,236
Bedeque	AB33127	0.071	0.041	168	1,965
Irishtown	KN80400	0.064	0.039	169	2,296
Eldon-Belfast	VC01440	0.048	0.028	209	1,519
Wood Islands	DV19005	0.038	0.020	139	1,390
Cavendish	BG56300	0.037	0.015	57	1,375
Wellington West	WL02002	0.031	0.019	218	1,810
Confederation	CO07100	0.030	0.026	14	2,055
Pooles Corner	GT00670	0.029	0.022	172	1,318
Maritime Electric Average Feeder		**0.018**	**0.11**	**65**	**1,124**

e. <u>Feeder Reliability Improvements Proposed for 2023</u>

Maritime Electric is in the process of adding reclosers, and/or communication to existing reclosers, on distribution lines outside of the substation for the Tignish West, Irishtown, and Cavendish feeders. These additions, which are included in the 2022 Capital Budget, will allow for automated switching during outages, enabling the Energy Control Centre ("ECC") to restore power to some customers before crews arrive onsite.

For 2023, Maritime Electric is proposing the Woodstock switching station project as described in Section 6.1c and the Tignish substation project as described in Section 6.1d.

The Woodstock switching station project will improve reliability on the Wellington East, Wellington West and Tignish West feeders, as it will establish a transmission loop in western PEI that provides an alternate path for supplying substations west of Sherbrooke, in the event of an outage on radial transmission lines T-5 and T-21, between Sherbrooke and O'Leary. It is estimated that this project will reduce annual customer outage hours in western PEI by approximately 55 per cent.

The Tignish substation project will improve reliability for customers currently on the Tignish West feeder by moving them to three new feeders serving the Tignish area. Currently, the Tignish feeder is 252 kilometre ("km") long and has 2,825 customers connected. Once the Tignish substation is in service, the average feeder will be 63 km long and will connect 706 customers, thereby decreasing the impact of outages in this area.

3.6 Planning Capital Investments

Maritime Electric makes capital investments in the electrical system to ensure that, as required by Section 3(a) of the *Electric Power Act*, it is sustained in a condition that provides reliable service to customers and it has sufficient capacity to meet customer requirements as individual and overall system loads increase. When planning these investments, the Company must balance the need to replace system components, based on average service life expectations, and expand the system as new customers are added. Failure to achieve a proper balance can result in future system deficiencies that affect safety, reliability and cost. Considering the Company's size, Maritime Electric has an appropriate process for planning capital projects as described in this section of the Application and all capital projects planned for 2023 are considered necessary for the Company to meet its obligations as a public utility.

a. Capital Planning Process

The Company's annual capital budget application outlines the projects, programs and activities that are necessary to meet system load requirements and provide safe and reliable service to customers. The items budgeted are required to: (i) connect new customers to the electrical system; (ii) replace equipment that has been damaged or failed as a result of storms other causes; (iii) meet health, safety and environmental regulatory requirements; (iv) improve reliability; (v) provide security of supply; (vi) ensure system cybersecurity; and (vii) strategically replace assets that have reached the end of their useful life.

The 2023 Capital Budget Application was based on the most recent information and analyses with respect to energy and load growth forecasts, asset inspection

and monitoring data, electrical system reliability performance, operations and business technology requirements, and other factors that may impact the timing of capital projects over the near term. In addition, the Company's ISP and DAMP both guide the planning of projects to meet anticipated longer term system and customer requirements.

The ISP identifies medium- and long-term system requirements based on a combination of historical system performance, load forecasting and professional engineering analysis, along with technological trends. For example, the ISP identifies major assets that need to be constructed or upgraded due to system load growth and/or age. The Marshfield substation, which is currently under construction, is an example of a load-growth-driven project and the Crossroads Substation Upgrade, also currently under construction, is an example of a project that is driven by a combination of load growth and age.

Complementary to the ISP, the DAMP ensures that distribution assets are prudently and effectively managed to balance system reliability, cost and risk of failure. It helps to ensure that sufficient overall investment is being made to:

i. Provide for the growth needs of customers;
ii. Provide safe, reliable and high-quality service; and
iii. Satisfy the first two principles in a way that minimizes long-term costs.

Inherent in the DAMP is the determination of optimal asset management practices. Such practices can include the differentiation between a high volume of individually low cost assets and a low volume of individually high cost assets. For example, Maritime Electric has a high volume of poles and polemount transformers that are, individually, relatively low cost with a reasonably maintenance free service life (400,000 hours for poles and 300,000 hours for transformers). In addition, because

pole and transformer failures often impact only a few customers, a replacement program that is based on an average annual replacement rate is acceptable.[9]

In contrast, Maritime Electric has a low volume of high cost substation equipment that upon failure affects a large numbers of customers (e.g., substation power transformers, breakers and switches). Therefore, capital programs that include stocking critical spares, and monitoring of individually high cost assets to detect problems and proactively address issues to avoid failure, is required.

The DAMP outlines the Company's general approach to identifying system needs for capital budget decision making; however, it is also important to note that dynamics outside of the Company's control can change project timing (in some cases with little or no advance notice). Examples of this include the addition of new commercial and large industrial customers and the electrification of space heating, which increased system load over the past several years. While the DAMP is specific to the distribution system, generation and transmission assets are managed in a similar fashion and are also subject to the influence of external factors.

Supply chain is another external dynamic that has the potential to change project timing if delays are not anticipated in advance. Supply chain shortages have been experienced on a global scale by electric utilities since the onset of the COVID-19 pandemic ("COVID-19") in early 2020 and are expected to continue into the foreseeable future. Maritime Electric has not been immune to this problem and has had to modify its capital planning, budgeting and procurement processes to address any delays that could impact new construction, system upgrades, asset replacement and Company's ability to meet its obligations under the *Electric Power Act*. With capital planning and budgeting, some projects that in the past could be completed in one year, now require two (or more) years to complete, once

[9] The DAMP recommends an average replacement rate of 850 transformers per year, based on approximately 34,000 transformers in service having an expected life of 40 years, and 2,600 wood poles per year, based on approximately 132,000 wood poles in service having an expected life of 50 years.

approved. Line operation vehicles in Section 5.8 – Transportation Equipment is an example of such a change, as vehicle down payments are budgeted for 2023 and the balance budgeted for 2024, making it a multi-year project. Substation power transformers are also subject to long deliveries and are now also purchased over more than one budget year, but usually within a larger project that is multi-year for other reasons. Supply chain shortages also have an impact on procurement management, as consideration has to be given to stocking critical spares and ordering extra inventory to have on hand in the event of future supply disruption. This is more applicable to materials required for recurring capital work that is beyond the control of the Company, such as replacements due to road alterations, storm restoration, services and street lighting, and customer driven line extensions. To manage potential inventory deficiencies, the Company carefully monitors internal and supplier stock, and makes ordering decisions based on current information. When the Company cannot replace an out-of-stock item from suppliers within the timeframe that is required, other options, including loans from other Fortis Inc. ("Fortis"), or neighboring utilities, are pursued.

The development of a capital budget includes an assessment of the effectiveness and progress of existing activities, and the identification of new cost-effective activities that achieve reliability, provision of service and safety objectives, while responding to customer demands, load growth requirements and other system dynamics. A balanced capital budget will pursue these objectives while considering the long-term costs to be borne by customers. Maritime Electric has developed the 2023 Capital Budget Application to achieve a just and reasonable balance of system needs and the interests of customers.

In addition to the Company's process for planning and forecasting electrical system capital projects, there is also a need to invest in work support services to meet health, safety and environmental ("HSE") regulatory requirements, communicate effectively with customers, provide functional and safe work facilities for employees, ensure a safe and reliable transportation fleet, and provide cyber secure information and operational technology solutions. The evidence provided

in this Application explains how the need for capital investment is determined, and why the capital projects planned for 2023 are necessary.

b. <u>Deferral in the Planning Process</u>

The process of determining the projects required for 2023 also considered whether projects could be deferred to a later date. Projects that are required to: (i) connect new customers to the electrical system; (ii) replace equipment that failed as a result of storm damage or other causes; or (iii) meet HSE regulatory requirements, typically, cannot be deferred. Projects to strategically replace assets that have reached the end of their useful life may, in theory, be deferred in the short term (i.e., one to two years).

The need to achieve an appropriate level of investment must be balanced against the overall risks associated with such deferrals. Therefore, annual capital expenditures are planned to avoid a long-term backlog of such capital projects; otherwise, the result would be an asset management program that is not achieving its sustainable objective.

As indicated, capital projects to strategically replace assets that have reached the end of their useful life may, in theory, be deferred in the short term. An example is the replacement of a distribution line that is aged and deteriorated. Such a project should only be deferred in the short term as a longer-term deferral runs the risk of multiple failures of that asset prior to replacement, resulting in unnecessary customer outages or an unsafe situation. Also, the replacement of failed assets is typically more expensive (e.g., when overtime is required) than a planned replacement. Always deferring to failure would be in direct contradiction to the Company's objective to provide reliable service at the least cost. Examples of capital projects that were identified in previous years but deferred until 2023 are provided in Table 9, and examples of capital projects originally planned for 2023 that have been deferred to subsequent years are provided in Table 10.

Table 9 2023 Capital Project Deferred from Previous Years	
Project	**Description**
Engineering Fixed Assets	The Company installed Fluke software in 2018 for managing its combustion turbine maintenance records. A capital project to utilize this software for managing substation maintenance records was planned for 2022, pending an evaluation of the Fluke software for that purpose. The evaluation process led to an alternative option being identified and selected as the preferred solution. This change to the proposed Cascade system, as described in Section 7.2e, resulted in the project being deferred to 2023.
Bloomfield to Elmsdale (Route 2) Line Rebuild	Five line rebuild projects were initially identified as necessary during the preparation of the 2022 Capital Budget. The Bloomfield to Elmsdale line rebuild was one of the five projects. With line construction resources in high demand due to the on-going PEI Broadband Project, it was decided that the four most urgent projects should be proposed for 2022, with one project deferred to 2023. The Bloomfield to Elmsdale line rebuild was selected for deferral as the other projects were more urgent due to condition of conductor or in need of voltage conversion to address power quality issues.

Table 10 Capital Projects Deferred from 2023 to Subsequent Years	
Project	**Description**
Alberton Substation Upgrade	The Alberton substation upgrade was previously planned for 2023 due to some components being aged and deteriorated, but has been deferred to 2026 to follow the completion of the proposed Tignish substation project, as described in Section 6.1d. With the Tignish substation, there will be a reduced load on the Alberton substation, as it will no longer serve the Tignish area. Also, the Tignish substation will be able to temporarily serve some of the Alberton substation load while it is being upgraded. By minimizing load on the Alberton substation prior to its upgrade, there will be more operational flexibility to complete work without interrupting supply to customers.
Communication Fibre – Church Road to Souris	Maritime Electric is in the process of upgrading communication from ECC to and between substations through the installation of fibre optic cable. This is expected to take several years to complete, with projects prioritized based on the communication technology in place at each substation location. The installation of communication fibre between the Church Road and Souris substations was previously planned for 2023 due to limitations of the current analog system, but has been deferred to 2026 as new facilities planned for western PEI will require communication connections to be installed over a three year period, from 2023 to 2025. Once the fibre work to support the new western PEI facilities is completed, the next priority will be to install communication fibre between Church Road and Souris substations.

Capital projects are scheduled to address known or anticipated issues related to age, condition, safety, capacity and reliability. While the Company endeavors to provide the most accurate forecast of future capital projects, unforeseen issues can arise causing the timing of projects to change, new projects to be added, and

in some cases, significant change to the scope of projects. As such, the List of Future Capital Projects provided in Appendix F, is based on current information. Changing information may result in a project being advanced to an earlier year, being deferred to a later year, or removed entirely. Examples of new information that could result in the deferral or removal of a project include:

i. Updated customer, energy and demand forecast. A reduced forecast could result in the deferral of a planned substation or distribution upgrade.
ii. Updated condition assessments of equipment. A piece of equipment that is aged but inspected and found to be in adequate condition could result in the deferral of a refurbishment or replacement project.
iii. Updated assessments of potential customer benefits. Changes in system costs or technologies may result in a project no longer being economic for customers, allowing the project to be deferred or eliminated.

The Company considers all available information in evaluating alternatives for meeting a particular system requirement. This can include solutions that do not require capital investments, such as transferring customer load to an adjacent substation when overload conditions arise. It can also include small capital investments to delay the full replacement of the asset, such as the replacement of component parts (e.g., switches) when reasonably practical. Each of these factors can result in the deferral of a project.

While the deferral of capital projects can and do occur, it must be recognized that the prolonged deferral of a project required to sustain the system can result in assets being unsafe for the public and Company employees, lead to more frequent outage events (especially during storm situations) and increase costs because it is often more time consuming to safely work on (or around) deteriorated assets. Similarly, the prolonged deferral of capital projects that are driven by load growth can lead to outages at times of high demand, low voltage situations that can damage customer assets (resulting in damage claims), and be harmful to critical

system components. Good utility practice requires consideration of all of these factors to develop and implement sustainable levels of annual capital investment.

c. <u>Capital Cost Accounting</u>

Maritime Electric follows Canadian private entity Generally Accepted Accounting Principles ("GAAP"), which allows reference to other guidance including accounting principles established in the United States. In the United States, the Federal Energy Regulatory Commission ("FERC"), which regulates the transmission and wholesale sale of electricity, developed a Uniform System of Accounts ("USofA") for the financial accounting of regulated utilities. Following the FERC USofA is considered good utility practice in Canada. According to FERC, to capitalize project costs, the costs must meet the following two qualifications:

1. Extend the life, increase the capacity, or improve the safety or efficiency of an existing asset owned by a company; and
2. Improve the condition of that asset after the costs are incurred, as compared with the condition of that asset when originally constructed or acquired.

The overall management of the electrical system also includes the identification of critical components that upon failure would affect a large number of customers. If these components are difficult to source or have a significant delivery time, it is considered prudent to secure critical spares.

Under the "used and useful" concept, only system equipment (or "plant") that is currently providing or capable of providing utility service to customers is to be included in rate base. However, maintaining critical spares is an essential component of the requirement to provide least cost, reliable service. To address this need, FERC and most regulators allow "plant held for future use" to also be included in rate base provided there is a definite plan for its use (i.e., it is intended for a very specific and essential purpose). This approach is consistent with recognized accounting standards as indicated below.

According to Chartered Professional Accountants Canada Handbook, Part II Accounting Standards for Private Enterprises, Section 3061.03:

> *"Spare parts and servicing equipment are usually carried as inventory and recognized in net income as consumed. However, major spare parts and standby equipment qualify as property, plant and equipment when an entity expects to use them during more than one period. Similarly, if the spare parts and servicing equipment can only be used in connection with an item of property, plant and equipment, they are accounted for as property, plant and equipment."*

International Accounting Standard ("IAS"), IAS16, paragraph 8 includes the following discussion:

> *"Spare parts and servicing equipment are usually carried as inventory and recognized in profit or loss as consumed. However, major spare parts and stand-by equipment qualify as property, plant and equipment when an entity expects to use them during more than one period. Similarly, if the spare parts and servicing equipment can be used only in connection with an item of property, plant and equipment, they are accounted for as property, plant and equipment.*
>
> *For rate-making and reporting purposes, in most cases major spare parts and stand-by equipment (e.g., transformers and meters) should be accounted for as property, plant and equipment capital assets, as it is expected that:*
>
> *a. these items are not held for sale in the ordinary course of business or to be consumed in the production process or rendering of services;*

b. they have a longer period of future economic benefit as compared to inventory items;

c. they form an integral part of the original distribution plant by enhancing the system reliability of the original distribution plant; and

d. they embody future economic benefits because they are expected to be placed in service."

Based on the above, Maritime Electric considers investment in critical spares as part of the capital planning process and, as such, these capital assets are properly included in rate base.

3.7 Budget Components and Process

The type and scope of each capital project or program proposed in this Application determines the relative balance of internal labour, external labour, materials, equipment and other resources that are budgeted to complete the proposed work.[10] An overview of each of these budgetary components and how they are incorporated into the estimating process is provided as follows.

a. Internal Labour and Transportation

Maritime Electric generally constructs, monitors and services its own assets and, as such, most capital project and program cost estimates include an internal labour component. Furthermore, because the nature of the work and the disbursement of assets across the Island requires access to a fleet of vehicles to perform this work, the internal labour cost includes associated transportation costs.

Internal Labour

The Company's capital investment is based on a least cost approach with internal labour mainly provided by a unionized workforce under a Collective Agreement

[10] A capital project is typically associated with a specific undertaking with activities in a defined location and a completion timeframe of less than a year (although some larger projects can be multi-year). A capital program is typically designed to address a specific issue at multiple locations over a period of several years.

with Local 1928 of the International Brotherhood of Electrical Workers. Internal labour also includes non-union positions typically for planning, engineering support, project management, field supervision and administration. The Collective Agreement establishes the negotiated hourly rates of the unionized workforce for regular, overtime and double-time work. Salaries for non-union positions are determined using a structured Korn-Ferry process that reflects job functions and comparable employment in the region. Therefore, internal labour costs are supported by either a negotiated Collective Agreement or comparison to regional benchmarks.

Transportation

The Company operates five classes of vehicles in its fleet: (i) passenger vehicles; (ii) pickup trucks; (iii) vans; (iv) 1 to 3 ton trucks; and (v) trucks over 3 tons. The cost to operate these vehicles includes fuel, insurance, registration, maintenance, parking, washing and lease costs (when applicable). For budgeting, an hourly rate for each class of vehicle is calculated based on the total operating costs for the previous year. Vehicles are assigned to employees by the type required and the hourly vehicle rate is combined with the employee hourly rate resulting in an internal labour and transportation rate for that employee position.

Standard Distribution of Costs

For each capital project or program proposed in this Application, a total cost of internal labour and transportation is provided. Internal labour and transportation costs are allocated to operating and capital accounts using a standard distribution approach that is based on the scope of activities and responsibilities for each employee, both union and non-union. For example, it is estimated that in 2023, an Engineering and T&D Utility Person (“Surveyor”) will spend approximately 75 per cent of their time working on capital activities, approximately 5 per cent on operating activities and approximately 20 per cent on asset removal and retirement. The capital component of standard distribution related to labour and transportation for the Surveyor position is further broken down in Table 11.

Table 11 Capital Accounts Standard Distribution of Surveyor Labour and Transportation	
Capital Budget Category	**Per cent Allocation**
5.3 Services and Street Lighting	35%
5.4 Line Extensions	20%
5.5 Line Rebuilds	20%

The standard distribution of labour and transportation costs is reviewed and updated annually to ensure that it accurately allocates costs to the appropriate accounts based on the planned capital and operating activities for that year. If actual activities differ significantly from what was planned, the standard distribution allocations are updated accordingly. The use of standard distribution is a cost-effective approach that results in an appropriate allocation of labour and transportation to operating and capital activities.

b. <u>External Labour</u>

Maritime Electric engages external consultants and contractors to perform work that the Company does not have sufficient internal labour resources to perform or, in some instances, the necessary experience, expertise or equipment to do the work safely. The specifics of each capital project or program in this Application dictates whether or not external labour is required.

Contractor labour is typically sourced locally through fixed-term agreements (one-year or multi-year contracts) or a competitive bidding process. Fixed-term agreements are more applicable to distribution and transmission line projects involving line crews, vegetation management crews and traffic control crews. Such agreements establish hourly contractor rates that apply to planned work as well as unplanned system events that require external resources (e.g., storm response). Similar to internal labour, hourly rates for contractor labour typically include a transportation cost component. An example of a fixed-term agreement for traffic control services is provided in Confidential Appendix N-2.

A competitive bidding process is used where fixed-term agreements are not in place. A competitive bidding process is sometimes used even where a fixed-term agreement is in place in order to check that the rates specified in the fixed-term agreement are reasonably competitive. An example of a past call for tender and associated bid submissions for vegetation management work is provided in Confidential Appendix N-3.

c. Materials and Equipment

Maritime Electric typically procures materials and equipment for capital projects and programs through competitively sourced standing offer material supply contracts or job-specific material and equipment tenders. The Company has also benefitted from its affiliation with other Fortis companies. For example, in the past, the group purchasing of poles with Newfoundland Power resulted in a lower price than the Company could have secured on its own. The Company also participates in Fortis group tendering for transformers but purchases directly from the chosen supplier at the tendered prices.

Materials for capital projects and programs are incorporated into proposed budget amounts using the unit cost of each specific item that has been entered into the Company's financial inventory system which is based on competitively sourced or standing offer pricing.

d. Estimating Capital Expenditures

Capital projects tend to be localized to a community level with durations measured in weeks or months (e.g., rebuilds and line extensions). Capital programs typically address the upgrading or replacement of equipment, parts and tools on an as required provisional basis, or specific system issues that require a longer term and Island-wide approach to effectively monitor, maintain and/or replace capital assets (e.g., substation modernization, distribution line refurbishment, eastern cedar pole and deteriorated conductor replacement, backlot feed relocations, etc.).

Maritime Electric incorporates a variety of methods to estimate proposed capital expenditures. An overview of how the Company typically estimates budgets for line construction and asset replacement activities is provided below.

Capital projects tend to require a more detailed consideration of costs that cannot be reasonably estimated using broad assumptions. For example, a kilometre ("km") of three phase line construction can vary considerably by location due to variations in work methods and/or the extent of requirements for traffic control, vegetation clearing, travel time, etc. This being the case, the Company estimates project costs based upon the labour, material, equipment and other resource requirements, as well as consideration of job-specific factors. The job-specific factors for each line construction project proposed in this application are outlined in the project descriptions provided in Appendices G, H and L.

For capital programs, recent historical data is often adequate to estimate unit costs that can be extrapolated to quantify the program scope (e.g., the number of eastern cedar poles replaced within budget allocations of previous years). Use of historical cost data is more applicable to capital programs that span several years than it is to customer or event-driven provisional allocations (e.g., storm response, system modifications due to road alterations, new service connections, etc.).

As outlined above, distribution and transmission line construction projects are estimated on a job-by-job basis to ensure that the proposed budget allocation is as accurate as possible. Material estimates are prepared using the Company's survey system which has an integrated material database that is updated regularly.[11] The estimating process involves, but is not limited to, the following steps and considerations:

[11] The survey system is an in-house developed software application that is used to assign survey work, track its status, specify material and labour requirements, estimate costs, and prepare jobs for assignment to line crews and technicians.

Project Definition

- Project scoping with input from Maritime Electric professional engineering staff and the district superintendent where the project will be located;
- Determination if the line extension or rebuild will be constructed on the same side or opposite side of the road relative to the existing line;
- Identification of any environmental restrictions or special considerations that will affect the project;
- Selection of conductor type based on current and future load requirements;
- Determination of joint-use status and scope conversion requirements, if applicable; and
- Determination of pole span requirements based on the selected conductor and the joint-use requirements.

Construction Cost Factors

- Pole height and hardware requirements are based on line type, rights of way topography, roadway clearances and space for joint-use attachments, if applicable;
- Quantity and height of tangent pole, single pin turn, double pin turn, running angle turn and double dead-end corner structures;
- Amount of conductor and neutral wire required, allowing for sag;
- Number of primary service take-offs to customer premises, and related quantity of primary wire and cutouts;
- Number of transformers to be removed/installed and associated requirements for secondary wire;
- Number of street lights that need to be removed/installed; and
- Requirements for traffic control, vegetation clearing, special pole supports (culvert and gravel), portable washrooms, job trailers, snow removal from ditches, equipment rental, lodging crews, etc.

An estimate template is used in conjunction with the survey system, which allows the incorporation of job- and site-specific factors that can impact the overall project cost. This may involve applying contingency amounts to the labour components of the job. Also, as already noted, heavy vegetation, high speed or high volume traffic,

and requirements for hot-line work are examples of job- and site-specific factors that can cause similar sized jobs in different locations to vary considerably in cost.

Inflation and Supply Chain Considerations

Annual adjustments for inflation in Maritime Electric's capital budget applications over the past several years have typically been in the 2 to 3 per cent range. This has usually been adequate to cover increases in external and internal labour rates, which tend to be across the board, and increases in equipment and material costs, which can vary but tend to average out.

Over the past two years, coinciding with COVID-19, Maritime Electric has experienced above normal inflation and supply chain delays on some equipment and materials that it relies upon to operate the electrical system. Increased capital expenditures due to inflation have led to over-budget variances on some projects, and supply chain delays have led to capital budget carryovers being required. In 2021, an example of the former is the project to relocate the Backup Control Centre ("BCC") at West Royalty Service Centre ("WRSC"), which cost 65 per cent more than expected. An example of the latter is the Rattenbury power transformer upgrade project, where the original transformer delivery date of October 15, 2021 was delayed by five months, and delivered on March 14, 2022.

It is expected that inflation and supply chain delays will continue to impact the projects and programs proposed in the 2023 Capital Budget Application; however, to the extent possible, the proposed expenditures and project completion timelines indicated in the Application are current in terms of labour, equipment, and material cost, as well as resource/product availability.

The 2023 Capital Budget is approximately 25 per cent higher than the 2022 Capital Budget. The primary reasons for the increase include:

a. More investment needed to meet aged asset replacement, customer and associated load growth, and system reliability obligations; and

b. Inflation pressures associated with supply and demand for labour, equipment and materials.

Based on a review of the projects proposed in the 2023 Capital Budget Application, approximately $5.2 million, or 50 per cent, of the increase over 2022 is attributed to inflation. Capital budget items that have estimated cost increases above recent typical inflation factors of 3 per cent on materials and 2.5 per cent on labour include:

a. Line construction equipment and material (i.e., poles, conductors, insulators, installation hardware, etc.) cost increases up to 15 per cent;
b. Polemount and padmount transformer cost increases up to 50 per cent;
c. Large substation power transformer cost increases up to 60 per cent; and
d. Computer hardware and software cost increases up to 12 per cent.

To minimize the impact of supply chain delays that could result in the need to carry over budget allocations into 2024, Maritime Electric will place orders for long delivery items at the earliest possible dates in 2023.

Contingencies

Contingency amounts are included in some cost estimates to allow for unforeseen costs associated with project uncertainties. Cost uncertainties are common in unique or complex projects as well as when the timeframe between estimating and incurring costs is protracted.

Contingency amounts (typically between 5 and 30 per cent) are determined based on the estimator's judgement/experience, the level of project definition (i.e., percentage of detailed engineering completed) at the time the cost estimate was prepared, the number of potential bidders for a project (i.e., sole source projects often require higher contingencies), and the complexity of the project. When setting contingency amounts, Maritime Electric compares historical project costs to budgeted project costs and adjusts contingency amounts accordingly.

Maritime Electric cost estimates often include contingencies similar to those published in the American Association of Cost Estimating ("AACE") International's Recommended Practice 18R-97, as shown in Table 12. With this cost estimating methodology, contingencies vary based on the class of cost estimate prepared.

Generation projects tend to include contingency amounts because they are often unique "one-of" projects compared to Distribution, Transmission and Corporate projects. Contingency allocations are often not budgeted for capital programs, line construction and corporate projects, as they tend to be similar from year to year and the estimator has actual expenditures from the previous years to base the estimate upon. However, exceptions are required when the projects are complex (e.g., energized rebuild work or the development of a customized software application) and when civil works are involved (e.g., construction of substations and other facilities). In such cases, these projects are also typically estimated to an AACE Class 2 or Class 3 level.

Table 12
AACE International's Recommended Practice for Cost Estimating

	Primary Characteristic	*Secondary Characteristic*			
ESTIMATE CLASS	**LEVEL OF PROJECT DEFINITION** Expressed as % of complete definition	**END USAGE** Typical purpose of estimate	**METHODOLOGY** Typical estimating method	**EXPECTED ACCURACY RANGE** Typical variation in low and high ranges [a]	**PREPARATION EFFORT** Typical degree of effort relative to least cost index of 1 [b]
Class 5	0% to 2%	Concept Screening	Capacity Factored, Parametric Models, Judgment, or Analogy	L: -20% to -50% H: +30% to +100%	1
Class 4	1% to 15%	Study or Feasibility	Equipment Factored or Parametric Models	L: -15% to -30% H: +20% to +50%	2 to 4
Class 3	10% to 40%	Budget, Authorization, or Control	Semi-Detailed Unit Costs with Assembly Level Line Items	L: -10% to -20% H: +10% to +30%	3 to 10
Class 2	30% to 70%	Control or Bid/ Tender	Detailed Unit Cost with Forced Detailed Take-Off	L: -5% to -15% H: +5% to +20%	4 to 20
Class 1	50% to 100%	Check Estimate or Bid/Tender	Detailed Unit Cost with Detailed Take-Off	L: -3% to -10% H: +3% to +15%	5 to 100

Notes: [a] The state of process technology and availability of applicable reference cost data affect the range markedly. The +/- value represents typical percentage variation of actual costs from the cost estimate after application of contingency (typically at a 50% level of confidence) for given scope.
[b] If the range index value of "1" represents 0.005% of project costs, then an index value of 100 represents 0.5%. Estimate preparation effort is highly dependent upon the size of the project and the quality of estimating data and tools.

4.0 GENERATION $1,540,000

Maritime Electric's two on-Island generating stations, which are primarily backup supply sources, are equipped as follows:

Borden Generating Station ("BGS")	2 Generators	40 MW (total)
Charlottetown Generating Station ("CGS")	1 Generator	50 MW

The BGS is the site where Combustion Turbine 1 ("CT1") and Combustion Turbine 2 ("CT2") are located. The CGS is the site where Combustion Turbine 3 ("CT3") is located. The primary role of Maritime Electric's on-Island generation is to supply energy in times of curtailment from off-Island energy suppliers, or during transmission line outages or curtailments on either PEI or the mainland. Other benefits of having on-Island generation include reduced purchased capacity costs and the ability to provide backup for the four submarine cables connecting PEI to the mainland.[12]

The Generation component of the Capital Budget is comprised of projects required to maintain the generating stations in a state that enables the Company to meet reliability and safety requirements. These requirements are specified in the Company's Energy Purchase Agreement ("EPA") with NB Power, health and safety regulations, provincial pressure vessel inspector recommendations, insurance requirements and contingency plans.

4.1 Charlottetown Generating Station - Buildings and Site Services *$ 113,000*

This category includes CGS expenditures required for buildings and site services projects, which includes necessary refurbishments, replacements and upgrades to the ECC, BCC and to infrastructure within the CGS site.

The ECC provides continuous 24-hour monitoring and operation of Maritime Electric's electrical system by performing functions such as energy purchases, load and wind

[12] Having dispatchable on-Island generation enables Maritime Electric to purchase interruptible energy which is less costly than non-interruptible (or "firm") energy. Also, it puts an upper limit on the cost of purchased energy (i.e., when the price is too high, the energy can be produced by running the on-Island generation).

forecasting, generation dispatch and line crew dispatch. The ECC building, located on Cumberland Street in Charlottetown, was constructed in 1976. The BCC, located at WRSC, is equipped to serve as the control centre for Company operations in the event that the ECC is not available for any reason. The BCC has also been used concurrently with the ECC to segregate operators into cohorts in accordance with the Company's pandemic response operational plan.

The CGS site encompasses the following infrastructure inside the fence line at the Cumberland Street site: ECC building; 69 kilovolt ("kV") Charlottetown Plant substation; substation control building; 69 kV capacitor bank; 50 MW CT3; X4 step-up power transformer and auxiliaries; fuel storage, containment and offloading facility; machine shop; and storage building.

A breakdown of the historical expenditures, 2022 budget and the proposed 2023 budget allocation for CGS buildings and site service projects is shown in Table 13.

Table 13
Historical and Proposed Expenditures
CGS Buildings and Site Services[a]

Description	2018	2019	2020 [b]	2021[c]	2022 Budget	2023 Budget
Material	$ 87,126	$ 44,298	$ 226,327	$ 136,535	$ 26,000	$ 95,000
External Labour	-	17,937	61,251	23,171	-	-
Internal Labour and Transportation	11,100	35,750	6,639	6,612	4,000	18,000
Other	11,805	-	2,238	5,935	-	-
TOTAL	**$ 110,031**	**$ 97,985**	**$ 296,455**	**$ 172,253**	**$ 30,000**	**$ 113,000**

a Prior to 2022, the equivalent Generation subcategory was identified as Charlottetown Plant Buildings and Services Projects.
b. Includes $26,538 for 2020 projects carried over and completed in 2021.
c. Includes $66,000 budgeted for 2021 projects carried over to be completed in 2022.

a. <u>ECC Facility and Equipment Upgrades</u> (Justifiable) $ 78,000

This project includes upgrades to the ECC meeting room audio visual components, replacing ECC and BCC operator chairs, installing bicycle racks and replacing a deteriorated portion of the fence along Cumberland Street.

The ECC meeting room is the only such designated space in the ECC building and at the CGS site. It is used for Maritime Electric internal meetings as well as meetings with contractors, consultants, government officials and others. The meeting room has capacity for ten people and is equipped with a conference phone and a projector. Since the onset of COVID-19, the frequency in which virtual meetings are held has significantly increased. This project includes upgrades to the audio visual components in the ECC meeting room to better facilitate virtual meetings.

The position of ECC operator is staffed every hour of the year and involves primarily desk work from a seated position in the control room. This project includes the replacement of the ECC and BCC operator chairs, which were originally purchased in 2017. The replacement model is identical to the existing operator chairs, which provide industry standard ergonomics.

Maritime Electric promotes the use of sustainable transportation and a healthy lifestyle for employees but does not have a dedicated storage location for bicycles at ECC, BCC and CGS. This project includes the purchase and installation of bicycle racking at these locations.

A portion of the property along Cumberland Street is fenced to separate the unloading bay of the Richmond Street storage building from a public walkway. This portion of fencing and its extension to the edge of the property were installed during public accessibility modifications in approximately 2005. The fence is wooden and deteriorated, posing a safety risk and liability concerns. This project includes the replacement of the existing fence with an upgrade in material from wood to steel.

The upgrade in material is to increase the life expectancy of the asset and to match existing fencing along the ECC southern perimeter.

Justification

The proposed ECC facility and equipment upgrades are justified on the need to replace aged and deteriorated assets due to safety concerns, and ensure that employees stationed at the ECC and BCC are provided with a functional, efficient, and sustainable working environment.

Costing Methodology

The proposed budget allocation is based on a combination of professional engineering estimates for internal labour and vendor quotations.

A breakdown of the proposed budget for ECC facility and equipment upgrades is shown in Table 14. A contingency has been budgeted as this is a one-of project, the vendor quotation may need to be refreshed, some project component costs were estimated, and to accommodate minor adjustments in scope of supply that are commonly required with this type of project.[13]

Table 14
Breakdown of Proposed Budget Allocation
ECC Facility and Equipment Upgrades

Description	**Budget**
Materials and External Labour	$ 65,000
Internal Labour and Transportation	3,000
Contingency (15 per cent)	10,000
TOTAL	**$ 78,000**

Supporting information for the cost estimates included in Table 14 is provided in Confidential Appendix N-4.

[13] See Contingencies in Section 3.7d – Estimating Capital Expenditures.

To ensure this project is completed at the lowest possible cost, consistent with safe and reliable service, all materials and external labour will be obtained through competitive procurement processes.

The expected start date for the project is January 2023 with in-service dates throughout the year.

Alternatives

Alternative materials and equipment were reviewed and evaluated for each component of this project. The selected components satisfy the minimum requirements of the upgrade and utilize quality materials, where economical, to increase the life expectancy of the assets. Maritime Electric ECC operators and industry peers were consulted in the review of alternatives. Cost, durability and operation were all considered in selecting the preferred solution.

Future Commitments

This is not a multi-year capital budget commitment.

b. <u>CGS Miscellaneous Building and Site Upgrades</u> (Recurring) $ 35,000

As CGS buildings and site services age, upgrades are required each year to address deteriorated components. Experience indicates that unplanned and emergency events will also occur that require capital replacements, refurbishments and upgrades. Performing necessary replacement, refurbishment and upgrade work in a timely manner, when the need arises, helps to ensure that CGS facilities remain in adequate condition for the safety of employees and to avoid costly emergency repairs or replacements.

As the projects under this budget category are unplanned and identified on an as-required basis, cost projections at the item level cannot be determined in advance and, therefore, the proposed budget allocation is provisional.

Justification

The proposed provisional budget allocation is justified on the obligation to ensure the efficient and safe operation and use of CGS facilities. For this reason, when projects arise throughout the year, they cannot be deferred.

Costing Methodology

A breakdown of the historical expenditures, 2022 budget and the proposed 2023 budget allocation for CGS miscellaneous building and site upgrades is shown in Table 15. Reduced expenditure requirements in 2021, 2022 and 2023 reflect the retirement of the Charlottetown Thermal Generating Station ("CTGS") at the end of 2021.

