

1 Q. Please provide a quantitative analysis of Newfoundland Hydro's observations
2 regarding Newfoundland Hydro versus Newfoundland Power capital trajectory for
3 investments in: (a) distribution, and (b) 138 and 66kV radial lines feeding
4 distribution facilities.

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7 A. Hydro has completed the requested quantitative analysis regarding Hydro vs
8 Newfoundland Power capital trajectory for distribution, and 138 and 66kV radial
9 lines and made observations based on the data available. To more easily view data
10 trends, the response uses three-year moving average in data presentation.

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12 **Distribution Capital Expenditures**

13 Figure 1 provides the ongoing three-year averages for Hydro's annual proposed
14 capital expenditures^{1 2} for distribution³ against that of Newfoundland Power for the
15 period 2010 to 2023.

¹ Proposed Capital Expenditure as proposed in annual Capital Budget Applications and Supplemental Capital budget Applications.

² Capital Expenditures for 2020 to 2023 are based on Hydro's current five-year plan and Newfoundland Power's five-year plan provided in their 2019 Capital Budget Application.

³ The data used excludes substation investment.

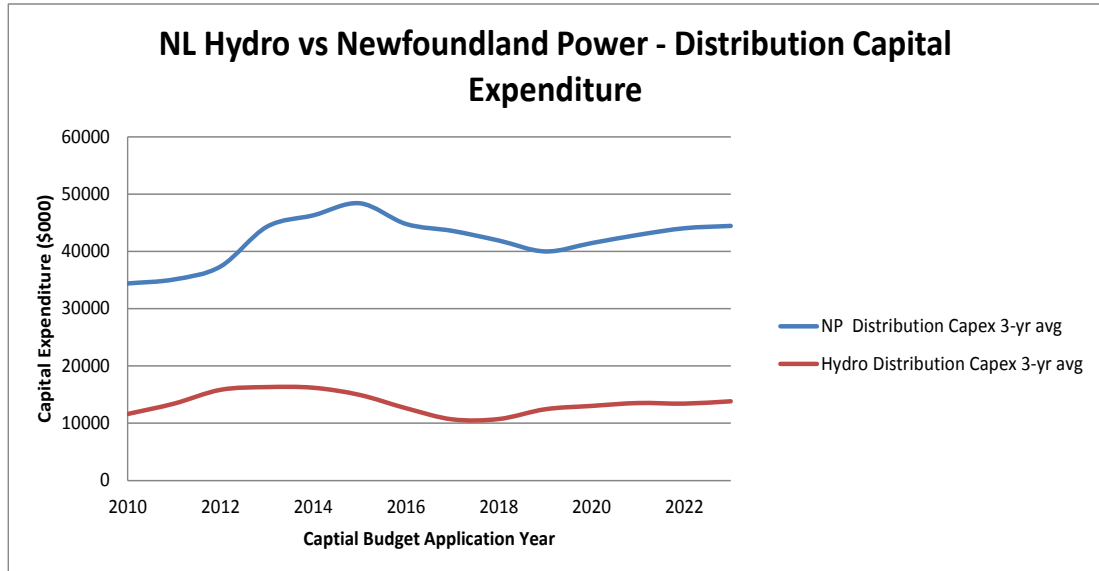


Figure 1: Hydro vs Newfoundland Power – Distribution Capital Expenditure

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Over this period, Newfoundland Power’s proposed or planned average annual capital expenditure on distribution is over three times that of Hydro (\$42M vs \$13.5M) . This is to be expected, given the size of Newfoundland Power’s distribution system (approximately 10,500 km) vs Hydro’s distribution system (approximately 3000 km). On a per-kilometre basis, both company’s distribution capital expenditures are comparable. Given the rural nature of Hydro’s distribution systems, a detailed comparison of distribution expenditures would require a breakdown of Newfoundland Power’s rural versus urban distribution expenditures.

