newfoundland labrador
hydro
a nalcor energy company

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April 1, 2019

The Board of Commissioners of Public Utilities
Prince Charles Building
120 Torbay Road
St. John's, NL A1A 5B2

Attention: **Ms. Cheryl Blundon**
Director of Corporate Services & Board Secretary

Dear Ms. Blundon:

Re: Newfoundland and Labrador Hydro's 2018 Annual Return

Enclosed please find the original and eight copies of Hydro's annual return filed pursuant to section 59(2) of the *Public Utilities Act*.

Hydro will file the enclosed with the required Parties subsequent to its presentation in the House of Assembly of Newfoundland and Labrador.

Should you have any questions, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO

Shirley A. Walsh
Senior Legal Counsel, Regulatory
SAW/sk

2018 Annual Return

(Return 20 pursuant to Section 59(20) of the Public Utilities Act)

April 1, 2019

A Report to the Board of Commissioners of Public Utilities

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Return 1
Annual Audited Non-Consoliated Financial Statements

NEWFOUNDLAND AND LABRADOR HYDRO
NON-CONSOLIDATED FINANCIAL STATEMENTS
December 31, 2018

Deloitte LLP
5 Springdale Street
Suite 1000
St. John's NL A1E 0E4
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Independent Auditor's Report

To the Directors of Newfoundland and Labrador Hydro

Opinion
We have audited the non-consolidated financial statements of Newfoundland and Labrador Hydro (the "Company"), which comprise the non-consolidated statement of financial position as at December 31, 2018, and the non-consolidated statements of profit and comprehensive income, changes in equity and cash flows for the year then ended, and notes to the non-consolidated financial statements, including a summary of significant accounting policies (collectively referred to as the "financial statements").

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of the Company as at December 31, 2018, and the results of its financial performance and its cash flows for the year then ended in accordance with the financial reporting provisions of Section 59 of the Public Utilities Act.

Basis for Opinion
We conducted our audit in accordance with Canadian generally accepted auditing standards ("Canadian GAAS"). Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Statements* section of our report. We are independent of the Company in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Emphasis of Matter - Basis of Accounting
We draw attention to Note 2 to the financial statements, which describes the basis of accounting. The financial statements are prepared to assist the Company in complying with the financial reporting provisions of Section 59 of the Public Utilities Act. As a result, the financial statements may not be suitable for another purpose.

Emphasis of Matter – Restated Comparative Information
We draw attention to Note 4 to the financial statements, which explains that certain comparative information presented for December 31, 2017 has been restated due to the adoption of IFRS 9, Financial Instruments. Our opinion is not modified in respect to this matter.

Other Matter
As part of our audit of the financial statements for the year ended December 31, 2018, we audited the adjustments in Note 4 that were applied to restate certain comparative information presented for the year ended December 31, 2017 related to the adoption of IFRS 9.

Other Matter
Newfoundland and Labrador Hydro has prepared separate consolidated financial statements for the year ended December 31, 2018 in accordance with International Financial Reporting Standards on which we issued an unmodified auditor's report to the Lieutenant-Governor in Council, Province of Newfoundland and Labrador dated March 15, 2019.

Responsibilities of Management and Those Charged with Governance for the Financial Statements
Management is responsible for the preparation and fair presentation of the financial statements in accordance with the financial reporting provisions of Section 59 of the Public Utilities Act, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Company or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Company's financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements
Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian GAAS will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Canadian GAAS, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

Auditor's Responsibilities for the Audit of the Financial Statements (continued)

- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Deloitte LLP

Chartered Professional Accountants
March 15, 2019

NEWFOUNDLAND AND LABRADOR HYDRO
NON-CONSOLIDATED STATEMENT OF FINANCIAL POSITION

As at December 31 (millions of Canadian dollars)	Notes	**2018**	2017
			(Restated - Note 4.1, 30)
ASSETS			
Current assets			
Cash and cash equivalents	5	**-**	8
Trade and other receivables	6	**136**	138
Inventories	7	**94**	93
Prepayments		**6**	5
Deferred asset	8	**21**	31
Total current assets		**257**	275
Non-current assets			
Property, plant and equipment	9,30	**2,144**	2,080
Intangible assets	10	**6**	7
Other long-term assets	11	**164**	156
Investments in joint arrangements	12	**558**	532
Total assets		**3,129**	3,050
Regulatory deferrals	13	**159**	117
Total assets and regulatory deferrals		**3,288**	3,167
LIABILITIES AND EQUITY			
Current liabilities			
Short-term borrowings	15	**189**	369
Trade and other payables	14	**118**	163
Current portion of long-term debt	15	**7**	7
Current portion of deferred contributions	16	**1**	1
Derivative liability	8,24	**21**	31
Total current liabilities		**336**	571
Non-current liabilities			
Long-term debt	15	**1,784**	1,482
Deferred contributions	16,30	**18**	16
Decommissioning liabilities	17	**14**	14
Employee future benefits	18	**86**	90
Total liabilities		**2,238**	2,173
Shareholder’s equity			
Share capital	20	**23**	23
Contributed capital	20	**147**	146
Reserves		**(13)**	(22)
Retained earnings		**822**	768
Total equity		**979**	915
Total liabilities and equity		**3,217**	3,088
Regulatory deferrals	13	**71**	79
Total liabilities, equity and regulatory deferrals		**3,288**	3,167

Commitments and contingencies (Note 26)

See accompanying notes

On behalf of the Board

DIRECTOR

DIRECTOR

NEWFOUNDLAND AND LABRADOR HYDRO
NON-CONSOLIDATED STATEMENT OF PROFIT AND COMPREHENSIVE INCOME

For the year ended December 31 (millions of Canadian dollars)	Notes	**2018**	2017 (Restated - Note 4.1)
Energy sales		**598**	549
Other revenue		**27**	25
Revenue		**625**	574
Fuels		**189**	226
Power purchased		**111**	104
Operating costs	21	**136**	131
Transmission rental		**21**	20
Depreciation and amortization	9,10	**87**	78
Net finance expense	22	**86**	65
Other expense	23	**13**	6
Expenses		**643**	630
Loss for the year from operations		**(18)**	(56)
Share of profit of joint arrangement	12	**25**	26
Preferred dividends		**8**	7
Profit (loss) before regulatory adjustments		**15**	(23)
Regulatory adjustments	13	**(47)**	(92)
Profit for the year		**62**	69
Other comprehensive income			
Items that may or have been reclassified to profit or loss			
Regulatory adjustment		**-**	-
Actuarial gain (loss) on employee future benefits	18,19	**8**	(2)
Total items that may be reclassified subsequently to profit or loss		**8**	(2)
Items that will not be reclassified subsequently to profit or loss			
Share of other comprehensive gain (loss) for the year	19	**1**	(1)
Total items that will not be reclassified subsequently to profit or loss		**1**	(1)
Other comprehensive income (loss) for the year		**9**	(3)
Total comprehensive income for the year		**71**	66

See accompanying notes

NEWFOUNDLAND AND LABRADOR HYDRO
NON-CONSOLIDATED STATEMENT OF CHANGES IN EQUITY

(millions of Canadian dollars)	Notes	Share Capital	Contributed Capital	Employee Benefit Reserve	Retained Earnings	Total
Balance at January 1, 2018		**23**	**146**	**(22)**	**768**	**915**
Profit for the year		**-**	**-**	**-**	**62**	**62**
Actuarial gain on employee future benefits	**18**	**-**	**-**	**8**	**-**	**8**
Other comprehensive gain from investment in joint arrangement	**19**	**-**	**-**	**1**	**-**	**1**
Total comprehensive income for the year		**-**	**-**	**9**	**62**	**71**
Contributed capital	**20**		**2**	**-**	**-**	**2**
Regulatory adjustment	**20**		**(1)**	**-**	**-**	**(1)**
Dividends	**20**	**-**	**-**	**-**	**(8)**	**(8)**
Balance at December 31, 2018		**23**	**147**	**(13)**	**822**	**979**

					(Restated - Note 4.1)	
Balance at January 1, 2017		23	144	(19)	706	854
Profit for the year		-	-	-	69	69
Actuarial loss on employee future benefits	18	-	-	(2)	-	(2)
Other comprehensive loss from investment in joint arrangement	19	-	-	(1)	-	(1)
Total comprehensive income for the year		-	-	(3)	69	66
Contributed capital	20		3	-	-	3
Regulatory adjustment	20		(1)	-	-	(1)
Dividends	20	-	-	-	(7)	(7)
Balance at December 31, 2017		23	146	(22)	768	915

See accompanying notes

NEWFOUNDLAND AND LABRADOR HYDRO
NON-CONSOLIDATED STATEMENT OF CASH FLOWS

For the year ended December 31 (millions of Canadian dollars)	Notes	**2018**	2017
Operating activities			
Profit for the year		**62**	69
Adjustments to reconcile profit to cash provided from (used in) operating activities:			
Depreciation - property, plant and equipment	9	**85**	77
Amortization - intangible assets	10	**2**	1
Employee future benefits		**5**	3
Regulatory adjustments	13	**(47)**	(92)
Share of profit of joint arrangement	12	**(25)**	(26)
Finance income	22	**(12)**	(13)
Finance expense	22	**98**	78
Other		**4**	3
		172	100
Changes in non-cash working capital balances	28	**(20)**	(35)
Interest received		**1**	23
Interest paid		**(104)**	(95)
Net cash provided from (used in) operating activities		**49**	(7)
Investing activities			
Additions to property, plant and equipment		**(154)**	(329)
Additions to intangible assets	10	**(1)**	(1)
(Increase) decrease of sinking funds	11	**(7)**	68
Decrease in long-term receivables		**-**	1
Proceeds on disposal of property, plant and equipment		**-**	10
Changes in non-cash working capital balances	28	**(21)**	4
Net cash used in investing activities		**(183)**	(247)
Financing activities			
Proceeds from long-term debt		**316**	612
Retirement of long-term debt	15	**-**	(150)
Dividends paid	20	**(8)**	(7)
Decrease in short-term borrowings	15	**(180)**	(66)
Rate stabilization plan refund	13	**(3)**	(131)
Other		**1**	1
Net cash provided from financing activities		**126**	259
Net (decrease) increase in cash and cash equivalents		**(8)**	5
Cash and cash equivalents, beginning of year		**8**	3
Cash and cash equivalents, end of year		**-**	8

See accompanying notes

1. DESCRIPTION OF BUSINESS

Newfoundland and Labrador Hydro (Hydro or the Company) is incorporated under a special act of the Legislature of the Province of Newfoundland and Labrador (the Province). The principal activity of Hydro is the generation, transmission and sale of electricity. Hydro's operations include both regulated and non-regulated activities. Hydro is a 100% owned subsidiary of Nalcor Energy (Nalcor). Hydro's head office is located at 500 Columbus Drive in St. John's, Newfoundland and Labrador, A1B 0C9, Canada.

