

1 **Q. Please provide the 10-year capital expenditure history; and the most recent 5-year**  
 2 **projected capital forecast (i.e. Newfoundland Power's 2020 Capital Budget**  
 3 **Application filing) in the following categories:**

4 **a. Distribution capital (Island Interconnected Distribution)**

5 **b. Transmission capital (Island transmission, excluding 230 KV) broken down as**  
 6 **follows:**

7 **i. Transmission lines.**

8 **ii. Transmission terminal stations/substations.**

9 **iii. Other (balance of transmission capital), if any.**

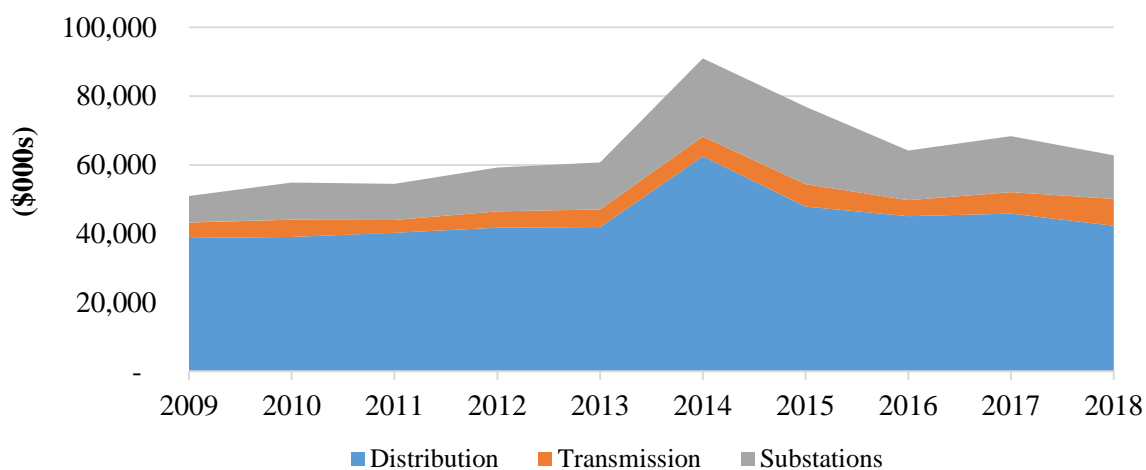
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 11 **A. A. Historical Capital Expenditures**

12 *Annual Expenditures*

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 14  
 15 Newfoundland Power is required to routinely invest in its electrical system to ensure the  
 16 delivery of safe and reliable service to customers. The Company targets stability and  
 17 predictability in its annual capital budgeting. This is conducive to rate stability for  
 18 customers and the maintenance of overall system performance.<sup>1</sup>

19  
 20 Figure 1 shows Newfoundland Power’s historical capital expenditures over the 10-year  
 21 period 2009 to 2018 related to distribution, transmission and substations.<sup>2</sup>

**Figure 1:  
 Historical Capital Expenditures  
 Distribution, Transmission and Substations  
 (2009 to 2018)**



<sup>1</sup> Rate stability and predictability are among the regulatory principles established by the Board. See, for example, Order No. P.U. 19 (2003), page 15.

<sup>2</sup> See Attachment A to this response for the corresponding data for Figure 1. Capital expenditures were higher in 2014 than in previous years as a result of: (i) the one-time replacement of the Bell Island submarine cable at a cost of approximately \$13.4 million; (ii) \$2.9 million in supplemental expenditures to improve system operations following the widespread outages known as #darknl; and (iii) increased substation expenditures related to the procurement of a portable substation, the installation of 2 power transformers and the associated coordination of required refurbishment and modernization work.

1 Over the period 2009 to 2018, approximately 54% of distribution, transmission and  
 2 substation-related capital expenditures were associated with the replacement of existing  
 3 plant. This is reflective of the general age of Newfoundland Power's electrical system  
 4 and the need to maintain overall system condition.

### 5 ***Distribution***

6 Newfoundland Power operates approximately 10,500 km of distribution lines to serve its  
 7 customers. These distribution lines have been in service for an average of 33 years.

