
Newfoundland & Labrador

BOARD OF COMMISSIONERS OF PUBLIC UTILITIES

REFERENCE TO THE BOARD

**RATE MITIGATION OPTIONS AND IMPACTS
MUSKRAT FALLS PROJECT**

FINAL REPORT

FEBRUARY 7, 2020

BEFORE:

**Darlene Whalen, P. Eng., FEC
Chair and CEO**

**Dwanda Newman, LL.B.
Vice Chair**

**John O'Brien, FCPA, FCA, CISA
Commissioner**



NEWFOUNDLAND AND LABRADOR
BOARD OF COMMISSIONERS OF PUBLIC UTILITIES
120 Torbay Road, P.O. Box 21040, St. John's, Newfoundland and Labrador, Canada, A1A 5B2

February 7, 2020

The Honourable Siobhan Coady
Minister of Natural Resources
Provincial Office
100 Prince Philip Drive
Government of Newfoundland and Labrador
P.O. Box 8700
St. John's, NL A1B 4J6

Dear Minister:

On September 5, 2018 Government issued a Reference directing the Board to review and report on options to reduce the impact of the Muskrat Falls Project costs on electricity rates up to the year 2030. The Reference set out three questions to be addressed by the Board and directed the Board to provide its final report by January 31, 2020. This date was subsequently extended to February 7, 2020.

The enclosed report is submitted in accordance with the requirements of the Reference.

Respectfully submitted,

A handwritten signature in blue ink that appears to read "Darlene Whalen".

Darlene Whalen, P. Eng., FEC
Chair and CEO

A handwritten signature in blue ink that appears to read "Dwanda Newman".

Dwanda Newman, LL.B.
Vice Chair

A handwritten signature in blue ink that appears to read "John O'Brien".

John O'Brien, FCPA, FCA, CISA
Commissioner

EXECUTIVE SUMMARY

The Reference

On September 5, 2018 Government issued a Reference to the Board of Commissioners of Public Utilities (the “Board”) directing the Board to review and report on three Reference Questions related to the Muskrat Falls Project: i) options to reduce the impact of the Muskrat Falls Project Costs on electricity rates; ii) the amount of energy and capacity from the Muskrat Falls Project required to meet Island Interconnected load and the remaining surplus energy and capacity available for other uses such as export and load growth; and iii) the potential electricity rate impacts of the options identified based on the most recent Muskrat Falls Project cost estimates.

In answering the Reference Questions the Board was directed to consider the power policy of the Province as well as i) potential Nalcor income and other cost savings within Nalcor and its subsidiaries that could be used to reduce rates, ii) whether it is more advantageous to maximize domestic load or maximize exports sales and electrification and energy conservation options to facilitate each, iii) forward looking cost savings and opportunities for increased efficiency for operating and maintenance costs for the Muskrat Falls Project, and iv) industry best practices related to external market purchases and sales of electricity.

Review Process

As required by the Reference an interim report of the Board’s preliminary findings on Questions 1 and 2 was provided to Government on February 15, 2019 based on preliminary reports from the Board’s expert consultants The Liberty Consulting Group (Liberty) and Synapse Energy Economics Inc. (Synapse) and stakeholder input. Final reports were filed by Liberty and Synapse in September 2019 following an extensive information gathering process.

Parties to the review included the Consumer Advocate, Nalcor, Newfoundland and Labrador Hydro (Hydro), Newfoundland Power and a group of Island Industrial customers. Limited standing was granted to a group of customers on the Labrador Interconnected system. A public hearing was held in October 2019 to hear presentations from the Board’s consultants and the Parties as well as other interested persons.

Forecast Rate Impacts

Based on the most recent project update released by Nalcor in June 2017 the average domestic rate for customers on the Island is forecast to increase to 22.89 cents/kWh in 2021 when the Muskrat Falls Project is commissioned and project costs are required to be included in customer rates. This is a 75% increase from the current average domestic rate of 13.06 cents/kWh. Industrial customers on the Island will also see significant rate increases. These extraordinary increases in rates were an overriding issue in the review with stakeholders expressing concern about rate shock and the resulting impact on customers. Island Industrial customers were especially concerned about their ability to remain competitive in a global economy stating: “The broad and steep impact of these projected rate increases is unprecedented in the history of electrical power regulation before the Board, and indeed appear to be unprecedented in recent North American experience.”

Rate Mitigation Options and Opportunities

Available options to reduce the impact of the Muskrat Falls Project costs on electricity rates include both cost savings and revenue opportunities in relation to operational synergies and efficiencies at Nalcor and Hydro, future operating and maintenance costs of the Muskrat Falls Project, as well as existing and new sources of income from financial sources and in-province load growth.

The financial opportunities identified include the returns and dividends from Muskrat Falls, Churchill Falls and Hydro, Nalcor's share of the export sales revenues, as well as water power rentals related to Muskrat Falls, Churchill Falls and Newfoundland Power. These opportunities represent the most significant source of potential mitigation, ranging from \$171 million in 2021 to \$526 million in 2030. The Board has recommended that these financial sources be applied to rate mitigation to the extent that it does not detrimentally impact the Province's financial position. This potential mitigation includes the recommendation that Hydro's target equity be reduced from 25% to 20%. Reducing the equity target would result in higher dividends in the early years following project commissioning when rate mitigation needs are highest. Considerations associated with these financial options include the impact on the Province with the redirection of Government revenues to rate mitigation and ensuring decisions with respect to Hydro's capital structure do not affect its self-sustaining status.

Operational opportunities to produce cost savings that could be used for rate mitigation were identified relating to the re-integration of Power Supply and Hydro, the implementation of additional efficiency and productivity measures at Nalcor and Hydro, and Muskrat Falls Project operating and maintenance costs. The estimated mitigation potential associated with these operational savings ranges from \$22 million in 2021 to \$48 million in 2030. These opportunities represent the only true cost savings identified and will not impact Government revenues. While the amounts are not as significant as those from the financial opportunities, over time the savings could be significant and will, in the Board's view, lead to a more efficient and effective utility. The Board has recommended that these operational opportunities be pursued. The primary consideration with the implementation of these measures is to ensure that the changes are effectively managed so that steady-state operation of the Muskrat Falls Project is not impacted.

Revenue opportunities arising from increased electrification in the building and transportation sectors in the Province were also considered. The primary consideration with electrification is to ensure that higher electricity use does not significantly impact the peak load on the system, requiring future capital investment and higher system costs. The mitigation potential was estimated to be in the range of \$40 million to \$70 million annually after 2025, but the revenue potential and timing of these revenues continues to be refined as a part of the significant ongoing work in relation to electrification and conservation programming in the Province. It would be premature to make specific recommendations on appropriate options to encourage electrification and conservation at this time as the required information is not available to allow informed decisions. The work currently underway by both Hydro and Newfoundland Power on the potential for electrification and energy conservation in the Province is critical and should be prioritized. Government and the utilities should work together to develop a comprehensive and coordinated approach on the development of the most appropriate programs for the Province.

Other mitigation opportunities identified during the review include the provincial portion of the HST and the elimination of the rural subsidy, which would both directly impact customers' bills. Revenues from Nalcor's oil and gas activities were also raised as a potential mitigation source but not included in the scope of the Board's review. In addition there may be mitigation potential associated with the Province's ongoing engagement with the Government of Canada in relation to the Muskrat Falls Project financing, though examination of this opportunity was suspended during this review when Government engaged in rate mitigation discussions with the Government of Canada.

Available Energy and Capacity for Load Growth and/or Export Sales

The amount of energy and capacity from the Muskrat Falls Project available for in-province load growth and/or export sales will depend on the total load requirements for the Island and Labrador Interconnected systems and whether the Recall energy and capacity from the Churchill Falls Plant is exported or used for meeting Island Interconnected load. The available energy for 2020-2030 for export and load growth after accounting for Nova Scotia commitments was estimated to be approximately 2000 GWh annually when Recall is used for export and 3500 GWh annually when Recall is used to meet provincial load. This surplus energy can be used to support both electrification needs and increased export sales. The availability and customer take-up of electrification and energy conservation programs as well as rate design options will affect this estimate. The examination of whether it is more advantageous to maximize export sales or maximize domestic load concluded that maximizing domestic load through electrification, improving energy efficiency and using demand response to reduce peak and allow for increased export sales leads to the best outcomes for customers. This is primarily because export market prices are currently low. Due to transmission constraints and the uncertainty surrounding the future capacity requirements in the Province, the amount of capacity that can be exported is relatively modest.

External Market Sales and Purchases – Industry Best Practices

The Board has reviewed industry best practices in relation to external market purchases and sales of electricity as requested in the Reference. The Board has recommended that Government take the following actions to ensure that best practices are followed:

- i) review and implement appropriate structural changes so that NEM takes direction from Hydro
- ii) implement regulatory oversight of NEM; and
- iii) allocate Nalcor's profits on export sales to reduce the costs to be recovered in rates.

Policy Considerations

To ensure compliance with the power policy of the Province of "least-cost reliable service" the Board has recommended that Government consider its options with respect to the implementation of independent oversight of the Muskrat Falls Project sustaining capital and operating and maintenance costs. In addition Government should consider whether regulatory oversight by the Board of Hydro's return on equity and capital structure should be re-instated. Existing policies related to rural rates in the Province may also need to be reconsidered in light of the significant rate increases expected.

Rate Impacts of Mitigation

When the Muskrat Falls Project is commissioned the average domestic rate for customers on the Island Interconnected system is forecast to increase to 22.89 cents/kWh. This is an increase of 75% from the current average domestic rate of 13.06 cents/kWh. Even if all the recommended sources of mitigation are applied it is estimated that rates will still increase by just over 50% to approximately 20 cents/kWh. There are also a number of factors that may significantly impact the revenue requirements to be recovered.

Island Industrial customers will also see significant rate increases which raised concerns during the review with respect to their ability to remain competitive in such a high-cost jurisdiction.

During the course of the review Government announced its intention to keep domestic rates on the Island Interconnected system at or below 13.5 cents/ kWh in 2021. While it is not clear whether this target rate will be maintained in subsequent years it is clear that, even with the application of the potential mitigation identified, domestic rates in 2021 would be well above the target rate. The mitigation shortfall to cover this gap is estimated to be just over \$400 million in 2021. In addition this amount would rise if there are increases in revenue requirements, for example as the result of changes to schedule and cost estimates of the Muskrat Falls Project, the timing of the transition of the Holyrood Plant and other cost increases. To close this substantial gap additional sources of mitigation will be necessary.

Next Steps

As Government develops its rate mitigation plan it will be necessary to determine the extent of the mitigation that is to be applied and the manner in which it is accomplished. The potential rate mitigation opportunities will have to be prioritized in the context of other Government priorities, existing Government policy and other considerations. Decisions will also have to be made as to how the identified rate mitigation sources are to be used to accomplish rate mitigation, which may raise issues related to the Muskrat Falls Project contractual and regulatory framework and accounting issues. An important consideration relates to the transparency of the rate mitigation measures and how they will be communicated to customers. Considering the imminent extraordinary rate increases and the extent of the work required to effect a rate mitigation plan, the Board has suggested a timeline for the consideration of Government in the development of its work plan.

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PART ONE: THE REFERENCE

1.0 SCOPE AND OBJECTIVES

This report presents the results of a review of rate mitigation options to reduce the impacts of the Muskrat Falls Project costs on electricity rates undertaken by the Board of Commissioners of Public Utilities (the “Board”) at the direction of the Government of Newfoundland and Labrador (“Government”). An interim report of preliminary findings was filed on February 15, 2019. This final report reflects the results of expert studies commissioned by the Board, input from stakeholders, as well as other information and analyses available to the Board.

2.0 MANDATE AND AUTHORITY

The Board is an independent administrative tribunal constituted under the *Public Utilities Act*, RSNL 1990, c. P-47. The Board is responsible for, among other things, the regulation of and general supervision of public utilities in the Province of Newfoundland and Labrador (“Province”). In carrying out its responsibilities the Board is required to implement the power policy set out in the *Electrical Power Control Act, 1994*, SNL 1994, c. E-5.1 (the “EPCA”). The EPCA also provides the authority for the Lieutenant-Governor in Council to direct the Board with respect to areas of its mandate and to exempt a public utility from the application of all or portions of the EPCA. Under section 5.1(1) of the EPCA the Lieutenant-Governor in Council may also refer a matter relating to power in the Province to the Board for review.

Nalcor Energy (“Nalcor”) is a provincial crown corporation created in 2007 by the *Energy Corporation Act, 2007*, c. E-11.01, to engage in activities in all areas of the energy sector in the Province and elsewhere, including the generation, transmission, distribution and export of power. The Board does not regulate Nalcor which is exempt from the provisions of the *Public Utilities Act* and the authority of the Board under section 17(2) of the *Energy Corporation Act*. Newfoundland and Labrador Hydro (“Hydro”) is a subsidiary of Nalcor and, as a public utility, is regulated by the Board under the *Public Utilities Act*, as is Newfoundland Power Limited (“Newfoundland Power”). While Hydro is subject to regulation, the Board’s jurisdiction may be limited by direction issued under section 5.1(1) of the EPCA.

Nalcor and certain of its subsidiaries is constructing the Muskrat Falls Project and will be responsible for its operation and maintenance when in-service. The Muskrat Falls Project Exemption Order issued under Order-in-Council 2013-342 pursuant to section 5.2 of the EPCA exempts the project from the Board’s review. The Board’s jurisdiction to review the costs incurred by Hydro in relation to the project was restricted by Order-in-Council 2013-343 which directs the Board to allow the recovery of the Muskrat Falls Project costs in the electricity rates of Island Interconnected customers without disallowance, reduction or alteration.

On September 5, 2018 Government issued a Reference under section 5.1(1) of the EPCA directing the Board to review and report on options to reduce the impact of Muskrat Falls Project costs on electricity rates setting out three Reference Questions to be addressed. A copy of the Reference is provided in Exhibit 1.

3.0 THE REFERENCE QUESTIONS

The Board was directed to review and report on the following three Reference Questions:

- 1) Options to reduce the impact of the Muskrat Falls Project costs on electricity rates up to the year 2030, or such shorter period as the Board sees fit, including cost savings and revenue opportunities with respect to electricity, including generation, transmission, distribution, sales, and marketing assets and activities of Nalcor Energy and its Subsidiaries, including Hydro, Labrador Island Link Holding Corporation, LIL General Partner Corporation, LIL Operating Corporation, Lower Churchill Management Corporation, Muskrat Falls Corporation, Labrador Transmission Corporation, Nalcor Energy Marketing Corporation, and the Gull Island Power Company.
- 2) The amount of energy and capacity from the Muskrat Falls Project required to meet Island interconnected load and the remaining surplus energy and capacity available for other uses such as export and load growth.
- 3) The potential electricity rate impacts of the options identified in Question 1, based on the most recent Muskrat Falls Project cost estimates.

In answering the Reference Questions the Board was directed to consider the power policy in the *EPCA* and the following:

- new and existing sources of Nalcor income that could be put towards reducing rate increases, including income from:
 - Nalcor power exports, including those from generation assets it owns or controls, the Muskrat Falls Project, and Churchill Falls recapture power, taking into account any export-related costs such as those relating to Nalcor Energy Marketing; and
 - any other effective opportunities to find synergies, efficiencies and reduce duplication and costs within Nalcor and its subsidiaries.
- whether it is more advantageous to ratepayers to maximize domestic load or maximize exports. Depending on the Board's recommendation, provide options for:
 - increasing domestic load, such as:
 - the electrification of industrial facilities and oil-fired boilers in heating plants; and
 - incentives for increased electrification and usage by ratepayers, including increasing number of ratepayers, electric vehicles and electric heating; or
 - increasing exports, such as:
 - incentives for energy conservation, including for lowering system peak demand to maximize system capacity reserves, in order to increase availability of energy and capacity for export.
- forward-looking cost savings and opportunities for increased efficiency related to operating and maintenance of the Muskrat Falls Project.
- what are industry best practices related to external market purchases and sales of electricity.

Dennis Browne, Q.C. was appointed by Government as the Consumer Advocate for the purpose of participating in the Reference.

4.0 REVIEW PROCESS

Given the requirement set out in the Reference to file an interim report by February 15, 2019, the Board decided to approach the review in two phases with the first phase focusing on the identification of potential rate mitigation options, cost savings, revenue enhancement opportunities and the load requirements of the Island Interconnected system required to answer Questions 1 and 2. The Board also decided that experts would be retained to provide preliminary findings and that an invitation for formal participation by parties, other than Nalcor, would occur in the next phase.

4.1 Consultants

The Board retained two expert consultants, The Liberty Consulting Group (“Liberty”) and Synapse Energy Economics, Inc. (“Synapse”), to assist with the review required by the Board for the Reference.^{1,2}

Liberty’s scope of work included:

- determining the total revenue required to recover the cost of the Muskrat Falls Project with no rate mitigation applied;
- examining the structure of Nalcor and its subsidiaries and identifying cost savings and revenue opportunities associated with their activities, including opportunities to find efficiencies and reduce duplications;
- examining the forecast operating and maintenance costs for the Muskrat Falls Project to identify cost savings and efficiencies;
- identification of the impacts of various rate mitigation options; and
- reviewing industry best practices related to external market purchases and sales of electricity.

Synapse’s scope of work included:

- determining the amount of energy and capacity required to meet load on the Island Interconnected system and the amount available from the Muskrat Falls Project to serve the existing and future Island Interconnected system load;
- examining the impact of increasing prices on elasticity demand and the impacts on the Island Interconnected system load;
- determining the amount of energy and capacity available for export and export market opportunities;
- examining the potential for energy efficiency alternatives and their impact on the Island Interconnected system load forecast;

¹ Liberty has extensive experience in management and operation audits of utilities and has provided consulting services to the Board on a variety of matters including the investigation into the 2014 power outages, the 2015 review of the prudence of certain Hydro expenditures, and the ongoing review of the impact of the Muskrat Falls Project on the reliability of the Island Interconnected system.

² Synapse has extensive experience in the electric power sector in the Maritimes and northeast region of the United States. It regularly reviews utility load forecasts, provides rate design expertise, and has assessed demand-side resource economics on behalf of regulators in Ontario, Nova Scotia, New Brunswick and Prince Edward Island. It also has expertise in the valuation of export market opportunities.

- examining the potential for electrification and its impacts on the Island Interconnected system load forecast; and
- determining rate design alternatives to support rate mitigation approaches and potential policy decisions on energy efficiency alternatives and electrification opportunities.

4.2 Interim Report

On December 31, 2018 Liberty’s *Final Report on Phase One of Muskrat Falls Project Potential Rate Mitigation Opportunities* (“Liberty Phase One Report”) and Synapse’s report *Phase 1 Findings on Muskrat Falls Project Rate Mitigation* (“Synapse Phase One Report”) were filed with the Board. The reports were made available on the Board’s website and submissions and comments were invited.³

The Board filed its interim report on February 15, 2019 setting out preliminary findings for Questions 1 and 2 with respect to reasonably anticipated cost savings and reasonably anticipated revenue from surplus energy and capacity. The interim report also set out options that were identified at that preliminary stage which, if implemented, may reduce or offset increases in electricity rates attributable to the Muskrat Falls Project, as well as the next steps to be undertaken.

4.3 Phase Two Work

The second phase of the Reference focused on the preliminary findings relating to Questions 1 and 2 in Phase One, as well as Question 3 which directed the Board to review and report on the potential electricity rate impacts of the options identified in Question 1, based on the most recent Muskrat Falls Project cost estimates. Liberty and Synapse continued their work in Phase Two.

4.3.1 Participants

Nalcor and the Consumer Advocate had full standing by virtue of the Reference. An Invitation to Request Standing for the Reference was published February 22, 2019 following which the Board granted standing as Parties to Hydro, Newfoundland Power and the Industrial Customer Group (Corner Brook Pulp & Paper Limited, NARL Refining LP and Vale Newfoundland and Labrador Limited). The Labrador Interconnected Customer Group (Sheshatshiu Innu First Nation, Happy-Valley Goose Bay, Wabush and the Town of Labrador City) were granted limited standing by the Board, to represent the interests of the Labrador Interconnected system customers where those diverge from the general interest of all ratepayers.

Interested persons who did not request standing or who were not granted standing had the opportunity to make a presentation, file a written submission or a letter of comment for the consideration of the Board.

³ Seventeen submissions and comments were received, including submissions from Nalcor, Newfoundland Power, the Consumer Advocate, a group of Island Industrial Customers and a group of Labrador Interconnected customers.

4.3.2 Information Gathering

Consultation and cooperation throughout the information gathering and evaluation process of the second phase of work was essential in answering the Reference Questions to ensure all potential options were appropriately evaluated. The information gathering in the second phase consisted of Information Requests from the Board and its consultants, various meetings and three technical conferences. The Board also provided the Parties with a draft of the issues to be reviewed to respond to the Reference Questions for comments before finalizing the Issues List and Schedule.

i) Information Requests

A significant amount of documentation was filed during the Reference. Nalcor filed responses to 287 Information Requests and Newfoundland Power filed responses to 104 Information Requests. The Information Requests and responses were made available on the Board's website with the exception of the responses that were considered to include commercially sensitive information. These responses were available to the Parties with standing who signed non-disclosure agreements with both utilities.

ii) Meetings

Liberty and Synapse participated in various meetings with the executives and senior management of Nalcor, Hydro and Newfoundland Power. Hydro and Newfoundland Power also participated in joint meetings with Liberty. The consultants also met with the Consumer Advocate and his experts and participated in a conference call with the Industrial Customer Group's counsel and expert. Liberty also met with representatives of the IBEW Local 1615.

iii) Technical Conferences

The first technical conference was held on March 28, 2019. Liberty and Synapse attended as well as representatives from the Board and the Parties. The consultants provided their plans for the Phase Two work and the issues/areas they were requested by the Board to review and answered questions from those in attendance.

The second technical conference was held on June 4, 2019. Liberty and Synapse attended this conference via conference call and representatives for the Board and the Parties either attended at the Board office or participated by conference call. The consultants provided an update to the Parties on the progress of their work to that date.

The third technical conference was held August 1, 2019. Liberty and Synapse attended as well as representatives from the Board and the Parties. Liberty and Synapse presented their preliminary findings based on the work completed to date and provided the parties the opportunity to ask questions and provide feedback before the consultants concluded their work and finalized their reports for the Board.

4.3.3 Reports and Submissions

On September 3, 2019 Liberty's *Final Report on Phase Two of Muskrat Falls Project Potential Rate Mitigation Opportunities* ("Liberty Report") and Synapse's report *Phase 2 Report on*

Muskrat Falls Project Rate Mitigation (“Synapse Report”) were filed with the Board. These reports were provided to the Parties and posted on the Board’s website.

Parties filed their views in relation to the consultants’ reports as well as expert and non-expert evidence on September 20, 2019 as follows:

- i) Nalcor/Hydro:
 - a. *Reference to the Board on Rate Mitigation Options and Impacts – Nalcor/Hydro Joint Evidence.* (“Nalcor/Hydro Evidence”)
 - b. *Power Advisory Report – Review of North American Electric Utility Structures & Implications for Proposals in The Liberty Consulting Group Final Report* (“Power Advisory Report One” filed as Appendix 1 of Nalcor/Hydro Evidence)
 - c. *Extended Review of The Liberty Consulting Group Executive Organization Analysis and Results, Power Advisory.* (“Power Advisory Report Two” filed as Appendix 4A of Nalcor/Hydro Evidence)
- ii) Newfoundland Power: Comments on Phase Two Reports (“Newfoundland Power Comments”)
- iii) Consumer Advocate: Non-Expert Evidence (“Consumer Advocate Comments”)
- iv) Industrial Customer Group: *Muskrat Falls Project Rate Mitigation Options and Impacts Review – Pre-filed Testimony of Patrick Bowman. InterGroup Consultants* (“InterGroup Report”)

4.3.4 Public Hearing

A Notice of Public Hearing was published during the week of September 7-14, 2019 providing information on the time and location of the hearing. Persons interested in presenting their views were invited to make a presentation during the hearing or provide a written submission or comments up to September 20, 2019. A subsequent media release was issued on October 2, 2019 advising of the schedule for the public hearing commencing on October 3, 2019, and informing any interested persons that they could file written comments or information up to October 25, 2019.

The public hearing was held at the Board’s offices in St. John’s from October 3-18, 2019. Liberty and Synapse presented their findings and Parties were provided an opportunity to ask questions of the Board’s consultants, make presentations and also ask questions of other presenters that attended on behalf of the Parties. Interested persons that were not participants in the Reference were provided the opportunity to make a presentation during the hearing or provide a written submission and comments.

A list of persons and organizations who participated in the public hearing either as Parties or as public presenters is provided in Exhibit 2.

Daily transcripts and audio recordings of the hearing were made available on the Board’s website.

4.3.5 Final Submissions and Comments

Final submissions by the Parties were filed by November 4, 2019.

Written submissions and comments were received from interested persons during both phases of the Reference. (Exhibit 3)

The Board expresses its appreciation to Nalcor, Hydro and Newfoundland Power for their co-operation and assistance, and in particular for responding to the significant number of Information Requests from the Board and its consultants in a timely and fulsome manner. The Board also thanks the Parties' counsel and experts for their active interest, input and involvement throughout the review process, as well as those who took the time to present to the Board during the Public Presentation day and who provided comments and submissions.

5.0 REPORT STRUCTURE

Sections 6.0 to 8.0 in Part Two provide background information in relation to the work undertaken by the Board in addressing the issues set out in the Reference. Section 6 describes the current electrical system in the Province. Section 7.0 describes the Muskrat Falls Project and its implications for the provincial electrical system while Section 8.0 explains the potential impact the project will have on customers' electricity rates.

The remainder of the report addresses the issues the Board was requested to review. Sections 9, 10 and 11 in Part Three set out for Government's consideration the opportunities identified during the review that are available to mitigate customers' rates. Section 12 explains the electricity requirements in the Province and the available capacity and energy available for export, after consideration of potential electrification and conservation demand programs. Section 13 summarizes the rate mitigation opportunities.

Sections 14 and 15 in Part Four raise a number of policy issues related to rate mitigation and regulatory oversight for Government's consideration in its development of a rate mitigation plan.

Section 16 in Part Five provides the impact on customers' electricity rates of the various potential mitigation opportunities identified during the review.

Part Six sets out the answers to the Reference Questions and provides additional commentary on the challenges facing the Province of unprecedented potential electricity rate increases.

PART TWO: BACKGROUND

6.0 PROVINCIAL ELECTRICAL SYSTEM PRE-MUSKRAT FALLS

Two electrical utilities currently provide the electrical requirements in the Province: Newfoundland Power, an investor-owned utility and Hydro, a crown-owned utility. Both utilities are regulated by the Board. Newfoundland Power is primarily a distribution utility and Hydro is primarily a generation and transmission utility. The electrical system comprises two major systems: the Island Interconnected system supplied by hydro and thermal generation on the Island portion of the Province, and the Labrador Interconnected system, supplied from the Churchill Falls Plant. There are also a number of isolated systems supplied by diesel generation.

Newfoundland Power operates only on the Island portion of the Province and serves approximately 269,000 customers, or 87% of all customers in the Province. Newfoundland Power purchases approximately 93% of the electricity it requires to serve its customers from Hydro.

Hydro operates on both the Island and in Labrador and serves approximately 38,600 customers, including Newfoundland Power, five industrial customers on the Island Interconnected system, and two industrial customers on the Labrador Interconnected system. Hydro serves 22,900 rural customers located on the Island Interconnected system, 4,500 retail customers in twenty isolated diesel communities on the Island and in Labrador and 11,200 customers on the Labrador Interconnected system.

Hydro generates more than 80% of the electrical energy consumed in the Province annually. Currently Hydro has an installed generating capacity of approximately 1700 MW, not including diesel, as shown below:

Hydro's Existing Generating Capacity	
Hydroelectric	
<u>Plant</u>	<u>Capacity (MW)</u>
Bay d'Espoir	613.4
Cat Arm	137.0
Hinds Lake	75.0
Upper Salmon	84.0
Granite Canal	40.0
Paradise River	8.0
Mini Hydro	4.0
	961.4
Thermal	
Holyrood	490.0
Island Gas Turbines	223.5
Labrador Interconnected Gas Turbine	25.0
	738.5
Total	1699.9

Hydro also purchases all the power from the hydroelectric generating plants on the Exploits River (113.6 MW) which are currently owned by the Province, from two wind farms (54 MW)

and from a small hydroelectric plant (4 MW) owned by private investors. One of Hydro's industrial customers has its own generating capacity of 99 MW. Newfoundland Power owns 23 small hydroelectric plants with a total capacity of approximately 98 MW.

On the Island system Newfoundland Power owns and operates the majority of distribution and low voltage transmission lines with Hydro owning the balance.⁴ Hydro owns and operates the 230 kV transmission network which extends from Stephenville in the west to St. John's in the east and is supported by a series of other interconnected high voltage lines at 138 kV and 66 kV, some in network configuration and others operating radially. The table below shows the breakdown of the ownership of these lines, including Hydro transmission lines in Labrador.

Transmission and Distribution Lines by Utility				
Utility	Distribution & Transmission		Bulk Transmission	Total Kilometers of Transmission lines by Utility
	66/69 kV	138 kV	230 kV	
Hydro	583	1,500	1,821	3,904
Newfoundland Power	1,590	472	0	2,062
Total Kilometers	2,173	1,972	1,821	5,966

Source: PUB-Nalcor-155, PUB-NP-035

Electricity required to serve the Labrador Interconnected system comes from the hydro plant located in Churchill Falls ("Churchill Falls Plant") owned by Churchill Falls (Labrador) Corporation ("CF(L)Co"), a subsidiary of Hydro. Two blocks of power are available from the Churchill Falls Plant that are not sold to Hydro Quebec under a long term contract: Recall (300 MW) and the Twinco Block (225 MW). Electricity not required to serve retail and industrial customers on the Labrador Interconnected system is available for the Island Interconnected system over the Labrador Island Link and for export. Hydro owns or operates the 230 kV and the 138 kV transmission lines that bring power to the towns on the Labrador Interconnected system from the Churchill Falls Plant. Hydro also has a 25 MW gas turbine at Happy Valley-Goose Bay.

A map of the provincial generation and transmission system and the distribution service areas for Newfoundland Power and Hydro is provided on the following page.⁵

⁴ PUB-NP-084 and PUB-NP-094.

⁵ Prepared by Hydro.



7.0 MUSKRAT FALLS PROJECT INTERCONNECTION

The Muskrat Falls Project was sanctioned in 2012 at a total forecast cost of \$7.4 billion and a projected first power date in the fourth quarter of 2017. It is currently under construction by Nalcor and certain of its subsidiaries. The project is comprised of the following which collectively in this report will be referred to as the Muskrat Falls Project:

- the Muskrat Falls Generating Station, an 824 MW hydroelectric generating facility in Labrador;
- the Labrador Transmission Assets two 250 km High Voltage alternating current (HVac) transmission lines between Muskrat Falls and Churchill Falls; and
- the Labrador Island Link, a 1,100 km High Voltage direct current (HVdc) transmission line from Muskrat Falls to Soldier's Pond on the Island, including a subsea cable across the Strait of Belle Isle.

The most recent update on the project released by Nalcor on June 23, 2017 (“2017 Project Update”) indicated that the capital cost and during-construction costs is forecast to be \$12.7 billion.⁶ Nalcor also announced at that time that the Labrador Island Link and the Labrador Transmission Assets would be in-service in mid-2018 and first power from the Muskrat Falls Generating Station would be expected in the first quarter of 2020, with full commissioning scheduled for late 2020.

In conjunction with the Muskrat Falls Project, Emera Inc. (“Emera”) built the Maritime Link which connects the Island with Nova Scotia to enable delivery of the electricity it has committed to purchase from the Muskrat Falls Project when it is in-service. The Maritime Link is a 500 MW HVdc transmission line as well as a 230 kV HVac transmission line and associated infrastructure. The Maritime Link went into service in 2018 and Nalcor made limited purchases of power delivered over the Maritime Link in 2018 and 2019.

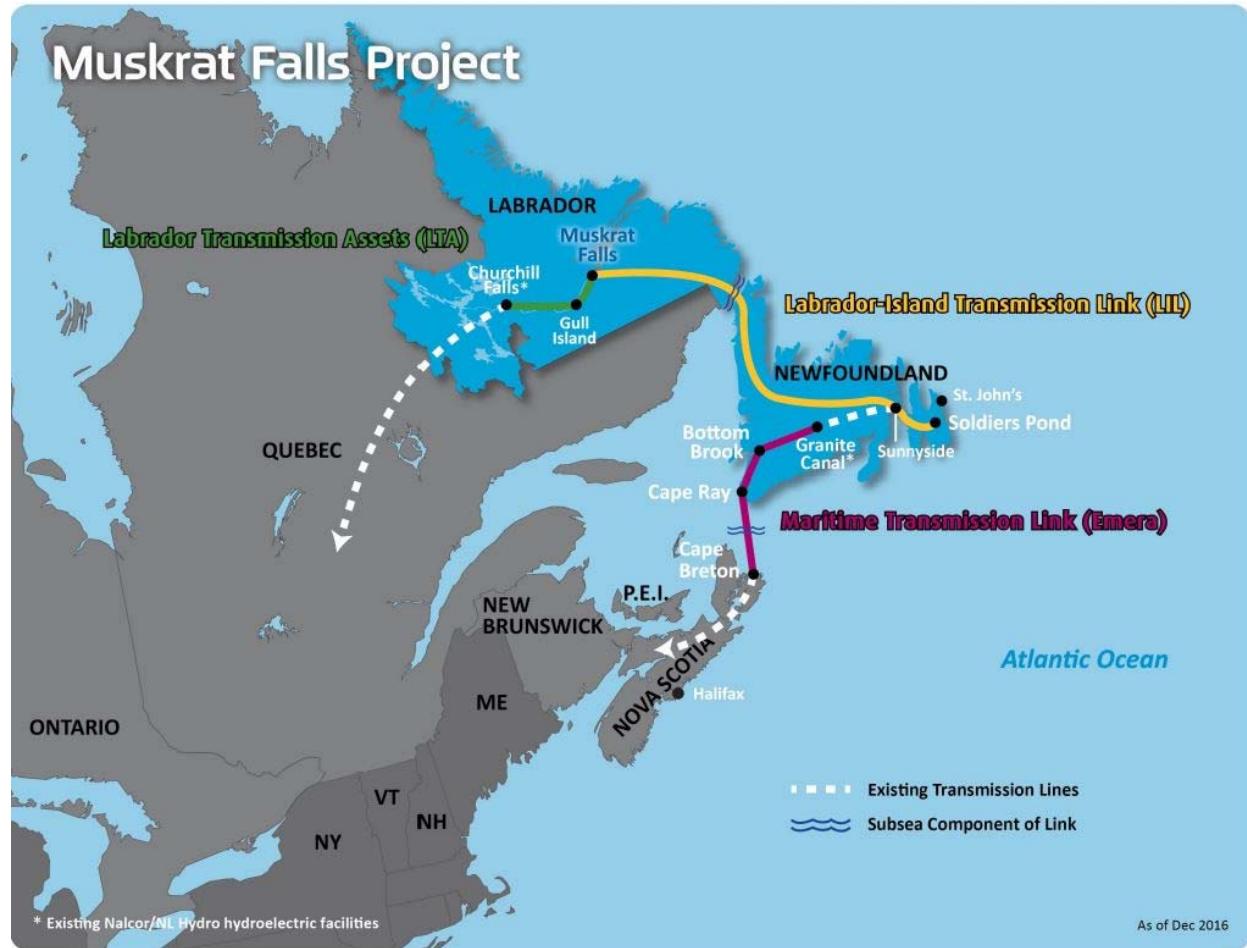
The Labrador Island Link commenced operation in 2018 at significantly reduced capacity for testing purposes. Limited amounts of power from export purchases and from the Churchill Falls Plant have been transmitted over the Labrador Island Link in 2018 and 2019. Nalcor forecasts that it will be in full commercial service in 2020. However, operation of the Labrador Island Link has been subject to ongoing problems, particularly with the software required for operations and more recently with the synchronous condensers located at Soldier's Pond. The Board continues to monitor the ongoing issues associated with Labrador Island Link operations.

With the completion of the Maritime Link, the Labrador Island Link and the Labrador Transmission Assets in 2018, the Island Interconnected system was connected to the North American grid for the first time with connections to Nova Scotia through the Maritime Link and to Quebec through the Labrador Island Link, the Labrador Transmission Assets and Churchill Falls transmission lines. The first units at the Muskrat Falls Generating Station are scheduled to be in-service in the first quarter of 2020 with all units in-service by the end of the year. Construction of the Labrador Transmission Assets is complete and are also forecast to be in service with the in-service of the first generating units at Muskrat Falls.

⁶ PUB-Nalcor-026, Attachment 1.

The amounts of capacity and energy available from the Muskrat Falls Project for the Island Interconnected system, committed to Emera and available for exports is discussed in Section 12 of this report.

The figure below shows an overview of the Muskrat Falls Project and the interconnections to the North American grid that it will provide.⁷



When the Muskrat Falls Project is in full commercial operation hydroelectricity will be the predominant source of supply for the Island Interconnected system. Nalcor plans to maintain the 490 MW Holyrood Thermal Generating Station (“Holyrood Plant”) as a backup source of supply for the Island Interconnected system for a short period following the commissioning of the Muskrat Falls Project. Current Nalcor plans include the de-commissioning of the Holyrood Plant and the Hardwoods and Stephenville 50 MW gas turbines in 2021.⁸

The majority of customers on the Island reside on the Avalon Peninsula while all Hydro's hydroelectric plants are located outside the Avalon Peninsula. Once the Holyrood Plant and the two gas turbines are de-commissioned no generating capacity will remain on the Avalon

⁷ PUB-Nalcor-026, Attachment 1.

⁸ Hydro's Resource and Reliability Study, Volume III, page 21.

Peninsula, other than a 123 MW gas turbine at Holyrood, which presents particular reliability challenges. The impact of the Muskrat Falls Project on the reliability of the Island Interconnected system is currently before the Board in its review of Hydro's Reliability and Resource Adequacy Study, including whether any additional generation will be required to support the Island Interconnected system in the event of an outage of the Labrador Island Link. This review will include the appropriateness and cost of the continued operation of the Holyrood Plant as a potential backup source of supply.

Nalcor also currently plans to operate and maintain the Muskrat Falls Project assets through Power Supply, a division created for this purpose in 2016. Prior to the creation of Power Supply, Nalcor had planned for Hydro to operate and maintain these assets.