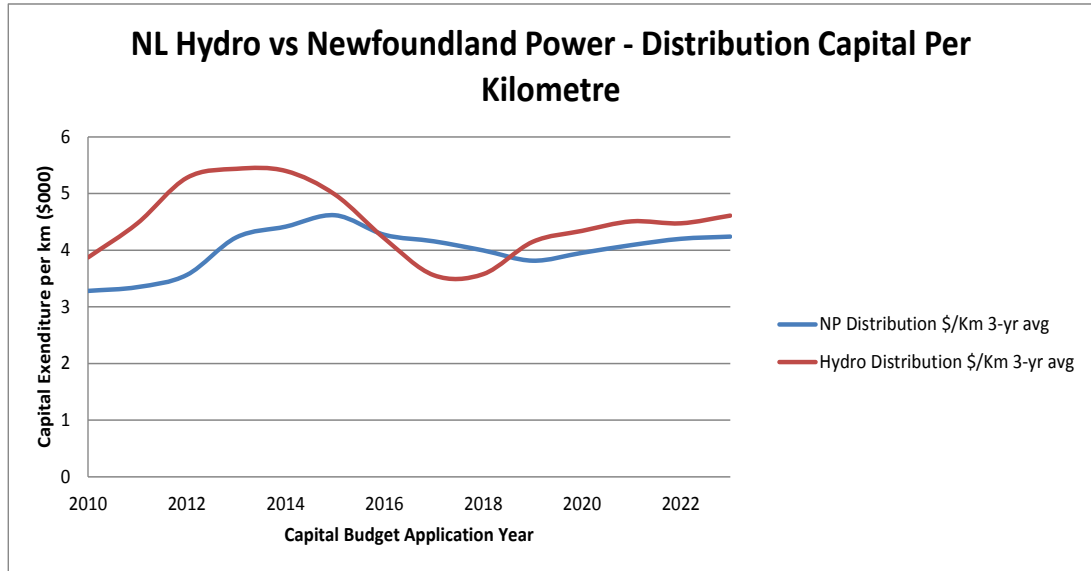


Figure 2: Hydro vs Newfoundland Power – Distribution Capital per Kilometre

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Distribution Reliability-Related Capital Expenditures

Considering only those capital expenditures justified on the basis of reliability improvements, Hydro has spent or plans to spend more on a per-kilometre basis during the period of 2010 to 2023. Hydro has spent an average of \$2,400 per kilometre annually on distribution-related projects, versus \$1000 per kilometre annually for Newfoundland Power. Hydro’s customers are generally more geographically dispersed than those of Newfoundland Power, whose customers are more densely populated, generally resulting in greater costs for an equivalent gain in reliability statistics for Hydro.

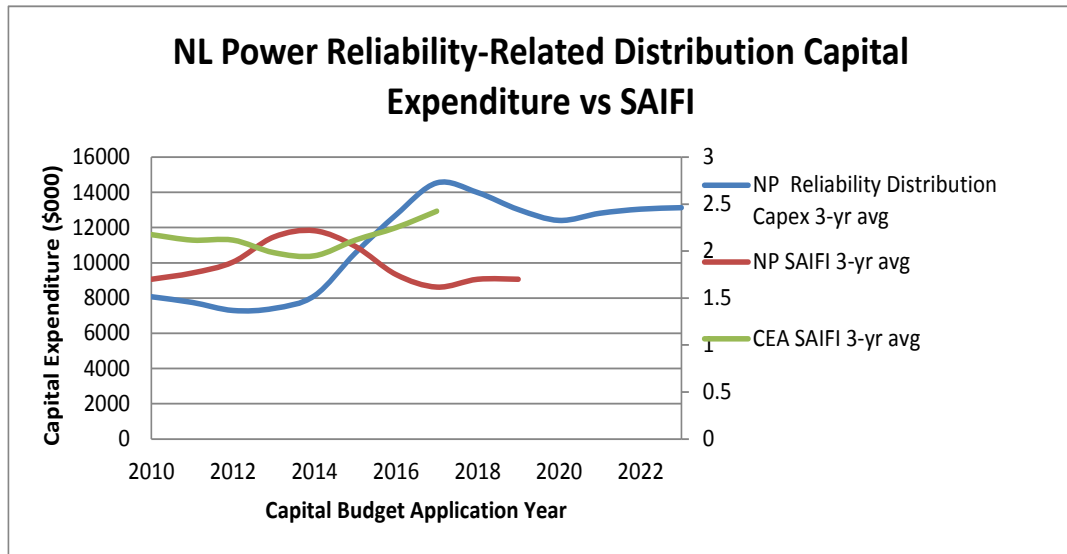
In Newfoundland Power’s 2019/2020 General Rate Application, Newfoundland Power stated that “The average duration of customer outages has been ½ the

1 Canadian average over the last 10 years. The average frequency of customer
 2 outages has been consistent with the Canadian average”.⁴

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4 Figure 3 provides three-year averages of Newfoundland Power’s distribution
 5 reliability-related capital expenditures in addition to the Newfoundland Power SAIFI
 6 and CEA SAIFI reliability data (also provided on a three-year average basis).

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9 **Figure 3: Newfoundland Power Reliability-Related Distribution Capital Expenditure vs. SAIFI**

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11 Figure 4⁵ provides three-year moving averages of Newfoundland Power’s
 12 distribution reliability-related capital expenditures in addition to the Newfoundland
 13 Power SAIDI and CEA SAIDI reliability data (also provided on a three-year average
 14 basis).