8 Distribution-related capital expenditures are primarily driven by rebuilding aged and  
 9 deteriorated infrastructure and new customer connections. These expenditures are guided  
 10 by structured programs to respond to the needs of customers, such as the *Distribution*  
 11 *Reliability Initiative*,<sup>3</sup> *Feeder Additions for Load Growth*,<sup>4</sup> and *Rebuild Distribution*  
 12 *Lines*.<sup>5</sup>

13 Over the period 2009 to 2018, the kilometres of distribution line maintained by  
 14 Newfoundland Power increased by approximately 2.0% per year.<sup>6</sup> Distribution-related  
 15 capital expenditures, on the other hand, remained reasonably stable, increasing by  
 16 approximately 1.0% per year over the same period.<sup>7</sup> Reliability-related capital  
 17 expenditures on the distribution system have also remained reasonably stable.<sup>8</sup>

### 18 ***Transmission***

19 Newfoundland Power operates approximately 2,100 km of transmission lines to serve its  
 20 customers. These transmission lines vary in age with approximately: (i) 23% of total line  
 21 length built in the 1950s and 1960s; (ii) 48% built in the 1970s and 1980s; and (iii) 29%  
 22 built following the 1980s.

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<sup>3</sup> Newfoundland Power's *Distribution Reliability Initiative* ("DRI") is a capital program aimed at improving the reliability of the Company's worst-performing feeders where customers experience significantly below-average reliability. This program is consistent with good utility practice and involves: (i) annually assessing the reliability performance of each feeder based on standard industry metrics; (ii) determining the cause of reliability issues for the 15 worst-performing feeders for each metric; and (iii) completing engineering assessments, where appropriate, to determine whether targeted capital expenditures on a feeder would improve reliability for customers in a particular area.

<sup>4</sup> The *Feeder Additions for Load Growth* program consists of expenditures to address overload conditions and provide additional capacity to address growth in the number of customers and related electricity requirements.

<sup>5</sup> The *Rebuild Distribution Lines* program involves the replacement of deteriorated distribution structures and electrical equipment that have been previously identified through the ongoing preventative maintenance program or engineering reviews. Projects completed under this program consist of either the complete rebuilding of deteriorated distribution line sections or the selective replacement of various line components.

<sup>6</sup> Newfoundland Power maintained approximately 8,900 km of distribution line in 2009 and 10,500 km in 2018.

<sup>7</sup> Distribution-related capital expenditures totaled approximately \$38.8 million in 2009 and \$42.3 million in 2018.

<sup>8</sup> For example, capital expenditures under Newfoundland Power's DRI have remained reasonably consistent. Over the first 5 years of the program from 1998 to 2002, capital expenditures averaged approximately \$1.5 million per year. Over the most recent 5 year period from 2015 to 2019, capital expenditures averaged approximately \$1.3 million per year.

1 Transmission-related capital expenditures are primarily driven by the need to rebuild  
 2 aged transmission lines, preventative capital maintenance on aged and deteriorated  
 3 transmission structures, and third-party relocation requests. Required rebuilds are  
 4 completed in accordance with the Company's long-term *Transmission Line Rebuild*  
 5 *Strategy*.<sup>9</sup> This strategy prioritizes the rebuilding of transmission lines based on physical  
 6 condition, risk of failure, and potential customer impact in the event of a failure.

7  
 8 Transmission-related capital expenditures increased by approximately \$3.2 million  
 9 between 2009 and 2018. Increased transmission-related expenditures over this period  
 10 reflect the need to maintain the condition of Newfoundland Power's aging transmission  
 11 lines. All transmission lines that have been rebuilt to date were originally constructed  
 12 between the 1930s and 1960s.

### 13 *Substations*

14  
 15  
 16 Newfoundland Power operates 130 substations to serve its customers. These substations  
 17 range in age from 17 to over 100 years and contain over 4,000 pieces of electrical system  
 18 equipment.

19  
 20 Substation-related capital expenditures are primarily driven by preventative capital  
 21 maintenance and modernization, breakdown capital maintenance, government regulations  
 22 and system load growth. Much of the capital work required to maintain the Company's  
 23 substations is completed under its long-term *Substation Refurbishment and*  
 24 *Modernization Plan*.<sup>10</sup> Under this plan, projects are identified based on the condition of  
 25 the infrastructure and equipment, the need to upgrade and modernize protection and  
 26 control systems, and other relevant work.<sup>11</sup>

27  
 28 Substation-related capital expenditures increased by approximately \$5.0 million between  
 29 2009 and 2018. Increased substation-related expenditures reflect the need to modernize  
 30 and refurbish aging substation equipment and the government-mandated phase-out of  
 31 Polychlorinated Biphenyls ("PCBs").<sup>12</sup> Substation-related expenditures over the period  
 32 also reflect an increased number of power transformer installations due to system load  
 33 growth.<sup>13</sup>

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<sup>9</sup> Newfoundland Power filed its *Transmission Line Rebuild Strategy* with the Board as part of its 2006 *Capital Budget Application*.