Table 15
Historical and Proposed Expenditures
CGS Miscellaneous Building and Site Upgrades

Description	2019[a]	2020[a,b]	2021[c, d]	2022 Budget	2023 Budget
Material	$ -	$ 67,092	$ 23,531	$ 9,000	$ 20,000
External Labour	14,837	45,550	-	-	-
Internal Labour and Transportation	6,000	5,790	1,120	-	15,000
Other	-	4,781	-	-	-
TOTAL	**$ 20,837**	**$ 123,213**	**$ 24,651**	**$ 9,000**	**$ 35,000**

a. In the 2019 and 2020 Capital Budgets, the equivalent item was under 4.1c Charlottetown Plant Miscellaneous Buildings and Services and prior to 2019, there was no equivalent item (i.e., it was consolidated with all Charlottetown Plant Buildings and Services Projects).
b. Includes $26,538 for 2020 projects carried over and completed in 2021.
c. In the 2021 Capital Budget, the equivalent budget allocation is listed as item iii in Table 9 of Section 4.1a.
d. Includes $3,000 budgeted for 2021 projects carried over to be completed in 2022.

To ensure projects are completed at the lowest possible cost, all material and external labour contracts will be obtained through competitive procurement processes. In situations where there are no competitive contractors in the service area, the Company will negotiate the best possible pricing.

The expected start date for the project is January 2023 with completion dates throughout the year.

Alternatives

Alternatives will be considered at the time when CGS miscellaneous building and site upgrades are identified, as required.

Future Commitments

This is not a multi-year capital budget commitment; however, it is a recurring provisional capital requirement that is budgeted annually.

4.2 Charlottetown Generating Station – Turbine Generator *$ 349,000*

This category includes expenditures associated with the generation equipment located at the CGS, which includes CT3 and ancillary systems.

The CT3 ancillary systems include the following: ventilation and combustion air system; lube oil system; instrument air system; liquid fuel system; fire protection system; generator excitation system; vibration monitoring system; and balance of plant equipment. The capital projects proposed in this category are critical to ensuring CT3 is in a state that it is ready to operate on demand.

A breakdown of the historical expenditures, 2022 budget and the proposed 2023 budget allocation for CGS turbine generator projects is shown in Table 16.

Table 16 Historical and Proposed Expenditures Charlottetown Generating Station - Turbine Generator[a]						
Description	**2018**	**2019[b]**	**2020[c]**	**2021[d]**	**2022 Budget**	**2023 Budget**
Material	$ 550,742	$ 864,105	$ 154,095	$ 567,007	$ 198,000	$ 312,000
External Labour	12,280	46,927	16,841	634	300,000	8,000
Internal Labour and Transportation	131,403	104,759	4,578	139,565	26,000	29,000
Other	6,483	3,231	2,658	15,625	-	-
TOTAL	**$ 700,908**	**$1,019,022**	**$ 178,172**	**$ 722,831**	**$ 524,000**	**$ 349,000**

a. Prior to 2022 the equivalent Generation category was identified as Charlottetown Plant Turbine-Generator Projects.
b. Includes $695,977 for 2019 projects carried over and completed in 2020.
c. Includes $10,067 for 2020 projects carried over and completed in 2021.
d. Includes $40,000 budgeted for a 2021 project carried over to be completed in 2022.

a. CT3 Fuel Forwarding Building Upgrades (Justifiable) $ 114,000

This project involves upgrades to the CT3 fuel forwarding building to add fire detection devices, improve operator access to critical components, and upgrade CT3 lube oil storage.

The fuel forwarding building contains critical infrastructure for the supply of clean, temperature appropriate fuel to CT3. The fuel forwarding infrastructure was originally constructed in 2005 and renovated to be enclosed with walls and a roof in 2007. The fuel forwarding building contains pumps, filters, heaters and several critical instruments which direct fuel between tanks and to CT3. Access to the building is through two existing person doors.

The presence of diesel fuel, electrical heating elements, and electrical components inside the fuel forwarding building creates a risk of fire. To date, there has not been an event resulting in fire inside this building; however, to mitigate employee safety hazards, building damage, and loss of supply risks due to fire, it is recommended by Maritime Electric insurers that fire detection and communication be installed.

Dedicated walkways inside the fuel forwarding building are restricted due to piping and equipment placement in a limited footprint. Operator access to critical components on the north side of the building are via fixed ladders and a catwalk. Daily rounds, regular preventive maintenance activities and CT3 operation result in CT3 operators frequently accessing the north side of the building. Personnel are required to climb ladders, often with tools or other materials, which presents an employee safety risk. Improving accessibility by adding an extension to the exterior catwalk and a third building entrance, significantly reduces the risk of employee injury and improves accessibility for maintenance and operation.

There are nine different types of lubrication oil and several specialized greases used to reduce friction in rotational components of CT3. Oil stored in bulk storage barrels and smaller containers is commonly used for preventative maintenance and operation, and is stored in several locations around the CGS site. The consolidation of product will mitigate environmental risk associated with loss of containment, operational risk associated with inventory management, and safety hazards associated with product storage manipulation. While the location for CT3 lubrication oil consolidation has not yet been selected, several locations on the property have been identified as suitable.

Justification

The proposed fuel forwarding building upgrades are justified on basis that they mitigate the risk associated with fire, employee safety hazards and environmental releases. The fuel forwarding building is necessary to operate the generation equipment at the site and Maritime Electric is obligated to provide functional and safe facilities for employees and the environment.

Costing Methodology

The proposed budget allocation is based on a combination of professional engineering estimates for internal labour and vendor quotations. A breakdown of the budget is shown in Table 17.

Table 17
Breakdown of Proposed Budget Allocation
CT3 Fuel Forwarding Building Upgrades

Description	**Budget**
Materials and External Labour	$ 91,000
Internal Labour and Transportation	8,000
Contingency (15 per cent)	15,000
TOTAL	**$ 114,000**

Supporting information for the cost estimates included in Table 17 is provided in Confidential Appendix N-4.

To ensure this project is completed at the lowest possible cost, consistent with safe and reliable service, all materials and external labour will be obtained through competitive procurement processes.

A contingency has been budgeted as this is a one-of project, the vendor quotations may need to be refreshed, some project component costs were estimated, and minor adjustments in scope of work are commonly required with this type of project.

The expected start date for the project is January 2023 with completion by June 2023.

Alternatives

There is no alternative to this project. The fuel forwarding building is critical to the continued reliability of CT3. The identified hazards associated with the CT3 fuel forwarding building present safety, environmental and supply risks. The proposed upgrades significantly mitigate these risks.

Future Commitments

This is not a multi-year capital budget commitment.

b. <u>CT3 Fuel Tank Coating System Upgrade</u> (Justifiable) $ 60,000

This project involves upgrading the exterior coating on the CT3 primary bulk storage fuel tank.

The CT3 diesel storage fuel tank has a storage capacity of two million litres, stands 40 feet ("ft") high and has an exterior diameter of 49.5 ft. The CT3 fuel tank is critical to the operation of CT3. The tank exterior coating was originally applied during construction in 2005. The exterior surface of the tank has deteriorated, posing a risk of corrosion. Upgrading the tank's exterior coating involves the removal of the existing coating, preparation of the surface, and application of a new coating.

Justification

This project is justified on the obligation to provide security of supply and cannot be deferred due to the importance of preventing further deterioration to the CT3 tank surface.

Costing Methodology

A breakdown of the proposed budget for upgrading the CT3 fuel tank's coating system is shown in Table 18. A contingency has been budgeted as this is a one-of project, the vendor quotation may need to be refreshed, and to allow for minor adjustments in the scope of work that may be necessary to complete the project.

Table 18
Breakdown of Proposed Budget Allocation
CT3 Fuel Tank Coating System Upgrade

Description	**Budget**
Materials and External Labour	$ 46,000
Internal Labour and Transportation	6,000
Contingency (15 per cent)	8,000
TOTAL	**$ 60,000**

Supporting information for the cost estimates included in Table 18 is provided in Confidential Appendix N-4.

To ensure this project is completed at the lowest possible cost, consistent with safe and reliable service, all materials and external labour will be obtained through competitive procurement processes.

The expected start date for this project is May 2023 with completion by July 2023.

Alternatives

There is no alternative to this project as the CT3 fuel tank is critical to the continued reliability of CT3.

Future Commitments

This is not a multi-year capital budget commitment.

c. <u>CGS Combustion Turbine Improvements, Parts and Tools</u>

(Recurring) $ 175,000

The proposed budget allocation is for the supply and installation of replacement equipment, critical parts and tools as required for the continued safe and reliable operation of the CT3 unit.

As the projects under this budget category are unplanned and identified on an as-required basis, cost projections at the item level cannot be determined in advance and, therefore, the proposed budget is provisional.

Justification

This project is justified based on the obligation of a public utility, under the *Electric Power Act*, to provide reasonably safe and adequate service, which requires the Company to manage security of supply. This includes the ability to avoid or mitigate the impact of an extended off-Island supply disruption.

Costing Methodology

The proposed provisional budget was estimated based on historical expenditures for equipment replacements due to in-service failures. A breakdown of the historical expenditures, 2022 budget and proposed 2023 budget allocation for CGS combustion turbine improvements, parts and tools is shown in Table 19.

Table 19
Historical and Proposed Capital Expenditures
CGS Combustion Turbine Improvements, Parts and Tools

Description	2018	2019	2020[a]	2021	2022 Budget	2023 Budget
Material	$ 73,821	$ 134,896	$ 53,425	$ 133,532	$ 164,000	$ 160,000
External Labour	4,600	40,427	16,842	634	-	-
Internal Labour and Transportation	8,320	-	4,578	14,794	-	15,000
Other	-	6,500	2,658	8,991	-	-
TOTAL	**$ 86,741**	**$ 181,823**	**$ 77,503**	**$ 157,951**	**$ 164,000**	**$ 175,000**

a. The 2020 budget was reduced from historical levels due to the proposed CT3 Equipment Building Project, which was denied under Order UE19-08.

To ensure this project is completed at the lowest possible cost, consistent with safe and reliable service, all materials and external labour will be obtained through a combination of competitive procurement processes and sole source purchases (where materials and services are best supplied by the original equipment manufacturer).

The expected start date for this project is January 2023 with in-service dates throughout the year, as required.

Alternatives

There is no alternative to this project. CT3 provides critical on-Island backup generation capability and the consequence of not having readily available funds to enable the acquisition of critical parts or replacements due to unforeseen in-service

failures, could result in the equipment not being available for operation when required.

Future Commitments

This is not a multi-year capital budget commitment but it is a recurring provisional capital requirement that is budgeted annually.

4.3 <u>Borden Generating Station - Buildings and Site Services</u> *$ 136,000*

This category includes BGS expenditures required for building and site services projects, which includes necessary refurbishments, replacements and upgrades to the buildings and infrastructure within the BGS site.

The BGS site encompasses the following infrastructure inside the fence line at the Carleton Street site in Borden-Carleton: BGS maintenance building; two control room buildings; 69 kV Borden substation with two step-up power transformers X1 and X2; three diesel fuel storage tanks; a fuel tanker truck offloading facility; a lube oil storage building; two storage buildings for spare lengths of submarine cable; and the adjacent 138 kV Borden riser station for submarine cables 3 and 4.

a. <u>BGS Communication Equipment Upgrades</u> (Justifiable) $ 50,000

This project involves an upgrade to the BGS wireless internet and communication devices. Currently, the BGS utilizes a digitized phone line for internet access. Communication devices are critical for the operation of the BGS. Internet connection is required for access to company files, operating procedures and email. The proposed upgrades would improve the BGS internet to high speed with wireless distribution inside the main building, maintenance building and two control rooms.

Justification

The proposed communication equipment upgrades are justified on the need to ensure that the BGS operators, which are required to operate the station and generation equipment at the site, have a functional and safe working environment.

Costing Methodology

The proposed budget allocation shown in Table 20 is based on a combination of professional engineering estimates for internal labour and vendor quotations. A contingency has been budgeted as this is a one-of project, the vendor quotations may need to be refreshed, some project component costs were estimated, and to allow for minor adjustments in the scope of work that may be necessary to complete the project.

Table 20
Breakdown of Proposed Budget Allocation
BGS Communication Equipment Upgrades

Description	**Budget**
Materials and External Labour	$ 37,000
Internal Labour and Transportation	7,000
Contingency (15 per cent)	6,000
TOTAL	**$ 50,000**

Supporting information for cost estimates included in Table 20 is provided in Confidential Appendix N-4.

To ensure this project is completed at the lowest possible cost, consistent with safe and reliable service, all materials and external labour will be obtained through competitive procurement processes.

The expected start date for this project is April 2023 and the expected in-service date is October 2023.

Alternatives

There is no alternative to this project. This project will significantly improve communications at the BGS. Failure to address the BGS communications presents an operational inefficiency and a safety risk to the employees working at the BGS site.

Future Commitments

This is not a multi-year capital budget commitment.

b. <u>BGS Entrance Landscaping</u> (Justifiable) $ 51,000

This project involves the supply and installation of 90 new trees and an upgrade to the deteriorated landscaping along the entrance to the BGS site.

Maritime Electric's BGS is an industrial component of the Borden-Carleton community, located along a residential street in close proximity to local schools and visible from the Confederation Bridge. The majority of the existing landscaping was installed in 2017 when approximately 800 trees were planted at the site, which have experienced varying levels of growth. Proposed upgrades to the existing landscaping include removing dead trees, upgrading tree trunk protection, reinstalling trunk supports and applying mulch to all remaining trees.

Justification

This project is justified on an obligation to maintain an acceptable roadside appearance of the BGS, subject to commitments made to the community of Borden-Carleton and to protect existing landscaping assets from further deterioration.

Costing Methodology

The proposed budget allocation shown in Table 21 is based on a combination of professional engineering estimates for internal labour and a vendor quotation. A contingency has been budgeted as this is a one-of project, the vendor quotation may need to be refreshed, some project component costs were estimated, and to allow for minor adjustments in the scope of work that may be necessary to complete the project.

Table 21 Breakdown of Proposed Budget Allocation BGS Entrance Landscaping	
Description	**Budget**
Materials and External Labour	$ 41,000
Internal Labour and Transportation	3,000
Contingency (15 per cent)	7,000
TOTAL	**$ 51,000**

Supporting information for the cost estimates included in Table 21 is provided in Confidential Appendix N-4.

To ensure this project is completed at the lowest possible cost, consistent with safe and reliable service, all materials and external labour will be obtained through competitive procurement processes.

The expected start date for this project is June 2023 with completion by October 2023.

Alternatives

Several considerations for the scope of supply were considered. The proposed quantity of new trees is considered to be the minimum quantity of which a noticeable impact to the appearance of the BGS can be achieved.

Future Commitments

This is not a multi-year capital budget commitment.

c. <u>BGS Miscellaneous Building and Site Upgrades</u> (Recurring) $ 35,000

As BGS buildings and site services age, upgrades are required each year to address deteriorated components. Experience indicates that unplanned and emergency events will also occur that require capital replacements, refurbishments and upgrades. Performing necessary replacement, refurbishment and upgrade work in a timely manner when the need arises, helps to ensure that

BGS facilities remain in adequate condition for the safety of employees and to avoid costly emergency repairs or replacements.

As the projects under this budget category are unplanned and identified on an as-required basis, cost projections at the item level cannot be determined in advance and, therefore, the proposed budget allocation is provisional.

Justification

The proposed provisional budget allocation is justified on the obligation to ensure the efficient and safe operation and use of BGS facilities. For this reason, when projects arise throughout the year, they cannot be deferred.

Costing Methodology

A breakdown of the historical expenditures, 2022 budget and the proposed 2023 budget allocation for BGS miscellaneous building and site upgrades is shown in Table 22.

Table 22
Historical and Proposed Capital Expenditures
BGS Miscellaneous Building and Site Upgrades

Description	2018	2019	2020[a]	2021[b,c]	2022 Budget[d]	2023 Budget
Material and External Labour	$ 9,426	$ 979	$ -	$ 4,550	$ 74,000	$ 20,000
Internal Labour and Transportation	1,230	2,000	-	1,747	100,000	15,000
Other	-	-	-	526	19,000	-
TOTAL	**$ 10,656**	**$ 2,979**	**$ -**	**$ 6,823**	**$ 193,000**	**$ 35,000**

a. There was no spending under this budget item in 2020.
b. In the 2021 Capital Budget, BGS – Buildings and Site Services and BGS – Turbine Generators were consolidated in Section 4.3 - Borden Plant Projects, with a budget of $113,000. It is estimated that approximately 10 per cent of the expenditures for "Borden Plant Projects" were required for BGS Buildings and Site Services, and approximately 90 per cent was required for BGS Turbine Generators.
c. Includes 10 per cent of $2,000 budgeted for 2021 projects carried over to be completed in 2022.
d. The budget for 2022 is higher than prior years due to changes in how expenditures are allocated and due to significant upgrades to the BGS maintenance building being required, as well as electrical and heating upgrades to other BGS buildings.

To ensure this project is completed at the lowest possible cost, consistent with safe and reliable service, all materials and external labour will be obtained through competitive procurement processes.

The expected start date for this project is January 2023 with completion dates throughout the year.

Alternatives

Alternatives will be considered at the time when BGS miscellaneous building and site upgrades are identified, as required.

Future Commitments

This is not a multi-year capital budget commitment; however, it is a recurring provisional capital requirement that is budgeted annually.

4.4 Borden Generating Station – Turbine Generators *$ 942,000*

This category includes expenditures associated with the generation equipment located at the BGS site, which includes CT1, CT2 and ancillary systems.

a. CT1 Generator Overhaul (Justifiable) $ 663,000

CT1 has been in service for 50 years and is comprised of a Rolls Royce combustion turbine with an English Electric brushless generator. The CT1 overhaul includes the inspection and testing of the generators rotor and stator, bore-scope testing on the bearings, and gearbox inspection. Industry practice for generator inspection and overhaul is typically a ten-year cycle; the last time this was completed for CT1 was 2007.

Justification

The project is justified based on the obligation of a public utility, under the *Electric Power Act*, to provide reasonably safe and adequate service, which requires the Company to manage security of supply. This includes the ability to avoid or mitigate the impact of an extended off-Island supply disruption.

Costing Methodology

The proposed budget allocation shown in Table 23 is based on a combination of professional engineering estimates for materials, services, internal labour, and a vendor quotation for inspection and overhaul services. A contingency has been budgeted as the vendor quotation may need to be refreshed, some project cost components were estimated, and to allow for minor adjustments in the scope of work that may be necessary to complete the project.

Table 23
Breakdown of Proposed Budget Allocation
CT1 Generator Overhaul

Description	**Budget**
Materials and External Labour	$ 318,000
Internal Labour and Transportation	259,000
Contingency (15 per cent)	86,000
TOTAL	**$ 663,000**

Supporting information for the cost estimates included in Table 23 is provided in Confidential Appendix N-4.

To ensure the project is completed at the lowest possible, cost consistent with safe and reliable service, all materials and external labour will be obtained through competitive procurement processes.

The expected start date for this project is May, 2023 and the expected completion date is June, 2023.

Alternatives

There is no alternative to this project. A thorough inspection and overhaul of CT1 is necessary due to the increased reliance on the unit now that the CTGS has been retired.

Future Commitments

This is not a multi-year capital budget commitment.

b. <u>BGS Tank Farm Upgrades</u> (Justifiable) $ 164,000

This project involves upgrading the exterior coating on two primary bulk storage fuel tanks, replacing manual valves and upgrading the sump located inside the tank berm.

The BGS diesel storage fuel tanks each have a storage capacity of 750,000 liters, stand 32 ft high and have an exterior diameter of 33.5 ft. The fuel tanks are critical to the operation of CT1 and CT2. The tank's exterior coating was last upgraded in 2008. The exterior surface of the tank has deteriorated, posing a risk of corrosion. Upgrading the tank's exterior coating involves the removal of the existing coating, preparation of the surface and application of a new coating.

The BGS fuel distribution piping is critical in the supply of fuel to CT1 and CT2. There are 27 manual valves which facilitate operation of fuel distribution system. These valves, which are critical components for venting, draining and isolation, have been in service for 50 years and pose an environmental risk of leaking due to their aged and deteriorated condition. This project will replace all manual valves and apply a surface protection coating.

The BGS tank berm was constructed to American Petroleum Institute ("API") code API 650 and as such, was designed to prevent fluid from releasing to the environment in the event of a spill. The berm collects precipitation in the tank farm and a sump pump system is used to discharge any water that accumulates. The sump is manually inspected prior to operation of the pump to confirm that the contents are free of hydrocarbons. The operator is required to enter the bermed area, complete a manual inspection, connect temporary hoses to the pump, locate the temporary hoses outside of the berm, and run the pump. This project proposes the installation of permanent discharge piping from the sump with hydrocarbon detecting instruments.

Justification

This project is justified on the obligation to provide security of supply and cannot be deferred due to the importance of the BGS tank farm to the operation of the CTs, and to prevent further deterioration to the BGS tank farm. Additionally, the proposed BGS tank farm upgrades are justified on basis that the manual operation of the pump presents employee safety hazards.

Costing Methodology

The proposed budget allocation shown in Table 24 is based on a combination of professional engineering estimates for internal labour and vendor quotations. A contingency has been budgeted as this is a one-of project, the vendor quotations may need to be refreshed, and to allow for minor adjustments in the scope of work that may be necessary to complete the project.

Table 24
Breakdown of Proposed Budget Allocation
BGS Tank Farm Upgrades

Description	**Budget**
Materials and External Labour	$ 116,000
Internal Labour and Transportation	27,000
Contingency (15 per cent)	21,000
TOTAL	**$ 164,000**

Supporting information for the cost estimates included in Table 24 is provided in Confidential Appendix N-4.

To ensure this project is completed at the lowest possible cost, consistent with safe and reliable service, all materials and external labour will be obtained through competitive procurement processes.

This project is expected to start in May 2023 and be completed in October 2023.

Alternatives

There is no alternative to this project. Failure to address the condition of the BGS tank farm will result in further deterioration, presenting environmental and security of supply risks. The BGS tank farm is critical to the continued reliability of CT1 and CT2.

Future Commitments

This is not a multi-year capital budget commitment.

c. <u>BGS Combustion Turbine Improvements, Parts and Tools</u>

(Recurring) $ 115,000

The proposed budget allocation is for the supply and installation of replacement equipment, critical parts and tools as required for the continued safe and reliable operation of the BGS.

As the projects under this budget category are unplanned and identified on an as-required basis, cost projections at the item level cannot be determined in advance and, therefore, the proposed budget is provisional.

Justification

The project is justified based on the obligation of a public utility, under the *Electric Power Act*, to provide reasonably safe and adequate service, which requires the Company to manage security of supply. This includes the ability to avoid or mitigate the impact of an extended off-Island supply disruption.

Costing Methodology

The proposed provisional budget was estimated based on average historical expenditures for equipment replacements due to in-service failures. A breakdown of the historical expenditures, 2022 budget and proposed 2023 budget allocation for BGS combustion turbine improvements, parts and tools is shown in Table 25.

Table 25 Historical and Proposed Capital Expenditures BGS Combustion Turbine Improvements, Parts and Tools						
Description	**2018**	**2019**	**2020**	**2021[a b]**	**2022 Budget**	**2023 Budget**
Material	$ 45,068	$ 43,949	$ 139,571	$ 40,959	$ 108,000	$ 110,000
External Labour	55,700	4,298	77,845	15,723	-	-
Internal Labour and Transportation	16,457	8,000	-	4,737	-	5,000
TOTAL	**$ 117,225**	**$ 56,247**	**$ 217,416**	**$ 61,419**	**$ 108,000**	**$ 115,000**

a. In the 2021 Capital Budget, BGS – Buildings and Site Services and BGS – Turbine Generators were consolidated in Section 4.3 - Borden Plant Projects, with a budget of $113,000. It is estimated that approximately 10 per cent of the expenditures for "Borden Plant Projects" was required for BGS Buildings and Site Services, and approximately 90 per cent was required for BGS Turbine Generators.
b. Includes 90 per cent of $2,000 budgeted for 2021 projects carried over to be completed in 2022.

To ensure this project is completed at the lowest possible cost, consistent with safe and reliable service, all materials and external labour will be obtained through a combination of competitive procurement processes and sole source purchases (where materials and services are best supplied by the original equipment manufacturer).

The expected start date for this project is January 2023 with in-service dates throughout the year, as required.

Alternatives

There is no alternative to this project. The BGS combustion turbines provide critical backup generation capability and the consequence of not having readily available funds to enable the acquisition of critical parts or replacements due to unforeseen in-service failures, could result in the equipment not being available for operation when required.

Future Commitments

This is not a multi-year capital budget commitment; however, it is a recurring provisional capital requirement that is budget annually.

5.0 DISTRIBUTION $ 28,977,000

Maritime Electric's proposed 2023 capital expenditures for distribution were developed using the Company's ISP and DAMP, and is focused on the replacement of aged infrastructure to maintain system reliability, improve energy efficiency and ensure continued compliance with all safety and environmental requirements. In addition, distribution assets will be installed to serve new customers, modify existing service connections, address system load growth impacts and facilitate joint use of utility poles with communication providers. The Company's asset database, field inspection results, and reliability data is used to identify facilities and equipment for priority replacement.

5.1 Replacements Due to Storms, Collisions, Fire and Road Alterations *$ 1,840,000*

This provisional budget allocation is required for capital replacements due to storms, fire, motor vehicle accidents, other emergency incidents and road alterations. The amount for 2023 as shown in Table 26 is lower than the historical five-year average because severe storms in 2018 and 2019 resulted in higher-than-normal annual expenditures. The proposed budget for 2023 is increased over 2022 by more than inflation to raise the allocation for road alterations, which has seen increased activity (resulting in over budget variances) in recent years.

Table 26
Historical and Proposed Capital Expenditures
Replacements Due to Storms, Collisions, Fire and Road Alterations

Description	2018[a]	2019[a]	2020	2021	2022 Budget	2023 Budget
Material	$ 476,673	$ 406,239	$ 411,621	$ 483,296	$ 282,000	$ 335,000
Contractor Labour	1,105,758	703,015	517,043	528,127	401,000	538,000
Internal Labour and Transportation	1,154,987	947,426	873,796	726,159	948,000	967,000
Other	44,803	63,048	13,624	2,473	-	-
TOTAL	**$2,782,221**	**$2,119,728**	**$1,816,084**	**$1,740,055**	**$1,631,000**	**$1,840,000**

a. Includes expenditures due to above average storm activity that caused system damage requiring replacement of capital assets.

a. <u>Replacements Due to Storms, Fire and Collisions</u> (Recurring) $ 998,000

Maritime Electric operates approximately 5,800 km of distribution lines to serve customers within its service territory. When damage occurs to distribution structures and equipment, the Company is obligated to respond in a timely manner and restore the electrical system to a safe and reliable operating condition. The scope and severity of damage caused by storms and other adverse events can be highly variable from year to year. For this reason, the budgeted amount is a provisional cost estimate for labour and material that will be required to replace distribution equipment (predominantly poles, transformers and wire) damaged as a result of unforeseen events that are beyond the Company's control.

This budget allocation differs from the budget allocation in Section 5.5 - Line Rebuilds, as the work is unplanned and is necessary to address operational events, including power interruptions and customer trouble calls.

Justification

The provisional budget allocation for distribution system replacements due to storms, fire and collisions is justified on the obligation to provide safe and reliable service to customers and cannot be deferred.

Costing Methodology

A breakdown of the historical expenditures, 2022 budget and the proposed 2023 budget allocation for the storm response and other outage restoration activity that the Company is obligated to provide is shown in Table 27.

Table 27 Historical and Proposed Expenditures Replacements Due to Storms, Fires and Collisions						
Description	**2018[a]**	**2019[a]**	**2020**	**2021**	**2022 Budget**	**2023 Budget**
Material	$ 281,194	$ 199,489	$ 196,970	$ 175,252	$ 175,000	$ 180,000
Contractor Labour	884,193	282,229	120,973	42,466	255,000	256,000
Internal Labour and Transportation	818,537	575,937	667,791	506,391	560,000	562,000
Other	37,674	50,849	8,162	2,473	-	-
TOTAL	**$2,021,598**	**$1,108,504**	**$ 993,896**	**$ 726,582**	**$ 990,000**	**$ 998,000**
Less: Significant Storm Events[a]	(861,296)	(388,110)	-	-	-	-
TOTAL Excluding Significant Storm Events	**$1,160,302**	**$ 720,394**	**$ 993,896**	**$ 726,582**	**$ 990,000**	**$ 998,000**

a. Significant Storm Events:
2018 – November 29, 2018 - snow, ice and wind storm
2019 – September 7, 2019 – post-tropical storm Dorian

Future Commitments

This is not a multi-year capital budget commitment; however, it is a recurring provisional capital requirement that is budgeted annually.

b. Replacements Due to Road Alterations (Recurring) $ 842,000

Each year, the Company relocates or replaces distribution and transmission assets to accommodate Provincial Government activities in public rights of way. The most common activities requiring the relocation or replacement of distribution and transmission assets are related to infrastructure projects such as sidewalk installations, sewer and water line extensions, road widening, road construction and bridge replacements. At the time that the 2023 Capital Budget was developed, Provincial Government plans for infrastructure work in 2023 were not yet confirmed and, therefore, a provisional amount has been budgeted.

Requests by other entities to relocate or replace Company assets are governed by the provisions of any agreements between the Company and the requesting parties, or are dealt with on a case by case basis.

Justification

The provisional budget allocation for distribution system replacements due to road alterations is justified on the obligation to ensure the safe and reliable operation of the electrical system and cannot be deferred.

Costing Methodology

A breakdown of the historical expenditures, 2022 budget and the proposed 2023 budget allocation for system alteration activities in public rights of way that the Company is obligated to provide, is shown in Table 28.

In recent years, the Provincial Government has significantly increased its annual investments in improvements to intersections, roads and bridges across the province, which has increased the requirement for modifications to the electrical system. To better reflect this increased requirement, the provisional budget for system modifications due to road alterations has been increased by approximately 30 per cent (over 2022). Depending upon the end of year variance for this budget item, additional adjustments may be warranted in the future.

Table 28
Historical and Proposed Capital Expenditures
Replacements Due to Road Alterations

Description	2018	2019	2020	2021	2022 Budget	2023 Budget
Material	$ 195,479	$ 206,750	$ 214,651	$ 308,043	$ 107,000	$ 155,000
Contractor Labour	221,566	420,785	396,070	485,660	146,000	282,000
Internal Labour and Transportation	336,449	371,490	206,005	219,768	388,000	405,000
Other	7,129	12,199	5,462	-	-	-
TOTAL	**$ 760,623**	**$1,011,224**	**$ 822,188**	**$1,013,471**	**$ 641,000**	**$ 842,000**

Future Commitments

This is not a multi-year capital budget commitment; however, it is a recurring provisional capital requirement that is budgeted annually.

5.2 <u>Distribution Transformers</u> (Recurring/Mandatory[14]) *$ 9,327,000*

The purchase and installation of new distribution transformers and other related equipment is an annual recurring capital budget expenditure that is required to serve new customers, accommodate changes for existing customers and replace deteriorated or damaged units. This requirement has steadily grown in recent years due to the increase in the number of new services related to housing starts.

The Company expects an increase in transformer requirements in 2023 based on customer growth and necessary equipment replacements, upgrades and retirements. Supply chain constraints also factor into the 2023 budget for distribution transformers, as limited inventory at the supplier level reduces the availability of certain types and capacities of transformers, and delivery times increase when units are out of stock and backordered. The Company has budgeted for 1,722 polemount and 144 padmount transformers in 2023, an increase of 18 and 122 per cent, respectively, over 2022. Also, per unit costs have increased by approximately 35 per cent for polemount transformers and approximately 55 per cent for padmount transformers in the past year.

Work to replace PCB containing electrical equipment will continue in 2023, to ensure compliance with the December 31, 2025 federal regulated replacement deadline.[15]

Justification

The budget for distribution transformers is justified based on the need to maintain safe, reliable electrical service at least cost, and the obligation to provide equitable access to

[14] Mandatory replacement of transformer equipment containing PCBs is budgeted at $546,000, which is included in the proposed budget for distribution transformers.

[15] Federal regulations state that polemount electrical transformers and their polemount auxiliary electrical equipment as well as current transformers, potential transformers, circuit breakers, reclosers and bushings that are located at an electrical generation, transmission or distribution facility, which contain PCBs in a concentration of 500mg/kg or more, have an end of use deadline of December 31, 2025.

an adequate supply of power to new and existing customers. For the reasons provided, it cannot be deferred.

Costing Methodology

The proposed budget allocation for transformers is based on the previous year's usage, upcoming line rebuilds, new housing start forecasts, transformer inspections and recent annual expenditures as shown in Table 29. Supporting information for the 2023 transformer budget is provided in Confidential Appendix N-5.

Table 29
Historical and Proposed Capital Expenditures
Distribution Transformers

Description	2018	2019	2020[a]	2021	2022 Budget	2023 Budget
Material	$2,714,234	$3,328,997	$3,243,305	$5,083,289	$4,335,000	$8,211,000
Contractor Labour	154,102	10,963	36,652	51,175	77,000	82,000
Internal Labour and Transportation	395,282	582,219	600,717	759,863	925,000	1,034,000
Other	3,829	2,006	39,845	46,084	-	-
TOTAL	**$3,267,447**	**$3,924,185**	**$3,920,519**	**$5,940,411**	**$5,337,000**	**$9,327,000**

a. Includes $110,927 for 2020 transformers carried over and delivered in 2021.

To ensure this project is completed at the lowest possible cost, consistent with safe and reliable service, all materials will be obtained through competitive procurement processes.

The expected start date for this project is January 2023 and will continue to end of the year with in-service dates throughout.

Future Commitments

This is not a multi-year capital budget commitment; however, it is recurring capital requirement that is budgeted annually.

5.3 Services and Street Lighting *$ 5,650,000*

This provisional budget allocation provides for the construction of service lines to connect new customers, refurbishment of aged service lines, and installation of new street lights and replacement of existing street lights with energy efficient light-emitting diode ("LED") fixtures. The services and street lighting expenditures are expected to be partially offset by customer contributions for construction charges as set by the General Rules and Regulations of the Company.

The proposed budget is based upon historical spending as shown in Table 30 and reflects a sustained level of activity since 2018.

Table 30
Historical and Proposed Capital Expenditures
Services and Street Lighting

Description	2018	2019	2020	2021	2022 Budget	2023 Budget
Material	$1,416,821	$1,121,510	$1,271,480	$1,444,434	$1,252,000	$1,302,000
Contractor Labour	768,782	787,209	422,633	1,024,810	248,000	258,000
Internal Labour and Transportation	2,910,330	2,960,358	3,463,387	3,956,116	4,073,000	4,090,000
Other	16,265	47,979	75,671	55,937	-	-
TOTAL	**$5,112,198**	**$4,917,056**	**$5,233,171**	**$6,481,297**	**$5,573,000**	**$5,650,000**

a. Overhead and Underground Services (Recurring) $ 4,795,000

Service work involves the installation and replacement of distribution wires that connect a customer's electrical service equipment to the Company's transformers, and the transformers to the main line. The volume of new and replacement services work fluctuates from year to year. As such, the budgeted amount for labour and material to install or replace overhead and underground services is a provisional estimate based on historical customer requests. Replacement of existing service wires is typically due to deterioration, failure, damage or to accommodate an increased customer load.

Justification

The provisional budget allocation for overhead and underground service work is justified on the obligation to provide equitable access to an adequate supply of power to new and existing customers and cannot be deferred.

Costing Methodology

A breakdown of the historical expenditures, 2022 budget and proposed 2023 budget allocation for customer service work that the Company is obligated to provide is shown in Table 31.

Table 31
Historical and Proposed Capital Expenditures
Overhead and Underground Services

Description	2018	2019	2020	2021	2022 Budget	2023 Budget
Material	$ 896,891	$ 722,368	$ 906,081	$1,035,009	$ 920,000	$ 958,000
Contractor Labour	767,192	787,209	422,633	1,010,142	217,000	226,000
Internal Labour and Transportation	2,596,372	2,579,271	3,034,889	3,511,007	3,601,000	3,611,000
Other	16,231	47,979	75,671	55,937	-	-
TOTAL	**$4,276,686**	**$4,136,827**	**$4,439,274**	**$5,612,095**	**$4,738,000**	**$4,795,000**

Future Commitments

This is not a multi-year capital budget commitment; however, it is a recurring provisional capital requirement that is budgeted annually.

b. Street and Area Lighting (Recurring) $ 855,000

Street and area lighting is an established service offered by Maritime Electric. Changes in lighting technology over the past several years has resulted in existing high-pressure sodium and mercury vapour light fixtures being replaced with energy efficient LED fixtures under a Commission approved conversion program which began in 2015. In 2023, the conversion program will be on schedule, in the ninth year of a planned ten-year duration.

