APPENDIX E

VEGETATION MANAGEMENT PROGRAM

OVERVIEW

Vegetation management is the practice of clearing trees and bushes from transmission and distribution rights of way to prevent outages caused by vegetation coming in contact with power lines and create a safe work space for power line technicians. As discussed in Section 4.2.3 of the 2023 General Rate Application ("Application"), over 50 per cent of Maritime Electric's outages are caused by wind and tree contacts, which suggests that improved tree clearances would have prevented many of these outages. Having trees in close proximity to power lines also presents a significant safety hazard for power line technicians.

The Company plans to address these reliability and safety concerns by significantly improving the vegetation management cycle and transitioning to a ten-year cycle for distribution and a seven-year cycle for transmission by 2027.[1] The evidence that follows will demonstrate that the 2021 operating budget for vegetation management is materially insufficient to allow for a vegetation management cycle in line with industry practice.

As discussed in Section 5.1.2 of the Application, the Company seeks approval to increase the operating budget for transmission and distribution rights of way from $1.8 million in 2021 to $4.0 million by 2025.[2]

Benefits of Expanded Vegetation Management

Expanding vegetation management will result in safety, reliability and cost benefits.

Safety is Maritime Electric's highest priority. Therefore, the safety benefits of a proper vegetation management cycle is a key driver in this plan. Proximity of trees to transmission or distribution lines increases the safety hazard for power line technicians and utility arborists who are required to work on or near the lines. Such proximity requires a layer of safety protocols including the use

[1] A vegetation management cycle is the number of years between first trimming or ground cutting a right of way, when the distribution or transmission line was constructed and returning to trim or ground cut the vegetation growth. Good utility practice requires a higher reliability standard and, therefore, a shorter transmission cycle, compared to a distribution cycle, due to the impact on customer outages.

[2] The 2021 rights of way approved budget was composed of $1.4 million for distribution and $0.4 million for transmission. The proposed 2025 budget is composed of $3.4 million for distribution and $0.6 million for transmission.

of specialized equipment and protection permits. Managing vegetation prior to it reaching the power lines is the best way to reduce this hazard.

Reliability is increasingly important to customers and it is a key metric used by Maritime Electric to assess its performance.

Proper maintenance of the electrical system is necessary to provide an acceptable level of reliability for customers, and Electricity Canada (formally known as the Canadian Electrical Association) indicates that the industry average for tree-related outages from 2011 to 2021 was 14 per cent. In comparison, Maritime Electric outage statistics for that same period show that 33 per cent of reported outages, excluding the impact of post-tropical storm Dorian, were attributed to trees and/or wind, which is well above the industry average.

Maritime Electric's customers report reliability dissatisfaction as one of the key reasons for a poor opinion of the Company. This dissatisfaction can be linked to Maritime Electric's five-year rolling average for SAIDI (All In), which is trending upwards.[3] Reliability impacts increase significantly during major storm events where the effects of not achieving a reasonable vegetation management cycle are magnified and often result in longer restoration times.

Furthermore, as the Province transitions to the use of electricity as a clean fuel source and customers switch to electric heat sources and electric vehicles, the expectations for reliability will increase even beyond current levels. Therefore, without a reasonable vegetation management cycle customers' satisfaction is expected to deteriorate.

Cost efficiencies will be achieved with Maritime Electric's plan to enhance vegetation management. The proposal includes an increase in ground cutting. If an area is ground cut, it generally means vegetation management will not be needed for a longer period of time. In comparison, the Company's experience indicates that if an area is only trimmed, vegetation management could be needed in as little as three years. Therefore, ground cutting is more cost effective.

[3] SAIDI (All In) refers to System Average Interruption Duration Index under all operating conditions (i.e., including major system events) and is discussed in Section 4.2.2 of the Application.

In addition, by maintaining a reasonable vegetation management cycle even trimming activities will be more cost effective. Without a reasonable trimming cycle, costs to trim are generally one and a half to two times higher because the trees grow up and around the lines, which then requires protection permits and additional work safe procedures. Vegetation management activities performed after the trees reach energized lines is a suboptimal use of the existing budget.

Maritime Electric's Expanded Vegetation Management

The increased operating budget will allow Maritime Electric to: (i) shorten the vegetation management cycle; (ii) focus on ground cutting rather than trimming; (iii) complete a re-vegetation pilot project; and (iv) identify opportunities to recycle the cut vegetation.