8.0 FORECAST RATE IMPACTS

The Reference stated that rates for domestic customers on the Island are forecast to increase to 22.89 cents/kWh in 2021, based on the 2017 Project Update, with related increases for other Island rate classes. This increase was said to be primarily attributable to the impact of the cost recovery required for the Muskrat Falls Project. The total cost or revenue requirement for Hydro's Island Interconnected system is currently forecast to be approximately \$642 million, without export sales in 2020, prior to the in-service of Muskrat Falls Project.⁹ The forecast revenue requirement for the Muskrat Falls Project to be included in the rates charged to customers is approximately \$726 million in 2021. Hydro's total Island Interconnected revenue requirement, including the Muskrat Falls Project, is forecast to be \$1.1 billion in 2021, without export sales and assuming the de-commissioning of the Holyrood Plant. This is an increase of more than 70% from the 2020 requirement. The revenue requirement for the Muskrat Falls Project will increase to \$1.2 billion in 2039.¹⁰

During the review Nalcor provided its forecast of domestic electricity rates for the period 2019-2039, including recovery of all costs associated with the Muskrat Falls Project, assuming no rate mitigation is implemented.¹¹ On December 4, 2019 Nalcor provided a revised forecast domestic electricity rate for 2021 of 22.2 cents/kWh which was said to be based on Nalcor's January 2019 forecast.¹² Nalcor subsequently advised that it was working on developing revised unmitigated rates based on its October, 2019 long-term forecast and that the revised rates would not be available until mid-January 2020. The Board has not received any revised forecast as of the time of writing this report. Nalcor also advised during the review that the cost and schedule for the Project had not changed since the 2017 Project Update and therefore no more current forecast was available.

The forecast domestic electricity rate for the first full year for the recovery of the Muskrat Falls Project costs has varied slightly during the review as more current forecasts were completed by Nalcor with the changes in the forecast rates being very minor. Given that the Reference assumed the forecast 2021 domestic electricity rate to be 22.89 cents/kwh, with subsequent

⁹ Hydro's revenue requirement of \$592 million as set out in PUB-Nalcor-049 in addition to \$50 million export sales included in PUB-Nalcor-046.

¹⁰ PUB-Nalcor-046.

¹¹ PUB-Nalcor-029.

¹² PUB-Nalcor-029 (Rev.1), PUB-Nalcor-078 (Rev.1).

changes being so minor as to not significantly affect any of the analyses that were completed, and that the analyses is intended to be illustrative not definitive of the potential impact of the recovery of Muskrat Falls Project costs, the Board will refer to the forecast unmitigated 2021 domestic electricity rate as 22.89 cents/kWh as stated in the Reference. This forecast 2021 domestic electricity rate is a 75% increase from the current average domestic rate of 13.06 cents/kWh. While the information provided and the analyses completed during the review focused primarily on domestic electricity rates, the potential impact on industrial rate increases is also significant. Any commentary in this report on domestic electricity rate increases generally applies as well to expected increases for Island Industrial customer rates.

On April 15, 2019 Government released a plan entitled “Protecting You from the Cost Impacts of Muskrat Falls” which included a preliminary plan to mitigate rates. The plan included a commitment to engage with the Government of Canada to examine the underlying drivers of the expected electricity rate increases and a commitment to maintain domestic electricity rates at 13.5 cents/kWh in 2021. The plan included proposed savings and revenues totalling \$725.9 million to be allocated to revenue mitigation and included a gap of \$200 million to be addressed with the involvement of the Government of Canada.

PART THREE: RATE MITIGATION OPTIONS AND OPPORTUNITIES

In its interim report the Board identified a number of initiatives which offered potential to mitigate the expected rate increases with the interconnection of the Muskrat Falls Project. These initiatives related to financing, returns and dividends, Nalcor restructuring, the transfer of certain responsibilities to Newfoundland Power, future operating and maintenance costs for the Muskrat Falls Project, electrification and export sales revenue. At the time of the interim report it was not possible, based on the work completed to that point, to conclude as to the magnitude of the potential rate mitigation offered by these opportunities or whether potential barriers or constraints could be addressed. The Board was able to conclude, however, that no one rate mitigation initiative would generate enough cost savings or revenue to mitigate the expected rate increases to current levels or, alternatively, to average Atlantic Canadian rates.

One of the key preliminary findings in the interim report was that the financing costs and returns and dividends in relation to the project, which account for more than 50% of Hydro's total revenue requirement in the years following project commissioning, offer significant opportunities for rate mitigation. The Board identified some key policy issues for consideration by Government in advance of the Board's final report, including engaging in discussions with the Government of Canada and other stakeholders in relation to the project financing. In April 15, 2019 Government announced that it had secured a federal commitment to further engage with the Province to expeditiously examine the underlying drivers of the expected rate increases from the Muskrat Fall Project in relation to rate mitigation.

On April 25, 2019 the Board advised Government that, as a result of the commitment of Government to engage in discussions with the Government of Canada, it would suspend its work on the analysis of possible options to mitigate rates that may arise from the Muskrat Falls Project financing. The Board requested to be advised on the outcome of the discussions between the two levels of government so that any key policy issues identified may be considered before completion of its final report on January 31, 2020. On September 18, 2019 the Board wrote the Minister to request an update on the discussions. No response has been received. This final report includes no additional information on the potential rate mitigation opportunities related to the Muskrat Falls Project financing beyond that included in the interim report.

Substantial work has been completed and received since the Board's interim report, including further detailed costing analysis and reports by Liberty and Synapse as well as expert reports from Nalcor and the Industrial Customer Group. The public hearing involved presentations by Liberty and Synapse as well as staff and executive from Nalcor, Hydro and Newfoundland Power, and by experts on behalf of Nalcor and the Industrial Customer Group. Presentations from other interested persons were also made. Parties filed comprehensive final submissions and a number of written comments and submissions were received from other interested persons. While the additional work and input was comprehensive and important in the completion of this final report no additional options were identified that would offer significant potential for revenue or cost savings to be used for rate mitigation.

While some elements included in the Government's plan were reviewed by the Board in this Reference, no information was provided to the Board on how the savings and revenues in the Government's plan were derived. The Board's experts completed their own independent analysis of the areas they reviewed and did not take into account the savings or revenues projected in

Government's plan. Therefore, cost savings and revenue opportunities identified during the Reference will have different values than those for the same or similar elements of Government's plan. It is not possible with the available information to explain these differences.

9.0 FINANCIAL OPPORTUNITIES

A number of potential financial opportunities were identified during the review to reduce the impact of the Muskrat Falls Project costs on electricity rates, including the Muskrat Falls Project returns and dividends, CF(L)Co returns and dividends, Hydro returns and dividends and export sales and depreciation.

9.1 Muskrat Falls Project Returns and Dividends

The Province has made an equity investment in the Muskrat Falls Project of approximately \$3.7 billion. This equity investment will earn returns and dividends which may be treated as a revenue source to fund rate mitigation.

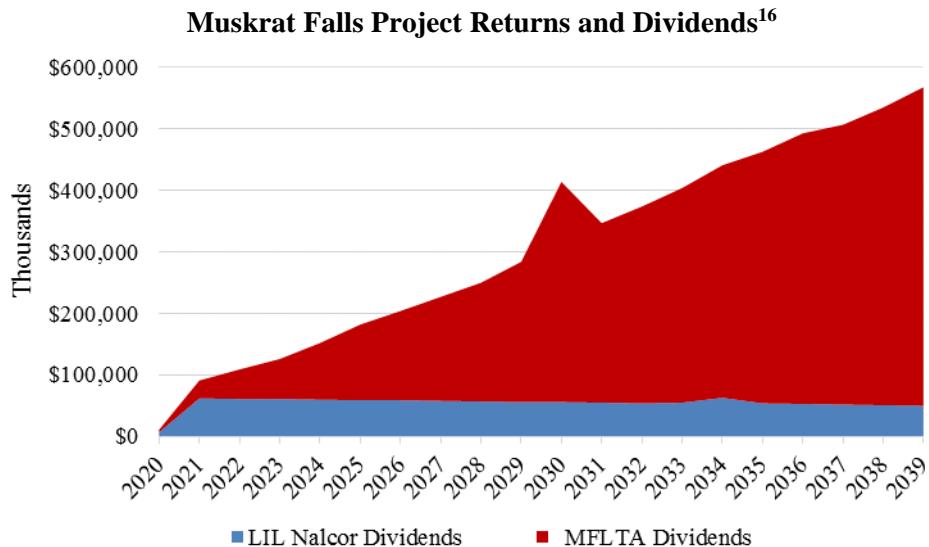
Two agreements require Hydro to make purchases from the Muskrat Falls Project and to pay for the right to transmit power from Muskrat Falls to the Island: the Power Purchase Agreement, related to the Muskrat Falls and Labrador Transmission assets, and the Transmission Funding Agreement, related to the Labrador Island Link assets.¹³ These agreements require Hydro to make payments that include returns to go to various Nalcor subsidiaries and Emera which are similar to returns that would be expected of investor-owned utilities.

Liberty estimated that, over the period 2020 to 2039, the forecast returns and dividends related to the Province's Muskrat Falls Project investment would be over \$6.2 billion.¹⁴ According to Liberty this is the largest portion of the identified financial sources of mitigation. The forecast returns and dividends are small in the early years after commissioning but grow considerably thereafter. Eventually these returns and dividends would offset more than half of the forecast increase in rates. The forecast returns and dividends on the Province's investment in the Muskrat Falls Project over time until 2039 are shown below:¹⁵

¹³ PUB-Nalcor-016. These agreements also provide for the repayment of this investment and set out the related guarantees and financing agreements.

¹⁴ Liberty forecast over a twenty year period from 2020 to 2039 rather than a 10 year period to 2030 since Liberty anticipated that results could differ substantially and that measures might exist for transferring sources of reduction to earlier years.

¹⁵ Liberty Report, Figure II.3, page 16.



This figure shows returns and dividends are \$90 million in 2021 and grow to more than \$285 million by 2029, \$414 million in 2030 and \$569 million in 2039. The primary reason for this substantial increase in the forecast returns and dividends is that the Power Purchase Agreement provides for a return on the Muskrat Falls and the Labrador Transmission assets which is low in the early years but steadily increases over time.¹⁷ The Transmission Funding Agreement provides for a higher return in the early years which decreases over time. According to Liberty:

This later growth shows strikingly how limits on providing rate relief ease in the years following the end of the Reference's study period. Financial means for advancing those later year benefits have substantial importance in bringing pre-2029 rates into line with those lower ones achievable in succeeding years.¹⁸

Nalcor/Hydro agreed that the Muskrat Falls Project returns and dividends could be used to reduce rates but commented that, in general, a balance must be found between rate subsidization and other required Government expenditures.

Newfoundland Power, the Consumer Advocate and the Industrial Customer Group supported the use of the Muskrat Falls Project returns and dividends towards rate mitigation.

9.2 CF(L)Co Dividends

The Churchill Falls Plant operates under joint ownership of Hydro (65.8%) and Hydro-Quebec (34.2%).¹⁹ Hydro's equity investment in these assets earn returns and dividends which may be considered as a revenue source to fund rate mitigation.

¹⁶ In this figure MFLTA refers to the Muskrat Falls and Labrador Transmission Assets.

¹⁷ Because of the return recovery methods used for the Labrador Island Link and the Muskrat Falls/Labrador Transmission Assets. The Power Purchase Agreement results in back-loading of the equity returns for Muskrat Falls/Labrador Transmission Assets.

¹⁸ Liberty Report, page 15.

¹⁹ Liberty Report, page 17.

Common dividends were historically paid by CF(L)Co. In 2010 a Long Term Asset Management Plan was established to provide for a fully rebuilt plant by 2041 which led to a large increase in capital expenditures. It was decided that these expenditures would be funded from operating cash flows, which left no cash flows to fund the payment of common dividends to the owners. Liberty noted that the owners are currently considering an update to the Long Term Asset Management Plan which may change the strategy of funding all capital improvements using operating cash flows.

According to Liberty preferred dividends continue to be paid to CF(L)Co shareholders. CF(L)Co forecasts show preferred dividends from Hydro “A” and “C” shares of \$6 million to \$7 million annually from 2020 to 2039.²⁰ In Liberty’s view these moderate sums offer another source of utility-related mitigation.

Nalcor/Hydro agreed that the CF(L)Co preferred dividends could be applied to reduce rates but commented that, in general, a balance must be found between rate subsidization and other required Government expenditures.

Newfoundland Power, the Consumer Advocate and the Industrial Customer Group supported the use of CF(L)Co dividends for mitigation.

9.3 Hydro Dividends

Hydro’s dividends may also be considered as a revenue source to fund rate mitigation. The revenue available for rate mitigation will depend on Hydro’s earnings and whether these earnings are retained or paid out in dividends.

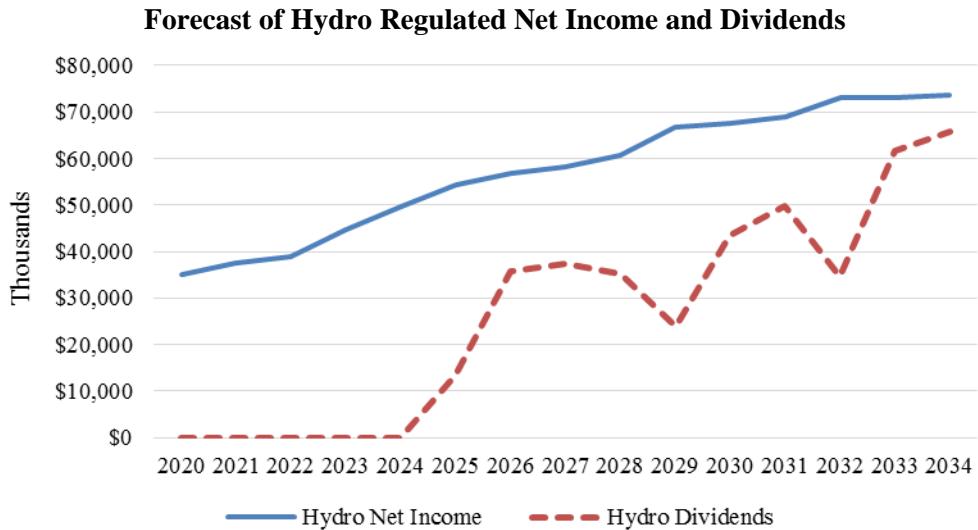
9.3.1 Forecast Dividends

Based on Hydro’s current equity component and established rate of return Liberty forecast that, beginning in 2026, Hydro would have dividends of \$35 million to \$50 million annually. According to Liberty the average annual dividends available for mitigation after 2025 would be \$43 million.²¹ Liberty’s forecast of Hydro’s dividends over the period 2020 to 2034 is as follows:²²

²⁰ Liberty Report, page 18.

²¹ Transcript, October 3, 2019, page 37/10-16 - John Antonuk, Liberty.

²² Liberty Report, Figure II.7, page 24.



These forecast dividends assume that Hydro is able to earn its current rate of return of 8.5%.²³ If Hydro does not earn this rate of return the available dividends would be lower. Hydro noted that there are risks that could impact the amount and timing of dividends, including achieving the financial returns projected, transition from the Holyrood Plant to the integration of the Muskrat Falls Project assets, recovery of projected costs in revenue requirement and capital expenditures.²⁴

In addition it should be noted that, while Hydro is forecast to earn a return through the entire 2020 to 2034 period, there are no dividends forecast to be paid until 2025 when Hydro is forecast to reach the target equity component of 25% in its capital structure.

9.3.2 Hydro's Capital Structure

Hydro's target equity component in its capital structure was established in 2009. The Province made a \$100 million equity injection at that time to raise Hydro's equity level to approximately 25%. At the same time Hydro clarified its dividend policy so that earnings are required to be re-invested. The equity component subsequently eroded and Hydro stopped paying dividends in 2012.²⁵ Despite having not paid dividends since 2012 Hydro's equity component has not yet reached 25%. At the end of 2018 Hydro's equity component was 18.8%²⁶ and the forecast equity component for 2019 was 19.48%.²⁷

Liberty examined the potential impact of lowering Hydro's target equity component from 25% to 20%. If the target equity component is reduced to 20% Hydro could begin paying dividends once its equity reaches 20%. The dividends available at a target equity of both 25% and 20% are as follows.²⁸

²³ Order-in-Council 2009-063 requires that Hydro's return be equal to the rate established for Newfoundland Power, currently 8.5%, PUB-Nalcor-214.

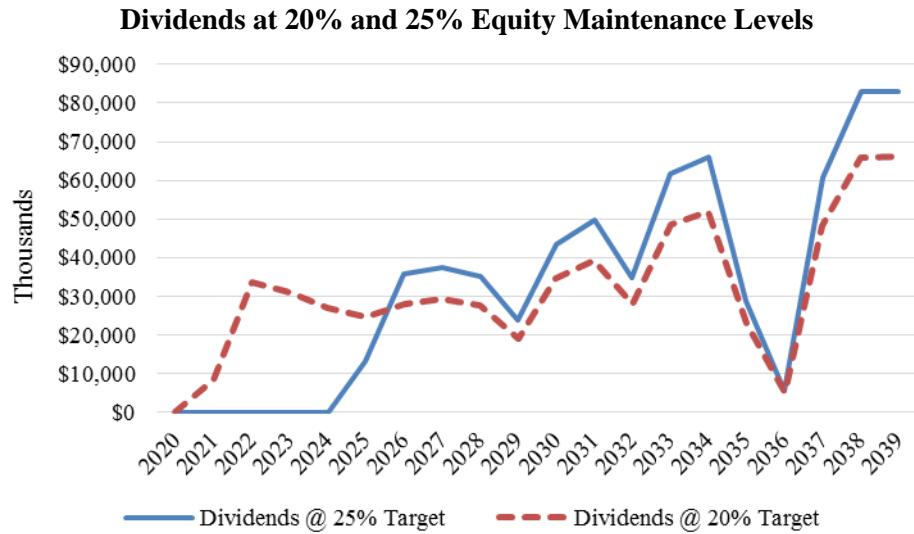
²⁴ Nalcor/Hydro Evidence, page 11.

²⁵ Liberty Report, page 22. Order-in-Council 2009-063 directs that Hydro's equity component can be no higher 45%, the same as the Board has established for Newfoundland Power. PUB-Nalcor-214.

²⁶ Liberty Report, page 22.

²⁷ Nalcor/Hydro Evidence, page 10.

²⁸ Liberty Report, Figure 11.8, page 25.



As this figure shows a 20% target equity is forecast to result in the payment of dividends beginning in 2021. This would allow the payment of higher dividends in the early years which could be used to mitigate rates when the amount of other sources of rate mitigation are lower. According to Liberty a target equity of 20% would result in forecast total dividends for the period 2021 to 2025 of \$111 million while there would be no dividends until 2025 if the 25% target equity component is maintained.²⁹ Liberty noted that lowering the equity component to 20% would mean that the level of dividends would be lower in the subsequent years as compared to the continuation of the higher equity component. Further the cumulative amount of dividends paid through 2039 would be \$22 million lower.

9.3.3 Hydro's Returns

Liberty also considered the potential impact of lowering Hydro's established rate of return on equity which would reduce the revenue requirement for Hydro thus contributing to lowering rates for customers. According to Liberty lowering the return from 8.5% to 5% would decrease Hydro's revenue requirements on the Island Interconnected system by approximately \$16 million in 2021 and by \$551 million through the period to 2039. It would, however, also reduce Hydro's earnings available for rate mitigation and cash flow by about one-half. Liberty explained that the effect of lowering the return to 5%, should the 25% equity target be maintained, would be to eliminate all Hydro dividends until 2039.³⁰

9.3.4 Hydro's Self-Sustaining Status

A key concern when considering whether to lower Hydro's equity component or reduce its rate of return is the impact such action may have on Hydro's self-sustaining status which allows Hydro to borrow and service its debt without impacting the Province's credit rating. According to Liberty a self-sufficient Hydro is material in avoiding adverse rating consequences for the

²⁹ Liberty Report, page 24.

³⁰ Liberty Report, page 25.

Province as it keeps Hydro's debt off the Province's books. Having equity returns built into Hydro's rates comprised a central element in remaining self-sufficient.³¹

Liberty provided a comparison of Canadian crown electric utility equity metrics as set out below:³²

Recent Canadian Crown Electric Utility Equity Metrics			
Entity	Target Equity	Actual Equity	Target ROE
Ontario Power Generation	45%	25%	8.8%
New Brunswick Power	35%	5%	10.0%
Hydro Québec Distribution	35%	28%	8.2%
Hydro Québec Transenergie	30%	28%	8.2%
SaskPower	25-40%	21%	8.5%
BC Hydro	20-40%	16%	11.8%
Manitoba Hydro	25%	11%	n/a
Newfoundland and Labrador Hydro Regulated	25%	19%	8.5%

Liberty noted that Hydro's actual equity component is 2% below the median of 21% and that all of the actual equity components fall below target, some by much more than Hydro's. Liberty explained that:

...25 percent, not an uncommon target, but it is an uncommon achievement. Rates are often lower. Hydro's is at 19 percent. Some are even well below that. The issue becomes, I think from our perspective, not setting the rate so much because I think the Province needs to determine that because what will be required in the future for the financial markets to consider Hydro as self-sustaining, that's necessary a static process. That number will change as circumstances in the industry change and as circumstances at Hydro change.³³

According to Liberty the uncertainties related to rates and the completion and operation of the Muskrat Falls Project lends credence to maintaining a 25% equity and also the concerns the Province faces and the implications for its credit standing would weigh against a sustained level materially below 20%. Liberty stated:

Another question looms as well. It is not one our work scope includes but it merits attention in that it implicates the degree to which the Province, effective holder of Hydro equity interests, is willing to risk change to its financial standing due to issues and uncertainties at and involving Hydro.³⁴

Nalcor commented that the capital structure is a public policy decision for the Province and that Hydro's self-sustaining status has provincial implications.³⁵

³¹ Liberty Report, pages 21-22.

³² Liberty Report, page 23, Table II.6.

³³ Transcript, October 3, 2019, page 40/11-23 - John Antonuk, Liberty.

³⁴ Liberty Report, page 23.

³⁵ Nalcor/Hydro Evidence, pages 10-11.

InterGroup recommended lowering Hydro's target equity to 20% or lower, stating "...it would make little sense to continue with a path of building equity in Hydro, at the expense of ratepayers, at a time when mitigation efforts are underway and ratepayers are effectively unable to fund these increases."³⁶ According to InterGroup, while government-related entities deemed not self-sufficient do typically have their debt consolidated into the debt of the parent government, it is not a given that this would be an adverse rating consequence. InterGroup noted that Standard and Poor's has revised their ratings approach for Crown entities and some utilities such as Manitoba Hydro, SaskPower and NB Power are no longer considered to be self-supporting. In the case of Manitoba Hydro InterGroup stated that this has not necessarily led to any downgrading of Manitoba's provincial credit rating. InterGroup noted that in 2013 the Manitoba Public Utilities Board recommended that the provincial government support "a relaxation of Manitoba Hydro's 75/25 debt-to-equity ratio to smooth out rate increases."³⁷ Manitoba Hydro's equity ratio was allowed to be lowered and is currently at 11%.

Nalcor/Hydro agreed with Liberty's observations on Hydro's equity levels and stated that equity returns built into Hydro's rates are central to remaining self-sustaining which has Provincial fiscal implications. They also noted that reducing the target equity in the capital structure will require an increase in Hydro's debt and that the target equity for Hydro is a public policy decision for the Province but agreed that adjusting the equity target in its capital structure should be considered.³⁸ Nalcor/Hydro commented that many factors such as capital requirements for asset reliability, credit agency standards for self-sustainability and the financial requirements of the Province all need to be considered.

Newfoundland Power and the Consumer Advocate supported using Hydro's dividends towards rate mitigation.

The Industrial Customer Group also supported using Hydro's dividends towards rate mitigation and stated that changes should be considered to Hydro's return on equity and equity targets. The Industrial Customer Group urged "that there should be a willingness to reconsider conventional or entrenched assumptions with respect to Hydro's return on equity and equity targets, given the extraordinary dilemma represented by MFP costs."³⁹ According to the Industrial Customer Group a reduction in Hydro's equity target to 20% or lower in the shorter term and aimed at achieving rate mitigation is needed.

9.4 Depreciation

The depreciation methods and policies in relation to both the Muskrat Falls Project assets and Hydro's assets were reviewed by Liberty as a potential source of rate mitigation. In particular Liberty reviewed whether extension of the service lives for these assets should be considered.

Hydro's depreciation methods and policies were recently reviewed by the Board as part of Hydro's 2017 General Rate Application. In its decision the Board approved extensions to average service life estimates which resulted in a reduction in Hydro's depreciation expense in

³⁶ InterGroup Report, page 13.

³⁷ InterGroup Report, page 14.

³⁸ Nalcor/Hydro Evidence, page 11.

³⁹ Industrial Customer Group Final Submission, page 9.

its test year revenue requirement.⁴⁰ Liberty explained that, as compared to its Canadian peers, Hydro's depreciation methods were found to produce longer service lives for larger asset categories e.g. dams and dykes, and lower depreciation expense. Based on its review Liberty concluded that further extension of service lives at Hydro did not offer a material opportunity for additional rate mitigation.⁴¹

With respect to the potential for extending service lives of the Muskrat Falls Project assets Liberty concluded that the Power Purchase Agreement and the Transmission Funding Agreement pose fundamental obstacles to extending the service lives of these assets. The pricing provisions in the agreements have been fixed based on 50-year service lives for these assets so any change would require amendment to the agreements with the Government of Canada, Emera and the bond holders. Liberty examined the impact of extending the Muskrat Falls Project asset lives to 75 years and found that there was a one-to-one correspondence between revenue requirements benefits from the depreciation changes and dividends available for mitigation. Liberty acknowledged during the hearing that if the financing agreements were re-negotiated this could be one area to consider.⁴²

InterGroup addressed the depreciation methods for the Muskrat Falls Project assets and noted that the one-to-one correspondence found by Liberty only holds true if all of the dividends are utilized to support rate mitigation. If the dividends are not used for rate mitigation then any cost reductions in depreciation expense would aid mitigation efforts. InterGroup also suggested that, in addition to changing the service lives of the Muskrat Falls Project assets, alternative non-straight line depreciation methods could be considered which would result in moving a portion of the depreciation expense from earlier years to later years.⁴³ The Industrial Customer Group acknowledged that the adoption of non-straight line depreciation methods would only be possible with the re-negotiation of the Muskrat Falls Project financing agreements.⁴⁴

9.5 Export Sales Revenue

Export sales of excess energy from the Muskrat Falls Project offers another potential source of mitigation revenue. Total export revenue, net of all costs and system losses, from all sources is forecast to grow from approximately \$95 million in 2021 to \$125 million in 2030 and \$141 million in 2039. This total was allocated between Hydro and Nalcor in the forecasts of revenue requirements and electricity rates provided by Nalcor during the review. The allocation to Hydro was forecast to be approximately \$54 million in 2021, growing to \$79 million in 2030 and \$118 million in 2039. Nalcor's forecasts applied Hydro's net export revenue to the revenue requirement to reduce electricity rates. The allocation to Nalcor was forecast to range from \$41 million in 2021 to \$46 million in 2030 and \$23 million in 2039. This portion was considered as "unregulated" by Nalcor and was not applied to reduce electricity rates.⁴⁵

Liberty noted that Nalcor's approach to not apply its share of export revenue to reduce rates is contrary to essentially universal North American practice. Liberty recommended that Nalcor's

⁴⁰ Order No. P.U. 16(2019).

⁴¹ Liberty Report, page 27.

⁴² Transcript, October 4, 2019, page 9/1-25 - Randy Vickroy, Liberty.

⁴³ InterGroup Report, page 19.

⁴⁴ Industrial Customer Group Final Submission, page 10.

⁴⁵ PUB-Nalcor-034.

share of export revenues be applied for rate mitigation. The Parties supported this position. This issue is discussed in Section 14 of this report.

9.6 Additional Opportunities

A number of other potential sources of rate mitigation were identified during the review, including water rentals and royalties, the provincial portion of the harmonized sales tax (HST), and carbon credits.

i) Water Power Rentals and Royalties

The Province receives annual water rentals and royalties from CF(L)Co which totalled \$6.7 million in 2018 declining to \$5.7 million in 2030. Newfoundland Power also pays a water royalty to the Province of approximately \$1 million annually. Water power rental payments will also form part of the charges to Hydro under the Power Purchase Agreement upon commissioning of the Muskrat Falls Project and are expected to be approximately \$16 million in 2021, escalating at an assumed rate of 2% per year thereafter.⁴⁶

ii) HST

Domestic customers of Hydro and Newfoundland Power pay HST of 15% on their purchase of electricity, comprising a 10% provincial portion. Newfoundland Power estimated the provincial portion of the HST payments to be collected from its customers in 2021 at \$43.9 million while Hydro estimated its customers would pay \$8.3 million in 2021, meaning that the Province will collect approximately \$52 million in HST from domestic customers for electricity sales in 2021.⁴⁷ In the past the Province has rebated the provincial share of HST on domestic electricity sales to customers with the rebate applied directly on customers' bills. This rebate was in effect from October 1, 2011 to July 1, 2015.

Liberty suggested that a similar rebate could be implemented again to assist residential customers with higher electricity bills and aid in lowering their bills. This would not represent a financial source to mitigate electricity rates but a reduction in the customer's overall electricity bill.

iii) Carbon Credits

The evolving green economy may create an opportunity for the Muskrat Falls Project to receive certain carbon credits from the sale of power. The Consumer Advocate noted that there may be an opportunity for these carbon credits to attract a value that could be beneficial to ratepayers in the Province and assist in rate mitigation. Nalcor agreed that there was potential for renewable energy credits and markets do exist but they change quite dramatically in price. Nalcor stated:

But if you look into the New England and New York marketplaces, renewable energy credits have ranged from \$50.00 a megawatt hour to five cents a kilowatt hour equivalent. They have been down as low as \$15.00 a megawatt hour or one and a half cents. The

⁴⁶ Liberty Report, pages 17 and 19; Transcript, October 15, 2019, page 100/11-20.

⁴⁷ Liberty Report, page 27.

market changes quite dramatically as different policy initiatives are put in place by the various governments. So we would be looking to trade into those markets to the extent that we had renewable energy credits here, so recognizing Hydro are clean and non-emitting, basically gives us the ability to sell into green markets and right now, at the current state we are not eligible to trade RECs into New England because we are called a second tier jurisdiction, so we're two jurisdictions away from New England.⁴⁸

Nalcor commented that Hydro is currently ineligible for these credits, but discussions have occurred with the Massachusetts Department of Energy about making energy from Newfoundland and Labrador eligible to qualify for green energy credits in New England.⁴⁹

9.7 Comments and Submissions

Nalcor/Hydro noted that financial sources to reduce rates are the dominant source of all the opportunities identified by Liberty and that Nalcor's internal analysis is consistent with Liberty's assessment. Nalcor/Hydro also submitted that each of these opportunities are a form of rate subsidization, meaning that a Government decision and/or intervention is required for implementation.

Newfoundland Power, the Consumer Advocate and the Industrial Customer Group all supported applying the financial opportunities identified by Liberty to rate mitigation.

9.8 Board Comments

The identified financial opportunities offer significant rate mitigation potential:

- Muskrat Falls Project assets returns and dividends offer the largest source of potential rate mitigation with the Province's share of equity returns forecast to be \$90 million in 2021, \$414 million in 2030, and \$569 million in 2039.
- Churchill Falls assets returns and dividends are forecast to be \$6 to \$7 million annually as only preferred dividends are currently being paid.
- Hydro's returns and dividends at 25% equity are forecast to be approximately \$nil million in 2021, \$13 million in 2025, \$43 million in 2030 and \$83 million in 2039.
- Nalcor's allocation of export sales revenues forecast to be \$41 million in 2021, \$46 million in 2030 and \$23 million in 2039.
- Water power rentals and royalties from Muskrat Falls, Churchill Falls, and Newfoundland Power forecast to be approximately \$24 million to \$26 million annually over the period 2021 to 2030.

There was consensus in the hearing that these financial mitigation sources should be used to fund rate mitigation.

Additional revenues to mitigate rates in the early years would also be available if the target equity component in Hydro's capital structure is reduced. Lowering this target from 25% to 20% could produce additional dividends of \$111 million in the period 2021 to 2025 but would result

⁴⁸ Transcript, October 10, 2019, page 125/22-25 to page 126/1-14 - Greg Jones, Director of NEM.

⁴⁹ Transcript, October 10, 2019, page 16/15-25 to page 127/1-5 - Greg Jones, Director of NEM.

in \$22 million less in cumulative dividends over the full period to 2039.⁵⁰ Such a reduction may impact Hydro's self-sustaining status and therefore may have implications for the Province's financial position, though it is noted that other Canadian crown utilities have operated with lower target equity components without impact on the financial position of their provincial owners. The risks associated with lowering Hydro's target equity would need to be balanced against the potential for higher levels of rate mitigation in the early and critical years after commissioning of the Muskrat Falls Project. The Board believes that the extraordinary rate increases facing customers upon the commissioning of the Muskrat Falls Project require that all possible opportunities be explored, including those that might not otherwise be considered such as lowering Hydro's equity target. It is notable that in 2013 similar action was taken by the Government in Manitoba to smooth out rate increases.

Other financial opportunities raised in this review include lowering Hydro's rate of return, changes to the depreciation methods for Hydro and the Muskrat Falls Project assets, carbon credits from the Muskrat Falls Project and the Province's portion of the HST. The Board notes that lowering Hydro's rate of return may also impact Hydro's self-sustaining status and would not contribute to rate mitigation if Hydro's returns and dividends are to be applied to mitigation. Liberty did not recommend lowering Hydro's returns and the Board does not believe that it should be pursued at this time. In addition there does not appear to be material rate mitigation potential associated with changing the current depreciation methods for Hydro's assets and the Muskrat Falls Project assets. While the value of carbon credits from the Muskrat Falls Project was raised as a potential rate mitigation opportunity it is not a realistic option at this time since Nalcor is currently ineligible for these credits. The application of the Province's portion of the HST offers an opportunity to reduce customer costs if the Government determines that it is appropriate to reinstate its policy of rebating these revenues on customer bills as was done from 2011 to 2015. This would require an assessment of the impact on the Province's financial position.

The Board recommends that the returns and dividends from the Muskrat Falls Project assets, Churchill Falls assets and Hydro's assets, Nalcor's profits from export sales, and water power rentals from Muskrat Falls, Churchill Falls and Newfoundland Power should be applied to rate mitigation to the extent that the use of these revenues does not detrimentally impact Government's financial position. The Board also recommends that, to the extent that it does not impact Hydro's self-sustaining status, Hydro's target equity component in its capital structure should be reduced to 20%.

10.0 OPERATIONAL OPPORTUNITIES

The Board was directed to review and report on cost savings opportunities with respect to electricity, including generation, transmission, distribution, sales and marketing assets and the activities of Nalcor and its subsidiaries. Cost savings associated with various efficiency opportunities were a focus for this review. Three main areas were discussed; i) the consolidation of certain assets or operations of Hydro and Newfoundland Power; ii) re-integrating Power Supply with Hydro, and iii) finding efficiencies within the existing structure at Nalcor and Hydro.

⁵⁰ Liberty Report, page 24.

10.1 Combining Hydro and Newfoundland Power Assets or Operations

Both Hydro and Newfoundland Power have generation, transmission and retail assets and operations in the Province and the potential for cost savings with the consolidation of these assets and operations was a focus in this review. While Newfoundland Power serves most electricity customers in the Province, Hydro is responsible for most of the generation and transmission and provides more than 90% of Newfoundland Power's supply through its generation and bulk transmission system.

Liberty examined whether the combination of Hydro and Newfoundland Power assets or operations would reduce revenue requirements without sacrificing customer service or reliability. The following options were considered:

- The transfer of Hydro's retail and 66/138 kV operations to Newfoundland Power
- The transfer of Hydro's customer service operations to Newfoundland Power
- Combining island small hydro generating stations in either Hydro or Newfoundland Power
- Combining Hydro and Newfoundland Power contracting and procurement

The transfer of Hydro's 230 kV and Power Supply's transmission facilities was not examined on the basis of the criticality of these assets to overall system integrity and reliability, the need to reach steady state operation of the Muskrat Falls Project, and Liberty's assessment of Newfoundland Power's lack of operational experience with such facilities.

10.1.1 Potential Cost Savings

Liberty examined the costs associated with the transfer of assets to Newfoundland Power and concluded that it would have negative rate consequences for customers. Liberty explained that Hydro's carrying costs for capital investments are significantly lower than Newfoundland Power's given that it has lower equity and taxation levels and lower debt costs.⁵¹ The carrying costs associated with the transfer of distribution assets to Newfoundland Power were estimated to be in the order of \$10 to \$15 million per year assuming the value of the assets was approximately \$300 million. According to Liberty these carrying costs were significant enough that it was not necessary to address all the associated transfer costs.⁵² Liberty also examined the possible transfer of assets to Hydro from Newfoundland Power and explained that, since assets are typically transferred at multiples of book value, the increase in rate base would effectively wipe out Hydro's lower capital cost advantage.⁵³

The costs of transferring operational responsibility to Newfoundland Power without transferring ownership of the associated assets was also examined. Liberty's analysis showed a total potential savings of \$7 million associated with the transfer from Hydro to Newfoundland Power of both retail and 66/138 kV operations and customer service operations and combining small hydro

⁵¹ Liberty Report, pages 6-7.

⁵² Liberty Report, page 46.

⁵³ Transcript, October 3, 2019, page 88/1-24 - John Antonuk, Liberty.

generating stations in either Hydro or Newfoundland Power.⁵⁴ These potential savings were considered by Liberty to be modest and subject to offsetting costs and significant barriers and execution risks. Liberty concluded that the potential savings do not warrant the substantial effort it would take to determine the transition costs and to address the significant barriers and execution risks associated with these transfers. Common contracting was found to offer the potential for savings and, while a full analysis was not completed during the review, Liberty estimated these savings could be in the order of \$5 million annually.⁵⁵

10.1.2 Considerations, Barriers and Risks

Significant barriers and execution risks were identified by Liberty in relation to the combination of Hydro and Newfoundland Power operations, as summarized below:

- The transfer of retail and 66/138 kV operations would require consideration of issues related to bargaining agreements, labour differences, rationalization of work rules, necessary retraining, integration of different corporate cultures, and required capital spending.
- The transfer of customer service operations to Newfoundland Power would require merging of customer billing data and modification of Newfoundland Power's customer information system to support Hydro's tariffs and rate structures, as well harmonization of automated metering technologies, staff training and additional internal and external communication.⁵⁶
- The potential savings from combining small hydro generation operations could also be achieved by Hydro with the implementation of operational efficiencies at Exploits generation without the substantial barriers and execution risk of a transfer of operational responsibilities to Newfoundland Power.
- Common contracting would require legislative changes and further analysis to determine whether there are potential significant savings.⁵⁷
- Hydro's isolated Island diesel customers and its Labrador customers were included in the analysis of the retail transfer of assets and operating responsibilities but a period of years would be required to allow Newfoundland Power to become familiar with the local conditions, systems, and customers.