Hydro holds interests in the following entities:

A 65.8% interest in Churchill Falls (Labrador) Corporation Limited (Churchill Falls). Churchill Falls is incorporated under the laws of Canada and owns and operates a hydroelectric generating plant and related transmission facilities situated in Labrador which has a rated capacity of 5,428 megawatts (MW).

A 51.0% interest in Lower Churchill Development Corporation (LCDC), an inactive subsidiary. LCDC is incorporated under the laws of Newfoundland and Labrador and was established with the objective of developing all or part of the hydroelectric potential of the Lower Churchill River.

2. SIGNIFICANT ACCOUNTING POLICIES

2.1 Statement of Compliance and Basis of Measurement

These annual audited non-consolidated financial statements have been prepared in accordance with International Financial Reporting Standards (IFRS), as issued by the International Accounting Standards Board (IASB) with the exception of Hydro's investments in joint arrangements and related disclosures. These statements are non-consolidated as the investments in joint arrangements have been accounted for using the equity method of accounting, as described in Note 2.8. Consolidated statements for the same period have been prepared for presentation to the Lieutenant Governor in Council of the Province.

These annual audited non-consolidated financial statements have been prepared on a historical cost basis, except for financial instruments at fair value through profit or loss (FVTPL) which have been measured at fair value. The annual audited non-consolidated financial statements are presented in Canadian Dollars (CAD) and all values rounded to the nearest million, except when otherwise noted. The annual audited non-consolidated financial statements were approved by Hydro's Board of Directors (the Board) on March 1, 2019.

2.2 Cash and Cash Equivalents and Short-Term Investments

Cash and cash equivalents consist of amounts on deposit with Schedule 1 Canadian Chartered banks, as well as highly liquid investments with maturities of three months or less. Investments with maturities greater than three months and less than twelve months are classified as short-term investments. Cash and cash equivalents are measured at cost, which approximates fair value, while short-term investments are measured at fair value.

2.3 Inventories

Inventories are carried at the lower of cost and net realizable value. Cost is determined on a weighted average basis and includes expenditures incurred in acquiring the inventories and bringing them to their existing condition and location. Net realizable value represents the estimated selling price for inventories less all estimated costs of completion and costs necessary to make the sale.

2.4 Property, Plant and Equipment

Items of property, plant and equipment are recognized using the cost model and thus are recorded at cost less accumulated depreciation and accumulated impairment losses. Cost includes materials, labour, contracted services, professional fees and, for qualifying assets, borrowing costs capitalized in accordance with Hydro's accounting policy outlined in Note 2.6. Costs capitalized with the related asset include all those costs directly attributable to bringing the asset into operation. When significant parts of property, plant and equipment are required to be replaced at intervals, Hydro recognizes such parts as individual assets with specific useful lives and depreciation, respectively. Likewise, when a major inspection is performed, its cost is recognized in the carrying amount of the plant and equipment as a replacement if the recognition criteria are satisfied. All other repairs and maintenance costs are recognized in profit or loss as incurred. Property, plant and equipment is not revalued for financial reporting purposes. Depreciation of these assets commences when the assets are ready for their intended use. The estimated useful life and amortization method are reviewed periodically with the effect of any changes in estimate being accounted for on a prospective basis.

Depreciation is calculated on a straight-line basis over the estimated useful lives of the assets as follows:

Generation plant	
Hydroelectric	45 to 100 years
Thermal	35 to 65 years
Diesel	25 to 55 years
Transmission	
Lines	30 to 65 years
Terminal stations	40 to 55 years
Distribution system	30 to 55 years
Other assets	5 to 55 years

Hydroelectric generation plant includes the powerhouse, turbines, governors and generators, as well as water conveying and control structures, including dams, dikes, tailraces, penstocks and intake structures. Thermal generation plant is comprised of the powerhouse, turbines and generators, boilers, oil storage tanks, stacks, and auxiliary systems. Diesel generation plant includes the buildings, engines, generators, switchgear, fuel storage and transfer systems, dikes and liners and cooling systems.

Transmission lines include the support structures, foundations and insulators associated with lines at voltages of 230, 138 and 69 kilovolt (kV). Terminal station assets are used to step up voltages of electricity for transmission and to step down voltages for distribution. Distribution system assets include poles, transformers, insulators, and conductors.

Other assets include telecontrol, buildings, vehicles, furniture, tools and equipment.

2.5 Intangible Assets

Intangible assets that are expected to generate future economic benefit and are measurable, including computer software costs and studies, are capitalized as intangible assets in accordance with IAS 38.

Intangible assets with finite useful lives are carried at cost less accumulated amortization and accumulated impairment losses. The estimated useful life and amortization method are reviewed periodically with the effect of any changes in estimate being accounted for on a prospective basis. Intangible assets with indefinite useful lives are carried at cost less accumulated impairment losses.

Amortization is calculated on a straight-line basis over the estimated useful lives of the assets as follows:

Feasibility studies	5 to 20 years
Computer software	10 years

2.6 Borrowing Costs

Borrowing costs directly attributable to the acquisition, construction or production of qualifying assets, which are assets that take a substantial period of time to get ready for their intended use or sale, are added to the cost of those assets, until such time as the assets are substantially ready for their intended use or sale. Investment income earned on the temporary investment of specific borrowings pending their expenditure on qualifying assets is deducted from the borrowing costs eligible for capitalization. All other borrowing costs are recognized in profit or loss in the period in which they are incurred.

2.7 Impairment of Non-Financial Assets

At the end of each reporting period, Hydro reviews the carrying amounts of its non-financial assets, to determine whether there is any indication that those assets may be impaired. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of the impairment loss, if any.

Where it is not possible to estimate the recoverable amount of an individual asset, Hydro estimates the recoverable amount of the cash-generating unit (CGU) to which the asset belongs. Where a reasonable and consistent basis of allocation can be identified, corporate assets are also allocated to individual CGUs, or otherwise they are allocated to the smallest group of CGUs for which a reasonable and consistent allocation basis can be identified. The recoverable amount is the higher of fair value less costs to sell and value in use. In assessing value in use, the estimated future cash flows are discounted to their present value using a discount rate that reflects current market assessments of the time value of money and the risks specific to the asset for which the estimates of future cash flows have not been adjusted. Value in use is generally computed by reference to the present value of future cash flows expected to be derived from non-financial assets.

If the recoverable amount of an asset or CGU is estimated to be less than its carrying amount, the carrying amount of the asset or CGU is reduced to its recoverable amount. An impairment loss is recognized immediately in profit or loss.

2.8 Investments in Joint Arrangements

A joint arrangement is an arrangement of which two or more parties involved have joint control. Control exists when Hydro has the power, directly or indirectly, to govern the financial and operating policies of another entity, so as to obtain benefits from its activities. A joint arrangement is either classified as a joint operation or a joint venture based on the rights of the parties involved.

Effective June 18, 1999, Hydro, Churchill Falls and Hydro-Québec entered into a shareholders' agreement which provided, among other matters, that certain of the strategic operating, financing and investing policies of Churchill Falls be subject to approval jointly by representatives of Hydro and Hydro-Québec who are members on the Board of Directors of Churchill Falls. Although Hydro retains its 65.8% ownership interest, the agreement changed the nature of the relationship between Hydro and Hydro-Québec, with respect to Churchill Falls, from that of majority and minority shareholders, respectively, to that of joint operators. For the purposes of these non-consolidated financial statements, the investment is recorded using the equity method of accounting. Under the equity method, the interest in the investment is carried in the Non-Consolidated Statement of Financial Position at cost plus post acquisition changes in Hydro's share of net assets of the investment. The Non-Consolidated Statement of Profit and Comprehensive Income reflects the share of the profit or loss of the joint arrangement.

2.9 Employee Future Benefits

(i) Pension Plan

Employees participate in the Province's Public Service Pension Plan, a multi-employer defined benefit plan. Contributions by Hydro to this Plan are recognized as an expense when employees have rendered service entitling them to the contributions. Liabilities associated with this Plan are held with the Province.

(ii) Other Benefits

Hydro provides group life insurance and health care benefits on a cost-shared basis to retired employees, in addition to a retirement allowance upon retirement.

The cost of providing these benefits is determined using the projected unit credit method, with actuarial valuations being completed on an annual basis, based on service and Management's best estimate of salary escalation, retirement ages of employees and expected health care costs.

Actuarial gains and losses on Hydro's defined benefit obligation are recognized in reserves in the period in which they occur. Past service costs are recognized in operating costs as incurred. Pursuant to Order No. P.U. 36 (2015), Hydro recognizes the amortization of employee future benefit actuarial gains and losses in profit or loss as a regulatory adjustment.

The retirement benefit obligation recognized in the Non-Consolidated Statement of Financial Position represents the present value of the defined benefit obligation.

2.10 Provisions

A provision is a liability of uncertain timing or amount. A provision is recognized if Hydro has a present legal obligation or constructive obligation as a result of past events, it is probable that an outflow of resources will be required to settle the obligation and the amount can be reliably estimated. Provisions are not recognized for future operating losses. The provision is measured at the present value of the best estimate of the expenditures expected to be required to settle the obligation using a discount rate that reflects the current market assessments of the time value of money and the risks specific to the obligation. Provisions are re-measured at each Non-Consolidated Statement of Financial Position date using the current discount rate.

2.11 Decommissioning, Restoration and Environmental Liabilities

Legal and constructive obligations associated with the retirement of property, plant and equipment are recorded as liabilities when those obligations are incurred and are measured as the present value of the expected costs to settle the liability, discounted at a rate specific to the liability. The liability is accreted up to the date the liability will be incurred with a corresponding charge to net finance expense. The carrying amount of decommissioning, restoration and environmental liabilities is reviewed annually with changes in the estimates of timing or amount of cash flows added to or deducted from the cost of the related asset or expensed in profit or loss if the liability is short-term in nature.

2.12 Revenue from Contracts with Customers

Hydro recognizes revenue from contracts with customers related to the sale of electricity.

Hydro recognizes revenue from the sale of electricity to Regulated industrial, utility and rural customers in Newfoundland and Labrador and to Non-Regulated industrial, utility and external market customers.

Revenue is measured based on the consideration specified in a contract with a customer and excludes amounts collected on behalf of third parties. Hydro recognizes revenue when it transfers control of a product or service to a customer.

Revenue from the sale of energy is recognized when Hydro satisfies its performance obligation by transferring energy to the customer. Sales within the Province are primarily at rates approved by the Newfoundland and Labrador Board of Commissioners of Public Utilities (PUB), whereas export sales and sales to certain major industrial customers are either at rates under the terms of the applicable contracts, or at market rates. Hydro will continue to recognize revenue as customers are invoiced on a monthly basis using practical expedient IFRS 15.B16. Hydro recognizes revenue at the amount to which it has the right to invoice, which corresponds directly to the value of Hydro's performance to date.

