

1 **Reference: 2024-2028 Capital Plan**

2
3 **Q. Page 1. It is stated that a framework for scope, stages and timelines has been**
4 **developed for the asset management review being undertaken by**
5 **Newfoundland Power. Please provide a copy of this framework.**

6
7 A. Attachment A contains the *Asset Management Review – 2022-2024 Assessment*
8 *Framework*.

9
10 Newfoundland Power’s approach to asset management has delivered sound outcomes
11 for its customers, including reasonable levels of service reliability and customer
12 satisfaction.

13
14 While historical results have been sound, the context within which the Company
15 manages its assets is changing. A large portion of Newfoundland Power’s assets were
16 constructed during the same period in order to provide the province with access to
17 electricity and are now approaching end of life. At the same time, the Company is
18 experiencing a demographic transition within its workforce due to retirements, upcoming
19 obsolescence of its asset management technology, and an evolving regulatory
20 landscape.

21
22 The convergence of these factors has the potential to impact how Newfoundland Power
23 manages its assets in providing safe and reliable service to its customers at the lowest
24 possible cost. The Company has initiated a review of its asset management system.
25 The review will be guided by the attached assessment framework which: (i) provides
26 background information on asset management and current industry experience;
27 (ii) establishes the context in which the review is being completed; and (iii) outlines the
28 milestones and schedules associated with the review.



ATTACHMENT A:

Asset Management Review

2022-2024 Assessment Framework

Asset Management Review

2022-2024 Assessment Framework

November 1, 2022



WHENEVER. WHEREVER.
We'll be there.

NEWFOUNDLAND
POWER
A FORTIS COMPANY

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1.0 Introduction

Newfoundland Power Inc.'s ("Newfoundland Power" or the "Company") approach to asset management has delivered sound outcomes for its customers, including reasonable levels of service reliability and customer satisfaction.

While historical results have been sound, the context within which the Company manages its assets is changing. A large portion of the Newfoundland Power's assets were constructed during the same period in order to provide the province with access to electricity and are now approaching end of life. At the same time, the Company is experiencing a demographic transition within its workforce due to retirements, upcoming obsolescence of its asset management technology, and an evolving regulatory landscape.

The convergence of these factors has the potential to impact how Newfoundland Power manages its assets in providing safe and reliable service to its customers at the lowest possible cost. The Company has initiated a review of its asset management. The review will be guided by this assessment framework, which: (i) provides background information on asset management and current industry experience; (ii) establishes the context in which the review is being completed; and (ii) outlines the milestones and schedules associated with the review.

The review is expected to require 18 months to complete and will inform the next steps in Newfoundland Power's asset management journey, to ensure it continues to achieve sound outcomes for its customers.

2.0 Background

2.1 Understanding Asset Management

According to the International Organization of Standardization (“ISO”), asset management is about enabling an organization to realize value from its assets by ensuring asset-related decisions, plans and activities are aligned with the achievement of an organization’s objectives.¹

The Institute for Asset Management (“IAM”) is an international organization that develops asset management knowledge and best practices. The IAM has produced a conceptual model showing the typical scope of asset management. This model is purposefully general and can be applied to any industry or organization with assets to manage.

Figure 1 provides the IAM’s conceptual model showing the scope of asset management.

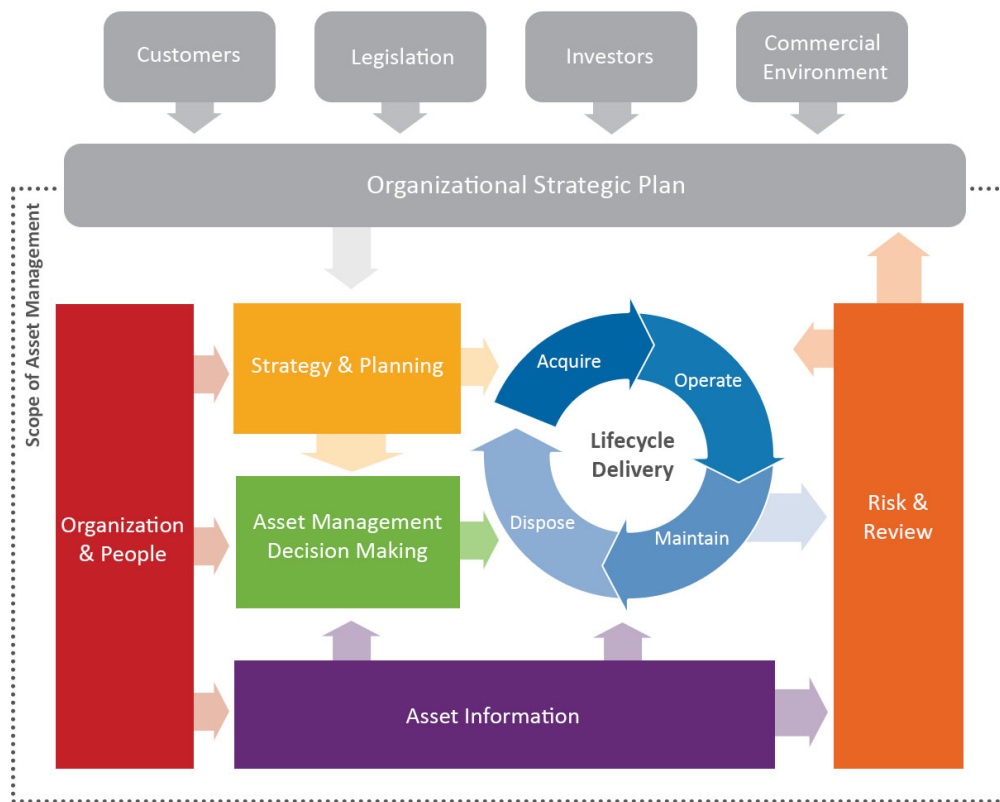


Figure 1: IAM Asset Management Model

¹ The ISO is an independent, non-governmental international organization with a membership of 167 national standards bodies. Its standards for asset management are ISO 55000:2014, 55001:2014 and 55002:2018.

1 The IAM model includes six elements that are within the scope of asset management:²

2

3 (i) **Strategy and Planning** – Strategy and planning is where top-down direction merges
4 with bottom-up knowledge. It aims to translate organizational objectives into asset-
5 related decisions through policies and strategies, which establishes the principles an
6 organization intends to apply asset management.

7

8 (ii) **Decision Making** – Asset management decision making is fundamentally about
9 balancing performance, cost and risk. A consistent, repeatable approach is required
10 for making asset-related decisions. The decision-making process can be aided by
11 data and technology, but is ultimately a human activity that relies on the expertise
12 of the organization’s people.

13

14 (iii) **Life Cycle Delivery** – Implementation of the asset management plans that are
15 developed in Strategy and Planning. Includes control and oversight of the activities,
16 and associated risks, to acquire, operate, maintain and dispose of assets. A focus on
17 integration of activities across the life cycle can enable organizations to reduce
18 avoidable downstream costs.

19

20 (iv) **Organization and People** – Asset management requires qualified, trained individuals
21 in a suitably structured organization to facilitate the necessary decisions. Individuals
22 must have competence levels that are appropriate for their roles. Visible support
23 and engagement from top management is essential to creating a culture of effective
24 asset management.

25

26 (v) **Asset Information** – High-quality asset information forms the foundation of effective
27 asset management. Access to consistent, reliable information underpins decisions
28 about managing an asset’s lifecycle to balance performance, cost and risk.

² For more information, see the IAM, “NxtGen Webinar - Asset Management Where do I start?,” January 18, 2022.