Liberty also noted that there are significant risks associated with establishing an operating agreement with respect to the costs of the compensation arrangement and execution given the unfamiliarity of these types of operating agreements and the historical background of the two utilities.⁵⁸

⁵⁴ The estimated savings included \$3 to \$3.5 million in relation to the transfer of retail and 66/138 kV transmission operations, \$1.5 million in relation to the transfer of customer service operations and \$2.5 million in relation to combining island small hydro generating stations.

⁵⁵ Liberty Report, page 45.

⁵⁶ Liberty Report, pages 53-54.

⁵⁷ Transcript, October 3, 2019, page 93/17-25 to page 95/1-11 - John Antonuk, Liberty. The legislation currently in place includes requirements with respect to procurement at Hydro but not at Newfoundland Power.

⁵⁸ Liberty Report, pages 49 and 51.

10.1.3 Comments and Submissions

Nalcor/Hydro stated that its findings and analysis were consistent with Liberty's conclusion on the negative customer impact of transferring assets to Newfoundland Power and submitted that combining the assets or operations of Hydro and Newfoundland Power would not provide a net benefit to customers in the Province. According to Nalcor/Hydro any transfer of assets from Hydro to Newfoundland Power could increase rates, and while there may be modest savings opportunities there would be significant execution risks and transition needs. A number of issues associated with the transfer of assets from a crown corporation to an investor-owned utility were noted, including the loss of the public revenue stream, increased customer costs associated with a higher equity level and taxation costs, the amount of tax payments, reduced opportunity to utilize the assets for public policy issues and the loss of operating control over the assets.

In terms of the transfer of operational responsibility Nalcor stated that this has the significant potential to introduce material complexity to the operating and regulatory environment and additional costs.^{59,60} In Nalcor/Hydro's view cost savings opportunities within Hydro's current operations should be pursued as opposed to an asset sale or operations transfer between Hydro and Newfoundland Power. Nalcor/Hydro recognized the potential benefits in joint purchasing power and indicated that it is open to exploring solutions to potential policy barriers if it is determined that sufficient savings can be achieved.⁶¹

Newfoundland Power acknowledged that the consolidation of operations as considered by Liberty would not yield immediate costs savings for customers but indicated that there may be potential long-term benefits that merit further study.⁶² They clarified that Newfoundland Power does not share Liberty's view in terms of its lack of experience in 230 kV transmission operations and stated that Newfoundland Power is capable of operating these assets in the same way it operates its own transmission lines today.⁶³ Newfoundland Power also indicated that potential savings to customers from joint procurement are uncertain and require further analysis.⁶⁴ Newfoundland Power submitted that Liberty's conclusion that the potential savings with a transfer of operating responsibilities from Hydro to Newfoundland Power are modest and subject to significant execution risks and limitations, is reasonable.⁶⁵

InterGroup stated that Liberty's conclusions in relation to the consolidation of Hydro and Newfoundland Power are sound and directionally consistent with their expectations. InterGroup concluded that there does not appear to be material benefits available from Hydro and

⁵⁹ Nalcor/Hydro Final Submission, pages 12-13; Nalcor/Hydro Evidence, pages 14-15.

⁶⁰ PUB-NLH-280. Other considerations included the complexity of Hydro's customer service and billing, Newfoundland Power's lack of experience with respect to diesel generation in isolated communities, rural deficit recovery, timing issues associated with the Board's ongoing Reliability and Resource Adequacy review, issues associated with capital planning and operating and maintenance oversight, asset management practices and regulatory challenges, cost allocation, revenue requirement considerations, asset impairment costs, depreciation rates, credit facility requirements and rating implications and information management considerations.

⁶¹ Nalcor/Hydro Evidence, pages 10 and 18.

⁶² Transcript, October 15, page 10/2 to page 12/15 - Byron Chubbs, Vice-President, Energy Supply and Planning, Newfoundland Power.

⁶³ Transcript, October 15, page 97/18 to page 99/10 - Byron Chubbs, Vice-President, Energy Supply and Planning, Newfoundland Power.

⁶⁴ Newfoundland Power Evidence, page 4.

⁶⁵ Newfoundland Power Final Submission, page 8.

Newfoundland Power asset transfers, and this topic should not be prioritized as a mitigation action.⁶⁶ The Industrial Customer Group also agreed with Liberty's conclusion that the transfer of assets or operating responsibilities between Hydro and Newfoundland Power would not be expected to yield sufficient benefits to outweigh the complexity, risks and costs of implementing such transfers.⁶⁷

The Labrador Interconnected Group expressed its concerns about the possible restructuring of Hydro and Newfoundland Power given the potential negative impacts for customers on the Labrador Interconnected system, stating:

The LIS differs from the Island Interconnected System in important ways, and NP lacks any experience or knowledge of how the system operates and what planning decisions will be in the LIS users' best interest. No comprehensive analysis of the service impacts and challenges that a restructuring would pose has been conducted to date, and without such information any contemplation of this would be premature.⁶⁸

According to the Labrador Interconnected Group the reorganization of Hydro and Newfoundland Power's relationship, including the possible transfer of distribution and customer service on the Labrador Interconnected system, would be ill-advised at this time not only based on Liberty's conclusion that it would not be advisable as a rate mitigation measure but also because no analysis has been conducted of the potential impacts such restructuring would have on ratepayers on the Labrador Interconnected system.⁶⁹

10.1.4 Board Comments

The potential for cost savings with the consolidation of Hydro and Newfoundland Power assets or operations was examined in this review. Liberty concluded that a transfer of assets would have negative rate consequences for customers and that an operational transfer would be associated with significant barriers and risks that outweighed the potential benefits. Specifically the \$4.5 million to \$5 million in annual savings which were estimated with the transfer of retail, 66/138 kV and customer service operations would be outweighed by the significant costs and barriers associated with this transfer. While there were estimated savings of \$2.5 million associated with combining small hydro generating operations, these savings could also be achieved without the challenges associated with the transfer of assets or operations through the implementation of efficiencies at Exploits generating station. The potential savings associated with common contracting would require a change with respect to the legislative requirements in relation to Hydro's procurement and would also require further work to quantify the potential savings. At the end of the hearing all the parties were in agreement that there does not appear to be material benefits associated with combining Hydro and Newfoundland Power assets or operations at this time.

Based on the information provided during this review there appears to be little merit in pursuing the transfer of assets or operations between Hydro and Newfoundland Power as the estimated savings associated with combining assets or operations are outweighed by the costs, barriers and

⁶⁶ InterGroup Report, page 17.

⁶⁷ Industrial Customer Group Final Submission, page 10.

⁶⁸ Labrador Interconnected Group Final Submission, page 2.

⁶⁹ Labrador Interconnected Group Final Submission, page 3.

risks. Common contracting remains as an opportunity for cost savings if it is determined that amendments to the legislative requirements with respect to procurement at Hydro are appropriate.

10.2 Re-Integrating Power Supply and Hydro

A primary area of potential cost saving considered related to the re-integration of Power Supply and Hydro to create a unified operating entity. When Nalcor was restructured in 2016 Power Supply and Hydro were segregated, with Power Supply given responsibility for the construction and operation of the Muskrat Falls transmission assets as well as certain other activities, including Nalcor Energy Marketing and the development of future generation.⁷⁰ Power Development was also created with responsibility for the construction of the Muskrat Falls generating plant, though Power Supply was to be responsible for these assets upon commissioning. Prior to the 2016 reorganization it was contemplated that the Muskrat Falls generation and transmission assets would be operated and maintained by Hydro.⁷¹

The intention of the reorganization in 2016 was to ensure the successful completion of the Muskrat Falls Project, to prepare the electricity system for the integration of the Muskrat Falls Project, and to create a clear separation between regulated and unregulated operations.⁷² It was also intended to allow the use of corporate competitiveness and strategic flexibility of the non-regulated assets and operations to leverage commercial opportunities within the electrical industry to maximize benefits for customers and people of the Province.⁷³ As a result of this reorganization the departments within Nalcor and Hydro were significantly changed and a shared services model was implemented.⁷⁴

Now that one of the principle reasons for the creation of Power Supply in 2016, the completion and commissioning of the Muskrat Falls Project, is drawing near Liberty suggested it is timely to consider whether Power Supply should be re-integrated with Hydro. In the context of this major milestone Liberty also suggested that the remaining two objectives of the 2016 reorganization, being the separation of regulated and non-regulated operations and the opportunity to leverage commercial opportunities, may not justify the continuation of this structure. According to Liberty the pursuit of the savings associated with the re-integration of Power Supply and Hydro would promote the efficiency required to provide reliable service at optimum cost for customers.⁷⁵

⁷⁰ Nalcor/Hydro Evidence, page 7.

⁷¹ Transcript, October 10, 2019 pages 264-265 - Jim Haynes, Executive Vice President, Nalcor; Transcript, October 10, 2019, page 267, Jennifer Williams, President of Hydro .

⁷² PUB-NLH-140, Attachment 1, page 1.

⁷³ Nalcor/Hydro Evidence, page 25.

⁷⁴ PUB-Nalcor-140 sets out that both Nalcor and Hydro have departments in Finance, Internal Audit, Legal, Corporate Communications and Shareholder Relations, Project Execution and Technical Services, Human Resources and Organizational Effectiveness, though there is some sharing of services. Strategic Planning and Business Development and Information Systems and Management departments are in Nalcor while Information Technology and Operating Technology and Supply Chain Management are in Hydro.

⁷⁵ Liberty Report, page 6.

10.2.1 Potential Cost Savings

Liberty examined whether cost savings could be achieved with the re-integration of Power Supply and Hydro to produce an organization that reflects an industry typical model for a small, vertically-integrated electric utility. Based on its analysis Liberty estimated that the re-integration of Power Supply and Hydro would initially result in approximately \$12.7 million in annual savings, increasing to \$17.6 million by 2023, as shown below:⁷⁶

Potential Annual Savings with Re-integration of Power Supply and Hydro	
Functions	Costs
Engineering	\$4,000,000 ⁷⁷
Transmission	\$1,000,000 ⁷⁸
Generation	N/A
Finance	\$2,200,000
Corporate Services	\$3,600,000 ⁷⁹
Exec./Sr. Mgmt.	\$4,300,000
Small Hydro Stations	\$2,500,000
Total	\$17,600,000

When the estimated additional savings of \$3.1 million associated with the Muskrat Falls Project labour costs are included Liberty's estimated annual savings increase to approximately \$20.7 million.⁸⁰ Liberty acknowledged that there would have to be significant restructuring to achieve the estimated savings and that a comprehensive review would be required. Liberty was confident that this review would result in the same level of reductions but acknowledged that the actual positions consolidated or eliminated may be different.⁸¹

According to Liberty there is no sound operational reason for maintaining the distinction between Power Supply and Hydro which together have the characteristics of a reasonably small and vertically-integrated utility which could be effectively managed with a fairly straightforward and simple top management structure. In Liberty's view consolidation of the Engineering Services Group under the leadership of an executive reporting to the President of Hydro would be more efficient and effective. Combined generation would promote accountability and provide a more solid foundation and basis for promoting best practices. In addition re-integration would eliminate the need for separate Nalcor-level financial, corporate support and legal organizations. Liberty also suggested it would be possible to eliminate a significant number of top-level executives, including eight executive positions, three senior management positions and two

⁷⁶ Liberty Report, page 64.

⁷⁷ The estimated Engineering savings are \$3 million in 2020 rising to \$4 million after a two-year phase-in.

⁷⁸ The Transmission savings would commence within two quarters of re-integration of Power Supply and Hydro with completion within six months.

⁷⁹ The Corporate Services savings include \$800,000 with the combination of communication and safety, health, environmental, and sustainability; \$1.1 million with the combination of Human Resources; and \$900,000 with the elimination of the seven vacant positions in Supply Chain and IT resources.

⁸⁰ The estimated savings do not reflect transition costs but according to Liberty these costs are not a barrier to making reductions, Transcript, October 3, 2019, pages 143-144. Liberty also noted that the \$1.4 million of costs related to Corporate Services and Engineering included in MFP O&M are included in the \$20.7 million, Liberty Report, page 89.

⁸¹ Liberty Report, page 64.

support positions that are now required by the separate Power Supply, Nalcor corporate services and legal groups. Liberty noted the number of officers at Nalcor/Hydro is “far, far out of line” with what it has seen throughout the United States and far out of line with Canadian crown corporations.⁸²

Liberty’s estimated reductions would represent a 5% to 10% reduction which, according to Liberty, is a fairly moderate target and achievement rate for utilities going through right sizing.⁸³ During the hearing Liberty explained that it has participated in engagements where there were reductions of 5% to 10% without much analysis and where reductions of 20% were implemented overnight without notice.⁸⁴ Liberty expressed confidence that the savings would likely be higher than estimated and detailed the lengthy and comprehensive work that was done in the review and the wide range of expertise of the professionals who completed this work. Liberty’s work included talking to the people in the various positions, looking at existing spans of control, assessing work requirements, considering what the positions would look like in the new organization, completing a comparative analysis of positions and entities, and considering what distinguished some of the technical requirements of Power Supply’s work as compared to Hydro’s work.⁸⁵

10.2.2 Considerations, Barriers and Risks

Nalcor raised a number of issues in relation to the possible impact on the organization of re-integration of Power Supply and Hydro as proposed by Liberty. Nalcor questioned whether the change would be appropriate considering its mission and the fact that there are both regulated and unregulated operations in the organization. In Nalcor’s view the existing structure provides a dedicated focus through Hydro on its regulated electricity operations with a single executive leadership to ensure the provision of reliable service and a separate focus through Power Supply on completion and eventual operation of the Muskrat Falls Project. According to Nalcor this structure also provides for the use of existing and future non-regulated assets to maximize value for the Province.

Nalcor suggested that the prescriptive reductions suggested by Liberty would greatly impair both Nalcor’s and Hydro’s ability to provide quality service and fulfill their mandate. Nalcor raised concerns with the methodology used by Liberty to identify the targeted full-time equivalent (“FTE”) reductions and suggested that Liberty’s conclusions were not based on any known workload analysis and that the assumptions used were not tested. According to Nalcor Liberty’s analysis did not consider a number of other factors, including succession planning, recruitment and retention challenges, capacities and capabilities of the current team in light of increased complexity of the electrical system, and engagement and demands of current stakeholders.⁸⁶ Nalcor did not accept Liberty’s findings with respect to its Executive and stated that it is incorrect to state that there is substantial overlap in the senior management level. Nalcor stated that reorganization would not result in less leaders but rather just different roles, titles and spans of control.⁸⁷

⁸² Liberty Report, pages 63-64, 69-70 and 82-83.

⁸³ Transcript, October 3, 2019, page 131 - John Antonuk, Liberty.

⁸⁴ Transcript, October 3, 2019, pages 71 and 76 - John Antonuk, Liberty.

⁸⁵ Transcript, October 3, 2019, page 72/15-25 to page 73/1-21 - John Antonuk, Liberty.

⁸⁶ Nalcor/Hydro Evidence page 24 and 29.

⁸⁷ Nalcor/Hydro Evidence, Appendix 4, page 9.

Power Advisory questioned whether Liberty's estimated reductions could be achieved without impairing service quality or organizational capability and effectiveness. Power Advisory also suggested that Liberty did not appropriately value the importance of maintaining the organizational capability to deliver on Nalcor's resource development mandate and the essential role of an unregulated development organization to do so. In its opinion the current structure provides a clear focus to Hydro and Power Supply which is likely to support better decision making with respect to key planning, investment and operating decisions and the current organizational structure is appropriate and aligns with other electricity sector organization structures.⁸⁸ During the hearing Power Advisory explained that regulated and non-regulated operations are typically separated on the basis that it simplifies oversight of regulated operations and avoids the risk of cross subsidization and there are typically distinct capabilities required for regulated and non-regulated operations.⁸⁹ They noted that the Power Supply and Power Development model follows the successful model employed by Hydro Quebec.⁹⁰

Power Advisory's review of Liberty's executive organization analysis and results concluded that Liberty's executive organization analysis is severely flawed from its use of officers to the actual data values and calculations.⁹¹ During the hearing Power Advisory did agree that reductions in the range of 5% to 10% are not uncommon in electric utility industry restructuring and noted that Manitoba recently went through a 15% reduction in its workforce and a 30% reduction in its executive structure. In addition Power Advisory acknowledged that their work was a high level review in the nature of a desk-top study which did not include talking to various people in the organization and did not delve into the FTE analysis done by Liberty.⁹²

Liberty did not share the concerns expressed by Nalcor and Power Advisory with respect to the impact of the re-integration of Power Supply and Hydro on the organization. During the hearing Liberty stated:

What we did conclude effecting essentially total integration between power supply and hydro would produce a unified and more effective operating entity. It would create a structure much more typical of a small vertically integrated utility. It would eliminate duplication in technical, operating, and corporate and support organizations. Most dramatically, on a percentage basis, affecting executive positions and least dramatically affecting bargaining unit positions.⁹³

Liberty explained that this would leave Nalcor free to pursue other aspects of its mission which would be consistent with trying to make electric utility operations more streamlined and cost effective and operationally more effective. Liberty noted that it would be important for such an organizational change to reflect strong support from the top and that continued adherence to the regulated and unregulated split approach is a major and likely insurmountable barrier to effective execution.

⁸⁸ Power Advisory Report One, pages 22 and 37.

⁸⁹ Transcript, October 8, 2019, page 169/23-35 to page 170/1-8 – John Dalton, Power Advisory.

⁹⁰ Transcript October 8, 2019, page 181; Power Advisory Report Two, pages 26 and 29.

⁹¹ Power Advisory Report Two, page 15.

⁹² Transcript, October 9, 2019 page 85; Transcript, October 9, pages 67 and 69-70 – John Dalton, Power Advisory.

⁹³ Transcript, October 3, 2019, page 52/18-25 to page 53/1-15 – John Antonuk, Liberty.

According to Liberty the transparency and separation that Nalcor considers important to maintain between regulated and “unregulated” asset management and operation is highly unusual in its justification and cumbersome in the organization and resource levels that it would require when the Muskrat Falls Project is finally commissioned. Liberty noted that separate organizations are not preferred where they produce avoidable duplication and the distinction between regulated and non-regulated can be addressed by a soundly constructed, well controlled, carefully executed system of cost charging and allocation. Further, integrating resources dedicated to the development mission of Nalcor into Power Supply/Hydro does not appear logical for a utility-focused organization likely to remain in a low-growth mode for the foreseeable future.⁹⁴

Nalcor also expressed concern about the timing of any re-integration, submitting that in its view now is not the time to make significant changes to the organization given the necessity to focus on the interconnection of the Muskrat Falls Project.⁹⁵ The opportunity for staff reductions is more appropriate when steady-state of the system is reached.⁹⁶

Liberty acknowledged that steady-state operation of the Muskrat Falls Project assets has not yet occurred and stated that, based on its analysis, it was not recommending changes to resources supporting the Muskrat Falls Project completion. According to Liberty re-integration would be completed through a multi-year transition period which considers both a phase-in to the steady-state operation of the Muskrat Falls Project assets and the effective reduction of personnel.⁹⁷ Liberty explained that the potential disruption associated with re-integration is not a cause for great concern but rather a case for management attention.⁹⁸

Several other considerations with respect to the re-integration of Power Supply and Hydro were raised by Nalcor as summarized below:⁹⁹

- Legislative considerations - The *Energy Corporation Act* sets out exemptions for Nalcor that do not apply to Hydro with respect to the *Access to Information and Privacy Act* and the *Public Procurement Act*. Also the *Hydro Corporation Act, 2007* may need to be amended to ensure the continued insulation of the Crown from liability and to permit Hydro to sell energy outside of the Province. Legislative direction may be required to clarify cost recovery as currently set out in OC2013-343.
- Financing considerations - The provisions and requirements related to the Federal Loan Guarantee Security and the project financing agreements including the intermediary trust and the trust deed would need to be reviewed.
- Commercial considerations - The Labrador Island Link agreement, the Labrador Island Lease, the Transmission Funding Agreement, the Muskrat Falls Power Purchase Agreement, the Generator Interconnection Agreement and the Emera agreements would need to be considered as well as Nalcor’s tax exempt status.
- Labour considerations - There are separate bargaining units and separate agreements. These agreements do not allow for reciprocity with respect to seniority and contain

⁹⁴ Liberty Report, pages 63, 65-66, and 79.

⁹⁵ Nalcor/Hydro Evidence, pages 20-30.

⁹⁶ Transcript, October 8, 2019, page 15/3-5, page 32/10-18 and page 46.

⁹⁷ Liberty Report, page 6.

⁹⁸ Transcript, October 3, 2019, page 147.

⁹⁹ PUB-NLH-008.

different terms and conditions. Complexities would have to be resolved with respect to the Lower Churchill Innu Impacts and Benefits Agreement.

- Operational considerations - Nalcor and Hydro currently share staff and resources and it is not clear that the resources required to operate Nalcor and Hydro in a reliable manner would change significantly with re-integration.

10.2.3 Comments and Submissions

Nalcor/Hydro submitted that the re-integration of Power Supply and Hydro would add risk to the organization at a time where it is already experiencing significant change and has the potential to negatively impact the competitiveness of the organization in the future. They noted that shared services are utilized to avoid duplication and associated costs and that all steps have been and will continue to be taken to reduce costs within the various organizations. Nalcor/Hydro stated that Power Advisory confirmed that it is not uncommon to combine operating and developing activities in one entity as is the case in Manitoba Hydro, Ontario Power Generation and Hydro Quebec. They expressed caution about any organizational change that could distract or disrupt achievement of steady-state operations.¹⁰⁰

Newfoundland Power submitted that work completed during the review showed that the current structure of utility operations results in duplication that may not be consistent with least-cost service delivery to customers, for example Liberty's finding that integrating Hydro and Power Supply could yield cost savings of approximately \$20 million. Newfoundland Power stated that it recognizes that it is necessary to maintain focus on completion of the Muskrat Falls Project before implementing organizational changes to achieve efficiencies, particularly given the uncertainties that exist regarding rate mitigation and the resources required to ensure adequate service reliability for customers in the future. Once customer rate shock is mitigated and the Muskrat Falls Project is operating reliably, Newfoundland Power believes Government should undertake a comprehensive review of utility operations in the Province to ensure customers receive reliable service at the lowest possible cost.¹⁰¹

The Consumer Advocate agreed that, following completion of the Muskrat Falls Project, consideration should be given to combining Power Supply and Hydro into a single organization. In the Consumer Advocate's view the provincial power system is small relative to other jurisdictions and there is no justification for having two small organizations doing much the same business. The Consumer Advocate stated that there is little work for Power Supply following completion of the Muskrat Falls Project and the work which has been identified appears to be well into the future and could easily be handled by transferring Power Supply into Hydro. The Consumer Advocate submitted that the arguments of Nalcor and its consultant, Power Advisory, that Power Supply remains a viable and needed entity beyond commissioning of the Muskrat Falls Project are not convincing. The Consumer Advocate noted that, unlike Liberty, Power Advisory appears not to have interviewed Nalcor or Hydro staff members in person and that, when asked whether they had talked to people in Hydro or Nalcor to understand the functions they perform and how they inter-relate, Power Advisory stated that they did not get into that level of detail.¹⁰²

¹⁰⁰ Nalcor/Hydro Final Submission, pages 21-25.

¹⁰¹ Newfoundland Power Final Submission, pages 14-16.

¹⁰² Consumer Advocate Final Submission, page 9-10.

InterGroup noted that Liberty's conclusions are based on relatively comprehensive review working closely with the utilities and should be given significant weight.¹⁰³ InterGroup recommended that Hydro should be directed to aggressively pursue operating and integration cost savings in the areas identified by Liberty and report on progress at its next general rate application. In their final submission the Industrial Customer Group submitted that at least until the Muskrat Falls Project achieves "steady state" full in-service the functional integration of Nalcor's Power Supply division with Hydro could risk being unduly disruptive. In the interim the Industrial Customer Group suggest that there should be greater regulation of Power Supply. In the longer term the Industrial Customer Group believes it would be appropriate to consider whether full functional integration of Power Supply and Hydro would be in the best interests of ratepayers.

During their presentation at the hearing representatives of the IBEW Local 1615 explained that they did not agree with formation of Power Supply and raised concerns with respect to the continued segregation. They raised several issues, including the duplication of labour negotiations, the geographic distance between crews and the location of the lines, the oversight committees and the costs associated with the operating contracts.¹⁰⁴ In a follow-up submission the IBEW Local 1615 supported the re-integration of Power Supply and Hydro and set out several advantages, including efficiency and elimination of contracting out, more reliability and response to emergencies, no duplication with respect to labour relations, elimination of duplication of services, lower operations costs and maintenance expenses, and increased regulation by the Board. In the opinion of the IBEW Local 1615 the decision to create Power Supply was not in the best interest of taxpayers or ratepayers and created concerns in relation to reliability and response time.

10.2.4 Board Comments

As the Muskrat Falls Project is approaching commissioning it is timely to consider whether the organizational structure which may have been necessary for Nalcor in 2016 continues to be appropriate. Based on Liberty's analysis the re-integration of Power Supply and Hydro would result in potential cost savings of approximately \$21 million annually and would produce a unified and more effective operating entity. It is noted however that Liberty estimated lower savings in the first year to reflect the necessary caution associated with ensuring steady-state operation of the Muskrat Falls Project assets. Significant potential for cost savings exist at the Executive level as it appears that the number of executives at Nalcor is higher than necessary and out of line with what would be expected in the circumstances. In Liberty's view there are no operational barriers or risks associated with re-integration, though the necessary significant restructuring and additional study would require the dedicated focus of management and staff.

Nalcor/Hydro did not agree with Liberty's conclusions. In Nalcor's view the segregation of its regulated and non-regulated operations and its power development mandate are important continuing considerations that justify the segregation of Power Supply and Hydro. In addition Nalcor expressed significant concern in relation to the potential impact of re-integration on the organization and emphasized that there should be no organizational changes until after steady-state operation of the Muskrat Falls Project assets. Nalcor also raised several other considerations

¹⁰³ InterGroup Report, page 18.

¹⁰⁴ Transcript, October 18, 2019, pages 26-30 and 32-35.

that would need to be addressed, including the current legislative provisions, financing terms, contractual requirements and Nalcor's tax exempt status. Nalcor questioned Liberty's analysis and in particular did not agree with respect to the significant potential efficiency opportunities at the Executive level and in Engineering Services. Power Advisory supported Nalcor's current structure and challenged Liberty's analysis in relation to the re-integration of Power Supply and Hydro.

The Board notes that Power Advisory's opinion was based on a high level review which did not include consultations with Nalcor or Hydro staff. In contrast, the work completed by Liberty was in-depth and comprehensive. Liberty's review was conducted over several months by professionals with a wide range of expertise. Liberty gathered information directly from both Nalcor and Hydro through written requests for information and meetings with staff and management. The Consumer Advocate, Newfoundland Power and the Industrial Customer Group supported Liberty's analysis. Both Power Advisory and Liberty agreed that the magnitude of the estimated savings, in the order of 5% to 10%, would be common in electricity utility restructuring. The Board believes that Liberty's analysis and conclusions in relation to the re-integration of Power Supply and Hydro are reasonable and should be accepted as the starting point for organizational review at Nalcor.

The potential cost savings associated with the re-integration of Power Supply and Hydro are estimated to be over \$20 million annually after steady-state is reached. While there appear to be no significant operational barriers or risks to prevent the re-integration of Power Supply and Hydro, significant restructuring would be required and a number of issues would have to be addressed. Most importantly the re-integration would have to be closely managed to avoid negative impacts on operations and in particular the transition to steady-state operation of the Muskrat Falls Project assets.¹⁰⁵ The Board recommends that Nalcor immediately start the necessary analysis towards re-integration of Power Supply and Hydro.

10.3 Efficiency Opportunities within the Current Structure

Nalcor suggested that there are opportunities for efficiencies and enhancements which can be achieved through continued organizational improvement and collaboration within the existing structure.

10.3.1 Potential Cost Savings

Nalcor advised that it plans to reduce labour costs which would result in savings of \$15 to \$20 million annually. According to Nalcor the goal of the organization is to have the same or less FTEs as prior to the commencement of the Muskrat Falls Project.¹⁰⁶ Nalcor stated: "This will be achieved without the specific position reductions proposed by Liberty, and in a fashion that best responds to the evolving requirements of both Nalcor and Hydro."¹⁰⁷

¹⁰⁵ Based on the most recently available information Muskrat Falls generation and the associated transmission is expected to be in operation by the end of 2020 and full normal operations by 2021.

¹⁰⁶ Nalcor/Hydro Evidence, page 27. The number of FTEs in 2016 was 1463 and forecast FTEs are 1630 in 2020 and 1492 in 2022. The 2020 increase was primarily related to the commissioning of the Muskrat Falls Project assets and the subsequent reduction in 2022 primarily reflects the planned transition of the Holyrood Thermal Generating Station from a generating to a synchronous condenser facility.

¹⁰⁷ Nalcor/Hydro Evidence, page 27.

Hydro also committed to achieving efficiency and productivity gains in the amount of \$2 million plus \$2.5 million at the Exploits generation operations.¹⁰⁸ Hydro advised that it has established an Efficiency and Effectiveness Plan which is focused on securing internal efficiencies and delivering cost savings.

Liberty noted that a full examination of the potential savings associated with specific opportunities for internal efficiencies and effectiveness at Nalcor and Hydro was outside of the scope of its work in this review but expressed the view that a concerted examination would discover efficiencies and areas for resource reduction. Liberty was of the view that an examination of efficiency and effectiveness could produce additional savings that would be the same magnitude or more than those that were estimated with the re-integration of Power Supply and Hydro.¹⁰⁹ According to Liberty this would require a focused, comprehensive examination of efficiency and effectiveness undertaken promptly and objectively with a high level of transparency to the Board and stakeholders. In addition Liberty suggested it is reasonable to expect Hydro to be able to produce savings in the range of at least \$2 million.

Nalcor agreed with Liberty that there are FTE reductions that are achievable.¹¹⁰ During the hearing Nalcor discussed its plans to reduce labour costs which include the reductions in the number of FTEs as set out below:¹¹¹

Nalcor Planned Labour Reductions	
Department	FTEs
Power Development	25
Transition to Operations	10
Business Systems	15
Corporate Services	15-20
Holyrood Thermal Generating Station	90
Total	155-160

Nalcor added that it intends to find another 20 or 30 FTEs to get back down to 2016 levels which would net approximately \$15 million to \$20 million in cost savings.¹¹² While Nalcor expressed confidence that the additional FTEs can be found they acknowledged that this would be contingent on the transition of the Holyrood Plant to synchronous condenser mode.¹¹³ Nalcor did not commit to providing additional information in relation to these reductions, either in terms of the implementation of its plan or ultimately the success of the efforts.

10.3.2 Considerations, Barriers and Risks

During the hearing Nalcor was questioned whether these savings were already included in the forecast revenue requirements and customer rates that had been reviewed by Liberty. The

¹⁰⁸ Nalcor/Hydro Evidence, pages 16-17.

¹⁰⁹ Liberty Report, page 7.

¹¹⁰ Transcript, October 9, 2019, page 137/15-23.

¹¹¹ Transcript, October 10, 2019, pages 35-36 – Mike Roberts, Nalcor. Roberts indicated that these were rough numbers. In addition these numbers reference to the 2019 forecast FTEs of 1654 rather than the 2020 FTEs set out in Nalcor's evidence.

¹¹² Transcript, October 9, 2019, page 141/8-15.

¹¹³ Transcript, October 9, 2019, page 138; Transcript, October 10, 2019, page 38-39.

reductions proposed by Nalcor related to the de-commissioning of the Holyrood Plant and the completion of the Muskrat Falls Project which account for at least 125 FTEs of the total proposed reductions. It was explained that the assumptions used to forecast revenue requirement and electricity rates included the de-commissioning of the Holyrood Plant for generation and the elimination of the resources for the Muskrat Falls Project team. Nalcor confirmed that the vast majority of the proposed reductions were most likely already accounted for in Liberty's analysis and would not provide additional savings.¹¹⁴

Hydro provided more information in relation to its planned reductions and explained that it:

- Has commenced the development of a multi-year plan to identify and implement the requirements necessary to centralize its planning and scheduling functions which is expected to be developed and implemented over a three-year period with the productivity gains expected to start in 2021.
- Is developing a request for proposals to assess opportunities for technology adoption and the identified projects will be developed and implemented over a multi-year schedule.
- Commits to undertaking a multi-year efficiency review of the Exploits operations targeting annual savings of \$2.5 million, which is over 25% of the current annual operating budget, with changes to be implemented over three to five years.¹¹⁵
- Plans to enhance scrutiny of its capital planning approach to reduce capital expenditures.
- Is open to exploring opportunities to determine whether common contracting with Newfoundland Power can produce savings.
- Commits to reducing FTEs in its human resource management through attrition to minimize the impact. Hydro noted that in 2016 it recommitted through new processes to rigorously manage replacement and new FTEs.¹¹⁶

According to Hydro it has already achieved a number of significant gains including changes to the leadership structure to eliminate one Vice-President and one Director as well as improved overtime and attendance program management.¹¹⁷ Hydro expressed confidence that it will become more efficient going forward and deliver more savings, indicating that savings of more than \$2 million are possible in addition to the savings mandated by the Board in its last general rate application.¹¹⁸ Hydro did acknowledge that there would be some overlap with Liberty's estimated reductions.¹¹⁹ Hydro committed to providing regular updates to the Board on the execution of its plan, with its first progress report to be filed in the second quarter of 2020.¹²⁰

Nalcor and Hydro also expressed concern with the time and effort associated with achieving sustained substantial efficiencies. Newfoundland Power agreed that effective restructuring takes

¹¹⁴ Transcript, October 11, 2019, pages 160-166.

¹¹⁵ While Hydro stated that it anticipated filing an application in 2019 for the approval of the Board to acquire the Exploits assets it has not yet filed for such approval.

¹¹⁶ Nalcor/Hydro Evidence, Appendix 3, page 11.

¹¹⁷ PUB-Nalcor-218 sets out savings of \$500,000 in relation to the leadership structure, of \$1.5 million as compared to 2018 overtime and \$5.4 million as compared to 2017, over \$2.1 in relation to the attendance support program, \$450,000 as a result of changes to the Corner Brook Pulp and Paper Ltd capacity assistance agreement, and \$500,000 related to its diesel engine overhaul program changes. Capital cost savings of approximately \$700,000 were also realized as a result of reduced reliance on embedded contractors.

¹¹⁸ Transcript, October 11, 2019, pages 23-24.

¹¹⁹ Transcript, October 10, 2019, page 54 and 57, Oct 11, pages 18-19.

¹²⁰ Nalcor/Hydro Evidence, Appendix 3, page 5.

time and effort, describing their efforts to achieve restructuring and efficiencies which took several years to properly implement.¹²¹

10.3.3 Comments and Submissions

According to Nalcor finding efficiencies in current utility operations is likely to result in savings without the risks it believes exist with Liberty's proposed reductions. Nalcor stated that it plans to reduce labour costs by \$15 million to \$20 million by 2022. Further Hydro recognizes there are efficiencies to be gained within its current utility operations and that it will actively pursue such opportunities, including \$2 million in annual savings from activities related to its regulated business and \$2.5 million in the Exploits operation over a three to five year period. The precise nature and timing of the steps to be taken to achieve Hydro's savings will be estimated and communicated to the Board in a progress report in the second quarter of 2020, with continuing oversight of the Board.¹²²

Newfoundland Power submitted that the efficiency opportunities identified by Liberty were reasonable opportunities to mitigate rates. They also recognized the need to focus on completing Muskrat Falls before implementing organizational changes to achieve efficiencies.¹²³

InterGroup recommended that Hydro should be directed to aggressively pursue operating and integration cost savings in the areas identified by Liberty and report on progress in its next general rate application. The Industrial Customer Group accepted that, until the Muskrat Falls Project achieves steady state operation, full integration of Power Supply and Hydro could risk being disruptive.¹²⁴

The Consumer Advocate did not comment specifically on the efficiency initiatives proposed by Nalcor/Hydro.

The representatives of the IBEW Local 1615 raised concerns in relation to the impact of the implementation of cost saving measures on reliability and staff, noting that efficiencies often seem to impact union workers most.¹²⁵ It was noted that while the amount of transmission line has increased since 1995, the number of positions has decreased by 25% and it is not possible to get all the work done now. The IBEW Local 1615 also raised a number of concerns in relation to the impact of reductions at the Exploits generating station given the unique circumstances of this plant.¹²⁶

Nalcor replied to the IBEW Local 1615 comments noting that the percentage of union employees within Hydro remained fairly constant over the 2005 to 2018 period, at around 60%. In terms of line workers Nalcor explained that improvements in tools and technology resulted in productivity improvements. According to Hydro its staffing is reflective of acceptable response time with consideration to cost of service. In terms of Exploits Generation Nalcor submitted that Hydro is

¹²¹ Transcript, October 15, 2019, page 12/6 to page 14/3 - Byron Chubbs, Vice-President, Energy Supply and Planning, Newfoundland Power.

¹²² Nalcor/Hydro Final Submission, page 5.

¹²³ Newfoundland Power Final Submission, page 15/12-13.

¹²⁴ Industrial Customer Group Final Submission, page 11.

¹²⁵ Transcript, October 18, 2019, page 40.

¹²⁶ IBEW 1615 Submission, pages 5-6.

required to create an organization that reflects an appropriate management, maintenance and capital program and is planning a multi-year efficiency review for Exploits targeting annual savings of \$2.5 million which is over 25% of the operating budget.

10.3.4 Board Comments

In Nalcor's view pursuing efficiencies within the existing organization offers greater rate mitigation potential without the risks of a major restructuring. According to Liberty an examination of efficiency and effectiveness within the current structure could produce additional savings in similar amounts to, and perhaps larger than, the estimated re-integration savings of \$21 million.

During the review Nalcor advised that it plans to reduce labour costs by \$15 million to \$20 million but the vast majority of the identified labour reductions are the result of changes in operations which are anticipated with the completion of the Muskrat Falls Project, including more than half which are associated with the transition of the Holyrood Plant to synchronous condenser operations.¹²⁷ Based on the information provided these reductions would have already been reflected in the estimated post-commissioning costs and forecast electricity rates. As a result Nalcor's commitment to reduce labour costs by \$15 million to \$20 million within the current structure would not generate material cost savings and would not significantly mitigate the anticipated rate increases. In contrast, the reduction of \$21 million estimated by Liberty with re-integration would result in actual cost savings and would contribute to rate mitigation. In addition Liberty believes that there is an opportunity for as much savings again with the implementation of new efficiency and productivity measures.