2.13 Leasing

Leases are classified as finance leases whenever the terms of the lease transfer substantially all the risks and rewards of ownership to the lessee. All other leases are classified as operating leases.

Lessor accounting

Amounts due from lessees under finance leases are recognized as receivables at the amount of Hydro's net investment in the leases. Finance lease income is allocated to accounting periods so as to reflect a constant periodic rate of return on Hydro's net investment outstanding in respect of the leases.

Rental income from operating leases is recognized on a straight-line basis over the term of the relevant lease. Initial direct costs incurred in negotiating and arranging an operating lease are added to the carrying amount of the leased asset and recognized on a straight-line basis over the lease term.

Lessee accounting

Assets held under finance leases are initially recognized as assets of Hydro at their fair value at the inception of the lease or, if lower, at the present value of the minimum lease payments. The corresponding liability to the lessor is included in the Non-Consolidated Statement of Financial Position as a finance lease obligation.

Lease payments are apportioned between finance expenses and reduction of the lease obligation so as to achieve a constant rate of interest on the remaining balance of the liability. Finance expenses are recognized immediately in profit or loss, unless they are directly attributable to qualifying assets, in which case they are capitalized in accordance with Hydro's general policy on borrowing costs (Note 2.6). Contingent rental costs are recognized as operating costs in the periods in which they are incurred.

Operating lease payments are recognized as an expense on a straight-line basis over the lease term, except where another systematic basis is more representative of the time pattern in which economic benefits from the leased asset are consumed. Contingent rentals arising under operating leases are recognized as an expense in the period in which they are incurred.

In the event that lease incentives are received to enter into operating leases, such incentives are recognized as a liability. The aggregate benefit of incentives is recognized as a reduction of rental expense on a straight-line basis, except where another systematic basis is more representative of the time pattern in which economic benefits from the leased asset are consumed.

2.14 Foreign Currencies

Transactions in currencies other than Hydro's functional currency (foreign currencies) are recognized using the exchange rate in effect at the date of transaction, approximated by the prior month end close rate. At the end of each reporting period, monetary items denominated in foreign currencies are translated at the rates of exchange in effect at the period end date. Foreign exchange gains and losses not included in regulatory deferrals are recorded in profit or loss as other expense.

2.15 Income Taxes

Hydro is exempt from paying income taxes under Section 149(1) (d.2) of the Income Tax Act.

2.16 Financial Instruments

Financial assets and financial liabilities are recognized in the Non-Consolidated Statement of Financial Position when Hydro becomes a party to the contractual provisions of the instrument and are initially measured at fair value. Transaction costs that are directly attributable to the acquisition or issue of financial assets and financial liabilities (other than financial assets and financial liabilities at fair value through profit or loss) are added to or deducted from the fair value of the financial assets or financial liabilities, as appropriate, on initial recognition. Transaction costs directly attributable to the acquisition of financial assets or financial liabilities at fair value through profit or loss are recognized immediately in profit or loss. All recognized financial assets and financial liabilities are subsequently measured in their entirety at either amortized cost or fair value, depending on the classification of the financial assets and financial liabilities.

Classification of Financial Instruments

Hydro has classified each of its financial instruments into the following categories: amortized cost and derivatives designated as fair value through profit or loss.

Financial Instrument	Category
Cash and cash equivalents	Amortized cost
Trade and other receivables	Amortized cost
Derivative instruments	FVTPL
Sinking funds – investments in same Hydro issue	Amortized cost
Sinking funds – other investments	Amortized cost
Long-term receivables	Amortized cost
Trade and other payables	Amortized cost
Short-term borrowings	Amortized cost
Long-term debt	Amortized cost

(i) Effective Interest Method

The effective interest method is a method of calculating the amortized cost of a debt instrument and allocating interest income or expense over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash receipts or payments (including all fees on points paid or received that form an integral part of the effective interest rate, transaction costs and other premiums or discounts) excluding expected credit losses for debt financial assets, through the expected life of the debt instrument, or, where appropriate, a shorter period to the gross carrying amount on initial recognition.

Income or expense is recognized on an effective interest basis for debt instruments other than those financial assets and liabilities classified as at FVTPL.

Financial Assets

(ii) Financial Assets at Amortized Cost

The amortized cost of a financial asset is the amount at which the financial asset is measured at initial recognition minus the principal repayments, plus the cumulative amortization using the effective interest method of any difference between that initial amount and the maturity amount, adjusted for any loss allowance. The gross carrying amount of a financial asset is the amortized cost of a financial asset before adjusting for any loss allowance.

Interest income is calculated by applying the effective interest rate to the gross carrying amount of a financial asset, except for financial assets that have subsequently become credit-impaired. For financial assets that have subsequently become credit-impaired, interest income is recognized by applying the effective interest rate to the amortized cost of the financial asset. If, in subsequent reporting periods, the credit risk on the credit-impaired financial instrument improves so that the financial asset is no longer credit-impaired, interest income is recognized by applying the effective interest rate to the gross carrying amount of the financial asset.

Interest income is recognized in profit or loss and is included in ‘net finance expense’.

(iii) Financial Assets at FVTPL

Financial assets that do not meet the criteria for being measured at amortized cost or fair value through other comprehensive income (FVTOCI) are measured at FVTPL. Specifically:

- Investments in equity instruments are classified at FVTPL, unless Hydro designates an equity investment that is neither held for trading nor a contingent consideration arising from a business combination at FVTOCI on initial recognition.

- Debt instruments that do not meet the amortized cost criteria or the FVTOCI criteria are classified at FVTPL. In addition, debt instruments that meet either the amortized cost criteria or the FVTOCI criteria may be designated at FVTPL upon initial recognition if such designation eliminates or significantly reduces a measurement or recognition inconsistency that would arise from measuring assets or liabilities or recognizing the gains and losses on them on different bases.

Hydro has not designated any debt instruments at FVTPL nor does Hydro hold any equity investments classified at FVTPL.

Financial assets at FVTPL are measured at fair value at the end of each reporting period, with any fair value gains or losses recognized in profit or loss to the extent they are not part of a designated hedging relationship. The net gain or loss recognized in profit or loss includes any dividend or interest earned on the financial asset and is included in 'net finance expense'.

Financial Liabilities

(iv) Financial liabilities at amortized cost
Financial liabilities that do not meet the criteria of FVTPL or are not designated as such are subsequently measured at amortized cost using the effective interest method.

(v) Derivative Instruments and Financial Instruments Used for Hedging
Derivative instruments are utilized by Hydro to manage risk. Hydro's policy is not to utilize derivative instruments for speculative purposes. Derivatives are initially measured at fair value at the date the derivative contracts are entered into and are subsequently measured at their fair value at the end of each reporting period. The resulting gain or loss is recognized in profit or loss immediately unless the derivative is designated and effective as a hedging relationship.

2.17 Derecognition of Financial Instruments

Hydro derecognizes a financial asset only when the contractual rights to the cash flows from the asset expire, or when it transfers the financial asset and substantially all the risks and rewards of ownership of the asset to another entity. If Hydro neither transfers nor retains substantially all the risks and rewards of ownership and continues to control the transferred asset, its retained interest in the asset and any associated liability for amounts it may have to pay is recognized. If Hydro retains substantially all the risks and rewards of ownership of a transferred financial asset, it continues to recognize the financial asset and also recognizes the collateralized borrowing for the proceeds received.

On derecognition of a financial asset measured at amortized cost, the difference between the asset's carrying amount and the sum of the consideration received and receivable is recognized in profit or loss. In addition, on derecognition of an investment in a debt instrument classified as at FVTOCI, the cumulative gain or loss previously accumulated in the fair value reserve is reclassified to profit or loss. In contrast, on derecognition of an investment in equity instrument which Hydro has elected on initial recognition to measure at FVTOCI, the cumulative gain or loss previously accumulated in the fair value reserve is not reclassified to profit or loss, but is transferred to retained earnings.

Hydro derecognizes financial liabilities when, and only when, its obligations are discharged, cancelled or they expire. The difference between the carrying amount of the financial liability derecognized and the consideration paid and payable, including any non-cash assets transferred or liabilities assumed, is recognized in profit or loss.

2.18 Impairment of Financial Assets

Hydro recognizes a loss allowance for expected credit losses on investments in debt instruments that are measured at amortized cost or at FVTOCI. The amount of expected credit losses is updated at each reporting date to reflect changes in credit risk since initial recognition of the respective financial instrument.

Hydro recognizes lifetime expected credit losses (ECL) for trade and other receivables. The expected credit losses on these financial assets are estimated based on Hydro's historical credit loss experience, adjusted for factors that are specific to the debtors, general economic conditions and an assessment of both the current as well as the forecast direction of conditions at the reporting date, including time value of money where appropriate. Hydro also records 12-month ECL for those financial assets which have low credit risk and where the low credit risk exemption has been applied. The classes of financial assets that have been identified to have low credit risk are cash and cash equivalents, restricted cash, short-term investments, long-term investments, and sinking funds.

For all other financial instruments, Hydro recognizes lifetime ECL when there has been a significant increase in credit risk since initial recognition. If, on the other hand, the credit risk on the financial instrument has not increased significantly since initial recognition, Hydro measures the loss allowance for that financial instrument at an amount equal to 12 month ECL. The assessment of whether lifetime ECL should be recognized is based on significant increases in the likelihood or risk of a default occurring since initial recognition instead of on evidence of a financial asset being credit-impaired at the reporting date or an actual default occurring.

Lifetime ECL represents the expected credit losses that will result from all possible default events over the expected life of a financial instrument. In contrast, 12 month ECL represents the portion of lifetime ECL that is expected to result from default events on a financial instrument that are possible within 12 months after the reporting date.

Significant increase in credit risk

In assessing whether the credit risk on a financial instrument has increased significantly since initial recognition, Hydro compares the risk of a default occurring on the financial instrument as at the reporting date with the risk of a default occurring on the financial instrument as at the date of initial recognition. In making this assessment, Hydro considers both quantitative and qualitative information that is reasonable and supportable, including historical experience and forward-looking information that is available without undue cost or effort. Forward-looking information considered includes the future prospects of the industries in which Hydro's debtors operate, obtained from economic expert reports, financial analysts, governmental bodies and other similar organizations, as well as consideration of various external sources of actual and forecasted economic information that relate to Hydro's core operations.

In particular, the following information is taken into account when assessing whether credit risk has increased significantly since initial recognition:

- an actual or expected significant deterioration in the financial instrument's external (if available) or internal credit rating;
- significant deterioration in external market indicators of credit risk for a particular financial instrument,
- existing or forecast adverse changes in business, financial or economic conditions that are expected to cause a significant decrease in the debtor's ability to meet its debt obligations;
- an actual or expected significant deterioration in the operating results of the debtor;
- significant increases in credit risk on other financial instruments of the same debtor;
- an actual or expected significant adverse change in the regulatory, economic, or technological environment of the debtor that results in a significant decrease in the debtor's ability to meet its debt obligations.