1 (vi) **Risk and Review** – Asset management is a continual journey without an end.
2 Internal and external environments are subject to continual change. Routine
3 evaluations are required to examine whether an organization is operating in an
4 effective manner to achieve its objectives.

5
6 The IAM model demonstrates that asset management is about more than managing assets.
7 There are numerous decisions to be made across an asset’s lifecycle, such as whether to buy or
8 lease, or whether to maintain or run to failure. Asset management aims to ensure an
9 organization makes decisions effectively across the lifecycle of its assets.

10

11 **2.2 Asset Management at Newfoundland Power**

12 Newfoundland Power is the primary distributor of electricity in Newfoundland and Labrador,
13 serving approximately 87% of all customers in the province. The Company owns and operates
14 approximately 9,500 kilometres of distribution line, approximately 2,100 kilometres of
15 transmission line, and 131 substations to serve its customers.

16

17 Newfoundland Power is dependent upon Newfoundland and Labrador Hydro to supply
18 approximately 93% of the electricity it requires to serve its customers. The Company’s fleet of
19 generating assets is relatively small, consisting of 23 hydro plants and six thermal generating
20 plants that provide emergency backup and system support.³

³ Newfoundland Power’s hydro plants generate 438 GWh annually at a capacity of 98 MW.

1 Figure 2 is a map of Newfoundland Power's transmission, substation and hydro plant assets.

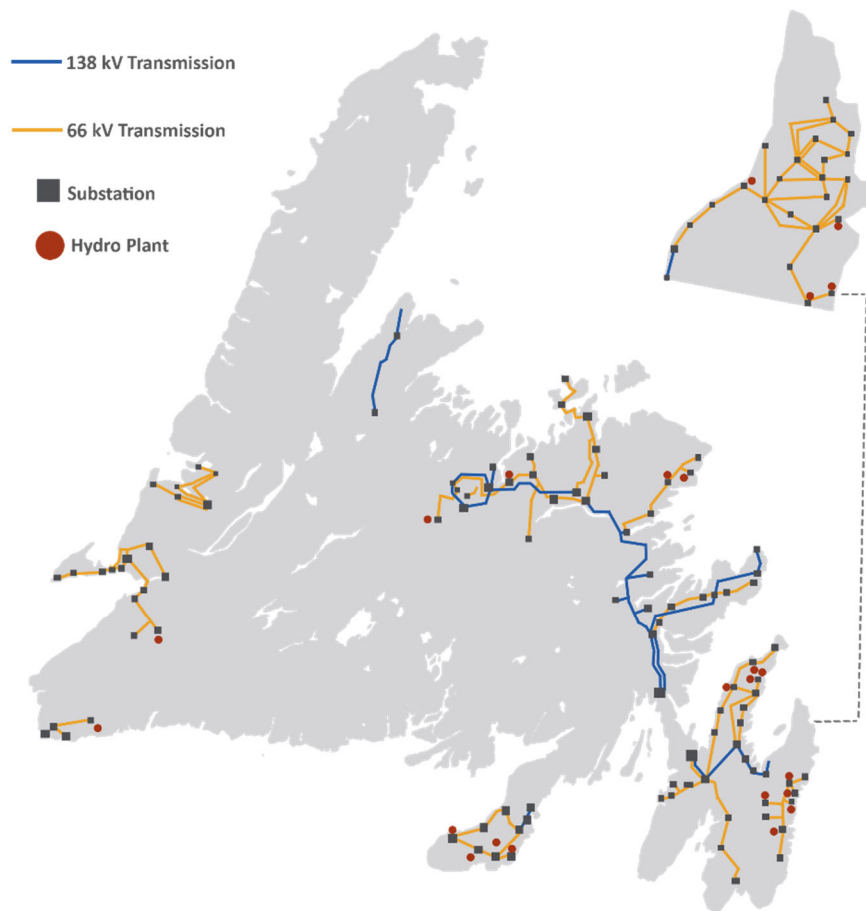


Figure 2: Newfoundland Power Electrical System Assets

2 Newfoundland Power manages its electrical system assets through a combination of
3 inspections and maintenance programs and long-term asset management strategies. Asset
4 management is organized by asset class, with separate practices applied to distribution,
5 transmission, substation and generation assets.

6
7 The Company operates approximately 300 distribution feeders. Distribution feeders are
8 inspected on a seven-year cycle with deficiencies prioritized for correction based on severity as
9 part of corrective or preventative maintenance.⁴ The distribution system is also maintained
10 through a longstanding project that targets capital investments on the Company's worst

⁴ Newfoundland Power's corrective and preventative maintenance programs for its distribution system are presented in its annual capital budget applications as its *Reconstruction* and *Rebuild Distribution Lines* programs.

1 performing feeders.⁵ Capital additions and upgrades are also required annually to connect new
2 customers to the distribution system and respond to system load growth.⁶

3
4 The majority of Newfoundland Power's transmission lines operate at 66 kV and 138 kV.
5 Transmission lines are inspected annually to identify deficiencies. Similar to distribution,
6 deficiencies on the transmission system are prioritized for correction based on severity.⁷ The
7 condition of the transmission system is also maintained through rebuild projects. These
8 projects target the Company's oldest and most deteriorated transmission lines and are
9 completed in accordance with its longstanding *Transmission Line Rebuild Strategy*.⁸

10

11 Substations are inspected eight times annually to identify deficiencies and required
12 maintenance. Equipment that fails or is at imminent risk of failure is addressed through
13 corrective maintenance.⁹ Major refurbishment projects are implemented in accordance with
14 the Company's longstanding *Substation Refurbishment and Modernization Plan*.¹⁰ Annual
15 projects also exist to modernize specific types of substation equipment, such as obsolete
16 protection and control equipment and ground grids.

17

18 Generating plants are inspected by plant operators to identify deficiencies. Equipment that
19 fails or is at imminent risk of failure is addressed under corrective maintenance programs for
20 hydro plants and thermal assets, as well as rehabilitation projects for civil works.¹¹ Major plant
21 refurbishment projects, such as penstock replacements, are accompanied by economic analyses
22 to confirm that continued operation of a hydro plant is least-cost for customers.

⁵ The Company's worst performing feeders program is known as its *Distribution Reliability Initiative*.

⁶ This can include, as examples, the addition of services, meters or transformers, and the upgrading of a distribution feeder from single phase to three phase.

⁷ Newfoundland Power's *Transmission Line Maintenance* program forms part of its annual capital budget applications and includes both preventative and corrective maintenance.