The 2023 budget amount allows for the replacement of approximately 750 LED street lights through the conversion program. The budget amount also includes the installation of approximately 150 LED street and yard lights based on the historical level of customer requests and light replacements due to fixtures reaching the end of their useful life.

Justification

The budget allocation for street and area lighting is justified on the obligation to serve new and existing customers and cannot be deferred.

Costing Methodology

A breakdown of the historical expenditures, 2022 budget and the proposed 2023 budget allocation for street and area lighting service that the Company is obligated to provide is shown in Table 32.

Table 32
Historical and Proposed Capital Expenditures
Street and Area Lighting

Description	2018	2019	2020	2021	2022 Budget	2023 Budget
Material	$ 519,930	$ 399,142	$ 365,399	$ 409,425	$ 332,000	$ 344,000
Contractor Labour	1,590	-	-	14,668	31,000	32,000
Internal Labour and Transportation	313,958	381,087	428,498	445,109	472,000	479,000
Other	34	-	-	-	-	-
TOTAL	**$ 835,512**	**$ 780,229**	**$ 793,897**	**$ 869,202**	**$ 835,000**	**$ 855,000**

Future Commitments

This is not a multi-year capital budget commitment; however, it is a recurring provisional capital requirement that is budgeted annually. The LED street light conversion program is being carried out over ten years pending approval annually through the Company's capital budget application.

5.4 Line Extensions *$ 3,439,000*

Line extension projects involve the construction of both primary and secondary distribution lines to connect new customers to the electrical system or to upgrade the capacity of existing lines to accommodate increased customer loads. Line extensions can also be initiated by the Company as a means to cost effectively redistribute system loads by reconfiguring circuits or establishing new circuits for overall improvements in system reliability and operability.

Line extension work to connect new customers or accommodate increased customer loads is categorized as customer driven line extensions and the proposed budget allocation is provisional. Line extension projects initiated by the Company to redistribute system loads are categorized as reliability driven line extensions and the proposed budget allocation is based on estimated material and labour requirements.

The proposed budget allocation for line extensions is provided in Table 33 and is expected to be partially offset by customer contributions.

Table 33
Historical and Proposed Capital Expenditures
Line Extensions

Description	2018[a]	2019[b]	2020[c]	2021	2022 Budget	2023 Budget
Material	$ 847,432	$ 1,647,328	$ 1,096,282	$ 1,135,187	$ 470,000	$ 539,000
Contractor Labour	839,120	739,610	1,290,375	928,010	908,000	1,643,000
Internal Labour and Transportation	1,541,163	1,392,227	1,287,603	989,452	1,194,000	1,257,000
Other	36,018	12,800	6,788	(194,174)	-	-
TOTAL	**$ 3,263,733**	**$ 3,791,965**	**$ 3,681,048**	**$ 2,858,475**	**$ 2,572,000**	**$ 3,439,000**

a. Includes $640,939 for 2018 projects carried over and completed in 2019.
b. Includes $862,451 for a 2019 project carried over and completed in 2021.
c. Includes $303,354 for a 2020 project carried over and completed in 2021.

a. <u>Customer Driven Line Extensions</u> (Recurring) $ 1,457,000

Line extension work will involve both upgrades to existing infrastructure and new construction of single phase and three phase distribution lines to serve all types of customers and customer driven supply requirements.

Justification

The provisional allocation within this budget category is justified on the obligation to provide equitable access to an adequate supply of power to new and existing customers and cannot be deferred.

Costing Methodology

A breakdown of the historical expenditures, 2022 budget and the proposed 2023 budget allocation for customer driven line extension work that the Company is obligated to provide is shown in Table 34.

Table 34
Historical and Proposed Capital Expenditures
Customer Driven Line Extensions[a]

Description	2019	2020	2021	2022 Budget	2023 Budget
Material	$ 604,506	$ 638,240	$ 890,020	$ 290,000	$ 283,000
Contractor Labour	329,851	114,369	617,310	263,000	265,000
Internal Labour and Transportation	1,388,688	1,012,452	720,157	894,000	909,000
Other	9,915	1,691	7,273	-	-
Less: Joint Use Charged To/Owned by Third Party	-	-	(208,406)	-	-
TOTAL	**$ 2,332,960**	**$ 1,766,752**	**$ 2,026,354**	**$ 1,447,000**	**$ 1,457,000**

a. Prior to 2019, customer driven line extensions and reliability driven line extensions were not broken out as separate items.

Future Commitments

This is not a multi-year capital budget commitment; however, it is a recurring provisional capital requirement that is budgeted annually.

b. <u>Reliability Driven Line Extensions</u> (Justifiable) $ 1,982,000

The proposed budget provides for the extension of single phase and three phase distribution lines including joint use lines. Projects are prioritized based on the need to redistribute feeder load, balance load on three phase lines and address reliability issues associated with projected load growth.

The following reliability driven line extension projects are planned for 2023:

i. Robertson Road Three Phase Conversion; and
ii. Coleman Feeder.

Additional details on the proposed reliability driven line extension projects are provided in Appendix G.

Justification

The proposed reliability driven line extension projects are justified based on the obligation to provide safe and reliable service to customers.

Costing Methodology

A breakdown of the historical expenditures, 2022 budget and proposed 2023 budget allocation for reliability driven line extensions is provided in Table 35.

Table 35 Historical and Proposed Capital Expenditures Reliability Driven Line Extensions					
Description	**2019[a,b]**	**2020[c]**	**2021**	**2022 Budget**	**2023 Budget**
Material	$1,042,822	$ 458,042	$ 245,167	$ 180,000	$ 256,000
Contractor Labour	409,759	1,176,006	310,700	645,000	1,378,000
Internal Labour and Transportation	3,539	275,151	270,000	300,000	348,000
Other	2,885	5,097	6,255	-	-
TOTAL	**$1,459,005**	**$1,914,296**	**$ 832,122**	**$1,125,000**	**$1,982,000**

a. Prior to 2019, reliability driven line extensions and customer driven line extensions were not broken out as separate items.
b. Includes $862,451 for a 2019 project carried over and completed in 2021.
c. Includes $303,354 for a 2020 project carried over and completed in 2021.

5.5 Line Rebuilds *$ 5,330,000*

The projects and programs proposed in the line rebuilds budget category enable the Company to address the timely replacement of aged infrastructure, improve reliability and voltage levels, reduce electrical losses and improve safety for workers by upgrading the system to meet current construction standards. The Company's asset database, field inspection results and reliability data serve as the primary tools for planning single and three phase rebuilds, pole and component replacements and other reliability improvement activities. Projects initiated by third-party telecommunication companies requesting joint use line conversions to accommodate communication equipment are also included in this category. The communications make-ready requests are customer driven and are often received without advance notice; however, the Company is still obligated to complete such work in a timely manner. As such, communications make-ready work is not budgeted and instead reported to the Commission quarterly through capital expenditure forecasts and when large projects warrant, through the supplemental capital budget request ("SCBR") process. Customer driven capital expenditures, including communication make-ready requests, can be fully or partially offset by a contribution, depending upon the specifics of the project.

A breakdown of the historical expenditures, 2022 budget and proposed 2023 budget allocation for line rebuilds is shown in Table 36.

Table 36
Historical and Proposed Capital Expenditures
Line Rebuilds

Description	2018	2019[a]	2020	2021[d]	2022 Budget	2023 Budget
Material	$ 994,150	$ 1,052,116	$ 798,628	$ 990,614	$ 757,000	$1,041,000
External Labour	2,340,138	2,779,812	1,960,459	2,340,981	2,277,000	2,843,000
Internal Labour and Transportation	1,424,613	1,096,644	1,128,543	1,238,058	1,278,000	1,446,000
Other	30,101	134,706	29,823	54,590	-	-
PEI Broadband	-	-	9,190,493[b]	4,431,318[e]	4,564,000	-
Less: Joint Use Charged to/Owned by Third Party	(506,976)	(688,471)	(3,614,883)[c]	(265,986)	-	-
TOTAL	**$ 4,282,026**	**$ 4,374,807**	**$ 9,493,063**	**$ 8,789,575**	**$ 8,876,000**	**$ 5,330,000**

a. Includes $90,295 for a 2019 project carried over and completed in 2020.
b. Includes $3,325,051 in actual and $3,439,000 budgeted for 2020 PEI Broadband Project work carried over to be completed in 2022.
c. $3,480,427 of joint use charges relates to PEI Broadband Project.
d. Includes $603,000 budgeted for 2021 eastern cedar pole replacement program work carried over to be completed in 2022.
e. Includes $886,318 in actual and $3,545,000 budgeted for 2021 PEI Broadband Project work carried over to be completed in 2022.

a. Single Phase and Three Phase Line Rebuilds (Justifiable) $ 2,406,000

The proposed budget provides for the rebuilding of single phase and three phase distribution lines including joint use lines. Projects are identified for rebuild based on the condition of poles and wire, length of spans, historical reliability issues associated with the line and historical and projected load growth in this area. Changes required to meet the current CSA Overhead Systems Standard also impacts line rebuild requirements.

The proposed rebuilds will improve reliability and voltage stability, allow for future load growth, and reduce system losses. The rebuilds will also improve safety for

power line technicians by upgrading old lines to modern construction standards with increased clearances and updated system equipment. Two of the rebuilds planned for 2023 are on lines with numerous eastern cedar poles that are approximately 50 years old, or that have damaged or deteriorated conductor. One of the projects includes a voltage conversion from 7,200 to 14,400 volts, which is required to off load equipment and to improve the power quality and reliability for customers.

The following single phase and three phase line rebuilds are planned for 2023:

i. Bloomfield to Elmsdale (Route 2);
ii. Argyle Shore Line Upgrade and Voltage Conversion; and
iii. Old Post Road (Crapaud).

Additional project details and justifications are provided in Appendix H.

Justification

The timely refurbishment of deteriorated distribution structures and equipment is justified on the obligation to maintain a safe and reliable electricity supply system and cannot be deferred.

Costing Methodology

A breakdown of the historical expenditures, 2022 budget and proposed 2023 budget allocation for single and three phase line rebuild projects is shown in Table 37. The budget amount for each project is a function of the distance covered by the rebuild, the customer density along the line and the construction standard used in the design.

Table 37 Historical and Proposed Capital Expenditures Single Phase and Three Phase Line Rebuilds						
Description	**2018**	**2019[a]**	**2020**	**2021**	**2022 Budget**	**2023 Budget**
Material	$ 843,153	$ 500,591	$ 502,601	$ 590,220	$ 388,000	$ 476,000
Contractor Labour	1,977,286	1,591,122	1,379,381	1,308,585	1,143,000	1,251,000
Internal Labour and Transportation	1,072,506	422,300	307,485	683,106	674,000	679,000
Other	27,998	44,241	28,212	(212,582)	-	-
Less: Joint Use Charged to/Owned by Third Party	(506,976)	(428,747)	(134,115)	-	-	-
TOTAL	**$ 3,413,967**	**$ 2,129,507**	**$ 2,083,564**	**$ 2,329,329**	**$ 2,205,000**	**$2,406,000**

a. Includes $90,295 for a 2019 project carried over to be completed in 2020.

Future Commitments

None of the proposed line rebuild projects are multi-year capital budget commitments.

b. Distribution Line Refurbishment (Recurring) $ 815,000

In 2017, the Company initiated a distribution inspection program as a proactive way to improve reliability through identifying components of the distribution system that are unsafe or at risk of failure. The program was designed to ensure that all overhead primary distribution lines are subject to a detailed ground inspection every six years.

The structured inspection and refurbishment of distribution lines plays a critical role in extending and/or maintaining their lifespan, enhancing employee and public safety, and improving system reliability by reducing the probability of component failure. Photographs of deficiencies identified through distribution line inspection are shown in Appendix I.

Justification

The timely replacement or refurbishment of deteriorated distribution structures and equipment is justified on the obligation to maintain a safe and reliable electrical system and cannot be deferred.

Costing Methodology

The proposed budget allocation for distribution line refurbishment is based upon historical and budgeted spending over the first five years of the program, 2018 to 2022. A breakdown of the historical expenditures, 2022 budget and proposed 2023 budget allocation for distribution line refurbishment is shown in Table 38.

Table 38
Historical and Proposed Capital Expenditures
Distribution Line Refurbishment

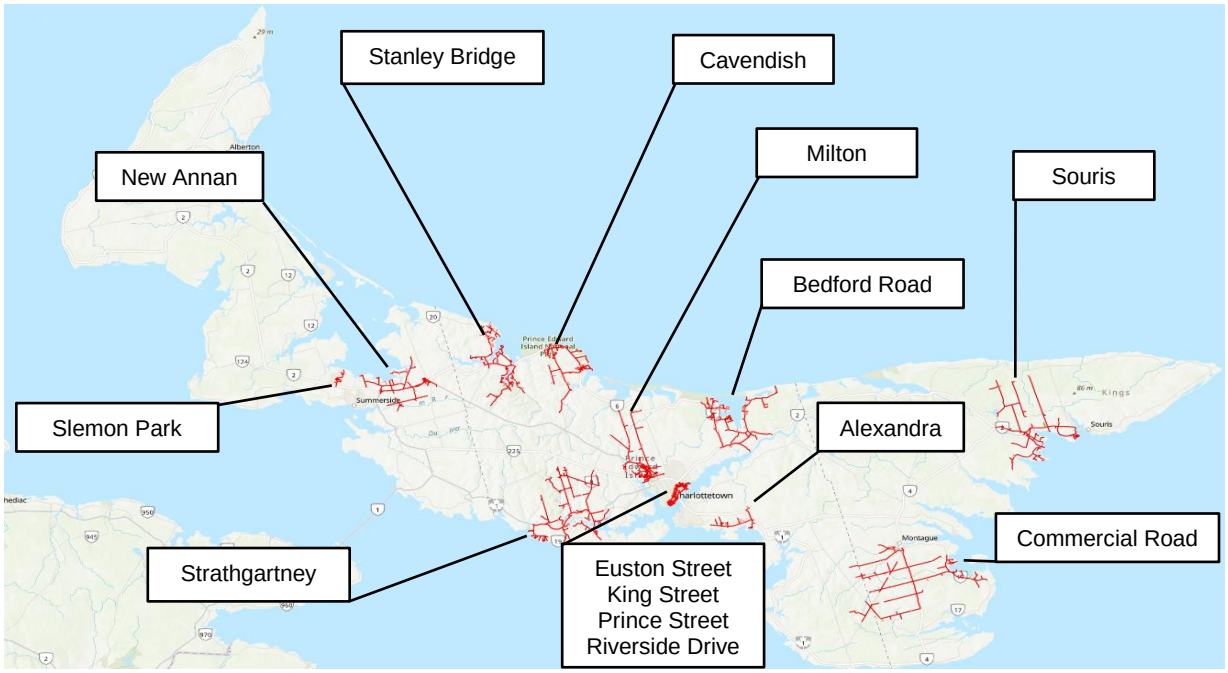
Description	2018	2019	2020	2021	2022 Budget	2023 Budget
Material	$ 70,620	$ 262,615	$ 115,947	$ 151,540	$ 128,000	$ 132,000
Contractor Labour	226,230	240,802	127,162	116,133	167,000	171,000
Internal Labour and Transportation	300,525	435,511	499,475	473,189	499,000	512,000
Other	1,613	1,348	168	(1,643)	-	-
Less: Joint Use Charged to/ Owned by Third Party	-	(100,159)	-	-	-	-
TOTAL	**$ 598,988**	**$ 840,117**	**$ 742,752**	**$ 739,219**	**$ 794,000**	**$ 815,000**

The proposed budget allocation will allow for inspection of feeders identified in Table 39 and the prioritized replacement of deteriorated assets such as poles, crossarms, conductor and hardware. The locations of the feeders are provided in Figure 7.

Table 39 Distribution Feeders to be Inspected in 2023		
Feeders	**Kilometres**	**Number of Customers**
Alexandra [MA58300]	19	251
Bedford Road [SF01197]	76	931
Cavendish [BG56300]	57	1,375
Commercial Road [VC02340]	115	897
Euston Street [ES04000]	22	2,490
King Street [KS05001]	8	1,791
Milton [WR01662]	75	2,514
New Annan [KN80001]	65	1,383
Prince Street [PS06100]	4	980
Riverside Drive [RD04100]	12	771
Slemon Park [SE23200]	7	315
Souris [DM00539]	96	928
Stanley Bridge [RT01085]	71	929
Strathgartney [CL54100]	119	1,291
TOTAL	**746**	**16,846**

1

Figure 7
2023 Distribution Feeder Inspection Locations



Future Commitments

Distribution inspection and refurbishment is structured on a six-year cycle pending approval annually through the Company's capital budget application. As such, this is not a multi-year capital budget commitment; however, it is a recurring capital program that is budgeted annually.

c. <u>Accelerated Distribution Component Replacement</u> (Justifiable)$ 2,109,000

This proposed budget allocation provides for the accelerated replacement of eastern cedar poles and deteriorated conductor, as well as the relocation of backlot feed lines. Rationale and justification for each program follows.

i. <u>Eastern Cedar Pole Replacement Program</u> $ 1,242,000

The vast majority of eastern cedar poles in the Company's distribution system are approximately 50 years old. Prior to the program, these poles were being replaced through a combination of rebuild projects and storms at a combined rate of approximately 900 per year. As such, it was estimated in 2018 that it would take up to 20 years to replace the 16,000 eastern cedar poles remaining in the system.

With the addition of the program to accelerate the replacement of eastern cedar poles in 2019, the target replacement rate was increased to approximately 1,500 poles per year. This improved the timeframe for substantial removal of all eastern cedar distribution poles to approximately ten years.

Justification

The accelerated replacement of eastern cedar poles is justified on the obligation to maintain a safe and reliable electrical system and cannot be deferred.

Costing Methodology

A breakdown of the historical expenditures, 2022 budget and the proposed 2023 budget allocation for the eastern cedar pole replacement program is shown in Table 40.

Table 40
Historical and Proposed Capital Expenditures
Eastern Cedar Pole Replacement Program

Description	2019[a]	2020[b]	2021[c]	2022 Budget	2023 Budget
Materials	$ 194,264	$ 118,123	$ 109,096	$ 210,000	$ 216,000
Contractor Labour	873,902	396,359	1,036,791	924,000	947,000
Internal Labour and Transportation	67,665	250,096	31,291	77,000	79,000
Other	88,890	1,444	2,827	-	-
Less: Joint Use Charged to/Owned by Third Party	(105,513)	-	-	-	-
TOTAL	**$1,119,208**	**$ 766,022**	**$1,180,005**	**$1,211,000**	**$1,242,000**

a. 2019 was the first year of the program; therefore, there is no historical data prior to 2019.
b. In 2020, the program budget was decreased to reflect an expectation that the PEI Broadband Project would result in a significant number of eastern cedar pole replacements. This did not occur and targeted replacements under the program was returned to 2019 levels in 2021.
c. Includes $603,000 budgeted for 2021 eastern cedar pole replacement work carried over to be completed in 2022.

Future Commitments

This is not a multi-year capital budget commitment; however, it is a recurring capital requirement that is budgeted annually for the duration of the program.

ii. Deteriorated Conductor Replacement Program $ 420,000

The deteriorated conductor replacement program is targeted at replacing aged and deteriorated copper conductor and smooth body ACSR conductor within the distribution system. The conductor is not safe to work on while energized, as it is brittle and at risk of failure when being handled. The condition of the conductor also puts it at an elevated risk of failure during storm conditions. Should failure occur, repairs are more challenging

and additional repair time is often required, which negatively impacts reliability and cost.

A recent partial audit of deteriorated copper conductor indicates there are 87 sections of line totalling approximately 28 km in the distribution system that requires replacement. The annual distribution inspections will record the quantity of smooth body ACSR conductor, as well as any other deteriorated conductor requiring replacement under the program. The program is expected to take approximately ten years to complete.

Justification

The replacement of deteriorated conductor is justified on the obligation to maintain a safe and reliable electrical system and cannot be deferred.

Costing Methodology

A breakdown of the proposed 2023 budget allocation for the replacement of deteriorated conductor is provided in Table 41.

Table 41
Proposed Capital Expenditures
Deteriorated Conductor Replacement Program

Description	**2023 Budget**
Materials	$ 93,000
Contractor Labour	228,000
Internal Labour and Transportation	99,000
Other	-
TOTAL	**$ 420,000**

Future Commitments

This is not a multi-year capital budget commitment; however, it is a recurring capital requirement that is budgeted annually for the duration of the program.

iii. <u>Backlot Feed Relocation Program</u> ***$ 447,000***

The majority of Maritime Electric's distribution lines are in public rights of way that are accessible by on-road vehicles for overhead service. The backlot feed relocation program will target existing overhead distribution lines feeding service locations that are not accessible by on-road vehicles, or have an existing non-standard delivery point.

The presence of backlot feeds does not deter customers from installing fences, sheds, pools, septic systems, solar panels, and other items in their backyards, all of which can limit access to power lines for maintenance and power restoration. The access challenges that these installations present often require specialized equipment, increasing outage restoration times, and generally making it more difficult and costly to maintain the system at safe and reliable levels.

In addition, backlot feeds typically have an increased safety risk to the public with the possibility of children climbing trees, snow banks, and play equipment, thereby reducing the safe distance to energized lines. These risks are also present when homeowners are performing yard maintenance, installing pools and decks, and adding storage structures.

Through the program, the Company will target projects with the greatest impact to improve public safety and system access by line crews, by removing hard to access backlot service lines and replacing them with more accessible roadside service lines. The program is expected to take approximately 10 years to complete.

Justification

The relocation of backlot feed distribution lines is justified on the obligation to maintain a safe and reliable electrical system and cannot be deferred.

Costing Methodology

A breakdown of the proposed 2023 budget allocation for the backlot feed relocation program is provided in Table 42.

Table 42 Proposed Capital Expenditures Backlot Feed Relocation Program	
Description	**2023 Budget**
Materials	$ 124,000
Contractor Labour	246,000
Internal Labour and Transportation	77,000
Other	-
TOTAL	**$ 447,000**

Future Commitments

This is not a multi-year capital budget commitment; however, it is a recurring capital requirement that is budgeted annually for the duration of the program.

5.6 System Meters (Recurring) ***$ 656,000***

This proposed budget for system meters is to provide for the purchase and installation of revenue metering and associated equipment. A breakdown of the historical expenditures, 2022 budget and proposed 2023 budget allocation for system meters is provided in Table 43.

Table 43 Historical and Proposed Capital Expenditures System Meters						
Description	**2018[a]**	**2019**	**2020[b]**	**2021[c]**	**2022 Budget**	**2023 Budget**
Material	$ 256,493	$ 296,327	$ 323,690	$ 345,433	$ 304,000	$ 306,000
External Labour	-	-	172,270	-	-	-
Internal Labour and Transportation	297,264	344,822	372,174	286,410	360,000	350,000
Other	340	4,218	20,060	-	-	-
TOTAL	**$ 554,097**	**$ 645,367**	**$ 888,194**	**$ 631,843**	**$ 664,000**	**$ 656,000**

a. Includes $22,050 for 2018 system meters work carried over and completed in 2019.
b. The 2020 approved capital budget included $300,000 for an Advanced Metering Infrastructure ("AMI") project.
c. Includes $33,000 budgeted for 2021 system meters work carried over to be completed in 2022.

Justification

The proposed budget allocation for system meters is justified on the obligation to serve new and existing customers and cannot be deferred.

Costing Methodology

An itemized breakdown of the proposed budget for system meters is shown in Table 44.

Table 44 Breakdown of Proposed Budget Allocation System Meters			
Description	**Materials**	**Internal Labour and Transportation**	**Budget**
a. Watt Hour Meters	$ 194,000	$ 250,000	$ 444,000
b. Combination Meters	38,000	50,000	88,000
c. Outdoor Metering Tanks	36,000	50,000	86,000
d. Miscellaneous Metering Equipment	38,000	-	38,000
TOTAL	**$ 306,000**	**$ 350,000**	**$ 656,000**

Additional information for each of the system meters items listed in Table 44 follows.

a. Watt-Hour Meters **$ 444,000**

The 2023 budget for radio frequency ("RF") remote interrogation watt-hour meters includes a provision for new service installations, an allowance for the replacement of damaged or failed units, and the replacement of RF watt-hour meters to permit annual sample testing of approximately 500 meters, which is required to ensure compliance with Industry Canada/Measurement Canada Standards.

Table 45 provides a forecast of watt-hour meter installs in 2023 based on the anticipated rate of customer growth, historical equipment damage and failure rates, and the requirement to conduct annual compliance testing.

The proposed budget allocation for watt-hour meters reflects the continuation of an increased need for single phase meters and associated installation labour due to an ongoing strong demand for net metering installations. There is also a continued demand for five jaw meters in the watt-hour category as these meters are required for larger apartment buildings to step down from three phase to single phase power. These meters carry a 100 per cent premium over regular watt-hour meters and are required for approximately 50 per cent of meter installations.

Table 45
Forecast of Watt-Hour Meter Installs in 2023

Description	Installs
Single phase – customer growth, replacements and annual testing	1,155
Network and three phase meters	345
Total Watt-Hour Meters	**1,500**

The budget for watt-hour meters is based on vendor invoice information from previous years, provided in Confidential Appendix N-6.

b. Combination Meters **$ 88,000**

The proposed budget allocation provides for the purchase and installation of new combination meters that measure both demand and energy consumption. New combination meters are required to meet forecast customer growth levels and to

replace existing meters due to damage, failure and customer service entrance size upgrades.

In addition, the proposed budget provides for in-situ meter installation tests (potential transformers and current transformers) to confirm accuracy. Measurement Canada recommends the testing of meter installations on an eight-year cycle.

Table 46 provides a forecast of new and replacement combination meters required in 2023.

Table 46
Forecast of New and Replacement Combination Meters Installs in 2023

Description	Installs
Customer growth	85
Replacements due to upgrades, damage and failure	5
Total Combination Meters	**90**

The budget for combination meters is based on vendor invoice information from previous years, provided in Confidential Appendix N-6.

c. Outdoor Metering Tanks $ 86,000

Outdoor metering tanks are used in the Company's substations and in specific customer applications where customers are metered at either transmission or primary voltage levels. The proposed budget allocation provides for the purchase of two outdoor metering tanks and is based on vendor invoice information from previous years, provided in Confidential Appendix N-6.

d. Miscellaneous Metering Equipment $ 38,000

The proposed budget allocation provides for the purchase of miscellaneous metering equipment such as potential transformers, current transformers, cabinets, security bands, sealing rings, locks, meter covers, load limiters, cable connectors, meter adapters, test blocks, phase indicators, neutral isolators,

communication cables and media converters for interval meters, DC breakers and disconnect sleeves.

Future Commitments

System meters is not a multi-year capital budget commitment; however, it is a recurring capital requirement that is budgeted annually.

5.7 <u>Distribution Equipment</u> (Recurring) ***$ 1,477,000***

The proposed budget allocation is necessary to replace distribution system equipment that has failed or is deemed unsafe due to storm damage, lightning strikes, vandalism, electrical or mechanical damage, corrosion damage, technical obsolescence or performance testing.

The budget also provides for the replacement of aged system equipment that is used to provide voltage support, communications, and protection and control of the Company's assets, as well as the replacement of line tools and equipment as identified in Table 47.

System equipment that fails in service requires immediate attention as it is usually essential to the integrity and reliability of the electrical system. Therefore, a recurring investment in distribution system equipment is necessary to provide ongoing reliable service to customers.

Justification

The budget proposed for distribution equipment is justified based on the need to maintain safe, reliable electrical service at the least cost and to ensure that the electrical system equipment operates as designed, to prevent catastrophic damage or injury to employees or the public. For the reasons provided, the timely replacement or upgrading of aged and deteriorated distribution equipment cannot be deferred.

Costing Methodology

The distribution equipment budget for 2023, shown in Table 47, is based on past experience, professional engineering judgement and historical expenditures. In some cases, distribution equipment assets will only require refurbishment to extend their life while others will require a complete replacement.

Table 47 Distribution Equipment Budget			
Description	**Materials**	**Internal Labour and Transportation**	**Budget**
a. Substation, Line and Communication Equipment	**$ 779,000**	**$ 207,000**	**$ 986,000**
Electronic Reclosers[a]	129,000	-	-
Recloser Controllers to replace obsolete Controllers	20,000	-	-
Voltage Regulator Controls Replacement	22,000	-	-
Voltage Regulators[a]	184,000	-	-
Capacitor Bank Controllers	10,000	-	-
Capacitor Banks and Parts	25,000	-	-
Voltage Regulator and Recloser Parts	12,000	-	-
Power Transformer Parts	5,000	-	-
Transformer Oil	28,000	-	-
Transformer Oil Reconditioning	20,000	-	-
69 kV and 138 kV Breaker Contacts	30,000	-	-
Annual Dissolved Gas Analysis	25,000	-	-
Tap Changer Contacts	30,000	-	-
SCADA Remote Terminal Unit Retrofit Parts	15,000	-	-
Fault Indicators	22,000	-	-
Vehicle Antennas (Radio and RF Meters)	3,000	-	-
Doble Power Factor Test Equipment	43,000	-	-
Protection Relay Test Set	76,000	-	-
Aging Battery Bank Replacement	20,000	-	-
Substation Radio Equipment Replacement	30,000	-	-
Communication Tower Equipment Replacements	30,000	-	-
b. Relay Replacement Equipment	**$ 134,000**	**$ 30,000**	**$ 164,000**
Relay Replacement Equipment[a]	134,000	-	-
c. Switch Replacement Equipment	**$ 55,000**	**$ 12,000**	**$ 67,000**
Recloser By-Pass Switch[a]	18,000	-	-
Distribution Switches[a]	21,000	-	-
Voltage Regulator By-Pass Switch[a]	16,000	-	-
d. Line Tools and Equipment	**$ 228,000**	**$ -**	**$ 228,000**
e. Meter Shop Equipment	**$ 32,000**	**$ -**	**$ 32,000**
TOTAL	**$ 1,228,000**	**$ 249,000**	**$ 1,477,000**

1 a. Supporting information is provided in Confidential Appendix N-7.

Materials and equipment will be obtained through competitive procurement processes to ensure the best possible pricing is achieved. The expected start date for the project is January 2023 with in-service dates throughout the year.

Additional information for each of the distribution equipment groupings listed in Table 47 follows.

a. <u>Substation, Line and Communication Equipment</u> $ 986,000

The Company operates 30 substations and approximately 5,800 km of main line distribution infrastructure with equipment such as reclosers, voltage regulators, capacitor banks, power transformers and circuit breakers. The need to replace equipment is determined on the basis of equipment condition, age, test results and operational history.

A breakdown of the historical expenditures, 2022 budget and proposed 2023 budget allocation for substation, line and communication equipment is shown in Table 48. Supporting information for some proposed material costs is provided in Confidential Appendix N-7.

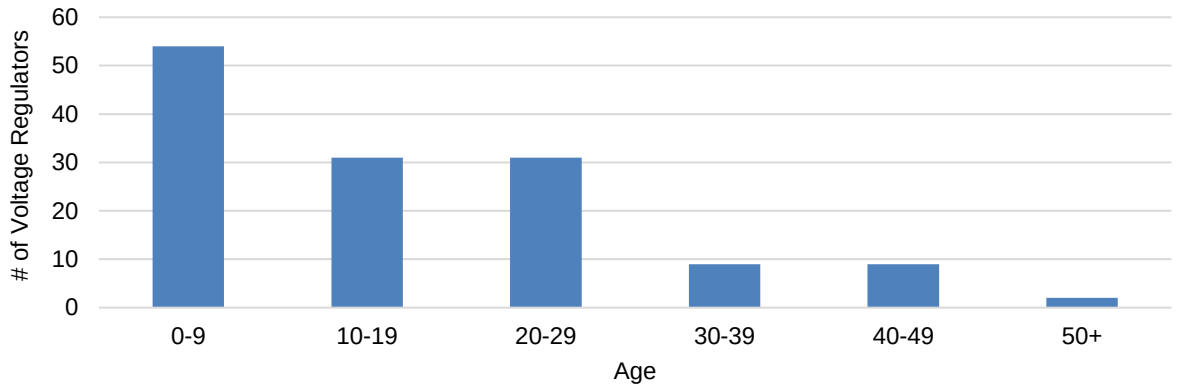
Table 48
Historical and Proposed Capital Expenditures
Substation, Line and Communication Equipment

	2018	2019[a]	2020[b]	2021[c]	2022 Budget	2023 Budget
Material	$ 769,434	$ 1,057,740	$ 657,815	$ 915,712	$ 858,000	$ 779,000
External Labour	22,244	418	21,472	-	-	-
Internal Labour and Transportation	372,718	351,886	244,864	278,817	174,000	207,000
Other	7,815	9,192	15,998	-	-	-
TOTAL	**<u>$ 1,172,211</u>**	**<u>$ 1,419,236</u>**	**<u>$ 940,149</u>**	**<u>$ 1,194,529</u>**	**<u>$ 1,032,000</u>**	**<u>$ 986,000</u>**

a. Includes $175,854 for 2019 substation, line and communication equipment carried over and delivered in 2020.
b. Includes $28,001 for 2020 substation, line and communication equipment carried over and delivered in 2021.
c. Includes $192,000 budgeted for 2021 substation line and communication equipment carried over to be delivered in 2022.

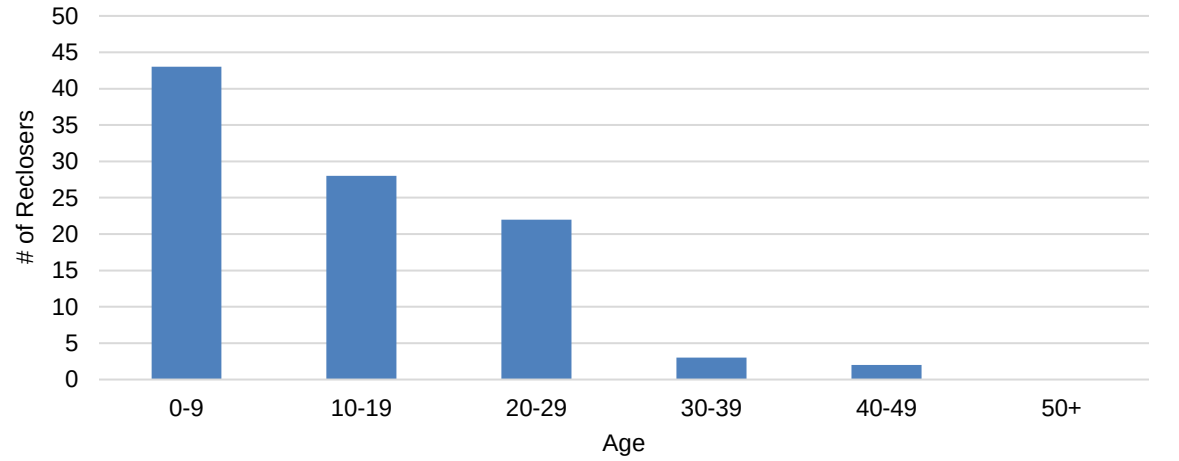
The average age of the voltage regulators in the distribution system is approximately 17 years and approximately eight per cent are over 40 years old and at the end of their useful life, as shown in Figure 8.

Figure 8
Voltage Regulators Installed in the Distribution System



The average age of the reclosers in the distribution system is approximately 13 years and approximately two per cent are over 40 years old and at the end of their useful life, is shown in Figure 9.

Figure 9
Reclosers Installed in the Distribution System



The Company has 44 communication sites comprised of a 7 GHz microwave and fibre backbone system. The need to replace communication equipment is determined on the basis of equipment condition, age, test results and operational history.

b. Relay Replacement Equipment $ 164,000

New generation microprocessor-based relays offer a host of advantages compared to electromechanical relays because of enhanced capabilities and programming versatility. One microprocessor-based relay replaces several electromechanical relays resulting in cost and efficiency advantages. The proposed budget is for the continued replacement and upgrade of relays.

A breakdown of the historical expenditures, 2022 budget and proposed 2023 budget allocation for relay replacement equipment is shown in Table 49. Supporting information for the proposed material costs is provided in Confidential Appendix N-7.