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⁴ See RFI NP 2019/2020 GRA CA-NP-023.

⁵ Newfoundland Power and CEA reliability metrics approximated from NP 2019/2020 GRA RFI CA-NP-023.

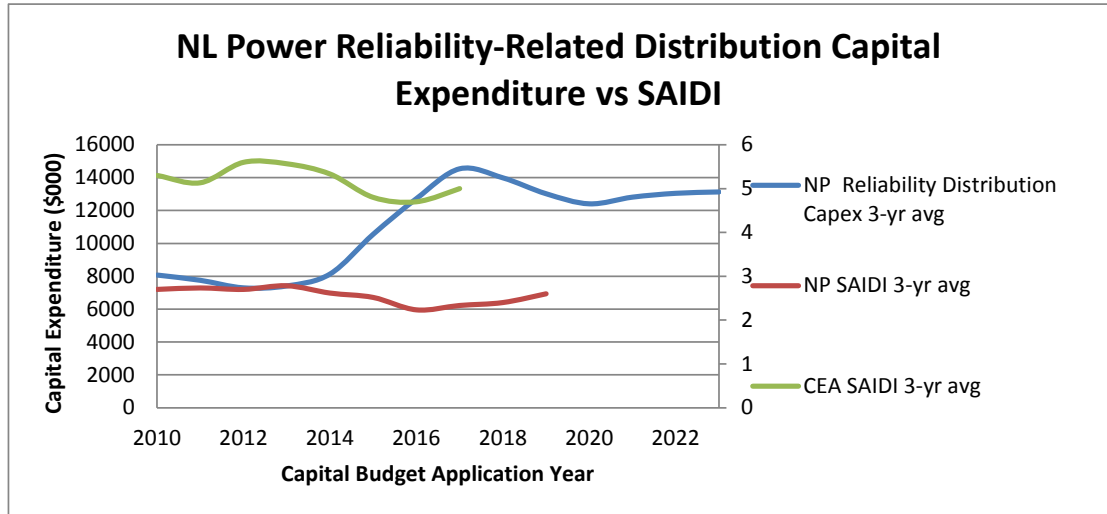


Figure 4: Newfoundland Power Reliability-Related Distribution Capital Expenditure vs. SAIDI

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Hydro observes that Figures 3 and 4 indicate that despite Newfoundland Power’s reliability performance exceeding the Canadian average over the past 10 years, Newfoundland Power’s reliability-related capital expenditures have trended upward.

Newfoundland Power’s Distribution Reliability Initiative is an annually proposed capital program, aiming to reconstruct distribution lines which underperform compared to the company average, based on reliability statistics such as SAIDI and SAIFI.⁶ By targeting distribution feeders whose performance is worse than the company average, Newfoundland Power appears to target continued reduction in the frequency and duration of customer outages.

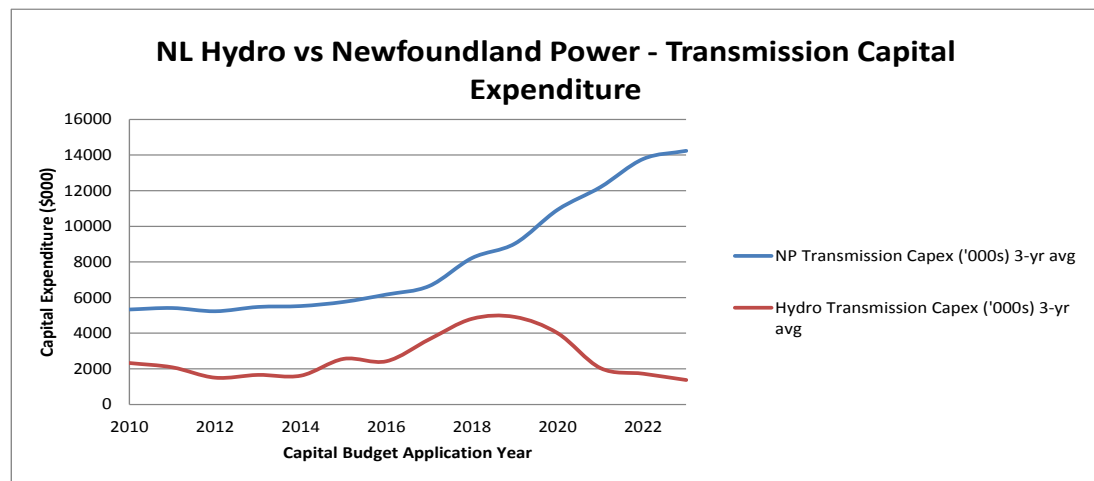
Without considering additional metrics, an approach based solely on internal performance metrics can result in the reconstruction, partial reconstruction, or

⁶ See Newfoundland Power’s 2018 Capital Budget Application.