Irrespective of the outcome of the above assessment, Hydro presumes that the credit risk on a financial asset has increased significantly since initial recognition when contractual payments are more than 30 days past due, unless Hydro has reasonable and supportable information that demonstrates otherwise.

Hydro assumes that the credit risk on a financial instrument has not increased significantly since initial recognition if the financial instrument is determined to have low credit risk at the reporting date. A financial instrument is determined to have low credit risk if the financial instrument has a low risk of default, the borrower has a strong capacity to meet its contractual cash flow obligations in the near term and adverse changes in economic and business conditions in the longer term may, but will not necessarily, reduce the ability of the borrower to fulfill its contractual cash flow obligations. Hydro considers a financial asset to have low credit risk when it has an internal or external credit rating of 'investment grade' as per globally understood definition.

Hydro regularly monitors the effectiveness of the criteria used to identify whether there has been a significant increase in credit risk and revises them as appropriate to ensure that the criteria are capable of identifying significant increase in credit risk before the amount becomes past due.

Definition of default
Hydro considers that an event default has occurred when there is a breach of financial covenants by a counterparty or information developed internally or obtained from external sources indicates that the debtor is unlikely to pay its creditors, including Hydro, in full. Irrespective of the outcome of the above assessment, Hydro considers that default has occurred when a financial asset is more than 90 days past due unless Hydro has reasonable and supportable information to demonstrate that a more lagging default criterion is more appropriate.

Credit-impaired financial assets
A financial asset is credit-impaired when one or more events that have a detrimental impact on the estimated future cash flows of that financial asset have occurred. Evidence that a financial asset is credit-impaired includes observable data about significant financial difficulty of the issuer or the borrower; a breach of contract, such as a default or past due event; the lender of the borrower, for economic or contractual reasons relating to the borrower's financial difficulty, having granted to the borrower a concession that the lender would not otherwise consider; it is becoming probable that the borrower will enter bankruptcy or other financial reorganization; or the disappearance of an active market for that financial asset because of financial difficulties.

Write-off policy
Hydro writes off a financial asset when there is information indicating that the counterparty is in severe financial difficulty and there is no realistic prospect of recovery. Financial assets written off may still be subject to enforcement activities under Hydro's recovery procedures, taking into account legal advice where appropriate. Any recoveries made are recognized in profit or loss.

Measurement and recognition of expected credit losses
The measurement of expected credit losses is a function of the probability of default, loss given default (i.e. the magnitude of the loss if there is a default) and the exposure at default. The assessment of the probability of default and loss given default is based on historical data adjusted by forward-looking information as described above. As for the exposure at default, for financial assets, this is represented by the assets' gross carrying amount at the reporting date.

For financial assets, the expected credit loss is estimated as the difference between all contractual cash flows that are due to Hydro in accordance with the contract and all the cash flows that Hydro expects to receive, discounted at the original effective interest rate. For a lease receivable, the cash flows used for determining the expected credit losses is consistent with the cash flows used in measuring the lease receivable in accordance with IAS 17 Leases.

Where lifetime ECL is measured on a collective basis to cater to cases where evidence of significant increases in credit risk at the individual instrument level may not yet be available, the financial instruments are grouped by the nature of the financial instruments; past due status; nature and size of industry of debtors; nature of collaterals for finance lease receivables; and external credit ratings where available. The grouping is regularly reviewed by management to ensure the constituents of each group continue to share similar credit risk characteristics.

If Hydro has measured the loss allowance for a financial instrument at an amount equal to lifetime ECL in the previous reporting period, but determines at the current reporting date that the conditions for lifetime ECL are no longer met, Hydro measures the loss allowance at an amount equal to 12 month ECL at the current reporting date.

Hydro recognizes an impairment gain or loss in profit or loss for all financial instruments with a corresponding adjustment to their carrying amount through a loss allowance account, except for investments that are measured at FVTOCI, for which the loss allowance is recognized in other comprehensive income and accumulated in the investment revaluation reserve, and does not reduce the carrying amount of the financial asset in the Statement of Financial Position.

2.19 Government Grants

Government grants are recognized when there is reasonable assurance that Hydro will comply with the associated conditions and that the grants will be received.

Government grants are recognized in profit or loss on a systematic basis over the periods in which Hydro recognizes as expenses the related costs for which the grants are intended to compensate. Specifically, government grants whose primary condition is that Hydro should purchase, construct or otherwise acquire non-current assets are recognized as deferred revenue in the Non-Consolidated Statement of Financial Position and transferred to profit or loss on a systematic and rational basis over the useful lives of the related assets.

Government grants that are receivable as compensation for expenses or losses already incurred or for the purpose of giving immediate financial support to Hydro with no future related costs are recognized in profit or loss in the period in which they become receivable.

2.20 Regulatory Deferrals

Hydro’s revenues from its electrical sales to most customers within the Province are subject to rate regulation by the PUB. Hydro's borrowing and capital expenditure programs are also subject to review and approval by the PUB. Rates are set through periodic general rate applications utilizing a cost of service methodology. Hydro’s allowed rate of return based upon Board Order No. P.U. 49 (2016) is 6.6% in 2018 and 6.6% in 2017 +/- 20 basis points. On July 28, 2017, Hydro Regulated filed its 2017 GRA to set a new rate of return for 2018 and 2019. The hearing portion of Hydro Regulated’s 2017 GRA has concluded and the PUB’s decision and Order on the 2017 GRA is not expected until the second quarter of 2019. Any adjustments to the requested revenue requirements from January 1, 2018 until final rates are approved, will not be known until that time and any required adjustments will be reflected when the Order is received.

Hydro applies various accounting policies that differ from enterprises that do not operate in a rate regulated environment. Generally, these policies result in the deferral and amortization of costs or credits which are expected to be recovered or refunded in future rates. In the absence of rate regulation, these amounts would be included in the determination of profit or loss in the year the amounts are incurred. The effects of rate regulation on the annual audited non-consolidated financial statements are disclosed in Note 13.

3. SIGNIFICANT ACCOUNTING JUDGMENTS, ESTIMATES AND ASSUMPTIONS

The preparation of the annual audited non-consolidated financial statements in conformity with IFRS requires Management to make judgments, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, revenues and expenses. Actual results may differ materially from these estimates, including changes as a result of future decisions made by the PUB. The estimates and underlying assumptions are reviewed on an on-going basis. Revisions to accounting estimates are recognized in the period in which the estimate is reviewed if the revision affects only that period or future periods.

3.1 Use of Judgments

(i) Property, Plant and Equipment
Hydro's accounting policy relating to property, plant and equipment is described in Note 2.4. In applying this policy, judgment is used in determining whether certain costs are additions to the carrying amount of the property, plant and equipment as opposed to repairs and maintenance. If an asset has been developed, judgment is required to identify the point at which the asset is capable of being used as intended and to identify the directly attributable borrowing costs to be included in the carrying value of the development asset. Judgment is also used in determining the appropriate componentization structure for Hydro's property, plant and equipment.

(ii) Revenue
Management exercises judgment in estimating the value of electricity consumed by retail customers in the period, but billed subsequent to the end of the reporting period. Specifically, this involves an estimate of consumption for each retail customer, based on the customer's past consumption history.

When recognizing deferrals and related amortization of costs or credits in Hydro Regulated, Management assumes that such costs or credits will be recovered or refunded through customer rates in future years. Recovery of some of these deferrals is subject to a future PUB order. As such, there is a risk that some or all of the regulatory deferrals will not be approved by the PUB which could have a material impact on Hydro Regulated's profit or loss in the year the order is received.

(iii) Determination of CGUs
Hydro's accounting policy relating to impairment of non-financial assets is described in Note 2.7. In applying this policy, Hydro groups assets into the smallest identifiable group for which cash flows are largely independent of the cash flows from other assets or groups of assets. Judgment is used in determining the level at which cash flows are largely independent of other assets or groups of assets.

(iv) Discount Rates
Certain of Hydro's financial liabilities are discounted using discount rates that are subject to Management's judgment.

3.2 Use of Estimates

(i) Property, Plant and Equipment
Amounts recorded for depreciation are based on the useful lives of Hydro's assets. The useful lives of property, plant and equipment are determined by independent specialists and reviewed annually by Hydro. These useful lives are Management's best estimate of the service lives of these assets. Changes to these lives could materially affect the amount of depreciation recorded.

(ii) Intangible Assets
Amounts recorded for amortization are based on the useful lives of Hydro's assets. These useful lives are Management's best estimate of the service lives of these assets. Changes to these lives would not materially affect the amount of amortization recorded.

(iii) Decommissioning Liabilities
Hydro recognizes a liability for the fair value of the future expenditures required to settle obligations associated with the retirement of property, plant and equipment. Decommissioning liabilities are recorded as a liability at fair value, with a corresponding increase to property, plant and equipment. Accretion of decommissioning liabilities is included in the Non-Consolidated Statement of Profit and Comprehensive Income through net finance expense. Differences between the recorded decommissioning liabilities and the actual decommissioning costs incurred are recorded as a gain or loss in the settlement period.

(iv) Employee Benefits

Hydro provides group life insurance and health care benefits on a cost-shared basis to retired employees, in addition to a severance payment upon retirement. The expected cost of providing these other employee benefits is accounted for on an accrual basis, and has been actuarially determined using the projected unit credit method prorated on service, and Management's best estimate of salary escalation, retirement ages of employees and expected health care costs.

3.3 Use of Assumptions

Deferred Assets and Derivative Liabilities

Effective October 1, 2015, Hydro entered into a power purchase agreement (PPA) with Nalcor Energy Marketing Corporation which allows for the purchase of available recapture energy from Hydro for resale by Nalcor Energy Marketing in export markets or through agreements with counterparties. Additionally, the PPA allows for the use of Hydro's transmission service rights by Energy Marketing to deliver electricity, through rights which are provided to Hydro pursuant to a Transmission Service Agreement with Hydro-Québec dated April 1, 2009. In September 2016, the terms of the PPA were amended to require a 60 day termination notice by either party. This replaced the previous termination clause of 90 days prior the end of the operating year. Management's assumption is that the term of the PPA at December 31, 2018, will continue for at least the next 12 months.

Fair values relating to Hydro's financial instruments and derivatives that have been classified as Level 3 have been determined using inputs for the assets or liabilities that are not readily observable. Certain of these fair values are classified as Level 3 as the transactions do not occur in an active market, or the terms extend beyond the period for which a quoted price is available.