Hydro also committed during the review to achieving efficiency and productivity gains of \$2 million, in addition to the planned savings at Exploits generation of \$2.5 million. Hydro's commitment appears to be somewhat conservative given both Hydro's and Liberty's optimism with respect to the potential for even higher levels of savings and given that the targeted \$2 million reduction is about 1.5% of Hydro's operating costs.¹²⁸ Cost reduction at Hydro has been a regulatory focus over the last several years and in Hydro's two most recent general rate applications the Board found that Hydro had failed to demonstrate reasonable efficiency measures and ordered reductions in the test year costs.¹²⁹

The Board believes that the implementation of new efficiency and productivity measures could produce significant cost savings in addition to the savings which are possible with the re-integration of Power Supply and Hydro. While Nalcor and Hydro committed to reducing costs during the review, Hydro's plan is not fully developed or sufficiently ambitious and Nalcor's reductions will not result in cost savings which would contribute materially to rate mitigation. The Board recommends that Nalcor and Hydro immediately begin a comprehensive

¹²⁷ The transition of the Holyrood Plant to synchronous condenser operations may be delayed and, in the longer term, this transition is subject to the results of the ongoing Reliability and Resources Adequacy Study Review.

¹²⁸ Based on the information provided in Hydro's last general rate application its operating costs were \$123.9 million in 2016, \$130.2 million in 2017 and approved test year operating costs of \$134.5 million in 2018 and \$137 million in 2019.

¹²⁹ In Order No. P.U. 49(2016) the Board reduced Hydro's operating costs by \$6.8 million and in Order No. P.U. 16(2019) the Board reduced Hydro's test year operating costs by \$4 million in 2018 and 2019.

organizational review with a view to achieving savings in the order of \$20 million through the implementation of efficiency and productivity measures throughout the organization.

10.4 Future Project Operating and Maintenance Costs

The Board was directed to consider forward-looking cost savings and opportunities for increased efficiency related to operating and maintenance (O&M) costs of the Muskrat Falls Project. Liberty was asked as part of its review and analysis to look at these costs.

The forecast O&M costs have fluctuated significantly since the Muskrat Falls Project was sanctioned, as shown below:¹³⁰

July 2012	\$28.4 million
October 2013	\$34.4 million
June 2017	\$109.0 million
March 2018	\$106.3 million
October 2018	\$97.4 million

When asked why the forecast had increased so significantly since 2012 Nalcor explained that the 2018 forecasts were based on a detailed build-up of the O&M estimated costs.¹³¹ Nalcor also said the increase in the forecast was due to a number of factors, including a reassessment that took into account current industry benchmarks relating to O&M expenses as a percent of installed asset base and HVdc staffing models, the decision by Nalcor to functionally separate the Power Supply organization from Hydro to manage the Project assets, a change in operating philosophy to support a high degree of reliability and availability of the assets, the knowledge Nalcor had obtained regarding the O&M requirements and the requirement in the initial years for additional contracted HVdc resources to support the building of internal experience.¹³²

Liberty noted that the early estimates of O&M costs did not include water power rental fees and Impacts and Benefits Agreement payments of approximately \$20 million whereas the more recent estimates did, and also that there were significant increases in the other categories of the estimated O&M costs. According to Liberty, however, the latest estimates took an appropriately conservative view of the requirements for operations of the Muskrat Falls Project which will, when in-service, be critical for the reliable supply of power to Island Interconnected customers. Liberty also determined that the 2018 estimates provide sound well-developed baselines for projecting reasonable forecasts of the O&M costs while recognizing the high degree of reliability required of the project assets. Liberty did conclude that the forecast costs could be reduced by approximately \$12 million, including reductions of \$3.1 million in operations related labour, \$1.4 million in corporate engineering services, \$4.8 million in contingency and \$2.5 million in administrative support and system equipment maintenance.¹³³

Nalcor agreed with the majority of Liberty's findings, including that there are opportunities to reduce forecast O&M costs for the Muskrat Falls Project. Nalcor also stated in its submission that it has been committed to reducing the O&M costs since the estimates were developed and

¹³⁰ Liberty Report, page 85.

¹³¹ PUB-Nalcor-050.

¹³² PUB-Nalcor-051.

¹³³ Liberty Report, page 7, pages 84-85.

that this will continue to be a priority.¹³⁴ Nalcor cautioned, however, that any reductions in O&M costs must take into account the need to achieve full and stable operation of the project assets.¹³⁵

The Parties agreed that savings in the O&M costs identified by Liberty should be pursued. The Consumer Advocate recommended that all sources of mitigation funds identified by Liberty should be included.¹³⁶ In commenting on Liberty's and Synapse's reports Newfoundland Power supported pursuing opportunities to reduce O&M costs and shared Liberty's concern that reliability had to remain paramount while pursuing cost reduction. Newfoundland Power further stated that the options identified by Liberty to reduce the O&M costs represent reasonable opportunities to mitigate customer rate increases.¹³⁷

InterGroup concluded that Liberty's findings on the O&M costs should be given significant weight as they were based on a relatively comprehensive review and recommended that Hydro be directed to aggressively pursue the savings identified by Liberty and report on progress at the next general rate application.¹³⁸

Board Comments

The forecast Muskrat Falls Project operating and maintenance costs have fluctuated significantly since the project was sanctioned but the most recent forecast were found by Liberty to provide a sound baseline while recognizing the high degree of reliability required for the project assets. Liberty concluded that the forecast Muskrat Falls Project operating and maintenance costs can be reduced by \$12 million. Nalcor agreed that this magnitude of savings was realistic. The Parties agreed that these potential savings appeared reasonable and should be pursued. The Board recommends that the savings estimated by Liberty in relation to the future operating and maintenance costs of the Muskrat Falls Project be pursued by Nalcor.

10.5 Capital Spending by Hydro and Newfoundland Power

In their report Liberty commented on the level of capital spending of nearly \$0.5 billion over the next five years (2020-2024) for both utilities and suggested that moderate reductions in capital spending would produce reductions in the revenue requirements and could lead to potential savings.¹³⁹ During the hearing Liberty provided further comment on capital spending and the Board's approval process, stating:

We've done no investigations that would give us concern about whether any project proposed by either company was inappropriately proposed. We have no – we've done no comparison of capital programs here versus elsewhere. The only reason it was striking is that when we looked at the amount of dollars on a maximum basis that could be saved through combining Hydro and Nalcor or Newfoundland Power, it was obvious that even small changes, if hypothetically achievable, in capital cost could produce similar savings.

¹³⁴ Nalcor/Hydro Submission, page 5.

¹³⁵ Nalcor/Hydro Evidence, pages 18-19; Transcript, October 8, page 33/24 to page 34/5; Transcript, October 11, 2019, page 65/3-13.

¹³⁶ Consumer Advocate Final Submission, page 15.

¹³⁷ Newfoundland Power Final Submission, page 3 and 8; Transcript, October 15, 2019, page 9/21 to page 10/2.

¹³⁸ InterGroup Report, page 18/6-17.

¹³⁹ Liberty Report, pages 7 and 45.

So that was – what was striking was the sort of the ability for relatively moderate changes to produce savings. It was not in any way a criticism of those proposals, nor an expression of concern about any of the projects or of the Board's ability to address them as part of its normal processes.¹⁴⁰

According to Liberty capital spending should be evaluated with the additional consideration of balancing reliability and price:

So, we weren't even looking at it as something that said, you know, the Board better do something different tomorrow. It was more, you know, as you look at capital costs like this, if they're going to be proposed at a sustained level, just making sure that they're analysed with the new twist we're taking about, which is the balance between reliability and price...¹⁴¹

The Consumer Advocate expressed concerns relating to capital spending by both utilities and with the process for reviewing capital budgets, stating that he has been concerned with the significant level of capital spending by Hydro and Newfoundland Power and has expressed these concerns at capital budget and general rate hearings.¹⁴² The Consumer Advocate recommended that the Board implement a capital spending cap. According to Liberty the idea of placing a cap on capital spending is not recommended as a sustaining way of achieving savings while balancing costs with reliability.¹⁴³

The Industrial Customer Group commented on the projected capital spending levels as follows:

The IIC Group are of the view that, until MFP achieves steady state full in-service and until the question of whether further generation replacement or expansion may be needed to ensure reliability of power on the island is addressed by other proceedings before this Board, it will be difficult to come to grips with what should be appropriate levels of Hydro sustaining capital expenditure, and what further processes may be needed to control those expenditures. In the interim, the existing capital budget and general rate application processes before the Board should continue to be applied with the appropriate rigour.¹⁴⁴

Nalcor/Hydro did not support a cap on capital spending as proposed by the Consumer Advocate, noting that capping sustaining capital costs by legislation received no specific support from any witness at the hearing and submitting that an arbitrary cap would risk putting reliability in jeopardy.¹⁴⁵

During the hearing, Hydro commented on their level of capital spending:

We've been wanting to strike the right balance in cost and reliability there from an investment perspective, but we might have to make a large investment in one of those Penstocks. So, you know, we are taking steps to send a very strong signal internally to all our asset-holders, is that we are interested in lowering capital spend and then we're going

¹⁴⁰ Transcript, October 4, 2019, page 133/1-20 – John Antonuk, Liberty.

¹⁴¹ Transcript, October 4, 2019, page 134/1-9 – John Antonuk, Liberty.

¹⁴² Consumer Advocate Final Submission, page 13.

¹⁴³ Transcript, October 4, 2019, page 98.

¹⁴⁴ Industrial Customer Group Final Submission, page 11.

¹⁴⁵ Nalcor/Hydro Final Submission, page 34.

to have to prioritize better than we ever have before. So, we are definitely sending a signal internally into the parties here that we want to invest less and we want to look very closely at the cost and reliability balance.¹⁴⁶

Newfoundland Power's view on annual capital spending expressed during the hearing was as follows:

Newfoundland Power doesn't believe a cap is in the best interest of our customers. All of our capital projects that we put forward are consistent with the power policy of the Province, that is to provide least cost reliable service and I think we do that and we provide – we justify all those capital projects on those basis to the Board and we think that that works for our customers.¹⁴⁷

Board Comments

While the potential for rate mitigation associated with reductions in future capital expenditures by Hydro and Newfoundland Power was raised by Liberty, the Board notes that Liberty did not conduct an examination of the utilities' capital spending or processes and there was little information presented during the review in relation to this issue. The Consumer Advocate recommended the implementation of a cap on capital spending. This was not supported by Newfoundland Power, Nalcor and Hydro, all of whom raised concerns in relation to striking the right balance between cost and reliability.

To ensure the appropriate balance between least-cost reliable power, determinations in relation to annual capital budgets and whether individual capital projects should be approved are made only after a full examination of all of the circumstances. Currently these determinations are made by the Board in a comprehensive process established in accordance with the requirements in the *Public Utilities Act*. This process requires the submission of an annual capital budget application with detailed and comprehensive support and the provision of additional information where requested by the Board or parties and, where appropriate, a technical conference and hearing. The Board believes that the best way to ensure that future capital spending of the utilities appropriately balances cost and reliability is through a full and comprehensive review of the circumstances. The Industrial Customer Group suggested that in the near-term there should be continuing oversight of capital spending through these existing processes.

The Board notes that it has initiated a review of its capital budget approval processes to ensure appropriate oversight of the utilities' capital spending in the future. In addition issues related to Hydro's capital spending are expected to be raised in the Board's ongoing review of the Reliability and Resource Adequacy Study. In the short-term the Board does not believe that it would be appropriate or in keeping with the principle of least-cost reliable power to implement a prescriptive and arbitrary threshold such as a cap. While the Board acknowledges that reductions in capital spending will reduce costs over time it is not possible to conclude, based on the information provided in the review, that there is potential for rate mitigation associated with future capital spending by Hydro or Newfoundland Power.

¹⁴⁶ Transcript, October 10, 2019, page 73/5-19 – Jennifer Williams, President of Hydro.

¹⁴⁷ Transcript, October 15, 2019, pages 44/25 to page 45/9 – Byron Chubbs, Vice-President, Energy Supply and Planning, Newfoundland Power.

10.6 Concluding Comments

The opportunity for cost savings through the implementation of efficiency measures and organizational changes was one of the areas which generated the most discussion during this review. The identified opportunities for achieving these cost reductions involved; i) consolidation of Hydro and Newfoundland Power assets or operations, ii) re-integration of Power Supply and Hydro, iii) implementation of efficiencies within the existing structure at Nalcor and Hydro, iv) future project operating and maintenance costs, and v) capital spending by Hydro and Newfoundland Power.

The Board believes that the operational opportunities identified in this review offer an important source of cost savings, estimated to be in the order of \$48 million by 2030. These are true cost savings which will be earned annually and which will not impact Government's other revenues. The Board recommends that Nalcor begin the necessary work to re-integrate Power Supply and Hydro, to implement additional operational efficiency and productivity measures within Nalcor and Hydro, and to reduce future operational and maintenance costs for the Muskrat Falls Project. This work must at all times recognize that reliability is paramount. Government should consider whether a direction to Nalcor to undertake this work is appropriate in the circumstances.

11.0 ELECTRIFICATION AND CONSERVATION

Electrification and energy conservation can both affect the amount of capacity and energy required for provincial load and for exports and influence the revenues available for rate mitigation. Electrification of certain end-use sectors provides an opportunity to directly increase domestic load resulting in higher sales of electricity and increased utility revenues to cover Muskrat Falls Project costs. Higher in-province sales will, however, reduce the amount of energy available for export sales and may also increase the peak load resulting in the need for additional capital investment for capacity. These impacts can be mitigated somewhat through rate design. Programs aimed at reducing in-province consumption, such as conservation and demand management (CDM) and demand response (DR), will increase available energy and capacity for potential export sales and result in lower bills for customers who avail of such programs.

Different combinations of CDM, electrification and rate design parameters were analyzed by Synapse to test the effects of various scenarios on the amount of available energy and capacity after accounting for in-province load, the commitments to Nova Scotia and the resulting export sales revenues.

11.1 Electrification Opportunities

Synapse identified opportunities for electrification through fuel switching in heating systems for residential and commercial buildings and in the transportation sector. According to Synapse the opportunity for electrification in these sectors is high based on the following factors:

- Approximately 23% of the residences on the Island Interconnected system and 14% of residences on the Labrador Interconnected system have oil heating systems.
- Institutional buildings are large energy users on the island with nearly half of the institutional buildings on the island currently heated by oil.

- The Province moving towards the all-Canada goal of reaching 30% electric vehicle (EV) sales by 2030.

The analyses for building electrification focused on the conversion of oil heating systems in the residential and commercial sectors on both the Island Interconnected system and the Labrador Interconnected system to electrified heating systems (mini-split air source heat pumps or electric resistance boilers). Scenarios for both low and high system conversion rates were considered with results for a low growth scenario with peak reduction on the coldest days of the year and a high growth scenario with no peak reduction.¹⁴⁸

In the case of the residential sector Synapse evaluated the potential to electrify oil-heated homes by installing ductless mini-split air source heat pumps in residences. Synapse assumed 6% of oil-heated homes would convert to heat pumps by 2030 in the low growth scenario and 24% would convert in the high growth scenario. For commercial buildings Synapse examined the potential for conversion of oil-heated small and large commercial buildings to heat pumps and for conversion of oil boilers in institutional commercial buildings to electric resistance boilers. In the low growth rate scenario Synapse assumed that 1% of oil-heated commercial buildings would convert to electric heating systems annually, while in the high growth scenario a 4% conversion rate was assumed. In the case of the Memorial University campus in St. John's, which is considering replacing a portion of its oil-fired heating plant with two 10 MW electric resistance boilers, the low scenario assumed one electric boiler is added in 2021 and the high scenario assumed a second is added in 2024.¹⁴⁹

Synapse also evaluated the potential for electrification of light-duty and medium-duty vehicles and the addition of shore-side power at ship berths at the St. John's port.^{150,151} Similar to the building electrification analysis Synapse considered both low and high adoption rate scenarios with both scenarios incorporating Newfoundland and Labrador's historical (pre-2019) EV adoption data. For both light-duty and medium-duty vehicles the low adoption rate scenario assumed 1.5% of vehicle stock would consist of EVs by 2030 compared to 7.5% by 2030 in the high adoption rate scenario.¹⁵² In the case of the St. John's port Synapse assumed an increase in on-shore power consumption of 6% annually in the low adoption rate scenario and a 12% increase annually in the high adoption rate scenario.

¹⁴⁸ The low scenario assumed that all oil-heated buildings will maintain their oil systems as a back-up heating system and that the building will have integrated controls to allow use of the oil system below -7 deg C. The high scenario assumed that no oil-heated building will maintain their oil systems as back-up heating systems.

¹⁴⁹ The addition of one electric boiler in 2021 would replace 50% of the university's oil consumption while a second boiler in 2024 would replace an additional 25%. It was also assumed that the university would continue to use some oil during on-peak hours to avoid high electricity demand charges and that the electric boilers would be run continuously, with the oil units used during colder weather for higher loads.

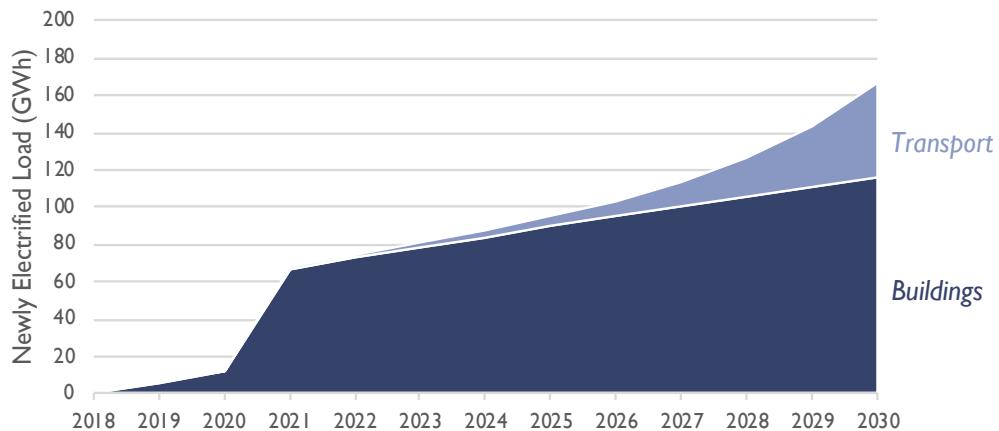
¹⁵⁰ Light-duty vehicles include gasoline fueled cars and light trucks (SUVs, pick-up trucks and some cross-overs and mini-vans). Medium duty-vehicles include diesel-fueled school buses, transit buses and delivery trucks. Heavy-duty vehicles were not analyzed due to unavailability of commercially viable electrified technology in the near to medium-term.

¹⁵¹ Synapse noted that only the port of St. John's was analysed as most of the ship traffic in the Province travels into and out of St. John's port.

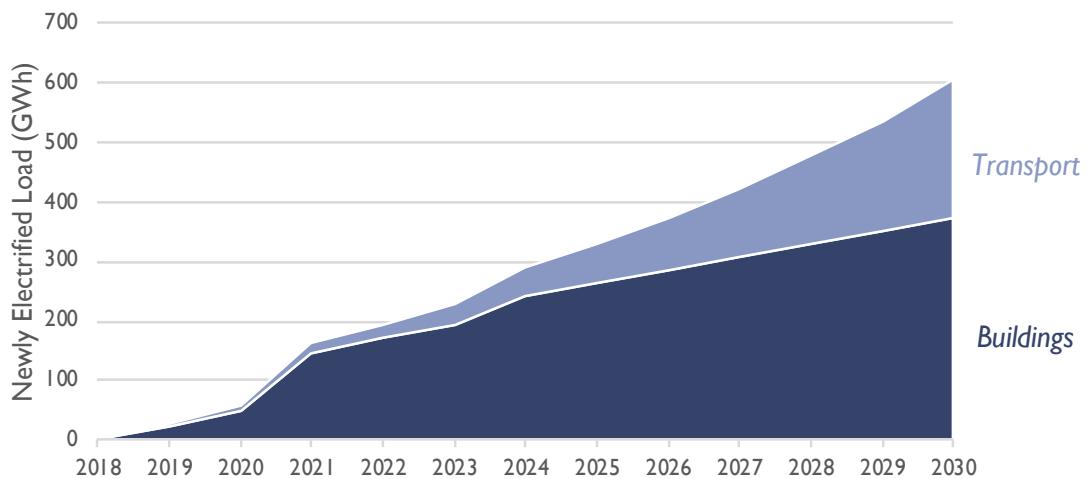
¹⁵² In the high scenario Synapse assumed that Newfoundland reaches the all-Canada goal of reaching 30% EV sales by 2030. The low scenario assumed the high scenario curve is delayed by five years and only reaches 10% EV sales by 2030.

Based on its analysis Synapse estimates that, under the low electrification scenario, the load from newly electrified end uses could reach 166 GWh by 2030 with 163 GWh (98%) on the Island Interconnected system. Under the high electrification scenario the potential increase in load could reach 605 GWh by 2030, with 587 GWh or 97% of this load on the Island Interconnected system. The contribution of building and transportation end-uses for each scenario is shown below:¹⁵³

Electrification Potential – Low Adoption Rate



Electrification Potential – High Adoption Rate



In the low adoption rate scenario building electrification is expected to result in 117 GWh (70%) of this new electrified load, with institutional buildings comprising 104 GWh by 2030. The high adoption rate scenario could result in 373 GWh (62%) of new load from buildings, with institutional buildings comprising 273 GWh by 2030. Transportation electrification is estimated to contribute 30% to 38% of the new electrified load by 2030 in the low and high adoption rate scenarios respectively.

¹⁵³ Synapse Report, Figures 14 and 18.

The capacity impact of this new electrified load is expected to reach 38 MW by 2030 under the low adoption rate scenario with 37 MW of this capacity impacting the winter peak on the Island Interconnected system. In the high adoption rate scenario the peak impacts could reach 151 MW by 2030 with 147 MW of this capacity impacting the winter peak for the Island Interconnected system.

During 2019 Newfoundland Power and Hydro engaged Dunskey Energy Consulting (“Dunskey”) to prepare the 2020-2034 Conservation Potential Study (“CPS”).¹⁵⁴ Dunskey assessed the potential conservation and electrification potential in the Province. With respect to EVs Dunskey noted that projections for EV sales in Newfoundland and Labrador are well below national projections, primarily due to lack of public charging infrastructure. Under a business as usual case Dunskey predicts that, by 2034, 41,400 EVs will be on the road, adding approximately 266 GWh of energy to Newfoundland Power’s load (approximately 5% of projected energy sales in 2034) and increasing peak load by 106 MW. However, with programming to influence customers to buy EVs and investment in DC fast charging stations, load management programs and commercial fleet programs, Dunskey estimates this potential could increase to 132,000 EVs by 2034, adding 647 GWh of electricity consumption and an increase in the utilities’ peak demand of 42 MW. Newfoundland Power noted the net present value of EV deployment under this scenario is estimated at \$170 million.¹⁵⁵ Dunskey highlighted the potential impact of EV adoption on peak loads suggesting that programs to manage load, for example by shifting peak charging to off-peak hours, were critical to handling the system impacts and realizing the financial benefits of EV adoption.¹⁵⁶

11.2 Electrification Costs and Savings

Electrification impacts both the utility and customer as revenue and cost streams change from fossil fuels to electricity. Synapse examined the economics of electrification for the utility as well as for a “typical” EV customer and a “typical” residential heat pump customer. In the case of the utility additional costs associated with electrification include incentives for heat pumps and installation costs for EV charging stations. Based on its analysis Synapse estimated the utility costs on the Island Interconnected system for the period 2020-2030 as shown below:

¹⁵⁴ A copy of this report was provided in response to PUB-NP-104.

¹⁵⁵ Transcript, October 15, 2019, page 17/16 to page 18/1; PUB-NP-104, Attachment A: Dunskey Figure 6-16 and Table 6-4. This reflects a \$20 million investment in DC fast charging stations, load management programs, public education and awareness, and commercial fleet programs.

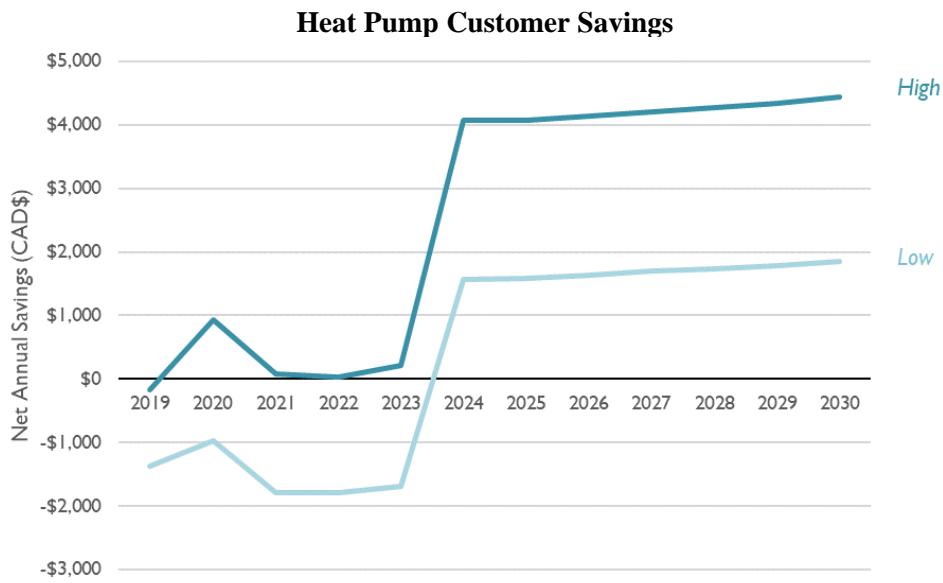
¹⁵⁶ Dunskey, page 11; PUB-NP-104.

Electrification Utility Investment (millions CAD\$) by scenario and year: 2020, 2025, 2030

Electrification Scenario	Investment	2020	2025	2030
Low	Heat Pump Installs	248	236	225
	Heat Pump Incentive Costs	\$0.77	\$0.81	\$0.85
	L2 Charging Station Installs	2	7	81
	Fast Charger Installs	0	0	3
	EV Charging Station Costs	\$0.02	\$0.13	\$1.52
	Total Costs	\$0.80	\$0.94	\$2.37
High	Heat Pump Installs	981	889	810
	Heat Pump Incentive Costs	\$1.07	\$1.07	\$1.07
	L2 Charging Station Installs	17	116	494
	Fast Charger Installs	1	4	18
	EV Charging Station Costs	\$0.24	\$2.39	\$10.68
	Total Costs	\$1.31	\$3.45	\$11.76

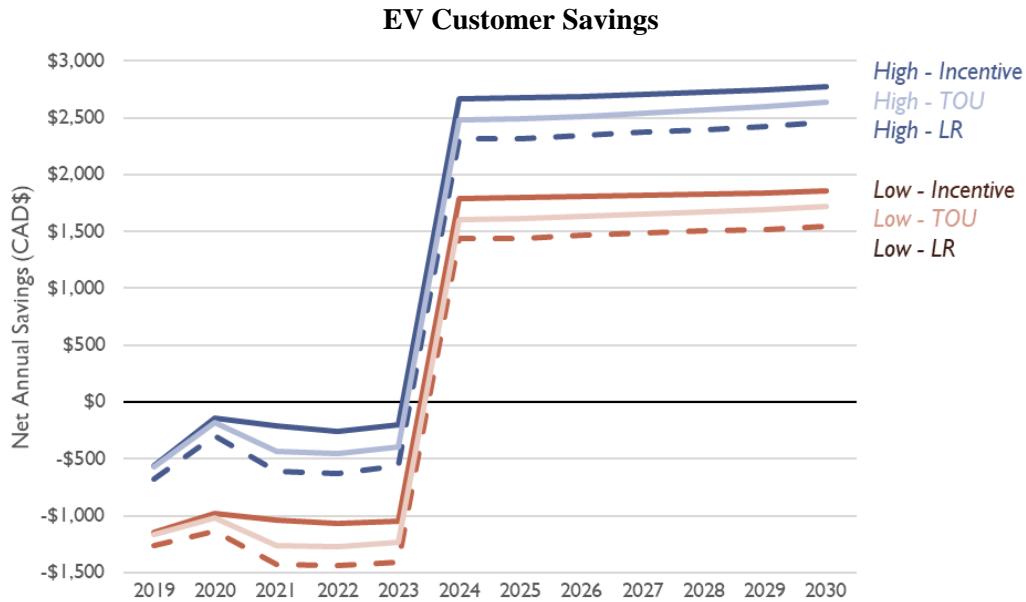
Source: Synapse Report, Table 15. Note: Values represent in-year investments (not cumulative).

In the case of residential customers electrification costs include purchase costs for an EV and/or heat pumps (less any financial incentives) and the cost of electricity.¹⁵⁷ The benefits for customers are primarily avoided fuel costs for gasoline and heating oil. Based on its analysis Synapse found favourable economics for customers beyond 2024 for purchase and operation of EVs and heat pumps, with the high adoption scenario for heat pumps showing customer savings from 2020 onwards, as shown in the following:¹⁵⁸



¹⁵⁷ Synapse's analysis includes the current federal EV incentive of \$5000 per vehicle with assumptions for reduced incentives as EV sales increase. Other assumptions for Synapse's analysis of electrification costs for customers are set out in the Synapse Report on pages 53-55.

¹⁵⁸ Synapse Report, Figures 22 and 23.



11.3 Conservation Opportunities

While electrification can increase utility revenues through higher domestic sales conservation programs such as CDM and DR decrease utility revenues as a result of lower energy use. CDM programs are designed to lower energy consumption, especially during the winter months when electricity demand is highest, resulting in lower energy costs for consumers. CDM programs may include behaviour changes such as turning back thermostats or cold water washing, investments in programmable thermostats and energy efficient appliances or lighting, adding or upgrading insulation, or substituting existing electric resistance heating with heat pumps.

CDM programs are currently offered to customers in the Province under the takeCHARGE program available through Newfoundland Power and Hydro. Synapse noted that energy savings from CDM programs have been increasing since 2013 with most of these savings from Newfoundland Power's residential CDM programs. The total 2019 energy savings from Newfoundland Power's CDM programs are forecast to be about 43 GWh while energy savings from Hydro's CDM programs are expected to be about 2 GWh.¹⁵⁹

The loss of revenue to the utilities means that the potential direct contribution to rate mitigation from CDM and DR is limited; however, customers availing of conservation will have lower bills. The system benefits of conservation can also lead to lower overall costs through lower energy needs and deferral of future capacity requirements. As noted by Newfoundland Power:

The primary reason that customers conserve is reduced electricity costs. Conservation provides tangible benefits in two ways. First, it lowers individual customer bills. Second, it reduces overall system costs which benefit all users of the electrical system. Over the past decade, Newfoundland Power has consistently met or exceeded all of its targets set out in its conservation plans every year. This has allowed customers to save almost 60 million

¹⁵⁹ Synapse Report, Figure 31, page 74. Newfoundland Power's CDM program savings include both residential and commercial customers while Hydro's savings include residential, commercial and industrial.

dollars on their electricity bills, and has also saved 74 million dollars in avoided fuel costs at the Holyrood generating station.¹⁶⁰

Since CDM programs reduce the revenues available to utilities to cover fixed costs, higher rates may be required to ensure that costs are recovered from all customers. This could lead to higher bills for those customers who don't participate in CDM programs. This point was highlighted by Nalcor/Hydro in its evidence, which noted that Synapse's approach to CDM is not focused solely on the rate mitigation goal of minimizing the retail rate, but rather on "total household energy expenditures". According to Nalcor/Hydro:

The likely outcome of this approach would be that middle and upper income customers who own their homes would take advantage of CDM initiatives to offset the higher rates. However, lower income households and renters may not be able to take advantage of these incentives, thereby shifting the burden of MFP costs disproportionately to this group of customers. This could be mitigated, in part, by targeting lower income customers with incentives (e.g. a sliding scale based on income), however, renters and very low-income customers would likely still be excluded. Aggressive CDM in the name of lower "average energy expenditures" should be approached with caution to avoid any unanticipated consequences.¹⁶¹

The bill impact for customers can, however, be quite significant, with Synapse suggesting a potential reduction in total average energy consumption of up to 12% between 2019-2030 in the high CDM scenario.

Synapse also responded to the issue raised by Nalcor/Hydro on potential inequities of CDM programs for lower income customers. Synapse explained that policies and programs to promote wide participation over time can mitigate against the risk of non-participant inequities.¹⁶²

11.4 Conservation Costs and Savings

Synapse estimated the annual energy and winter peak demand savings and associated program costs for CDM and DR programs by end-use and building types for the Island Interconnected system and the Labrador Interconnected system separately.¹⁶³ Assumptions used for estimated energy and peak savings as well as program participation rates and costs in the end-use model were tested against actual results in other North American jurisdictions. The impact of heat pump conversions was analyzed separately due to the scale of potential impacts and differences in recent market adoption in the Province. Synapse noted that the number of Newfoundland Power's electric heat customers with heat pump installations has increased significantly since 2014, from 4% to almost 18% in 2018. Costs and savings were analyzed for three scenarios reflecting various levels of CDM and DR activities and heat pump conversions over time.¹⁶⁴

¹⁶⁰ Transcript, October 15, 2019, page 15/13 to page 16/1 – Krista Langthorne, Manager of Energy Conservation, Newfoundland Power.

¹⁶¹ Nalcor/Hydro Evidence, page 8.

¹⁶² Transcript, October 7, 2019, page 91/1-25; Synapse Presentation, page 5.

¹⁶³ End-use categories analyzed included space heating, water heating, lighting, refrigerator and freezer, and others within five different building types (detached single family with electric heat, detached single family without electric heat, attached single family with electric heat, multifamily with electric heat and others).

¹⁶⁴ The three scenarios included: i) a Base Case reflecting the energy and peak load reductions embedded in Synapse's base load forecast with current levels of CDM and heat pump conversions; no DR assumed since no DR

Based on its analysis Synapse concluded that, for the Island Interconnected system, CDM programs with heat pumps are very cost-effective with benefit-cost ratios for the period 2020-2030 ranging from 2.8 to 3.3 under the high case scenario and from 1.5 to 1.7 under the low case scenario. Synapse noted that the substantially higher benefit cost ratios under the high case scenario are largely from the significant contributions of heat pumps that provide more energy savings than conventional CDM but cost significantly less. The benefit streams associated with the low case and high case scenarios on the Island Interconnected system are shown below:

Low Case Benefit Cost of CDM with Heat Pumps

Stream of Benefits, Real	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Net Energy Savings (GWh)	0	2	5	11	19	29	42	57	76	98	123
Net Peak Savings (MW)	0	0	1	2	3	4	6	8	11	14	18
Energy Benefits (\$ million)	0.0	0.1	0.2	0.4	0.6	1.0	1.4	1.9	2.5	3.2	4.1
Capacity Benefits (\$ million)	0.0	0.1	0.2	0.5	0.9	1.3	1.9	2.6	3.5	4.5	5.6
Total Benefits (\$ million)	0.0	0.1	0.4	0.9	1.5	2.3	3.3	4.5	6.0	7.7	9.7
Net cumulative amortized costs (\$ million)	0.0	0.1	0.3	0.6	1.0	1.5	2.2	2.9	3.8	4.7	5.7
B/C Ratio	n/a	1.50	1.51	1.51	1.52	1.53	1.53	1.54	1.58	1.63	1.69

Source: Synapse Report, Table 37

High Case Benefit Cost of CDM with Heat Pumps

Stream of Benefits, Real	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Net Energy Savings (GWh)	18	47	94	157	233	321	421	522	621	725	832
Net Peak Savings (MW)	3	8	17	27	40	55	72	89	105	123	141
Energy Benefits (\$ million)	0.6	1.6	3.1	5.2	7.7	10.6	13.9	17.2	20.5	23.9	27.4
Capacity Benefits (\$ million)	1.0	2.6	5.2	8.7	12.8	17.5	22.8	28.1	33.4	38.9	44.6
Total Benefits (\$ million)	1.6	4.2	8.4	13.8	20.5	28.1	36.7	45.4	53.9	62.8	72.1
Net cumulative amortized costs (\$ million)	1	1	3	5	7	10	13	16	18	20	22
B/C Ratio	3.12	3.01	2.98	2.95	2.90	2.84	2.78	2.83	2.94	3.10	3.31

Source: Synapse Report, Table 36

On the Labrador Interconnected system CDM programs were not found to be cost-effective in either of the scenarios analyzed due to lower avoided capacity costs and lower heat pump adoptions relative the Island Interconnected system.

In the case of DR programs Synapse also found the associated benefit cost ratios to be relatively high due to the low cost of DR measures ranging from \$50 to \$160 per year, which is much lower than the cost of capacity.

programs currently in place; ii) a Low Case reflecting slightly increasing levels of CDM over time, the same level of heat pump conversions as in the base case, and gradually increasing levels of DR programs; and iii) a High Case assuming aggressively increasing levels of CDM and DR program activities and assumed maximum heat pump potential in the Province. See Synapse Report, page 57.

Synapse concluded that the CDM-only scenarios exhibit poor mitigation opportunity from a rates perspective because of the loss of revenue from customers on the Island. The capacity avoidance value, along with the increased export revenue value, are not sufficient on their own to fully offset both the CDM cost (which is offset when considering only avoided capacity and energy value) and the revenue loss. Synapse noted however that, from a customer perspective, the energy and electric bill impacts are relevant since both high and low CDM scenarios exhibit net benefits on the average customer bill.¹⁶⁵

Synapse noted that Dunsby presents a much more in-depth analysis of local conditions and should be used for detailed input into the 2020-2034 CDM program design, as it was intended. Synapse recommended the development of CDM programs including initiatives to most efficiently and effectively increase the activity in the Province such as.¹⁶⁶

- Including standard approaches to enhancing CDM effects with careful attention to program design and equity across all customers
- Including demand response mechanisms – conventional industrial curtailment and incremental peak load shaving using enabling control technologies (eg. thermostats) and/or rate drivers such as critical peak pricing (for all if advance metering infrastructure is developed)
- Including potential incentives for heat pumps that demonstrate increased performance and/or other technologies that can potentially be deployed to reduce peak load

11.5 Rate Design Considerations

Rate design can be an important element of electrification and CDM programs as it can reduce peak demand and shift electricity consumption to certain hours or time periods, usually through implementation of Time-of-Use (TOU) rates or Critical Peak Pricing (CPP). Incentive rates can also be used to encourage adoption of electrification technologies.

TOU rates are designed to provide customers with a more accurate price signal with the intent to shift electricity consumption, where practical, from more costly on-peak hours to less costly off-peak hours. For example the costs of providing electricity in the on-peak morning and evening hours are nearly four times higher than serving load in the middle of the night, and costs for serving peak hours during the winter are nearly 11 times more costly than non-winter hours.¹⁶⁷ CPP involves the implementation of a much higher price during a small number of event hours per year usually to reduce peak demand on the system. Typically customers receive notification the day before an event occurrence to allow for the opportunity to shift or adjust power consumption to lower usage during the higher price event.