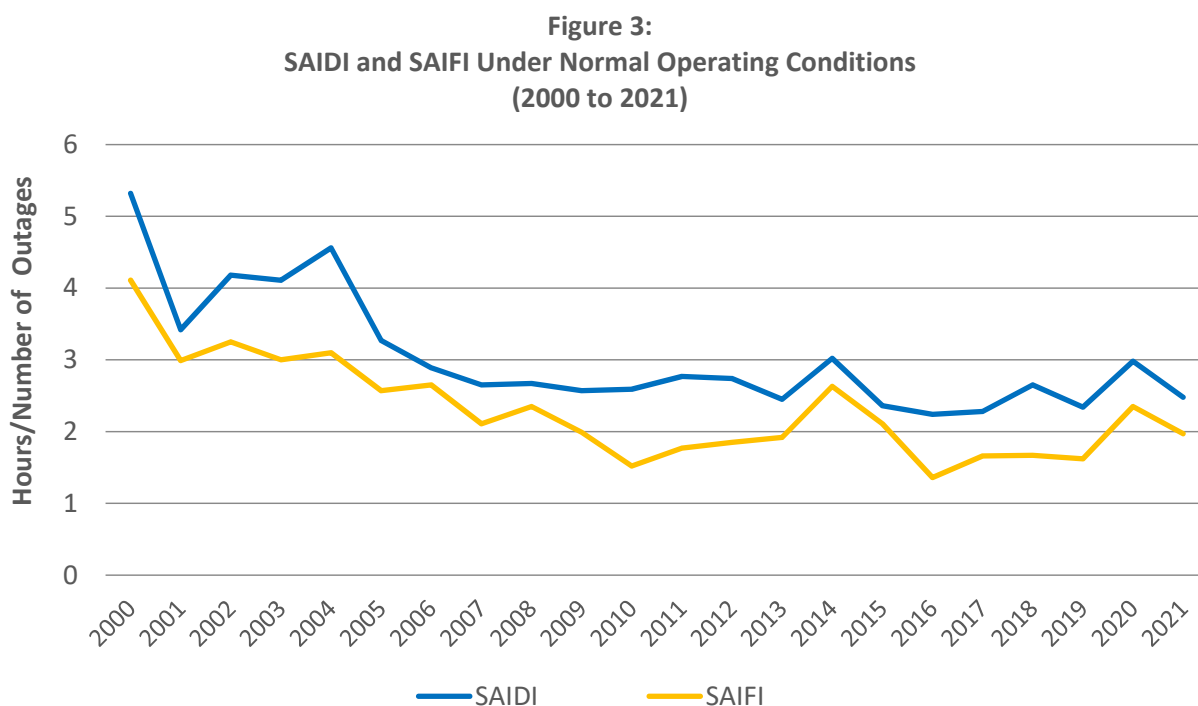
⁸ The *Transmission Line Rebuild Strategy* was originally included as part of Newfoundland Power's *2006 Capital Budget Application*.

⁹ The Company's company's corrective maintenance program for its substation assets is presented in its annual capital budget applications as its *Substation Replacements Due to In-Service Failures* program.

¹⁰ The *Substation Refurbishment and Modernization Plan* formed part of the *Substation Strategic Plan* included in Newfoundland Power's *2007 Capital Budget Application*.

¹¹ These programs and projects are presented in the Company's annual capital budget applications as the *Hydro Plant Replacements Due to In-Service Failures* program, *Thermal Plant Replacements Due to In-Service Failures* program, and *Hydro Facility Rehabilitation* project.

1 Many of Newfoundland Power’s current asset management practices have been in place for
 2 between 15 and 20 years. The Company’s asset management practices are fundamental to
 3 providing reliable service to its customers. An independent review of Newfoundland Power’s
 4 operations completed in 2014 found that the Company’s asset management conformed to
 5 good utility practice and contributed to improvements in service reliability for customers.¹²
 6
 7 Figure 3 shows the average duration (“SAIDI”) and frequency (“SAIFI”) of outages to
 8 Newfoundland Power’s customers from 2000 to 2021 under normal operating conditions.¹³



9 From 2000 to 2010, Newfoundland Power reduced both the frequency and duration of
 10 customer outages by over half. The service reliability experienced by customers has been
 11 reasonably stable since 2011, averaging approximately 1.9 outages and 2.6 hours of outage
 12 annually. The average duration of outages to Newfoundland Power’s customers has been half

¹² See The Liberty Consulting Group, *Executive Summary of Report on Island Interconnected System to Interconnection with Muskrat Falls addressing Newfoundland Power Inc.*, December 17, 2014, page ES-1.

¹³ Newfoundland Power calculates its SAIDI (“System Average Interruption Duration Index”) and SAIFI (“System Average Interruption Frequency Index”) in accordance with industry guidelines. The data shown in Figure 3 does not include customer outages due to significant events or loss of supply from Newfoundland and Labrador Hydro.

1 the Canadian average over the last decade and the average frequency of outages has been
2 consistent with the Canadian average.¹⁴

3
4 Quarterly surveys indicate that customers are reasonably satisfied with the quality of service
5 provided by Newfoundland Power. The Company's customer satisfaction rate has averaged
6 approximately 86% over the last decade. Newfoundland Power's objective is to maintain
7 current levels of overall service reliability for its customers at the lowest possible cost.¹⁵

9 **2.3 Current Utility Experience**

10 Industry research has generally shown that North American utilities are in different stages of
11 their asset management journeys. Utilities' approaches to asset management reflect a number
12 of factors, including the size and condition of their electrical systems and organizational
13 objectives.

14
15 While practices vary, many utilities are experiencing the same drivers of change along their
16 asset management journeys. A 2015 report by Deloitte LLP ("Deloitte") noted common drivers
17 of change in utilities' asset management include, among others: (i) a large portion of assets
18 nearing the end of life; (ii) requirements for increased spending to manage aging assets; (iii) an
19 aging workforce meaning tacit knowledge is leaving organizations; and (iv) regulators
20 demanding more detailed analysis to justify utility budgets.¹⁶ These factors have contributed to
21 the emergence of certain trends in asset management as utilities endeavor to gain the tools
22 and processes necessary to manage the performance, cost and risk of their assets.

23
24 A trend that has gained prominence in recent years is the use of asset health indexes to
25 quantify the condition of electrical system assets.¹⁷ A 2015 report prepared by Deloitte for

¹⁴ The Canadian average for SAIDI and SAIFI is based on Region 2 utilities of Electricity Canada, which are utilities that serve a mix of urban and rural areas. The Canadian average SAIDI was 5.2 from 2011 to 2021 and the average SAIFI was 2.1.

¹⁵ Newfoundland Power's operations must comply with the provincial power policy contained in section 3 of the *Electrical Power Control Act, 1994*. Section 3(b)(iii) requires that customers be provided with service at the lowest possible cost consistent with reliable service.

¹⁶ See Deloitte, *Asset Health Indices: A utility industry necessity*, 2015.

¹⁷ Asset health indexes quantify the condition of electrical system assets by incorporating data such as asset type, age and inspection results. For example, assets can receive a score on a scale of one to 10, where one indicates an asset in "new" condition, while 10 indicates an asset could fail at any moment.

1 Electricity Canada, formerly the Canadian Electricity Association, explored the use of asset
2 health indexes among utilities. Deloitte’s report showed that asset health indexes can support
3 utilities in making asset-related decisions. Deloitte observed there was a large variation in the
4 maturity of asset health indexes for Canadian utilities.¹⁸

5
6 A separate report prepared by Deloitte around the same time focused on risk-based asset
7 management. Deloitte noted that risk-based asset management has proven effective for
8 balancing the operational performance of assets against lifecycle costs.¹⁹ Deloitte found that
9 asset risk management was at differing levels of maturity among utilities and that risk models
10 involving predictive analytics were not widely used at that time.²⁰

11
12 Deloitte’s survey also showed that a minority of utilities planned on seeking certification with
13 ISO 55001.²¹ ISO 55001 has emerged as the prevailing industry standard related to asset
14 management in North America. Hydro Ottawa became the first electric utility in Canada to
15 become ISO 55001 certified in 2020.²² While utilities do not often seek ISO 55001 certification,
16 the standard is generally recognized as an authoritative guideline on best practices in asset
17 management.

18
19 Newfoundland Power conducted a survey via the Centre for Energy Advancement through
20 Technological Innovation (“CEATI”) in 2022 to obtain a current view asset management trends,
21 including asset health indexes, risk assessments and adherence to ISO 55001.²³ Eighteen North
22 American utilities responded to the survey, including a mix of vertically integrated, distribution
23 and transmission utilities.

¹⁸ See Deloitte, *Asset Health Indices: A utility industry necessity*, 2015.