Table 49
Historical and Proposed Capital Expenditures
Relay Replacement Equipment

	2018	2019	2020	2021	2022 Budget	2023 Budget
Material	$ 163,997	$ 185,014	$ 109,484	$ 172,249	$ 130,000	$ 134,000
Internal Labour and Transportation	8,184	-	68,295	19,500	28,000	30,000
Other	167	-	-	-	-	-
TOTAL	**$ 172,348**	**$ 185,014**	**$ 177,779**	**$ 191,749**	**$ 158,000**	**$ 164,000**

c. Switch Replacement Equipment $ 67,000

The requirement to replace switches is based on findings of an ongoing switch inspection program. The proposed budget also includes a provision for replacing switches that are used for bypassing recloser and voltage regulators when performing equipment upgrades. The need to replace switch equipment is determined on the basis of equipment condition, age, and operational history.

A breakdown of the historical expenditures, 2022 budget and proposed 2023 budget allocation for switch replacement equipment is shown in Table 50. Supporting information for the proposed material costs is provided in Confidential Appendix N-7.

Table 50
Historical and Proposed Capital Expenditures
Switch Replacement Equipment

	2018	2019	2020	2021	2022 Budget	2023 Budget
Material	$ 60,890	$ 110,986	$ 145,867	$ 115,796	$ 92,000	$ 55,000
External Labour	82,065	25,000	-	-	-	-
Internal Labour and Transportation	28,235	-	81,162	112,679	21,000	12,000
TOTAL	**$ 171,190**	**$ 135,986**	**$ 227,029**	**$ 228,475**	**$ 113,000**	**$ 67,000**

d. Line Tools and Equipment $ 228,000

The proposed budget is for the replacement of line equipment such as hotline sticks, phasing sticks, potential indicators, ground mats, hard and rubber cover-up, fall arrest equipment, survey equipment and material handling equipment such as presses and dies, running blocks and chain hoists.

A breakdown of the historical expenditures, 2022 budget and proposed 2023 budget allocation for line tools and equipment is shown in Table 51.

Table 51
Historical and Proposed Capital Expenditures
Line Tools and Equipment

	2018	2019	2020	2021	2022 Budget	2023 Budget
Material	$ 137,237	$ 136,528	$ 118,953	$ 153,936	$ 222,000	$ 228,000
Other	34,305	125,489	55,521	72,539	-	-
TOTAL	**$ 171,542**	**$ 262,017**	**$ 174,474**	**$ 226,475**	**$ 222,000**	**$ 228,000**

e. Meter Shop Equipment **$ 32,000**

The proposed budget provides for the purchase of power quality test equipment, voltmeters and meter test equipment.

A breakdown of the historical expenditures, 2022 budget and proposed 2023 budget allocation for meter shop equipment is shown in Table 52.

Table 52
Historical and Proposed Capital Expenditures
Meter Shop Equipment

	2018	2019	2020	2021[a]	2022 Budget	2023 Budget
Material	$ 13,539	$ 29,660	$ 22,382	$ 20,250	$ 31,000	$ 32,000
External Labour	6,494	-	-	-	-	-
TOTAL	**$ 20,033**	**$ 29,660**	**$ 22,382**	**$ 20,250**	**$ 31,000**	**$ 32,000**

a. Includes $18,000 for 2021 meter shop equipment carried over to be delivered in 2022.

Future Commitment

Distribution equipment is not a multi-year capital budget commitment; however, it is a recurring capital requirement that is budgeted annually.

5.8 Transportation Equipment (Work Support Services) ***$ 1,258,000***

Maritime Electric's transportation fleet consists of large line operation vehicles with aerial and/or digger attachments, and smaller vehicles and equipment including cars, pick-up trucks, cargo vans, off-road vehicles, pole and wire trailers, and other similar items.

Line operation vehicle replacements are planned based on the age and condition of the unit. The life span of these vehicles average from ten to twelve years with the aerial units lasting longer than the digger units. Supplier timeframes for delivery of new line operation vehicles is typically in the 12 to 18 month range; however, over the past two years, global supply chain delays have increased the delivery timeframe for some vehicles to 24 months. To better accommodate a two-year vehicle delivery schedule, the Company is proposing to budget line operation vehicle replacements on a multi-year basis. This will provide a more accurate estimate of proposed transportation equipment expenditures in

annual capital budget applications and help to minimize future carryover requirements for transportation equipment.

Smaller vehicle replacements depend on age, mileage and type of service, with the life span typically five to ten years. Until recently, small vehicles and other transportation equipment were typically available within weeks or months of ordering. This has changed in the past year due to supply chain issues and delivery of some items is taking longer than in the past; however, most small vehicles and equipment can still be ordered and received within the budget year.

The 2023 Transportation Equipment Report is included in Appendix J.

Justification

The timely replacement of aged and deteriorated transportation equipment is justified to protect the safety of employees and the general public, as well as the obligation to provide reliable service to customers at least cost.

Costing Methodology

A breakdown of the historical expenditures, 2022 budget and proposed 2023 budget allocation for transportation equipment is shown in Table 53. The proposed budget allocation for 2023 is lower than the historical five-year average, due to the change to multi-year budgeting for line operation vehicles.

Table 53 Historical and Proposed Capital Expenditures Transportation Equipment						
	2018[a]	**2019[b]**	**2020[c]**	**2021[d]**	**2022 Budget**	**2023 Budget**
Material	$ 1,311,175	$ 1,537,603	$ 1,744,554	$ 1,731,049	$ 1,958,000	$ 1,208,000
Internal Labour and Transportation	32,343	69,839	36,667	51,928	82,000	$ 50,000
Other	4,257	1,887	5,960	-	-	
TOTAL	**$ 1,347,775**	**$ 1,609,329**	**$ 1,787,181**	**$ 1,782,977**	**$ 2,040,000**	**$ 1,258,000**

a. Includes $608,068 for 2018 transportation equipment carried over and delivered in 2019.
b. Includes $566,257 in carryover costs for 2019 transportation equipment carried over and delivered in 2020.
c. Includes $1,097,181 in actual and $690,000 budgeted for transportation equipment carried over to be delivered in 2022.
d. Includes $923,000 budgeted for 2021 transportation equipment carried over to be delivered in 2022.

The budget is based on a combination of professional engineering estimates and vendor invoice information from prior years for similar items. A breakdown of the proposed transportation equipment replacements and additions for 2023 is shown in Table 54.

Table 54 Breakdown of Proposed Budget Allocation Transportation Equipment	
Description	**Budget**
a. Line Operation Vehicles	$ 545,000
b. Small Vehicles and Equipment	713,000
TOTAL	**$ 1,258,000**

To ensure that transportation equipment is purchased at the lowest possible cost, all materials and services will be obtained through competitive procurement processes.

Additional information for each of the transportation equipment items listed in Table 54 follows.

a. Line Operation Vehicles $ 545,000

The replacement of two existing and the addition of two new line operation vehicles is proposed for 2023. The proposed replacements are consistent with Maritime

Electric's criteria for heavy vehicle replacement, which identifies ten years or 250,000 km as the standard milestone for replacement. The proposed new line operation vehicles will be utilized to add a line crew to the Western District and for vegetation management, as the Company plans to increase the amount of vegetation management work done by in-house resources and reduce its dependence on contractor services. The addition of vegetation management crews will involve hiring utility arborists to eventually have a crew in each district by 2027 for responding to customer requests for tree trimming work.

Table 55 provides a multi-year breakdown of the proposed line operation vehicle replacements to be initiated in 2023 with downpayments, for delivery in 2024.

Table 55
Line Operation Vehicles Budget

	Description	Location	Age (Yrs)	Current Mileage (km)	2019-2021 Annual Maintenance Cost[a]	2023	2024	Budget
1.	Digger/Derrick Truck	Western Line	-	-	$ -	$ 153,500	$ 483,000	$ 636,500
2.	Digger/Derrick Truck	Central Line	9	116,620	40,000	153,500	483,000	636,500
3.	Vegetation Management Truck/Chipper	Eastern Line	-	-	-	138,000	286,000	424,000
4.	CSUP Truck	Western Line	6	334,598	33,000	100,000	199,000	299,000
TOTAL						**$ 545,000**	**$ 1,451,000**	**$ 1,996,000**

a. Three-year average.

Supporting information for line operation vehicles cost estimates is provided in Confidential Appendix N-8.

b. Small Vehicles and Equipment $ 713,000

The replacement of eight existing passenger vehicles and the addition of two trailers are planned for 2023. These replacements are consistent with Maritime Electric's criteria for passenger vehicles replacement, which identifies seven years or 200,000 km as the standard milestone for replacement. The new pole trailer and

trailer jeep will be utilized to support Company operations in moving materials and equipment to and from job sites.

Maritime Electric is in the process of transitioning its passenger vehicle fleet to plug-in hybrid electric vehicles ("PHEV") and all-electric vehicles with individual replacement decisions based on job functions, vehicle specifications, availability and price. The proposed replacement of a vehicle in the Metering department (Item 8 in Table 56) in 2023 will consider PHEV options.

Table 56 provides a breakdown of the proposed small vehicle replacements and trailer additions planned for 2023.

Table 56
Small Vehicles and Equipment Budget

	Description	Location	Age (Yrs)	Current Mileage (km)	2019-2021 Annual Maintenance Cost[a]	2023
1.	½ Ton Truck	Transformer Shop	7	106,734	1,666	$ 63,000
2.	½ Ton Truck	Transformer Shop	7	93,340	1,500	63,000
3.	½ Ton Truck	Technical Services	7	121,801	1,121	63,000
4.	½ Ton Truck	Technical Services	7	206,350	3,882	63,000
5.	½ Ton Truck	Survey	7	224,584	3,219	63,000
6.	½ Ton Truck	Survey	7	200,857	4,179	63,000
7.	½ Ton Truck	Central Line	7	122,400	4,918	63,000
8.	Meter Reading (PHEV)	Metering	5	173,998	4,035	52,000
9.	Pole Trailer	Line Operations	-	-	-	39,000
10.	Specialized Trailer (Jeep) – Tandem Axle Extension	Transformer Shop	-	-	-	91,000
11.	Allowance for unforeseen capital expenditures					90,000
TOTAL						**$ 713,000**

a. Three year average.

Supporting information for small vehicles and equipment cost estimates is provided in Confidential Appendix N-8.

Future Commitments

Transportation equipment is a recurring capital requirement that is budgeted annually. The purchase of line operation vehicles is a multi-year capital budget commitment that will be completed over two years, in 2023 and 2024. If there are any changes to the evidence provided herein including changes in scope, budget or timelines subsequent to approval, further evidence will be provided in the 2024 Capital Budget Application.

6.0 TRANSMISSION *$ 15,825,000*

The Transmission category reflects the Company's proposed activities for the expansion and replacement of the 69 kV (T-line) and 138 kV (Y-line) transmission system using the Company's ISP as a guideline. This includes transmission lines, substations, power transformers and protection devices such as circuit breakers.

6.1 Substation Projects *$ 13,807,000*

The proposed budget allocation for substation projects is shown in Table 57.

Table 57
Breakdown of Proposed Budget Allocation
Substation Projects

Description	Budget
a. Crossroads Substation Rebuild	$ 3,323,000
b. West Royalty X5 Autotransformer Upgrade	4,650,000
c. Woodstock Switching Station	1,741,000
d. Tignish Substation	2,573,000
e. Substation Oil Containment Program	152,000
f. Substation Modernization Program	528,000
g. 138 kV Breaker Replacement Program	153,000
h. Communication Fibre – Alberton to Tignish	643,000
i. Fibre Modifications Due to Road Alterations	44,000
TOTAL	**$ 13,807,000**

a. Crossroads Substation Rebuild (Justifiable) $ 3,323,000

This will be the second and final year of construction for the Crossroads substation rebuild that was included as a multi-year project in the 2022 Capital Budget Application.

The project work plan for 2023 includes ordering and installing the structural steel, purchasing and installing station equipment, high voltage bus work and power transformer installation, assembly of control panels and substation commissioning.

An increase of $800,000 to the 2023 project budget that was originally included in the 2022 Capital Budget Application is required to address cost increases associated with the power transformer, structural steel and substation equipment, as well as the addition of a 69 kV breaker, determined to be necessary during the final design of the protection and control system. For example, the cost of the power transformer has significantly increased as a result of supply chain issues.

Justification

The project is justifed based on the need to rebuild the Crossroads substation due to deteriorated infrastucture. In addition, the substation will be rebuilt with the capacity to serve the growing load in the Stratford area into the future. For the reasons provided, the project cannot be deferred.

Costing Methodology

The estimated construction costs in Table 58 are based on previous substation projects, including the Clyde River and Marshfield substations, along with current and projected material costs. A contingency has been budgeted as the rebuild will occur within an energized substation, some vendor quotations may need to be refreshed, some project component costs were estimated, and to accommodate minor adjustments in project scope that are commonly required with this type of project during construction.

Table 58 Breakdown of Proposed Multi-Year Budget Crossroads Substation Rebuild				
Description	**2022 (A)**	**2023 Original**	**2023 Revised (B)**	**Budget (C = A + B)**
Civil Works	$ 423,000	$ 435,000	$ 442,000	$ 865,000
Substation Equipment	220,000	227,000	359,000	579,000
Protection and Control	90,000	91,500	94,000	184,000
OT Cybersecurity	44,500	46,000	45,000	89,500
Structural Steel	147,000	151,000	347,000	494,000
Bus Works	193,000	198,000	214,000	407,000
Power Transformer Equipment	1,075,000	1,107,000	1,503,000	2,578,000
Engineering Design	120,000	-	-	120,000
Internal Labour and Transportation	152,000	153,000	109,000	261,000
Contingency (6 per cent)	155,500	117,500	210,000	365,500
TOTAL	**$ 2,620,000**	**$ 2,526,000**	**$ 3,323,000**	**$ 5,943,000**

Supporting information for the cost estimates in Table 58 is provided in Confidential Appendix N-9.

The Crossroads substation rebuild is interdependent with two other capital projects that were included in the 2022 Capital Budget.[16] One is the Mount Herbert three phase conversion project and the other is the Crossroads substation transmission modifications project.[17] Crossroads substation transmission modifications is also included in this Application, as additional work on transmission line T-2, not included in the 2022 project budget, is necessary to accommodate protection and control requirements, and future load growth in the area.[18] The combined budget of these three interdependent projects is shown in Table 59.

[16] The 2022 Capital Budget was approved by Commission Order UE21-16.
[17] See Appendix H and Appendix O of the 2022 Capital Budget Application for a description of the Mount Herbert three phase conversion project and Crossroads substation transmission modifications project, respectively.
[18] See Appendix L for a description of the Crossroads substation transmission modifications that are required in 2023.

Table 59 Combined Budget of Interdependent Projects			
Project	**2022**	**2023**	**Budget**
Crossroads Substation Rebuild	$ 2,620,000	$ 3,323,000	$ 5,943,000
Mount Herbert Three Phase Conversion	615,000	-	615,000
Crossroads Substation Transmission Modifications	81,000	147,000	228,000
TOTAL	**$ 3,316,000**	**$ 3,470,000**	**$ 6,786,000**

To ensure this project is completed at the lowest possible cost, consistent with safe and reliable service, all materials and external labour will be obtained through competitive procurement processes.

The project was initiated in early 2022 and is scheduled to be completed in the fourth quarter of 2023.

Alternatives

As the project is currently underway, there are no alternatives to completing the project as planned.

Future Commitments

This is a multi-year project that is proposed to be completed over two years in 2022 and 2023.

b. West Royalty X5 Autotransformer Upgrade (Justifiable) $ 4,650,000

This will be the second and final year of the West Royalty X5 autotransformer upgrade project that was included as a multi-year project in the 2022 Capital Budget Application. The autotransformer was ordered in early 2022 and will be delivered and installed in 2023.

An increase of $1,908,000 to the 2023 project budget that was originally included in the 2022 Capital Budget Application is proposed to address cost increases associated with the power transformer and additional modifications that are necessary due to load growth in the service area. The scope of the modifications

includes moving transmission line Y-111 to terminate on the opposite side of the West Royalty 138 kV substation bus, and adding a 138 kV tie breaker to separate the 138 kV bus. These modifications enable bus faults to be cleared without a complete loss of load and will also provide flexibility to complete maintenance on one side of the 138 kV bus without a complete shutdown, depending on the system load.

Justification

The project is justified based on the need to replace a critical aged asset that has reached end of life and cannot be operated to failure. For this reason, it cannot be deferred.

Costing Methodology

The budget for this project is provided in Table 60. A contingency has been budgeted as some major cost components were estimated, and to allow for minor adjustments to the project scope of work.

Table 60
West Royalty X5 Autotransformer Upgrade Budget

Description	2022 (A)	2023 Original	2023 Revised (B)	Budget (C = A + B)
Civil Works	$ -	$ 170,000	$ 570,000	$ 570,000
Substation Equipment	-	423,000	630,000	630,000
High Voltage Bus Works	-	50,000	160,000	160,000
Structural Steel	-	128,000	138,000	138,000
69 kV Underground Cable and Trenching	-	200,000	364,000	364,000
Autotransformer Equipment	322,000	1,237,000	1,989,000	2,311,000
Protection and Control	-	80,000	184,000	184,000
Engineering Design	30,000	40,000	45,000	75,000
Internal Labour and Transportation	11,000	166,000	147,000	158,000
Contingency (9 per cent)	-	248,000	423,000	423,000
TOTAL	**$ 363,000**	**$ 2,742,000**	**$ 4,650,000**	**$ 5,013,000**

Supporting information for the cost estimates in Table 60 is provided in Confidential Appendix N-10.

The West Royalty X5 autotransformer upgrade is interdependent with the West Royalty substation transmission modifications project, also planned for 2023.[19] The transmission modifications project, which was approved as a 2022 capital project but has been delayed to coincide with the delivery of the X5 autotransformer, will connect the new configuration to the existing transmission system. The combined budget of the two interdependent projects is shown in Table 61.

Table 61
Combined Budget of Interdependent Projects

Project	2022	2023	Budget
West Royalty X5 Autotransformer Upgrade	$ 363,000	$ 4,650,000	$ 5,013,000
West Royalty Substation Transmission Modifications	48,000[a]	-	48,000
TOTAL	**$ 411,000**	**$ 4,650,000**	**$ 5,061,000**

a. The 2022 budget allocation for West Royalty substation transmission modifications will be carried over the complete the project in 2023.

To ensure this project is completed at the lowest possible cost, consistent with safe and reliable service, all materials and external labour will be obtained through a combination of competitive procurement processes and sole source purchases (e.g., where materials and services are best supplied by the original equipment manufacturer).

Alternatives

There is no alternative to replacing West Royalty X5 autotransformer.

[19] See Appendix O of the 2022 Capital Budget Application for a description of the West Royalty substation transmission modifications project.

Future Commitments

This is a multi-year project that is proposed to be completed over two years in 2022 and 2023.

c. <u>Woodstock Switching Station</u> (Justifiable) $ 1,741,000

A single radial 69 kV transmission line currently feeds western PEI, with the Wellington and St. Eleanors substations fed from transmission line T-5, and the O'Leary and Alberton substations fed from T-21. Currently, there are more than 12,500 customers with a coincidental peak load of 43.6 megavolt-amperes ("MVA") served from these four substations, as shown in Table 62. Transmission lines T-5 and T-21 are also interconnected to four wind farms in the North Cape area with a total generating capacity of 32.5 MW, and a 10 MW solar farm in Slemon Park, expected to be operational in early 2023, will increase the total generation on the radial transmission line feeding western PEI to 42.5 MW.

Table 62
Western PEI Substations Fed from T-5 and T-21

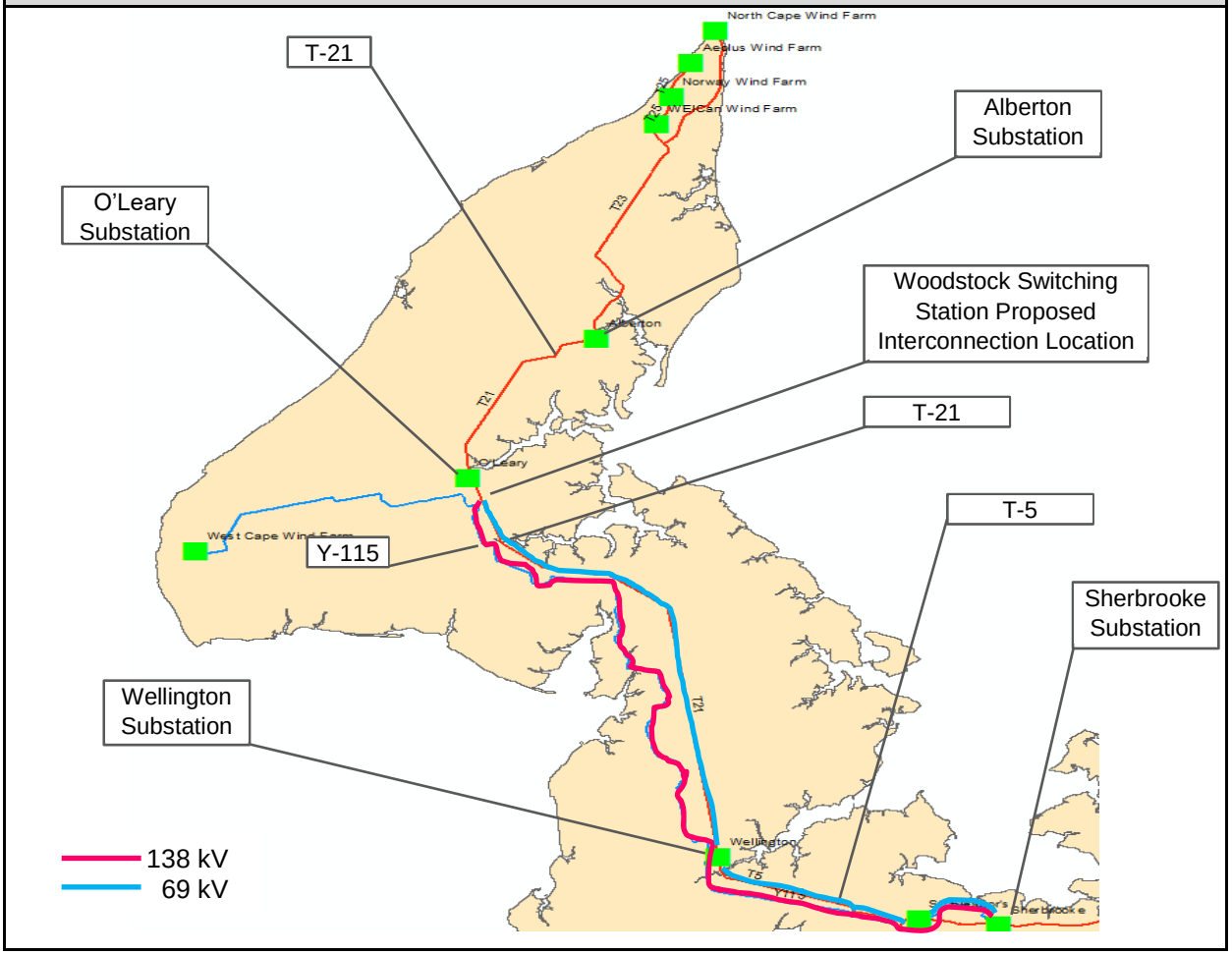
Substation	Customer Count	Peak Load (MVA)
Alberton	4,209	13.6
O'Leary	3,367	11.5
Wellington	3,355	11.0
St Eleanors	1,794	7.5
Total	**12,725**	**43.6**

The radial nature of T-5 and T-21 has negative effects on reliability in the area. Any fault or planned outage on either line will cause all customers downstream of the affected line, including the wind and solar farms, to lose power until the line is restored. On average since 2012, western PEI has experienced 209,178 customer outage hours per year, which is considered high.

The proposed switching station project will establish a transmission loop between the Sherbrooke and O'Leary substations, by interconnecting transmission lines T-21 and Y-115 in Woodstock, approximately 1.2 km north of the O'Leary roundabout, as shown in Figure 10. The 138 kV transmission line Y-115 was

constructed in 2009 to interconnect the 99 MW ENGIE-owned West Cape Wind Farm ("WCWF"). While Y-115 is owned by Maritime Electric, it currently serves WCWF as a dedicated facility under the Open Access Transmission Tariff ("OATT"), and as such, ENGIE is responsible for all operation and maintenance ("O&M") costs for the line. Once the section of Y-115 from O'Leary to Sherbrooke is connected to the Woodstock switching station to establish the transmission loop, the Company will be responsible for its O&M, while the section from O'Leary to West Cape will remain a dedicated facility.

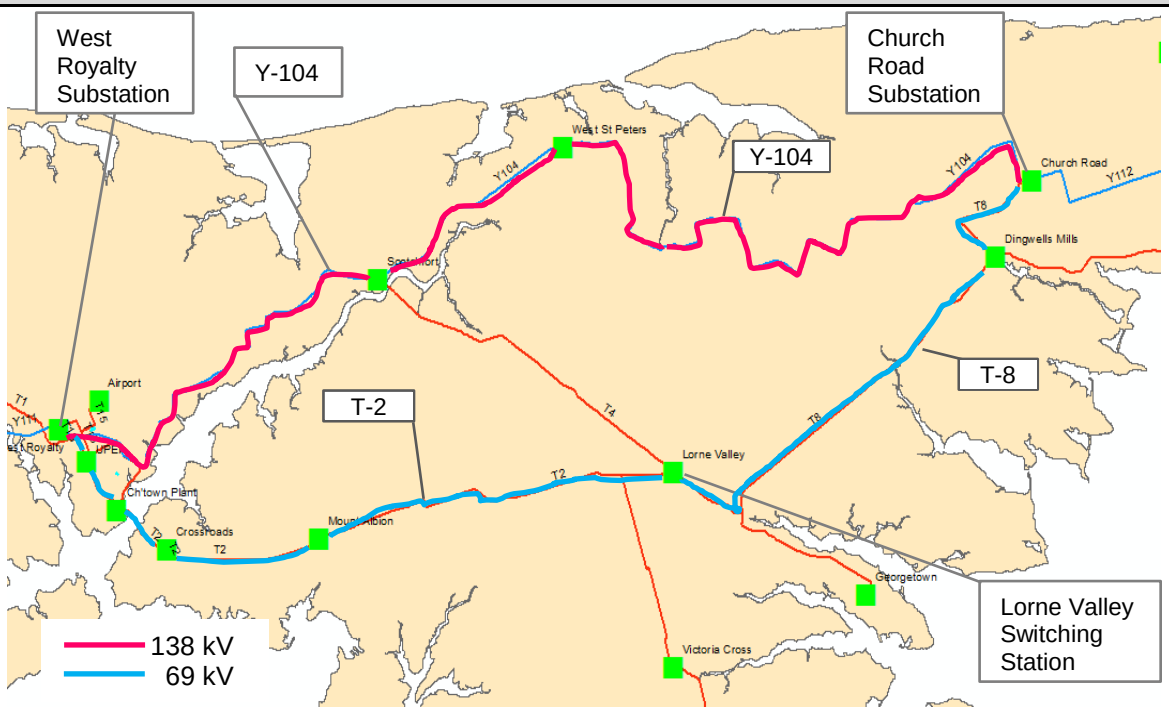
Figure 10
Western PEI Transmission Interconnection Location



Maritime Electric's ISP identifies the need to interconnect Y-115 and T-21, via a 75 MVA autotransformer, to improve power quality and reliability for customers in western PEI. Construction of the Woodstock switching station, as proposed, will facilitate this interconnection.

Typically, looped transmission systems provide enhanced reliability for customers as electricity can be rerouted from another path if one path becomes unavailable. For example, in eastern PEI the backbone of the transmission system includes the 138 kV transmission line Y-104, 69 kV transmission lines T-2 and T-8, and a 138/69 kV, 75 MVA autotransformer in the Church Road substation, which form a looped system as shown in Figure 11.

Figure 11
Eastern PEI Transmission Loop

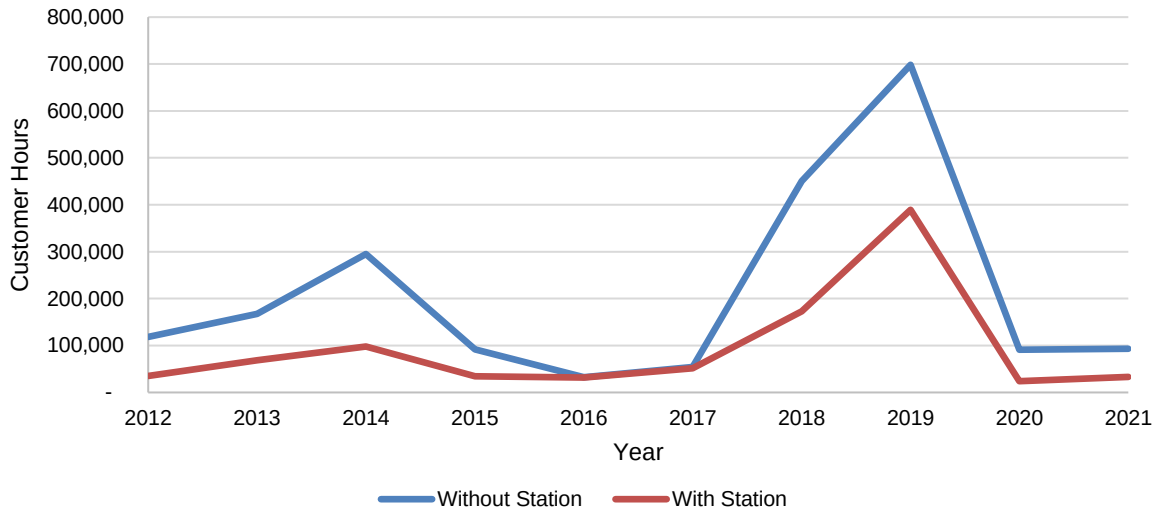


The proposed switching station in Woodstock that will establish the western PEI transmission loop, will have a "ring" bus configuration for both the 138 kV and 69 kV systems, including three 138 kV breakers, three 69 kV breakers, and one 138/69 kV, 75 MVA autotransformer. The configuration will provide operation and

maintenance flexibilities, as any breaker outage will not impact the availability of 138 kV lines, 69 kV lines, or the autotransformer.

The impact of a 69 kV transmission system outage will be reduced significantly once customers in the area are supplied by two sources. For example, an outage on T-5 will not result in an extended customer outage after the transmission loop is established. In the case of an outage on T-5, customers connected to St. Eleanors, Wellington, O' Leary, Alberton and Tignish substations will be fed via Y-115, through the Woodstock switching station and T-21. This is also the case for an outage on T-21 south of Woodstock, except that St. Eleanors substation would not be affected by a T-21 outage. It is estimated that average annual customer outage hours in western PEI will be reduced from 209,178 to 93,869, a reduction of 55 per cent. This represents a significant reliability improvement as shown in Figure 12.

Figure 12
Western PEI Customer Outage Hours (SAIDI All-In)
with and without the Woodstock Switching Station



Along with reliability improvements for distribution customers, the four wind farms in the North Cape area will have redundant access to the 138 kV transmission

system through the Woodstock switching station interconnection, and the Company will be in a better position to interconnect future wind generation facilities in western PEI.

The work plan for the Woodstock switching station is as follows:

Year 1

In 2023, engineering design will be completed early in the year followed by driveway construction, site stumping, backfilling and rough grading, as soon as site conditions in the spring allow. Phase 1 will be completed with the installation of the 69 kV-side foundations for the steel structures.

Year 2

In 2024, the switching station yard civil work will continue as the ground grid, cable trench, fencing, conduits and oil containment system for the autotransformer are installed. The 138 kV-side foundations for the steel structures will also be installed. Final grading and gravel installation will then be completed to conclude the civil works portion of the project.

While the civil work is progressing, long-lead equipment, including the autotransformer, will be tendered and ordered. Also in 2024, the construction of cybersecurity and protection and control panels will begin once the in-house design is complete, the steel structures on the 69 kV side of the station will be ordered and installed, and the control building will be constructed.

Year 3

In 2025, the steel structures on the 138 kV side of the station will be ordered and installed, the remaining equipment will be ordered, the cybersecurity and protection and control panels will be completed and installed in the control building, and all 138 kV and 69 kV high-voltage equipment and bus work will be installed. Once the autotransformer is received and installed the equipment wiring and commissioning will start. Finally, when the installation of the control fibre and the

transmission lines into the station is complete, the transmission lines will be connected. The switching station will be fully commissioned and energized in 2025.

Justification

The Woodstock switching station project is justified based on the need to improve voltage support and reliability for customers in western PEI and cannot be deferred.

Costing Methodology

A breakdown of the proposed multi-year budget for the Woodstock switching station project is shown in Table 63.

Table 63
Breakdown of Proposed Multi-Year Budget
Woodstock Switching Station

Description	2023	2024	2025	Budget
Civil Works	$ 1,469,000	$ 2,270,000	$ -	$ 3,739,000
Switching Station Equipment	-	1,214,000	561,000	1,775,000
Control Building and Station Service Equipment	-	587,000	801,000	1,388,000
Autotransformer Equipment	-	481,000	2,116,000	2,597,000
Structural Steel	-	754,000	777,000	1,531,000
High Voltage Bus Works	-	-	543,000	543,000
Engineering Design	150,000	-	-	150,000
Internal Labour and Transportation	59,000	311,000	285,000	655,000
Contingency (12.5 per cent)	63,000	406,000	1,125,000	1,594,000
TOTAL (rounded)	**$ 1,741,000**	**$ 6,023,000**	**$ 6,208,000**	**$ 13,972,000**

Supporting information for the costs estimates in Table 63 is provided in Confidential Appendix N-11.

The Woodstock switching station is interdependent with transmission line modifications that will be included in the 2024 Capital Budget Application. The

transmission line modifications will connect the new switching station to the existing transmission system. The combined budget of the two interdependent projects is shown in Table 64.

Table 64
Combined Budget of Interdependent Projects

Project	2023	2024	2025	Budget
Woodstock Switching Station	$ 1,741,000	$ 6,023,000	$ 6,208,000	$13,972,000
Woodstock Transmission Line Modifications	-	1,233,000	-	1,233,000
TOTAL	**$ 1,741,000**	**$ 7,256,000**	**$ 6,208,000**	**$15,205,000**

In addition to the proposed multi-year budget, an allocation of $170,000 for land acquisition in the O'Leary area to interconnect Y-115 and T-21 was included in the Company's 2020 Capital Budget, but has been carried over to 2022 due to delays in identifying a suitable site.[20] With Woodstock confirmed as the preferred area for the interconnection, land acquisition can now be completed.

To ensure this project is completed at the lowest possible cost, consistent with safe and reliable service, all materials and external labour will be obtained through competitive procurement processes.

The expected start date for the project is January 2023 with a completion date in the fourth quarter of 2025.

Alternatives

For the proposed western PEI transmission loop, several interconnection locations were analyzed for their reliability benefit. It was determined that placing the interconnection as close to the O'Leary substation as possible will provide the greatest reliability improvement.

[20] The 2020 Capital Budget was approved by Commission Order UE19-09.

Future Commitments

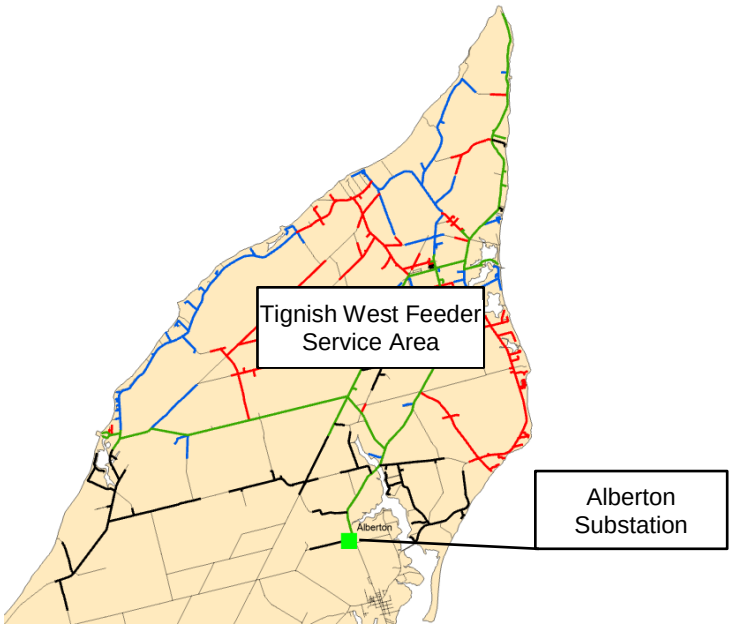
This is a multi-year project that is to be completed over three years from 2023 to 2025. If there are any changes to the evidence provided herein including changes in scope, budget or timelines subsequent to approval, further evidence will be provided in the 2024 and/or 2025 Capital Budget Applications.

d. <u>Tignish Substation</u> (Justifiable) $ 2,573,000

A new substation with a 10 MVA power transformer and three feeders is proposed for the Tignish area to address load growth and improve reliability, power quality, and distributed energy resources ("DER") hosting capacity.[21]

The area north of Alberton is currently fed from the Alberton substation via the Tignish West feeder as shown in Figure 13. As of January 2022, there are 2,825 customers served by the Tignish West feeder at a distribution voltage of 12.47 kV, with a winter peak of 9.03 MVA and a summer peak of 8.39 MVA.