Synapse considered the impact of a number of rate design options in its analysis of costs and savings for electrification and CDM scenarios, including TOU rates with CPP for all customers, TOU rates for EV customers only, and incentive rates for transportation electrification.

¹⁶⁵ Synapse Report, page 9

¹⁶⁶ Synapse Presentation, page 55.

¹⁶⁷ Synapse Report, page 106.

i) TOU Rates with CPP for all Customers

Synapse's analysis of TOU and CPP rates on the Island Interconnected system used the marginal costs provided by Hydro.¹⁶⁸ The specific rates vary based on the amount of electrification and/or CDM scenario used but all prices were designed to be at or above marginal cost.¹⁶⁹ In addition, since TOU rates and CPP require the ability of the utilities to read meters at various time intervals, Synapse assumed that advance metering infrastructure ("AMI") was also implemented.^{170,171}

Based on work from other similar jurisdictions Synapse estimated that TOU rates alone would produce peak load reductions of approximately 1% for the Province. When combined with CPP minor load reductions could be achieved in the early years, increasing to between 3% and 7% by 2030, depending on the scenario of electrification and/or CDM used.¹⁷² Synapse noted that, because Newfoundland Power has only recently implemented automated meter reading (AMR) technology, the operational savings would not be as significant from the installation of AMI in the near-term. According to Synapse it would only be cost effective to install AMI to allow widespread use of TOU rates if doing so would result in the peak demand being materially reduced and additional generation capacity costs being avoided.

Synapse concluded that there is a potential for net benefits with the implementation of TOU rates and CPP but recommended a closer examination of the costs and benefits to gain a better understanding of the overall benefits. This should include a more accurate estimate of the costs associated with the implementation of AMI, the value of any other benefits that may be available over the current metering technology and pilot studies to test the responsiveness and consumption patterns of customers under both TOU and CPP rate design.

ii) TOU Rates for EV Customers

Because of the uncertainty of the overall economic benefits of the widespread implementation of AMI to enable TOU rates for all customers Synapse considered a rate design using TOU rates for electric vehicle customers only, since this would be less expensive than having to implement AMI. Since electric vehicles have the ability to use submetering technologies an electric vehicle can be billed on a TOU rate while the rest of the household can continue to be billed on the standard rate.¹⁷³

¹⁶⁸ Synapse used a two-period TOU rate structure, with the on-peak hours set at 6:00 am -10:59 am and 4:00 pm - 8:59 pm. A CPP was layered on top of the TOU to reduce peak demand. Synapse assumed that critical peak events would be called as necessary and would apply to approximately 50 hours per year.

¹⁶⁹ Synapse Report, page 106-107.

¹⁷⁰ Newfoundland Power recently installed automated meter reading (AMR) technology which allows for automated meter reading but it is not capable of hourly metering for the purpose of implementing TOU rates.

¹⁷¹ Based on their research of AMI procurement costs for other AMI installations in Canada and the US Synapse has assumed that the installation of 290,000 meters, at a cost of approximately \$300 per meter, would result in an investment of \$87 million. For rate design purposes, they also assumed that the meters would be installed over a three year period, escalated for inflation, and amortized over a 20-year period.

¹⁷² Synapse Report, page 111.

¹⁷³ Synapse Report, page 112. Synapse provided three currently available technology options for submeters which all collect electric vehicle charging data and use a Wi-Fi or a cellular network to record and transmit usage data to third party vendors or directly to the utility. Synapse assumed the cost of this option to be \$400 per electric vehicle to cover the program costs including a rebate to encourage customers to purchase a Wi-Fi enabled meter.

TOU rates for customers with EVs would result in the charging of the vehicles during non-peak hours, at lower rates. This would reduce the usage of electricity during the on-peak hours resulting in a decrease in peak demand and potentially lower overall system costs. However, the actual revenues received by the utility from EV customers billed on TOU rate would be lower compared to the revenue collected on a standard rate. The shortfall in revenues would have to be collected from the remaining customers which could lead to higher standard rates. Synapse noted in their report that TOU for EVs charging demonstrates better overall rate mitigation.

iii) Incentive Rates for Transportation Electrification

Even though operating costs for EVs are lower, up-front costs are higher and so further incentives, such as reduced electricity prices for EV charging, may be required to obtain the number of vehicles required to achieve the High Electrification scenario put forward by Synapse. Synapse examined the average rate impact for non-EV customers with the implementation of an incentive EV rate and the EV TOU rate. Based on their analysis, the non-EV customers would experience less of benefit on rates than they would if all customers paid the average rate. The EV TOU rate would also reduce the benefit received by non-EV customers but, according to Synapse, this would only be a slight impact. Synapse noted that these impacts would need to be weighed against the need for incentive rate structures to attract new load.¹⁷⁴

Dunsky also assessed various demand response program scenarios to determine which offers the most potential when the net impact on peak demand is assessed. One of the scenarios presented focused on the demand response potential using rate design measures such as TOU rates and/or CPP, in addition to the current existing curtailment programs that Hydro and Newfoundland Power have in place. Dunsky concluded that under this scenario, the overall potential to decrease peak demand does not occur when TOU rates are added to the current mix of programs, as it undermines the ability of Hydro's Industrial Curtailment program by creating new, choppier peaks. The Dunsky report noted, as an example, that if the utilities are able to negotiate Industrial Curtailment contracts with longer demand response event durations, it may be possible that TOU and CPP rates could offer additional potential in reducing peak demand as compared to the results in their study. They also noted that the results presented in their study indicate that fuel switching and electric vehicle adoption could alter the utility load curve shapes which may create an opportunity for TOU and CPP rates to add further peak load reduction potentials.¹⁷⁵

Synapse recognized that Dunsky is more tentative on achieving peak reduction through the use of TOU and CPP rates but noted that Dunsky does allow for possible changes to conditions that may make this type of rate design more effective in the future. Newfoundland Power and Hydro noted that further analysis will be undertaken on the issues raised in Dunsky's report.

11.6 Revenue Potential

Synapse modeled the revenues associated with a number of electrification/CDM/rate design scenarios and found increases in utility revenues for all scenarios with the exception of high CDM only, with the amount dependent on the extent of CDM and DR programs and rate design parameters in place. These scenario results are set out below:

¹⁷⁴ Synapse Report, page 115.

¹⁷⁵ Dunsky Report, pages x-xiii; PUB-NP-104.

Components of Net Mitigation Effect, Island Interconnected System

Scenario	Delta Internal Revenues		Delta Export Revenues (Millions)		CDM, Elec DR, TOU Costs (Millions)		Delta Capacity Costs (Millions)		Delta Utility Revenues (Millions)	
	2025	2030	2025	2030	2025	2030	2025	2030	2025	2030
6. High CDM	(\$55)	(\$156)	\$14	\$45	\$9	\$23	(\$16)	(\$50)	(\$35)	(\$84)
10. High Elec	\$65	\$129	(\$13)	(\$29)	\$3	\$12	\$17	\$37	\$33	\$52
12. High Elec w/EV TOU	\$65	\$129	(\$12)	(\$29)	\$5	\$15	\$15	\$30	\$34	\$55
12a. High Elec w/EV TOU w/DR	\$65	\$128	(\$12)	(\$29)	\$7	\$23	\$7	\$6	\$40	\$70
20. High Elec w/EV TOU, High CDM	\$11	(\$23)	\$2	\$19	\$14	\$38	(\$3)	(\$23)	\$2	(\$18)
20a. High Elec w/EV TOU, High CDM w/DR	\$11	(\$24)	\$2	\$19	\$16	\$46	(\$12)	(\$46)	\$9	(\$4)
24. High Elec w/EV TOU, High CDM w/TOU+CPP	\$11	(\$25)	\$2	\$19	\$22	\$42	(\$16)	(\$50)	\$7	\$2

Source: Synapse Report, Table 2.

Note: Positive Delta Revenue values indicate increased utility revenue relative to the Synapse LR scenario. Positive Costs indicate increased utility spending relative to the Synapse LR Scenario.

As the above table shows the maximum net revenue potential is approximately \$70 million in 2030 with a high electrification scenario including EV, TOU and DR. This equates to approximately 1 cent/kWh potentially available for rate mitigation in 2030. Revenue potential decreases when CDM programs and TOU and critical peak pricing are included such that the net revenues are negative, meaning that revenues don't offset the costs. While Synapse recommended further analysis of electrification potential it was noted that:

...implementation of such various initiatives will not, by themselves, reduce rates enough to offset the rate increase needed to cover Muskrat Falls costs. At the same time, the combination of electrification and increased CDM has the potential to reduce total Provincial energy costs by a greater amount than either electrification or CDM alone, while also delivering some rate mitigation.¹⁷⁶

11.7 Overall Conclusions and Next Steps

Synapse's overall conclusions on electrification and CDM potential include the following:¹⁷⁷

- High levels of policy-supported electrification with enhanced CDM and use of multiple forms of rate design is the best overall for rate and bill mitigation effect.

¹⁷⁶ Synapse Report, page 10.

¹⁷⁷ Synapse Report, page 128-129.

- Electrification has the highest value mitigation opportunity because of two underlying factors: avoided oil fuel expenditures (new savings) and the effect of technological improvements (cars, batteries, heat pumps).
- CDM on the Island Interconnected system complements and supports electrification because it allows for both increases in export sales, and also mitigates the peak-load-increasing effect of electrification consumption in peak periods.
- Rate design at the sectoral level, guided by high-level analyses, can help to provide efficient price signals to optimize load in the Province. For example, TOU and CPP rates can encourage customers to reduce demand when capacity is constrained while increasing consumption when capacity is not constrained, and incentives can be provided to encourage customers to adopt electrification opportunities.
- Federal and provincial government policies have a material effect of reducing costs and jumpstarting trends to encourage customer behaviours to support electrification and CDM programs.

Synapse recommended a number of actions which could be taken as the next steps in moving forward to develop appropriate programs for the Province. In their opinion detailed analysis on the following is required to develop programs best suited to meet provincial requirements:¹⁷⁸

- the development of electrification policies including specific rate structures and incentives to encourage electrification and the development of plans to install EV chargers across the island;
- the development of CDM programs, including initiatives to address any potential inequities for non-participants, and assessment of industrial customers' load curtailment programs, demand response mechanisms and incentives to install heat pumps;
- rate design approaches such as TOU and CPP to support electrification and CDM programs; and
- the impact of federal and provincial policies that provide funding for building energy efficiency, fuel switching and EV rebates.

11.8 Comments and Submissions

Nalcor/Hydro supported electrification efforts as a means to achieve long term sustainable rate mitigation but cautioned that careful consideration is needed to ensure that the increase in the use of electricity does not have a significant impact on peak, requiring additional capital investment. They agreed that more study is required to develop a comprehensive plan which should, among other factors, include the consideration of the use of TOU rates, CPP and peak demand management. Nalcor/Hydro also noted that CPP for electric heat sources is a potential strategy to mitigate the risk of a significant impact on peak.¹⁷⁹ They recommended that, based on the information from Synapse and Dunsby and subject to further study:

- Level 3 Direct Current Fast Chargers be deployed across the Province with a view towards increasing the amount of domestic energy consumption from EVs
- Incentives be developed for business owners to install smart Level 2 chargers for employees and the general public to avail of, while providing consumers with price signals to avoid charging at peak times.

¹⁷⁸ Synapse Presentation, page 55; Transcript, October 7, 2019, page 65/18 to page 66/3.

¹⁷⁹ Nalcor/Hydro Final Submission, pages 29 and 32.

- Further investigation to determine if there would be benefits in modifying building codes and parking lot regulations such that Level 2 EV charging infrastructure be more readily available for use by EV owners.

With respect to conservation programming Nalcor/Hydro noted that some CDM programs discussed by Synapse, such as rebates on heat pumps for homes currently using electric resistance heat, would result in increased customer rates but lower average bills. Non-participants in these programs may see increased costs as a result. They noted that, while Synapse acknowledged this risk, there were no suggestions put forward as to how this risk could be mitigated or what policies or programs would ensure broad participation, considering the impact on non-participants.

Newfoundland Power stated that Synapse's findings with respect to the role of electrification in rate mitigation are generally consistent with its own research and also that Synapse's observation that more research is required to gain a better understanding of the potential of TOU rates aligns with Newfoundland Power's research.¹⁸⁰ Newfoundland Power noted that it and Hydro have started the development of conservation and electrification programming to reflect the changing system with the Muskrat Falls Project interconnection and that Dunsby's report will be used for detailed input into the 2020-2025 CDM program design and customer education will be a prominent feature of future programs.

The Industrial Customer Group generally supported Synapse's assessment of potentially significant rate mitigation benefits that could be obtained by electrification but noted that these electrification measures would be in addition to existing loads. The Industrial Customers agreed that efforts should be focused on maintaining and growing on-island consumption but identified the following caveats:

1. Electrification programs need to be carefully tested and incrementally introduced to ensure there is not over investment in initiatives which do not in practice achieve the ultimate program goals which should always be focused on system-wide rate mitigation that benefits all ratepayer classes.
2. Electrification programs need to be carefully designed and managed to prevent their driving new demand peaks (and the consequent result of increased system unreliability and/or the need for further capital investment for additional generation on the Island).

With respect to the potential impact of CDM programs the Industrial Customer Group submitted that more analysis is required with respect to whether CDM could make a positive contribution to system-wide rate mitigation, stating:

...CDM pursued on its own gives rise to effects that are inconsistent with rate mitigation, and gives rise to "win-lose" scenarios, between ratepayers in a class and between ratepayer classes, which are problematic for fairness and rate design.¹⁸¹

It was recommended that CDM programs be restricted to those initiatives that can be demonstrated to reduce overall system rates, as compared to rate levels without such CDM

¹⁸⁰ Newfoundland Power Final Submission, pages 9-10; Transcript, October 15, 2019, page 19-20.

¹⁸¹ Industrial Customer Group Final Submission, pages 12.

initiatives and that the Rate Impact Measures (“RIM”) test, which considers impact of energy efficiency on those that do not participate be used for evaluation of initiatives.

The Consumer Advocate stated that he was generally not in favour of promotional rates since these rates tend to favour customers who are better off financially but that in certain situations these rates may be acceptable provided that the rates are not less than potential export prices and that such promotions also benefit non-participating customers. In addition, they must not be used in situations where electricity consumption would have taken place anyway, and not interfere with business competition. According to the Consumer Advocate, rates that are designed correctly will promote the correct consumption decisions by customers and send the correct signal to the market, foregoing the need for promotional rates. The Consumer Advocate noted that, based on his understanding, Hydro is having discussions with the Industrial Customer Group and Newfoundland Power on wholesale rate design, and that Newfoundland Power is planning a rate design review for its customers. He recommended that all potential rate designs be considered in these studies, including TOU rates, and stated that in all cases, the price signal should promote efficiency by reflecting marginal costs while also taking into consideration other rate design criteria such as revenue requirement recovery, fairness, and ease of understanding. He also concluded that these studies should be considered in hearings before the Board.¹⁸²

In their presentation representatives of DriveNL spoke to the benefits of EVs and the measures that, in their view, are necessary to jump start the adoption of EVs by drivers in the Province. The lower operating costs of EVs and the contribution to rate mitigation of the additional electricity sales revenue, estimated at \$500 annually per EV was highlighted. However, according to DriveNL the lack of public charging stations in the Province is hindering EV adoption. It was noted that Level 3 DC fast chargers are available in every state and province except Newfoundland and Labrador. DriveNL supported the recommendation of the Dunsby report of \$20 million investment over ten years for a fast charging network in the Province. According to DriveNL this would create an EV friendly environment where drivers would not have to worry about where they would be able to charge their EVs when away from home.¹⁸³

DriveNL also supported efforts by Government and Hydro to implement a high speed charging network in the Province, noting the \$2 million that has already been allotted to that initiative by Government in the recent budget. Because of the timing associated with getting the network in place and the required lead time for ordering and delivery of EVs DriveNL urged action by Government on this issue.¹⁸⁴ DriveNL spoke to the risks of inaction, noting that the Province would lag behind the rest of the country and in opportunities to avail of federal funding currently being offered to encourage EV uptake. Other initiatives supported by DriveNL included:

- A provincial rebate to purchasers of EVs to offset the cost of purchase to help jumpstart the market
- A rebate to purchasers of EVs to offset the cost of installing a charger at their residence (similar to heat pump incentive)
- Electrifying public transportation
- A Government fleet replacement policy of buying EVs as a first option
- Education efforts to raise awareness of the benefits of EVs

¹⁸² Consumer Advocate Final Submission, page 14.

¹⁸³ Transcript, October 18, 2019, page 147/16-25.

¹⁸⁴ Transcript, October 18, 2019, page 148/4-14.

Efficiency Canada identified energy efficiency as a “cost-effective and abundant resource, that prevents ratepayers bearing unnecessary costs for energy infrastructure” and advocated for maximization of all cost-effective energy efficiency options before any supply side alternatives are considered, highlighting the practices at several US utilities to acquire all cost-effective energy efficiency. The legislative requirement for the British Columbia Utility Commission to require utilities proposing new capital projects to explain why demand cannot be met through increased demand side management was also highlighted. With respect to the use of the RIM test as suggested by the Industrial Customer Group it was noted that no other Canadian provinces use the RIM test as a primary decision-making tool. According to Efficiency Canada:

The RIM test provides as very incomplete picture because efficiency strategies can increase participation and the test does not consider that non-participants benefit from avoiding energy system risks (including future cost overruns), and societal benefits of energy efficiency such as lower pollution, and lower bills leading to re-spending in the local economy.¹⁸⁵

Efficiency Canada also noted that Newfoundland and Labrador has a relatively low number of public charging stations per road kilometer compared to other hydro-rich provinces such as Quebec and British Columbia, which suggests that there is significant potential to promote vehicle electrification above current levels.¹⁸⁶

11.9 Board Comments

Electrification offers opportunity for load growth in the Province and higher revenues from increased sales. Nalcor/Hydro and Newfoundland Power generally supported increased electrification but suggested further study on the impact of electrification policies on peak demand and system costs. The Industrial Customer Group also supported a cautious approach to ensure that electrification policies and incentives result in benefits that extend to the entire system and all rate classes.

An important concern with electrification is the potential impact on the demand peak which could result in the need for additional investment in required capacity on the Island Interconnected system for reliability. Electrification initiatives will contribute to capacity additions unless CDM targeted at demand management is also pursued. Synapse considered programs that could be implemented to reduce the impact of electrification on system peak, including incentives to charge EVs at off-peak hours and for adding a demand response program. Electrification policies should be developed to address the specific rate structures and levels that would apply for newly-electrified load as well as the form and level of incentives for electrification to be made available.

As noted by the Industrial Customer Group demand response programs (such as industrial curtailable and capacity assistance programs) can only be achieved with cooperation of customers and appropriate compensation for taking on the risks of the loss of supply at key times. These programs should continue to be part of managing demand on the Island Interconnected system.

¹⁸⁵ Efficiency Canada Submission, page 2.

¹⁸⁶ According to Efficiency Canada NL has 23 charging stations (1.7 stations per 1000 km) while Quebec and BC have 20.1 and 13.2 stations per 1000 km.

It is noted that Government and Hydro are already pursuing electrification initiatives. Government released a plan in April 2019 which identified five buildings to be converted from oil-fired to electric boilers in 2019-20, with another 15 identified for future work. Hydro has issued a request for proposals for 14 land lease agreements for fast charging stations along the Trans-Canada Highway. It is also noted that federal and provincial policies that provide funding for building energy efficiency, fuel switching and EV conversion are available.

The Reference directed the Board to consider whether it is more advantageous to maximize domestic load or exports and, depending on its recommendation, provide options for increasing or decreasing domestic load. Synapse's analysis demonstrated that more detailed work on provincial requirements is needed before recommendations can be made on specific options to support appropriate electrification and CDM programs. Nalcor/Hydro, Newfoundland Power and the Industrial Customer Group all agreed that more detailed analysis is required before an overall comprehensive electrification/CDM program can be implemented in the Province. Hydro and Newfoundland Power are, with Dunskey, their consultant, currently undertaking analysis of a number of the related issues. The Board believes it would be premature to make specific recommendations on appropriate options to encourage electrification and CDM at this time as the required information is not available to allow informed conclusions.

Appropriate electrification programs should be pursued by Government and the utilities, taking into account the impact such programs can have on the Island Interconnected system peak through CDM programs. The work being undertaken by Hydro and Newfoundland Power on the potential in the Province for electrification and CDM is critical and this analysis should be completed and made available to the Board and stakeholders as soon as possible. The Board also encourages the utilities and Government to work together to develop a comprehensive and coordinated approach on the development of the most appropriate programs for the Province.

12.0 ENERGY AND CAPACITY FOR IN-PROVINCE LOAD AND EXPORT SALES

The Board was asked to review and report on the amount of energy and capacity available from the Muskrat Falls Project required to meet Island Interconnected load and the remaining surplus energy and capacity available for other uses such as load growth and export. The available energy and capacity for load growth and export will depend on the total forecasted load requirements on the Island Interconnected system and the Labrador Interconnected system. As noted by Synapse the load forecasts and electricity price trajectories for the Island Interconnected system are highly uncertain at this point which will affect customer response and behaviour. As rates increase, or are forecast to increase, customers may choose to take certain actions on their own to mitigate the impacts on their bills. The extent of electrification and energy conservation initiatives and resulting customer take-up will also affect the amount of energy and capacity available for external use.

This section (i) sets out the forecast energy and peak load requirements for the Province based on Synapse's base case load forecast for 2019-2030; (ii) discusses the impact on the base case load forecast of customer response to increasing rates and of potential electrification and energy conservation initiatives; and (iii) provides the potential export sales and revenues of available energy and capacity.

12.1 Provincial Energy and Peak Load Requirements for 2019-2030

Hydro provided three load forecasts scenarios based on low, mid and high rate forecasts for the Island Interconnected system. Synapse developed three comparable load forecast scenarios that modified Hydro's forecast for the period 2019-2030 as Synapse incorporated Newfoundland Power's load forecast trends.¹⁸⁷ Synapse's reference or base case load forecast is based on Hydro's "low rate" forecast equal to Hydro's domestic retail rate of 17.5 cents/kWh in 2021.¹⁸⁸ Synapse's reference forecast for the Island Interconnected system is shown below:

Island System Reference Forecast				
Energy Requirements (GWh)	2019	2020	2025	2030
Newfoundland Power	6,350	6,291	6,220	6,104
Deliveries from NLH	5,920	5,854	5,783	5,667
NP Own Generation	430	437	437	437
NLH Rural	432	425	401	401
Sales to Customers	432	425	401	401
Industrial	1,520	1,493	1,493	1,490
Deliveries from NLH	647	612	612	610
Industrial Self-Generation	873	881	881	880
NLH Total Island Sales	6,999	6,892	6,796	6,678
IIS Total Energy Requirement	8,301	8,208	8,113	7,997
Island Losses	295	362	426	417
LIL Losses	56	278	306	304
Total Energy Requirement	8,653	8,850	8,846	8,716
Peak Demand (MW)	2019	2020	2025	2030
Newfoundland Power Retail	1,402	1,397	1,398	1,399
NLH Rural Retail	105	105	105	105
Industrial Retail	185	182	182	182
Annual Retail Peak	1,692	1,684	1,684	1,685

Source: Synapse Report, Table 5

Hydro's load forecast for the Labrador Interconnected system is relatively flat to 2030 but Synapse notes that the industrial load may increase. The reactivation of Wabush Mines by Tacora Resources is expected to increase peak load on the Labrador Interconnected system by 55 MW and annual energy load by 430 GWh by 2021.¹⁸⁹ Hydro also provided its estimate of potential increments of load in addition to the increased requirements for Wabush Mines, which showed further possible peak and energy load additions over a 20-year planning horizon.¹⁹⁰ Potential data centre loads in particular could require a significant peak and energy load requirement over that period. This potential increased load on the Labrador Interconnected system will utilize more Recall which would reduce the amount of Recall available for export

¹⁸⁷ Synapse Report, pages 27-28 and Figure 8: Rate Scenarios.

¹⁸⁸ Synapse Report pages 5-6. The Reference scenario "low rate" assumes that average rates increase from 11.3 cents/kWh in 2019 to 19.9 cents/kWh in 2023 (nominal), before flattening out after 2023.

¹⁸⁹ PUB-Nalcor-103.

¹⁹⁰ In PUB-Nalcor-104 Hydro indicated potential load growth from Department of National Defence central heating plant conversion (12-20 MW, 50 to 80 GWh), data centers (300+ MW, 2300+ GWh) and an additional iron ore mine (55 to 65 MW, 400 to 500 GWh).

sales or use on the Island Interconnected system. Synapse's base load forecast for the Labrador Interconnected system is shown below:

Labrador Base Forecast				
Energy Sales (GWh)	2019	2020	2025	2030
Hydro Rural	753	742	795	736
Labrador Industrial	1,742	1,741	1,742	1,741
Reactivation Wasbush mines, Tacora	251	415	420	420
Total Sales	2,745	2,897	2,956	2,897
Transmission Losses	160	159	163	159
Total Energy Requirement	2,905	3,057	3,119	3,055
Peak Load (MW)	2019	2020	2025	2030
Hydro Rural	171	166	168	172
Labrador Industrial	251	250	250	250
Total	422	416	418	422

Source: Synapse Report, Table 9

12.2 Impact on Load Forecast of Customer Response to Increasing Prices

When prices for electricity increase customers may choose to substitute other options for electricity, modify usage behaviour or change technology for electricity usage to avoid the impacts of higher prices. Domestic and commercial customers on the Island Interconnected system have some options for immediate behavioural changes, such as turning off lights or turning down thermostats, but existing electricity infrastructure and the use of electricity for basic necessities such as heating, lights and cooking mean that short-term options to significantly reduce usage are limited. Longer term options include customer investment in more efficient buildings, appliances and equipment. Synapse noted that a significant portion of electricity is used for electric resistance space heating and that heat pump substitution for this use would reduce electricity consumption.

Industrial customers are more price sensitive as their processes are generally energy intensive and these customers are subject to international markets. Synapse noted the relatively low rates currently in place for most large industrial customers and suggested that a significant increase in price or change in international competitiveness could lead to a significant reduction in industrial load.

Price elasticity is used to model the price response of customer behaviour. Synapse noted that the level of projected rate increases arising from the Muskrat Falls Project means that traditional econometric modeling and estimating techniques for predicting the impact of customer response on forecasts are not as effective or certain as usual. In this circumstance Hydro has reflected customer response in its low load forecast by using a slightly higher price elasticity than would be used in conventional econometric estimating techniques.¹⁹¹ Synapse found Hydro's approach reasonable given limited substitution options. The actual customer response will depend on how rapidly rates increase, how high rates go and incentives and the type and availability of programs for increased electrification and conservation measures as well as heat pump adoption rates.

¹⁹¹ Hydro used a price elasticity of approximately -0.30 which Synapse notes is slightly higher than the Energy Information Administration's three-year value of -0.24 but less than the 25-year value of -0.40.

Synapse noted that customer responses will have to be closely monitored and programs implemented that economically encourage the use of electricity.

12.3 Impact on Load Forecast of Electrification and CDM Programs

The extent to which electrification and CDM programs are implemented will also impact the load forecast and electricity requirements for the Province and the amount of capacity and energy available for export. Higher levels of energy efficiency programming and customer take-up will result in less internal load and more surplus energy available for export while higher levels of electrification will result in higher internal load and less surplus energy available for export. Synapse estimated that its high electrification potential case would add 600 GWh to the load forecast by 2030 while its high CDM potential case could reduce energy requirements by 832 GWh by 2030. The table below illustrates the impact of various electrification and CDM cases on the forecast load.

Interconnected System Load Forecasts – Including Self-Generation and Losses												
Load (GWh)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
NLH Low Rate Forecast	8,301	8,208	8,191	8,176	8,162	8,152	8,192	8,235	8,281	8,321	8,362	8,406
Synapse Low Rate Forecast	8,301	8,208	8,191	8,176	8,162	8,136	8,113	8,087	8,065	8,041	8,019	7,997
Synapse Low Rate, High CDM w/TOU	8,301	8,190	8,144	8,081	8,005	7,902	7,792	7,666	7,544	7,417	7,295	7,165
Synapse Low Rate, High CDM w/TOU, High Electrification w/EV TOU	8,330	8,248	8,305	8,273	8,230	8,188	8,116	8,032	7,957	7,885	7,818	7,753
Synapse Low Rate, High Electrification	8,330	8,266	8,352	8,368	8,387	8,422	8,437	8,453	8,479	8,508	8,542	8,584
Extreme Low Load Scenario	8,301	8,128	7,955	7,782	7,609	7,436	7,263	7,090	6,917	6,744	6,571	6,398
Peak (MW)												
NLH Low Rate Forecast	1,671	1,662	1,657	1,659	1,663	1,666	1,672	1,677	1,686	1,696	1,706	1,716
Synapse Low Rate Forecast	1,671	1,662	1,657	1,659	1,663	1,662	1,663	1,662	1,664	1,664	1,664	1,664
Synapse Low Rate, High CDM with TOU	1,671	1,655	1,625	1,611	1,598	1,589	1,574	1,528	1,533	1,511	1,482	1,447
Synapse Low Rate, High CDM w/TOU, High Electrification w/EV TOU	1,675	1,665	1,647	1,646	1,638	1,622	1,606	1,590	1,574	1,552	1,532	1,513
Synapse Low Rate, High Electrification	1,675	1,671	1,679	1,694	1,704	1,704	1,714	1,733	1,735	1,751	1,749	1,767
Extreme Low Load Scenario	1,671	1,644	1,618	1,591	1,564	1,538	1,511	1,485	1,458	1,431	1,405	1,378

Synapse Report, Table 11 (Excludes LIL losses. Includes NP and industrial self-generation. Source: Synapse calculations and underlying responses to PUB-Nalcor-074, PUB-Nalcor-112 and PUB-Nalcor-057)

12.4 Available Capacity and Energy for Load Growth and Export

The volume of energy exports available to sell after the Muskrat Falls Project comes online consists of the total energy available from all sources less the energy required to meet industrial, commercial and domestic loads in the Province.¹⁹² The amount of energy available for export will also be affected by the time of the day, month and year that sales are made – less energy is available in the winter months when domestic loads are highest and the patterns of demand for peak and off-peak hours within any given month will affect energy availability. Export sales opportunities can also be impacted by transmission constraints both in and outside the Province.

Synapse modeled the energy available between the Island Interconnected system and the Muskrat Falls Project associated with its base case load forecast for 2020-2030 for two scenarios, depending on whether the excess Recall is exported or used first for meeting the Island Interconnected system needs. The load in Labrador is met using the TwinCo block energy, with any remaining requirements coming from the Recall.

The table below provides the computation of the amount of Muskrat Falls energy available for export, using both scenarios, after fulfilling the amount required for the Island as well as the energy required for the commitments to Nova Scotia.¹⁹³

¹⁹² Net of self-generation by Industrial Customers and NP and including energy for makeup transmission and distribution losses. Economic purchases for import from NS were also considered by Synapse.

¹⁹³ Synapse Presentation, page 9.

Muskrat Falls Project Energy Available for Load Growth / Export Sales, Selected Years (2020-2025, 2030), Synapse LR Reference, Excluding and Including Recall Energy Availability

GWh	2020	2021	2022	2023	2024	2025	2030
Island Load, Losses, and Generation							
Island Load (including self-supply)	8,078	8,039	7,981	7,967	7,942	7,919	7,806
Labrador Island Link Losses	305	324	317	318	317	319	321
Island Transmission Losses	418	432	452	447	447	450	441
Total Energy Requirement	8,801	8,795	8,750	8,732	8,706	8,688	8,568
Island Generation (all owners)	7,285	7,014	6,974	6,909	6,909	6,899	6,702
Net Requirement from Off-Island	1,516	1,781	1,776	1,823	1,796	1,789	1,866
Energy Balance - MFP Serving Balance of Needs Excluding Use of Recall Energy							
Net Requirement from Off-Island	1,516	1,781	1,776	1,823	1,796	1,789	1,866
Muskrat Falls Generation	4,068	5,043	5,035	5,043	5,057	5,041	5,042
Muskrat Fall Generation Available after Island Needs	2,552	3,262	3,259	3,220	3,261	3,252	3,175
Nova Scotia Block and Supplemental Obligation	682	1,132	1,148	1,149	1,133	1,043	916
Maritime Line Losses	100	155	141	138	138	140	136
Nova Scotia Obligation Energy Total	781	1,287	1,289	1,287	1,271	1,183	1,052
<u>Excluding Recall</u>							
Muskrat Falls Generation Available after Island and Nova Scotia Obligations	1,771	1,975	1,970	1,933	1,989	2,069	2,123
Recall Energy Available for Island After Labrador Load Requirement							
<u>Including Recall</u>							
Muskrat Falls Available after Island/Nova Scotia Needs, Assuming Recall serves Island	2,989	3,447	3,386	3,374	3,450	3,487	3,522

Source: Synapse Final Report, Tables 41 and 42 (PLEXOS modeling of Synapse LR Scenario, and Response to PUB-Nalcor-112).

The available energy from Muskrat Falls for export and load growth, when the excess Recall energy is used for export purposes, ranges from approximately 1,975 GWh in 2021 to 2,123 GWh in 2030. When the excess Recall energy is used for Island Interconnected system needs the energy available for export increases to approximately 3,447 GWh in 2021 to 3,522 GWh in 2030.

Synapse also modeled the capacity available between the Island Interconnected system and the Muskrat Falls Project associated with its base case load forecast for 2020-2030 for two scenarios, depending on whether the Recall capacity is used for exporting power or used for meeting the needs of the Island Interconnected system. The following table shows the excess capacity at Muskrat Falls available for export, using both scenarios, after fulfilling the amount required for the Island that would be available for export and load growth.

Muskrat Falls Power /Island Interconnected System Capacity Balance, Selected Years (2020-2025, 2030), Synapse LR Reference, Excluding and Including Recall Capacity Availability to Serve Island Interconnected System Peak Demand

MW	Beginning of Year						
	2020	2021	2022	2023	2024	2025	2030
Island Load, Losses, Generation, and Labrador Island Link at Peak							
Island Load (including self-supplied load)	1,662	1,657	1,659	1,663	1,662	1,663	1,664
Island Transmission Losses	141	141	141	141	141	141	141
Total Capacity Requirement	1,804	1,798	1,800	1,805	1,803	1,804	1,805
Island Generation (all owners) Peak Capacity	1,935	1,935	1,345	1,345	1,345	1,345	1,345
Interruptible Capability	119	119	119	119	119	119	119
Capacity Available for Island Before Muskrat Falls/Labrador Island Link	2,054	2,054	1,464	1,464	1,464	1,464	1,464
Island Peak Load Total Requirements (Load + Losses)	1,804	1,798	1,800	1,805	1,803	1,804	1,805
Proposed Threshold Island Reserve Margin	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%
Minimum Requirements at Above Reserve Margin	2,056	2,049	2,052	2,057	2,056	2,057	2,058
Capacity Required Across Labrador Island Link to Meet Reserve Margin	NA	NA	589	594	592	593	594
Muskrat Falls Firm Capacity			790	790	790	790	790
<u>Excluding Recall Capacity</u>							
Excess Capacity at Muskrat Falls Available for Load Growth or Export			201	196	198	197	196
Remaining Recall Capacity After Labrador Requirements	107	106	106	105	104	104	100
<u>Including Recall Capacity</u>							
Excess Capacity at Muskrat Falls Available for Load Growth or Export (Use of Recall to meet partial needs)			307	301	302	300	295

Source: Synapse Report, Tables 43 and 44 (PLEXOS modeling of Synapse LR Scenario, and Response to PUB-Nalcor-112.)

According to the table above, the available capacity from Muskrat Falls for export and load growth, when the excess Recall capacity is used for export purposes, ranges from approximately 201 MW in 2022 to 196 MW in 2030, and the capacity available ranges from 307 MW in 2022 to 295 MW in 2030 when the excess Recall capacity is used for Island Interconnected system needs.

Synapse concluded that the amount of surplus available from Muskrat Falls Project can be used to both fully support electrification needs (energy and peak additions) and increase export sales of surplus energy (and potentially capacity). The levels available will be influenced by the extent

of CDM and electrification that is achieved in the Province. Synapse also noted there is sufficient surplus available to meet electrification peak loads when CDM is maximized.

12.5 Maximizing Export Sales

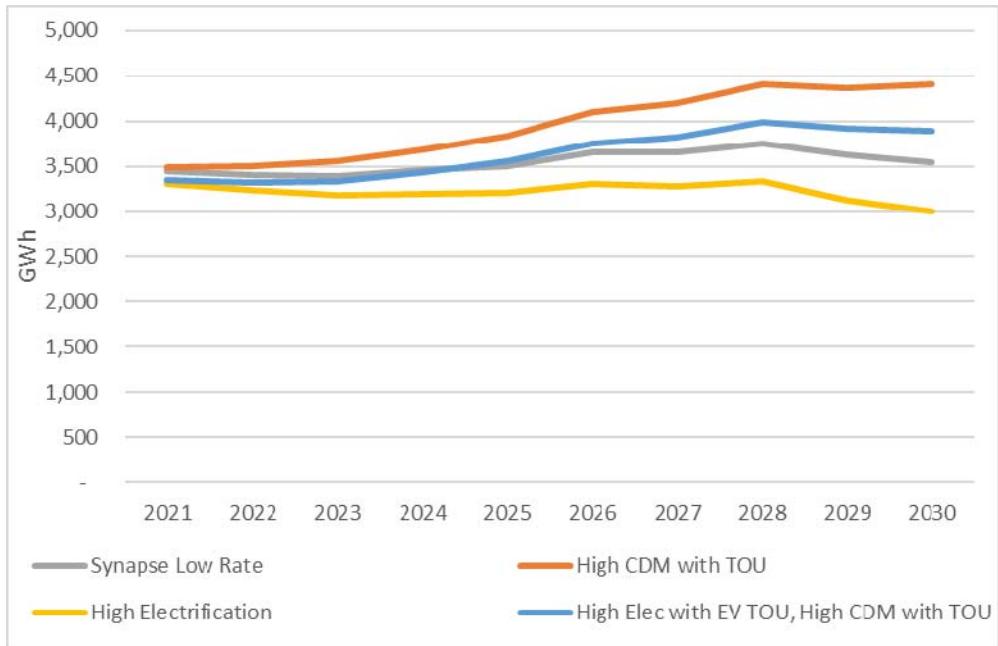
The Board was directed to examine whether it is more advantageous to ratepayers to maximize domestic load or maximize exports and, depending on the recommendation, provide options for increasing domestic load or increasing exports. This question requires consideration of the balance to be struck between maximizing domestic load and maximizing export sales.