¹⁹ See Deloitte, *Asset Management: A Risk-Based Approach, Energy & Resources Benchmark Survey*, 2015.

²⁰ Predictive analytics for risk management involve statistical analysis of the probability of failure through the derivation of failure curves based on industry experience and/or utility data. Predictive analytics can also quantify asset impacts, including direct tangible costs (e.g. cost of response, lost revenue) and socioeconomic impacts (e.g. cost of safety incident, environmental remediation).

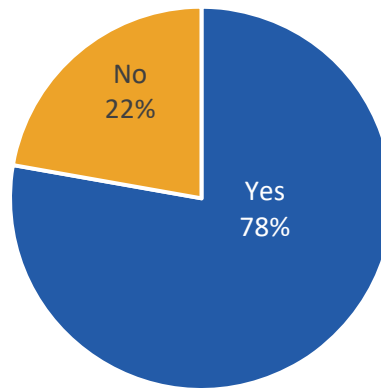
²¹ When considering certification with ISO 55000, only 25% of respondents indicated that they plan to seek certification within the next 12 months.

²² See <https://hydroottawa.com/en/save-energy/innovation/iso-550012014-certification>.

²³ CEATI is an organization driven by utility membership that provides a network for research and information sharing.

1 Figure 4 summarizes the use of asset health indexes among surveyed utilities.

**Figure 4:
2022 Utility Survey
Use of Asset Health Indexes**

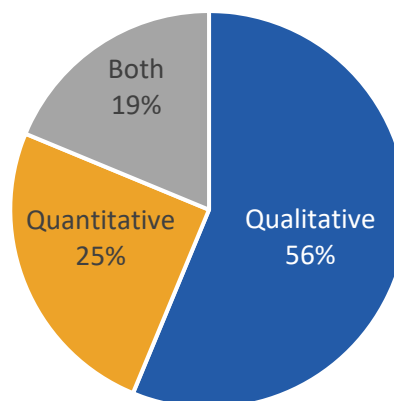


2 The survey shows asset health indexes have become widely adopted among North American
3 utilities. A total of 78% of surveyed utilities indicated they use asset health indexes to quantify
4 asset condition. The surveyed utilities use this data to inform capital investment and/or
5 maintenance requirements for their most critical asset types.

6

7 Figure 5 summarizes the approach to risk assessments among surveyed utilities.

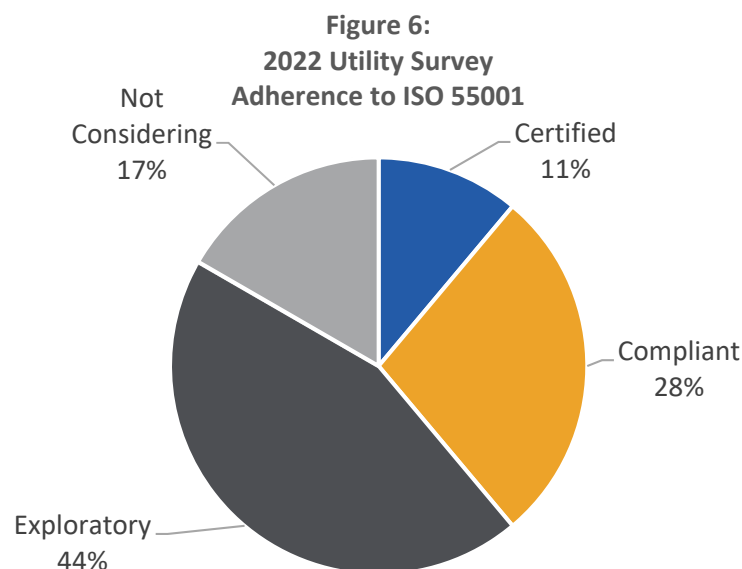
**Figure 5:
2022 Utility Survey
Approach to Risk Assessments**



1 The majority of surveyed utilities reported using qualitative approaches when conducting risk
 2 assessments as part of asset management. Qualitative approaches include the use of
 3 engineering judgement and tools such as risk matrices. Quantitative approaches alone are used
 4 by 25% of utilities when conducting risk assessments. Quantitative approaches include the use
 5 of weighted formulas such as asset health indexes or an advanced risk modelling software.
 6 Predictive analytics are not widely used among surveyed utilities, with only two utilities
 7 reporting the use of such advanced software.²⁴

8

9 Figure 6 summarizes the adherence to ISO 55001 among surveyed utilities.



10 The survey confirmed that ISO 55001 certification is relatively rare among utilities. Only two
 11 utilities, or 11%, indicated they are ISO 55001 certified. Over one quarter of surveyed utilities
 12 reported they are ISO 55001 compliant, meaning they have assessed and applied the standard,
 13 but are not formally certified. A further 44% of utilities are exploring use of the standard and
 14 the remaining 17% reported they are not considering it.

15

16 Overall, the 2022 survey shows the asset management trends identified by Deloitte in the
 17 reports from 2015 have continued. While the adoption of asset health indexes has increased in

²⁴ Two utilities were excluded from the results of this question, as the respondents were unsure of the practice.

1 recent years, qualitative risk assessments continue to be used more widely than quantitative
2 approaches. While a minority of utilities are ISO 55001 certified, the standard continues to be
3 used as a guideline among utilities.
4

5 **3.0 Assessment Context**

6 As described above, utilities are exposed to many of the same drivers for change that are
7 influencing how they attempt to balance the performance, cost and risk of their assets. Many
8 of the drivers of change that are influencing the asset management journeys of other utilities
9 are applicable to Newfoundland Power. These factors are relevant to the Company's asset
10 management journey as it looks to continue balancing the performance, cost and risk of its
11 assets, and are explained in further detail below.
12

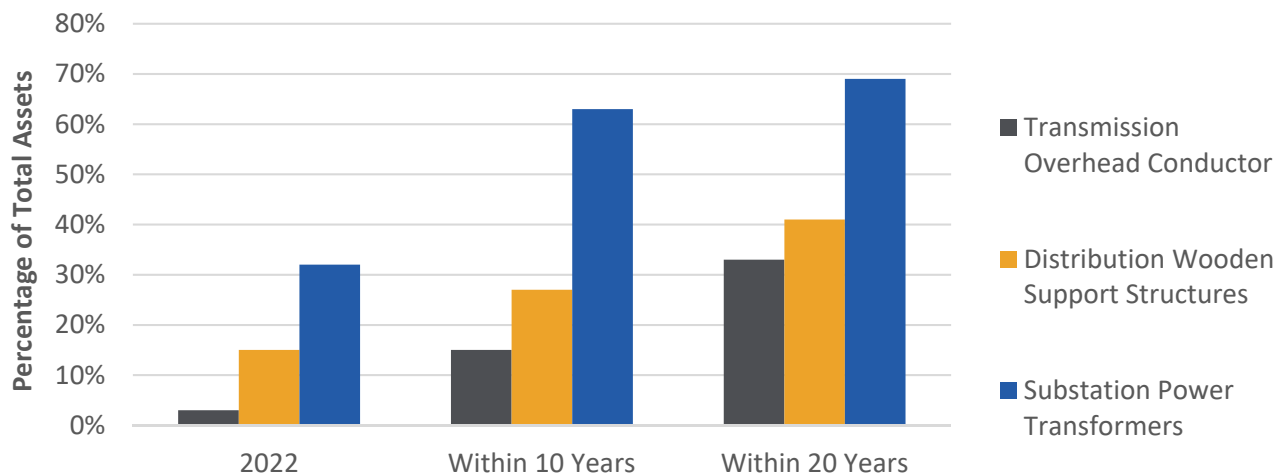
13 ***Aging Electrical System***

14 A significant portion of Newfoundland Power's electrical system was constructed in the 1960s
15 and 1970s following provincial electrification efforts in rural areas.²⁵ Many of these assets,
16 including overhead conductor and wooden support structures, have expected useful service
17 lives of between 50 and 60 years. A large portion of assets constructed in the 1960s and 1970s
18 are now approaching the end of their expected useful lives. While age is not the sole
19 determinant as to whether an asset requires replacement, it provides a reasonable indication of
20 when an asset's condition may degrade, eventually requiring replacement.