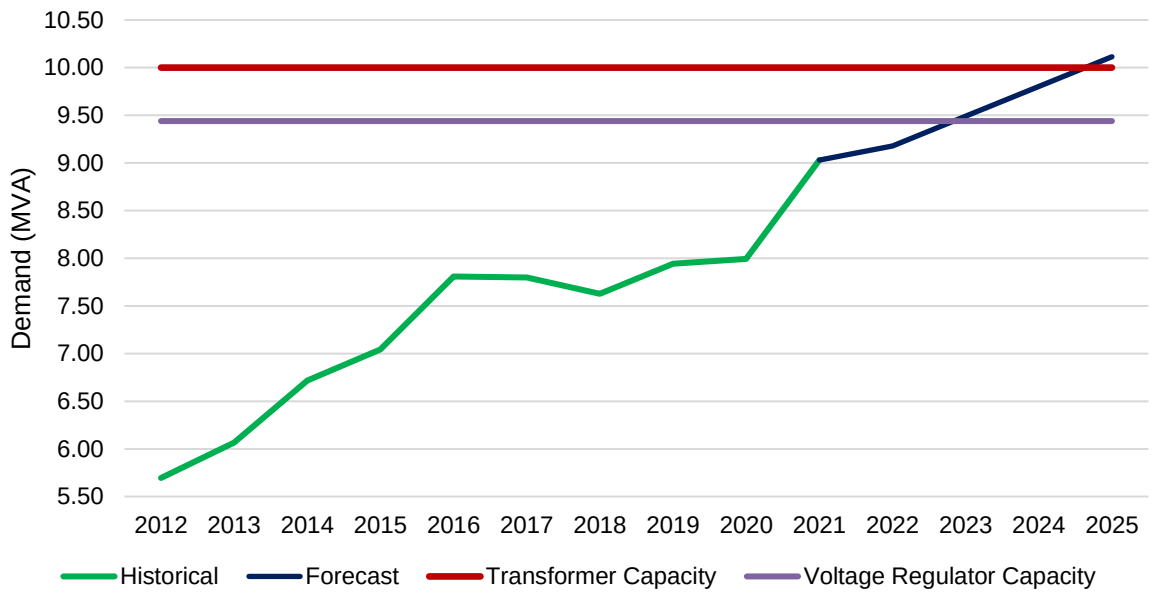
Figure 13
Tignish West Feeder Service Area



[21] Distributed Energy Resource ("DER"): A source of electric power that is not directly connected to a bulk power system. DER includes both generators and energy storage technologies capable of exporting active power to an electric power system (IEEE, 2018). DERs includes net metered solar and wind generation.

Currently, the capacity of the power transformer serving the Tignish West feeder is 10 MVA and the capacity of the voltage regulators is 9.44 MVA. A graph of the historical and forecast winter peak demand on the Tignish West feeder is shown in Figure 14. Based on the forecast, the voltage regulators are projected to overload in winter 2023/24 and the power transformer is projected to overload in winter 2025/26.

Figure 14
Historical and Forecast Winter Demand for Tignish West Feeder



With the addition of the proposed Tignish substation, including a new 10 MVA power transformer with an on-load tap changer, the transformer and voltage regulator overload concerns will be addressed for the Alberton substation.

With an increased reliance on electricity as an essential service, the Company is committed to improving power system reliability for its customers. The Tignish West feeder, in terms of annual outage hours, is one of the worst performing

feeders in the Company's distribution system.[22] Comparing the Tignish West feeder to other rural feeders, it is the longest feeder (250 km) and supplies the most customers (2,825 customers). These two factors, along with the lack of a suitable backup supply, contribute to the Tignish West feeder's comparatively poor reliability performance.

Once the Tignish substation is operational, reliability will improve for customers in the Tignish area. With three feeders initially established out of the new substation, a single feeder outage will affect, on average, 706 customers rather than the current 2,825 customers, and with two substations in western PEI, the impact of many outages will be reduced.

Due to the physical distance between the Alberton substation and the load in the Tignish area, the minimum voltage on the line is 112.5 V, which is at the low end of the range set by the CSA. As load grows in the area the voltage on the line will continue to decrease, if left as is. Once the Tignish substation is complete, the voltage profile in the area will improve.

A feeder's hosting capacity is the amount of DER allowed on the feeder before safety, power quality or reliability issues occur. The DER hosting capacity in the area currently served by the Alberton substation will increase significantly with the addition of the Tignish substation.

Justification

The Tignish substation project is justified based on the need to increase system capacity to better serve customers in western PEI. The project is also justified based on the need to improve power quality, reliability and DER hosting capacity. For the reasons provided, the Tignish substation cannot be deferred.

[22] See Tables 7 and 8 in Section 3.5d – Feeder Reliability Performance.

Costing Methodology

A breakdown of the proposed multi-year budget for the Tignish substation project is shown in Table 65.

Table 65
Breakdown of Proposed Multi-Year Budget
Tignish Substation

Description	2023	2024	Budget
Civil Works	$ 1,092,000	$ -	$ 1,092,000
Substation Equipment	333,000	343,000	676,000
Control Building and Station Service Equipment	50,000	205,000	255,000
Power Transformer Equipment	308,000	476,000	784,000
Land Purchase and Site Survey	180,000	-	180,000
Protection and Control	75,000	77,000	152,000
Structural Steel, Bus Works and High Voltage Equipment	53,000	702,000	755,000
Engineering Design	100,000	-	100,000
Cybersecurity	-	75,000	75,000
Internal Labour and Transportation	88,000	121,000	209,000
Contingency (15 per cent)	294,000	348,000	642,000
TOTAL	**$ 2,573,000**	**$ 2,347,000**	**$ 4,920,000**

Supporting information for the cost estimates in Table 65 is provided in Confidential Appendix N-12.

The Tignish substation project is interdependent with the Alberton to Tignish communication fibre project, the Tignish substation transmission project and the Tignish substation distribution project. The communication fibre project will connect the Alberton and Tignish stations with fibre optic cable, significantly improving the communication connection, the transmission project will involve purchasing T-23 from PEIEC and interconnecting it with the new substation, and

the distribution project will establish three feeders out of the substation.[23] The combined budget of the three interdependent projects is shown in Table 66.

Table 66
Combined Budget of Interdependent Projects

Project	2023	2024	Budget
Tignish Substation	$ 2,573,000	$ 2,347,000	$ 4,920,000
Tignish Substation Transmission	307,000	428,000	735,000
Communication Fibre – Alberton to Tignish	643,000	-	643,000
Tignish Substation Distribution	-	1,961,000	1,961,000
TOTAL	**$ 3,523,000**	**$ 4,736,000**	**$ 8,258,000**

To ensure this project is completed at the lowest possible cost, consistent with safe and reliable service, all materials and external labour will be obtained through competitive procurement processes.

The expected start date for the project is January 2023 with a completion date in the fourth quarter of 2024.

Alternatives

There are no feasible alternatives to the Tignish substation.

Future Commitments

This is a multi-year project that is to be completed over two years in 2023 and 2024. If there are any changes to the evidence provided herein, including changes in scope, budget or timelines subsequent to approval, further evidence will be provided in the 2024 Capital Budget Application.

[23] See Section 6.1h for a description of the Alberton to Tignish communication fibre project and Appendix L for a description of the Tignish substation transmission project. A description of the Tignish substation distribution project will be provided in the 2024 Capital Budget Application.

e. <u>Substation Oil Containment Program</u> (Mandatory) $ 152,000

The risk of power transformer oil being released into the environment is reduced considerably when an oil containment system is installed. This program involves the installation of oil containment systems in older substations.

Maritime Electric currently has 35 power transformers which require oil containment systems. Depending on location, in some circumstances, one system can serve multiple transformers. For that reason, there are 22 systems required. The program, which started in 2021, is anticipated to take approximately 15 years to complete. As systems are site specific, annual budget requirements vary.

The proposed budget allocation is for the addition of an oil containment system for two power transformers in the Albany substation. The same oil containment system that has been installed in new substations since 2015 will be installed in Albany, as it is the most cost effective system in regards to installation and maintenance.

Justification

The proposed substation oil containment system project is justified based on the need to protect against power transformer oil spills in substations, which can result in environmental damage, costly cleanups and long-term contamination liabilities. For these reasons, the project cannot be deferred.

Costing Methodology

A breakdown of the proposed budget allocation for the substation oil containment program is shown in Table 67 and supporting information is provided in Confidential Appendix N-13. A contingency has been budgeted as the vendor quotation may need to be refreshed and to allow for minor adjustments in the scope of work that may be necessary to complete the project.

Table 67 Breakdown of Proposed Budget Allocation Substation Oil Containment Program	
Description	**Budget**
Oil Containment System	$ 102,000
Miscellaneous Civil Works	30,000
Internal Labour and Transportation	10,000
Contingency (7 per cent)	10,000
TOTAL	**$ 152,000**

To ensure that this project is completed at the lowest possible cost, consistent with safe and reliable service, all materials and external labour will be obtained through competitive procurement processes.

The expected start date for the project is January 2023 with a planned commissioning date in the fourth quarter of 2023.

Alternatives

There is no alternative for substation oil containment.

Future Commitments

This is not a multi-year capital budget commitment; however, it will be a recurring capital requirement that is budgeted annually until all substations have oil containment systems in place.

f. Substation Modernization Program (Justifiable) $ 528,000

The substation modernization program, which started in 2019, is necessary for the planned replacement and upgrading of deteriorated and substandard substation infrastructure, including the installation of security cameras, protective relaying, additional grounding, backup generators and fencing. Infrastructure replacement requirements are identified through inspections, professional engineering assessments and operating experience.

Justification

The substation modernization program is justified based on the obligation to ensure the safety and reliability of the electrical system and cannot be deferred.

Costing Methodology

A breakdown of the proposed budget allocation for the substation modernization program is provided in Table 68.

Table 68
Breakdown of Proposed Budget Allocation
Substation Modernization Program

Description	**Budget**
(i) Ground Grid Upgrades	$ 62,000
(ii) Security Upgrades	56,000
(iii) Fence Upgrades	28,000
(iv) Equipment Upgrades	100,000
(v) Backup Generator Systems	80,000
(vi) Mobile Transformer Accommodation	103,000
(vii) Transformer Reclosers	71,000
Internal Labour and Transportation	28,000
TOTAL	**$ 528,000**

To ensure the substation modernization program is completed at the lowest possible cost, consistent with safe and reliable service, all materials and external labour will be obtained through competitive procurement process.

A description of the items in Table 68 is provided below and a breakdown of the budget proposed for each item is provided in Confidential Appendix N-13.

i. Ground Grid Upgrades

To deter copper theft, the Company is proposing to replace all exposed copper grounding leads in existing substations with theft-deterrent Erico cable. Erico cable consists of outer galvanized steel strands with inner tinned copper strands. The cable provides the functionality of copper

conductor, but appears to be a non-copper conductor and is difficult to cut with hand tools. This program requires a consultant study and design plan for each substation followed by the replacement or repairs of the grounding system specific to each station. The 2023 budget includes a study of the copper grounding system in the BGS.

ii. Security Upgrades

Security cameras are now a standard component of all new substations. The addition of security cameras to existing substations is an additional measure to secure older substations and deter copper theft. The addition of security cameras to the Albany substation is proposed for 2023.

iii. Fence Upgrades

Substation fence upgrades are regularly required to improve the safety and security of existing substations. The proposed budget is provisional based on past experience, professional engineering judgement and historical expenditures.

iv. Equipment Upgrades

Substation equipment upgrades involves installing new reclosers with associated communication, in areas identified with automation potential or poor reliability, to allow for automated switching during outages. For 2023, line recloser upgrades are proposed for the Marshfield area.

v. Backup Generator Systems

In 2020, Maritime Electric began upgrading critical substations by replacing aged, or adding new, back generators. Backup generators are important to a substation's reliability as they supply the required power to charge the station batteries and keep systems online in the event of a power outage. The proposed budget allocation will enable the Company to install a backup generator at the Albany substation in 2023. Additional costs for transfer switches, disconnects and civil work are also included in the proposed budget.

vi. Mobile Transformer Accommodation

The Company has two 10 MVA mobile power transformers, one with a high voltage rating of 69 kV and the other with a dual 138/69 kV high voltage rating. The mobile bays in older substations require expansion to be able to accommodate the larger dual voltage mobile transformer. The proposed budget allocation will allow the Company to upgrade the mobile transformer bay at the Souris substation in 2023. Substation changes to accommodate the larger mobile transformer include modifications to the high voltage bus structures, addition of a 69 kV switch, civil works and fence upgrades.

vii. Transformer Reclosers

Distribution substations typically have one or two power transformers and the current design for new substations is to have a recloser on the secondary side of each transformer. This provides for a better protection scheme and also allows for ease of isolation when performing maintenance. The proposed budget allocation will allow the Company to install two new transformer reclosers in the Albany substation.

The expected start date for the substation modernization program is January 2023 with in-service dates throughout the year.

Future Commitments

This is not a multi-year capital budget commitment; however, it will be a recurring capital requirement that is budgeted annually until all substations meet the current standards.

g. 138 kV Breaker Replacement Program (Justifiable) $ 153,000

The proposed budget allocation is for the replacement of the 138 kV breaker at the Bedeque substation that serves Y-101 which was installed in 1976.[24] The

[24] Y-101 and Y103, as well as some Bedeque substation components such as 138 kV breakers and reactors, are currently owned by the Provincial Government but expected to become the property of Maritime Electric by 2023, pending Commission approval.

requirement for this breaker replacement is based on test results, age and the severity of the resulting system impact in the event of failure. The Company continuously monitors the condition of breakers to assess the need for life extension or replacement. Due to age, condition, availability of parts and vendor support availability for the breaker, replacement is necessary.

Justification

The proposed 138 kV breaker replacement project is justified based on the need to replace aged equipment at the end of its useful life and cannot be deferred.

Costing Methodology

A breakdown of the proposed budget allocation for the 138 kV breaker replacement program is shown in Table 69 and supporting information is provided in Confidential Appendix N-13.

Table 69
Breakdown of Proposed Budget Allocation
138 kV Breaker Replacement Program

Description	Budget
138 kV Breaker	$ 103,000
Foundation and Civil Works (estimate)	20,000
Control Cable and Miscellaneous Materials (estimate)	20,000
Internal Labour and Transportation	10,000
TOTAL	**$ 153,000**

Future Commitments

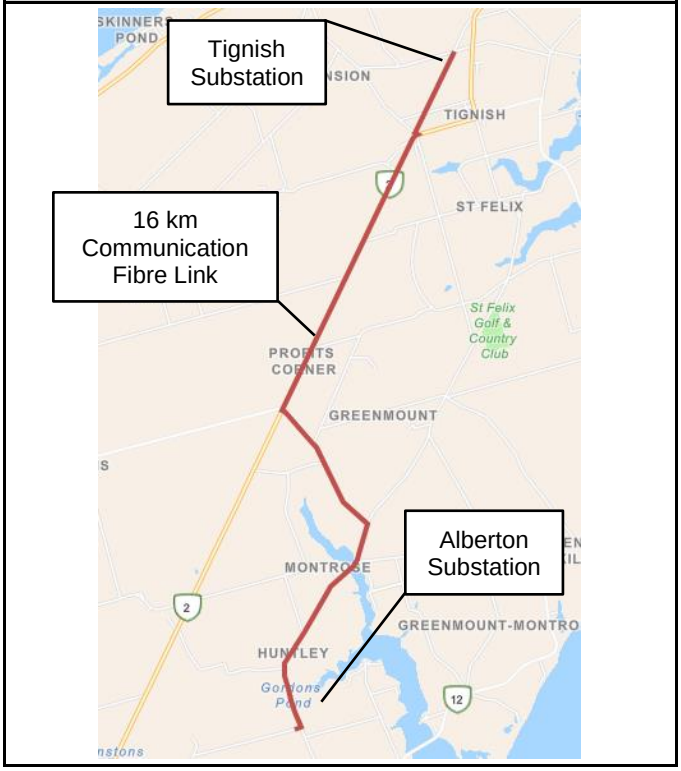
This is not a multi-year capital budget commitment; however, it is a regularly occurring capital requirement that is budgeted annually, as required.

h. <u>Communication Fibre – Alberton to Tignish</u> (Justifiable) $ 643,000

The Company is planning a new substation in the Tignish area that will need communication to the ECC. The Company's current communication standard requires that, where feasible, new substations are connected to the communication system using fibre optic cable.

This project involves installing approximately 16 km of communication fibre from the Alberton substation to the proposed Tignish substation. As such, it is interdependent with the Tignish substation project, Tignish substation transmission modifications project and Tignish substation distribution project. The communication fibre, which is expected to follow the preliminary route shown in Figure 15, will also be used to provide remote control from ECC to various devices on the distribution system, where possible, to improve safety and system reliability.

Figure 15
Alberton to Tignish Preliminary Route



Justification

The proposed fibre installation project is justified on the need to provide communication between the ECC, substations and field equipment, as communication is required to provide safe and reliable power. For the reasons provided, it cannot be deferred.

Costing Methodology

A breakdown of the proposed budget allocation for installing fibre between the Alberton and Tignish substations is shown in Table 70, and supporting information is provided in Confidential Appendix N-14.

Table 70
Breakdown of Proposed Budget Allocation
Communication Fibre – Alberton to Tignish

Description	**Budget**
Fibre Optic Cable	$ 69,000
Labour for Fibre Installation	143,000
Material for Fibre Installation	38,000
Wind Spoilers	54,000
Splicing Services	40,000
Traffic Control	62,000
Make-Ready Conversion	160,000
Internal Labour and Transportation	18,000
Contingency (10 per cent)	59,000
TOTAL	**$ 643,000**

To ensure that the project is completed at the lowest possible cost, consistent with safe and reliable service, all materials will be obtained through competitive procurement processes.

The expected start date for the project is May 2023, with completion expected by the end of the year.

Future Commitments

This is not a multi-year capital budget commitment.

i. <u>Fibre Modifications Due to Road Alterations</u> (Recurring) $ 44,000

Each year the Company relocates or replaces communication fibre to accommodate Provincial Government infrastructure projects such as sidewalk

installations, sewer and water line extensions, road widening, road construction and bridge replacements.

Justification

As communication fibre is increasingly utilized within the electrical system, the need to modify its location and configuration will also increase in frequency. The proposed provisional budget allocation for fibre modifications due to road alterations is justified based on the obligation to provide safe and reliable service to customers and cannot be deferred.

Costing Methodology

A breakdown of the proposed provisional budget allocation for fibre modifications due to road alterations is shown in Table 71.

Table 71
Breakdown of Proposed Budget Allocation
Fibre Modifications Due to Road Alterations

Description	Budget
Materials and External Labour	$ 41,000
Internal Labour and Transportation	3,000
TOTAL	**$ 44,000**

To ensure that all fibre modifications work is completed at the lowest possible costs, all materials and external labour will be obtained through competitive procurement processes.

Future Commitments

This is not a multi-year capital budget commitment; however, it is a recurring provisional capital requirement that is budgeted annually.

6.2 Transmission Projects — *$ 2,018,000*

The capital work proposed in the transmission projects category addresses the timely replacement of aged infrastructure, improves reliability and voltage levels, reduces electrical losses and improves safety for workers by upgrading the system to meet current

construction standards. The Company's asset database, field inspection results and reliability data serve as the primary tools for identifying necessary transmission system upgrade activities.

The proposed budget allocation for transmission projects provided in Table 72 was established based on historical expenditures and project cost estimates.

Table 72
Historical and Proposed Capital Expenditures
Transmission Projects

Description	2018[a]	2019	2020[b]	2021[c]	2022 Budget	2023 Budget
Material	$ 1,356,116	$ 479,651	$ 1,132,385	$ 2,454,970	$ 620,000	$ 366,000
Contractor Labour	1,351,636	691,280	1,394,029	1,902,424	815,000	156,000
Internal Labour and Transportation	695,613	1,032,254	1,206,833	1,152,806	1,332,000	1,189,000
Other	75,833	85,441	71,590	22,923	-	307,000
TOTAL	**$ 3,479,198**	**$ 2,288,626**	**$ 3,804,837**	**$ 5,533,123**	**$ 2,767,000**	**$ 2,018,000**

a. Includes $185,744 for a 2018 project carried over and completed in 2019.
b. Includes $1,010,047 for 2020 projects carried over and completed in 2021.
c. Includes $167,000 budgeted for 2021 projects carried over to be completed in 2022.

a. 69 kV and 138 kV Switch Program (Recurring) $ 613,000

The purpose of the program is to replace or upgrade and extend the life of selected 69 kV and 138 kV line switches to improve the reliability and safe operation of this equipment. The Company has an air switch inspection program and a transmission line refurbishment program that provides for annual inspection of switches and transmission lines. Based on previous inspections, the Company identified a requirement to replace three existing 69 kV switches, including:

- Switch SW662 will be replaced with a motorized switch and connected to communication fibre for remote operation. This will allow for the Souris substation to be isolated from the transmission system (i.e., transmission line T-8); and

- Two new motorized switches will be installed on transmission line T-15 to replace the existing manual inline switches, and communication fibre will be added to provide remote operation capability to the switches.

Justification

The proposed 69 kV and 138 kV switch program is justified on the obligation to maintain a safe and reliable electrical system and cannot be deferred.

Costing Methodology

A breakdown of the historical expenditures, 2022 budget and the proposed 2023 budget allocation for the 69 kV and 138 kV switch program is shown in Table 73.

Table 73
Historical and Proposed Capital Expenditures
69kV and 138 kV Switch Program

Description	2018	2019	2020	2021[a]	2022 Budget	2023 Budget
Material	$ 191,063	$ 20,640	$ 288,649	$ 214,343	$ 156,000	$ 166,000
Contractor Labour	23,000	6,500	18,794	16,438	-	5,000
Internal Labour and Transportation	208,032	378,746	259,036	343,842	434,000	442,000
Other	-	35,781	-	449	-	-
TOTAL	**$ 422,095**	**$ 441,667**	**$ 566,479**	**$ 575,072**	**$ 590,000**	**$ 613,000**

a. Includes $77,000 budgeted for 2021 switch replacement projects carried over to be completed in 2022.

The expected start date for work under the program is January 2023 and work will progress throughout the year.

Future Commitments

This is not a multi-year capital budget commitment; however, it is a recurring capital requirement that is budgeted annually.

b. <u>Transmission Line Refurbishment</u> (Recurring) $ 951,000

The 69 kV and 138 kV transmission lines are critical elements of Maritime Electric's electrical system.

The proposed budget provides for the inspection and life extension activities of the transmission system, which will also support system reliability. Completion of ground inspection and correction of emergency and priority deficiencies found on the following 69 kV (T-line) and 138 kV (Y-line) transmission lines are planned for 2023:

- T-1 between West Royalty and Sherbrooke substations;
- T-2 between Charlottetown and Lorne Valley substations;
- T-4 between Scotchfort and Lorne Valley substations;
- T-10 between Lorne Valley and Dover substations;
- T-11 between Sherbrooke and Summerside Electric substations;
- T-13 and T-15 between West Royalty and Charlottetown Plant substations;
- Y-101 and Y-103 between Richmond Cove riser station and Bedeque substation;
- Y-104 between West Royalty and West St. Peters substations;
- Y-108 between Church Road and Hermanville wind farm substations;
- Y-112 between Church Road and Eastern Kings wind farm substations; and
- Y-115 between Sherbrooke and West Cape wind farm substations.

Photographs of deficiencies recently identified through the program are shown in Appendix K.

Justification

The timely refurbishment of deteriorated transmission structures and equipment is justified on the obligation to maintain a safe and reliable electrical system and cannot be deferred.

Costing Methodology

A breakdown of the historical expenditures, 2022 budget and the proposed 2023 budget allocation for transmission line refurbishment is shown in Table 74.

Table 74
Historical and Proposed Capital Expenditures
Transmission Line Refurbishment

Description	2018	2019	2020	2021	2022 Budget	2023 Budget
Material	$ 176,348	$ 115,667	$ 136,263	$ 180,425	$ 155,000	$ 165,000
Contractor Labour	393,244	306,760	224,425	91,159	113,000	116,000
Internal Labour and Transportation	153,197	370,625	601,101	634,799	664,000	670,000
Other	6,062	7,492	8,272	598	-	-
TOTAL	**$ 728,851**	**$ 800,544**	**$ 970,061**	**$ 906,981**	**$ 932,000**	**$ 951,000**

The expected start date for the program is January 2023 and work will progress throughout the year.

Future Commitments

This is not a multi-year capital budget commitment; however, it is a recurring capital requirement that is budgeted annually.

c. Transmission Lines (Justifiable) $ 454,000

The proposed transmission lines budget provides for the timely replacement of aged infrastructure, connections to new or upgraded substations and equipment, improved reliability, reduced electrical losses and improved safety for workers by upgrading the system to meet current standards.

Two transmission line projects are planned for 2023, including:

i. Crossroads Substation Transmission Modifications; and
ii. Tignish Substation Transmission.

The Crossroads substation transmission modifications project is interdependent on the Crossroads substation rebuild project.[25] The proposed transmission modifications are required to accommodate the completion of the rebuild work at the Crossroads substation.

The Tignish substation transmission project is interdependent with the Tignish substation project, the Alberton to Tignish communication fibre project and the Tignish substation distribution project.[26] The multi-year project involves the purchase of transmission line T-23 between Alberton and Tignish in 2023, and the interconnection of T-23 to the new Tignish substation in 2024.

Additional details and justifications for the proposed transmission line projects is provided in Appendix L.

Costing Methodology

A breakdown of the historical expenditures, 2022 budget and the proposed 2023 budget allocation for transmission lines projects is shown in Table 75.

Table 75
Historical and Proposed Capital Expenditures
Transmission Lines

Description	2018[a]	2019	2020[b]	2021[c]	2022 Budget	2023 Budget
Material	$ 988,705	$ 343,344	$ 707,473	$ 1,964,893	$ 309,000	$ 35,000
Contractor Labour	935,392	378,020	1,150,810	1,837,638	702,000	35,000
Internal Labour and Transportation	334,384	282,883	347,696	227,173	234,000	77,000
Other	69,771	42,168	63,317	21,366	-	307,000[d]
TOTAL	**$ 2,328,252**	**$ 1,046,415**	**$ 2,269,296**	**$ 4,051,070**	**$ 1,245,000**	**$ 454,000**

a. Includes $185,744 for a 2018 project carried over and completed in 2019.
b. Includes $1,010,047 for 2020 projects carried over and completed in 2021.
c. Includes $90,000 budgeted for 2021 projects carried over to be completed in 2022.
d. Classified as “Other” expense as it involves the purchase of an existing transmission asset from PEIEC.

[25] See Section 6.1a for a description of the Crossroads substation rebuild project.
[26] See Section 6.1d for a description of the Tignish substation project and Section 6.1h for a description of the Alberton to Tignish communication fibre project. A description of the Tignish substation distribution project will be provided in the 2024 Capital Budget Application.

Future Commitments

The proposed Crossroads substation transmission modifications project was initiated in 2022 as a single-year project, but due to scope changes it is now a multi-year project that will be completed in 2023. The proposed Tignish substation transmission project is a multi-year capital budget commitment that will be completed over two years, in 2023 and 2024.

7.0 CORPORATE — *$ 3,463,000*

7.1 Corporate Services — *$ 1,338,000*

a. Recurring Annual Capital Requirements

(Work Support Services) $ 460,000

As Company facilities age and deteriorate, annual upgrades and replacements of various components are required. Also, experience indicates that unplanned and emergency events will occur that require capital replacements and refurbishments. Performing upgrades and refurbishments to ensure facilities remain in adequate condition prior to complete failure is required to ensure the safety of employees, customers and contractors, as well as to avoid costly emergency repairs or replacements.

Capital expenditures on facilities historically have been made as required to cover items including:

- Window and door replacements;
- Garage doors;
- Roofing and siding;
- Paving for facility entrances and parking lots;
- Office furniture and equipment; and
- Unforeseen capital expenditures.

As the projects under this budget category are unplanned and identified on an as required basis, cost projections at the item level cannot be determined in advance and therefore, the proposed budget allocation is provisional.

Justification

This proposed provisional budget allocation is justified on the obligation to provide safe and functional facilities for employees, contractors and the general public. For this reason, when projects arise throughout the year, they cannot be deferred.

Costing Methodology

A breakdown of the historical expenditures, 2022 budget and the proposed 2023 budget allocation for recurring annual capital requirements is shown in Table 76.

Table 76
Historical and Proposed Capital Expenditures
Recurring Annual Capital Requirements

	2018	2019	2020	2021	2022 Budget	2023 Budget
Material[a]	$ 6,818	$ 24,840	$ 190,698	$ 342,063	$ 426,000	$ 445,000
External Labour	99,619	103,897	13,963	24,004	-	-
Internal Labour and Transportation	13,978	14,090	34,596	14,339	15,000	15,000
Other	17,473	9,673	76,158	119,664	-	-
TOTAL	**$ 137,888**	**$ 152,500**	**$ 315,415**	**$ 500,070**	**$ 441,000**	**$ 460,000**

a. Material includes external labour for supply and install contracts.

To ensure projects are completed at the lowest possible costs, all materials and external labour will be obtained through competitive procurement processes. In certain situations, where there is a lack of available contractors in the service area, the Company will negotiate the best possible pricing.

Future Commitments

This is not a multi-year capital budget commitment; however, it is a recurring provisional capital requirement that is budgeted annually.

b. Comprehensive Building Condition Assessments

(Work Support Services) $ 410,000

Maritime Electric's main office building located at 180 Kent Street and the WRSC building located at 3 Fourth Street, are both aged facilities that require a comprehensive building condition assessment to determine how the Company should proceed to address issues of concern specific to each asset.

The 180 Kent Street building was purchased by Maritime Electric in 1989 and was completely refurbished at that time, except for a section of the second floor, in order to meet the needs of the Company and its staff.

For the 180 Kent Street building, the comprehensive building assessment will be used to determine whether it would be more cost effective to either renovate and upgrade, or to construct or purchase a new main office building and sell the existing asset.

Originally constructed in 1974, the 180 Kent Street building will be 50 years old in 2024. In 2019, the Company engaged an external consultant to assess the exterior condition of the building. The resulting report identified several issues that needed to be addressed and included recommendations to repair the roof and replace the windows.[27] The comprehensive building assessment will involve a more detailed energy efficiency analysis of the building envelope and its heating, ventilation, air conditioning and insulation system, to determine what is required to make it more environmentally sustainable.

In addition to the required exterior repair and upgrades, interior renovations will be required to accommodate the anticipated needs of the Company in the short, medium and long term. Over the years, minor interior renovations have been completed but because they were usually done at the lowest possible cost, optimal use of the building's floor plan was not always achieved. The current floor plan does not provide for sufficient meeting or work spaces for current and future employees. As a result, the building, as is, no longer adequately meets the needs of the Company.

WRSC is the central hub for the majority of the Company's field operations. The facility, located at the corner of 4th Street and Upton Road was originally built as a warehouse in 1978 and was acquired by Maritime Electric in 1989. It is strategically located near the perimeter highway and provides office storage space to accommodate the wide range of departmental functions. These functions include line operations for the Central District, material inventory and stores, distribution engineering and survey, metering and technical services, and BCC.

[27] Roof repairs was included in the 2022 Capital Budget Application and approved by the Commission.

Originally constructed in 1978, the WRSC building will be 45 years old in 2023. In 2017, the Company engaged BGHJ Architects ("BGHJ") to provide a master planning report with recommendations. Upgrades based on the BGHJ report were completed in 2018 as approved in UE17-03 for the 2018 Capital Budget.

WRSC will continue to be the central hub for the majority of the Company's field operations for the next 30 or more years. As such, the purpose of the comprehensive building assessment will be to evaluate the existing facility and provide detailed costs and requirements to bring the facility up to current standards. The assessment will include design modifications to better accommodate the increased staffing levels working out of this facility today and to meet future operational needs. In addition to upgrading to current standards, renovations to meet future requirements must be designed to ensure the facility incorporates sustainability and mitigates its carbon footprint by modifying heating, cooling and insulation systems, where economically feasible.

Justification

The project is justified on the obligation to provide safe, functional and sustainable facilities. Based on the age and condition of the 180 Kent Street and WRSC buildings, the project cannot be deferred.

Costing Methodology

The proposed budget allocation is an estimate of the cost to engage a local engineering or architecture consulting firm to carry out the studies.

To ensure this project is completed at the lowest possible cost, the consultant will be selected through a competitive request for proposals ("RFP") process. All RFP submissions will be evaluated on a combination of technical merit and price.

Alternatives

The Company does not have the internal expertise in the area of building construction and therefore will need to rely on industry experts.

Future Commitments

This is not a multi-year capital budget commitment; however, the resulting assessments will be used to determine future capital investment with respect to 180 Kent Street and WRSC buildings.

c. Facility Access Security System Replacement

(Work Support Services) $ 468,000

The entrances to five of the Company's facilities are secured by a wireless key fob security access system. The facilities and number of access point are listed in Table 77.

Table 77
Security System Replacement Requirements by Facility

Facility	Location	Number of Doors
West Royalty Service Centre	West Royalty	34
180 Kent Street	Charlottetown	25
Energy Control Centre	Charlottetown	14
Eastern District Service Centre	Roseneath	6
Western District Service Centre	Sherbrooke	6
TOTAL		**85**

The current security system utilized at Maritime Electric facilities for site and building access was installed in 2003. The system software has not been updated since 2016 and the operating system is no longer supported by Microsoft. As such, the system is near end of useful life and needs to be replaced to ensure that all Company facilities are secured with a system that utilizes current technologies and will be supported by its supplier.

Justification

This project is justified on the obligation to provide safe and secure facilities and cannot be deferred.

Costing Methodology

The proposed budget allocation is based on information provided by the supplier of the Company's existing security system. A breakdown of the budget is shown in Table 78 and supporting information is provided in Confidential Appendix N-15.

Table 78
Breakdown of Proposed Budget Allocation
Facility Access Security System Replacement

Description	Budget
Materials and External Labour	$ 438,000
Internal Labour and Transportation	30,000
TOTAL	**$ 468,000**

To ensure this project is completed at the lowest possible cost, all materials and external labour will be obtained through competitive procurement processes.

Alternatives

The only alternative is to defer the replacement of the existing system. This is not recommended as the software used by the system is no longer being updated, limiting the suppliers ability to service and secure the installations.

Future Commitments

This is not a multi-year capital budget commitment.

7.2 Information Technology *$ 2,125,000*

a. Hardware Acquisitions (Work Support Services) $ 334,000

The proposed budget allocation for information technology ("IT") network hardware acquisitions provides for the purchase and configuration of computer hardware additions, and life-cycle replacement or upgrading of existing haredware, including personal computers (e.g., desktops, laptops and tablets), printers, servers and communication equipment (e.g., switches and routers in the data centre). This equipment is critical to ensuring the efficient operation of the Company's business IT network and provision of service to customers. The Company has a total of

approximately 345 personal computers and printers in use, which are typically replaced on five-to-seven year cycle. The replacement or upgrade of servers and communications equipment is determined based on the existing performance of the equipment, the ability to expand the equipment for future growth, the criticality of the equipment based on the business or customer impact should the equipment fail, and the cost of replacing or upgrading as compared to the operating costs of the existing equipment. Industry practice is to replace servers and communication equipment every five years.

Justification

Hardware acquisitions are justified based on the need to maintain a reliable IT network, which is critical to the overall service the Company provides to customers.

Costing Methodology

A breakdown of the historical expenditures, 2022 budget and proposed 2023 budget allocation for hardware acquisitions is shown in Table 79.