Vegetation Management Cycle

Maritime Electric's 2021 rights of way budget of $1.8 million results in a 35-year cycle for distribution lines and a 14-year cycle for transmission lines.[4]

In assessing what would be a reasonable vegetation management cycle, the Company obtained information from other Atlantic Canadian utilities and a sister utility in the United States that have a similar vegetation profile as Prince Edward Island. Table E-1 provides some of the details of this research.

TABLE E-1
Utility Comparison – Distribution Vegetation Management

Utility[5]	Kilometers of Distribution A	2020 Budget B	Budget/km C = B/A	Cycle[6] (years)
Central Hudson (Fortis utility)	11,514	$ 25,300,000	$ 2,197	4.5
Nova Scotia Power[7]	25,000	25,000,000	1,000	8
NB Power	21,434	10,200,000	476	5 to 7
Maritime Electric[8]	5,780	1,376,400	238	35

[4] Distribution: $48.5 million (total cost from Table E-2) / $1.4 million (2021 budget) = 35 years; Transmission: $5.5 million (total cost from Table E-2) / $0.4 million (2021 budget) = 14 years.

[5] Newfoundland Power was not included in the analysis as their vegetation profile is not as densely populated and their growing cycle is shorter than Prince Edward Island.

[6] Hydro One in Ontario, which has a vegetation profile similar to Prince Edward Island, has a vegetation management cycle of six to eight years (https://www.hydroone.com/about/corporate-information/vegetation-management/practices).

[7] Nova Scotia Power's vegetation management program includes a budget to widen existing distribution rights of way, and the eight-year cycle is their target.

[8] Maritime Electric's kilometres of distribution is for over-head lines only.

As Table E-1 demonstrates, Maritime Electric's distribution vegetation management cycle is significantly higher than the other utilities, which averages six years. In addition, good utility practice recommends a vegetation management cycle of five to ten years, depending on the type of vegetation and climate. Climate change has resulted in warmer temperatures and longer growing seasons, which has resulted in utilities adjusting their vegetation management cycles to be more frequent than past practice.

To determine what it would cost to shorten the vegetation management cycle, Maritime Electric analyzed its vegetation management cost by span.[9]

In 2019 the Company completed a vegetation inspection of all of its off-road transmission system and almost half of its roadside transmission and distribution system. Extrapolating the results of this inspection, it is estimated that 60,600 distribution spans and 6,400 transmission spans require urgent vegetation management to avoid a significant deterioration of reliability.

Vegetation management includes two main cutting techniques: (i) trimming, which is cutting the trees and/or bushes such that they are three metres below the wire; and (ii) ground cutting, which is cutting the trees and/or bushes at ground level. Industry preference is to ground cut where possible because it is more cost effective.

Table E-2 calculates the total cost to appropriately address the 67,000 spans that require urgent vegetation management.

[9] A span refers to the area between two poles, in which the vegetation is located, and Maritime Electric has 10,333 transmission spans, of which 7,089 are roadside and 3,244 are off-road, and 79,733 distribution spans, which are mostly roadside.

TABLE E-2 Vegetation Management Costs			
	Trim	**Ground Cut**	**Total**
Distribution			
Number of Spans	48,500	12,100	60,600
Cost per Span	$ 700	$ 1,200	
Subtotal	**$ 33,950,000**	**$ 14,520,000**	**$ 48,470,000**
Transmission			
Number of Spans	4,300	2,100	6,400
Cost per Span	$ 700	$ 1,200	
Subtotal	**$ 3,010,000**	**$ 2,520,000**	**$ 5,530,000**
Total			**$ 54,000,000**

The Company first considered a target cycle of six years for the distribution system, consistent with average of the utilities in Table E-1. Based on an estimated total distribution cost of $48.5 million, achieving a distribution vegetation management cycle of six years would require an annual budget of $8.1 million. The Company considered an increase of approximately $6.7 million to be too high for customers.[10]

Alternatively, achieving a 10-year cycle for the distribution system, the upper end of industry practice and 7 years for the transmission system would lower the required budget increase while still achieving an acceptable vegetation management cycle necessary to ensure reliability. This option would require a one-time increase of $3.4 million for distribution and $0.4 million for transmission, which is still a significant one-time increase for customers.[11]

As an alternative, the Company considered a gradual transition over a five-year period to the required annual amount. Therefore, the Application proposes that the annual rights of way budget be increased by approximately $0.7 million annually until it reaches $4.0 million in 2025, as shown in Table E-3.[12]

[10] $8.1 million less $1.4 million (2021 distribution budget) = $6.7 million.