Hydro's PPA with Nalcor Energy Marketing is accounted for as a derivative instrument, where Hydro determines that the fair value at initial recognition differs from the transaction price and the fair value is evidenced neither by a quoted price in an active market for an identical asset or liability nor based on a valuation technique that uses only data from observable markets. These derivative transactions are initially measured at fair value and the expected difference is deferred. Subsequently, the deferred difference is recognized in other comprehensive income (loss) on an appropriate basis over the life of the related derivative instrument but not later than when the valuation is wholly supported by observable market data or the transaction has occurred.

Hydro has elected to defer the difference between the fair value of the power purchase derivative liability upon initial recognition and the transaction price of the power purchase derivative liability and to amortize the deferred asset on a straight-line basis over its effective term (Note 8). These methods, when compared with alternatives, were determined by Management to more accurately reflect the nature and substance of the transactions.

4. CURRENT AND FUTURE CHANGES IN ACCOUNTING POLICIES

The following is a list of standards/interpretations that have been issued and are effective for accounting periods commencing January 1, 2018, January 1, 2019 or January 1, 2020, as specified.

- IFRS 9 – Financial Instruments[1]
- IFRS 15 – Revenue from Contracts with Customers[1]
- IFRIC 22 – Foreign Currency Transactions and Advance Consideration[1]
- IFRS 16 – Leases[2]
- IFRS 9 – Prepayment Features with Negative Compensation[2]
- IAS 19 – Plan Amendment, Curtailment or Settlement (Amendments to IAS 19)[2]
- IAS 28 – Long-term Interests in Associates and Joint Ventures (Amendments to IAS 28)[2]
- IAS 23 – Borrowing Costs (Amendments to IAS 23)[2]
- IFRS 11 – Joint Arrangements (Amendments to IFRS 11)[2]
- IAS 1 – Presentation of Financial Statements[3] and IAS 8 – Accounting Policies, Changes in Accounting Estimates and Errors[3] (Amendments to IAS 1 and IAS 8)

[1] Effective for annual periods beginning on or after January 1, 2018.
[2] Effective for annual periods beginning on or after January 1, 2019, with earlier application permitted.
[3] Effective for annual periods beginning on or after January 1, 2020, with earlier application permitted.

4.1 IFRS 9 – Financial Instruments

IFRS 9 - Financial Instruments (as revised in July 2014) became effective for accounting periods commencing on January 1, 2018. IFRS 9 introduces new requirements for the classification and measurement of financial assets and financial liabilities, impairment for financial assets and general hedge accounting. Details of these new requirements as well as their impact on Hydro's non-consolidated financial statements are described below.

Hydro has applied IFRS 9 in accordance with the transition provisions set out in IFRS 9.

4.1.1 Classification and measurement of financial assets

The date of initial application of IFRS 9 is January 1, 2018. Hydro has applied the requirements of IFRS 9 to instruments that have not been derecognized as at January 1, 2018 and has not applied the requirements to instruments that have already been derecognized as at January 1, 2018. Comparative amounts in relation to instruments that have not been derecognized as at January 1, 2018 have been restated where appropriate.

All recognized financial assets that are within the scope of IFRS 9 are required to be subsequently measured at amortized cost or fair value on the basis of the entity's business model for managing the financial assets and the contractual cash flow characteristics of the financial assets.

Management reviewed and assessed Hydro's existing financial assets as at January 1, 2018 based on the facts and circumstances that existed at that date, and concluded that the initial application of IFRS 9 has had the following impact on Hydro's financial assets with regards to classification and measurement:

- financial assets classified as held-to-maturity and loans and receivables under IAS 39 that were measured at amortized cost continue to be measured at amortized cost under IFRS 9 as they are held within a business model to collect contractual cash flows and these cash flows consist solely of payments of principal and interest on the principal amount outstanding;
- the short-term investments and sinking funds have been classified as financial assets at amortized cost under IFRS 9 as they are held within a business model whose objective is to collect contractual cash flows, which consist solely of payments of principal and interest on the principal amount outstanding;
- financial assets that were measured at FVTPL under IAS 39 continue to be measured as such under IFRS 9.

For financial assets that have been reclassified to the amortized cost category, the fair value gain that would have been recognized if these financial assets had not been reclassified as part of the transition to IFRS 9 was $5.3 million for the year ended December 31, 2018.

4.1.5 illustrates the change in classification of Hydro's financial assets upon application of IFRS 9.

4.1.6 details the amount of adjustment for each financial statement line item affected by the application of IFRS 9 for the current and prior reporting periods.

4.1.2 Impairment of financial assets
In relation to the impairment of financial assets, IFRS 9 requires an expected credit loss model as opposed to an incurred credit loss model under IAS 39. The expected credit loss model requires Hydro to account for expected credit losses and changes in those expected credit losses at each reporting date to reflect changes in credit risk since initial recognition of the financial assets.

As at January 1, 2018, Management reviewed and assessed Hydro's existing financial assets and amounts due from customers for impairment using reasonable and supportable information that is available without undue cost or effort in accordance with the requirements of IFRS 9 to determine the credit risk of the respective items at the date they were initially recognized, and compared that to the credit risk as at January 1, 2017 and January 1, 2018. The comparison made as at January 1, 2017, January 1, 2018 and December 31, 2018 determines whether 12 month expected credit losses should be recognized or a lifetime expected credit loss should be recognized where credit risk has increased significantly for the respective financial instruments at that date. The change resulting from the application of the impairment model under IFRS 9 has not resulted in a material adjustment from what was previously recorded under IAS 39.

4.1.3 Classification and measurement of financial liabilities
The application of IFRS 9 has had no impact on the classification and measurement of Hydro's financial liabilities.

4.1.4 General hedge accounting
The new general hedge accounting requirements retain the three types of hedge accounting. However, greater flexibility has been introduced to the types of transactions eligible for hedge accounting, specifically broadening the types of instruments that qualify for hedging instruments and the types of risk components of non-financial items that are eligible for hedge accounting. In addition, the effectiveness test has been overhauled and replaced with the principle of an 'economic relationship'. Retrospective assessment of hedge effectiveness is also no longer required. Enhanced disclosure requirements about Hydro's risk management activities have also been introduced.

In accordance with IFRS 9's transition provisions for hedge accounting, Hydro has applied IFRS 9 hedge accounting requirements prospectively from the date of initial application on January 1, 2018. Hydro's qualifying hedging relationships in place as at January 1, 2018 qualified for hedge accounting in accordance with IFRS 9 and were therefore regarded as continuing hedging relationships. No rebalancing of any of the hedging relationships was necessary on January 1, 2018. As the critical terms of the hedging instruments match those of their corresponding hedged items, all hedging relationships continue to be effective under IFRS 9's effectiveness assessment requirements. Hydro has not designated any hedging relationships under IFRS 9 that would not have met the qualifying hedge accounting criteria under IAS 39. Consistent with prior periods, Hydro has continued to designate the change in fair value of the entire forward contract, i.e. including the forward element, as the hedging instrument in Hydro's cash flow hedge relationships.

The application of the IFRS 9 hedge accounting requirements has had no impact on the results and financial position of Hydro for the current and/or prior years. Refer to Note 24 for detailed disclosures regarding Hydro's risk management activities.

4.1.5 Disclosures in relation to the initial application of IFRS 9

The table below illustrates the classification and measurement of financial assets and financial liabilities under IFRS 9 and IAS 39 at January 1, 2018.

Financial instrument	Category under IAS 39	Category under IFRS 9
Cash and cash equivalents	Loans and receivables	Amortized cost
Trade and other receivables	Loans and receivables	Amortized cost
Derivative instruments	FVTPL	FVTPL
Sinking funds – investments in same Hydro issue	Held-to-maturity investments	Amortized cost
Sinking funds – other investments	AFS financial assets	Amortized cost
Long-term receivables	Loans and receivables	Amortized cost
Trade and other payables	Other financial liabilities	Amortized cost
Short-term borrowings	Other financial liabilities	Amortized cost
Long-term debt	Other financial liabilities	Amortized cost

The tables below address the changes resulting from the change in measurement category of Hydro's sinking funds in other investments.

(millions of Canadian dollars)	IAS 39 carrying amount December 31, 2017	Reclassification	Remeasurement	IFRS 9 carrying amount January 1, 2018	Retained earnings effect on January 1, 2018
Financial assets					
Amortized cost					
Additions:					
From available-for-sale (IAS 39)	-	190	(34)	156	-
Total	-	190	(34)	156	-
Financial assets					
FVTOCI					
Subtractions:					
Available-for-sale (IAS 39) to amortized cost (IFRS 9)	190	(190)	-	-	-
Total	190	(190)	-	-	-
Total financial asset balances, reclassifications and remeasurements at January 1, 2018	**190**	**-**	**(34)**	**156**	**-**

4.1.6 Financial impact of the application of IFRS 9

The tables below show the amount of adjustment for each financial statement line item affected by the application of IFRS 9 for the current and prior years.

For the year ended December 31 (millions of Canadian dollars)	**2018**	2017
Impact on other comprehensive income for the year		
Items that may be reclassified subsequently to profit or loss:		
Net fair value gain on available-for-sale financial instruments	**5**	11
Impact on other comprehensive income for the year	**5**	11

(millions of Canadian dollars)	As previously reported	IFRS 9 adjustments	**As restated**
Impact on assets, liabilities and equity as at January 1, 2017			
Other long-term assets	193	(45)	**148**
Total effect on assets	193	(45)	**148**
Reserves	26	(45)	**(19)**
Retained earnings	706	-	**706**
Total effect on equity	732	(45)	**687**

(millions of Canadian dollars)	As previously reported	IFRS 9 adjustments	As restated
Impact on assets, liabilities and equity as at December 31, 2017			
Other long-term assets	190	(34)	156
Total effect on assets	190	(34)	156
Reserves	12	(34)	(22)
Retained earnings	768	-	768
Total effect on equity	780	(34)	746

The application of IFRS 9 has had no impact on the cash flows of Hydro.

4.2 IFRS 15 – Revenue from Contracts with Customers

IFRS 15 – Revenue from Contracts with Customers (as amended in April 2016) became effective for accounting periods commencing on January 1, 2018. Hydro has applied IFRS 15 in accordance with the fully retrospective transitional approach using practical expedients for completed contracts (IFRS 15.C5(a)), modified contracts (IFRS 15.C5(c)) and allowing both non-disclosure of the amount of the transaction price allocated to the remaining performance obligations, and an explanation of when it expects to recognize that amount as revenue for all reporting periods presented before the date of initial application (IFRS 15.C5(d)). Subsequent to adopting IFRS 15 there were no material adjustments to the amounts reported in Hydro’s annual audited non-consolidated financial statements.

IFRS 15 establishes a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers. IFRS 15 will supersede the current revenue recognition guidance including IAS 18 – Revenue, IAS 11 – Construction Contracts and the related interpretations.