²⁵ In 1958, Newfoundland Power (then Newfoundland Light and Power Company Limited), signed a rural electrification agreement with the Provincial Government to provide electricity in areas where it was not economical for the Company to build its own transmission lines. As part of this agreement, assets owned by the Newfoundland and Labrador Power Commission, which eventually became Hydro, were divested to the Company. Other entities, including municipal corporations, also divested assets to Newfoundland Power over this period.

1 Figure 7 illustrates the aging of Newfoundland Power’s electrical system by showing the
 2 percentage of certain assets currently exceeding their expected useful service life, and the
 3 percentage that would exceed that threshold in 10 and 20 years if assets were not replaced.²⁶

**Figure 7:
 Electrical System Asset Age Profile
 Percentage Exceeding Expected Useful Life**



4 This analysis shows an increasing proportion of electrical system assets are approaching end of
 5 life over the next decade. Approximately 15% of distribution wooden support structures have
 6 exceeded the expected useful service life typically seen in the industry, increasing to 27% over
 7 the next decade.²⁷ The percentage of transmission overhead conductor exceeding the typical
 8 industry expected useful service life is forecast to increase from approximately 3% to 15% over
 9 the next decade.²⁸ The percentage substation power transformers exceeding this threshold is
 10 forecast to nearly double over the next decade from approximately 32% to 63%.²⁹

²⁶ The average industry expected useful service lives of distribution and transmission assets were derived from information published by the Federal Energy Regulatory Commission. A total of 38 utilities were included in the analysis. With respect to substation power transformers, practical conditions, such as ambient temperature, high loading and fault exposure, can reduce the expected service life of power transformers. See International Council on Large Electric Systems (“CIGRE”), *Asset Management Decision Making Using Different Risk Assessment Methodologies*, 2013, page 94.

²⁷ Industry experience indicates the expected useful service life of distribution wooden support structures is 54 years.

²⁸ Industry experience indicates the expected useful service life of transmission overhead conductor is 63 years.

²⁹ Industry experience indicates the expected useful service life of substation power transformers is 30 to 50 years, 50 years was assumed for these calculations.

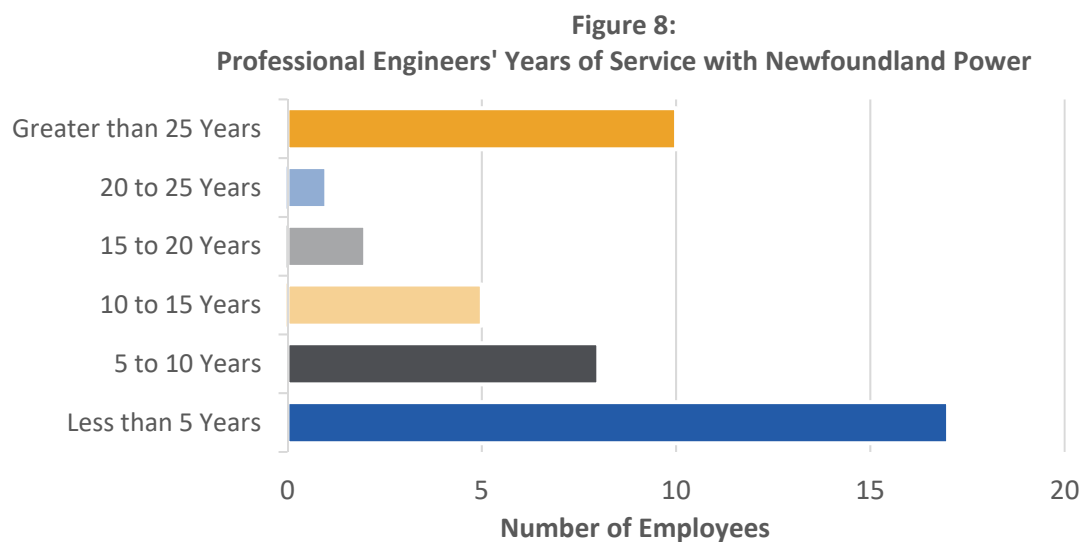
1 The aging of Newfoundland Power’s electrical system poses an increasing risk of equipment
 2 failures and deteriorating service reliability for customers. Maintaining reliable service for
 3 customers is expected to require increased investments in the planned refurbishment and
 4 replacement of assets going forward.³⁰ How to optimize the future replacement of these assets
 5 in order to balance performance, cost and risk is a key consideration for Newfoundland Power’s
 6 asset management journey.

7
 8 ***Changing Workforce Demographics***

9 The IAM model shows qualified, trained professionals are essential to asset management
 10 decision making.

11
 12 Newfoundland Power is experiencing a demographic transition within its workforce.
 13 Professional Engineers are responsible for many facets of the Company’s asset management,
 14 including strategic planning and decision making.

15
 16 Figure 8 provides a breakdown of Newfoundland Power’s workforce of Professional Engineers
 17 based on years of service with the Company.³¹



³⁰ For example, as of 2022, investments to replace or refurbish assets that are deteriorated, deficient or fail in service are forecast to increase from an annual average of approximately \$44.7 million from 2018 to 2022, to \$70.5 million from 2023 to 2027. See Newfoundland Power’s 2023 Capital Budget Application, 2023-2027 Capital Plan, Section 3.2 Planned Expenditures by Investment Classification.

³¹ Figure 8 does not include years of service in other engineering positions prior to joining Newfoundland Power.

1 Approximately 23% of the Company's Professional Engineers have over 25 years of service with
2 Newfoundland Power and will be eligible for retirement in the coming years.³² This represents
3 a material shift in the Company's workforce that is responsible for designing and executing its
4 asset management practices. This shift must be considered as Newfoundland Power charts the
5 next steps in its asset management journey to ensure decision making and strategic planning
6 remains sound once longstanding expertise has retired from the Company.

8 ***Technology Obsolescence***

9 The IAM model shows asset-related information is foundational to asset management.
10 Capturing and accessing this information often relies on information technology.

11
12 Newfoundland Power's existing asset management technology has been in operation for
13 approximately 20 years, its functionality is limited and is approaching end of life. The
14 technology is used to log deficiencies on the electrical system that require correction, but is
15 limited in its ability to provide data on asset condition. This limitation necessitates separate
16 engineering reviews to produce suitable condition data for investment planning. Additionally,
17 the system was designed to provide "steady state" information and does not provide detailed
18 trending data to assess changes in assets over time. More advanced analytics, such as asset
19 health indexes and risk modelling, cannot be produced using the current technology.

20
21 The service life of Newfoundland Power's asset management technology has been prolonged
22 through the use of an extended support contract with the vendor. While this has allowed the
23 Company to defer system replacement, the existing contract is expiring and the vendor is
24 discontinuing support of the system in 2026.

25
26 A replacement solution for the existing technology is expected to be required prior to it
27 reaching obsolescence in 2026. The Company must consider whether a like-for-like
28 replacement or an enhanced solution is necessary to facilitate its asset management journey.