Section 12.4 provides Synapse's base case of the volume of Muskrat Falls Project energy and capacity that would be available for export before taking into consideration electrification and CDM. Section 12.3 illustrates the impact electrification and CDM programs can have on the base case load forecast. Synapse also analyzed the effects of different combinations of CDM, electrification and rate design on the available energy and capacity available for export after accounting for in-province load and completed analysis of the resulting export sales revenues.

The forecast export market prices that Synapse used for export sales was provided by Nalcor on a confidential basis. Synapse found the prices that Nalcor provided were not unreasonable.¹⁹⁴ Synapse also considered the impact of market price variations on export sales revenues: increase in export sales revenues of \$75 million/year by 2030 (high prices), reduction in revenues of \$31 million/year (low prices). The estimated total net energy export sales volumes and net energy export sales revenues using various scenarios are shown in the following figures:

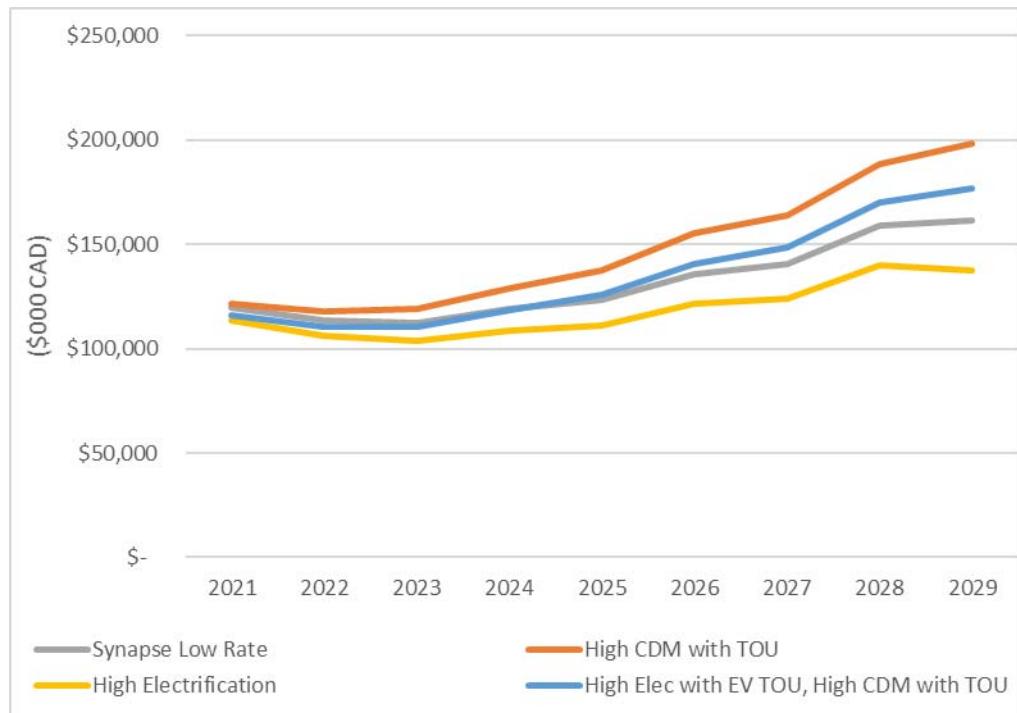
¹⁹⁴ Synapse Report, page 88.

Total net energy export sales volume by scenario



Source: Synapse Report, Figure 45, page 101.

Total net export sales revenue by scenario



Source: Synapse Report: Figure 46, page 102

The range of export sales volumes and net export sales revenue varies across the scenarios noted in the figures above, with the highest levels seen in the scenarios using the high CDM effects, in combination with lowest levels of electrification; and the lowest level of volumes and net revenue is shown in the scenarios where electrification is high and CDM efforts are lowest.

Synapse also considered the potential for sales of surplus capacity to external markets. The ability of the system to sustain sales of any available surplus capacity over a period of time will depend on the planning reserve requirements which determine the overall capacity needed to meet peak load requirements. Based on its analysis Synapse found that there is sufficient headroom capacity to support export capacity sales but noted that this finding may be affected after consideration of Labrador Island Link reliability and further determinations of requirements above the minimum reserve margin which are being considered by the Board in its review of Hydro's Reliability and Resource Adequacy Study. Assuming availability of this headroom capacity and considering the limitations across the Maritime Link Synapse estimated that about 70 MW could be available for capacity sale with an approximate revenue potential range of \$3.6 million to \$7.1 million depending on the assumptions used.

Synapse modelled various scenarios using the effects of electrification and CDM to determine the overall impact that the changes in domestic sales and/or export sales would have on the utility's revenue. All the scenarios with electrification showed a substantial increase in utility revenue. The "High Electrification" scenario with the base level of CDM, results in a net increase in 2030 of \$52 million in revenue for the utility, after taking into consideration the loss of revenue from export sales due to the reduction in available energy for export, less the additional costs for electrification and capacity costs. In this scenario for 2030, the revenue from domestic sales increases by \$129 million and the revenue from export sales decreases by \$29 million.¹⁹⁵

The "High CDM" scenario with no electrification, results in a net decrease in 2030 of \$84 million in revenue for the utility, after taking into consideration the increase in export sales, and the net savings in capacity costs less the costs of CDM programming. In this scenario, the forecast export revenue increases by \$45 million however, the utility's domestic revenue decreases by \$156 million.¹⁹⁶

These two scenarios illustrate that high levels of CDM alone will not provide enough additional revenue from export sales to assist with rate mitigation as compared to a high electrification scenario. The highest levels of additional revenue available for rate mitigation occur in the scenarios with high electrification in the Province. Electrification will increase utility revenue to help pay for the Muskrat Falls Project costs. As noted by Synapse, electrification increases electric utility bills for those that choose to electrify; however these customers will also reduce their consumption of oil or other fuels and, when these savings are accounted for, customers should experience a reduction in their "net bills".

Synapse concluded that it is more advantageous to ratepayers to maximize domestic load rather than maximize exports, primarily because the export market prices are relatively low. Synapse

¹⁹⁵ Synapse Report, page 8, Table 2, Scenario 10.

¹⁹⁶ Synapse Report, page 8, Table 2, Scenario 6.

also examined scenarios with higher prices, but did not have any basis to conclude that export prices are going to increase significantly from what was modelled in their analysis.¹⁹⁷

Synapse stated:

In short, increasing load through electrification, improving energy efficiency and using demand response to reduce peak and allow for increased export sales leads to the best possible outcomes for customers.

It allows for the sale of the remaining Muskrat Falls surplus to external markets and the CDM effect helps to prevent a need for future capacity expansion costs.

We model a lot of different scenarios to try to tease out differential effects between the different combinations of electrification, CDM and rate design effects and essentially, we find that some combination of those three things, aggressively pursuing electrification, using CDM to peak shave and at the same time using rate design to provide incentives for consumption, preferably during off-peak periods of time, results in the best customer outcomes. What we clearly show is that there is more than enough surplus available from Muskrat Falls to support these electrification needs.¹⁹⁸

Synapse concluded that maximizing export energy sales would not best mitigate rate or bill concerns. Maximizing in-province beneficial electrification first allows customers to capture oil savings, while providing revenues to help pay Muskrat Falls Project fixed costs.¹⁹⁹

12.6 Board Comments

Synapse's base case calculations of the energy available from the Muskrat Falls Project for domestic load growth and/or export sales after fulfilling the requirements for the Island Interconnected customers and Nova Scotia are set out in Section 12.4. Synapse modelled two scenarios depending on (i) whether the Recall energy is used in Labrador with the excess recall exported or (ii) whether the Recall energy after Labrador load is served is made available to service Island load. The Board accepts this analysis as reasonable with the results summarized as below:

Available Muskrat Falls Energy (GWh)			
	2021	2025	2030
Recall used for Export	1,975	2,069	2,123
Recall used for IIS	3,447	3,487	3,522

This availability of energy is before taking into account any impacts relating to electrification, CDM programs and rate design options, all of which can impact Synapse's base case load forecast for the Island Interconnected system.

Synapse also considered the capacity available for load growth and export and determined that the available capacity ranges from approximately 307 MW in 2022 to 295 MW in 2030 if excess

¹⁹⁷ Transcript, October 7, 2019, page 11

¹⁹⁸ Transcript, October 7, 2019, page 26/ 9 to page 27/8

¹⁹⁹ Synapse Presentation, page 54; Transcript October 7, 2019, page 61/11 to page 63/16.

Recall capacity is used for the Island Interconnected system and not considered for export. It decreases to 200 MW in 2022 and 196 MW in 2030 if Recall capacity is included for export and not for the Island Interconnected system. However, Synapse noted that existing transmission constraints limit potential capacity sales and the amount of available capacity which they determined is subject to review and adjustment in the Board's ongoing review of Hydro's Reliability and Resource Adequacy Study.

It is clear from Synapse's analysis and conclusions that maximizing domestic load through electrification would provide more revenue for the utility to use towards the costs of the Muskrat Falls Project as opposed to maximizing export sales. However, as noted by Synapse, it is also important to include CDM programs and consider rate design and to better manage the system peak demand to prevent a need for future capital investment and also allow for additional export sales.

13.0 Summary of Rate Mitigation Opportunities

Based on Liberty's analysis there are several financial and operational opportunities for rate mitigation. Liberty identified the financial sources of potential mitigation as the largest sources available for rate mitigation. The principal sources of these potential opportunities are amounts that will become available to the Government as the return for its investment in the Muskrat Falls Project and the profits from the sales of excess energy from the project that are allocated to Nalcor. The returns are forecast to begin at \$90 million in 2021, increasing to \$285 million by 2029, to \$414 million in 2030 and \$569 million in 2039.²⁰⁰ Nalcor's profits from the sale of excess energy are forecast to be \$41 million in 2021, increasing to \$46 million in 2030 and decreasing to \$23 million in 2039 with variability over the period.²⁰¹ Other financial sources include Hydro equity returns, water rental payments for generation at Churchill Falls and Muskrat Falls, and CF(L)Co preferred dividends. Maintaining the current Hydro capital structure target at 25% equity leaves dividends available for mitigation of approximately \$13 million in 2025 and \$43 million in 2030.²⁰² Water rental payments related to Muskrat Falls are approximately \$16 million commencing in 2021 and escalate at 2% thereafter.²⁰³ CF(L)Co water rental payments are \$6.8 million in 2021, decreasing to \$5.7 million in 2030.²⁰⁴

A number of other potential rate mitigation opportunities related to operational efficiencies were identified by Liberty. Liberty estimated that savings of \$12.7 million in 2020, increasing to \$20.7 million in 2023, could be realized if Power Supply and Hydro were re-integrated.²⁰⁵ These savings also include approximately \$2.5 million in savings that could be realized if inefficiencies in Hydro's operations at Exploits are eliminated. Potential savings of \$12 million in the Muskrat Falls Project O&M costs were also identified.²⁰⁶

²⁰⁰ Liberty Report, page 15; Liberty's Hearing Presentation, Slide 9; PUB-Nalcor-030.

²⁰¹ PUB-Nalcor-034.

²⁰² Liberty Report, pages 4 and 24; PUB-Nalcor-255.

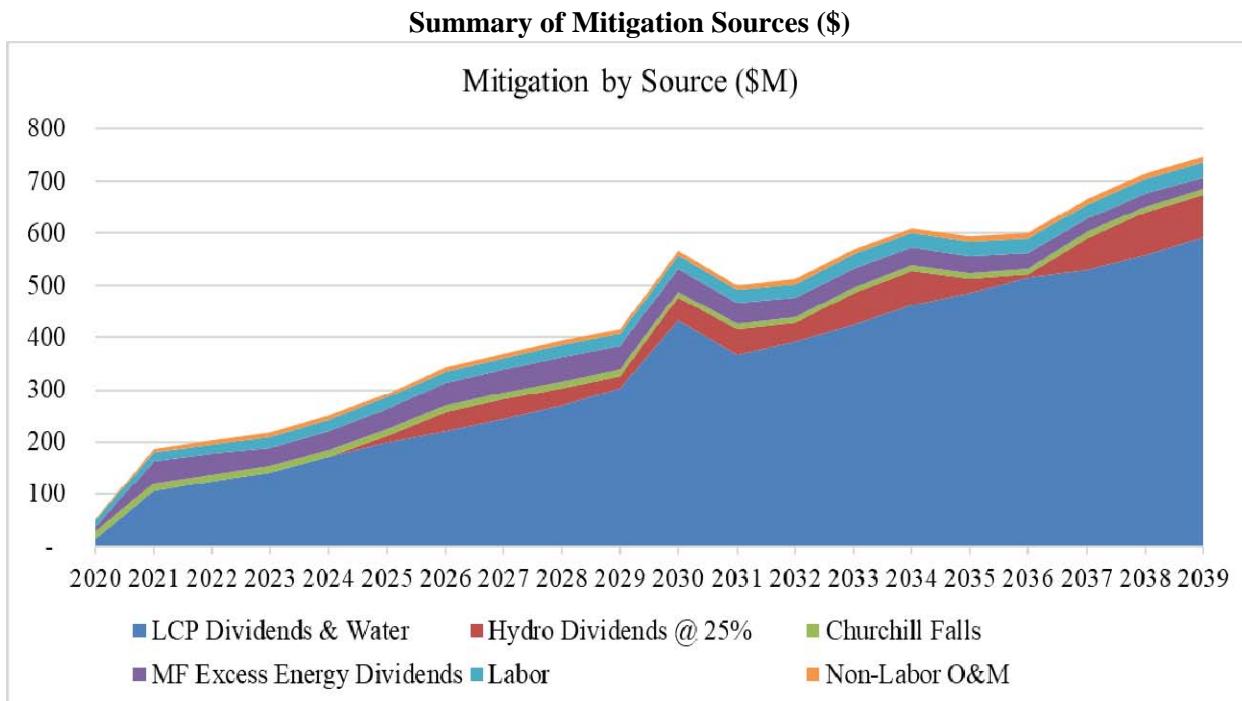
²⁰³ Liberty Report, page 17; PUB-Nalcor-201 and PUB-Nalcor-263.

²⁰⁴ PUB-Nalcor-144; Liberty Report, page 19.

²⁰⁵ Liberty Report, page 6 and pages 63-64. This \$20.7 million includes \$3.1 million in Muskrat Falls Project O&M for operations related to FTE reduction and \$1.4 million in Corporate Support and Engineering Services

²⁰⁶ Liberty Report, pages 7 and 84.

The cumulative sources of financial and operational rate mitigation opportunities identified by Liberty are shown in the following figure:²⁰⁷



Liberty also raised the issue of reducing the target for the equity component in Hydro's capital structure from 25% to 20%. This would increase the amount of dividends available for mitigation by about \$111 million in the period 2021 to 2026 when the need for rate mitigation is greatest; however, the dividends would be reduced thereafter so that over the period to 2039 the total dividends would be \$22 million less.²⁰⁸ If Hydro's equity target is reduced it would increase the amount of Hydro dividends available for rate mitigation in the early years following the in-service of the Muskrat Falls Project.

Liberty believes that in addition a comprehensive examination of efficiency and effectiveness within Nalcor/Hydro can produce results as or more substantial than those determined in their analysis of the re-integration of Power Supply and Hydro.²⁰⁹

The figure above does not reflect the potential revenue that was identified by Synapse or other mitigation opportunities identified, including the mitigation that may become available from the ongoing discussions with the Government of Canada or that may be associated with the provincial portion of the HST or carbon credits.

The table below provides the Board's summary for 2021, 2025 and 2030 of the information provided in the review in relation to the estimates of the rate mitigation potential of opportunities.

²⁰⁷ Slide 34 of Liberty's Presentation.

²⁰⁸ Liberty Report, page 24; PUB-Nalcor-255. This increase in dividends for 2021-2026 is not shown in the figure.

²⁰⁹ Liberty Report, page 7.

Estimated Rate Mitigation Potential			
Opportunity	2021 ('000)	2025 ('000)	2030 ('000)
Returns and Dividends			
Muskrat Falls Project	\$90,400	\$182,400	\$414,100
CF(L)Co	7,100	6,200	5,800
Hydro @ 25% equity target	0	13,300	43,400
Increase(decrease) Hydro @ 20% equity target	8,400	11,400	(8,800)
Nalcor's Allocation of Export Sales	41,000	38,600	46,100
Water Power Rentals			
Muskrat Falls Project	16,000	17,000	19,000
CF(L)Co	6,800	6,300	5,700
Newfoundland Power	1,000	1,000	1,000
Total Financial Opportunities (Hydro at 25% target)	\$162,300	\$264,800	\$535,100
Total Financial Opportunities (Hydro at 20% target)	\$170,700	\$276,200	\$526,300
Re-integration and MFP O&M (Labour)	12,700	20,700	20,700
MFP O&M - Not included in re-integration	7,300	7,300	7,300
Other efficiency initiatives – Nalcor/Hydro	2,000	20,000	20,000
Total Operational Opportunities	\$22,000	\$48,000	\$48,000
Total Mitigation Potential (Hydro at 25% target)	\$184,300	\$312,800	\$583,100
Total Mitigation Potential (Hydro at 20% target)	\$192,700	\$324,200	\$574,300

The information in this table was compiled from various information sources collected during the review including information requests, consultants reports, information from the hearing and represents the Board's assessment of what is considered to be realistic and achievable during the time period under review.²¹⁰

²¹⁰ Information sources for this table can be found in Exhibit 4.

PART FOUR: POLICY CONSIDERATIONS

14.0 EXTERNAL MARKET SALES AND PURCHASES – INDUSTRY BEST PRACTICES

The Board was directed by the Government, in answering the Reference Questions, to consider industry best practices related to external market purchases and sales of electricity. Liberty was asked to provide its expert opinion on best practices that are relevant for the current and proposed export sales and purchases by Nalcor and Hydro. Liberty provided its opinion on three issues: allocation of export revenues to reduce rates, regulatory oversight of external sales and purchases and whether there should be an external provider of these services.

14.1 Nalcor Energy Marketing Structure

Nalcor Energy Marketing Corporation (“NEM”) was created to market Nalcor’s and Hydro’s surplus energy throughout North America and to purchase electricity for the Island Interconnected system. It began as a line of business within Nalcor in 2009 and was incorporated as a subsidiary in 2014. Nalcor provided a number of reasons why NEM was incorporated as a separate entity including tax considerations and risk management purposes. Nalcor stated that a stand-alone marketing entity has become the Canadian market structure approach.²¹¹

Prior to 2009 the Recall was used by customers in Labrador and any remaining power was sold under a contract with Hydro Quebec. In late 2008 and early 2009 Nalcor conducted a review of the possible alternatives for the surplus Recall, as the contract with Hydro Quebec was up for renewal in early 2009. Nalcor decided to take control of marketing sales themselves and following a market solicitation for energy trading services, Emera Energy Services was selected as the service provider in April 2009 and provided this service to Nalcor until April, 2015 when NEM commenced providing the service.

In January, 2018 NEM also became involved in water management for the Island reservoirs and the preparation of the weekly plan for production scheduling. NEM manages the amount of hydro generation to minimize spill, minimize thermal production, maximize export volumes at times of higher prices and maximize the value of storage through ponding activities. NEM and Hydro work in collaboration pursuant to an agreement with the guiding principles, priority of security of domestic supply and resource optimization.²¹²

NEM currently manages the sale of Hydro’s surplus electricity and purchases of electricity from outside the Province. NEM now operates twenty four hours a day, seven days a week with twenty-five FTEs. It shares certain services with Nalcor, including risk management oversight and finance. NEM has a total annual budget of between \$5 million and \$6 million.²¹³

When the Muskrat Falls Project is in-service NEM will manage Hydro’s and Nalcor’s surplus from Muskrat Falls. Hydro’s surplus will include Recall not used in the Province and excess energy over and above what it uses of the forecast amount used to determine Hydro’s commitment under the Power Purchase Agreement between Hydro and the Muskrat Falls

²¹¹ PUB-Nalcor-008.

²¹² NEM-Hydro Interim Power Purchase Agreement; Transcript, October 9, 2019, page 202/13 to page 204/16.

²¹³ Transcript, October 9, 2019, page 186-187 and 213.

Corporation. The combined surplus available for export is forecast to be 3.5 TWh annually on average.²¹⁴ The capacity that will be available for the export markets is subject to the outcome of the review of Hydro's Reliability and Resource Adequacy study that has been filed with the Board.

Liberty did not take issue with NEM being a separate entity but expressed concern about where the marketing entity receives its direction. NEM is currently taking its direction from Power Supply, a non-regulated division within Nalcor. Liberty explained that incentives to optimize margins from export sales can produce diseconomies if the marketing entity has the ability to override utility decisions relating to reliable least cost power. Based on this current structure, Power Supply does not need to override utility decisions with respect to export sales, since NEM is under its authority it can make those decisions itself. Also, as Hydro's former water management and hydro production scheduling group was transferred to NEM in 2018, NEM has a central role in "optimizing" Hydro's assets.²¹⁵ Liberty recommended that NEM should take direction from Hydro to ensure that net customer costs get optimized, as opposed to marketing and trading margins. This will also provide Hydro, the entity responsible for generation operations, with the control of the water management and hydro production scheduling.²¹⁶

Nalcor/Hydro stated that value maximization is the primary reason behind the decision to relocate the Water Management and Production Scheduling from Hydro to NEM in 2018. According to Nalcor this will allow NEM to maximize the value of export activity through the use of all generating sources and reservoirs owned and operated by Nalcor and its affiliates, including Hydro. However, they stated that Hydro does maintain the authority respecting decisions that affect its assets and customers.²¹⁷

The Consumer Advocate submitted that the water management and production scheduling functions should be transferred back to Hydro since the reservoirs are assets that have been paid by the customers of the Island Interconnected system and the assets are important in the provision of least cost and reliable supply of electricity.²¹⁸

14.2 Provision of Services

Liberty considered whether Nalcor's and Hydro's export marketing services should be done by an external service provider. According to Liberty NEM has a comparatively small portfolio by industry standards even with Muskrat Falls. Liberty noted that, when Nalcor was structuring NEM, risk was an important consideration. Given the Government announcement of a separate Crown Corporation for Nalcor's oil and gas business and no clear commitment for Gull Island in the near future, Liberty believes there is no basis to organize NEM as an internal service to manage a larger portfolio. Even if the expiration of the Churchill Falls contract is considered, Liberty was of the opinion that what energy would remain available to market from Churchill

²¹⁴ Transcript, October 9, 2019, page 199/17-25.

²¹⁵ Liberty Report, page 40.

²¹⁶ Liberty Report, page 42.

²¹⁷ Nalcor/Hydro Final Submission, page 17/15-20.

²¹⁸ Consumer Advocate Final Submission, page 10, Issue #5.

Falls would not add enough to the Muskrat Falls excess energy to make NEM any more than a fairly small market participant.²¹⁹

Liberty indicated that there are difficulties when building an internal operation to manage a small portfolio of tradeable assets, such as acquiring a highly capable workforce, creating the systems and controls to manage the operations and risks, and developing a reputation that encourages confidence and trust. Liberty is of the opinion that management should consider a third party contracted option or agency similar to the arrangement that they previously had with Emera. According to Liberty there are providers with more extensive experience than NEM will be able to offer. However, Liberty is not certain if these marketers will find the Province's market an economically attractive opportunity. Liberty are not able to conclude at this time whether the contracted option would result in lower costs than having the current internal organization since in addition to the fees paid to the asset manager, Nalcor would still require a workforce to monitor the performance of the asset manager.²²⁰

Liberty recommended that Nalcor conduct a market solicitation that may be able to provide quantitative and qualitative information to determine whether alternatives exist to better manage NEM operating costs, transaction risks and the size of the margins produced to offset Hydro's revenue requirement. If this solicitation produces substantial interest, Liberty has recommended that Nalcor issue a formal Request for Proposals that will provide a comparison basis for determining, whether NEM is the best option for experience, costs and results.²²¹

Nalcor/Hydro disagreed with Liberty's recommendation of the possible outsourcing of the energy marketing and trading functions performed by NEM. They believe that Liberty's recommendation was based on their view that NEM has a small portfolio and those conducting the operations are not as experienced as the third party marketers. Nalcor/Hydro concluded that:

Outsourcing the energy marketing and trading function of Nalcor to an independent third party and foregoing the experience and expertise NEM has developed over more than 10 years of operations lacks merit. The service currently provided by NEM in-house are least cost, maximize value for the customers and are consistent with Canadian industry best practice.²²²

Nalcor/Hydro is of the opinion that not only does NEM bring value by marketing the energy surpluses but the market intelligence that will be gained in managing this function will provide important information and expertise with regards to Nalcor's future resource development opportunities. They referred to Power Advisory's opinion that energy marketing is a core competency for companies such as Nalcor that have significant hydroelectric resources. According to Power Advisory following the completion of Muskrat Falls, and excluding Hydro Quebec and Emera commitments, Nalcor will be the 5th largest electricity exporter in Canada out of more than 50 in the field. They stated that no Canadian utility with a portfolio the size of NEM's contracts out their marketing. According to Nalcor/Hydro, external energy marketers that would be familiar with the trading markets that are targeted by NEM, would also participate in

²¹⁹ Liberty Report, page 41.

²²⁰ Liberty Report, pages 41-42.

²²¹ Liberty Report, page 43.

²²² Nalcor/Hydro Final Submission, page 18/15-19.

these markets and be their direct competitors. They expressed concern that if the third party marketer finds themselves in a conflict of interest situation they may choose to make decisions that would not be in Nalcor's best interest. If the marketers operated in markets that did not result in competition with NEM, this could put the maximization of value at risk due to lack of experience and market knowledge.²²³

Nalcor/Hydro also expressed concern that outsourcing to a third party marketer would compromise their ability to realize the maximum value and flexibility of its hydro-electric resources from activities such as ponding. In order to maximize these opportunities, they believe an integrated subsidiary of Nalcor would be more effective, as it would result in the close coordination required between system operation, dispatch and energy marketing.²²⁴

Nalcor did not agree there would be merit in reviewing its previous analysis last reviewed in 2014 to determine if the internal growth model is still the appropriate way to operate. Nalcor explained that based on the portfolio of resources that NEM has going forward, there was too much risk going to a third party. They also noted that they did not see the point of even soliciting interest from the marketplace as Liberty suggested as this had been done back in 2009.²²⁵

The Consumer Advocate was the only party that commented on this issue. He agreed with Liberty's recommendation. He also concluded that Nalcor should conduct a market solicitation to determine if there are any other marketers that are willing to manage Hydro's off-island sales and purchases, and if they are able to provide greater value to the ratepayers than NEM.²²⁶

14.3 Regulatory Oversight of Export Sales and Purchases

NEM is not regulated by the Board. In Liberty's opinion consistency with prevailing industry practice would involve some form of regulatory oversight over the conduct of export sales and purchases and the operations of the provider of such services, here NEM. The key areas that should be subject to regulatory oversight in Liberty's view include NEM's structure and operating costs, the nature and extent of the export transactions, the controls it applies to ensure integrity in transacting, and the measures it takes to mitigate transaction risk.²²⁷

Liberty acknowledged that, with the exception of Nova Scotia, most of the jurisdictions in Canada do not fully regulate the operations of the entities responsible for export sales, even where they apply the margins produced to offset revenue requirements. However, based on Liberty's experience this is not the case in the United States.²²⁸ Liberty explained during the hearing that they would propose the Board review NEM from a standard of prudence. They also explained that typically regulators conduct periodic audits, where they would look at all aspects such as organization staffing, risk control, risk management, transaction processing. Liberty also confirmed that regulatory oversight does not necessarily mean that prior approval of transactions would be required by the regulator.²²⁹

²²³ Nalcor/Hydro Final Submission, page 19/10 to page 20/15.

²²⁴ Nalcor/Hydro Final Submission, page 20/4-10.

²²⁵ Transcript, October 11, 2019, pages 36-38 – Greg Jones.

²²⁶ Consumer Advocate Final Submission, page 16.

²²⁷ Liberty Report, page 42.

²²⁸ Liberty Report, pages 35-36.

²²⁹ Transcript, October 3, 2019, pages 176-177 - John Antonuk, Liberty.

During the hearing additional information was provided on forms of regulatory oversight in Canada and the United States. Power Advisory completed a jurisdictional scan of various utilities across Canada and in the U.S. They concluded in their report that in Canada, there is limited regulatory oversight over energy trading operations, with the exception of Nova Scotia. During the hearing Power Advisory also explained how the regulator in New Brunswick reviews the risk management practices of the New Brunswick Power's energy marketing entity.²³⁰ Power Advisory also referenced the independent review of BC Hydro conducted by the BC Government where, according to Power Advisory, Government concluded that if BC Hydro's energy trading affiliate, Powerex, was regulated by the BC regulator, this oversight would hinder Powerex's ability to compete and maximize profit in the fast moving competitive markets. Power Advisory concluded that Powerex is similar to NEM and the same rationale should apply to the operation of NEM, as well as other energy trading operations.²³¹

During the hearing Newfoundland Power described possible options for regulatory oversight. Based on Newfoundland Power's familiarity with experience in the U.S. they explained that regulators tend to look at the risk management policies of a utility for external market transactions and conduct audits or compliance reviews. Newfoundland Power compared it to how the Board currently regulates its contributions in aid of construction.²³² Newfoundland Power noted that this type of regulation is not expensive for Newfoundland Power to respond to and it doesn't restrain the behavior in a competitive market situation.²³³

InterGroup commented that energy marketing aspects managed by Manitoba Hydro are under the jurisdiction of the regulator with reviews of risk management practices, including the degree of risks taken. They also noted that there was a hearing around 2010 regarding risk management by Manitoba Hydro that included an assessment of approaches and decisions relating to trading, and the regulator weighed in on those aspects.²³⁴

Nalcor/Hydro did not agree that there should be any form of oversight of NEM and regulation should be avoided as it can limit the organization's ability to compete and maximize profits. They concluded that NEM should continue to operate in its current form. Nalcor/Hydro stated that Canadian energy marketing companies, affiliated with Crown utilities are not regulated to the same extent as energy marketing companies in the United States. They explained that because the electricity sector in Canada has developed with government shareholders the need to regulate the Crown electric corporations is not as strong. Nalcor explained that the organization has implemented a risk management manual that is in accordance with industry best practice, to manage the risks in energy trading and it is reviewed regularly by the Nalcor Board of Directors. The day to day trading and their compliance with established risk parameters are monitored by Nalcor's Treasury and Risk Management department with oversight by the NEM Board of Directors.²³⁵ Nalcor/Hydro noted that they believe the Board already provides some oversight of certain aspects of NEM, as a result of their review and approval of the Amended and Restated

²³⁰ Transcript, October 8, 2019, page 205/24 to page 206/10 - John Dalton, Power Advisory.

²³¹ Nalcor/Hydro Evidence, Appendix 1, pages 22-23; Transcript, October 8, 2019, page 171/2-17.

²³² The Board approves the CIAC policy, Newfoundland Power reports its CIAC activity once a year and is subject to an audit or review.

²³³ Transcript, October 15, 2019, pages 87-88 - Peter Alteen, President and CEO of Newfoundland Power.

²³⁴ Transcript, October 17, 2019, pages 96-97 - Patrick Bowman, InterGroup.

²³⁵ Nalcor/Hydro Final Submission, pages 15-18.

Power Purchase Agreement between Hydro and NEM and the approval in Order No. P.U. 49(2018) of the Pilot Agreement for the Optimization of Hydraulic Resources.²³⁶

The Consumer Advocate agreed that if NEM continues that it should be subject to “light-handed” regulatory oversight by the Board. He stated that regulatory oversight might include an audit every one or two years by an independent entity with expertise in power marketing activities to determine if NEM continues to meet its mandate and provide optimum value to Island Interconnected customers.

Newfoundland Power agreed that regulatory oversight should exist at least over NEM’s risk management policies and the execution of the policies.²³⁷

InterGroup stated that to the extent ratepayers are responsible for costs and are in a captive market, some aspect of regulatory oversight should exist. They explained that having regulation doesn’t necessarily mean that the regulator has to get into the detail of how fast paced decisions are made and referred to the regulator’s review in Manitoba of risk management policies practices as an example of appropriate regulatory oversight. They also explained that transparency and the provision of information alone is not a substitution for regulatory oversight. According to InterGroup, if that is considered to be acceptable then, why would a crown corporation such as Hydro that operates in the public interest be regulated at all.²³⁸

14.4 Allocation of Export Revenues

As explained in Section 9.5, total forecast export revenue, net of all costs and system losses, was allocated between Hydro and Nalcor. The portion allocated to Nalcor was considered “unregulated” and was not applied to reduce electricity rates.²³⁹

According to Liberty the current plan whereby the margins from the export sales allocated to Nalcor are not applied to reduce electricity rates is contrary to essentially universal North American practice.²⁴⁰ Liberty stated:

Like many major utility generating stations, Muskrat Falls will produce generation beyond what is needed to serve domestic load and other firm obligations (here, sales to Emera interests). Across North America, where customer rates recover the ownership and operating costs of such assets, those rates nearly universally are offset by the benefits of sales of power and energy beyond those requirements. Revenues from export sales by Hydro offset revenue requirements, but that is not the case from Muskrat Falls, whose margins from revenue of excess sales by Nalcor in excess of costs inure to the benefit of the Province. Applying the Province’s share of those Muskrat Falls export revenues (i.e. to offset customer rates) can provide another \$35-\$45 million annually to customers, based on Nalcor’s estimates.²⁴¹

²³⁶ Nalcor/Hydro Final Submission, page 16-17.

²³⁷ Transcript, October 15, 2019, page 89/9-12 - Peter Alteen, President and CEO of Newfoundland Power.

²³⁸ Transcript, October 17, 2019, page 98/13-17 – Patrick Bowman, InterGroup.

²³⁹ PUB-Nalcor-034.

²⁴⁰ Liberty Report, page 9.

²⁴¹ Liberty Report, page 4.

As ratepayers on the Island Interconnected system are required to pay all the costs of the Muskrat Falls Project Liberty recommended that the margins from the export sales that are allocated to Muskrat Falls and paid to Nalcor should be applied as an offset to Hydro's revenue requirement as a benefit for ratepayers.²⁴² During the review all Parties agreed with Liberty's opinion that it is normal practice for revenues from export sales to be applied to reduce rates where customers pay for the costs of the assets that generate the revenues. Power Advisory agreed that their research supported the position that it is nearly universal practice in both Canada and the United States to apply export revenues to offset revenue requirement. They did note that it was ultimately an appropriate decision for the shareholder and policy makers.²⁴³ Power Advisory agreed with Liberty that it is appropriate to consider the profits from energy trading operations to reduce rates when those profits are derived from assets that are paid for by customers.²⁴⁴

Nalcor/Hydro agreed with Liberty's recommendation that rate payers should benefit from the off-system sales from Muskrat Falls energy. They also agreed that it is consistent with industry practice in Canada. However they note that it is the Government's decision on how the margins arising from NEM's participation in extra-provincial electricity are treated.²⁴⁵

The Consumer Advocate submitted that Liberty's recommendation that Island Interconnected system customers should receive the benefit of all export sales from the Muskrat Falls Project as a result of having to pay all its costs, is a fair approach and is consistent with regulatory practice. He also stated that the export revenues paid to Nalcor should be used as a source of revenue for funding rate mitigation.²⁴⁶

Newfoundland Power agreed that the options identified by Liberty to mitigate customer rates, represent reasonable opportunities, including the allocation of Nalcor's portion of export sales revenue against customer rates.²⁴⁷

The Industrial Customer Group also supported the observations of Liberty regarding the actions that can be taken by the Government to mitigate the rate impacts of the Muskrat Falls Project, including dividends from Muskrat Falls excess energy.²⁴⁸

14.5 Board Comments

A number of issues were raised during the review as to industry best practices in relation to external market sales including; i) NEM structure, ii) the provision of services, iii) regulatory oversight, and iv) the allocation of Nalcor's export sales profits.

NEM manages the sale of surplus energy and purchases electricity for the Island Interconnected system. It conducts energy trading, water management and scheduling of production at Nalcor/Hydro facilities. Liberty noted that NEM is currently taking its direction from Power Supply and raised a possible conflict in relation to Power Supply's interest in optimizing margins

²⁴² Liberty Report, page 20.

²⁴³ Evidence of Nalcor/Hydro – Appendix 1, page 18.

²⁴⁴ Transcript, October 8, 2019, page 166/1-16 – John Dalton, Power Advisory.

²⁴⁵ Nalcor/Hydro Final Submission, page 15/6-12.

²⁴⁶ Consumer Advocate Final submission, page 11 and recommendation 11, page 16.

²⁴⁷ Newfoundland Power Final Submission, page 8; Transcript, October 15, page 9/11-12.

²⁴⁸ Industrial Customer Group Final Submission, pages 8-9.

from export sales and Hydro's interest in the provision of reliable least-cost service. Liberty recommended that NEM should take direction from Hydro which would provide Hydro, the entity responsible for generation operations, with the control of water management and scheduling. In the Consumer Advocate's view water management and production scheduling functions should be transferred back to Hydro.

Liberty also raised whether energy marketing services should be supplied by an external service provider but was not able to conclude that there would be interested providers or that the costs would be lower. Liberty recommended that Nalcor do a solicitation for interest. Nalcor did not agree that there would be merit in doing a solicitation in addition to the solicitations which had been done in the past and stated that the current costs are lower than the costs that were paid when Emera was the provider.²⁴⁹ Nalcor further described the value that NEM offers and the potential concerns in relation to an external service provider. Based on the information provided in the review it does not appear that there is a pressing need to conduct a market solicitation for an external energy provider at this time.

NEM is currently not regulated by the Board. While most jurisdictions in Canada do not fully regulate the operations of entities responsible for export sales, Nova Scotia, New Brunswick and Manitoba do have some regulatory oversight over these activities. Liberty noted that, in the United States, commissions conduct periodic audits where they would look at organization staffing, risk control, risk management. While Nalcor raised concerns in relation to whether regulation may limit NEM's ability to compete and maximize profits, the other Parties in the review expressed the view that some regulatory oversight of NEM is warranted. Based on the information provided during the review the concerns that were expressed in relation to the impact of oversight on NEM's operations can be avoided with the implementation of appropriate regulation. For example, NEM could be required to justify its proposed operating expenses and its risk management and other energy trading policies through a regulatory process.

Another issue raised in the review related to industry best practices was whether Nalcor's profits from export sales should be applied to reduce the cost of the Muskrat Falls Project. Currently this profit is not applied to the benefit of the Island Interconnected customers despite the fact that these customers will ultimately be responsible for paying the costs associated with these sales. The allocation of these profits to offset customer rates was supported by all the Parties in the review, is consistent with good utility practice and would contribute to the provision of least-cost service. There is no question that it would appropriate and in accordance with best practice to allocate Nalcor's profit from the export sales to reduce electricity rates.