IFRS 15 covers only revenue arising from contracts with customers. Under IFRS 15, a customer of Hydro is a party that has contracted with Hydro to obtain goods or services that are an output of Hydro’s ordinary activities in exchange for consideration. Unlike the scope of IAS 18, the recognition and measurement of interest income and dividend income from debt and equity investments are no longer within the scope of IFRS 15. Instead, they are within the scope of IFRS 9.

As mentioned above, IFRS 15 establishes a single model to deal with revenue from contracts with customers. Its core principle is that Hydro should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which Hydro expects to be entitled, in exchange for those goods or services.

Hydro's accounting policies for its revenue streams are disclosed in detail in Note 2.

4.3 IFRIC 22 – Foreign Currency Transactions and Advance Consideration

IFRIC 22 addresses how to determine the 'date of transaction' for the purpose of determining the exchange rate to use on initial recognition of an asset, expense or income, when consideration for that item has been paid or received in advance in a foreign currency which resulted in the recognition of a non-monetary asset or non-monetary liability (for example, a non-refundable deposit or deferred revenue).

The application of these amendments to IFRIC 22 did not have a material impact on Hydro's annual audited non-consolidated financial statements.

4.4 IFRS 16 – Leases

IFRS 16 provides a comprehensive model for the identification of lease arrangements and their treatment in the financial statements of both lessees and lessors. It will supersede the following lease standard and interpretations upon its effective date:

- IAS 17 – Leases;
- IFRIC 4 – Determining Whether an Arrangement contains a Lease;
- SIC-15 – Operating Leases – Incentives; and
- SIC-27 – Evaluating the Substance of Transactions Involving the Legal Form of a Lease.

IFRS 16 applies a control model to the identification of leases, distinguishing between leases and service contracts on the basis of whether there is an identified asset controlled by the customer.

The standard introduces significant changes to lessee accounting: it removes the distinction between operating and finance leases under IAS 17 and requires a lessee to recognize a right-of-use asset and a lease liability at lease commencement for all leases, except for short-term leases and leases of low value assets.

In contrast to lessee accounting, the IFRS 16 lessor accounting requirements remain largely unchanged from IAS 17, which continue to require a lessor to classify a lease as either an operating lease or a finance lease.

IFRS 16 is effective for reporting periods beginning on or after January 1, 2019 with early application permitted (as long as IFRS 15 is also applied). Management has elected to adopt the standard as of the effective date.

A lessee can apply IFRS 16 either by a full retrospective approach or a modified retrospective approach. Management intends to apply the modified approach, as a result there is no requirement to restate comparative information, the cumulative effect of initially applying IFRS 16 will be presented as an adjustment to opening retained earnings. Management anticipates the application of IFRS 16 may have a material impact on the amounts reported and disclosures made in Hydro's annual audited non-consolidated financial statements. However, it is not practicable to provide a reasonable estimate of the effect of IFRS 16 until Management concludes its detailed review.

4.5 IFRS 9 – Prepayment Features with Negative Compensation

Under IFRS 9, a debt instrument can be measured at amortized cost or at fair value through other comprehensive income, provided that the contractual cash flows are 'solely payments of principal and interest on the principal amount outstanding' (the SPPI criterion) and the instrument is held within the appropriate business model for that classification. The amendments to IFRS 9 clarify that a financial asset passes the SPPI criterion regardless of the event or circumstance that causes the early termination of the contract and irrespective of which party pays or receives reasonable compensation for the early termination of the contract.

The amendments are effective for annual periods beginning on or after January 1, 2019 with earlier application permitted. The application of these amendments to IFRS 9 will not have a material impact on Hydro's annual audited non-consolidated financial statements.

4.6 IAS 19 – Plan Amendment, Curtailment or Settlement (Amendments to IAS 19)

The amendments to IAS 19 address the accounting when a plan amendment, curtailment or settlement occurs during a reporting period. The amendments specify that when a plan amendment, curtailment or settlement occurs during the annual reporting period, an entity is required to:

- Determine current service cost for the remainder of the period after the plan amendment, curtailment or settlement, using the actuarial assumptions used to remeasure the net defined benefit liability (asset) reflecting the benefits offered under the plan and the plan assets after that event; and
- Determine net interest for the remainder of the period after the plan amendment, curtailment or settlement using: the net defined benefit liability (asset) reflecting the benefits offered under the plan and the plan assets after that event; and the discount rate used to remeasure that net defined benefit liability (asset).

The amendments also clarify that an entity first determines any past service cost, or a gain or loss on settlement, without considering the effect of the asset ceiling. This amount is recognized in profit or loss. An entity then determines the effect of the asset ceiling after the plan amendment, curtailment or settlement. Any change in that effect, excluding amounts included in the net interest, is recognized in other comprehensive income.

The amendments apply to plan amendments, curtailments, or settlements occurring on or after the beginning of the first annual reporting period that begins on or after January 1, 2019, with early application permitted. These amendments will apply only to any future plan amendments, curtailments, or settlements of Hydro.

4.7 IAS 28 – Long-term Interests in Associates and Joint Ventures (Amendments to IAS 28)

The amendments clarify that an entity applies IFRS 9 to long-term interests in an associate or joint venture to which the equity method is not applied but that, in substance, form part of the net investment in the associate or joint venture (long-term interests). This clarification is relevant because it implies that the expected credit loss model in IFRS 9 applies to such long-term interests.

The amendments also clarified that, in applying IFRS 9, an entity does not take account of any losses of the associate or joint venture, or any impairment losses on the net investment, recognized as adjustments to the net investment in the associate or joint venture that arise from applying IAS 28 Investments in Associates and Joint Ventures.

The amendments should be applied retrospectively and are effective from January 1, 2019, with early application permitted. The application of these amendments to IAS 28 will not have a material impact on Hydro's annual audited non-consolidated financial statements.

4.8 IAS 23 – Borrowing Costs (Amendments to IAS 23)

The amendments clarify that an entity treats as part of general borrowings any borrowing originally made to develop a qualifying asset when substantially all of the activities necessary to prepare that asset for its intended use or sale are complete.

An entity applies those amendments to borrowing costs incurred on or after the beginning of the annual reporting period in which the entity first applies those amendments (January 1, 2019), with early application permitted. Since Hydro's current practice is in line with these amendments, Hydro does not expect any effect on its annual audited non-consolidated financial statements.

4.9 IFRS 11 – Joint Arrangements (Amendments to IFRS 11)

The amendment to IFRS 11 clarifies that when an entity obtains joint control of a business that is a joint operation, the entity does not remeasure previously held interests in that business.

The amendments are effective for annual periods beginning on or after January 1, 2019 with earlier application permitted. These amendments are currently not applicable to Hydro but may apply to future transactions.

4.10 IAS 1 – Presentation of Financial Statements and IAS 8 – Accounting Policies, Changes in Accounting Estimates and Errors (Amendments to IAS 1 and IAS 8)

The International Accounting Standards Board issued amendments to IAS 1 and IAS 8 to align the definition of 'material' across the standards and to clarify certain aspects of the definition and to include the concept of 'obscuring information'.

The new definition states that 'information is material if omitting, misstating or obscuring it could reasonably be expected to influence decisions that the primary users of general purpose financial statements make on the basis of those financial statements, which provide financial information about a specific reporting entity.'

The amendments are effective for annual periods beginning on or after January 1, 2020 with earlier application permitted. The amendments are intended to improve the understanding of the existing requirements rather than to significantly impact Hydro's materiality judgments.

5. CASH AND CASH EQUIVALENTS

As at December 31, 2018 and 2017, cash and cash equivalents consist entirely of cash.

6. TRADE AND OTHER RECEIVABLES

As at December 31 (millions of Canadian dollars)	**2018**	2017
Trade receivables	**122**	118
Other receivables	**24**	32
Due from related parties	**7**	5
Allowance for doubtful accounts	**(17)**	(17)
	136	138

As at December 31 (millions of Canadian dollars)	**2018**	2017
0-60 days	**132**	125
60+ days	**4**	13
	136	138

As at December 31 (millions of Canadian dollars)	**2018**	2017
Allowance for doubtful accounts, beginning of year	**(17)**	(16)
Amounts provided for during the year	**-**	(1)
Allowance for doubtful accounts, end of year	**(17)**	(17)

7. INVENTORIES

As at December 31 (millions of Canadian dollars)	**2018**	2017
No. 6 fuel	**48**	48
Material and other	**36**	36
Diesel fuel	**4**	4
Other fuel	**5**	4
Construction aggregates	**1**	1
	94	93

The cost of inventories recognized as an expense during the year is $190.6 million (2017 - $232.3 million) and is included in operating costs and fuels.

8. DEFERRED ASSET

The deferred asset related to Hydro's power purchase agreement (PPA) with Nalcor Energy Marketing is amortized into income on a straight-line basis over the assumed 12 month term of the contract, which commenced on January 1, 2018. The components of change are as follows:

As at December 31 (millions of Canadian dollars)	**2018**	2017
Deferred asset, beginning of year	**31**	51
Additions	**21**	31
Amortization	**(31)**	(51)
Deferred asset, end of year	**21**	31

9. PROPERTY, PLANT AND EQUIPMENT

(millions of Canadian dollars)	Generation Plant	Transmission and Distribution	Other	Construction in Progress	Total
Cost					
Balance at January 1, 2017	1,169	682	107	92	2,050
Additions	-	1	-	344	345
Disposals	(2)	(3)	(1)	-	(6)
Transfers	50	322	13	(385)	-
Decommissioning liabilities and revisions	(1)	-	-	-	(1)
Other adjustments	-	-	(2)	(2)	(4)
Balance at December 31, 2017	1,216	1,002	117	49	2,384
Additions	**-**	**-**	**-**	**159**	**159**
Disposals	**(8)**	**(8)**	**(2)**	**-**	**(18)**
Transfers	**62**	**97**	**10**	**(170)**	**(1)**
Other adjustments	**(1)**	**-**	**-**	**2**	**1**
Balance at December 31, 2018	**1,269**	**1,091**	**125**	**40**	**2,525**
Depreciation					
Balance at January 1, 2017	130	73	27	-	230
Depreciation	45	24	8	-	77
Disposals	(1)	(1)	(1)	-	(3)
Balance at December 31, 2017	174	96	34	-	304
Depreciation	**45**	**31**	**9**	**-**	**85**
Disposals	**(5)**	**(1)**	**(2)**	**-**	**(8)**
Balance at December 31, 2018	**214**	**126**	**41**	**-**	**381**
Carrying value					
Balance at January 1, 2017	1,039	609	80	92	1,820
Balance at December 31, 2017	1,042	906	83	49	2,080
Balance at December 31, 2018	**1,055**	**965**	**84**	**40**	**2,144**

10. INTANGIBLE ASSETS

(millions of Canadian dollars)	Computer Software	Feasibility Studies	Assets Under Development	Total
Cost				
Balance at January 1, 2017	11	2	-	13
Additions	-	-	1	1
Transfers	1	-	(1)	-
Balance at December 31, 2017	12	2	-	14
Additions	**-**	**-**	**1**	**1**
Transfers	**1**	**-**	**(1)**	**-**
Balance at December 31, 2018	**13**	**2**	**-**	**15**
Amortization				
Balance at January 1, 2017	5	1	-	6
Amortization	1	-	-	1
Balance at December 31, 2017	6	1	-	7
Amortization	**2**	**-**	**-**	**2**
Balance at December 31, 2018	**8**	**1**	**-**	**9**
Carrying value				
Balance at January 1, 2017	6	1	-	7
Balance at December 31, 2017	6	1	-	7
Balance at December 31, 2018	**5**	**1**	**-**	**6**

11. OTHER LONG-TERM ASSETS

As at December 31 (millions of Canadian dollars)		**2018**	2017 (Restated - Note 4.1)
Long-term receivables	(a)	**-**	-
Sinking funds	(b)	**164**	156
		164	156
Less: current portion of sinking funds		**-**	-
Other long-term assets, end of year		**164**	156

(a) The balance of \$0.2 million (2017 - \$0.3 million) includes the non-current portion of receivables associated with customer payment plans and the long-term portion of employee purchase programs.