³² As of June 2022, Newfoundland Power had 43 Professional Engineers, including Engineers In Training, within its workforce. Of these, 10 Professional Engineers have over 25 years of service with Newfoundland Power ($10 / 43 = 0.23$, or 23%).

1 ***Evolving Regulatory Landscape***

2 As described in the IAM model, an organization’s strategic plan and asset management can be
3 influenced by external factors, including regulatory requirements.

4

5 The regulatory landscape in Newfoundland and Labrador is evolving. Newfoundland Power is
6 regulated by the Newfoundland and Labrador Board of Commissioners of Public Utilities (the
7 “Board”) pursuant to the *Public Utilities Act* and the *Electrical Power Control Act, 1994*. The
8 Company is required to submit an annual capital budget to the Board for its approval, and to
9 obtain Board approval prior to proceeding with any capital improvement or addition to its
10 property over \$50,000.³³

11

12 The Board has issued new *Capital Budget Application Guidelines (Provisional)* that require more
13 advanced data and information as part of annual capital budget applications. This includes the
14 type of data that must be provided to obtain regulatory approval of asset-related decisions,
15 such as whether to replace or refurbish an asset. While these guidelines are provisional and
16 may be subject to change, it is essential that the Company understand what is required to
17 achieve compliance with these requirements as part of its asset management journey.³⁴

18

19 The province’s legislative framework is also under review.³⁵ It is unclear at this time what, if
20 any, implications this review could have for Newfoundland Power’s asset management journey.

³³ See section 41 of the *Public Utilities Act*.

³⁴ In correspondence regarding the guidelines dated December 20, 2021, the Board noted that the guidelines are issued on a provisional basis to allow the parties and the Board an opportunity to ascertain how they operate and to identify any issues that may need to be addressed before they are finalized. The Board identified that it will seek further input prior to finalizing the guidelines.

³⁵ The Government of Newfoundland and Labrador announced a review of the legislation governing public utilities in 2021. See the Provincial Government’s press release, “*Provincial Government to Initiate Review of the Public Utilities Act*,” dated November 18, 2021.

4.0 Assessment Framework

4.1 General

Overall, the convergence of an aging electrical system, changing workforce demographics, technology obsolescence and an evolving regulatory landscape necessitates a review of asset management at Newfoundland Power. This review is necessary to ensure the Company continues to balance the performance, cost and risk of its assets in providing safe and reliable service to its customers. Operational requirements, industry trends and regulatory requirements are key inputs to considered as part of this review. The outputs of the review will inform the next phase of the Company's asset management journey.

The milestones, schedule and cost of the review are outlined below. The review is intended to focus on asset management within the Company's four largest and most critical asset classes, which are the transmission, substation, distribution and generation asset classes.

4.2 Milestones

4.2.1 Overview

Newfoundland Power's asset management review is divided into three milestones, which are:

- (i) **A Current State Assessment** to understand where Newfoundland Power is in its asset management journey, how it currently compares to other utilities, and opportunities to enhance its asset management practices;
- (ii) **A Target State Assessment** to assess the costs and customer benefits of opportunities to advance Newfoundland Power's asset management to ensure its practices continue to be adequate and aligned with sound public utility practice; and
- (iii) **Implementation Planning** to guide the execution of opportunities that are assessed as required to meet the Company's objective of continuing to provide safe and reliable service to customers at the lowest possible cost.

1 These milestones are described in further detail below.

2

3 **4.2.2 Current State Assessment**

4 Newfoundland Power contracted METSCO Energy Solutions Inc. (“METSCO”) in 2022 to
5 complete a current state assessment of the Company’s asset management. METSCO is an
6 independent consulting firm with expertise in utility asset management.

7

8 METSCO completed its assessment using industry standard methodologies. It first
9 benchmarked Newfoundland Power’s current asset management maturity. The benchmark
10 maturity assessment produced a comparison to other utilities in order to provide perspective
11 on how the Company compares to other utilities. The maturity assessment informed the
12 identification of opportunities that should be assessed as part of the Company’s asset
13 management review.

14

15 ***Benchmark Maturity***

16 METSCO benchmarked Newfoundland Power’s asset management maturity against the clauses
17 of ISO 55001 by using the IAM assessment tool. The IAM assessment tool evaluates adherence
18 to the clauses of ISO 55001 on a four-point scale, where zero is “innocent” or unaware of asset
19 management requirements, and four is “beyond ISO” requirements.

20

21 This is a standard approach used by utilities to understand the current state of their asset
22 management and provides a tool against which it can monitor progress in its asset
23 management journey over time. METSCO’s assessment was informed by interviews with
24 Newfoundland Power staff and a review of the Company’s asset management documentation,
25 including inspection and maintenance practices and asset management strategies.

26

27 Newfoundland Power’s overall maturity level, which is derived by taking an average of scores
28 across all clauses, is 1.38. This translates to a maturity level of between “aware,” which means
29 an organization has identified requirements for asset management, and “developing,” which
30 means an organization has identified the means through which to meet those requirements.

- 1 Figure 9 compares Newfoundland Power’s benchmark maturity level against eight other utilities
- 2 for which METSCO completed similar assessments.

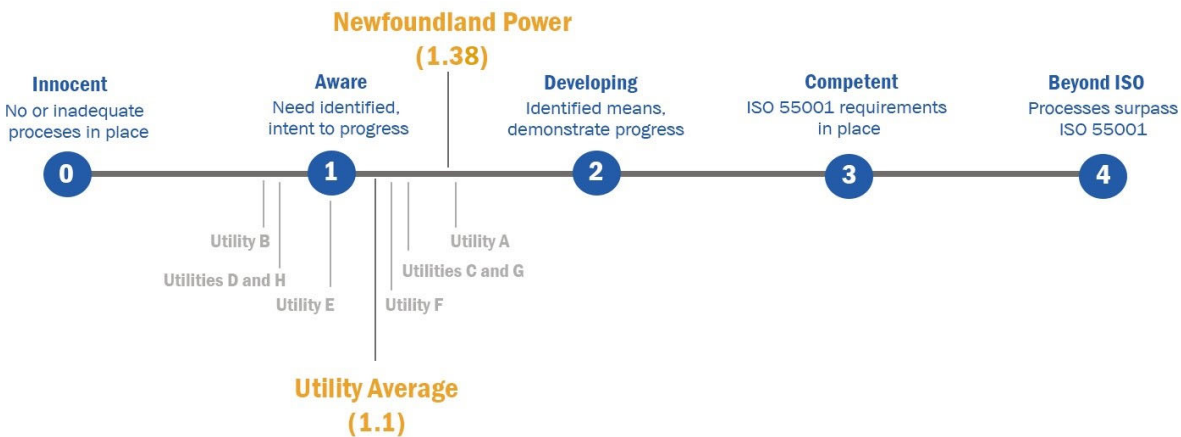


Figure 9: Asset Management Maturity Comparison

- 3 Newfoundland Power’s benchmark maturity appears reasonable when compared to that of
- 4 other utilities. The maturity scores of other eight other utilities for which METSCO completed
- 5 similar assessments ranged from approximately 0.9 to 1.2, averaging approximately 1.1. While
- 6 the Company’s performance appears reasonable, there is an opportunity to advance its
- 7 maturity level as part of its asset management review.

8

9 ***Opportunities for Assessment***

- 10 METSCO used the maturity assessment and its knowledge of industry best practices to identify
- 11 opportunities that Newfoundland Power should assess as part of its asset management review.
- 12 For each opportunity, METSCO provided a description of what implementation would entail,
- 13 including expected levels of impact, cost and difficulty.

- 1 Table 1 provides METSCO’s criteria for determining whether an opportunity had low, medium
- 2 or high levels of cost, impact and difficulty.

