



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

E-mail: rfagan@synapse-energy.com

2018-09-27

Robert Fagan
Vice President
Synapse Energy Economics, Inc.
485 Massachusetts Ave., Suite 2
Cambridge, MA 02139

Dear Mr. Fagan:

RE: Engagement Agreement: Rate Mitigation Options and Impacts Reference - Retention of Synapse Energy Economics, Inc. as an Expert Consultant

We are writing to confirm the retention of Synapse Energy Economics, Inc. ("Synapse") as an expert consultant in the Reference from the Lieutenant-Governor in Council to the Board of Commissioners of Newfoundland and Labrador (the "Board") to review and report on options to reduce the impact of the Muskrat Falls Project (defined later) on electricity rates up to the year 2030 or such shorter period as the Board sees fit. A copy of the Reference Questions is attached.

The areas Synapse are to review and report on include the amount of energy and capacity available from the Muskrat Falls Project to meet load on the Island interconnected system, the remaining amount available for export and future load growth, the potential for energy efficiency alternatives and their impact on the load forecast, the potential for electrification potential and their impact on the load forecast, the analysis of export market opportunities, the impact of increasing prices on electricity demand, and rate design and mitigation options. The scope of the services to be provided and the terms governing the provision of these services are set out below.

1. Definition of Terms

Muskrat Falls Project shall include the Muskrat Falls Generating Station, Labrador Transmission Assets, and the Labrador Island Link projects, collectively known as the Muskrat Falls Project.

Services shall mean the services to be provided as stated in Section 3 hereof.

2. Independence and Conflicts of Interest

Synapse confirms that they are not now performing services in conflict with the scope of services required for this engagement nor have they been in the past. Synapse further confirms that they have never performed any services for Nalcor Energy Corporation or any of its

subsidiaries or affiliated companies (“Nalcor”), the Government of Newfoundland and Labrador and Newfoundland Power Inc.

3. Scope of Services

Synapse will perform the following services:

Load forecasting - Review and evaluation of Nalcor’s short and long-term load forecast. In doing so Synapse will consider the implications for the load forecast of potential reductions in load arising from energy efficiency and conservation programs, and increased load demands due to electrification potential and the effect of increasing prices on electricity demand.

Export markets - Evaluate the potential for revenue optimization from the sale of surplus energy and capacity in export markets.

Rate Design - Evaluation of alternative rate design or cost recovery structures that will minimize rate increase required to recover the cost of the Muskrat Falls Project.

Preparation of interim and final reports - The Board is required to provide an interim report to Government by February 15, 2019 on Questions 1 and 2 in the Reference and a final report by January 2020. Synapse will provide an interim report by December 31, 2018 for consideration in the Board’s interim report and a final report in the early Fall of 2019, with the specific date to be determined later.

Expert Witness Evidence - Provision of expert evidence at hearings and/or technical conferences as determined by the Board.

It is anticipated that services will be provided in two phases. In carrying out its services Synapse shall do the following:

Phase 1 - Responses to Reference Questions 1 and 2

Interim Report on Reasonably-Anticipated Cost Savings and Revenue from Surplus Energy and Capacity

- i) **Project management.** Manage the project to ensure efficient staff utilization on multiple analytical fronts, with expedited development of an interim report by December 31, 2018.
- ii) **Document review and discovery development as necessary.** Review of Board, Nalcor, and other related documents and question/information request development as required.
- iii) **Load forecasting.** Analyze Nalcor’s load forecast. This will include initial estimation of the effects of price elasticity on otherwise “reference” forecast patterns, reviewing and critiquing (as necessary) current load forecasts and estimating a reasonable reference forecast and reasonable upper and lower bounds to such a reference load forecast.
- iv) **Energy Efficiency Cost Savings.** Analyze energy efficiency alternatives, cost savings, and effects on the load forecast. Synapse will estimate cost-effective levels of energy efficiency savings to support increasing the amount of export energy (and potentially capacity) for revenue generation.

- v) **Electrification potential and rate effect.** Estimate the range of electrification that could be accomplished cost effectively over time, under different scenarios of cost, to allow for greater “absorption” of Muskrat Falls Project surplus energy.
- vi) **Export market valuation.** Evaluate the potential for revenues received for surplus energy and capacity from the export market. Preliminary estimation will use available price forecasts for regional valuation of energy and capacity.
- vii) **Synthesis.** Conduct an initial synthesis of load forecast, energy efficiency alternatives, electrification, and export market valuation analytics to serve as Synapse’s core preliminary findings in information related to Reference Questions 1 and 2.
- viii) **Draft Findings Report.** Develop findings into a draft preliminary report for submission to the Board’s staff and advisors by December 17, 2018, and finalize preliminary findings report by December 31, 2018.