(b) As at December 31, 2018, sinking funds include \$164.4 million (2017 - \$156.4 million) related to the repayment of Hydro's long-term debt. Sinking fund investments consist of bonds, debentures, short-term borrowings and coupons issued by, or guaranteed by, the Government of Canada, provincial governments or Schedule 1 banks, and have maturity dates ranging from 2022 to 2033.

Hydro debentures, which are intended to be held to maturity, are deducted from debt while all other sinking fund investments are shown separately on the Non-Consolidated Statement of Financial Position as assets. Annual contributions to the various sinking funds are in accordance with bond indenture terms, and are structured to ensure the availability of adequate funds at the time of expected bond redemption. Effective yields range from 2.57% to 6.82% (2017 - 2.57% to 6.82%).

Sinking funds consist of the following:

As at December 31 (millions of Canadian dollars)	**2018**	2017
		(Restated - Note 4.1)
Sinking funds, beginning of year	**156**	222
Contributions	**7**	7
Change in sinking fund investments in own debentures	**(10)**	11
Earnings	**11**	11
Disposals and maturities	**-**	(95)
Sinking funds, end of year	**164**	156

Sinking fund instalments due over the next five years are as follows:

(millions of Canadian dollars)	2019	2020	2021	2022	2023
Sinking fund instalments	7	7	7	7	7

12. INVESTMENTS IN JOINT ARRANGEMENTS

As at December 31 (millions of Canadian dollars)	**Ownership Interest**	**2018**	2017
Churchill Falls	65.8%		
Shares, at cost		**167**	167
Equity in retained earnings, beginning of year		**369**	343
Accumulated other comprehensive loss, beginning of year		**(4)**	(3)
Other comprehensive loss		**1**	(1)
Equity in profit for the year		**25**	26
		558	532

13. REGULATORY DEFERRALS

(millions of Canadian dollars)		January 1 2018	Reclass & Disposition	Regulatory Activity	**December 31 2018**	Remaining Recovery Settlement Period (years)
Regulatory asset deferrals						
2018 cost deferral	(a)	-	-	19	**19**	n/a
Deferred energy conservation costs	(b)	9	-	-	**9**	n/a
Deferred foreign exchange on fuel	(c)	(1)	-	1	**-**	n/a
Deferred lease costs	(d)	4	-	(1)	**3**	2.4
Energy supply deferrals	(e)	52	-	25	**77**	n/a
Foreign exchange losses	(f)	52	-	(2)	**50**	23.0
Phase Two hearing costs	(g)	1	-	-	**1**	n/a
		117	-	42	**159**	
Regulatory liability deferrals						
Deferred specifically assigned industrial revenue	(h)	-	-	(1)	**(1)**	n/a
Insurance amortization and proceeds	(i)	(3)	-	1	**(2)**	n/a
Labrador refund	(j)	(1)	-	-	**(1)**	1.0
Rate stabilization plan (RSP)	(k)	(75)	3	4	**(68)**	n/a
Other	(q)	-	-	1	**1**	n/a
		(79)	3	5	**(71)**	

13.1 Regulatory Adjustments Recorded in the Non-Consolidated Statement of Profit and Comprehensive Income

For the year ended December 31 (millions of Canadian dollars)		**2018**	2017
RSP amortization		**(10)**	(53)
RSP fuel deferral		**2**	(19)
RSP interest		**4**	9
Rural rate adjustment		**-**	(3)
Total RSP activity	(k)	**(4)**	(66)
2014 cost deferral	(l)	**-**	1
2015 cost deferral	(m)	**-**	(3)
2016 cost deferral	(n)	**-**	(4)
2018 cost deferral	(a)	**(19)**	-
Amortization of deferred foreign exchange losses	(f)	**2**	2
Deferred energy conservation costs	(b)	**-**	(1)
Deferred foreign exchange on fuel	(c)	**(1)**	1
Deferred lease costs	(d)	**1**	1
Deferred specifically assigned industrial revenue	(h)	**1**	-
Energy supply deferrals	(e)	**(25)**	(21)
Insurance amortization and proceeds	(i)	**(1)**	(1)
Non-customer contributions in aid of construction	(o)	**(1)**	(1)
Other	(p,q,r,s)	**-**	-
		(47)	(92)

The following section describes Hydro’s regulatory assets and liabilities which will be, or are expected to be, reflected in customer rates in future periods and have been established through the rate setting process. In the absence of rate regulation, these amounts would be reflected in operating results in the year and profit for 2018 would have decreased by $46.6 million (2017 – a decrease of $91.9 million).

13.(a) 2018 Cost Deferral

In Board Order No. P.U. 48 (2018), the Board approved the 2018 cost deferral of $18.5 million (2017 - $nil) related to the differential in the 2018 depreciation, loss on retirement and removal costs associated with the proposed change in depreciation methodology as outlined in a general rate application settlement agreement.

13.(b) Deferred Energy Conservation Costs

In 2018, Hydro deferred $1.5 million (2017 - $1.5 million) in the Energy Conservation Costs regulatory asset associated with an electrical conservation program for residential, industrial, and commercial sectors. In addition, as per Board Order No. P.U. 22 (2017), Hydro recovered $1.2 million (2017 – $0.5 million) of the balance through a rate rider.

13.(c) Deferred Foreign Exchange on Fuel

Hydro purchases a significant amount of fuel for Holyrood Thermal Generating Station (HTGS) in USD. The RSP allows Hydro to defer variances in fuel prices (including foreign exchange fluctuations). During 2018, Hydro recognized in regulatory assets, foreign exchange losses on fuel purchases of $1.1 million (2017 - $0.4 million gain).

13.(d) Deferred Lease Costs

In Board Order No. P.U. 17 (2016), Board Order No. P.U. 23 (2016) and Board Order No. P.U. 49 (2016) the Board approved the amortization of diesel units at HTGS over a period of five years. In 2018, Hydro recorded amortization of $1.3 million (2017 - $1.3 million) of the deferred lease costs.

13.(e) Energy Supply Deferrals

Pursuant to Board Order No. P.U. 22 (2017), the Board approved the deferral of Energy Supply deferrals which includes the Energy Supply, Holyrood Conversion and Isolated Systems Supply deferral. The recovery of the deferral is subject to future Board order. In 2018, Hydro recorded a net increase to the deferral of $25.3 million (2017 - $21.3 million).

13.(f) Foreign Exchange Losses

In 2002, the PUB ordered Hydro to defer realized foreign exchange losses related to the issuance of Swiss Franc and Japanese Yen denominated debt and amortize the balance over a 40 year period. Accordingly, these costs were recognized as a regulatory asset. During 2018, the amortization of $2.2 million (2017 - $2.2 million) reduced regulatory assets.

13.(g) Phase Two Hearing Costs

Pursuant to Board Order No. P.U. 13 (2016), Hydro received approval to defer consulting fees, salary transfers and overtime relating to Phase Two of the investigation into the reliability and adequacy of power on the Island Interconnected system after the interconnection with the Muskrat Falls generating station. As a result, Hydro recorded a net increase to the regulatory asset of $0.1 million (2017 - $0.3 million).

13.(h) Deferred Specifically Assigned Industrial Revenue

In Board Order No. P.U. 7 (2018), Hydro was ordered to establish a deferral account, commencing April 1, 2018, to track the difference between the approved specifically assigned charges used to derive interim rates and the amount that would be charged if the proposed methodology in the general rate application is approved. During 2018, Hydro deferred $0.5 million.

13.(i) Insurance Amortization and Proceeds

Pursuant to Board Order No. P.U. 13 (2012), Hydro records net insurance proceeds against the capital costs and amortizes the balance over the life of the asset. Under IFRS, Hydro is required to recognize the insurance proceeds and corresponding amortization in regulatory liabilities. During 2018, Hydro recorded a decrease to regulatory liabilities resulting from amortization of $0.6 million (2017 - $0.5 million) related to the assets.

13.(j) Labrador Refund

Pursuant to Board Order No. P.U. 22 (2017), during 2017 Hydro refunded Labrador Industrial Transmission customers' excess revenues relating to the period of 2014 to 2017. The Board also ordered that Hydro apply a rate reduction for a 30-month period to address excess revenues relating to Hydro's rural customers on the Labrador Interconnected System. In 2018, Hydro recorded amortization of excess revenues which resulted in a decrease to profit of $0.2 million (2017 – $0.5 million).

13.(k) RSP

In 1986, the PUB ordered Hydro to implement the RSP which primarily provides for the deferral of fuel expense variances resulting from changes in fuel prices, hydrology and load and associated interest. Additionally, the RSP also includes costs associated with the island interconnected and isolated systems. Adjustments required in utility rates to cover the amortization of the balance are implemented on July 1 of each year. Similar adjustments required in industrial rates are implemented on January 1 of each year. On March 14, 2018, the PUB issued Board Order P.U. 7 (2018) which approved interim rates for Island Industrial and Labrador Industrial customers effective April 1, 2018. On May 28, 2018, the PUB issued Board Order No. P.U. 15 (2018). The order approved interim rates to be charged to Newfoundland Power commencing on July 1, 2018.

During 2018, Hydro recorded a net decrease in regulatory liabilities of $7.2 million (2017 - decrease of $269.4 million) resulting in an RSP ending balance for 2018 of $67.0 million (2017 - $74.2 million). The decrease in the RSP is primarily caused by the RSP surplus payout and the normal operation of the RSP. As per Board Order No. P.U. 36 (2016), the RSP was reduced by $3.4 million (2017 - $130.8 million) relating to the refund of the utility surplus balance. The reduction was comprised of a $3.2 million (2017 - $128.8 million) refund to customers and $0.2 million (2017 - $2.0 million) in administrative costs. The remaining portion of the utility surplus balance of $9.9 million (2017 - $12.6 million) is expected to be applied against the current balance of the RSP upon approval by the Board. The normal operation of the RSP resulted in an increase to net income of $3.8 million (2017 – $66.2 million).