[11] Distribution: $48.5 million / 10 years = $4.9 million/year compared to $1.4 million (2021 distribution budget) = $3.5 million increase; Transmission: $5.5 million / 7 years = $0.8 million/year compared to $0.4 million (2021 transmission budget) = $0.4 million increase.

[12] $4.0 million (2025 proposed transmission and distribution budget) less $1.8 million (2021 transmission and distribution budget) = $2.2 million / 3-year rate-setting period = $730 thousand per year.

TABLE E-3 Proposed Rights of Way Budget[13]				
	Kilometers A	**Budget B**	**Budget/km C = B/A**	**Cycle (years)**
2021 Distribution Budget	5,780	$ 1,435,700	$ 248	35
2025 Proposed Distribution Budget	**5,780**	**3,362,000**	**582**	**14**
2027 Proposed Distribution Budget	**5,780**	**4,900,000**	**848**	**10**
2021 Transmission Budget	761	399,800	525	14
2025 Proposed Transmission Budget	**761**	**627,000**	**824**	**9**
2027 Proposed Transmission Budget	**761**	**790,000**	**1,038**	**7**

Ground Cutting versus Trimming

As discussed above, ground cutting is more cost effective. However, on Prince Edward Island ground cutting is not permitted in certain areas. Municipal Tree Protection Bylaws, the Migratory Bird Convention Act, Provincial Heritage Highways protection, and agricultural hedgerow requirements impose limitations on the Company's ability to ground cut. Furthermore, poles are located along the edge of the rights of way and vegetation management has been limited to within the boundary of the rights of way.

Nonetheless, the Company estimates that it can increase its ground cutting efforts to account for approximately 20 per cent of the distribution spans.

Efforts are underway to partner with the Provincial Government to enhance vegetation management activities. This initiative includes the Provincial Government making changes to the permitting process.[14] In addition, the Company is pursuing a collaboration with the department of Transportation and Infrastructure whereby their forestry staff would assume some of the vegetation management activities. The Company will also pursue increasing the width of the rights of way where possible by acquiring permission to ground cut or trim trees on private property, which will reduce the risk of trees just outside the rights of way falling into the power lines and causing an outage.

[13] This Application seeks approval of the 2025 proposed forecasts only. The 2027 proposed budgets are presented to show the ultimate achievement of the recommended vegetation management cycles.

[14] The Company must obtain a permit in advance of vegetation management activities within Provincial rights of way and the permit will be revised to favour ground cutting activities.

To increase the social acceptance of ground cutting, the Company plans to develop a customer information and social media campaign to publicize the importance of maintaining trees around power lines, to encourage customers to avoid planting under power lines, and to educate customers on the best low growth vegetation to plant near power lines. It has been Maritime Electric's practice to obtain agreement from the private land owner, whose land is adjacent to the provincially owned rights of way, before ground cutting within that right of way. In select areas where ground cutting is permitted by the government, the Company will revise this practice.

In addition, the Company plans to launch a tree replacement pilot project. This pilot project would provide trees to customers in exchange for permission to ground cut trees on private property when vegetation poses a high risk to the power lines. This initiative presents carbon offsetting tree planting opportunities. Beyond working with private land owners, potential partnerships and sites for replacement tree planting may develop, such as partnering with Island Nature Trust, Parks Canada and other government groups.

Transmission Line Re-vegetation Pilot Project

The Company plans to investigate the benefit of planting low growth vegetation and/or pollinating vegetation within transmission rights of way after ground cutting has been completed. It is expected that planting alternate vegetation will limit or prohibit the regrowth of trees and, thereby, extend the vegetation management cycle.[15]

If successful and cost effective, the Company will consider expanding such an effort to the remainder of the transmission and distribution rights of way.

Recycle

The Company plans to pursue opportunities to collaborate with community and government groups to recycle the wood and chips from vegetation management activities.

[15] Canadian Electricity Association – The Grid 2021, page 20: https://issuu.com/canadianelectricityassociation/docs/cea_thegrid_2021?fr=sN2QxMTE1ODE1MTU

Conclusion

The evidence presented supporting an increased operating budget for vegetation management activities to maintain and improve system reliability for the benefit of Maritime Electric's customers.