Table 79
Historical and Proposed Capital Expenditures
Hardware Acquisitions

	2018	2019	2020	2021[a]	2022 Budget	2023 Budget
Material	$ 217,348	$ 264,257	$ 227,580	$ 242,923	$ 938,000	$ 265,000
Internal Labour and Transportation	14,726	12,417	7,114	26,668	58,000	69,000
TOTAL (rounded)	**$ 232,074**	**$ 276,674**	**$ 234,694**	**$ 269,591**	**$ 996,000**	**$334,000**

a. Includes $94,000 budgeted for 2021 hardware acquisitions carried over to be completed in 2022.

The proposed budget for hardware acquisitions by equipment type is shown in Table 80. The budget is based on the most recent purchases and vendor quotes for similar equipment and the estimated cost of internal labour required to deploy the equipment.

Table 80 Hardware Acquisitions	
Description	**Budget**
Personal Computing Devices and Printers	$ 171,000
Servers and Communication Equipment	163,000
TOTAL	**$ 334,000**

Supporting information for the hardware acquisitions budget is provided in Confidential Appendix N-16.

To ensure this project is completed at the lowest possible cost, all hardware acquisitions will be obtained through competitive procurement processes.

The expected start date of this project is January 2023 with in-service dates throughout the year.

Alternatives

The only alternative is to defer hardware acquisitions. This is not recommended as computer hardware, servers and communication equipment are critical to business operations, including providing service to customers.

Future Commitments

This is not a multi-year capital budget commitment; however, it is a recurring capital requirement that is budgeted annually.

b. <u>Purchased Software and Upgrades</u> (Work Support Services) $ 634,000

Maritime Electric's IT network relies on a wide variety of software to deliver service to customers. Vendors that supply and support this software charge for the ongoing development of new features, the creation of security patches and the support of system customizations. These enhancements improve the functionality, security and service life of the software. The internal labour component of the proposed budget allocation provides for software installation, patching, upgrading and testing.

Microsoft supplies end-user business software such as word processing, spreadsheets and email as well as key data centre software including the corporate database management system and the financial management suite. Microsoft also supplies most core operating systems on Company servers and computers. The budget amount provides for access to the latest versions of each software product.

ESRI is the Company's provider of enterprise Geographic Information System ("GIS") solutions. ESRI maps are embedded in most Maritime Electric applications including the customer information system, vegetation management system and the outage restoration map on the Company's website. The budget amount also provides for the continued support by the vendor, which contributes to the effective operation of the GIS.

Cybersecurity software is sourced from specialized vendors and provides essential services to Maritime Electric in order to maintain a safe network. These solutions include the management of mobile devices, second factor authentication and intrusion detection.

The Company also uses a wide variety of smaller applications that include software development tools, engineering design software and billing support applications.

Justification

Purchased software and upgrades are justified based on the need to have continued vendor support of the software products being utilized, which helps to ensure the security and operation of the IT network and is critical to the overall service the Company provides to customers.

Costing Methodology

A breakdown of the historical expenditures, 2022 budget, and proposed 2023 budget allocation for purchased software and upgrades is shown in Table 81.

Table 81 Historical and Proposed Capital Expenditures Purchased Software and Upgrades						
	2018	**2019**	**2020**	**2021**	**2022 Budget**	**2023 Budget**
Material	$ 299,701	$ 316,963	$ 383,780	$ 434,326	$ 433,000	$ 524,000
Internal Labour and Transportation	49,952	50,316	60,365	41,430	113,000	110,000
TOTAL	**$ 349,653**	**$ 367,279**	**$ 444,145**	**$ 475,756**	**$ 546,000**	**$ 634,000**

The proposed budget for purchased software and upgrades by software type is shown in Table 82. The budget is based on recent purchases and vendor quotes, as well as the estimated cost of internal labour required to install the software.

Table 82 Breakdown of Proposed Budget Allocation by Software Type Purchased Software and Upgrades	
Description	**Budget**
Microsoft Suite	$ 160,000
Great Plains Financials	22,000
ESRI Mapping	51,000
Software Development Tools	18,000
Cybersecurity Software	92,000
Miscellaneous Software Upgrades	139,000
New Purchases	42,000
Internal Labour and Transportation	110,000
TOTAL	**$ 634,000**

Supporting information for the purchased software and upgrades budget is provided in Confidential Appendix N-16.

To ensure this project is completed at the lowest possible cost, all purchased software and upgrades will be obtained through competitive procurement processes.

The expected start date of this project is January 2023 with in-service dates throughout the year.

Alternatives

The only alternative is to defer purchased software and upgrades projects. This is not recommended as software functionality and security is critical to business operations, including providing service to customers.

Future Commitments

This is not a multi-year capital budget commitment; however, it is a recurring capital requirement that is budgeted annually.

c. <u>Cybersecurity Enhancements</u> (Work Support Services) $ 572,000

Cybersecurity is a core strategic focus for Maritime Electric. Cyber threats are increasingly more complex, frequently utilizing highly sophisticated forms of malware to mount persistent and targeted attacks. The consequences of dealing with security breaches are significant and can include privacy violations, data corruption, loss of asset and system control, loss of customer confidence, financial penalties, legal exposure and negative press. This issue is even more concerning for companies with critical infrastructure assets such as Maritime Electric. For these reasons, the Company continues to invest in cybersecurity initiatives. Areas of investment are driven by the cyber risk management program ("CRMP"). The program evaluates core cyber risks against existing controls and identifies projects that can eliminate or mitigate risk. These projects drive a rolling five-year cybersecurity roadmap that guides investment. This proposed budget allocation will progress the roadmap in several areas.

The proposed cybersecurity enhancements work will involve review and analyses of the IT network and the operations technology ("OT") network by an external security specialist. The review evaluates the many facets of security against the latest trends in criminal cyber activity. The process consists of an independent audit, recommendations assessment, and the development and implementation of a work plan. The funds required to carry out the workplan are also included in the proposed budget allocation. The extensive upgrades to the OT network in recent

years have brought it to a level where annual cybersecurity reviews are now warranted.

Upgrades on the OT network will include the addition of new communication equipment at two substations and the implementation of a vulnerability management software solution. Vulnerability management software proactively identifies weaknesses by scanning a network and then providing remediation suggestions to mitigate potential risks.

Upgrades on the IT network will center on improving domain name system ("DNS") inspection and filtering capabilities. DNS is the process that translates internet website requests (e.g., www.maritimeelectric.com) to internet protocol addresses (e.g., 104.104.103.240). DNS traffic is commonly attacked and abused by cyber criminals. DNS inspection and filtering scans network traffic and alerts when suspicious behavior is identified. Cybersecurity improvements will also include the development of new incident response playbooks that will guide the Company's actions in the event of a cyber-breach.

Justification

The project is justified on the basis that cyber threats are constantly evolving and the protection of the IT and OT networks is critical to the security of the Company's asset and customer data.

Costing Methodology

A breakdown of the historical expenditures, 2022 budget and the proposed 2023 budget allocation for cybersecurity enhancements is shown in Table 83.

Table 83 Historical and Proposed Capital Expenditures[a] Cybersecurity Enhancements						
	2018b[b]	**2019[c]**	**2020[d]**	**2021[e]**	**2022 Budget**	**2023 Budget**
Material	$ 69,707	$ 24,274	$ 61,965	$ 445,433	$ 417,000	$ 418,000
External Labour	27,797	6,862	50,785	-	-	-
Internal Labour and Transportation	48,461	90,989	129,747	210,409	130,000	154,000
TOTAL	**$ 145,965**	**$ 122,125**	**$ 242,497**	**$ 655,842**	**$ 547,000**	**$ 572,000**

a. All cybersecurity initiatives in 2022 and 2023 have been consolidated under budget item 7.2c Cybersecurity Enhancements. Historical expenditures data represents the total amount for the equivalent cybersecurity initiatives in that year.
b. In 2018, the equivalent cybersecurity initiatives were Capital Budget items 7.2c Business Network Security Review and 7.2g Security Enhancements.
c. In 2019, the equivalent cybersecurity initiatives were Capital Budget items 7.2c Network Access Control and 7.2e Security Enhancements SCADA Network.
d. In 2020, the equivalent cybersecurity initiatives were Capital Budget items 7.2d Business Network Security Review and 7.2e Cybersecurity Enhancements.
e. In 2021, the equivalent cybersecurity initiatives were Capital Budget items 7.2d Business Network Security Review, 7.2e Cybersecurity Enhancements and 7.2f Operations Network Data Centre Infrastructure.

The proposed budget for cybersecurity enhancements is shown in Table 84. The budget is based on recent purchases and vendor quotes as well as the estimated cost of internal labour required to complete the projects.

Table 84 Breakdown of Proposed Budget Allocation Cybersecurity Enhancements	
Description	**Budget**
Information Technology Network	$ 190,000
Operations Technology Network	382,000
TOTAL	**$ 572,000**

Supporting information for the cybersecurity enhancements budget is provided in Confidential Appendix N-16.

To ensure this project is completed at the lowest possible cost, materials and services will be obtained through competitive procurement processes. Where alternative suppliers do not exist to provide competitive bids, the Company will negotiate the best possible pricing.

The project will start in January 2023 with in-service dates throughout the year.

Alternatives

The only alternative is to defer the proposed cybersecurity enhancements. This is not recommended as the protection of the Company's IT and OT networks is increasingly important, with cyber attacks occurring more frequently and becoming more sophisticated.

Future Commitments

This is not a multi-year capital budget commitment; however, it is a recurring capital requirement that is budgeted annually.

d. <u>Customer Services and Communication Enhancements</u>

(Work Support Services) $ 216,000

As the Company continues to develop and implement self-serve virtual contact centre ("VCC") functionality, online and mobile customer service tools will focus on providing an enhanced customer experience across all communication platforms. Additional information on proposed customer service and communication enhancement initiatives follow.

Working with the Company's VCC vendor, the proposed budget allocation will provide for automation to be added to the system to enable the customer to upgrade their account information without needing to speak directly with a customer service representative (although the option to contact a CSR directly will remain available). The VCC vendor will also update and enhance the functionality of the Company's web chat service, and add a new function to track customer satisfaction with the service provided by CSRs through telephone, email and web chat, as improved understanding of service performance is an important focus for the Company.

The Company is also proposing to add functionality to its website with new tools, features and self-service options to better serve customers. This will include a

calculator that will help customers to estimate their future bills, which will assist them with budget planning and forecasting. The new functionality will also provide a user-friendly breakdown of a typical monthly bill, as educating customers will become increasingly important as their reliance on electricity for heating and transportation grows in the future.

Justification

The project is justified based on the obligation to serve existing and new customers in a timely and informative manner.

Costing Methodology

A breakdown of the historical expenditures, 2022 budget and the proposed 2023 budget allocation for customer service and communication enhancements is shown in Table 85.

Table 85
Historical and Proposed Capital Expenditures[a]
Customer Service and Communication Enhancements

	2018	2019	2020	2021[b]	2022 Budget	2023 Budget
Material	$ -	$ -	$ -	$ -	$ 35,000	$ 177,000
External Labour	29,215	102,262	46,000	-	69,000	-
Internal Labour and Transportation	35,827	32,617	85,421	-	30,000	39,000
Other	40,785	60,425	26,349	-	-	-
TOTAL	**$ 105,827**	**$ 195,304**	**$ 157,770**	**$ -**	**$ 134,000**	**$ 216,000**

a. In 2020 and 2021, the equivalent Capital Budget item was On-Line Services and in 2018 and 2019, it was Customer Self Service.
b. Work under On-Line Services in 2021 was cancelled due to the planned replacement of the customer information and billing system ("CIS"), as the new CIS will provide many of the customer service functionalities that were proposed.

Supporting information for the project budget is provided in Confidential Appendix N-16.

The project will start in January 2023 with in-service dates throughout the year.

Alternatives

The only alternative is to defer the proposed customer service and communication enhancement projects. This is not recommended as customers increasingly expect to be able to communicate with the Company through a variety of service delivery options.

Future Commitments

This is not a multi-year capital budget commitment; however, it is a recurring capital requirement that is budgeted annually.

e. <u>Engineering Fixed Assets Management System</u>

(Work Support Services) $ 202,000

Electric utility asset management requires an integrated approach to effectively track the operation, maintenance, repair and life cycle of critical electrical system components. The intent is to maximize the benefits of the assets, reduce risks associated with premature or unexpected failure and provide satisfactory levels of service to customers.

A common approach to asset management is to use software designed specifically for that purpose. Maritime Electric does not currently have software specific to asset management and has to reply upon various documents and spreadsheets to manage critical equipment. As the electrical system continues to grow, it is becoming evident that the current method will become increasingly cumbersome and eventually ineffective for managing systems and equipment.

Maritime Electric has identified an asset management system called Cascade that is specially designed for power utilities. Cascade has the ability to collect and centralize operational and conditional data from multiple sources.

Some tangible benefits using the Cascade software platform will be:

- Better understanding and usage of data and information to support informed and consistent decision making;
- Improved planning for capital and operating expenditures;
- Reduction in unnecessary maintenance;
- Information consolidation and analysis to reveal at-risk devices;
- Ability to track and manage maintenance requirements for voltage testing equipment; and
- Production of work orders based on maintenance intervals for individual supply system components

The proposed budget allocation includes the purchase of the software and the support services required to integrate information from the Company's existing records.

Justification

This project is justified based on the need to provide reliable service and efficiently manage information concerning critical system components for the benefit of customers, and cannot be deferred.

Costing Methodology

A breakdown of the proposed budget for the engineering fixed assets management system project in shown in Table 86.

Table 86
Breakdown of Proposed Budget Allocation
Engineering Fixed Assets Management System

Description	Budget
Software and Vendor Labour	$ 176,000
Internal Labour and Transportation	26,000
TOTAL	**$ 202,000**

Supporting information for the project budget is provided in Confidential Appendix N-16.

Alternatives

The only alternative is to defer the project; however, this is not recommended as it is becoming increasingly difficult to efficiently and effectively manage the assets of the electrical supply system under the current approach.

Future Commitments

This is not a multi-year capital budget commitment.

f. <u>Line Inspection Application Enhancements</u>

(Work Support Services) $ 92,000

The line inspection system was developed in 2021 and currently allows operations employees to perform detailed inspections on transmission line assets. During the testing and implementation phases of the project, several additional features were identified that would significantly enhance the system. The enhancements include the addition of air switch and vault inspections, improved integration with the Company's service order system, and expansion of the system to include distribution lines.

Justification

This project is justified based on the efficiencies that the proposed system enhancements will provide and cannot be deferred.

Costing Methodology

A breakdown of the proposed budget allocation for the line inspection application enhancements project is shown in Table 87.

Table 87
Breakdown of Proposed Budget Allocation
Line Inspection Application Enhancements

Description	Budget
External Labour	$ 37,000
Internal Labour and Transportation	55,000
TOTAL	**$ 92,000**

Supporting information for the project budget is provided in Confidential Appendix N-16.

To ensure this project is completed at the lowest possible cost, materials and vendor services will be obtained through competitive procurement processes. Where alternative suppliers do not exist to provide competitive bids, materials and services will be negotiated to ensure they are least cost.

Future Commitments

This is not a multi-year capital budget commitment.

g. <u>Survey System Refresh</u> (Work Support Services) $ 75,000

The survey system is used by Surveyors to plan internal projects and service work requested by customers. The system allows users to input the required assets, record their GPS locations and add notes and field drawings. The system is capable of generating cost estimates including a list of the inventory items that will be required to complete the work. Information from the system is also used by the Company's work management system which is used to dispatch crews and record completed field work.

The existing survey system was developed in-house using technology that is now aged and difficult to support. The project will move the system, which is critical for field operations, to a new technology platform that is better positioned to be fully supported in the future.

Justification

The project is justified based on the obligation to serve existing and new customers in a timely and informative manner.

Costing Methodology

The proposed budget allocation, provided in Table 88, is an estimate based on past projects with similar levels of complexity. Supporting information for the project budget is provided in Confidential Appendix N-16.

Table 88
Breakdown of Proposed Budget Allocation
Survey System Refresh

Description	**Budget**
External Labour	$ 20,000
Internal Labour and Transportation	55,000
TOTAL	**$ 75,000**

Future Commitments

This is not a multi-year capital budget commitment.

8.0 CAPITALIZED GENERAL EXPENSE *$ 730,000*

The Capitalized General Expense ("CGE") budget amount includes a portion of administrative costs (predominately labour) that are properly recognized as part of the Company's overall capital expenditure program. These recurring expenditures represent an allocation of administrative costs, not specific to any one capital project, but rather as part of the overall development, implementation and management of the Company's capital budget program. The costs are labour and transportation related and derived from departments that support the overall capital program of the Company, primarily the Finance and Purchasing departments and Stores operations.

The proposed budget reflects historical spending over the past five years as shown in Table 89.

Table 89
Capitalized General Expenses

	2018	2019	2020	2021	2022 Budget	2023 Budget
Stores	$ 407,724	$ 494,872	$ 412,884	$ 434,102	$ 442,000	$ 461,000
Finance and Purchasing	67,644	72,633	76,861	78,925	79,000	82,000
Corporate Planning	-	-	-	168,106	169,000	187,000
TOTAL	**$ 475,368**	**$ 567,505**	**$ 489,745**	**$ 681,133**	**$ 690,000**	**$ 730,000**

9.0 INTEREST DURING CONSTRUCTION $ 680,000

This budget amount represents an allowance for the cost of funds used during the construction of certain assets. It is reflected in the accounts as an offset to financing costs and is based on the Company's cost of borrowing. This amount is allocated to fixed assets and recovered through amortization over the life of the assets. Appendix M to this Application provides the calculation of the budget provision for Interest During Construction ("IDC") for 2023.

10.0 PROPOSED ORDER

C A N A D A

PROVINCE OF PRINCE EDWARD ISLAND

BEFORE THE ISLAND REGULATORY
AND APPEALS COMMISSION

IN THE MATTER of 3.6 17(1) of the *Electric Power Act* (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving the 2023 Annual Capital Budget and for certain approvals incidental to such an order.

UPON receiving an Application by Maritime Electric Company, Limited (the "Company") for approval of the Company's capital budget for year 2023;

AND UPON considering the Application and Evidence filed in support thereof;

NOW THEREFORE, for the reasons given in the annexed Reasons for Order and pursuant to the *Electric Power Act*;

IT IS ORDERED THAT

The 2023 Capital Budget Application of the Company, filed herein on _____, 2023 and summarized below is approved:

2023 Capital Budget Summary	
Generation	$ 1,540,000
Distribution	28,977,000
Transmission	15,825,000
Corporate	3,643,000
General Expense Capitalized	730,000
Interest During Construction	680,000
TOTAL	$ 51,215,000
Less: Contributions	(750,000)
TOTAL (Net)	**$ 50,465,000**

DATED at Charlottetown, Prince Edward Island, this ___ day of _____, 2022.

BY THE COMMISSION:

_____

Chair

_____

Commissioner

_____

Commissioner

APPENDIX A

Summary of Actual and Proposed Capital Expenditures (2014 to 2027)

Maritime Electric Company, Limited
Summary of Actual and Proposed Capital Expenditures (2014 to 2027)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Budget	Budget	Forecast	Forecast	Forecast	Forecast
Generation														
Charlottetown Plant and CT3	$ 592,872	$ 451,154	$ 500,777	$ 983,658	$ 814,902	$ 426,114	$ 1,133,998	$ 789,085	$ 554,000	$ 462,000	$ 484,000	$ 1,345,000	$ 787,000	$ 520,000
Combustion Turbine #4								-	-	-	-	-	45,020,000	46,371,000
Borden Plant	1,468,960	234,642	740,335	81,062	185,765	59,226	291,417	211,457	691,000	1,078,000	1,022,000	577,000	579,000	774,000
Subtotal	2,061,832	685,796	1,241,112	1,064,720	1,000,667	485,340	1,425,415	1,000,542	1,245,000	1,540,000	1,506,000	1,922,000	46,386,000	47,665,000
Distribution and Transmission														
Distribution	16,974,255	16,132,068	18,246,306	19,834,463	21,445,487	23,777,736	23,530,799	24,772,109	28,249,000	28,977,000	43,571,000	43,878,000	33,217,000	33,912,000
Transmission	6,462,871	8,092,839	8,283,251	10,832,373	6,989,530	8,674,018	7,854,808	9,257,011	8,889,000	15,825,000	15,957,000	18,330,000	25,591,000	25,751,000
Subtotal	23,437,126	24,224,907	26,529,557	30,666,836	28,435,017	32,451,754	31,385,607	34,029,000	37,138,000	44,802,000	59,528,000	62,208,000	58,808,000	59,663,000
Corporate	979,141	897,585	1,039,510	841,786	2,143,044	1,850,589	1,894,378	2,311,382	4,035,000	6,651,000[1]	11,485,000	9,062,000	8,313,000	2,846,000
Subtotal	26,478,099	25,808,288	28,810,179	32,573,342	31,578,728	34,787,683	34,705,400	37,341,044	42,418,000	52,993,000	72,519,000	73,192,000	113,507,000	110,174,000
Capitalized General Expense	388,730	458,433	477,714	502,450	475,368	567,505	489,745	681,043	690,000	730,000	831,000	852,000	785,000	805,000
Interest During Construction	368,486	376,452	405,915	449,760	432,111	474,433	444,170	548,015	496,000	680,000	942,000	954,000	1,589,000	1,570,000
Subtotal	27,235,315	26,643,173	29,693,808	33,525,552	32,486,207	35,829,621	35,639,315	38,570,102	43,604,000	54,403,000	74,292,000	74,998,000	115,881,000	112,549,000
Less: Customer Contributions	(525,236)	(382,693)	(1,262,517)	(746,454)	(677,905)	(758,922)	(1,094,598)	(1,483,088)	(3,538,000)	(2,250,000)[2]	(10,250,000)	(8,750,000)	(750,000)	(750,000)
Net Capital Expenditures	**$ 26,710,079**	**$ 26,260,480**	**$ 28,431,291**	**$ 32,779,098**	**$ 31,808,302**	**$ 35,070,699**	**$ 34,544,717**	**$ 37,087,014**	**$ 40,066,000**	**$ 52,153,000**	**$ 64,042,000**	**$ 66,248,000**	**$ 115,131,000**	**$ 111,799,000**

[1] 2023 Corporate total includes an anticipated multi-year SCBR filing for a CIS replacement project in the amount of $3,188,000, not included in the Application.
[2] 2023 Customer Contributions includes contributions of $1,500,000 from the Federal Government, related to the anticipated SCBR filing for a CIS replacement project.

APPENDIX B

Proposed 2023 Capital Expenditures by CEJC Classification

Proposed 2023 Capital Expenditures by CEJC Classification

	Mandatory	Justifiable	Recurring	Work Support Services	Capitalized General Expense	Interest During Construction	TOTAL	% of Total Category Proposed
4.0 Generation								
4.1 Charlottetown Generating Station - Buildings and Site Services								
a. ECC Facility and Equipment Upgrades		$ 78,000						
b. CGS Miscellaneous Building and Site Upgrades			35,000					
	-	78,000	35,000	-	-	-	$ 113,000	7.3%
4.2 Charlottetown Generating Station - Turbine Generator								
a. CT3 Fuel Forwarding Building Upgrades		114,000						
b. CT3 Fuel Tank Coating System Upgrade		60,000						
c. CGS Combustion Turbine Improvements, Parts and Tools			175,000					
	-	174,000	175,000	-	-	-	349,000	22.7%
4.3 Borden Generating Station - Buildings and Site Services								
a. BGS Communication Equipment Upgrades		50,000						
b. BGS Entrance Landscaping		51,000						
c. BGS Miscellaneous Building and Site Upgrades			35,000					
	-	101,000	35,000	-	-	-	136,000	8.8%
4.4 Borden Generating Station - Turbine Generators								
a. CT1 Generator Overhaul		663,000						
b. BGS Tank Farm Upgrades		164,000						
c. BGS Combustion Turbine Improvements, Parts and Tools			115,000					
	-	827,000	115,000	-	-	-	942,000	61.2%
	-	**1,180,000**	**360,000**	**-**	**-**	**-**	**1,540,000**	**100.0%**
% of Total Category Proposed	**0.0%**	**76.6%**	**23.4%**	**0.0%**	**0.0%**	**0.0%**		**100.0%**

Proposed 2023 Capital Expenditures by CEJC Classification

	Mandatory	Justifiable	Recurring	Work Support Services	Capitalized General Expense	Interest During Construction	TOTAL	% of Total Category Proposed
5.0 Distribution								
5.1 Replacements due to Storms, Collisions, Fire and Road Alterations								
a. Replacements due to Storms, Fire and Collisions			998,000					
b. Replacements due to Road Alterations			842,000					
	-	-	1,840,000	-	-	-	1,840,000	6.3%
5.2 Distribution Transformers								
a. Polemount and Padmount Transformers			8,782,000					
b. PCB Equipment Replacements	545,000							
	545,000	-	8,782,000	-	-	-	9,327,000	32.2%
5.3 Services and Street Lighting								
a. Overhead and Underground Services			4,795,000					
b. Street and Area Lighting			855,000					
	-	-	5,650,000	-	-	-	5,650,000	19.5%
5.4 Line Extensions								
a. Customer Driven Line Extensions			1,457,000					
b. Reliability Driven Line Extensions		1,982,000						
	-	1,982,000	1,457,000	-	-	-	3,439,000	11.9%
5.5 Line Rebuilds								
a. Single Phase and Three Phase Rebuilds		2,406,000						
b. Distribution Line Refurbishment			815,000					
c. Accelerated Distribution Component Replacement		2,109,000						
	-	4,515,000	815,000	-	-	-	5,330,000	18.4%
5.6 System Meters								
a. Watt-Hour Meters			444,000					
b. Combination Meters			88,000					
c. Outdoor Metering Tanks			86,000					
d. Miscellaneous Metering Equipment			38,000					
	-	-	656,000	-	-	-	656,000	2.3%
5.7 Distribution Equipment								
a. Substation, Line and Communication Equipment			986,000					
b. Relay Replacement Equipment			164,000					
c. Switch Replacement Equipment			67,000					
d. Line Tools and Equipment			228,000					
e. Meter Shop Equipment			32,000					
	-	-	1,477,000	-	-	-	1,477,000	5.1%
5.8 Transportation Equipment	-	-	-	1,258,000	-	-	1,258,000	4.3%
	545,000	**6,497,000**	**20,677,000**	**1,258,000**	**-**	**-**	**28,977,000**	**100.0%**
% of Total Category Proposed	**1.9%**	**22.4%**	**71.4%**	**4.3%**	**0.0%**	**0.0%**		**100.0%**

Proposed 2023 Capital Expenditures by CEJC Classification

	Mandatory	Justifiable	Recurring	Work Support Services	Capitalized General Expense	Interest During Construction	TOTAL	% of Total Category Proposed
6.0 Transmission								
6.1 Substation Projects								
a. Crossroads Substation Rebuild		3,323,000						
b. West Royalty X5 Autotransformer Upgrade		4,650,000						
c. Woodstock Switching Station		1,741,000						
d. Tignish Substation		2,573,000						
e. Substation Oil Containment Program	152,000							
f. Substation Modernization Program		528,000						
g. 138 kV Breaker Replacement Program		153,000						
h. Communication Fibre - Alberton to Tignish		643,000						
i. Fibre Modifications Due to Road Alterations			44,000					
	152,000	13,611,000	44,000	-	-	-	13,807,000	87.2%
6.2 Transmission Projects								
a. 69 kV and 138 kV Switch Program			613,000					
b. Transmission Line Refurbishment			951,000					
c. Transmission Lines		454,000						
	-	454,000	1,564,000	-	-	-	2,018,000	12.8%
	152,000	**14,065,000**	**1,608,000**	**-**	**-**	**-**	**15,825,000**	**100.0%**
% of Total Category Proposed	**1.0%**	**88.9%**	**10.2%**	**0.0%**	**0.0%**	**0.0%**		**100.0%**
7.0 Corporate								
7.1 Corporate Services								
a. Recurring Annual Capital Requirements				460,000				
b. Comprehensive Building Condition Assessments				410,000				
c. Facilities Security System Replacement				468,000				
	-	-	-	1,338,000	-	-	1,338,000	38.6%
7.2 Information Technology								
a. Hardware Acquisitions				334,000				
b. Purchased Software and Upgrades				634,000				
c. Cybersecurity Enhancements				572,000				
d. Customer Services and Communication Enhancements				216,000				
e. Engineering Fixed Assets Management System				202,000				
f. Line Inspection Application Enhancements				92,000				
g. Survey System Refresh				75,000				
	-	-	-	2,125,000	-	-	2,125,000	61.4%
	-	**-**	**-**	**3,463,000**	**-**	**-**	**3,463,000**	**100.0%**
% of Total Category Proposed	**0.0%**	**0.0%**	**0.0%**	**100.0%**	**0.0%**	**0.0%**		**100.0%**
Subtotal	**697,000**	**21,742,000**	**22,645,000**	**4,721,000**	**-**	**-**	**49,805,000**	

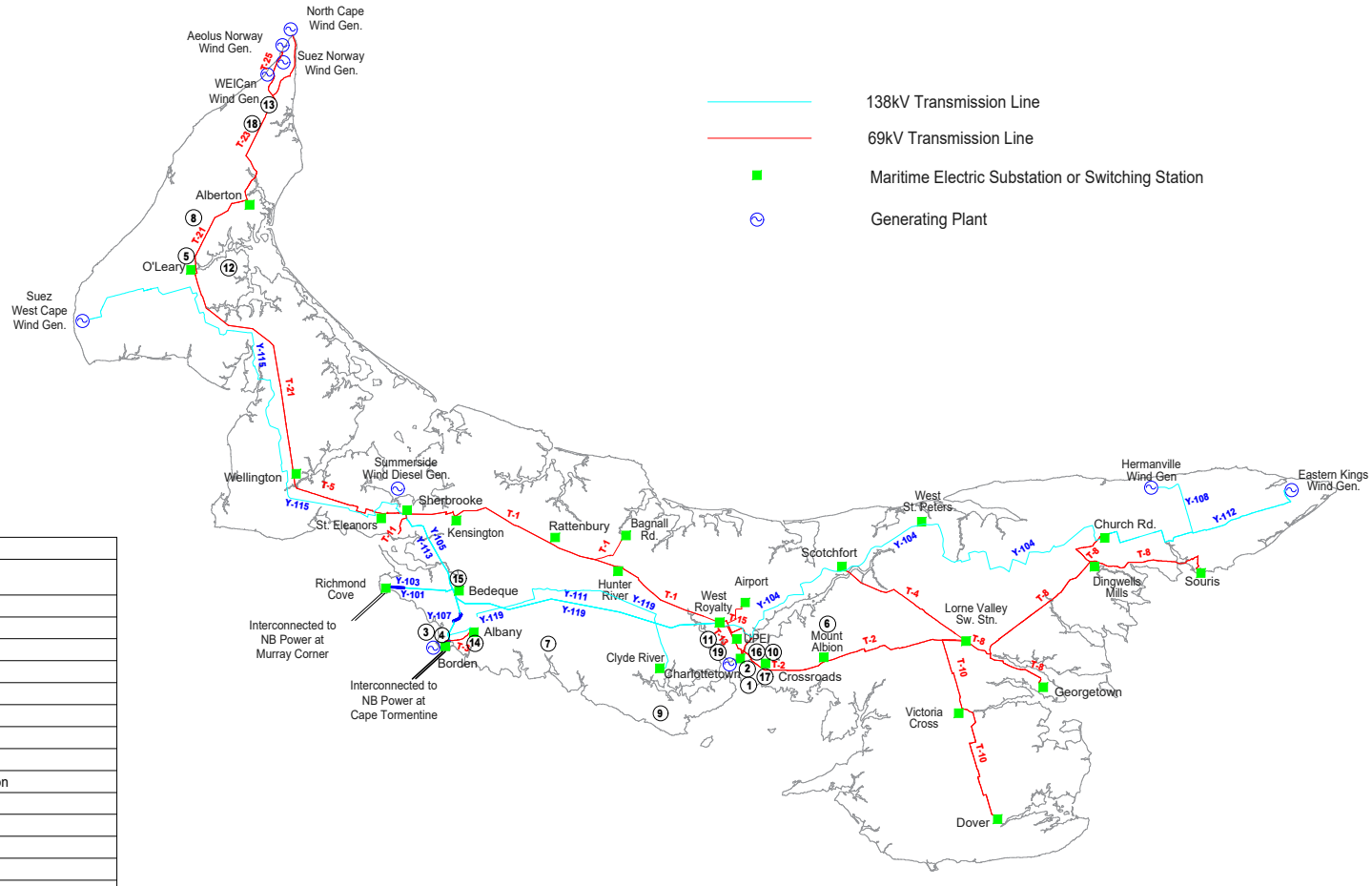
Proposed 2023 Capital Expenditures by CEJC Classification

	Mandatory	Justifiable	Recurring	Work Support Services	Capitalized General Expense	Interest During Construction	TOTAL	% of Total Category Proposed
8.0 Capitalized General Expense					730,000		730,000	
9.0 Interest During Construction						680,000	680,000	
TOTAL	**$697,000**	**$21,742,000**	**$22,645,000**	**$4,721,000**	**$730,000**	**$680,000**	**$ 51,215,000**	
% of Total Proposed	**1.4%**	**42.5%**	**44.2%**	**9.2%**	**1.4%**	**1.3%**		
Customer Contributions							(750,000)	
TOTAL (less Customer Contributions)							**$ 50,465,000**	

APPENDIX C

2023 Capital Budget Project Locations

2023 CAPITAL BUDGET PROJECT LOCATIONS



LEGEND OF PROJECT LOCATIONS ON MAP		
Map Location	Budget Category	Project Description
1	4.1	CGS Buildings and Site Services Projects
2	4.2	CGS Turbine Generator Projects
3	4.3	BGS Buildings and Site Services Projects
4	4.4	BGS Turbine Generator Projects
5	5.4b(i)	Coleman Feeder
6	5.4b(ii)	Robertson Road Three Phase Conversion
7	5.5a(i)	Old Post Road (Crapaud) Line Rebuild
8	5.5a(ii)	Bloomfield to Elmsdale (Route 2) Line Rebuild
9	5.5a(iii)	Argyle Shore Line Upgrade and Voltage Conversion
10	6.1a	Crossroads Substation Rebuild
11	6.1b	West Royalty X5 Autotransformer Upgrade
12	6.1c	Woodstock Switching Station
13	6.1d	Tignish Substation
14	6.1e	Substation Oil Containment Program
15	6.1g	138kV Breaker Replacement Program
16	6.1h	Communication Fibre - Alberton to Tignish
17	6.2c(i)	Crossroads Substation Transmission Modifications
18	6.2c(ii)	Tignish Substation Transmission
19	7.1b	Comprehensive Building Condition Assessments

MARITIME ELECTRIC
ELECTRICAL SYSTEM
PRINCE EDWARD ISLAND

APPENDIX D

Estimated Impact on Rate Base, Revenue Requirement and Customer Rates

Estimated Impact on Rate Base, Revenue Requirement and Customer Rates

Depreciation (000s)	**Reference**	**Annual**
Depreciation Expense		
Capital Investment per Table 1, Proposed 2023 Capital Expenditures	A = $50,465 + $750	51,215
Retirements (Note 1)	B = (A X 20%)	(10,243)
Plant Investment for Depreciation	C = A + B	$ 40,972
Depreciation Rate (Note 2)	D	3.67%
Depreciation Expense	E = C X D	$ 1,504
Capital Investment		
Capital Investment	A	51,215
Less: Customer Contributions per Table 1, Proposed 2023 Capital Expenditures	F	(750)
Total Capital Investment	G = A + F	$ 50,465
Accumulated Depreciation		
Costs of Removal (Note 3)	H = A / (1-17%) X 17%	(10,490)
Depreciation & Amortization	E	1,504
Total Change in Accumulated Depreciation	I = H + E	$ (8,986)
Net Book Value (NBV) - Plant Investment	**J = C - I**	**$ 49,958**
Customer Contributions		
Customer Contributions per Table 1, Proposed 2023 Capital Expenditures	F	**$ (750)**
Depreciation Expense - Contributions		
Annual Contributions	F	$ (750)
Depreciation Rate (Note 4)	K	3.55%
Amortization of Customer Contributions	L = F X K	$ (27)
Net Book Value (NBV) - Customer Contributions	**M = F - L**	**$ (723)**
Total Depreciation Expense (Net of Contributions)	**N = E + L**	**$ 1,477**

Note 1: Asset retirements estimated at 20% of capital expenditures based on average for 2018-2020.

Note 2: 2023 composite depreciation rate per 2020 Depreciation Study as proposed in GRA.

Note 3: Costs of Removal are estimated to be 17% of total capital investment and costs of removal based on average for 2018-2020.

Note 4: Distribution Contributions are depreciated using the rate per 2020 Depreciation Study for Distribution Service Lines.