Table 1: Opportunities for Assessment Degree of Impact, Cost and Difficulty			
Degree	Impact	Cost	Difficulty
Low ●	Some value to utility and its customers	Less than \$100,000	May or may not require outside resources
Medium ●	Moderate value to utility and its customers	Between \$100,000 and \$1,000,000	Likely to require a combination of internal capacity building and outside resources
High ●	Significant value to utility and its customers	Over \$1,000,000	Substantial challenges with implementation that will require dedicated project management and external facilitation

- 3 A total of 22 opportunities were identified for assessment as part of Newfoundland Power’s
- 4 asset management review. Newfoundland Power has organized these opportunities into three
- 5 categories: (i) organizational approach; (ii) plans and processes; and (iii) data and technology.

6

7 *Category 1: Organizational Approach*

- 8 Newfoundland Power’s organizational approach to asset management follows a decentralized
- 9 model that is organized by asset class. Asset management planning and decision making within
- 10 each asset class relies primarily on the expertise of Professional Engineers, in collaboration with
- 11 regional operations and other departments.

1 Table 2 lists the opportunities associated with organizational approaches to asset management.

Table 2: Opportunities for Assessment Organizational Approach			
Focus Areas	Impact	Cost	Difficulty
Expanding Newfoundland Power’s asset management vision and developing an enterprise-wide asset management policy.	●	●	●
Defining the scope of the asset management system, revisiting and refining (as necessary) the overall asset management roles across the organization and right sizing the asset management function.	●	●	●
Assessing and enhancing knowledge and competencies.	●	●	●
Expanding staff exposure to innovation and technology.	●	●	●
Clarifying the approach to stakeholder management.	●	●	●
Developing a change management plan with a supporting communication strategy.	●	●	●

2 Six opportunities were identified for assessment related to organizational approaches to asset
 3 management. These opportunities relate to the development of a company-wide policy, right-
 4 sizing the asset management function, enhancing knowledge and competencies, and
 5 communications and stakeholder management. These opportunities generally do not have
 6 high costs, are considered to be low difficulty, and are expected to be assessed primarily using
 7 internal resources, but may be informed by third-party expertise.

1 *Category 2: Plans and Processes*

2 As described above, Newfoundland Power’s asset management includes its inspection and
3 maintenance programs and asset management strategies. Many of these programs and
4 strategies have been in place for 15 to 20 years and a review is timely to ensure they continue
5 to be effective into the future.³⁶

6
7 Table 3 lists the opportunities associated with asset management plans and processes.

Table 3: Opportunities for Assessment Plans and Processes				
Focus Areas	Impact	Cost	Difficulty	
Developing an enterprise-wide Strategic Asset Management Plan.	●	●	●	
Developing asset type specific asset management plans for each major asset type within an asset class.	●	●	●	
Implementing a risk-based economic lifecycle modeling process for the most critical asset types.	●	●	●	
Ensuring congruency between the current capital investment and O&M spending portfolio development and maintenance program regimen with key elements of ISO 55001:2014.	●	●	●	
Enhancing the asset risk management process.	●	●	●	
Refining performance management framework and developing asset management controls, dashboards and reports.	●	●	●	
Developing management review function.	●	●	●	
Reviewing and enhancing asset management system documentation.	●	●	●	
Expanding the Internal Audit process to include asset management.	●	●	●	

³⁶ For example, Newfoundland Power’s maintenance programs for its distribution system have been in place for over 20 years, and the Company’s *Transmission Line Rebuild Strategy* and *Substation Refurbishment and Modernization Plan* have been in place for nearly 15 years.

1 Nine enhancement opportunities were identified for assessment related to asset management
 2 plans and processes. These opportunities relate to a variety of topics, including the
 3 development of a Strategic Asset Management Plan and plans for specific asset types, which
 4 are concepts of ISO 55001. It also includes processes to enhance risk and review processes.
 5 These opportunities range in complexity and assessing these opportunities is expected to
 6 require internal capacity building and may require external expertise.

7
 8 *Category 3: Data and Technology*

9 Newfoundland Power’s existing asset management technology is approaching end of life. The
 10 technology is expected to require replacement over the near term. Consideration is required as
 11 to whether a like-for-like replacement is suitable, or whether enhanced technologies are
 12 required to meet the Company’s asset management requirements into the future.

13
 14 Table 4 lists the opportunities related to asset management data and technology.

Table 4: Opportunities for Assessment Data and Technology				
Focus Areas	Impact	Cost	Difficulty	
Enhancing overall IT/OT enablement.	●	●	●	
Enhancing the collection, storage, maintenance, accuracy, completeness, and use of data.	●	●	●	
Installing a risk-based lifecycle modeling decision support tool.	●	●	●	
Installing a risk identification and analysis tool.	●	●	●	
Developing a capital investment and O&M spending portfolio optimization decision support tool.	●	●	●	
Enhancing or replacing the current enterprise asset management system.	●	●	●	
Deploying an asset management performance dashboard.	●	●	●	

1 Seven opportunities were identified for assessment related to asset management data and
 2 technology. These opportunities include a variety of tools available in the industry that would
 3 represent an enhancement to Newfoundland Power’s existing technology. Many of these tools
 4 could have a high impact on the Company’s asset management, but would also be costly and
 5 difficult to implement. External expertise will be required to assess these opportunities.

6

7 **4.2.3 Target State Assessment**

8 Newfoundland Power will assess each of the 22 opportunities identified by METSCO, including
 9 industry trends such as asset health indexes and risk modelling. The Company has grouped the
 10 22 opportunities into seven milestones to be completed as part of a target state assessment.
 11 These milestones will facilitate evaluating the cost and benefits of the identified opportunities
 12 to determine whether they would support Newfoundland Power’s objective of continuing to
 13 provide safe and reliable service to its customers at the lowest possible cost.

14

15 Newfoundland Power intends to apply the concepts presented in the ISO 55001 standard as
 16 part of its target state assessment, but does not currently anticipate seeking certification. The
 17 ISO 55001 maturity level ultimately targeted by the Company will depend upon the
 18 opportunities that are determined to be beneficial for its customers and operations.

19

20 Table 5 lists the milestones to be completed as part of the target state assessment.

Table 5: Target State Assessment Milestones	
1	<p><i>Documentation Gathering</i></p> <p><u>Objective:</u> Compile a library of documentation that establishes how Newfoundland Power conducts asset management and identify what changes may be required to existing documentation to facilitate its asset management journey.</p> <ul style="list-style-type: none"> • Compile existing documentation related to asset management, including corporate policies, inspection and maintenance practices, and asset management strategies/plans for individual asset classes. • Review documentation to identify any gaps and create documentation to address gaps where feasible, such as the creation of business process maps.