1 refurbishment of feeders whose performance are comparable or exceed the
 2 Canadian average. For context, the reliability performance of 139 of Hydro’s 149
 3 distribution feeders exceed Newfoundland Power’s company average for SAIDI and
 4 SAIFI, and therefore would be candidates for reconstruction, partial reconstruction,
 5 or refurbishment under their Distribution Reliability Initiative.

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 7 **Transmission Capital Expenditures**

8 Figure 5 provides Transmission Capital Expenditures for both companies for 69 and
 9 138 kV radial transmission lines.

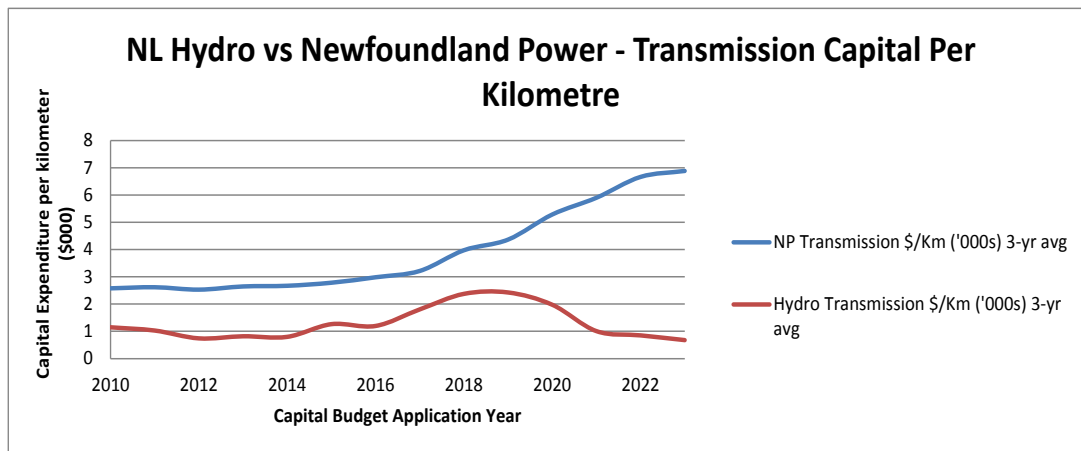


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 12 **Figure 5: Transmission Capital Expenditures**

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 14 Over the period of 2010-2023, Newfoundland Power’s proposed or planned
 15 average annual capital expenditure on transmission has trended upwards, and has
 16 consistently exceeded that of Hydro for 69 and 138 kV radial transmission lines.
 17 Newfoundland Power’s average annual proposed capital expenditure for the period
 18 2010 to 2018 was \$6.2M, whereas their planned transmission capital expenditure
 19 for the period 2019 to 2023 is \$12.2M. Hydro’s average annual expenditures over

1 each period are \$2.5M and \$3M, respectively. Figure 6 provides Transmission
 2 Capital Expenditures for both companies for 69 and 138 kV radial transmission lines
 3 on a per kilometre (km) basis.

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6 **Figure 6: Hydro vs Newfoundland Power – Transmission Capital Expenditure per Km**

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8 Figure 6 shows that on a per-km basis, Newfoundland Power’s capital expenditures
 9 on 69 kV and 138 kV transmission lines materially exceeded that of Hydro on a
 10 historical basis. The cost difference on a planned basis is more pronounced. On an
 11 annual average per-kilometre basis, Newfoundland Power’s proposed transmission
 12 capital expenditures were approximately \$2,800/km from 2010 to 2018, and
 13 planned expenditures from 2019 to 2023 average approximately \$5,900/km. For
 14 comparison, Hydro’s transmission capital expenditures for comparable periods
 15 were \$1,200/km and \$1,500/km respectively.