<sup>10</sup> Newfoundland Power's *Substation Refurbishment and Modernization Plan* is the result of the *Substation Strategic Plan* filed with the Company's 2007 *Capital Budget Application*.

<sup>11</sup> Capital work to refurbish and modernize substations is generally coordinated with other substation-related work, such as the need to install new power transformers. This coordination reduces overall costs and outages to customers.

<sup>12</sup> Government of Canada regulations require that substation transformer bushings, breakers and instrument transformers with: (i) PCB concentrations of greater than 500 ppm be removed from service by 2014; and (ii) PCB concentrations of greater than 50 ppm be removed from service by the end of 2025. The PCB phase-out program accounted for an increase of approximately \$850,000 in substation-related capital expenditures in 2018 compared to 2009. Expenditures under this program ranged as high as approximately \$3.4 million in 2013.

<sup>13</sup> Between 2009 and 2018, Newfoundland Power installed 14 power transformers to accommodate load growth, with 7 installed between 2014 and 2016. This compares to a forecast 3 installations over the 6-year period from 2019F to 2024F.

1           **B. Forecast Capital Expenditures**

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3           Newfoundland Power files a *5-Year Capital Plan* with the Board as part of its annual  
4           capital budget application. The capital plan is based on the best available information at  
5           the time of plan development and is typically the starting point for the development of the  
6           Company's next annual capital budget.<sup>14</sup>

7  
8           Table 1 provides Newfoundland Power's forecast capital expenditures for the period  
9           2019F to 2024F for distribution, transmission and substations.<sup>15</sup>

**Table 1:**  
**Forecast Capital Expenditures**  
**Distribution, Transmission and Substations**  
**2019F to 2024F**  
**(\$000s)**

	<b>2019F</b>	<b>2020F</b>	<b>2021F</b>	<b>2022F</b>	<b>2023F</b>	<b>2024F</b>
Distribution	41,178	44,623	48,124	47,793	49,929	52,110
Transmission	11,181	9,623	12,322	15,218	13,974	14,198
Substations	19,731	15,204	16,921	17,585	17,896	18,182

10           Over the period 2019F to 2024F, approximately  $\frac{2}{3}$  of forecast capital expenditures for  
11           distribution, transmission and substations relate to the replacement of existing plant.

12  
13           Forecast distribution-related capital expenditures include a new program to replace all  
14           existing High-Pressure Sodium ("HPS") street lighting fixtures with Light Emitting  
15           Diode ("LED") technology. Newfoundland Power intends to complete this program over  
16           a 6-year period commencing in 2021 at an annual cost of approximately \$5.6 million.<sup>16</sup>  
17           Distribution-related capital expenditures otherwise remain relatively consistent  
18           throughout the forecast period.

19  
20           Forecast transmission-related capital expenditures reflect the Company's continued focus  
21           on rebuilding aged transmission lines, with an increase in the kilometres of transmission

<sup>14</sup> In Order No. P.U. 35 (2003), the Board required that Newfoundland Power file a 5-year capital plan as part of its annual capital budget applications. While the Board does not specifically approve the 5-year capital plan, the Board indicated that it provides a mechanism for maintaining the stability and predictability of the capital budget and capital works program. For that reason, forecast expenditures are generally viewed as broadly indicative, as opposed to precisely accurate.

<sup>15</sup> Forecast capital expenditures in 2019 are based on Newfoundland Power's *2019 Capital Budget Application*, approved by the Board in Order No. P.U. 35 (2018), and supplemental expenditures approved in Order Nos. P.U. 5 (2019) and 6 (2019). Forecast capital expenditures for the 2020 to 2024 period reflect the *5-Year Capital Plan: 2020-2024* filed as part of the Company's *2020 Capital Budget Application*.

<sup>16</sup> As part of Newfoundland Power's *2019/2020 General Rate Application*, the Company sought approval to introduce LED street lighting as a new service option for customers. LED street lights are more efficient, provide a better lighting quality, and are the preferred lighting technology among customers. The Board approved the introduction of this service offering in Order No. P.U. 2 (2019).

1 line to be rebuilt each year. Newfoundland Power plans to continue its approach of  
2 rebuilding transmission lines constructed in the 1960s that are experiencing deterioration,  
3 constructed from non-standard equipment, and approaching the end of their useful service  
4 lives.<sup>17</sup> Engineering assessments will be completed over the forecast period to determine  
5 specific rebuild requirements.