Phase 2 - Potential Electricity Rate Impacts
Options to Reduce the Impacts of Muskrat Falls Project Costs on Ratepayers
Initial Task List

- ix) **Project Management and Document review.** The work in these areas in Phase 1 will continue in Phase 2.
- x) **Initial rate design review.** Develop and execute an analytical framework to address rate design options to help minimize rate shock.
- xi) **Production cost modeling for export market valuation.** Utilize a sophisticated production cost modeling tool to develop a range of export market valuation under different input assumption scenarios.
- xii) **Finalize load forecasting/elasticity effects.** Finalize execution of assessment of elasticity concerns for load forecasting. This will be based upon use of regression analysis to estimate short-term and long-term price elasticity of demand, and the effect on the load forecast.
- xiii) **Energy Efficiency Cost Savings.** Further develop/refine analysis of energy efficiency and, as appropriate, demand response potential and estimate related cost savings and the effect on surplus energy/capacity available for export.
- xiv) **Electrification.** Further develop and analyze electrification issues.
- xv) **Finalize rate design.** Finalize overall rate design analysis and assessment of rate mitigation approaches. This will include assessing options for deferring revenue collection, along with incorporation of analysis of the effects and costs of maximizing export market revenues for energy and capacity.
- xvi) **Final Report.** Develop a final report, in draft form and in finalized form at dates to be determined which are expected to be early Fall 2019.

xvii) **Expert Witness Appearance.** Appear as required at hearings and/or technical conferences.

Synapse will provide workplans to the Board for approval for the Services to be provided in each phase at dates to be mutually agreed.

4. Project Team

The project team shall include the following:

Robert Fagan, Vice-President, Project Manager for this engagement;
 Tim Woolf, Vice-President;
 Dr. David White, Principal Associate;
 Rachel Wilson, Senior Associate;
 Melissa Whited, Principal Associate;
 Dr. Asa Hopkins, Principal Associate;

and other support personnel as required.

Synapse shall not substitute or replace the named key personnel without the prior written consent of the Board.

5. Fees And Disbursements

The Board shall pay Synapse a total compensation consisting of payment for hours worked and disbursements. The hourly rates to be paid for the services performed are as set out below

Title	Hourly Rate (US\$)
Vice President	[REDACTED]
Principal Economist	[REDACTED]
Principal Associate	[REDACTED]
Senior Associate	[REDACTED]
Associate	[REDACTED]
Research Associate	[REDACTED]
Communications/Editorial	[REDACTED]

Synapse, upon request of the Board, shall provide a preliminary budget for the Services and regular forecast updates.

The Board will reimburse Synapse for all reasonable out-of-pocket expenses incurred by it in performing the Services, including but not limited to travel by the most economical means, accommodations, and other disbursements customary in engagements of this nature.

All invoices will be sent electronically to the Board and will contain a description of services, including the date, the person rendering the service, the amount of time involved, and a description of the task or activity. If applicable, any reimbursable expenses incurred will be included in the invoice.

Synapse will invoice the Board each calendar month for services provided during the preceding calendar month. Payment shall be due to Synapse within thirty (30) days after the Board receives an invoice from Synapse.

Synapse shall keep records and accounts showing all expenditures of whatever nature constituting reimbursable costs. Synapse records shall be kept in accordance with generally accepted accounting principles and practices consistently applied.

6. Change in Scope of Services

Any revisions with respect to the Services will be set forth in a written agreement executed by both the Board and Synapse (“Change Order”). If a Change Order recites revisions that materially increase the scope of the Services or the effort required to deliver the Services, then the Change Order will include the revised services, deliverables, delivery schedule, and payment schedule, as mutually agreed, and such will apply to the implementation of the revisions.

7. Termination

Either party may terminate the Services provided for in this Engagement Agreement upon thirty (30) days prior written notice to the other party. If this Engagement Agreement is terminated then the following will apply: (a) the parties will cooperate to effect an orderly, efficient, effective, and expeditious termination of the parties’ respective activities under the terminated Engagement Agreement; (b) the Board shall pay for services rendered prior to such termination; and (c) Synapse agrees to provide the Board with (i) all deliverables for which Synapse received payment and (ii) all property owned by the Board, whether tangible and intangible, in its possession and/or control and (iii) refund any and all payment(s) for Services it received in advance, for which Services were not performed.