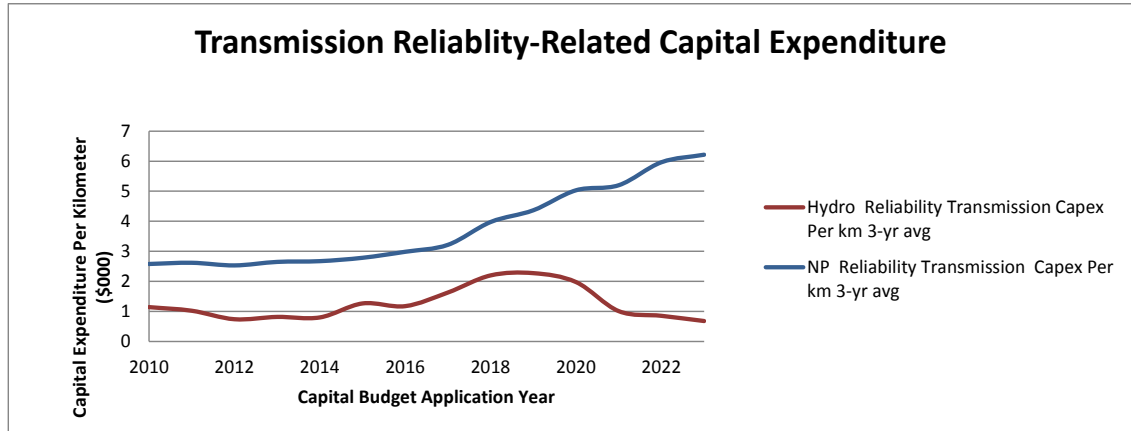
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17 **Transmission Reliability-Related Capital Expenditures**

18 Figure 7 compares Hydro’s planned Transmission Reliability-Related capital
 19 expenditure proposals per kilometre to that of Newfoundland Power. It is apparent

1 that Newfoundland Power’s expenditure per kilometre have increased over the
 2 period.

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5 **Figure 7: Transmission Reliability-Related Capital Expenditure**

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7 Through the Wood Pole Line Management (WPLM) program, Hydro inspects wood
 8 pole transmission lines in a sustained, planned manner. Any deficiencies noted
 9 during inspection are then addressed through targeted refurbishment or
 10 replacement of specific components. From 2010 to 2019, the WPLM program
 11 proposed costs averaged \$2.6M. In contrast to Hydro’s approach, Newfoundland
 12 Power’s Transmission Line Rebuild program includes the reconstruction of
 13 transmission lines which Newfoundland Power deems to have reached “end of
 14 service life”, at an average cost of \$6.3M annually over the period of 2010 to 2019,
 15 and a planned average cost of \$9.1M from 2019 to 2023.

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17 In their 2018 Capital Budget, Newfoundland Power proposed the complete
 18 replacement of 363 L, a 138 kV Transmission Line built in 1963, between the Baie
 19 Verte Junction Substation and Seal Cove Substation over a four year duration
 20 starting in 2018 at a total Capital cost of \$13,350,000. For comparison, Hydro

1 maintains and operates TL 224, a 138 kV Transmission line between Howley to
2 Indian River, built in 1962, which is located within a similar geographic region and
3 exposed to comparable environmental weather patterns. Under the inspection and
4 maintenance requirements outlined in the WPLM, Hydro has effectively maintained
5 reliability to customers of TL 224 using the WPLM at a cost of approximately
6 \$450,000. The current condition of TL 224 indicates that approximately 95% of the
7 line components are rated 2 or above indicating the condition of the line is
8 excellent and does not require full scale replacement. Hydro believes this example
9 provides a useful comparison of Hydro and Newfoundland Power's transmission
10 asset renewal strategies.⁷

11 **Summary of Observations**

- 13 • Hydro's capital expenditures on distribution are comparable to that of
14 Newfoundland Power, on a per-kilometre basis. Direct comparison of
15 distribution capital expenditures in the context of reliability is difficult given
16 that Hydro's distribution systems are rural in nature, and a breakdown of
17 Newfoundland Power's rural vs urban expenditures is not readily available.
- 18 • Newfoundland Power's capital program, in particular its Distribution
19 Reliability Initiative, continues to drive substantial investment in distribution
20 infrastructure despite Newfoundland Power's reliability statistics being
21 significantly better than the CEA average. It appears that if Newfoundland
22 Power took ownership of Hydro's distribution assets, the Distribution

⁷ Newfoundland Power has stated in the Capital Budget Application that inspections have identified construction standards, materials, and hardware used in the construction of the line are not to Newfoundland Power's standards and that components of the line are in advanced stages of deterioration and require replacement, as the transmission line has reached a point where continued maintenance is no longer feasible and it must be rebuilt to continue safe, reliable operation.

- 1 Reliability Initiative would likely result in material capital investment in the
2 distribution assets transferred from Hydro.
- 3 • Hydro's past and proposed capital expenditures on 69 and 138 kV
4 transmission lines are significantly lower than that of Newfoundland Power,
5 both on an absolute and per-kilometre basis. The reason for the difference
6 appears to be primarily a result of Hydro utilizing its WPLM to maximize the
7 useful life of its transmission lines, whereas Newfoundland Power uses a
8 Transmission Rebuild approach.