Estimated Impact on Rate Base, Revenue Requirement and Customer Rates

Income Taxes (000s)	**Reference**	**Annual**
Capital Cost Allowance		
Capital Investment per Table 1, Proposed 2023 Capital Expenditures	A = $50,465 + $750	51,215
UCC for Calculation (Accelerated Investment Incentive)	A	51,215
Capital Cost Allowance ("CCA") Rate (assumes class 47)	B	8.00%
CCA (Accelerated Investment Incentive @ 150%)	C = A X B X 150%	6,146
Ending UCC	D = A - C	$ 45,069
Future Income Taxes		
CCA	C	$ 6,146
Depreciation	E = N from Page 1	1,477
Difference CCA/Depreciation	F = C - E	4,669
Future Tax Rate	G	31.00%
Future Income Taxes	H = F X G	1,447
Income Tax Effects of Increased Return		
Return on Rate Base	I = H from Page 3	$ 3,292
Equity Return (grossed up)	J = G from Page 3 / (1-G)	2,743
Debt Return	K = F from Page 3	(1,399)
	L = J + K	$ 1,344
Income Tax Calculation		
Return on Rate Base	L	$ 1,344
Add: Depreciation	E	1,477
Less: CCA	C	(6,146)
	M = L + E + C	(3,325)
Corporate Tax Rate	G	31.00%
Current Income Taxes	N = M X G	(1,031)
Future Income Taxes	H	1,447
Total Income Tax Expense	**O = N + H**	**$ 416**

Estimated Impact on Rate Base, Revenue Requirement and Customer Rates

Rate Base & Cost of Capital (000s)	**Reference**		**Annual**
Net Book Value, Capital Investment	A = J from Page 1	$	49,958
Net Book Value, Contributions	B = M from Page 1		(723)
Future Income Taxes	C = H from Page 2		(1,447)
Projected Rate Base	**D = A + B + C**	**$**	**47,788**
% of 2023 Forecast Year End Rate Base	**E = D / R**		**9.91%**
Return on Debt	F = D X O	$	1,399
Return on Common Equity	G = D X P		1,893
Total Return On Rate Base	H = F + G	$	3,292
Weighted Average Cost of Capital ("WACC")			
Debt	I		60.0%
Common Equity	J		40.0%
Cost of Debt	K		4.91%
Cost of Common Equity	L		9.95%
Forecast 2023 Average Capitalization (Total Debt plus Common Equity)	M		468,293,900
Forecast 2023 Average Rate Base*	N		471,022,500
WA Cost of Debt	O = I X K X M/ N		2.93%
WA Cost of Common Equity	P = J X L X M/ N		3.96%
Forecast 2023 WACC	Q = O + P		6.89%
2023 Forecast Year End Rate Base *	**R**	**$**	**482,142**

* Per Table 6-2 of GRA filed on June 20, 2022.

Estimated Impact on Rate Base, Revenue Requirement and Customer Rates

Annual Project Revenue Requirement (000s)	**Reference**		**Annual**
Depreciation	A = N from Page 1	$	1,477
Return on Debt	B = F from Page 3		1,399
Return on Equity	C = G from Page 3		1,893
Income Taxes	D = O from Page 2		416
Estimated Annual Project Revenue Requirement	**E = A + B + C + D**	**$**	**5,186**
% of 2023 Forecast Revenue Requirement	**F = E / G**		**2.08%**
Forecast 2023 Revenue Requirement*	**G**	**$**	**249,256**

* 2023 revenue requirement per Table 6-6 of the GRA is $249,256.

Estimated Impact on Rate Base, Revenue Requirement and Customer Rates

Project Rate Impact	Reference	Annual
Total Project Revenue Requirement	A = E from Page 4 X 1000	$ 5,185,997
Forecast 2023 kWh Sales *	B	1,391,748,934
Forecast Increase Per kWh Project Rate Impact	**C = A / B**	**$ 0.00373**
Forecast Increase Annual Cost Benchmark Residential Customer (650 kWh per month) before tax	**D = 650 kWh X C X 12 months**	**$ 29.09**
% of 2023 Forecast Annual Cost for Rural Residential Customer	E = D / I	1.86%
% of 2023 Forecast Annual Cost for Urban Residential Customer	F = D / J	1.90%
Forecast Increase Annual Cost Benchmark General Service Customer (10,000 kWh per month) before tax	**G = 10,000 kWh X C X 12 months**	**$ 447.60**
% of 2023 Forecast Annual Cost for General Service Customer	H = G / K	1.83%
2023/2024 Forecast Annual Cost Benchmark Rural Residential Customer (650 kWh per month) excluding tax per Table 7-4 of GRA filed with the Commission on June 20, 2022.	I	$ 1,562.88
2023/2024 Forecast Annual Cost Benchmark Rural Residential Customer (650 kWh per month) excluding tax per Table 7-5 of GRA filed with the Commission on June 20, 2022.	J	$ 1,534.68
2022 Forecast Annual Cost Benchmark General Service Customer (10,000 kWh per month) excluding tax per Table 7-6 of GRA filed with the Commission on June 20, 2022.	K	$ 24,508.79

* Forecast 2023 kWh sales based on current load forecast at the time of filing this application.

APPENDIX E

Proposed 2023 Capital Expenditures by Investment Classification

Proposed 2023 Capital Expenditures by Investment Classification

	Mandatory	Access	System Growth	Renewal	Service Enhancement	General Plant	TOTAL
4.0 Generation							
4.1 Charlottetown Generating Station - Buildings and Site Services							
a. ECC Facility and Equipment Upgrades				$ 78,000			
b. CGS Miscellaneous Building and Site Upgrades						35,000	
Subtotal	-	-	-	78,000	-	35,000	$ 113,000
4.2 Charlottetown Generating Station - Turbine-Generator							
a. CT3 Fuel Forwarding Building Upgrades				114,000			
b. CT3 Fuel Tank Coating System Upgrade				60,000			
c. CGS Combustion Turbine Improvements, Parts and Tools				175,000			
Subtotal	-	-	-	349,000	-	-	$ 349,000
4.3 Borden Generating Station - Buildings and Site Services							
a. BGS Communication Equipment Upgrades				50,000			
b. BGS Entrance Landscaping						51,000	
c. BGS Miscellaneous Building and Site Upgrades						35,000	
Subtotal	-	-	-	50,000	-	86,000	$ 136,000
4.4 Borden Generating Station - Turbine Generators							
a. CT1 Generator Overhaul				663,000			
b. BGS Tank Farm Upgrades				164,000			
c. BGS Combustion Turbine Improvements, Parts and Tools				115,000			
Subtotal	-	-	-	942,000	-	-	$ 942,000
Generation Total	**-**	**-**	**-**	**1,419,000**	**-**	**121,000**	**1,540,000**
% of Generation Total by Investment Classification	**0.0%**	**0.0%**	**0.0%**	**92.1%**	**0.0%**	**7.9%**	**100.0%**
5.0 Distribution							
5.1 Replacements Due to Storms, Collisions, Fire and Road Alterations							
a. Replacements Due to Storms, Fire and Collisions				998,000			
b. Replacements Due to Road Alterations		842,000					
Subtotal	-	842,000	-	998,000	-	-	$ 1,840,000
5.2 Distribution Transformers							
a. Polemount and Padmount Transformers		4,391,000		4,391,000			
b. PCB Equipment Replacements	545,000						
Subtotal	545,000	4,391,000	-	4,391,000	-	-	$ 9,327,000
5.3 Services and Street Lighting							
a. Overhead and Underground Services		4,795,000					
b. Street and Area Lighting		855,000					
Subtotal	-	5,650,000	-	-	-	-	$ 5,650,000
5.4 Line Extensions							
a. Customer Driven Line Extensions		1,457,000					
b. Reliability Driven Line Extensions					1,982,000		
Subtotal	-	1,457,000	-	-	1,982,000	-	$ 3,439,000
5.5 Line Rebuilds							
a. Single Phase and Three Phase Rebuilds				2,406,000			
b. Distribution Line Refurbishment				815,000			
c. Accelerated Distribution Component Replacement				2,109,000			
Subtotal	-	-	-	5,330,000	-	-	$ 5,330,000
5.6 System Meters							
a. Watt-Hour Meters		284,000		160,000			
b. Combination Meters		56,000		32,000			
c. Outdoor Metering Tanks		55,000		31,000			
d. Miscellaneous Metering Equipment		24,000		14,000			
Subtotal	-	419,000	-	237,000	-	-	$ 656,000
5.7 Distribution Equipment							
a. Substation, Line and Communication Equipment				986,000			
b. Relay Replacement Equipment				164,000			
c. Switch Replacement Equipment				67,000			
d. Line Tools and Equipment						228,000	
c. Meter Shop Equipment						32,000	
Subtotal	-	-	-	1,217,000	-	260,000	$ 1,477,000
5.8 Transportation Equipment	-	-	-	-	-	1,258,000	$ 1,258,000
Subtotal	-	-	-	-	-	1,258,000	1,258,000
Distribution Total	**545,000**	**12,759,000**	**-**	**12,173,000**	**1,982,000**	**1,518,000**	**28,977,000**
% of Distribution Total by Investment Classification	**1.9%**	**44.0%**	**0.0%**	**42.0%**	**6.8%**	**5.2%**	**100%**
6.0 Transmission							
6.1 Substation Projects							
a. Crossroads Substation Rebuild				3,323,000			
b. West Royalty X5 Autotransformer Upgrade				4,650,000			
c. Woodstock Switching Station					1,741,000		
d. Tignish Substation			2,573,000				
e. Substation Oil Containment Program	152,000						
f. Substation Modernization Program				528,000			
g. 138 kV Breaker Replacement Program				153,000			
h. Communication Fibre - Alberton to Tignish			643,000				
i. Fibre Modifications Due to Road Alterations		44,000					
Subtotal	152,000	44,000	3,216,000	8,654,000	1,741,000	-	$ 13,807,000
6.2 Transmission Projects							
a. 69 kV and 138 kV Switch Program				613,000			
b. Transmission Line Refurbishment				951,000			
c. Transmission Lines							
i. Crossroads Substation Transmission Modifications				147,000			
ii. Tignish Substation Transmission			307,000				
Subtotal	-	-	307,000	1,711,000	-	-	$ 2,018,000
Transmission Total	**152,000**	**44,000**	**3,523,000**	**10,365,000**	**1,741,000**	**-**	**15,825,000**
% of Transmission Total by Investment Classification	**1.0%**	**0.3%**	**22.3%**	**65.5%**	**11.0%**	**0.0%**	**100%**
7.0 Corporate							
7.1 Corporate Services							
a. Recurring Annual Capital Requirements						460,000	
b. Comprehensive Building Condition Assessments						410,000	
c. Facilities Security System Replacement						468,000	
Subtotal	-			-	-	1,338,000	$ 1,338,000
7.2 Information Technology							
a. Hardware Acquisitions						334,000	
b. Purchased Software and Upgrades						634,000	
c. Cybersecurity Enhancements						572,000	
d. Customer Services and Communication Enhancements						216,000	
e. Engineering Fixed Assets Management System						202,000	
f. Line Inspection Application Enhancements						92,000	
g. Survey System Refresh						75,000	
Subtotal	-			-	-	2,125,000	$ 2,125,000
Corporate Total	**-**	**-**	**-**	**-**	**-**	**3,463,000**	**3,463,000**
% of Corporate Total by Investment Classification	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**	
TOTAL	**697,000**	**12,803,000**	**3,523,000**	**23,957,000**	**3,723,000**	**5,102,000**	**49,805,000**
% of TOTAL	**1.4%**	**25.7%**	**7.1%**	**48.1%**	**7.5%**	**10.2%**	**100.0%**

APPENDIX F

List of Future Capital Projects

Legend of Abbreviations – List of Future Capital Projects	
Abbreviation	**Description**
AMI	Advanced Metering Infrastructure
BCC	Backup Control Centre
BGS	Borden Generating Station
CIS	Customer Information and Billing System
CGS	Charlottetown Generating Station
CSUP	Customer Service Utility Person
CT1	Combustion Turbine #1
CT2	Combustion Turbine #2
CT3	Combustion Turbine #3
CT4	Combustion Turbine #4
ECC	Energy Control Centre
EIA	Environmental Impact Assessment
GIS	Geographic Information System
HMI	Human-Machine Interface
HVAC	Heating, Ventilation and Air Conditioning
IT	Information Technology
OT	Operations Technology
PCB	Polychlorinated Biphenyl
RO-EDI	Reverse Osmosis-Electrodeionization
SCADA	Supervisory Control and Data Acquisition
WRSC	West Royalty Service Centre
TCH	Trans Canada Highway

List of Future Capital Projects

	2023	2024	2025	2026	2027	Future
4.0 GENERATION	**4.1 - CGS - Buildings and Site Services**	**4.1 - CGS - Buildings and Site Services**	**4.1 - CGS - Buildings and Site Services**	**4.1 - CGS - Buildings and Site Services**	**4.1 - CGS - Buildings and Site Services**	**4.1 - CGS - Buildings and Site Services**
	CGS Miscellaneous Building and Site Upgrades	CGS Miscellaneous Building and Site Upgrades	CGS Miscellaneous Building and Site Upgrades	CGS Miscellaneous Building and Site Upgrades	CGS Miscellaneous Building and Site Upgrades	CGS Miscellaneous Building and Site Upgrades
	ECC Facility and Equipment Upgrades	ECC Mechanical and Electrical Upgrades	ECC Window Replacement	SCADA System GIS Capabilities	ECC Roof Replacement	ECC - SCADA Simulator
		CGS Storage Building Upgrades	SCADA Video Wall Display	Site Improvements & Landscaping		CGS - Storage Building Heating System
			Construction of New Water Street Entrance			CGS - Machine Shop Upgrades
			Paving for Fuel Offloading Facility and Parking Lot			CGS - Richmond Street Entrance Paving
	4.2 - CGS - Turbine Generator	**4.2 - CGS - Turbine Generator**	**4.2 - CGS - Turbine Generator**	**4.2 - CGS - Turbine Generator**	**4.2 - CGS - Turbine Generator**	**4.2 - CGS - Turbine Generator**
	CGS Combustion Turbine Improvements, Parts and Tools	CGS Combustion Turbine Improvements, Parts and Tools	CGS Combustion Turbine Improvements, Parts and Tools	CGS Combustion Turbine Improvements, Parts and Tools	CGS Combustion Turbine Improvements, Parts and Tools	CGS Combustion Turbine Improvements, Parts and Tools
	CT3 Fuel Forwarding Building Upgrades		Modify RO-EDI for Recirculation Flushing	CT4 Combustion Turbine Phase 1	CT4 Combustion Turbine Phase 2	Portable HMIs
	CT3 Fuel Tank Coating System Upgrade		RO-EDI Equipment Upgrades		Install Vibration Dampers on CT3 Auxiliary Equipment	Parts Storage Facility
						Wet Supression System for CT3
						Bird Deterrent Equipment
						Electronic Data Consolidation Equipment
						Replace Dorman Diesel
						CT3 Hybrid Battery System Retrofit
						New Diesel Pipeline Interconnection
	4.3 - BGS - Buildings and Site Services	**4.3 - BGS - Buildings and Site Services**	**4.3 - BGS - Buildings and Site Services**	**4.3 - BGS - Buildings and Site Services**	**4.3 - BGS - Buildings and Site Services**	**4.3 - BGS - Buildings and Site Services**
	BGS Miscellaneous Building and Site Upgrades	BGS Miscellaneous Building and Site Upgrades	BGS Miscellaneous Building and Site Upgrades	BGS Miscellaneous Building and Site Upgrades	BGS Miscellaneous Building and Site Upgrades	BGS Miscellaneous Building and Site Upgrades
	BGS Communication Equipment Upgrades					City Water Hookup and Fire Hydrant/Monitor Installation
	BGS Entrance Landscaping					Outbuildings Upgrades and/or Replacement
	4.4 - BGS - Turbine Generators	**4.4 - BGS - Turbine Generators**	**4.4 - BGS - Turbine Generators**	**4.4 - BGS - Turbine Generators**	**4.4 - BGS - Turbine Generators**	**4.4 - BGS - Turbine Generators**
	BGS Combustion Turbine Improvements, Parts and Tools	BGS Combustion Turbine Improvements, Parts and Tools	BGS Combustion Turbine Improvements, Parts and Tools	BGS Combustion Turbine Improvements, Parts and Tools	BGS Combustion Turbine Improvements, Parts and Tools	BGS Combustion Turbine Improvements, Parts and Tools
	CT1 Generator Overhaul	CT1 Life Extension	CT2 Life Extension	CT1 Main Unit Gearbox Inspection and Refurbishment	CT2 Sodium Filter Replacement	CT2 Motor Control Centre Upgrades
	BGS Tank Farm Upgrades	CT2 Generator Overhaul			Exhaust Volute on CT1	
					Renovate Air Filter House on CT2	
5.0 DISTRIBUTION	**5.1 - Replacements Due to Storms and Road Alterations**	**5.1 - Replacements Due to Storms and Road Alterations**	**5.1 - Replacements Due to Storms and Road Alterations**	**5.1 - Replacements Due to Storms and Road Alterations**	**5.1 - Replacements Due to Storms and Road Alterations**	**5.1 - Replacements Due to Storms and Road Alterations**
	Replacements Due to Storms, Fires and Collisions	Replacements Due to Storms, Fires and Collisions	Replacements Due to Storms, Fires and Collisions	Replacements Due to Storms, Fires and Collisions	Replacements Due to Storms, Fires and Collisions	Replacements Due to Storms, Fires and Collisions
	Replacements Due to Road Alterations	Replacements Due to Road Alterations	Replacements Due to Road Alterations	Replacements Due to Road Alterations	Replacements Due to Road Alterations	Replacements Due to Road Alterations
	5.2 - Distribution Transformers	**5.2 - Distribution Transformers**	**5.2 - Distribution Transformers**	**5.2 - Distribution Transformers**	**5.2 - Distribution Transformers**	**5.2 - Distribution Transformers**
	Polemount and Padmount Transformers	Polemount and Padmount Transformers	Polemount and Padmount Transformers	Polemount and Padmount Transformers	Polemount and Padmount Transformers	Polemount and Padmount Transformers
	PCB Equipment Replacements	PCB Equipment Replacements	PCB Equipment Replacements			
		Stepdown Spare Units				
	5.3 - Services and Street Lighting	**5.3 - Services and Street Lighting**	**5.3 - Services and Street Lighting**	**5.3 - Services and Street Lighting**	**5.3 - Services and Street Lighting**	**5.3 - Services and Street Lighting**
	Overhead and Underground Services	Overhead and Underground Services	Overhead and Underground Services	Overhead and Underground Services	Overhead and Underground Services	Overhead and Underground Services
	Street and Area Lighting	Street and Area Lighting	Street and Area Lighting	Street and Area Lighting	Street and Area Lighting	Street and Area Lighting
	5.4 - Line Extensions	**5.4 - Line Extensions**	**5.4 - Line Extensions**	**5.4 - Line Extensions**	**5.4 - Line Extensions**	**5.4 - Line Extensions**
	Customer Driven Line Extensions	Customer Driven Line Extensions	Customer Driven Line Extensions	Customer Driven Line Extensions	Customer Driven Line Extensions	Customer Driven Line Extensions
	Coleman Feeder	Tignish Substation Distribution	Blue Shank Road to Rte 1A (3 Phase Conversion)	New Kensington Substation Feeder	New Dover Substation Feeder	Tie Souris & Dingwells Mills (across the bridge)
	Robertson Road Three Phase Conversion	Lady Slipper Drive North (3 Phase Conversion)	Blue Shank Road KN80084 (3 Phase Conversion)	Mount Pleasant Substation Feeders	Wellington Substation 4th Feeder	Eldon-Belfast Voltage Conversion
			New Albany SubstationFeeder			Hunter River Substation Feeders
			Souris Substation Backup from Dingwell Mills			Albany Substation Feeders
						Cavendish Substation Feeders
						Charlottetown Plant Substation Feeders
						Bedeque Substation Feeders
	5.5 - Line Rebuilds	**5.5 - Line Rebuilds**	**5.5 - Line Rebuilds**	**5.5 - Line Rebuilds**	**5.5 - Line Rebuilds**	**5.5 - Line Rebuilds**
	Distribution Line Refurbishment Program	Distribution Line Refurbishment Program	Distribution Line Refurbishment Program	Distribution Line Refurbishment Program	Distribution Line Refurbishment Program	Distribution Line Refurbishment Program
	Eastern Cedar Pole Replacement Program	Eastern Cedar Pole Replacement Program	Eastern Cedar Pole Replacement Program	Eastern Cedar Pole Replacement Program	Eastern Cedar Pole Replacement Program	Eastern Cedar Pole Replacement Program
	Deteriorated Conductor Replacement Program	Deteriorated Conductor Replacement Program	Deteriorated Conductor Replacement Program	Deterioriated Conductor Replacement Program	Deteriorated Conductor Replacement Program	Deteriorated Conductor Replacement Program
	Backlot Feed Relocation Program	Backlot Feed Relocation Program	Backlot Feed Relocation Program	Backlot Feed Relocation Program	Backlot Feed Relocation Program	Backlot Feed Relocation Program
	Old Post Road (Crapaud)	Montrose to Tignish/Greenmount Road	Grahams Road	Rte 20 Malpeque	Alberton to Elmsdale	Kinross to Vernon River
	Bloomfield to Elmsdale (Route 2)	Village Green Road	Keppoch Road	Baltic Road	New Zealand Road-West	Kingston Voltage Conversion
	Argyle Shore Line Upgrade and Voltage Conversion	Miscellaneous Communication Make-Ready Projects	Egmont Bay Rte 11	Egmont Bay	Mount Edward Road	St. Peters Road
	Miscellaneous Communication Make-Ready Projects		North York Rebuild	TCH Mt Mellick to Rte 13	TCH Desable to Victoria	Cameron Road
			Backup Rattenbury with Kensington	Fernwood	Brackley Voltage Conversion	Eldon-Belfast Voltage Conversion
			Locke Road	Victoria Cross Voltage Conversion	New Haven Voltage Conversion	Lower Bedeque
			Orwell Cove Voltage Conversion	Stanhope Voltage Conversion	Rocky Point Voltage Conversion	Green Road Bonshaw
			Riverdale Road Voltage Conversion	New Dominion Voltage Conversion	Miscellaneous Communication Make-Ready Projects	Spring Park Road/Douglas Street
			Miscellaneous Communication Make-Ready Projects	Miscellaneous Communication Make-Ready Projects		Nodd Road
						Northside Road (3 phase)
						Baltic Road - East
						Millvale Road
						Cavendish Distribution Automation
						Crossroads Distribution Automation
						Charlottetown Circuits Distribution Automation
						Vernon Bridge Voltage Conversion
						Grandview Voltage Conversion
						Miscellaneous Communication Make-Ready Projects

List of Future Capital Projects

	2023	2024	2025	2026	2027	Future
5.0 DISTRIBUTION	**5.6 - System Meters**	**5.6 - System Meters**	**5.6 - System Meters**	**5.6 - System Meters**	**5.6 - System Meters**	**5.6 - System Meters**
	Watt-Hour Meters	Watt-Hour Meters	Watt-Hour Meters	Watt-Hour Meters	Watt-Hour Meters	Watt-Hour Meters
	Combination Meters	Combination Meters	Combination Meters	Combination Meters	Combination Meters	Combination Meters
	Outdoor Metering Tanks	Outdoor Metering Tanks	Outdoor Metering Tanks	Outdoor Metering Tanks	Outdoor Metering Tanks	Outdoor Metering Tanks
	Miscellaneous Metering Equipment	Miscellaneous Metering Equipment	Miscellaneous Metering Equipment	Miscellaneous Metering Equipment	Miscellaneous Metering Equipment	Miscellaneous Metering Equipment
		Smart Meters (AMI)	Smart Meters (AMI)	Smart Meters (AMI)	Smart Meters (AMI)	
	5.7 - Distribution Equipment	**5.7 - Distribution Equipment**	**5.7 - Distribution Equipment**	**5.7 - Distribution Equipment**	**5.7 - Distribution Equipment**	**5.7 - Distribution Equipment**
	Substation, Line and Communication Equipment	Substation, Line and Communication Equipment	Substation, Line and Communication Equipment	Substation, Line and Communication Equipment	Substation, Line and Communication Equipment	Substation, Line and Communication Equipment
	Relay Replacement Equipment	Relay Replacement Equipment	Relay Replacement Equipment	Relay Replacement Equipment	Relay Replacement Equipment	Relay Replacement Equipment
	Switch Replacement Equipment	Switch Replacement Equipment	Switch Replacement Equipment	Switch Replacement Equipment	Switch Replacement Equipment	Switch Replacement Equipment
	Line Tools and Equipment	Line Tools and Equipment	Line Tools and Equipment	Line Tools and Equipment	Line Tools and Equipment	Line Tools and Equipment
	Meter Shop Equipment	Meter Shop Equipment	Meter Shop Equipment	Meter Shop Equipment	Meter Shop Equipment	Meter Shop Equipment
	5.8 - Transportation Equipment	**5.8 - Transportation Equipment**	**5.8 - Transportation Equipment**	**5.8 - Transportation Equipment**	**5.8 - Transportation Equipment**	**5.8 - Transportation Equipment**
	Small Vehicles and Equipment	Small Vehicles and Equipment	Small Vehicles and Equipment	Small Vehicles and Equipment	Passenger Vehicles and Equipment	Small Vehicles and Equipment
	Vegetation Management Truck (East) - Year 1	Fleet Charging (Phase 1 - Engineering Site Evaluation) Location 1	Fleet Charging (Phase 1 - Engineering Site Evaluation) Location 2	Vegetation Management Truck (Central) - Year 2	Aerial Bucket Truck (East) - Year 2	Line Trucks and Other Large Vehicles
	Digger Derrick Truck (Central) - Year 1	Vegetation Management Truck (East) - Year 2	Vegetation Management Truck (West) - Year 2	CSUP Truck (Central) - Year 2	Digger Derrick Truck (Central) - Year 2	Offroad Vehicles
	Digger Derrick Truck (West) - Year 1	Digger Derrick Truck (Central) - Year 2	Aerial Bucket Truck (Central) - Year 2	Telehandler (Transformer Department) - Year 2	CSUP Truck (Central) - Year 2	Vehicle Charging Facilities
	CSUP Truck (West) - Year 1	Digger Derrick Truck (West) - Year 2	Digger Derrick Truck (Central) - Year 2	Aerial Bucket Truck (East) - Year 1	Aerial Bucket Truck (West) - Year 1	
		CSUP Truck (West) - Year 2	Vegetation Management Truck (Central) - Year 1	Digger Derrick Truck (Central) - Year 1	Aerial Bucket Truck (East) - Year 1	
		Vegetation Management Truck (West) - Year 1	CSUP Truck (Central) - Year 1	CSUP Truck (Central) - Year 1	CSUP Truck (Central) - Year 1	
		Aerial Bucket Truck (Central) - Year 1	Telehandler (Transformer Department) - Year 1			
		Digger Derrick Truck (Central) - Year 1				
6.0 TRANSMISSION	**6.1.- Substation Projects**	**6.1.- Substation Projects**	**6.1.- Substation Projects**	**6.1.- Substation Projects**	**6.1.- Substation Projects**	**6.1.- Substation Projects**
	Substation Oil Containment Program	Substation Oil Containment Program	Substation Oil Containment Program	Substation Oil Containment Program	Substation Oil Containment Program	Substation Oil Containment Program
	Substation Modernization Program	Substation Modernization Program	Substation Modernization Program	Substation Modernization Program	Substation Modernization Program	Substation Modernization Program
	138 kV Breaker Replacement Program	138 kV Breaker Replacement Program	138 kV Breaker Replacement Program	138 kV Breaker Replacement Program	138 kV Breaker Replacement Program	138 kV Breaker Replacement Program
	Fibre Modifications Due to Road Alterations	Fibre Modifications Due to Road Alterations	Fibre Modifications Due to Road Alterations	Fibre Modifications Due to Road Alterations	Fibre Modifications Due to Road Alterations	Fibre Modifications Due to Road Alterations
	Crossroads Substation Rebuild - Year 2	West Royalty 13.8 kV Feeder Cable Temp Replacement - Year 1	West Royalty 13.8 kV Feeder Cable Temp Replacement - Year 2	13.8 kV City Circuit Automation	69 kV Spare Breaker	New Scotchfort Substation Phase 3
	West Royalty X5 Autotransformer Upgrade - Year 2	Tignish Substation - Year 2	Mount Pleasant Substation - Year 2	West Royalty Autotransformer Upgrade - Year 1	138 kV Spare Breaker	Tignish Substation Construction
	Woodstock Switching Station - Year 1	Mount Pleasant Substation - Year 1	Woodstock Switching Station - Year 3	West Royalty 13.8 kV Feeder Cable Temp Replacement - Year 3	New 69 kV Breaker X4 (CT3)	Tignish Power Transformer
	Tignish Substation - Year 1	Woodstock Switching Station - Year 2	Woodstock - Autotransformer - Year 2	Alberton Substation Upgrade	13.8 kV City Circuit Automation (pilot)	Charlottetown Area Substation
	Communication Fibre - Alberton to Tignish	Woodstock - Autotransformer - Year 1	Sherbrook Switching Station Upgrade - Year 1	Mount Pleasant Substation - Year 3	New Scotchfort Substation - Year 2	Borden X3
		West Royalty X4 10 MVA Power Transformer	West Royalty X1 10 MVA Power Transformer	New Scotchford Substation - Year 1	Albany 10 MVA Transformer Upgrade	Communication Fibre Expansion
		Communication Fibre - Woodstock to Alberton	Communication Fibre - Wellington to Mount Pleasant	Sherbrook Switching Station Upgrade - Year 2	Reactor 2 Bedeque	69 kV Mobile Replace #47
				Rattenbury 10MVA Power Transformer Upgrade	69 kV Mobile Replacement - Year 1	O'Leary Switching Station Phase 2
				Kensington 10MVA Power Transformer Upgrade	Borden X3 - Year 1	Auto transformer O'Leary
				Reactor 1 Bedeque	Communication Fibre - Lorne Valley to Dingwell Mills	Cavendish Substation
				Communication Fibre - Church Road to Souris	West Royalty X6 Autotransformer Upgrade - Year 2	Bedeque Substation
					Communication Fibre - Borden to Albany	Mt. Pleasant Substation
	6.2 - Transmission Lines	**6.2 - Transmission Lines**	**6.2 - Transmission Lines**	**6.2 - Transmission Lines**	**6.2 - Transmission Lines**	**6.2 - Transmission Lines**
	69 kV and 138 kV Switch Program	69 kV and 138 kV Switch Program	69 kV and 138 kV Switch Program	69 kV and 138 kV Switch Program	69 kV and 138 kV Switch Program	69 kV and 138 kV Switch Program
	Transmission Line Refurbishment Program	Transmission Line Refurbishment Program	Transmission Line Refurbishment Program	Transmission Line Refurbishment Program	Transmission Line Refurbishment Program	Transmission Line Refurbishment Program
		Vegetation Management Corridor Expansion	Vegetation Management Corridor Expansion	Vegetation Management Corridor Expansion	Vegetation Management Corridor Expansion	Vegetation Management Corridor Expansion
	Crossroads Substation Transmission Modifications - Year 2	Transmission Lines Aerial Inspection	T-1 Re-route - Year 2	Transmission Lines Aerial Inspection	Y-101 Rebuild - Year 1	Transmission Lines Aerial Inspection
	Tignish Substation Transmission - Year 1	Woodstock Switching Station - Transmission Modificiations	3rd West to East 138 kV Line Engineering, Environmental, etc	Sherbrooke Autotransformer Transmission	Mount Pleasant Transmission	West to East 138 kV Line - Year 3 and 4
		T-1 Re-route - Year 1		T-1 Re-route - Year 3	Rebuild Y-111 from Tower to Bedeque Phase 2	Y-101 Rebuild - Year 2
		Tignish SubstationTransmission - Year 2		Rebuild Y-111 from Tower to Bedeque Phase 1	3rd West to East 138 kV Line - Year 2	T-15 Rebuild
				3rd West to East 138 kV Line - Year 1		Y-103 Rebuild
						Y-105 Rebuild
						Y-107 Rebuild
						Bedeque Substation Transmission
						Cavendish Substation Transmission
						Charlottetown Area Substation Transmissoin
						Scotchfort Substation Transmission
						138 kV Charlottetown Plant to Stratford Area
						Looped Transmission Feed to Victoria Cross (T-10)
						Looped Transmission Feed to Georgetown Substation
						Rebuild Georgetown Substation
						Y-110 from Scotchfort to Lorne Valley
						Lorne Valley Expansion
						Move Y-115 to Accessible Locations
7.0 CORPORATE	**7.1 Corporate Services**	**7.1 Corporate Services**	**7.1 Corporate Services**	**7.1 Corporate Services**	**7.1 Corporate Services**	**7.1 Corporate Services**
	Recurring Annual Capital Requirements	Recurring Annual Capital Requirements	Recurring Annual Capital Requirements	Recurring Annual Capital Requirements	Recurring Facilities Upgrade Projects	Recurring Facilities Upgrade Projects
	Comprehensive Building Condition Assessments	WRSC Upgrades				180 Kent HVAC, Insulation Electrical
	Facility Access Security System Replacement	Woodstock Service Depot				
	7.2 Information Technology	**7.2 Information Technology**	**7.2 Information Technology**	**7.2 Information Technology**	**7.2 Information Technology**	**7.2 Information Technology**
	Hardware Acquisitions	Hardware Acquisitions	Hardware Acquisitions	Hardware Acquisitions	Hardware Acquisitions	Hardware Acquisitions
	Purchased Software Upgrades	Purchased Software Upgrades	Purchased Software Upgrades	Purchased Software Upgrades	Purchased Software Upgrades	Purchased Software Upgrades
	Cybersecurity Enhancements	Cybersecurity Enhancements	Cybersecurity Enhancements	Cybersecurity Enhancements	Cybersecurity Enhancements	Cybersecurity Enhancements
	Customer Services and Communication Enhancements	Customer Services and Communication Enhancements	Customer Services and Communication Enhancements	Customer Services and Communication Enhancements	Customer Services and Communication Enhancements	Customer Services and Communication Enhancements
	CIS Replacement	CIS Replacement	CIS Replacement	CIS Replacement	Other IT Projects	Other IT Projects
	Engineering Fixed Assets Management System	Load Modeling Software	Other IT Projects	Other IT Projects		
	Line Inspection Enhancements	Document Management System				
	Survey System Refresh	Energy Purchase System Refresh				
		Other IT Projects				

APPENDIX G

Reliability Driven Line Extensions Description and Justification

Title:	**Robertson Road Three Phase Conversion**
Location:	**Mount Albion**
Line Type:	**Distribution – Three Phase Conversion**
Distance:	**2.5 km**
Amount:	**$565,000**

Project Description

The Robertson Road three phase conversion project involves converting lines MA58501 and MA58520 from single phase to three phase and filling in a 1.1 km gap between them. The line conversion starts at the intersection of the Robertson Road and the 48 Road, and goes to the end of the Robertson Road where it intersects the Bethel Road. The project also involves filling in a 0.4 km gap between lines MA58518 and CR00454. The locations where work will occur on both roads is shown in Figure 1. These lines currently operate at 7,200 volts.

Justification

The primary objective of the project is to reduce load on the Crossroads substation which continues to experience load growth from ongoing development in the Stratford area. The Crossroads substation is served by two 10 MVA power transformers. In January 2022, the Crossroads substation experienced a demand of 19.93 MVA, representing 99.7 per cent of the available capacity. This new line will allow the Company to transfer load from the Crossroads substation to the Mount Albion substation, enabling the Crossroads substation to accommodate future load growth in the area. In addition, the project will improve reliability by providing a backup option for approximately 1,800 customers on the Bunbury feeder (CR00484).

This project is justified based on the obligation to provide customers with equitable access to a safe, reliable, and adequate supply of power. For the reasons provided, the project is necessary and cannot be deferred.

Costing Methodology

A breakdown of the proposed budget allocation for the Robertson Road three phase conversion project is shown in Table 1.

Table 1 Breakdown of Proposed Budget Allocation Robertson Road Three-Phase Conversion	
Description	**Budget**
Material	$ 94,000
Contractor Labour	375,000
Internal Labour and Transportation	96,000
TOTAL	**$ 565,000**

Construction

The existing lines along Robertson Road and Bethel Road have #2 Quail conductor (rated for 180 amps) that is old, undersized, and in poor condition. It will be replaced with new 477 Cosmos conductor which is rated for 584 amps. Construction will be on the same side of the road as the existing line along the Bethel Road, and where the conversion occurs along the Robertson Road. Construction of the three phase extension along the Robertson Road will be on the opposite side of the road from the existing lines.