8. Confidential Information

Synapse acknowledges and agrees that information and documents exchanged between them or received by Synapse from Nalcor, including project specifications and other information related to the development and performance of Synapse’s services may constitute valuable confidential or proprietary information. For purposes of this Engagement Agreement, “Confidential Information” shall mean any and all information, writings, drawings, designs, plan, research, data, models, proposals, passwords, log-in information, non-public database contents, which are not public domain and any information that a reasonable person would understand to be confidential or proprietary given the nature of the information and the circumstances of the disclosure. Synapse shall keep all Confidential Information confidential and shall not at any time either directly or indirectly use, divulge, disclose or communicate to any person, firm, or corporation, in any manner whatsoever, all or any portion of the Confidential Information. Synapse shall not be prevented from using or disclosing information which: (i) is known prior to its obtaining the same information from Nalcor or the Board; (ii) is, at the time of disclosure, already in the public domain, (iii) is required by law or any court proceeding; or (iv) is independently developed by Synapse without use of or reference to the Confidential Information obtained in carrying out the Services.

Synapse, its servants or agents must sign Confidentiality Agreements as required by the Board.

9. Ownership of Drawings and Property Acquired for the Services

All reports, drawings, calculations, work sheets, and like documents, including software and intellectual property, prepared or caused to be prepared by Synapse in connection with the Services shall become the property of the Board.

All information, procedures, processes, reports, data and like documents provided by the Board to Synapse shall remain the property of the Board and returned to the Board upon completion of the Services.

10. Compliance with Laws

Synapse shall use due diligence, skill and care to observe and abide by and keep itself fully informed of all applicable laws, rules and regulations of any country, state, province and municipality where the Services are performed and the laws, rules and regulations of authorities acting thereunder in connection with the performance of the Services. The Services performed by Synapse shall be in compliance with all applicable laws in effect or which may become effective prior to completion of this Engagement Agreement.

11. Notices

11.1 Any written notice provided for herein to be given to one party by the other party shall be deemed properly given and received if:

- (a) delivered by hand to the receiving party's designated representative; or
- (b) either:
 - (i) being mailed by prepaid registered mail; or
 - (ii) transmitted by electronic methods;

to the receiving party's address as either stated in this Section or as changed through written notice to the other party.

11.2 Any notice which is sent by prepaid registered mail or transmitted by electronic methods shall be deemed to be given and received forty-eight (48) hours after mailing or transmission, as applicable; provided that if such time expires on a Saturday, Sunday or legal holiday, the notice shall be deemed to be given and received on the next normal business day.

11.3 Addresses of parties are:

Board:

Newfoundland and Labrador Board of Commissioners of Public Utilities
120 Torbay Road, Suite E-210
Prince Charles Building
P.O. Box 21040
St. John's, NL A1A 5B2

Attention: Ms. Cheryl Blundon
Director of Corporate Services & Board Secretary
E-mail: ito@pub.nl.ca

Consultant:

Synapse Energy Economics
485 Massachusetts Ave., Suite 2
Cambridge, MA 02139

Attention: Mr. Bob Fagan
Vice President
E-mail: rfagan@synapse-energy.com

or to such other address as either of the parties shall designate by written notice given as herein required.

12. Assignment

Neither of the parties hereto shall assign this Engagement Agreement or any part thereof or any interest herein without the prior written approval of the other parties hereto, which approval shall not be unreasonably withheld.

13. Governing Law and Forum

This Engagement Agreement shall be governed by and construed in accordance with the laws of the Province of Newfoundland and Labrador and every action or other proceeding arising hereunder shall be determined exclusively by a court of competent jurisdiction in the Province of Newfoundland and Labrador, subject to the right of appeal up to the Supreme Court of Canada where such appeal lies.

14. Duty of Care

Synapse agrees to use reasonable care, skill, competence and judgement in the performance of the Services hereunder which are generally consistent with professional standards for individuals providing similar service at the same time, in the same locals, and under like circumstances.

15. No Waiver

None of the provisions of this Engagement Agreement shall be consider waived by Synapse or the Board except when such waiver is given in writing. No such waiver shall be or shall construed to be, a waiver of any past or future default, breach or modification of any of the terms, provisions, conditions or covenants of this Engagement Agreement expressly stipulated in such waiver.

16. Indemnity

In no event shall the Board be liable for any bodily injury, death or property damage to Synapse, its employees or agents or for any claim, demand or action by any third party against Synapse, its employees, servants, officers, directors, managers, shareholders, agents, successors or assigns arising out of or in any way related to this engagement and Synapse shall at all times indemnify, save and keep harmless the Board, its employees, servants, officers, directors, managers, shareholders, agents, successors or assign from and against all suits, judgments, claims, demands and losses (including, without limitations, reasonable legal expenses).


We look forward to working with you. Please indicate your acceptance of the terms of this Agreement by signing and returning a copy.

Sincerely,



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

The Services and terms as set out in this Engagement Agreement are acknowledged and agreed to:

DocuSigned by:

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Synapse Energy Economics, Inc.

10/4/2018 | 12:34 PM PDT

Date

**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 hardship 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.