The Board recommends that Government take the following actions to ensure that industry best practices are followed in external market purchases and sales of electricity:

- i) review and implement appropriate structural changes so that NEM takes direction from Hydro, which would provide Hydro, the entity responsible for generation operations, with control of water management and scheduling;
- ii) implement regulatory oversight of NEM which is consistent with other jurisdictions and appropriate for this Province;

²⁴⁹ Nalcor/Hydro Final Submission, page 20.

- iii) allocate Nalcor's profits on export sales to the benefit of the customers that pay the costs of the provision of this service.

15.0 POLICY CONSIDERATIONS

In implementing any rate mitigation options there are a number of matters related to regulatory policy and rates that may require consideration, some of which were raised during the review and others which arise as a result of existing Government policies with respect to rural rates.

15.1 Regulatory Policy

A number of policy issues related to the regulation of electric utilities in the Province were raised during the review. These issues included the regulatory oversight of the Muskrat Falls Project capital and O&M costs following in-service, the regulation of Hydro's rate of return and capital structure, the current regulatory framework and a proposed review of the electric industry structure.

15.1.1 Regulatory Oversight of Muskrat Falls Project Capital and O&M Costs

As noted previously the Muskrat Falls Project is exempt from the jurisdiction of the Board and the Board is required to allow the recovery of all Muskrat Falls Project costs, including O&M costs, in the electricity rates paid by Island Interconnected customers without disallowance, reduction or alteration.²⁵⁰ Liberty noted that the ongoing capital and O&M costs for the Muskrat Falls Project will have a significant impact on future rates but the Board has no authority to examine them.²⁵¹ Liberty recommended that the future capital and O&M costs become subject to the Board's jurisdiction:

Empowering the Board to exercise with respect to LCP the same authority it has to review other ongoing utility capital and operating costs and operating and maintenance methods, practices, decisions and actions will provide a more unified basis for ensuring optimization of costs and reliability.²⁵²

According to Liberty the Board's ability to examine the reasonableness of such expenses can have a large impact on both cost and reliability. Liberty explained that utility regulation provides an alternative to the oversight of capital costs, operating costs, and reliability that a market would provide if it existed. In Liberty's opinion the lack of Board authority for addressing these costs is a direct threat to optimizing their efficiency and effectiveness.²⁵³

Nalcor/Hydro stated that it is not necessarily opposed to increasing the Board's oversight role in determining the O&M costs and future sustaining capital but there needs to be consideration of any implications from doing so under the current legislative framework, the financing arrangements and Nalcor's contractual commitments. In Nalcor/Hydro's opinion changes to the commercial arrangements for the project would likely be necessary to allow for greater Board oversight. They also explained that Hydro has an oversight role with respect to these costs and

²⁵⁰ OC2013-342 and OC2013-343.

²⁵¹ Liberty Report, page 10.

²⁵² Liberty Report, page 10.

²⁵³ Transcript, October 12, 2019, pages 16-24 – John Antonuk, Liberty; Liberty Report, page 29

commented that there is some benefit to transparency of these costs.²⁵⁴ Power Advisory stated that when costs are borne by customers it is appropriate and normal that there be some form of regulatory oversight but that constraints exist with respect to the Muskrat Falls Project that removed this typical oversight. Power Advisory acknowledged that if the constraints could be addressed it would be appropriate for there to be Board oversight.²⁵⁵

The Consumer Advocate submitted that ongoing capital and O&M costs for the Muskrat Falls Project should be subject to regulatory oversight by the Board in spite of how the financial instruments for the project are drafted.²⁵⁶

Newfoundland Power supported Liberty's recommendation to extend Board oversight to include project capital and O&M costs but noted that there are choices in the degree and form of oversight which will depend on a number of factors, including public policy and how costs are collected from customers. According to Newfoundland Power the Board's oversight could take the form of full regulatory oversight as exists for Newfoundland Power or a review by the Board with recommendations only to Government, as was the oversight for Hydro prior to it becoming regulated. Newfoundland Power submitted that the Board should recommend regulatory oversight of future capital and operating project costs and revenues to ensure customers' interests are protected but did not specify the form of regulatory oversight that should be recommended.²⁵⁷

InterGroup agreed with Liberty that a regulator normally ensures costs paid by ratepayers are reasonable and that, in their opinion, project O&M and capital costs should be subject to regulatory review.²⁵⁸ The Industrial Customer Group submitted that the regulatory regime necessary for the control of costs, including project sustaining costs, should be restored, stating:

There was no serious challenge in any of the Reference evidence to the well-recognized principle that electrical power customers who are served by a utility which holds a monopoly on electrical supply (a position held by Hydro, most markedly vis-a-vis the Island industrial customers for the reasons to(sic) discussed earlier in this submission) should be protected by utilities regulation, "if the customers are paying the cost" in the absence of competitive sources of supply that might otherwise serve to ensure reasonable rates.²⁵⁹

The Industrial Customer Group submitted that customers clearly have an interest in the necessary oversight being in place to ensure that the project sustaining costs are prudently incurred and that, at a minimum, there should be an assurance of transparency in the planning, approval and incurring of such costs. They submitted that the Board should recommend that the Government give the necessary direction to require Nalcor, on an annual basis, to provide information on proposed project sustaining expenditures (including capital and O&M expenditures) to the Board for scrutiny with the level of justification and detail required of Hydro in its annual capital

²⁵⁴ Nalcor/Hydro Final Submission, pages 6 and 28; Transcript, October 8, 2019, page 114/7-21.

²⁵⁵ Transcript, October 9, 2019, page 97/9 to page 101/17 - John Dalton, Power Advisory.

²⁵⁶ Consumer Advocate Final Submission, pages 11 and 15.

²⁵⁷ Newfoundland Power Final Submission, pages 13-14; Transcript, October 15, 2019, pages 80/9 to page 82/20 – Peter Alteen, President and CEO, Newfoundland Power.

²⁵⁸ Transcript, October 17, 2019, page 94/11-22; Transcript, October 17, 2019, page 95/4 to page 96/11 – Patrick Bowman, InterGroup.

²⁵⁹ Industrial Customer Group Final Submission, page 14/18 to page 15/3.

budget process and that the Board issue public reports on the prudence of the proposed expenditures. The Industrial Customer Group strongly urged that Government empower the Board to exercise an independent oversight role in respect of project sustaining costs, even if that role can't be extended to disallowance.²⁶⁰

15.1.2 Regulation of Hydro's Return on Equity and Capital Structure

Hydro's return on equity and capital structure is established pursuant to direction from Government in 2009. The Board was directed that the return on equity to be used in establishing Hydro's rates is to be the same as that approved by the Board for Newfoundland Power and that further Hydro's capital structure was permitted to have a maximum proportion of equity the same as approved for Newfoundland Power.²⁶¹ The current return on equity and capital structure approved for Newfoundland Power is 8.5% with an equity component of no higher than 45%.²⁶² In accordance with Government direction Hydro's rates reflect a return on equity of 8.5% and an equity component of 19% in its capital structure.²⁶³

Prior to Government direction in 2009 Hydro's capital structure and return were determined by the Board based on relevant regulatory principles and the factual circumstances at the time of the application for rates to be set. In Hydro's first general rate application after becoming regulated it proposed both long-term and short-term targets for return on equity and capital structure.²⁶⁴ The Board rejected Hydro's request to establish long term targets and accepted the proposed short-term targets of 3% for its return on equity and 80/20 for its debt/equity. The Board stated:

The Board finds no statutory basis for treating NLH as an investor owned utility. The Board concludes approval in principle of NLH's request to be treated as an investor owned utility is not justified based on its current operating characteristics. The Board believes NLH's request is premature in the absence of a sound plan by NLH of how it will achieve financial targets similar to an investor owned utility and what impact this will have on its customers. The Board notes that NLH's debt is guaranteed by Government and this ensures NLH's access to the capital markets of the world.²⁶⁵

In its next general rate application filed in 2003 the Board again rejected Hydro's request for a rate of return and capital structure as if it were an investor-owned utility and ordered a return on equity based on the Province's marginal cost of debt calculated using Hydro's actual capital structure which resulted in an approved return on equity of 5.83% and not the 9.75% requested by Hydro. The Board stated:

The Board will continue to recognize NLH as a Crown owned utility afforded the benefit of a debt guarantee provided by its shareholder, Government, which sustains NLH's access to capital markets.²⁶⁶

²⁶⁰ Industrial Customer Group Final Submission, pages 15-16; page 18.

²⁶¹ OC2009-063.

²⁶² Order No. P.U. 2(2019).

²⁶³ Order Nos. P.U.16 (2019) and P.U. 49(2019) and OC2009-064.

²⁶⁴ Order No. P.U. 7(2002-2003), page 2; Hydro proposed a return on equity of 11%-11.5% and a capital structure composed of debt/equity of 60/40 on the basis that it was similar to an investor-owned utility.

²⁶⁵ Order No. P.U. 7(2002-2003), page 42.

²⁶⁶ Order No. P.U. 14(2004), page 37.

The Consumer Advocate submitted that Government's direction with respect to Hydro's rate of return and capital structure should be rescinded and the Board should determine the appropriate return on equity for Hydro. He stated:²⁶⁷

The purpose of the PUB is to provide independent and informed regulatory oversight of the power sector. There has been far too much interference by Government in the electricity sector, in particular, relating to the MFP itself and OC2009-063 establishing Hydro's return at the same level as Newfoundland Power's return, an entity that is in a much different business with a much different risk profile, much different capital structure and much different performance. OC 2009-063 should be rescinded and Hydro's return should be determined by the PUB based on merits of Hydro's General Rate Application.²⁶⁸

InterGroup also recommended that the Board's ability to set Hydro's return on equity be restored. The Industrial Customer Group recommended and supported a broadening of the Board's involvement in setting Hydro's financial targets, submitting that "the Provincial Government would benefit from the Board's ongoing oversight and input in determining what is the correct balance between equity return and rate mitigation."²⁶⁹

15.1.3 Regulatory Framework

Hydro and Newfoundland Power are regulated by the Board using the traditional cost of service regulation model and have always been regulated in this manner. The requirement for the utility to recover its cost of providing service and a reasonable return is a commonly accepted regulatory principle that underlies the cost of service regulation model. Some utilities in Ontario, Alberta and British Columbia are regulated, in some aspects, using performance based regulation ("PBR"). PBR is a methodology designed to provide the utility with performance incentives, with the benefits achieved over a certain time period, such as lower costs and/or improved efficiency, being shared between the utility and the rate payer.

The Consumer Advocate recommended that a PBR scheme be designed and implemented in 2020 for Newfoundland Power as approved by the Board following due process. He also stated that he does not support PBR for Hydro as it is a crown owned utility with social obligations, and has less of a profit motive than a privately-owned company such as Newfoundland Power.²⁷⁰

This issue was briefly discussed during the hearing. The Consumer Advocate asked Liberty whether the current cost of service model makes sense in the Muskrat Falls era and whether other alternatives, such as PBR, should be considered. Liberty didn't see how PBR would be an alternative to help with what has happened so far. They also indicated that, while they like PBR conceptually, they have seen too many times that it doesn't do what they think it ought to do.²⁷¹

The Consumer Advocate also asked Newfoundland Power about the other Fortis subsidiaries that are under some form of PBR in other Canadian provinces. They explained that, based on a 20-

²⁶⁷ Consumer Advocate Final Submission, page 16.

²⁶⁸ Consumer Advocate Final Submission, page 11.

²⁶⁹ Transcript, October 17, 2019, page 91/23 to page 93/8 – Patrick Bowman, InterGroup; Industrial Customer Group Final Submission, page 9.

²⁷⁰ Consumer Advocate Final Submission, pages 13 and 17.

²⁷¹ Transcript, October 4, 2019, page 108 – John Antonuk, Liberty.

year study ending in 2017 that was completed for their 2019 rate case, Newfoundland Power was able to beat inflation by an aggregate of 24% over that 20 year period, at the same time increasing reliability by 39%.²⁷² In their opinion, Newfoundland Power has been providing least cost, reliable power to its customers for some time, and continues to do so, and that PBR is unlikely to have better outcomes for customers than Newfoundland Power's proven performance.²⁷³

InterGroup commented that PBR relies on the incentive of the utility to want to maximize profits so it works well for a private company, but they have not seen good examples of PBR working when the company's priority is not to maximize profits, which is why you don't often see PBR applied to Crown utilities, as they don't generally have the same profit maximizing objective. In their opinion, PBR could be applied well at a distribution level and may not work as well at a bulk power level, similar to Hydro. InterGroup said sometimes the best incentive for a Crown to keep their costs down is to avoid having to come for a rate increase and prepare for a public hearing.²⁷⁴

Nalcor/Hydro commented on the Consumer's Advocate's recommendation on PBR in their final submission stating that a change from cost-of-service based regulation to PBR needs to be carefully considered against the opportunity identified and costs and risks of making such a change. They also noted that there was no evidence presented during the review that PBR would lower electricity rates in the Province and, even though PBR is in effect in other Canadian provinces, it does not appear to be in effect for crown Canadian utilities.²⁷⁵

15.1.4 Industry Structure Review

During the hearing Newfoundland Power raised the issue of a comprehensive review of the electric utility industry sector, stating:

Once Muskrat Falls is complete, customers on the island will be paying for three separate utilities to operate the grid; a regulated Nalcor utility Newfoundland and Labrador Hydro, an unregulated Nalcor utility in Power Supply, and Newfoundland Power, a regulated utility. Multiple utilities each with similar roles to perform without a doubt results in duplications and inefficiencies in how we collectively operate, and this tells me that potential customer benefits might exist by restructuring the sector to reduce duplication, eliminate inefficiencies and keep costs as low as possible.²⁷⁶

Newfoundland Power expressed the view that, once Muskrat Falls is operational and the questions concerning rate mitigation and reliability being considered in the Board's review of Hydro's Reliability and Resource Adequacy Study are resolved, Government should undertake a comprehensive assessment of how the sector is structured and operated to ensure the sector delivers least cost reliable service over the long term. Newfoundland Power submitted that the

²⁷² Transcript, October 15, 2019, page 51 – Peter Alteen, President and CEO, Newfoundland Power. Mr. Alteen referenced PUB-NP-073 from Newfoundland Power's 2019 General Rate Application proceeding.

²⁷³ Transcript, October 15, 2019, pages 51 and 54 – Peter Alteen, President and CEO, Newfoundland Power.

²⁷⁴ Transcript, October 17, 2019, pages 80 to 81 – Patrick Bowman, InterGroup.

²⁷⁵ Nalcor/Hydro Final Submission, page 34.

²⁷⁶ Transcript, October 15, 2019, page 117-21 – Byron Chubbs, Vice-President, Energy Supply and Planning, Newfoundland Power.

Board should recommend that the Government undertake a comprehensive review of utility operations in the Province once customer rate shock is mitigated and the Muskrat Falls Project is operating reliably.²⁷⁷

The Consumer Advocate supported Newfoundland Power's position and submitted that the Province's power sector should be subject to a detailed review upon commissioning of the Muskrat Falls Project. According to the Consumer Advocate the review should include an examination of the legislation that gives Hydro the exclusive right to sell power in the Province and restructuring the market to incorporate an element of competition.²⁷⁸

15.1.5 Board Comments

A number of issues related to Government policy in relation the regulation of electric utilities in the Province were also raised in the review, including i) oversight of Muskrat Falls Project capital and operating and maintenance costs, ii) regulation of Hydro's return on equity and capital structure, and iii) regulatory framework and iv) the industry structure.

The ongoing capital and operating and maintenance costs for the Muskrat Falls Project will have a large impact on future rates but these are not subject to regulatory oversight. In Liberty's view the lack of oversight is a direct threat to optimizing efficiency and effectiveness. Liberty, the Consumer Advocate, Newfoundland Power and the Industrial Customer Group all supported some level of regulatory oversight of these costs. Nalcor/Hydro stated that they were not necessarily opposed to increased Board oversight of these costs, but identified several issues that would have to be considered. Power Advisory agreed that Board oversight would be appropriate if the existing constraints could be addressed. While there are currently barriers to oversight of the capital and operating and maintenance costs it is clearly in the best interests of stakeholders to ensure the project is operated in an efficient and effective manner thereby reducing costs to be recovered from customers. Independent oversight can provide the necessary rigour to ensure the utility is in compliance with the power policy of the Province with respect to the provision of least-cost reliable service. The transparency associated with regulatory oversight can also provide assurance that future decisions on planning and sustaining costs are prudent and that operating and maintenance costs have received the appropriate level of independent scrutiny. The Board recommends that Government consider its options with respect to implementing independent oversight of the Muskrat Falls Project sustaining capital and operating and maintenance costs.

The way in which Hydro's rate of return and capital structure are currently established was questioned in this review. Until 2009 Hydro's return on equity and capital structure were regulated by the Board in accordance with the power policy of the Province and sound public utility practice. Hydro's return and capital structure were established based on the Board's finding that it was not similar to an investor-owned utility and as a result its allowed return was substantially lower than Newfoundland Power's. This changed in 2009 when Government directed that Hydro's return on equity and capital structure shall be based on that which is

²⁷⁷ Newfoundland Power Final Submission, page16; Transcript, October 15, 2019, page 12/7-15 – Byron Chubbs, Vice-President, Energy Supply and Planning, Newfoundland Power.

²⁷⁸ Consumer Advocate Final Submission, page 11 and Recommendation 15, page 16.

established for Newfoundland Power.²⁷⁹ The Consumer Advocate and the Industrial Customer Group recommended this Government direction be rescinded and full jurisdiction be restored to the Board. If the Government direction with respect to Hydro's return on equity and capital structure is rescinded the Board will again determine the appropriate return and capital structure for rate setting for Hydro based on its circumstances at the time. If this results in a lower return on equity this would lower Hydro's revenue requirement and potentially rates. It is noted however that this may not aid in rate mitigation as it would also reduce the returns and dividends available to the Province. The Board recommends that Government consider returning the regulatory oversight of Hydro's rate of return and capital structure to the Board.

During the review the Consumer Advocate raised questions as to whether the current cost of service model for regulation in this Province continues to be appropriate and whether it should be replaced with performance based regulation. The Consumer Advocate recommended that a performance based regulatory scheme should be designed and implemented for Newfoundland Power but not for Hydro. This position was not shared by the other participants in the review. Liberty, Nalcor/Hydro and Newfoundland Power all expressed hesitation in relation to the outcomes of performance based regulation systems. The Board questions whether it would be appropriate to have two different regulatory models for the two small utilities in this Province and whether it would add to costs. Finally it would be necessary to consider the timing for such a change in light of the significant changes which will occur with the commissioning of the Muskrat Falls Project.

A review of industry structure was suggested during this review and, while such a review may be worthwhile after a period of operation of the Muskrat Falls Project, given the anticipated changes in the system in the next several years and the associated uncertainty, such a review should not be an immediate priority.

15.2 Electricity Rates Policy

The Government has given policy directions on how rates for Hydro's customers on the Island Interconnected system, in isolated diesel communities and on the Labrador Interconnected system are to be set. The Government has also now directed that the costs of the Muskrat Falls Project are to be recovered in full by Hydro in its Island Interconnected rates. However, given the manner in which rates are set for isolated diesel customers and for Labrador Interconnected customers, there could be consequential impacts for those customers unless the manner of setting their rates is altered.

15.2.1 Rural Rates

The electricity rates paid by Hydro's rural customers on the Island Interconnected system and in isolated diesel communities on both the Island and Labrador have always been based on Government policy directions which have not changed significantly since first established decades ago. Government's involvement in setting rates for rural customers arises from the historical context in which electrification occurred in the rural areas of the Province.²⁸⁰ A brief description of this context is provided here.

²⁷⁹ OC2009-063.

²⁸⁰ See Order No. P.U. 7(2002-2003) for a full discussion of the history of rural rate setting in the Province.

Prior to the establishment of the Newfoundland Power Commission (Hydro's predecessor) in 1954 the supply of power in the Province was through private investors. The Power Commission's initial mandate included the electrification of rural areas of the Province. With the expansion of the mandate of the Power Commission to include focus on an interconnected island system with significant generation and transmission requirements, in 1963 Government created power distribution districts (PDDs) to manage the supply of electricity to rural areas. Government's policy direction at that time was to electrify every community with fifteen families or more. In 1965 the Newfoundland Rural Electricity Authority (REA) was established to construct and operate diesel generating plants that would not be economically feasible for private investors. Assets to supply electricity in rural areas owned by the Power Commission were transferred to the REA which then owned all PDD systems. The REA initiated a program to transfer certain PDD assets to existing utilities which resulted in Newfoundland Power acquiring a number of assets that were originally owned by PDD. In 1971 more than 50 PDDs were consolidated into one entity. When the goal of electrifying the Province was substantially accomplished the REA was phased out in 1989, PDD was eliminated and its assets transferred to Hydro.

Currently rates for rural customers on Hydro's Island interconnected system and on the L'anse au Loup systems are the same as the rates charged to Newfoundland Power customers based on a 2002 decision of the Board on Hydro's first rate application when it became fully regulated.²⁸¹ The Board's decision was consistent with previous Government policy direction prior to Hydro being regulated. The Government subsequently directed the Board in 2003 to continue with certain rate policies as below:²⁸²

- Rates for domestic customers, excluding government departments, served by Hydro in isolated diesel communities on the Island and in Labrador be the same as the rates charged by Newfoundland Power for the basic customer charge and for the lifeline block.²⁸³ Rates for usage above the lifeline block are to be adjusted by the average rate of change approved by the Board for Newfoundland Power customers. Rates for general service customers are to be adjusted by the average rate of change approved for Newfoundland Power customers. Government users in isolated diesel communities pay the full cost of serving them.
- Preferential rates continue for certain rural customers so that these customers pay less than others in similar situations. These customers include fish plants, churches and community halls in diesel areas and the Burgeo school and library on the Island interconnected system.²⁸⁴

Government also directed that an increase approved by the Board in 2006 for non-government domestic and general service customers in isolated diesel areas be deferred each year since.²⁸⁵

In 2007 Government directed that a rebate be provided to domestic customers in Labrador isolated diesel communities and the L'Anse au Loup system to bring their costs for the basic

²⁸¹ Order No. P.U. 7(2002-2003), pages 127-128.

²⁸² OC2003-347.

²⁸³ The lifeline block is designed to provide essential services at non-discriminatory rates, including appliances and hot water heating but not electric heat.

²⁸⁴ The latest estimate of the additional costs of these preferential rates was approximately \$1 million and was provided by Hydro in its amended 2013 general rate application.

²⁸⁵ OC2019-166 defers this increase until July 2020.

customer charge and the lifeline block equivalent to that paid by Hydro's residential customers on the Labrador Interconnected system.

In the absence of changes to existing Government policy direction with respect to electricity rates, when the Muskrat Falls Project costs are passed on to Hydro's Island Interconnected customers, the rates for Hydro's isolated rural customers will increase as well.

15.2.2 Rural Deficit

The rates charged by Hydro to its rural customers do not recover the full cost of serving these customers with the shortfall ("Rural Deficit") recovered from customers of Newfoundland Power and those on the Labrador Interconnected system.²⁸⁶ The percentage of costs of serving these customers recovered in customer rates for 2019 was estimated to be:²⁸⁷

Cost of Serving Rural Customers for 2019	
Customers	Cost Recovery
Hydro's Rural Island Interconnected system	69%
Hydro's L'Anse au Loup	42%
Hydro's Labrador isolated	22%
Hydro's Island isolated	14%

The Rural Deficit was forecast to be \$64.3 million for 2019. Hydro estimated that the amount required to recover the forecast 2019 Rural Deficit added 13.9% to the revenue requirement for each of Newfoundland Power and the Labrador Interconnected system which is recovered in customer rates.²⁸⁸

During the period of rural electrification Government directly funded any shortfall between the revenues paid by rural customers and the costs of serving them. In 1989 Government decided that it would no longer fund the deficit, which was approximately \$30 million dollars annually at the time, and amended the *EPCA* to require that all other customers in the Province fund the deficit through electricity rates. In 1996 the *EPCA* was amended to relieve the industrial customers of the requirement to contribute to the Rural Deficit.

The Board has, on a number of occasions, raised the need to review the policies on rural rates and the implications of the Rural Deficit for the customers that pay it. Prior to Hydro becoming fully regulated in 1996, Hydro submitted applications on rates to the Board for review and report to Government. In 1992, following an application by Hydro, the Board recommended the gradual reduction of the Rural Deficit and the elimination of preferential rural rates. The Government did not accept the recommendations and directed the Board to investigate issues surrounding the supply of electricity in rural areas. The Board held an inquiry and following submission of its report in 1995 which made a number of recommendations to eliminate the Rural Deficit and move the rural rates to recover costs, the Government again declined to accept the recommendations and directed the Board to re-consider the issue. The Board submitted a revised report in mid-1996 but received no communication from Government on its recommendations.

²⁸⁶ OC2003-347.

²⁸⁷ NP-NLH-057 (Rev.1) filed as part of Hydro's 2017 General Rate Application.

²⁸⁸ Hydro's 2019 Compliance Application, Exhibit 14, page 9.

In Order No. P.U. 7(2002-2003), issued in Hydro's first general rate application after becoming fully regulated, the Board directed Hydro to prepare an evidentiary record on the Rural Deficit and consult with Government. The Board also determined that the preferential rural rates were discriminatory and directed Hydro to develop a plan to phase out these rates. The Board stated at that time:

The Board acknowledges that rural rates and the treatment of the rural deficit are some of the more prominent and controversial issues arising from the hearing. Decisions on these issues now and into the future will have far reaching economic and social consequences for the people of Newfoundland and Labrador. The Board cautions there are no easy solutions to these issues and likely no solutions that will satisfy all expectations.²⁸⁹

The Board acknowledges the burden the rural deficit places on subsidizing ratepayers and is concerned with the potential for increasing levels of subsidization. The Board notes that rising costs, and hence higher subsidies, may place an even greater burden on ratepayers who have no ability to control these costs but are responsible for paying them.²⁹⁰

Government subsequently confirmed the continuation of the policies for setting rural rates, including preferential rural rates.²⁹¹ In Order No. P.U. 49(2016) the Board noted the increasing Rural Deficit and that it was transferred to customers who had to pay rates higher than the cost of serving them with no ability to control the costs but referred to Government direction on the setting of rural rates and the recovery of the Rural Deficit.²⁹²

The Consumer Advocate raised the issue of the Rural Deficit during the review and recommended that, since the rural subsidy represents a Government social program, the Government should pay for it consistent with past practice.²⁹³

15.2.3 Board Comments

Government policy in relation to rural electricity rates in the Province has not changed substantially since the 1970s. Over the years Government has issued numerous directions which limit the rates which are required to be paid by customers in Hydro's rural systems. As a result these rates do not recover the cost of providing service in these areas. In the early years Government funded the deficit which was associated with this shortfall in rates. This is no longer the case and currently the Rural Deficit is recovered in the rates of customers of Newfoundland Power and customers on the Labrador Interconnected system. The Rural Deficit represents a significant cost for these customers which must be paid on top of the costs associated with their own electricity service. It was forecast to be \$64.3 million in 2019 and was estimated to add 13.9% to the revenue requirement for Newfoundland Power and Labrador Interconnected customers.

Government may need to consider the current policy framework in relation to electricity rates in the Province and whether it will reflect the intention of Government after the commissioning of

²⁸⁹ Order No. P.U. 7(2002-2003), page 121.

²⁹⁰ Order No. P.U. 7(2002-2003), page 126.

²⁹¹ OC2003-347.

²⁹² Order No. P.U. 49(2016), page 89.

²⁹³ Consumer Advocate Final Submission, page 17, Recommendation #22.

the Muskrat Falls Project. The apparent conflict between the Government direction, which limits recovery of Muskrat Falls Project costs to Island Interconnected system customers, and the policy directions, which require that rural rates are based on the rates charged to Newfoundland Power's customers will need to be resolved. Government may need to reassess its policy with respect to rural rates in isolated communities and whether it will continue to be appropriate for these rates to be determined based on the rates charged to Newfoundland Power after the commissioning of the Muskrat Falls Project. If not, a new rural rates policy which addresses the appropriate manner for setting rates for these customers may be required. If these rates will not recover the full cost of providing service in these areas it will also be necessary to determine how this shortfall will be funded.

The Island Interconnected customers who currently pay over 90% of the Rural Deficit will also be responsible for all the costs of the Muskrat Falls Project. In the absence of changes to the existing Government rates policy the rates charged to these customers will continue to reflect the costs of subsidizing rural rates in addition to the costs of the Muskrat Falls Project. Government may wish to consider whether it should return to the policy of funding the rural deficit as was done prior to 1989 to alleviate the Island Interconnected customers from this burden.

In the long-term the implications for rates on the Labrador Interconnected system arising with the interconnection to Muskrat Falls may also need to be considered. Currently the Labrador Interconnected system and the Island Interconnected system are treated as two separate systems and rates are established independently based on the respective costs of serving the customers on each of these systems. With the completion of the Muskrat Falls Project the Island Interconnected system and the Labrador Interconnected system will be connected. In addition a new transmission line has recently been approved between Happy Valley – Goose Bay and Muskrat Falls which will allow the transmission of power from Muskrat Falls to customers on the Labrador Interconnected system.²⁹⁴ These interconnections raise issues as to whether these two systems should continue to be treated separately in the long-term and whether Government's direction that the rates for Labrador Interconnected customers are not to include any Muskrat Falls Project costs will continue to be appropriate.

15.3 Concluding Comments

Given the transformative changes in the electrical system of the Province that will occur with the commissioning of the Muskrat Falls Project a review of established Government policy with respect to electricity rates and utility regulation is appropriate at this time. The Board recommends that Government:

- i) reconsider its policy in relation to rural rates in the Province, how these rates should be set, whether these rates should be subsidized and who should pay any subsidy;
- ii) review its options with respect to the implementation of independent oversight of the Muskrat Falls Project sustaining capital and operating costs; and
- iii) consider whether Hydro's return on equity and capital structure should be subject to the regulation of the Board.

²⁹⁴ Order P.U. No. 9(2019).

PART FIVE: RATE IMPACTS OF MITIGATION OPTIONS

The Board was directed to review and report on the potential electricity rate impacts of the mitigation options identified in the review. This section sets out the Board's assessment of the potential of the mitigation options identified in the previous sections to offset the increase in electricity rates required to recover the costs of the Muskrat Falls Project.

16.0 IMPACTS OF MITIGATION OPPORTUNITIES ON FORECAST RATES

16.1 Forecast Unmitigated Rates

At the beginning of the review in September 2018 the average domestic electricity rate was 12.26 cents/kWh, including the basic customer charge, energy charges reflecting 1,517 kwh of consumption and a prompt payment discount, but excluding taxes. This average rate increased as of October 1, 2019, following Hydro's 2017 general rate application, to 13.06 cents/kWh.²⁹⁵ Without mitigation the average domestic electricity rate is forecast to rise to 22.89 cents/kWh in 2021, an increase of approximately 75%. In the absence of a change in Government policy, rates for domestic customers on Hydro's isolated diesel systems will also be affected since these rates are based on Newfoundland Power's domestic rates.

The following table shows the 2021 forecast domestic rates for customers in the Atlantic provinces:

Average Domestic Electricity Rates ²⁹⁶		
Utility / Province	Current Rates (cents/kWh)	2021 Forecast Rates (cents/kWh)
Newfoundland Power (NL)	13.06	22.89
Nova Scotia Power (NS)	16.32	16.81
Maritime Electric (PEI)	15.99	16.10
New Brunswick Power (NB)	12.66	13.61

Rates for Island Industrial customers are also expected to increase significantly. InterGroup noted that in 2018 the average rate for Island Industrial customers was forecast to increase in 2021 to 12.44 cents/kWh, an increase of about 138% from then forecast 2019 rates.²⁹⁷ Following the Board's decisions arising from Hydro's Cost of Service and the 2017 General Rate Application the allocated revenue requirement and resulting rates for Island Industrial customers increased as of 2019. As a result it is expected that the forecast 2021 electricity rate increase for Island Industrial customers will be less than the original estimate of 138%, but it is clear that it will still be significant.

The substantial increases in rates expected in 2021 was an overriding issue in the review. Newfoundland Power stated that rate mitigation has been a significant concern for its customers since Nalcor announced a potential doubling of customer rates in June 2017 and that the short-term objective should be to avoid rate shock. According to Newfoundland Power the Muskrat

²⁹⁵ PUB-Nalcor-027 (Rev. 1) and PUB-Nalcor-029 (Rev.1).

²⁹⁶ PUB-Nalcor-027 (Rev. 1)

²⁹⁷ InterGroup Report, page 5.

Falls Project presents a threat to its customers' expectations of reliable service at affordable prices as required by the power policy set out in the *EPCA*.²⁹⁸ The Consumer Advocate noted the focus of this review is to address the rate shock arising from the Muskrat Falls Project as the resultant unmitigated electricity rates for Island Interconnected customers are expected to double their current level.²⁹⁹ Liberty noted: "I think we're at a point where we have to look very closely at a rate situation that is extreme."³⁰⁰ The Industrial Customer Group spoke to the impact of the projected rate increases on its sector, stating:

The unmitigated rate increases projected will, in a very short time frame, vault industrial rates from the low- to-moderate range to amongst the highest in Canada. Without having to invoke customer-specific examples, it is reasonable to have a high-index of concern about the future of the industrial sector of the Island if, along with the other high costs imposed by its geographic location, it is also to become a high cost electrical power jurisdiction.

The broad and steep impact of these projected rate increases is unprecedented in the history of electrical power regulation before the Board, and indeed appear to be unprecedented in recent North American experience.³⁰¹

16.2 Impacts of Rate Mitigation Opportunities on Rates

If domestic rates on the Island Interconnected system are to be held to 13.5 cents/kWh in 2021, as is the stated intention of Government, then mitigation will have to provide sufficient funds to offset an increase of 9.39 cents/kWh. The impact on forecast domestic rates on the Island Interconnected system can be estimated at a high-level based on the guideline provided by Nalcor which suggested that an average of \$66 million of rate mitigation applied to Hydro's revenue requirement would reduce domestic rates by 1 cent/kWh.³⁰² Applying this rough guideline would indicate that approximately \$620 million would be required in mitigation in 2021 to keep domestic electricity rates at 13.50 cents/kWh in 2021.³⁰³

The application of all the potential rate mitigation sources that Liberty included in its rates and potential mitigation analysis to reduce Hydro's revenue requirements in 2021 would reduce the costs to be recovered from Hydro's customers by approximately \$185 million, with reductions increasing to approximately \$565 million by 2030. The figure below shows Hydro's forecast revenue requirements to 2030 to be recovered from Island Interconnected customers along with the impact on reducing this revenue requirement if the mitigation measures included in Liberty's overall analysis are implemented.³⁰⁴

²⁹⁸ Newfoundland Power Final Submission, pages 5-6.

²⁹⁹ Consumer Advocate Final Submission, page 2.

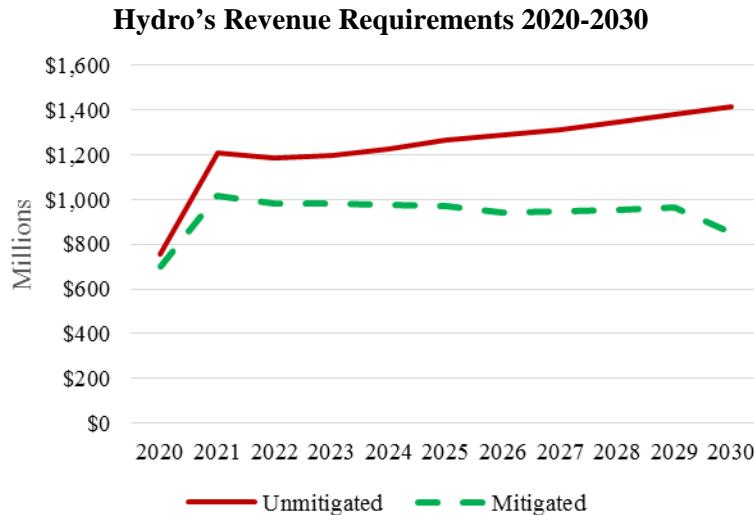
³⁰⁰ Transcript, October 4, 2019, page 128/13-15 – John Antonuk, Liberty.

³⁰¹ Industrial Customer Group Final Submission, page 3/2-107.

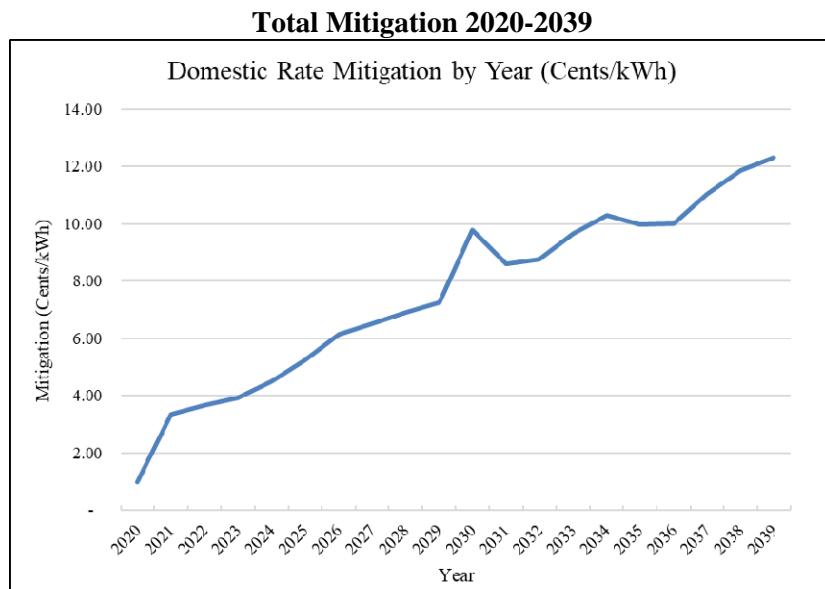
³⁰² PUB-Nalcor-031; PUB-Nalcor-056; PUB-Nalcor-079. Impact is pre HST. In its 2017 General Rate Application Hydro used a range of approximately \$60 million to \$70 million as the mitigation needed to reduce domestic rates by 1 cent per kWh. This would result in a range of \$563 million to \$657 million needed in 2021. Mitigation would be shared among all customers on the Island Interconnected system based on cost of service and is not a direct subsidy to domestic customers only.

³⁰³ The average current domestic rate is 13.06 cents/kWh.

³⁰⁴ Liberty Report, Figure I.4, page 10.