6  
7 Forecast substation-related capital expenditures reflect the continuation of Newfoundland  
8 Power's structured approach for refurbishing and modernizing its substations. Forecast  
9 expenditures also include the addition of 3 power transformers to accommodate load  
10 growth on the Avalon Peninsula. Engineering studies will be completed over the forecast  
11 period to determine specific requirements for power transformers.

### 12 **C. Balancing Costs and Reliability**

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15 The reliability experienced by customers is principally a reflection of the general  
16 condition of the electrical system. Newfoundland Power manages its operations,  
17 including its capital programs, in a manner that results in the least-cost delivery of  
18 reliable service to customers, as required by the provincial power policy.<sup>18</sup>

19  
20 Newfoundland Power's management of its operations has resulted in an improvement in  
21 reliability of almost 40% over 2 decades at a reduced cost to customers of approximately  
22 24%.<sup>19</sup> This performance is consistent with the Company's obligation to deliver reliable  
23 service to customers at least cost.

24  
25 This performance is also consistent with the findings of The Liberty Consulting Group  
26 ("Liberty") in 2014. Regarding Newfoundland Power, Liberty observed:

27  
28 *"Newfoundland Power's reliability has improved significantly since 1999 and has*  
29 *recently remained stable overall. Its transmission and distribution systems*  
30 *operate effectively in ensuring adequate service reliability. Effective maintenance*  
31 *and capital programs, that appropriately recognize the age of its assets, have*  
32 *contributed materially to improved reliability."*<sup>20</sup>

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<sup>17</sup> For example, in 2020 Newfoundland Power is planning to conclude a multi-year project to rebuild transmission line 363L, first approved by the Board in Order No. P.U. 37 (2017). Transmission line 363L was originally constructed in 1963 and is a radial transmission line that serves as the only source of supply for customers on the Baie Verte Peninsula. A failure of transmission line 363L could result in prolonged outages to all customers in that area. Inspections identified significant deterioration of the line due to decay, splits and checks in the poles and spar arms, cracks in insulators and other hardware deficiencies, as well as non-standard and damaged conductor. Newfoundland Power commenced a multi-year project to rebuild the line in 2018. For more information, see Newfoundland Power's 2020 Capital Budget Application, Report 3.1 2020 Transmission Line Rebuild, page 2.

<sup>18</sup> Section 3(b)(iii) of the *Electrical Power Control Act, 1994* establishes that power be provided to customers in the province at the lowest possible cost consistent with reliable service.

<sup>19</sup> See response to Information Request PUB-NP-055, Attachment C, for more details on Newfoundland Power's performance over a 20-year period.

<sup>20</sup> See Liberty's *Report on Island Interconnected System to Interconnection with Muskrat Falls addressing Newfoundland Power Inc.*, December 17, 2014, page ES-2.

1                    *“Newfoundland Power annually budgets various rebuild and modernization*  
2                    *capital projects to address transmission, distribution, and substation reliability*  
3                    *issues and to proactively address aged equipment condition and obsolescence*  
4                    *issues. Annual capital strategies include measures (Transmission Rebuild*  
5                    *Strategy, Rebuild Distribution Lines Projects, Distribution Reliability Initiative,*  
6                    *and Substation Refurbishment and Modernization Strategy) well targeted to the*  
7                    *needs of its equipment. Asset management strategies have promoted improved*  
8                    *system reliability since 1998, while keeping annual capital T&D expenditures*  
9                    *under control.”*<sup>21</sup>

10  
11                    Overall, Newfoundland Power’s historical and forecast capital expenditures are  
12                    consistent with stable and predictable expenditures, good utility practice, and the delivery  
13                    of reliable service to customers at least cost.

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<sup>21</sup> Ibid., page 52.

**Historical Capital Expenditures  
(2009 to 2018)**

Table A-1 provides Newfoundland Power's annual capital expenditures for distribution, transmission and substations as shown in Figure 1 of this response.

**Table A-1:**  
**Historical Capital Expenditures**  
**Distribution, Transmission and Substations**  
**2009 to 2018**  
**(\$000s)**

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	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
Distribution	38,769	39,098	40,262	41,768	41,976	62,526	47,884	45,072	45,879	42,333
Transmission	4,520	5,011	3,689	4,694	5,081	5,736	6,490	4,661	6,224	7,806
Substations	7,658	10,794	10,527	12,741	13,714	22,709	22,515	14,402	16,226	12,662