A permit from the Department of Transportation and Infrastructure will be required for the project and traffic control will be necessary, as the roads are narrow and traffic volume can be high at times.

Construction is scheduled to begin in the first quarter of 2023, with four crews working for seven weeks required to complete the project.

Future Commitments

This is not a multi-year project.

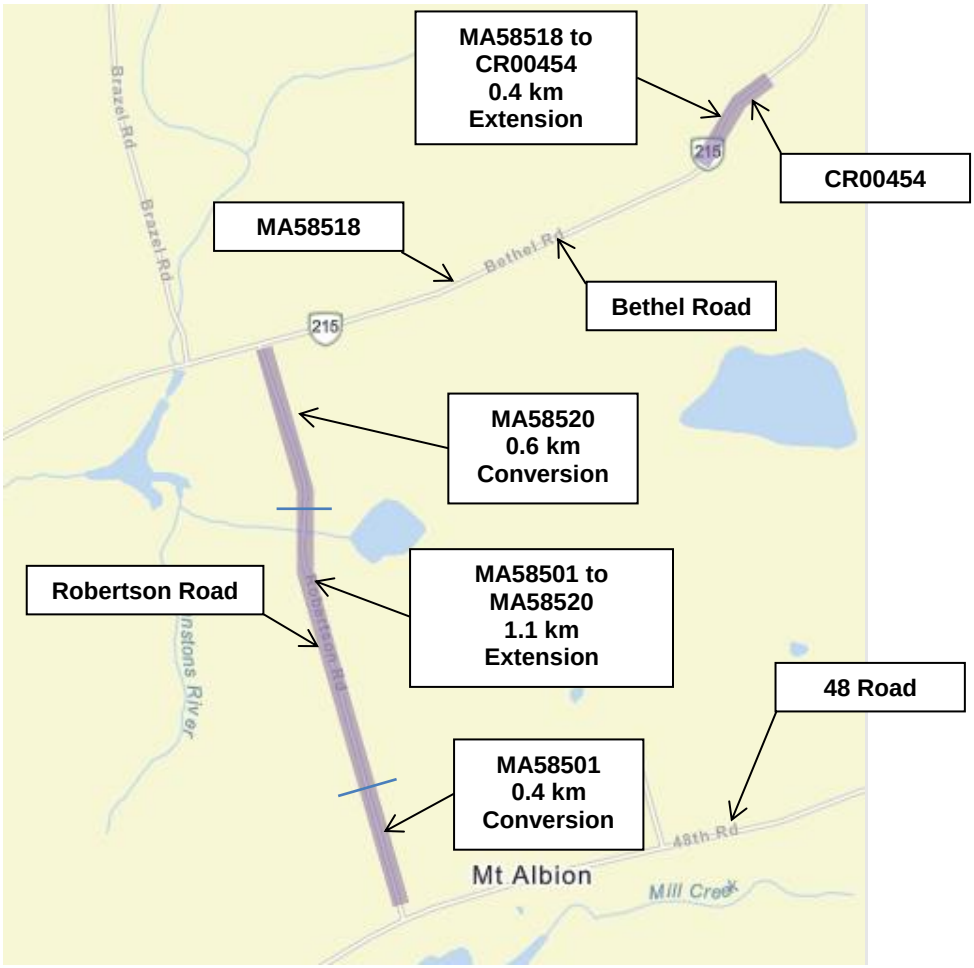


Figure 1
Scope of 2.5 km Robertson Road three phase conversion project, Mount Albion, PE.

Title:	**Coleman Feeder**
Location:	**St. Anthony**
Line Type:	**Distribution – Three Phase Extension**
Distance:	**2.7 km**
Amount:	**$1,417,000**

Project Description

The Coleman feeder project involves adding a fourth three phase feeder to the O'Leary substation. Construction of the 2.7 km section of line will start at civic address 63 Howlan Road (Route 143), head east towards the Western Road (Route 2), then follow the Western Road to the O'Leary roundabout on Main Street. The O'Leary feeder (OL00971) as it is currently configured will be revised to only feed the Town of O'Leary and the Cascumpec area. The proposed Coleman feeder will serve the Coleman, Portage and Foxley River areas, all of which are currently being served by the O'Leary feeder. The Coleman feeder will operate at 25,000 volts.

Justification

The primary objective of this project is to reduce load imbalance on the O'Leary feeder which is connected to the O'Leary substation. In early 2022, the neutral current on the O'Leary feeder exceeded 165 amps. This indicates a significant load imbalance as the neutral wire is the return path for any current imbalance. The presence of large neutral currents/load imbalances can cause voltage control problems. In addition, neutral currents of this magnitude are a safety hazard for communication companies working in the communication space on the joint use poles.

The O'Leary feeder currently has 2,148 customers over 207 km. This will be reduced to 811 customers over 44 km after the Coleman feeder, which will feed 1,337 customers over 163 km, is established. The project will also improve the average per feeder customer count and feeder length for the O'Leary substation, reducing the average feeder customer count from 1,118 to 839 and the average feeder length from 108 km to 81 km.

The changes resulting from the project, as proposed, will balance the load, provide backup opportunities and increase reliability to all the customers fed from the O'Leary substation. The

Coleman feeder will also support load growth in the O'Leary area, including a new shopping centre currently under construction in the Town of O'Leary.

This project is justified based on the obligation to provide customers with access to a safe, reliable, and adequate supply of power. For the reasons provided, the project is necessary and cannot be deferred.

Costing Methodology

A breakdown of the proposed budget allocation for the Coleman feeder project is shown in Table 1.

Table 1
Breakdown of Proposed Budget Allocation
Coleman Feeder

Description	**Budget**
Material	$ 162,000
Contractor Labour	1,003,000
Internal Labour and Transportation	252,000
TOTAL	**$ 1,417,000**

Construction

The proposed Coleman feeder will be constructed as an underbuild on the existing transmission Line T-21 that runs along the Howlan Road and a double circuit rebuild of existing distribution line OL00971 along the Western Road. The conductor will be 477 Cosmos which is rated for 584 amps.

A permit from the Department of Transportation and Infrastructure will be required and traffic control will be necessary for the project, as traffic volume and vehicle speed is high along the project route.

Construction is scheduled to begin in the second quarter of 2023, with six crews required for ten weeks to complete the project.

Alternatives

The project is necessary to improve reliability by balancing the O'Leary substation feeder loads, providing new backup opportunities and to reducing the feeder length and per feeder customer count. There are no reasonable alternatives to the proposed route, as it is the shortest and least cost option.

Future Commitments

This is not a multi-year project.

Figure 1
Scope of 2.7 km Coleman feeder project, St. Anthony, PE.

APPENDIX H

Single and Three Phase Line Rebuilds Description and Justification

Title: **Bloomfield to Elmsdale (Route 2) Line Rebuild**
Location: **Rosebank, PE**
Line Type: **Distribution – Three Phase**
Distance: **6.8 km**
Amount: **$1,404,000**

Project Description

The Bloomfield to Elmsdale line rebuild project will replace a 6.8 km section of three phase line (OL03140) along the Western Road (Route 2), from civic address 38562 to civic address 39902, as shown in Figure 1. The line is operated at 12,500 volts and is connected to the O'Leary substation. There are 78 customers fed from this line.

Justification

The primary objective of the project is to upgrade OL03140 which is aged, deteriorated and does not meet current construction standards (see Figures 2, 3 and 4). There are approximately 95 poles along the project route with 40 of them (42 per cent) being aged eastern cedar poles in poor condition, with the others being creosote poles that are approximately 50 years old. Customers fed from OL03140 have experienced 457 outage hours in the last five years.

The project is justified based on the obligation to provide safe and adequate service to customers. For the reasons provided, the project is necessary and cannot be deferred.

Costing Methodology

A breakdown of the proposed budget allocation for the Bloomfield to Elmsdale line rebuild project is shown in Table 1.

Table 1
Breakdown of Proposed Budget Allocation
Bloomfield to Elmsdale Line Rebuild

Description	Budget
Material	$ 270,000
Contractor Labour	750,000
Internal Labour and Transportation	384,000
TOTAL	**$ 1,404,000**

Construction

The existing conductor is #2 Quail (rated for 180 amps) and will be replaced with 477 Cosmos (rated for 584 amps) to bring the line to current standards. The line will be rebuilt on the same side of the road to utilize the existing main line and service poles that are in good condition and do not require replacement.

A permit from the Department of Transportation and Infrastructure will be required and traffic control will be necessary for the project as vehicle speed is high on this road.

Construction is scheduled to begin in the second quarter of 2023, with four crews working for twelve weeks required to complete the project.

Alternatives

There are no alternatives to this project. The section of line proposed for rebuild is at the end of its life and requires replacement.

Future Commitments

This is not a multi-year project.

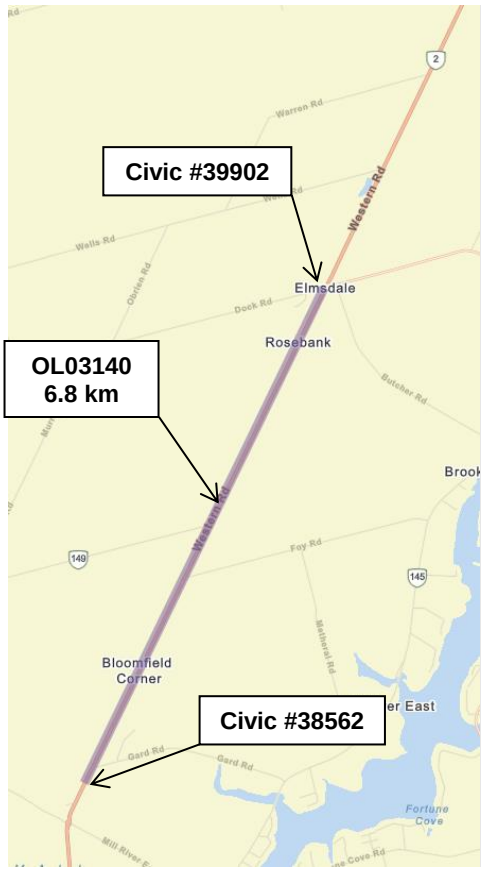


Figure 1
Scope of the 6.8 km Bloomfield to Elmsdale line rebuild project, Rosebank, PE.

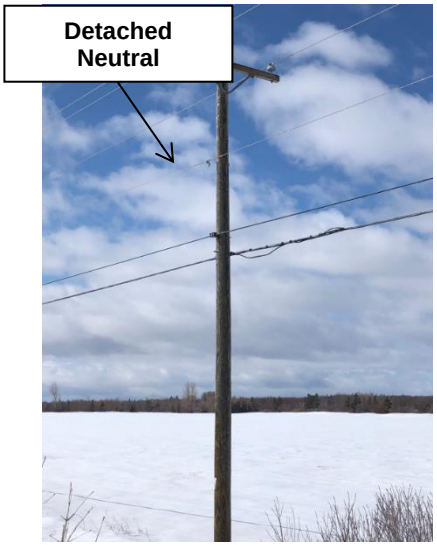


Figure 2
Neutral detached from structure.

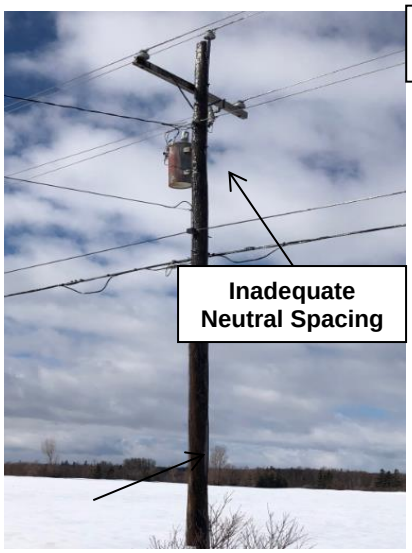


Figure 3
Eastern cedar pole with inadequate neutral spacing and rusted transformer.

Figure 4
Aged porcelain bell insulators.

Title:	**Argyle Shore Line Upgrade and Voltage Conversion**
Location:	**Argyle Shore, PE**
Line Type:	**Distribution – Single Phase**
Distance:	**12 km**
Amount:	**$462,000**

Project Description

The Argyle Shore line upgrade and voltage conversion project involves approximately 4.5 km of single phase line CL54333 from civic address 6559 to civic address 7500 along Route 19, and approximately 7.5 km of side roads, as shown in Figure 1. These lines are currently operated at 7,200 volts and connected to the Clyde River substation. Customers fed from CL54333 have experienced 160 outage hours in the last five years.

The project includes removing the aged step-down transformer shown in Figure 2 and installing its' replacement in a new location further down the line. The relocation of the step-down transformer will require converting 179 of the 291 customers on CL54333 to 14,400 volts, which will reduce the load on the step-down transformer.

Justification

The primary objective of the project is to improve the power quality and reliability for customers in the Argyle Shore area. Additional information supporting the need for the project includes:

a. The removal of the step-down transformer, which was manufactured in 1981, is necessary to ensure compliance with the regulations that require the retirement of electrical equipment containing PCBs by December 31, 2025.
b. The existing step-down transformer is rated for 250 kVA and has experienced a peak load of 709 kVA in 2021 (284 per cent above its' rated operating limit); and
c. The customers on the section of CL54333 that is converted to 14,400 volts will experience improved power quality, as the voltage drop on the converted line will be reduced by 75 per cent.

The project is justified based on the obligation to provide safe and adequate service to customers. For the reasons provided, the project is necessary and cannot be deferred.

Costing Methodology

A breakdown of the proposed budget allocation for the Argyle Shore line upgrade and voltage conversion project is shown in Table 1.

Table 1
Breakdown of Proposed Budget Allocation
Argyle Shore Line Upgrade and Voltage Conversion

Description	Budget
Material	$ 124,000
Contractor Labour	209,000
Internal Labour and Transportation	129,000
TOTAL	**$ 462,000**

Construction

Line CL54333 will not be rebuilt and only poles that are in poor condition will be replaced. The conversion will also require 97 of the 155 polemount transformers on CL54333 to be replaced. The relocated replacement step-down transformer will initially have a peak load of approximately 294 kVA, therefore the new unit will be rated for 500 kVA to allow for future load growth in the area.

Construction is scheduled to begin in the third quarter of 2023 with three crews working for four weeks, and additional crews for a planned outage during commissioning, required to complete the project.

Alternative

There is no alternative that would achieve the reliability and power quality improvements proposed. The step-down transformer must be removed from service and replaced with a larger capacity unit in a new location.

Future Commitments

This is not a multi-year project.

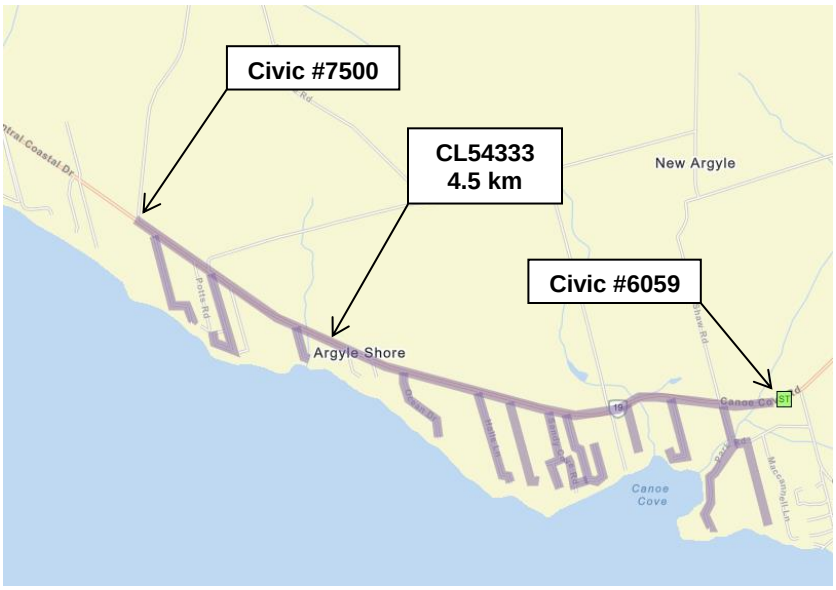


Figure 1
Scope of the 12 km Argyle Shore line upgrade and voltage conversion project, Argyle Shore, PE.

Figure 2
Aged pre-1982 step-down transformer.

Title:	**Old Post Road Line Rebuild**
Location:	**Crapaud, PE**
Line Type:	**Distribution – Three Phase**
Distance:	**1.6 km**
Amount:	**$540,000**

Project Description

The Old Post Road line rebuild project will replace a section of line AB33131 from civic address 38 to civic address 341 along the Old Post Road as shown in Figure 1. The line is operated at 12,500 volts and is connected to the Albany substation. There are 41 customers fed from this section of line. Customers fed from AB33131 have experienced 369 outage hours in the last five years.

Justification

The primary objective of the project is to replace the #2 smooth body conductor which is not safe to work on while energized, as it is brittle and at risk of failure when handled. Also, 9 of 30 poles on line AB33131 are aged and deteriorated, the line does not meet current construction standards (see Figures 2, 3 and 4), and the existing conductor is undersized for the load. The condition of the conductor also puts it at an elevated risk of failure during storm conditions, and when failure occurs, repairs are more challenging and additional repair time is required, which impacts reliability.

The project is justified based on the obligation to provide safe and adequate service to customers. For the reasons provided, the project cannot be deferred.

Costing Methodology

A breakdown of the proposed budget allocation for the Old Post Road line rebuild project is shown in Table 1.

Table 3 Breakdown of Proposed Budget Allocation Old Post Road Line Rebuild	
Description	**Budget**
Material	$ 82,000
Contractor Labour	292,000
Internal Labour and Transportation	166,000
TOTAL	**$ 540,000**

Construction

The existing conductor is #2 smooth body (rated for 180 amps) and will be replaced with 477 Cosmos (rated for 584 amps) to bring the line to current standards and accommodate future load growth. The line will be rebuilt on the same side of the road as vegetation management work was recently completed along the line.

A permit from the Department of Transportation and Infrastructure will be required and traffic control will be necessary for the project as vehicle speed is high on this road. Construction is scheduled to begin in the third quarter of 2023, with four crews working for four weeks required to complete the project.

Alternatives

There are no alternatives to this project. The conductor on this section of line is at the end of its life and requires replacement.

Future Commitments

This is not a multi-year project.

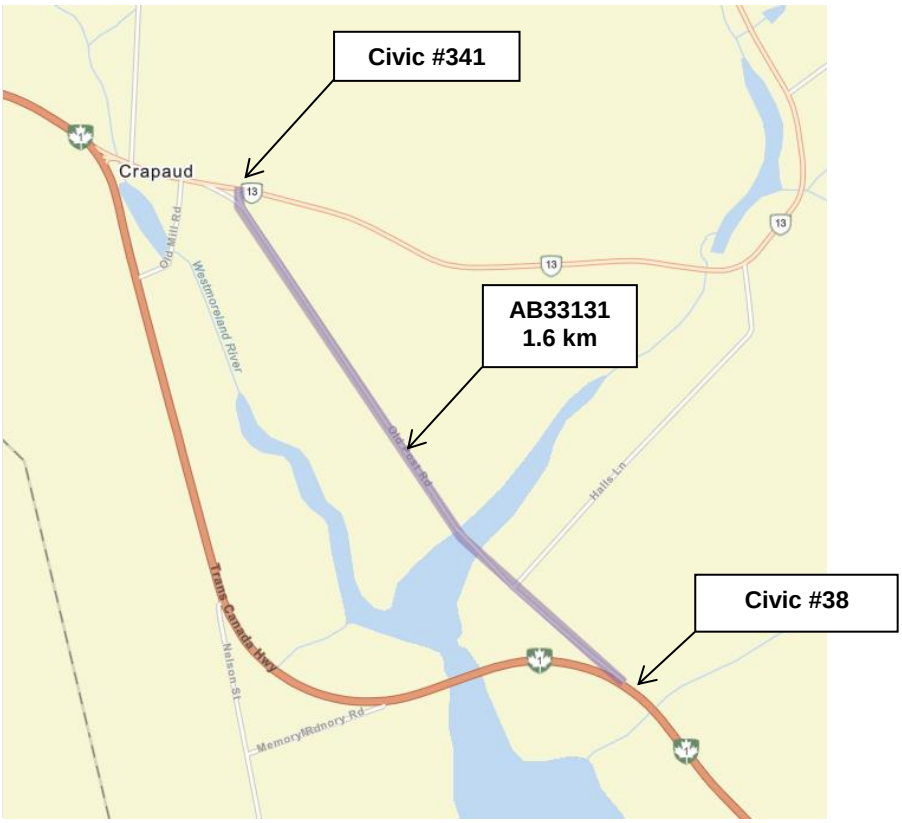


Figure 1
Scope of the 1.6 km Old Post Road line rebuild project, Crapaud, PE.

Figure 2
Long spans that do not meet current standards.

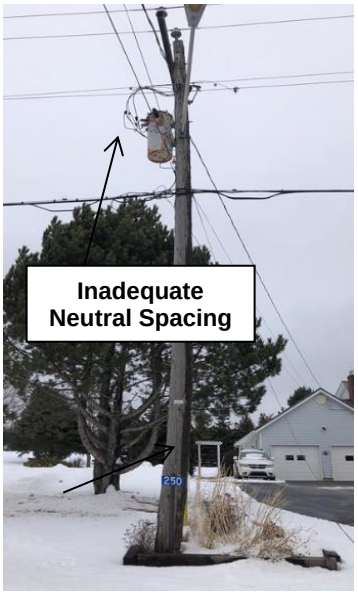


Figure 3
Inadequate neutral spacing and rusted transformer.

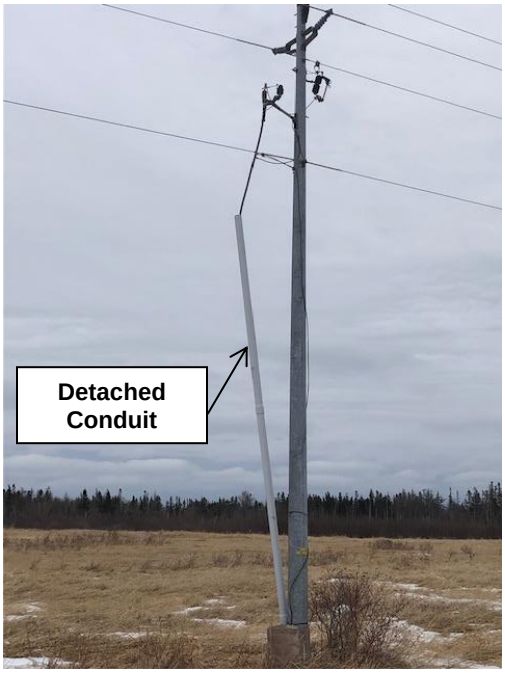
Figure 4
Structures with inadequate line spacing that do not meet current standards.

APPENDIX I

Distribution Inspection Deficiencies

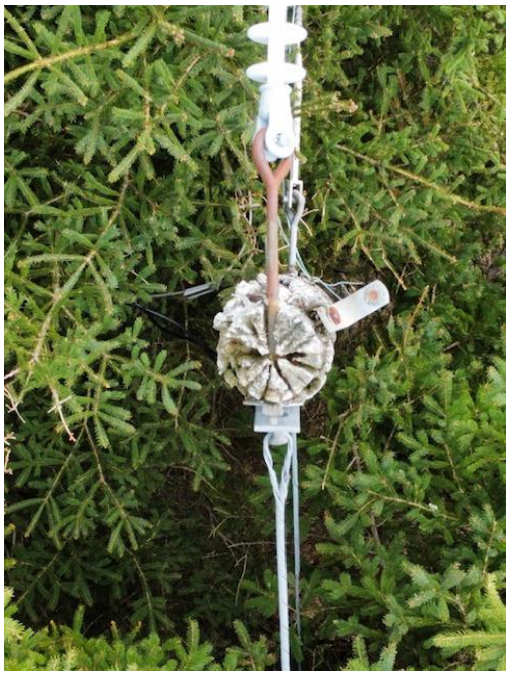
Rusted padmount transformer with sunken concrete pad.

Burn marks from a failed insulator.



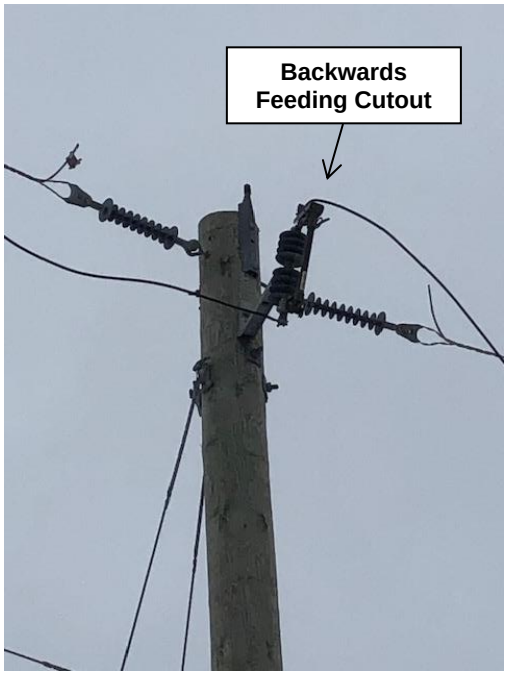
Underground primary conduit unattached from pole.

Slack anchor allowing the pole to lean.

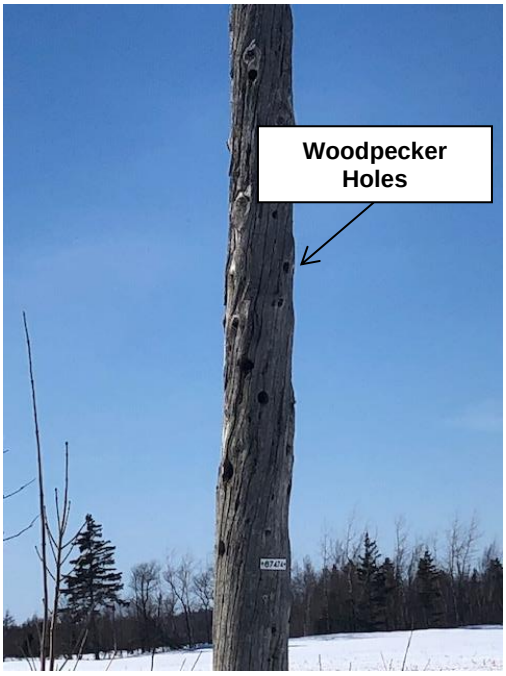


Deteriorated pole top with primary hardware exposed.

Primary line slack and laying in trees.



Backwards feeding cutout.



Aged eastern cedar pole with woodpecker holes.

APPENDIX J

2023 Transportation Equipment Report

2023 TRANSPORTATION EQUIPMENT REPORT

Prepared by: Kevin Burns
Reviewed by: Adam MacKenzie
Date: April 1, 2022

All our energy.
All the time.

MARITIME ELECTRIC
A FORTIS COMPANY

Table of Contents

1.0 Introduction

This transportation equipment budget proposal concerns the necessary addition and heavy fleet vehicles, trailers and passenger vehicles. Detailed evaluation of the units to be replaced indicates they have reached the end of their useful service life.

2.0 Vehicle Requirements in 2023

The transportation equipment purchases (by category) proposed for 2023 are shown in Table 1.

Table 1
2023 Proposed Vehicle Procurement

Category	No. of Units
Heavy Fleet Vehicles	3
Medium Fleet Vehicles	1
Passenger Vehicles	8
Trailers	2
Total	**14**

In 2023, with the exception of two additional heavy fleet vehicles that are required for new positions within the Company and one new trailer jeep for the large mobile transformer,[1] all proposed vehicle purchases meet the Company's replacement criteria for vehicles as provided (see Table 2 in Section 3).

[1] A trailer jeep is an additional axle or set of axles which can be added to a trailer to better distribute the weight of the load. A jeep can be added with relative ease allowing for increased weight distribution during transportation and easily removed to increase maneuverability during parking. The large mobile transformer trailer did not come with a jeep and cannot meet spring weight restrictions without one.

3.0 Vehicle Replacement Criteria

Maritime Electric's vehicle replacement criteria is shown in Table 2.

Table 2 Maritime Electric Replacement Criteria for Vehicles	
Tracked Heavy Vehicles	15 years
Heavy/Medium Flat Bed Trucks	10 years or 250,000 km
Heavy Vehicles	10 years or 250,000 km
Service Trucks (CSUP – run double shift) Medium Vehicles	5 years or 250,000 km
Passenger Vehicles	7 years or 200,000 km

To determine if a vehicle has reached the end of useful service life, the age of the vehicle is a guiding factor along with a number of additional criteria such as annual maintenance costs, power take-off ("PTO") hours (if applicable) and vehicle condition (e.g., rust, electrical issues, etc.). Based on all criteria considerations, it has been determined that each unit proposed for replacement will reach the end of its useful service life and will require replacement in 2023.

In addition to the units requiring replacement in 2023 the Company also requires two new large/heavy units, for new positions within the Company: one is a digger/derrick for the Western District to support a new line crew and the other is to support a new tree trimming crew that will work Island-wide.

Table 3 provides further information pertaining to the heavy and medium fleet vehicles proposed for addition or replacement in 2023, as these four vehicles make up approximately 44 per cent of the proposed 2023 transportation equipment budget.

Table 3 Details of Vehicles >$250,000 Proposed for Addition or Replacement in 2023				
Item	**Digger/Derrick Truck Central District**	**CSUP Truck Western District**	**Digger/Derrick Truck Western District**	**Vegetation Management Truck/Chipper Eastern District**
	Replacement Vehicles		**New Vehicles**	
Vehicle #	14-12-64	17-10-57	New	New
Chassis Make/Model	Freightliner	Dodge 5500	Freightliner	Freightliner
Boom Make/Model	Altec 50 ft digger/derrick	Altec 41 ft single person aerial bucket truck	50 ft digger/derrick	45 ft single person aerial bucket truck
Description	Chassis and boom is 2014. Unit is a 50 ft. digger /derrick truck	Chassis and aerial device is a 2017. Aerial device is a 41 ft. single person aerial bucket truck	Chassis and boom will be 2023. Unit will be a 50 ft. digger/derrick	Chassis, aerial device and wood chipper
Mileage as of March 28,2022	116,620 km	334,598 km	-	-
PTO or Engine Hours	7,940 Engine hours	1,564 PTO hours	-	-
Approximate Maintenance Costs Over Past 3 Years	$120,000	$99,000	-	-
Summary	The chassis will be 10 years old at time of replacement and is starting to show signs of age with increased maintenance costs and down time.	This unit operates on a double shift operating 16 hours per day, which is reflected in both the high mileage and PTO hours. This unit is first to respond to most no power calls and is the only truck of this type in its district so when the unit is down for maintenance it reflects on the company's response time.	New digger/derrick required in the Western District to support a new line crew in the district	New chassis, aerial device and wood chipper

4.0 Photographs

Digger/Derrick Truck Replacement - Central District
14-12-64

Truck 14-12-64 – Driver side view from front

Truck 14-12-64
Passenger side view from back

Truck 14-12-64
Turret for digger/derrick and control station

CSUP Truck Replacement - Western District
17-10-57

Truck 17-10-57 – Passenger side view

Truck 17-10-57
Passenger side view from rear

Truck 17-10-57
Rear view

Digger/Derrick Truck Addition - Western District

Vegetation Management Truck/Chipper – Eastern District

APPENDIX K

Transmission Inspection Deficiencies

Stand-off brackets on insulator to be replaced.

Rotten pole.

Sunken tower base.

Wood is splitting on pole.

X-brace detaching from pole.

Rotten crossarm.

Broken Insulator.

Cracked, damaged pole.

APPENDIX L

Transmission Lines Description and Justification

Title: **Crossroads Substation Transmission Modifications**
Location: **Stratford**
Line Type: **Transmission – 69 kV**
Amount: **$147,000**

Project Description

This project involves additional modifications to transmission line T-2 for the interdependent Crossroads substation rebuild project. The proposed work, which was not planned when the 2022 Capital Budget Application was being developed, includes installing a new 69 kV breaker in the Crossroads substation and constructing an additional tap line to T-2. This change was necessary to accommodate protection and control requirements and future load growth in the area. It also provides operational flexibility and improves safety and reliability on the system.

Justification

The change in project scope is justified on the basis that it is necessary to ensure the electrical system is adequately protected in the event of a fault and to provide for its safe and reliable operation.

Costing Methodology

A breakdown of the proposed budget allocation for the T-2 work required at the Crossroads substation is shown in Table 1.

Table 1
Breakdown of Proposed Budget Allocation
Crossroads Substation Transmission Modifications

Description	Budget
Material	$ 35,000
Contractor Labour	35,000
Internal Labour and Transportation	77,000
TOTAL	**$ 147,000**

Construction

Construction is scheduled to begin in the fourth quarter in 2023, with two crews working for three weeks required to complete the project. There will be no vegetation management or traffic control required for the project.

Alternatives

There are no alternatives for this project. The line modifications are necessary to allow the Crossroads substation to remain connected to transmission line T-2 during the rebuild project and to provide adequate protection and control once the substation returns to full operation.

Future Commitments

This is the second year of transmission modifications for the Crossroads substation. There are no further commitments upon completion of the proposed work.

Title: **Tignish Substation Transmission**
Location: **West Prince**
Line Type: **Transmission – 69 kV**
Amount: **$307,000 in 2023**

Project Description

This multi-year project, which is interdependent with the proposed Tignish substation project, Alberton to Tignish communication fibre project, and Tignish substation distribution project, involves purchasing a portion of transmission line T-23 from PEIEC to extend Maritime Electric's 69 kV transmission system from Alberton to Tignish, and connecting it to the Tignish substation.

Transmission line T-23, which operates at 69 kV, was constructed in 2001 by PEIEC to deliver energy generated by its wind farm in North Cape to the Alberton substation. The line, which runs from North Cape to Alberton, is 28.4 km long and the distance from Alberton to Tignish is approximately 16 km.

Justification

The project is justified on the basis that a transmission connection between Alberton substation and the Tignish substation will be required. There are advantages to purchasing part of an existing line rather than building a new one between Alberton and Tignish, including reduced cost as well as avoidance of route planning, engineering design and various approval processes that apply to new transmission construction projects.

Costing Methodology

A breakdown of the proposed multi-year budget allocation to purchase approximately 16 km of transmission line T-23 in 2023 and connect it to the Tignish substation in 2024 is shown in Table 1.

Table 1
Breakdown of Proposed Budget Allocation
Tignish Substation Transmission

Description	2023	2024	Budget
16 km of Transmission Line T-23 (estimate)	$ 307,000	$ -	$ 307,000
Tignish Substation Interconnection (estimate)	-	368,000	368,000
Internal Labour and Transportation	-	60,000	60,000
TOTAL	**$ 307,000**	**$ 428,000**	**$ 735,000**

Alternatives

The only alternative to the purchase of a portion of T-23 is to build a new transmission line from Alberton to Tignish, at a cost of approximately $2 million.

Future Commitments

This is a multi-year project that is proposed to be completed over two years in 2023 and 2024. If there are any changes to the evidence provided herein, including changes in scope, budget or timelines subsequent to approval, further evidence will be provided in the 2024 Capital Budget Application.

APPENDIX M

Interest During Construction

IDC, as proposed in Maritime Electric's budget Section 9.0, is calculated on all capital additions except those classified as: (i) services and street lighting; (ii) distribution equipment; (iii) transportation equipment; and (iv) information technology. The interest rate used in calculating IDC is the annual return on rate base and it is assumed that all applicable project costs are financed over an average 90 day cycle. The following table shows the calculation of the 2023 IDC budget.

2023 Estimated Interest During Construction	
Total Gross Capital Budget including GEC	$ 50,535,000
Less:	
5.3 Services and Street Lighting	(5,650,000)
5.7 Distribution Equipment	(1,477,000)
5.8 Transportation Equipment	(1,258,000)
7.2a Computer Hardware	(334,000)
7.2b Purchased Software and Upgrades	(634,000)
7.2c Other IT Projects	(1,157,000)
Total Estimated Capital Subject to IDC	**$ 40,025,000**
Forecast Average Return on Rate Base[a]	6.90%
Average Number of Days to Finance	90
Proposed 2023 Budget for IDC	**$ 680,000**

a. See Appendix D, page 3 for calculation of 2023 forecast weighted average cost of capital ("WACC") which is equivalent to the forecast average return on rate base.