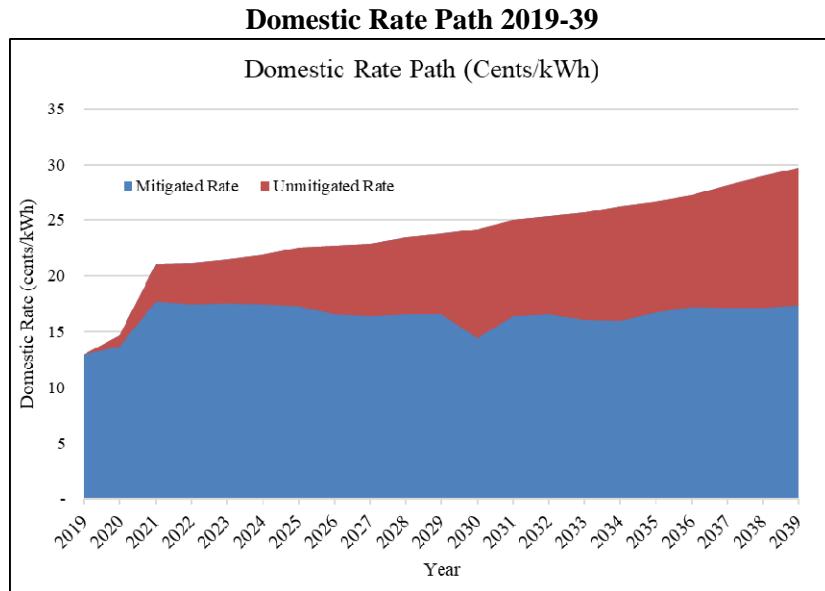
The figure below shows the corresponding reductions in average rates for domestic customers in cents/kwh.³⁰⁵



The figure below illustrates the forecast electricity rates for domestic customers without any mitigation applied and the rates with all mitigation opportunities included by Liberty applied.³⁰⁶

³⁰⁵ Liberty Report, Figure VII.14, page 100. The forecast 2021 domestic rate used by Liberty in the preparation of this Figure and others in this section was approximately 21 cents/kWh, which was the most recent forecast provided by Nalcor (based on an October 2018 long-term forecast) at the time of Liberty's analysis.

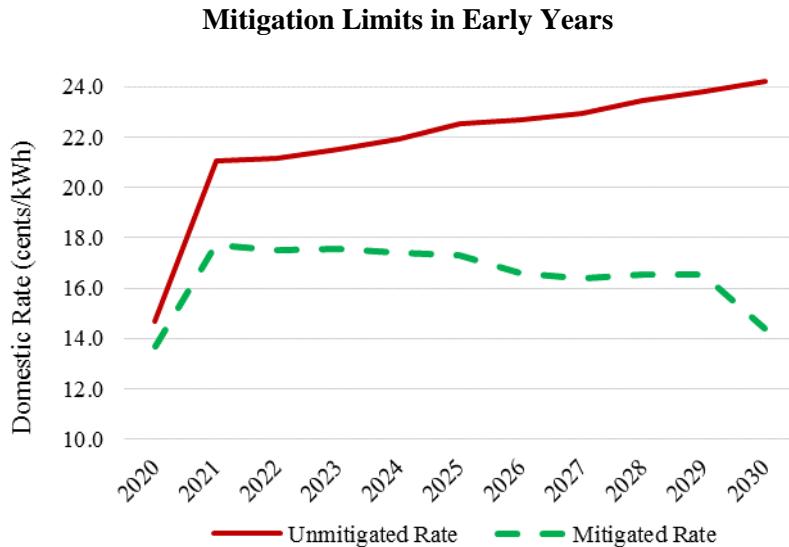
³⁰⁶ Liberty Report, Figure VII-15, page 100.



The above figure demonstrates that, even with the contribution of the significant financial and operational mitigation measures included in Liberty's analysis, there is still a significant gap in revenue to be recovered in customer rates. It should be noted that these figures do not reflect the other potential sources of mitigation identified by Liberty which could be used to reduce rates, including the reduction of Hydro's target equity component to 20% and the implementation of other efficiencies at Nalcor and Hydro.

The challenge with respect to the potential rate mitigation options that have been identified is that the magnitude of these options is lower in the early years when it is needed most to address Hydro's increased revenue requirement. As shown in the chart below the potential mitigation sources increase substantially over the period 2021-2039 and contribute to lower rates in the long-term. The financial sources, in particular, increase in magnitude over time with significantly lower potential contributions in the early years. At the same time in this early period the Muskrat Falls Project financing arrangements require significant payments. If these mitigation sources are applied as they arise it would produce an immediate increase in rates followed by a decrease which Liberty referred to as a "camel's hump," as illustrated in the following figure.³⁰⁷

³⁰⁷ Liberty Report, Figure I.3, page 9.



Liberty recommended considering the possibility of bringing forward mitigation sources earlier to produce a smoother rate path over time.³⁰⁸ While it is not shown in the figures above Liberty estimated that reducing Hydro's equity target to 20% would increase the mitigation potential in the early years. Implementing additional efficiencies at Nalcor and Hydro would also increase the mitigation potential over the study period but would not be significant in the first year since the measures will take some time to implement.

If Hydro's target equity is reduced to 20% and some additional efficiency and productivity measures are introduced the potential for rate mitigation increases from approximately \$185 million to approximately \$193 million in 2021. This will assist in mitigating rates to some degree but will not measurably change the amount of mitigation which would still be required in 2021 to mitigate rates. With a target rate of 13.50 cents/kWh the total estimated requirement would still be over \$400 million. Liberty analysis did not reflect a target domestic rate of 13.5 cents/kWh. As shown above the mitigation measures included in Liberty's analysis would result in the reduction of the forecast 2021 domestic rate to approximately 18 cents/kWh and a revenue requirement reduction of approximately \$200 million.

16.3 Industrial Rate Impacts and Competitiveness

The Industrial Customer Group expressed concern about the impact that unmitigated rate increases will have on their operations. InterGroup explained that industrial customers must have a long-term perspective, given their investments have a long-term nature and that they are required to purchase power from Hydro. This has led to concerns related to long-term stability and predictability of rates in the Province. InterGroup provided information on current industrial rates charged in various Canadian and American cities which showed that the current rate for Industrial customers in the Province is among the lowest in Canada and the United States. However, the projected unmitigated 2021 rate would be higher than any 2019 Canadian rate and among the highest in the United States.³⁰⁹

³⁰⁸ Liberty Report, page 2, Transcript, October 3, 2019, page 97/21 to page 98/13 – John Antonuk, Liberty.

³⁰⁹ Exhibit 1; Transcript October 17, page 4/24 to page 5/8; page 7/2 to page 8/5.

The impact of higher system costs and increasing rates on the continued viability of existing industrial customers was raised by the Industrial Customer Group. InterGroup expressed concern that Synapse had failed to appropriately address industrial competitiveness factors and to specifically address elasticity impacts on usage patterns of industrial customers.³¹⁰ The Industrial Customer Group referred to Synapse's suggestion that measures to ensure stability of industrial rates and promote industrial load retention should not be implemented unless there is a demonstrated and verified risk that load would depart the system, stating:

Synapse's view does not reflect the multi-factorial and time-sensitive nature of economic decisions by industry which must compete, and react to changes, on a world stage; we would suggest that is likely that the pernicious effects of the Island becoming a high industrial rate jurisdiction will not be able to be countered if government waits for a "demonstrated and verified risk" that industrial load will depart the system.³¹¹

According to the Industrial Customer Group Synapse's conclusion that load retention rates should not be implemented unless it has been demonstrated that there is a verified risk that the load would depart from the system may not be appropriate and further that Synapse's view does not reflect the various factors and time sensitive nature of industrial operations. The Industrial Customer Group submitted that the competitiveness of the island industrial sector requires further study.³¹² They suggested that the Board recommend that Government conduct a comprehensive review of industrial competitiveness in regard to load retention, competitiveness of energy-intensive firms and attraction of new loads.³¹³

16.4 Board Comments

Rates for all customers on the Island Interconnected system will increase significantly in 2021 when the costs of the Muskrat Falls Project are included in Hydro's revenue requirement to be recovered from customers. The anticipated rate increases are unprecedented. The average domestic customer rate is forecast to increase by 75% to 22.89 cents/kWh, with significant increases also forecast for other customers. If the average domestic rate is to be held to 13.5 cents/kWh as is the stated intention of Government the mitigation required to reduce rates by 9.39 cents/kWh to reach the target would be approximately \$620 million in 2021.

The impact of the Muskrat Falls Project costs on Island Industrial customer electricity rates will also be unprecedented and potentially impact the continued viability of existing industrial customers in the Province as rates will increase from among the lowest in the country to among the highest. These customers are large users of power and, as long as they continue to do so, they will contribute significantly to the recovery of the Muskrat Falls Project costs in future purchases of power.

The sources of mitigation summarized in Section 13 offer the potential to mitigate rates significantly. In 2021 the amount of mitigation which would flow from these sources, assuming Hydro's equity target is reduced to 20%, is estimated to be \$193 million, equating to approximately 3 cents/kWh. This would leave an estimated shortfall of \$400 million from the

³¹⁰ InterGroup Report, page 22; Transcript, October 17, pages 29-30 – Patrick Bowman, InterGroup.

³¹¹ Industrial Customer Group Final Submission, page 13/20 to page 14/4.

³¹² Industrial Customer Group Final Submission, page 14/9-10.

³¹³ InterGroup Report, page 23; Transcript, October 17, page 32.

13.5 cents/kWh target, or 6 cents/kWh to 7 cents/kWh. It is clear that this shortfall will not be closed by the identified mitigation sources. It is not clear whether the target rate of 13.5 cents/kWh will be maintained but even if it is escalated it would be a number of years before this gap will be closed. It is estimated that, in the absence of additional rate mitigation, the average domestic customer rate on the Island Interconnected system would be over 19 cents/kWh. If additional mitigation becomes available in 2021 as a result of the Province's engagement with the Government of Canada, this would further reduce this rate. For example, additional mitigation of \$200 million would reduce the average domestic rate to between 16 cents/kWh and 17 cents/kWh, close to the average of the other Atlantic provinces, but still higher than the target rate of 13.5 cents/kWh.

The most significant challenge will be finding a way to close this gap in the first few years when the costs of the Muskrat Falls Project are reflected in Hydro's revenue requirement but the magnitude of the available sources of mitigation is relatively small. Given the mismatch between when the potential rate mitigation is available and when it is most needed the key priority should be to identify those options that can have the most impact in the early years, including bringing forward some of the future value that the mitigation sources are expected to provide in later years. Considering the magnitude of the shortfall and given that the financial mitigation sources already require the redirection of significant Provincial revenues, it is clear that the outcome of the Province's ongoing engagement with the Government of Canada will be an important factor in mitigating rates in these early years. Other mitigation sources may also have to be considered depending on the level of contribution from the Government of Canada to address the significant gap in revenue available to meet the target of 13.5 cents/kWh.

PART SIX: CONCLUSIONS AND CONSIDERATIONS

The Board was directed to review and report to Government on three questions related to the Muskrat Falls Project: i) the options to reduce the impact on electricity rates, ii) the amount of energy and capacity available from the project, and iii) potential electricity rate impacts.

The analysis completed during this review demonstrates that, without rate mitigation, average domestic rates will increase by approximately 75% in 2021 to recover the full costs of the Muskrat Falls Project. The potential for electricity rates to almost double is without precedent in this Province and in regulatory practice in Canada and would have serious negative consequences for residents, businesses and industry. As stated by the Industrial Customer Group these extraordinary circumstances call for extraordinary measures.

It is hoped that the work completed in this review is of assistance to Government in identifying the issues to be addressed as well as the available options and the path forward. At the conclusion of this review the Board sets out its answers to the Reference Questions, other considerations to be addressed and the next steps which should be considered.

17.0 ANSWERS TO THE REFERENCE QUESTIONS

Question 1

The Board has reviewed the options to reduce the impact of the Muskrat Falls Project costs on electricity rates up to the year 2030. The available options include both cost savings and revenue opportunities identified in relation to operational synergies and efficiencies at Nalcor and Hydro, future operating and maintenance costs of the Muskrat Falls Project as well as existing financial sources and new sources of income from in-province load growth.

As a result of the work completed in this review the Board recommends that the following rate mitigation opportunities be considered by Government in the immediate term:

- Financial opportunities related to the returns and dividends from Muskrat Falls, Churchill Falls and Hydro, Nalcor's share of the export sales revenues, and the water power rentals in relation to Muskrat Falls, Churchill Falls and Newfoundland Power
- Operational opportunities related to the re-integration of Power Supply and Hydro and the implementation of additional efficiency and productivity measures at Nalcor and Hydro and Muskrat Falls Project operating and maintenance costs

While it is not possible at this stage to quantify with any degree of certainty the annual cost savings and revenues associated with these rate mitigation opportunities, the table below sets out the Board's estimates of the mitigation potential associated with each of these options. These estimates should be taken to indicate the potential that may be available rather than the results of an exact quantification of the amount that will be realized.

Estimated Rate Mitigation Potential of Recommended Options

Opportunity	2021 (‘000)	2030 (‘000)
Financial		
Muskrat Falls Project dividends	\$90,400	\$414,100
CF(L) Co dividends	7,100	5,800
Hydro dividends @ 20% target equity	8,400	34,600
Nalcor's export sales revenue	41,000	46,100
Water power rentals	23,800	25,700
Total Financial Opportunities	\$170,700	\$526,300
Operational		
Re-integration and MFP O&M (Labour)	12,700	20,700
Additional productivity measures	2,000	20,000
MFP O&M not included in re-integration	7,300	7,300
Total Operational Opportunities	\$22,000	\$48,000
Total Mitigation Potential	\$192,700	\$574,300

Financial opportunities offer the largest source of potential rate mitigation but these sources would require the redirection of Government revenues from other uses. If these funds are applied to rate mitigation they would no longer be available for other Government priorities.

In contrast, the operational opportunities do not require the redirection of Government revenues but rather represent cost savings which would mitigate rates without impacting the funds that would be available to the Province for other uses. These opportunities offer the only true cost savings identified in the review. While there remains uncertainty as to the extent of the savings which will be realized, the combined mitigation potential of these operational opportunities is estimated to be in the range of \$22 million to \$48 million annually between 2021 and 2030. These amounts may appear small relative to other mitigation opportunities, but over time they will be significant. In addition these measures would lead to a more effective and efficient utility operation in the Province. The primary consideration in this regard would be to ensure that the operational changes are effectively managed so that steady-state operation of the Muskrat Falls Project is not impacted. These opportunities should be prioritized and the necessary work to implement the identified measures should begin immediately and be pursued with determined urgency.

In addition to the options set out above the opportunity to maximize revenues through electrification and the sale of excess energy was the only new revenue opportunity identified. While it was estimated that the associated mitigation potential would be in the range of \$40 million to \$70 million between 2025 and 2030, the revenue potential and timing of these revenues continue to be refined as part of the significant ongoing work in relation to electrification and conservation programming in the Province. At this stage it appears that it will be a number of years before these revenues will materialize and the mitigation potential is relatively small in the early years. Nevertheless given that this opportunity represents new revenues it is critical that the ongoing work continue expeditiously toward the development of a comprehensive approach which is appropriate for the Province in the circumstances.

Other mitigation opportunities were identified but not examined during the review, including the Provinces' revenues from oil and gas, the Provincial portion of the HST and the elimination of the Rural Deficit which would be an additional cost for Government if it is eliminated from rates.

Government would need to consider whether these are feasible options on top of the other financial and operational opportunities which have been recommended. Another significant potential source of rate mitigation which was identified early in this review relates to the Muskrat Falls Project financing. This opportunity was addressed in the Board's interim report but no further work has been done in this review based on the Province's subsequent announcement that it is in discussions with the Government of Canada on these matters.

Question 2

The Board has reviewed the amount of energy and capacity from the Muskrat Falls Project required to meet the Island Interconnected load and the remaining surplus energy and capacity available for other uses such as load growth and export.

The amounts available for load growth and export sales depend on the total forecast load requirements on the Island Interconnected system and the Labrador Interconnected system which in turn can be impacted by customers' response to electricity rate increases and electrification and conservation demand management initiatives. A base case load forecast scenario was used as the basis to determine the amount of energy and capacity available from the Muskrat Falls Project for load growth and export sales for the period 2020 to 2030. The results of the analysis for the available energy and capacity are both dependent on whether Recall is used to meet load on the Island or used for export.

The balance of energy available from the Muskrat Falls Project for load growth and export sales after the Island interconnected load and the commitments to Nova Scotia are met, is set out below.

Available Muskrat Falls Energy (GWh)			
	2021	2025	2030
Recall used for export	1,975	2,069	2,123
Recall used for IIS	3,447	3,487	3,522

The capacity requirements for the Island Interconnected system and the Labrador Interconnected system were also determined and used to calculate the available capacity from the Muskrat Falls Project for load growth and export sales. If Recall is used for export, the amount of capacity available from the Muskrat Falls Project for load growth and export ranges from 201 MW in 2022 to 196 MW in 2030 and if Recall is used for the Island Interconnected system the amounts available from the Muskrat Falls Project range from 307 MW in 2022 to 295 MW in 2030. However, due to transmission constraints that exist and the uncertainty surrounding the future capacity requirements in the Province, the amount of capacity that can be exported is relatively modest.

The Board was also asked to consider whether it is more advantageous to ratepayers to maximize domestic load or exports and, depending on the recommendation, provide options to increase domestic load or exports. It is clear based on the analysis completed during the review that it is more advantageous to increase domestic load given the current and forecast export prices. While increased electrification in the Province has the highest value mitigation opportunity, appropriate CDM initiatives must also be pursued to ensure that the potential impact of increased electrification on the peak load is mitigated and does not drive capital investments for additional capacity. Rate design alternatives are also important considerations in determining the

appropriate targets for electrification and CDM programs. It was also clear during the review that more detailed analysis is required on provincial requirements before appropriate programs can be developed. It is premature at this time for the Board to make recommendations on specific initiatives to enhance electrification or CDM programs until this further analysis is completed.

Question 3

The Board has reviewed the potential electricity rate impacts of the options identified in Question 1.

When the Muskrat Falls Project was sanctioned in December 2012 the average domestic customer rate on the Island Interconnected system was projected to be 15.1 cents/kWh in 2021. In June 2017 this forecast rate had risen to 22.89 cents/kWh, an increase of approximately 75% from the current average domestic rate of 13.06 cents/kWh. An increase of this magnitude is well above the 10% threshold normally considered to cause “rate shock.” Even if all of the recommended sources of mitigation identified during the review are applied it is estimated that this rate increase would still be over 50% and the average domestic rate would be approximately 20 cents/kWh in 2021.

During the course of this review Government announced its intention to keep rates at or below 13.5 cents/kWh in 2021. This would require mitigation of over \$600 million. Applying the mitigation sources recommended by the Board would still leave a gap of over \$400 million in 2021. It is not clear whether the target rate of 13.5 cents/kWh will be maintained in subsequent years or will escalate over the period to 2030. It is clear however that, even with the application of all identified rate mitigation opportunities, the rates would remain well above 13.5 cents/kWh for a number of years.

To close this substantial gap it would be necessary to apply additional sources of mitigation. Based on the information provided, the primary additional source of mitigation relates to Muskrat Falls Project financing. This opportunity was addressed in the Board’s interim report but was not subsequently examined on the basis of Province’s announcement that it was in negotiations with the Government of Canada. Assuming that the available additional mitigation associated with this opportunity is approximately \$200 million, it is estimated this would reduce rates by approximately 3 cents/kWh to between 16 cents/kWh and 17 cents/kWh. This would still leave a gap of approximately \$200 million.

Before concluding this discussion of rates it is important to note that it is not only the domestic customers on the Island Interconnected system that will experience large rate increases with the commissioning of the Muskrat Falls Project. The rates for Island Industrial customers will also increase significantly. While the amount of the increase and the mitigation of these rates were not modelled in the review, the anticipated rate increase is expected to bring the rates for these customers from among the lowest rates in Canada to among the highest. These customers are highly sensitive to the long-term stability and predictability of rates and have concerns in relation to the impact of these rate increases on their continued viability in the Province. In addition other customers on Hydro’s isolated systems on the island and in Labrador will be impacted since rate increases on the Island Interconnected system flow to these customers as a result of long-standing Government policy related to rural electricity rates in the Province. The impacts on these customers would vary depending on class and location but, for some, the impact may be significant.

18.0 OTHER CONSIDERATIONS

As requested in the Reference the Board also considered industry best practices related to external market purchases and sales of electricity. Based on the information provided in the review the Board recommends that Government consider; i) structural changes at Nalcor so that NEM takes direction from Hydro, ii) the implementation of regulatory oversight of NEM, and iii) the allocation of Nalcor's profits on export sales consistent with regulatory practice.

During this review it became apparent that established Government policy in relation to utility regulation and electricity rates will have a bearing on the implementation of rate mitigation. The power policy of the Province requires "least-cost reliable service." To ensure compliance with this policy in the context of the transformative changes associated with the commissioning of the Muskrat Falls Project, the Board recommends that Government consider its options with respect to the implementation of independent oversight of the Muskrat Falls Project sustaining capital and operating and maintenance costs and whether Hydro's return on equity and capital structure should be subject to the regulation of the Board. In addition Government will need to reconsider its policy in relation to rural rates in the Province, specifically with respect to how these rates should be set, whether these rates should be subsidized and, if so, who should pay the subsidy.

19.0 NEXT STEPS

As Government develops its rate mitigation plan it will be necessary to determine the extent of the mitigation that is to be applied. As of the writing of this report the current average domestic rate is 13.06 cents/kWh and the suggested target mitigated rate for 2021 is 13.5 cents/kWh. How this target rate is to change in the subsequent years will be have to be assessed in the context of the available sources of mitigation. It should also be noted that there are a number of factors that may significantly influence the revenue requirements to be recovered, including the schedule and cost estimates for the Muskrat Falls Project, the timing of the transition of the Holyrood Plant, the findings in the Board's ongoing Reliability and Resource Adequacy review and the normal upward pressure on rates associated with ongoing utility capital and operational needs.

In determining the manner in which rate mitigation is to be accomplished each of the potential sources of rate mitigation must be evaluated and prioritized bearing in mind Government priorities, existing Government policy and the barriers and constraints associated with each. One of the most significant considerations for Government will be the impact on the Province's financial position. The feasibility of some of the rate mitigation opportunities can only be fully assessed by Government taking into account how the implementation of the opportunities will affect its fiscal position. In addition it will be necessary to assess how each of the identified sources are to be used to accomplish rate mitigation. Revenues and savings may be used to lower utility costs which would flow through to rates, or a subsidy or rebate may be applied. Determinations as to how the identified rate mitigation sources are applied may raise a number of other issues including the Muskrat Falls Project contractual and regulatory framework, and technical and accounting issues. One additional important consideration relates to the transparency of the rate mitigation measures and how they will be communicated to customers and other stakeholders. Government may also wish to consider other measures which may not reduce rates but which may impact overall customer electricity costs, for example rebating the provincial portion of the HST.

The commissioning of the Muskrat Falls Project will have far reaching economic consequences for the Province and there are no easy solutions to address the associated impacts on electricity rates. It is clear at the end of this review that the identified rate mitigation opportunities are not sufficient to close the substantial gap between current rates and the estimated cost when the project is commissioned. If the target rate of 13.5 cents/kWh is to be achieved it is critical that the Province reach an agreement in the ongoing engagement with the Government of Canada. Even with an agreement it will likely be necessary to consider using revenues from other Government sources, if the target rate is to be achieved.

A structured approach and focused rate mitigation plan will be essential to meeting the challenges facing the Province with the commissioning of the Muskrat Falls Project. Considering the imminent dramatic rate increases and the extent of work that is required to mitigate these increases there is a very short period of time to effect a rate mitigation plan before the anticipated rate increases, which are now less than a year away. The Muskrat Falls Project is scheduled to be in-service in the last quarter of 2020, with customers' electricity rates forecast to increase by approximately 75% in 2021. As stated by the Consumer Advocate rate mitigation requires immediate attention if ratepayers are to receive the benefits prior to the commissioning of the Muskrat Falls Project. Timely and effective rate mitigation will require that Government adopt a work plan which reflects the urgency of the circumstances. The Board recommends that Government consider the following schedule in developing its rate mitigation work plan.

To be completed in 1 to 3 months

- (1) The Province's ongoing engagement with the Government of Canada in relation to the Muskrat Falls Project financing must be a first priority as the outcome of these discussions will be a critical determinant in the Government's rate mitigation plan.
- (2) Pursue operational opportunities related to re-integration of Power Supply and Hydro, additional efficiency and productivity measures at Nalcor and Hydro, and reductions in the Muskrat Falls Project operating and maintenance costs. The Province may wish to give direction to Nalcor to develop a plan in relation to the operational opportunities and to immediately begin work, especially as it relates to the elimination of duplication at the executive level.
- (3) Assess and decide whether the equity component in Hydro's capital structure can be reduced to effect critical early period savings.
- (4) Consider the recommended mitigation opportunities as well as other available options and the potential impacts on the Province's finances as well as the requirements with respect to current Government policy.
- (5) Consider issues related to the rate impacts for Hydro's Island Industrial customers.
- (6) Consider best practices in relation to external market purchases and sales of electricity and whether the reporting structure for Nalcor Energy Marketing should be changed, whether there should be oversight of Nalcor Energy Marketing and whether the revenues associated with Nalcor's profits on export sales should be used to offset revenue requirements.
- (7) Review of Government policy in relation to electricity rates and utility regulation, including the level of oversight of future Muskrat Falls Project operating and maintenance costs and how Hydro's capital structure and allowed return on equity are to be established.

To be completed in 3 to 6 months

- (1) Develop a rate mitigation plan which considers Government's priorities, the Province's fiscal position and legislative and policy requirements, including the Muskrat Falls Project financing arrangements. This plan should clearly lay out the target for mitigated rates in the next several years and how this target will be achieved, including the legislative and other work which will be required.
- (2) Continue ongoing work in relation to electrification potential, conservation demand management and the role of rate design in supporting appropriate electrification and conservation demand programs designed for the provincial environment with coordination by Government to ensure that the framework is developed on a timely basis and that it represents a comprehensive approach to best meet provincial needs.

To be completed in six months to a year

- (1) Co-ordination of the development of a comprehensive electrification potential plan including electrification and conservation demand management programs to be finalized by the utilities and submitted to the Board in 2021.
- (2) The rate mitigation plan and the various policy issues should be reflected in Hydro's general rate application, now scheduled to be filed in September, 2020, to recover the costs of the Muskrat Falls Project.

**Reference Questions to the
Board of Commissioners of Public Utilities
Rate Mitigation Options and Impacts**

The June 23, 2017 update on the Muskrat Falls Project by Nalcor Energy indicates the capital cost and during-construction financing costs of the Muskrat Falls Project have risen to \$12.7 billion, which is more than double the estimated costs submitted to the Board of Commissioners of Public Utilities (the “**Board**”) in the 2011 reference question, when the Board was asked to compare the Muskrat Falls Project and an isolated-island alternative. The obligations under the Federal Loan Guarantee, dated November 30, 2012, place the financial burden of the Muskrat Falls Project on Newfoundland and Labrador ratepayers. As a result, the June 23, 2017 update forecasts that, without taking mitigating actions, rates for domestic customers on the Island of Newfoundland will increase to 22.89 cents per kilowatt hour in 2021, and related increases are expected for other Island rate classes. This rate increase is primarily attributable to the impact of cost recovery required for the Muskrat Falls Generating Station, Labrador Transmission Assets, and the Labrador Island Link projects, collectively known as the Muskrat Falls Project (the “**MFP**”), which was exempted from oversight by the Board on November 29, 2013.

Government’s position is that the projected rate increases associated with Muskrat Falls Project costs are not acceptable. Without intervention, these projected rate increases would likely cause financial hardships for customers in all rate classes on the island portion of Newfoundland and Labrador (“**Ratepayers**”). With the assistance of the Board, the Government of Newfoundland and Labrador wishes to examine options to reduce the impact of the Muskrat Falls Project on rates.

To assist with Government’s approach to this issue, pursuant to section 5 of the *Electrical Power Control Act, 1994*, the Government of Newfoundland and Labrador hereby refers the following matter to the Board:

The Reference Questions

The Board shall review and report to the Minister of Natural Resources on:

- 1) Options to reduce the impact of MFP costs on electricity rates up to the year 2030, or such shorter period as the Board sees fit, including cost savings and revenue opportunities with respect to electricity, including generation, transmission, distribution, sales, and marketing assets and activities of Nalcor Energy and its Subsidiaries, including NLH, Labrador Island Link Holding Corporation, LIL General Partner Corporation, LIL Operating Corporation, Lower Churchill Management Corporation, Muskrat Falls Corporation, Labrador Transmission Corporation, Nalcor Energy Marketing Corporation, and the Gull Island Power Company (together the “**Subsidiaries**”, and collectively with Nalcor Energy, (“**Nalcor**”));
- 2) The amount of energy and capacity from the MFP required to meet Island interconnected load and the remaining surplus energy and capacity available for other uses such as export and load growth; and
- 3) The potential electricity rate impacts of the options identified in Question 1, based on the most recent MFP cost estimates.

These questions are the “**Reference Questions**”. In answering the Reference Questions, the Board shall consider the power policy of the province, as set out in the *Electrical Power Control Act, 1994*, and the following:

- new and existing sources of Nalcor income that could be put towards reducing rate increases, including income from:
 - Nalcor power exports, including those from generation assets it owns or controls, the MFP, and Churchill Falls recapture power, taking into account any export-related costs such as those relating to Nalcor Energy Marketing; and
 - any other effective opportunities to find synergies, efficiencies and reduce duplication and costs within Nalcor and its subsidiaries.
- whether it is more advantageous to Ratepayers to maximize domestic load or maximize exports. Depending on the Board’s recommendation, provide options for:
 - increasing domestic load, such as:
 - The electrification of industrial facilities and oil-fueled boilers in heating plants; and
 - Incentives for increased electrification and usage by NL ratepayers, including increasing number of ratepayers, electric vehicles and electric heating; or
 - increasing exports, such as:
 - Incentives for energy conservation, including for lowering system peak demand to maximize system capacity reserves, in order to increase availability of energy and capacity for export.
- forward-looking cost savings and opportunities for increased efficiency related to operating and maintenance of MFP.
- what are industry best practices related to external market purchases and sales of electricity.

On November 20, 2017, the Government of Newfoundland and Labrador issued the *Commission of Inquiry Respecting the Muskrat Falls Project Order* under the *Public Inquiries Act, 2006*. As part of its mandate, the Commission of Inquiry is required to examine the sanction and execution of the MFP. Therefore, to avoid duplicating the work of the Commission of Inquiry, the Board shall not review MFP construction costs in answering the Reference Questions.

Where the Board determines that information required by the Board for this review is commercially sensitive information, as defined in the *Energy Corporation Act*, and the Board also determines that the release of such information would significantly harm the competitive position of, interfere significantly with the negotiating position of, or result in financial harm to Nalcor or a third party, the Board and its experts and consultants may use such information for this review but shall not release such information to any party.

For the purposes of this review, a consumer advocate shall be appointed pursuant to section 117 of the *Public Utilities Act*.

Any costs of the Board in respect of this review, shall be paid by Nalcor Energy, and shall not be considered MFP costs.

The Board shall provide an interim report to the Minister of Natural Resources by February 15, 2019. The interim report shall include the Board's preliminary findings from Questions 1 and 2 with respect to reasonably-anticipated cost savings, and reasonable-anticipated revenue from surplus energy and capacity.

The Board's final report shall be provided to the Minister of Natural Resources by January 31, 2020.

The Minister shall make the reports public.

**RATE MITIGATION OPTIONS AND IMPACTS REFERENCE
PARTIES**

Organization	Counsel
Nalcor Energy	Gregory J. Connors McInnes Cooper David Eaton, Q.C McInnes Cooper
Newfoundland and Labrador Hydro	Geoff Young, Q.C.
Newfoundland Power Inc.	Kelly Hopkins Liam O'Brian Curtis Dawe
Consumer Advocate	Dennis Browne, Q.C.
Island Industrial Customer Group	Paul Coxworthy Stewart McKelvey Stirling Scales Denis Fleming Cox & Palmer Dean Porter Poole Althouse
Labrador Interconnected Customer Group*	Senwung Luk Olthuis Kleer Townshend LLP

*Limited Standing

RATE MITIGATION OPTIONS AND IMPACTS REFERENCE
PRESENTERS

Date	Organization
October 3 & 4, 2019	The Liberty Consulting Group - Panel John Antonuk Brian Daschbach Kevin Cellars Dr. James Letzelter Randall Vickroy
Week of October 7, 2019	
October 7, 2019	Synapse Energy Economics, Inc. - Panel Robert Fagan Dr. Asa Hopkins Melissa Whited
October 8, 2019	Nalcor Energy and Newfoundland and Labrador Hydro Stan Marshall, President & CEO, Nalcor
October 8 & 9, 2019	Nalcor Energy and Newfoundland and Labrador Hydro Power Advisory LLC Panel, John Dalton and Michael Killeavy
October 9, 10 & 11, 2019	Nalcor Energy and Newfoundland and Labrador Hydro - Panel 1 Jim Haynes, Executive Vice President, Nalcor Jennifer Williams, President, Newfoundland and Labrador Hydro Michael Roberts, Senior Vice President Corporate Services & CHRO, Nalcor Greg Jones, Director, Nalcor Energy Marketing, Nalcor
October 11, 2019	Nalcor Energy and Newfoundland and Labrador Hydro - Panel 2 Jim Meaney, Vice President, Finance, Power Supply, Nalcor Lisa Hutchens, Vice President, Financial Services, Newfoundland and Labrador Hydro Auburn Warren, General Manager (Financial Planning, Treasury & Risk Management), Nalcor
Week of October 15, 2019	
October 15, 2019	Newfoundland Power - Panel Peter Alteen, Q. C., President & CEO Byron Chubbs, Vice-President, Energy Supply and Planning Krista Langthorne, Manager, Energy Conservation
October 17, 2019	Island Industrial Customer Group InterGroup Consultants Ltd., Patrick Bowman
October 18, 2019	Public Presentations Overton Colbourne, P.Eng. - Private Citizen Jabez Lane and Duane Warren - International Brotherhood of Electrical Workers, Local 1615 Andy Wells - Private Citizen Vaughn Hammond - Canadian Federation of Independent Business Jon Seary and Joe Butler - Drive Electric NL William Brown – Private Citizen

**RATE MITIGATION OPTIONS AND IMPACTS REFERENCE
PUBLIC COMMENTS / SUBMISSIONS RECEIVED**

*Name / Organization	Date Received
AS	January 3, 2019
BP	January 3, 2019
CR	January 3, 2019
PG	January 3, 2019
JM	January 8, 2019
SB	January 8, 2019
Wilfred Bartlett	January 10, 2019
RHE	January 17, 2019
Drive Electric NL	January 18, 2020
International Brotherhood of Electrical Workers Local 1615	January 18, 2020
Canadian Federation of Independent Business	January 18, 2020
RBB	January 22 & March 20, 2019
JB	September 10, 2019
SB	September 10, 2019
JP	September 10, 2019
MS	September 10, 2019
MW	September 10, 2019
TS	September 10 & 16, 2019
RG	September 19, 2019
CL	September 30, 2019
DB	October 3, 2019
LB	October 14, 2019
William Brown	October 25, 2019
Winston Adams	October 25, 2019
Brendan Haley, Efficiency Canada	October 25, 2019
WS	October 26, 2019
Jabez Lane & Duane Warren, IBEW, Local 1615	October 28, 2019
Andy Wells	October 29, 2019
Newfoundland Labrador Forest Industry Association	November 7, 2019

*Note: Initials used to protect confidentiality of personal information.

RATE MITIGATION OPTIONS AND IMPACTS REFERENCE

PARTY SUBMISSIONS RECEIVED

Organization	Date Received
Labrador Interconnected Customers	January 18, 2019 and October 31, 2019
Newfoundland Power Inc.	January 18, 2019 and November 1, 2019
Island Industrial Customers	January 18, 209 and November 4, 2019
Consumer Advocate	January 18, 2019 and November 1, 2019
Nalcor and Newfoundland and Labrador Hydro	January 9, 2019 and November 1, 2019

Estimated Rate Mitigation Potential			
Opportunity	2021 ('000)	2025 ('000)	2030 ('000)
Returns and Dividends			
Muskrat Falls Project ¹	\$90,400	\$182,400	\$414,100
CF(L)Co ²	7,100	6,200	5,800
Hydro @ 25% equity target ³	0	13,300	43,400
Increase (decrease) Hydro @ 20% equity target ⁴	8,400	11,400	(8,800)
Nalcor's Allocation of Export Sales ⁵	41,000	38,600	46,100
Water Power Rentals			
Muskrat Falls Project ⁶	16,000	17,000	19,000
CF(L)Co ⁷	6,800	6,300	5,700
Newfoundland Power ⁸	1,000	1,000	1,000
Total Financial Opportunities (Hydro at 25% target)	\$162,300	\$264,800	\$535,100
Total Financial Opportunities (Hydro at 20% target)	\$170,700	\$276,200	\$526,300
Re-integration and MFP O&M (Labour) ⁹	12,700	20,700	20,700
MFP O&M - Not included in re-integration ¹⁰	7,300	7,300	7,300
Other efficiency initiatives – Nalcor/Hydro ¹¹	2,000	20,000	20,000
Total Operational Opportunities	\$22,000	\$48,000	\$48,000
Total Mitigation Potential (Hydro at 25% target)	\$184,300	\$312,800	\$583,100
Total Mitigation Potential (Hydro at 20% target)	\$192,700	\$324,200	\$574,300

¹ PUB-Nalcor-030, page 3

² PUB-Nalcor-144, Attachment 1, page 9

³ PUB-Nalcor-255, Attachment 1, page 1

⁴ PUB-Nalcor-255, Attachment 1, page 2

⁵ PUB-Nalcor-034, page 1

⁶ PUB-Nalcor-263, Attachment 1, page 1

⁷ PUB-Nalcor-144, Attachment 1, page 1

⁸ Transcript, October 15, 2019, page 100/11-25

⁹ 2021 - Liberty Report, page 63

2025 - assuming MFP reaches steady state

 \$17.6 million Liberty Report, page 62

\$3.1 million Liberty Report, page 84

\$20.7 million Liberty Report, page 62

2030 - assuming savings similar to 2025

These savings do not factor in any one-time transition costs that may be required to achieve the reduction in FTEs.

¹⁰ MFP O&M

2021 - \$11.8 million, Liberty Report, page 84

 (\$3.1 million) Operations related FTE reductions is included in note 9

 (\$1.4 million) Corporate Support & Engineering Services included in Re-integration, Liberty Report, page 89

\$7.3 million

¹¹ Other efficiency initiatives

2021 - \$2.0 million Hydro efficiencies assuming achieved in 2021, Liberty Report, page 45

2025 - \$2.0 million Hydro Efficiencies

\$18.0 million Nalcor/Hydro efficiencies-assumed steady state

\$20.0 million, Liberty Report, page 7

2030 - assuming savings similar to 2025

Newfoundland & Labrador

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