**Table 5:
Target State Assessment Milestones**

2	<p>Staff Training</p> <p><u>Objective:</u> Build internal capacity to understand best practices in assessing and implementing asset management practices.</p> <ul style="list-style-type: none"> • Complete training with industry leading experts to understand best practices in asset management, including best practices in developing strategic asset management plans. • Avail of webinars, conferences and other opportunities offered by professional organizations with expertise in the utility industry, such CEATI. • Conduct site visits with other utilities to learn from utilities with practical experience in advancing their asset management practices.
3	<p>Employee Engagement</p> <p><u>Objective:</u> Build awareness of asset management and the review process, and solicit input and feedback from stakeholders to inform Newfoundland Power’s asset management journey.</p> <ul style="list-style-type: none"> • Provide presentations and Company-wide communications from senior management to create awareness of the asset management review. • Conduct workshops with employees throughout the Company to understand the strengths and weaknesses of Newfoundland Power’s approach to asset management, opportunities for improvement, and current and emerging business priorities.
4	<p>Pilot Project</p> <p><u>Objective:</u> Inform whether Newfoundland Power should implement asset health indexes and quantitative risk modelling as part of its asset management journey.</p> <ul style="list-style-type: none"> • Conduct a pilot project based on a sample of assets to understand: (i) how the resulting data could benefit operations, investment planning and compliance with regulatory requirements; and (ii) how implementing these analytics would require changes to Newfoundland Power’s processes, technology and data. • Provide a final report on outcomes of the pilot project and recommendations for moving forward on asset health indexes and risk modelling.
5	<p>Process and Planning Review</p> <p><u>Objective:</u> Identify what changes are required to Newfoundland Power’s asset management policies, processes and plans to facilitate the next steps in its asset management journey.</p> <ul style="list-style-type: none"> • Identify and document what changes are required to Newfoundland Power’s inspection and maintenance practices, operational processes and investment planning based on the findings of the documentation review, internal capacity building, employee engagement and pilot project. • Obtain third-party expertise to analyze business processes and requirements for sound utility practice, and assess how any changes would be prioritized as part of implementation planning.

Table 5: Target State Assessment Milestones	
6	<p><i>Data and Technology Assessment</i></p> <p><u>Objective:</u> Assess how to modernize Newfoundland Power’s asset management technology prior to obsolescence of existing system.</p> <ul style="list-style-type: none"> • Obtain third-party expertise to provide advice on alternatives to modernize existing technology, including assessments of software market, data quality, and functional and technical requirements. • Develop a plan to replace the existing asset management technology prior to obsolescence materializing at year-end 2026, as well as a roadmap to implementing any other technologies based on cost-benefit analysis.
7	<p><i>Resource Assessment</i></p> <p><u>Objective:</u> Identify the organizational approach, resources and competencies required to meet Newfoundland Power’s asset management objectives.</p> <ul style="list-style-type: none"> • Develop an organizational chart showing Newfoundland Power’s existing approach to asset management, current resource levels and competencies in order to facilitate change management. • Utilize third-party expertise for the analysis of different organizational models to identify a recommended option to meet asset management objectives. As well as, develop a resourcing plan for acquiring the resources and competencies necessary to implement the recommended organizational model.

1 **4.2.4 Implementation Planning**

2 The milestones identified as part of the target state assessment will inform the development of
 3 an implementation plan to guide the next phase of Newfoundland Power’s asset management
 4 journey. Opportunities will be prioritized for implementation based on the costs and benefits
 5 to Newfoundland Power’s customers and its operations.

6
 7 The implementation of these opportunities, if determined to be beneficial, is expected to entail
 8 a phased approach. Opportunities will be prioritized for the asset classes that are most critical
 9 in serving customers, such as transmission and substations, but are envisioned to be
 10 expandable to other asset classes over time, such as general properties.

1 4.3 Schedule

2 The target state assessment is planned to commence in October 2022 and require 18 months to
3 complete, with recommendations available in the first quarter of 2024.

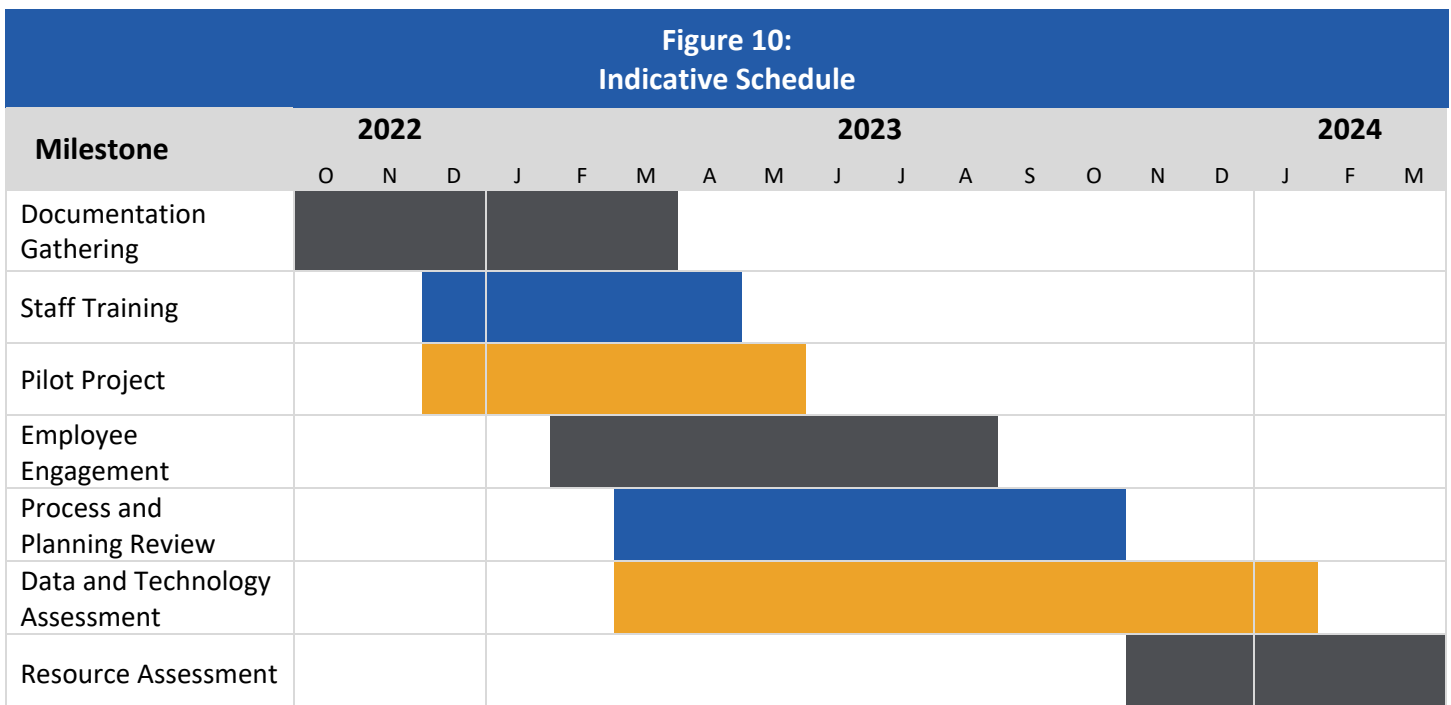
4

5 The schedule for the assessment is informed by several considerations. The Board has ordered
6 that Newfoundland Power’s next general rate application be filed by June 1, 2024.³⁷ Changes in
7 costs resulting from the review should be determined in advance of that application to ensure
8 they are reflected in test year revenue requirements. The replacement of the Company’s
9 existing asset management technology is expected to require a two-year capital project.

10 Newfoundland Power anticipates a capital project for the system’s replacement will be required
11 no later than its *2025 Capital Budget Application*, which is required to be filed by June 30, 2024.

12

13 Figure 10 provides a timeline for the milestones included in the target state assessment.



³⁷ See Order No. P.U. 3 (2022), page 19, lines 17 to 25.

1 **5.0 Next Steps**

2 The execution of Newfoundland Power's asset management review will ensure the Company's
3 asset management continues to facilitate the delivery of safe and reliable service to its
4 customers at the lowest possible cost. Opportunities identified for implementation will be
5 captured in an implementation plan. These opportunities may entail capital expenditures and
6 operating costs. Such costs, if required, will be proposed for Board approval through normal
7 regulatory proceedings, including annual capital budget applications and general rate
8 applications to ensure they are in the interest of customers.