13.(l) 2014 Cost Deferral

In Board Order No. P.U. 22 (2017), the Board approved $37.7 million of the $38.7 million 2014 cost deferral, resulting in a loss in 2017 of $1.0 million and the disposition of the deferral balance from the RSP. There was no additional activity in 2018.

13.(m) 2015 Cost Deferral

In Board Order No. P.U. 22 (2017), the Board approved $27.7 million of the 2015 cost deferral, resulting in a gain in 2017 of $3.2 million and the disposition of the deferral balance from the RSP. There was no additional activity in 2018.

13.(n) 2016 Cost Deferral

The 2016 cost deferral of $32.4 million consisted of energy supply costs of $31.0 million and other costs of $1.4 million. As a result of Board Order No. P.U. 22 (2017), $31.0 million was re-classified to the energy supply deferral. The Board also approved other 2016 costs of $5.0 million, which resulted in an increase in profit or loss of $3.6 million in 2017, and the disposition of the deferral balance from the RSP. There was no additional activity in 2018.

13.(o) Non-Customer Contributions in Aid of Construction

Pursuant to Board Order No. P.U. 1 (2017), Hydro recognized amortization of deferred contributions in aid of construction (CIAC) from entities which are not customers in profit or loss. During 2018, Hydro recorded $1.0 million (2017 - $1.1 million) non-customer CIAC amortization as a regulatory adjustment. In the absence of rate regulation, IFRS requires non-customer CIACs to be recorded as contributed capital with no corresponding amortization. As a result, during 2018 Hydro also recorded an increase of $1.0 million (2017 - $1.1 million) to contributed capital to recognize the amount that was reclassified to profit or loss.

13.(p) Asset Disposal

As per Board Order No. P.U. 49 (2016), the Board Ordered that Hydro recognize a regulatory asset of $0.4 million related to the Sunnyside transformer that was disposed of in 2014. Hydro is required to recover the deferred asset in rate base and amortize the asset for 22.4 years commencing in 2015. Hydro is required to exclude the new Sunnyside transformer from rate base until the Sunnyside Transformer Original Asset Deferral has been fully amortized.

13.(q) Deferred Purchased Power Savings

In 1997, the PUB ordered Hydro to defer $1.1 million related to reduced purchased power rates resulting from the interconnection of communities in the area of L'Anse au Clair to Red Bay to the Hydro-Québec system and amortize the balance over a 30 year period. The remaining unamortized savings in the amount of $0.3 million (2017 - $0.4 million) are deferred as a regulatory liability.

13.(r) Employee Future Benefits Actuarial Loss

Pursuant to Board Order No. P.U. 36 (2015), Hydro has recognized the amortization of employee future benefit actuarial gains and losses in net income. During 2018, Hydro recorded $0.2 million (2017 - $0.1 million) employee future benefits losses as a regulatory adjustment. In the absence of rate regulation, IFRS would require Hydro to include employee future benefits actuarial gains and losses in other comprehensive income. As a result, during 2018 Hydro also recorded a decrease of $0.2 million (2017 - $0.1 million) to other comprehensive income to recognize the amount that was reclassified to profit or loss.

13.(s) Hearing Costs

As per Board Order No. P.U. 49 (2016), the Board approved $0.8 million in hearing costs to be deferred and amortized over a three year period commencing 2015. In 2017, Hydro recorded amortization of $0.3 million. There was no additional activity in 2018.

14. TRADE AND OTHER PAYABLES

As at December 31 (millions of Canadian dollars)	**2018**	2017
Trade payables	**59**	110
Accrued interest payable	**25**	24
Due to related parties	**6**	6
Other payables	**28**	23
	118	163

As at December 31, 2018 trade and other payables included balances of $0.3 million (2017 - $18.6 million) denominated in USD.

15. DEBT

15.1 Short-term Borrowings

On June 29, 2018, Hydro signed an extension to its $200.0 million CAD or USD equivalent committed revolving term credit facility resulting in a new maturity date of July 27, 2020. As at December 31, 2018, there were no amounts drawn on the facility (2017 - $nil). Borrowings in CAD may take the form of Prime Rate Advances, Bankers' Acceptances (BAs), and letters of credit, with interest calculated at the Prime Rate or prevailing Government BA fee. Borrowings in USD may take the form of Base Rate Advances, London Interbank Offer Rate (LIBOR) Advances and letters of credit. The facility also provides coverage for overdrafts on Hydro's bank accounts, with interest calculated at the Prime Rate.

On March 14, 2018, Hydro repaid an intercompany loan in the amount of $225.0 million to Nalcor. This loan was set to mature on March 30, 2018 and carried an interest rate of 1.845%.

In addition, Hydro utilized its $300.0 million government guaranteed promissory note program to fulfill its short-term funding requirements. As at December 31, 2018, there were $189.0 million in promissory notes outstanding with a maturity date of January 3, 2019 bearing an interest rate of 1.77% (2017 - $144.0 million bearing an interest rate of 1.13%).

On January 3, 2019, Hydro reissued a promissory note in the amount of $196.0 million with a maturity date of January 21, 2019 bearing an interest rate of 1.80%. Upon maturity, the promissory note was reissued.

As at December 31 (millions of Canadian dollars)	**2018**	2017
Promissory notes - borrowed from Nalcor	**-**	225
Promissory notes - borrowed from external markets	**189**	144
	189	369

15.2 Long-term Debt

The following table represents the value of long-term debt measured at amortized cost:

As at December 31 (millions of Canadian dollars)	Face Value	Coupon Rate %	Year of Issue	Year of Maturity	**2018**	2017
Hydro						
Y *	300	8.40	1996	2026	**296**	295
AB *	300	6.65	2001	2031	**305**	305
AD *	125	5.70	2003	2033	**124**	124
AF	500	3.60	2014/2017	2045	**480**	480
1A	600	3.70	2017/2018	2048	**641**	330
Total	1,825				**1,846**	1,534
Less: Sinking fund investments in own debentures					**55**	45
					1,791	1,489
Less: Sinking fund payments within one year					**7**	7
Total					**1,784**	1,482

*Sinking funds have been established for these issues.
*Hydro's V Series debentures had a balance of $0.2 million outstanding as at December 31, 2018.

Hydro’s promissory notes and debentures are unsecured and unconditionally guaranteed as to principal and interest and, where applicable, sinking fund payments, by the Province, with exception of Series 1A. The Province charges Hydro a guarantee fee of 25 basis points annually on the total debt (net of sinking funds) with a remaining term to maturity of less than or equal to 10 years and 50 basis points annually on total debt (net of sinking funds) with a remaining term to maturity greater than 10 years for debt outstanding as of December 31, 2010. For debt issued subsequent to December 31, 2010, the guarantee rate is 25 basis points annually on the total debt (net of sinking funds) with an original term to maturity of less than or equal to 10 years and 50 basis points annually on total debt (net of sinking funds) with an original term to maturity greater than 10 years. The guarantee fee charged by the province for the year ended December 31, 2018 was $6.9 million (December 31, 2017 - $4.1 million).

On March 14, 2018 Hydro issued additional long-term debt, Series 1A, with face value of $300.0 million. The Province issued debt specifically on Hydro’s behalf and lent the proceeds to Hydro. The debt, repayable to the Province, matures on October 17, 2048 with a coupon rate of 3.70% paid semi-annually.

16. DEFERRED CONTRIBUTIONS

Hydro has received contributions in aid of construction of property, plant and equipment. These contributions are deferred and amortized to other revenue over the life of the related property, plant and equipment asset.

As at December 31 (millions of Canadian dollars)	**2018**	2017
Deferred contributions, beginning of year	**17**	6
Additions	**1**	1
Other adjustments	**2**	11
Amortization	**(1)**	(1)
Deferred contributions, end of year	**19**	17
Less: current portion	**(1)**	(1)
	18	16

17. DECOMMISSIONING LIABILITIES

Hydro has recognized liabilities associated with the retirement of portions of the HTGS and the disposal of Polychlorinated Biphenyls (PCB).

The reconciliation of the beginning and ending carrying amounts of decommissioning liabilities for December 31, 2018 and December 31, 2017 are as follows:

As at December 31 (millions of Canadian dollars)	**2018**	2017
Decommissioning liabilities, beginning of year	**14**	15
Accretion	**-**	-
Revisions	**-**	(1)
Decommissioning liabilities, end of year	**14**	14

The total estimated undiscounted cash flows required to settle the HTGS obligations at December 31, 2018 are \$15.2 million (2017 - \$15.2 million). Payments to settle the liability are expected to occur between 2020 and 2023. The fair value of the decommissioning liabilities was determined using the present value of future cash flows discounted at Hydro’s credit adjusted risk free rate of 2.3% (2017 - 2.6%). Hydro has recorded \$13.9 million (2017 - \$13.5 million) related to HTGS obligations.

The total estimated undiscounted cash flows required to settle the PCB obligations at December 31, 2018 are \$0.5 million (2017 - \$0.4 million). Payments to settle the liability are expected to occur between 2019 and 2025. The fair value of the decommissioning liabilities was determined using the present value of future cash flows discounted at Hydro’s credit adjusted risk free rate of 2.5% (2017 - 2.8%). Hydro has recorded \$0.4 million (2017 - \$0.3 million) related to PCB obligations.

A significant number of Hydro’s assets include generation plants, transmission assets and distribution systems. These assets can continue to run indefinitely with ongoing maintenance activities. As it is expected that Hydro's assets will be used for an indefinite period, no removal date can be determined and consequently, a reasonable estimate of the fair value of any related decommissioning liability cannot be determined at this time. If it becomes possible to estimate the fair value of the cost of removing assets that Hydro is required to remove, a decommissioning liability for those assets will be recognized at that time.

18. EMPLOYEE FUTURE BENEFITS

18.1 Pension Plan

Employees participate in the Province's Public Service Pension Plan, a multi-employer defined benefit plan. The employer's contributions for the year ended December 31, 2018 of $8.0 million (2017 - $8.1 million) are expensed as incurred.

18.2 Other Benefits

Hydro provides group life insurance and health care benefits on a cost shared basis to retired employees, and in certain cases, their surviving spouses, in addition to a retirement allowance upon retirement. In 2018, cash payments to beneficiaries for its unfunded other employee future benefits were $2.4 million (2017 - $3.2 million). An actuarial valuation was performed as at December 31, 2018.

As at December 31 (millions of Canadian dollars)		**2018**	2017
Accrued benefit obligation, beginning of year		**90**	85
Current service cost		**4**	3
Interest cost		**3**	3
Benefits paid		**(2)**	(3)
Actuarial (gain) loss		**(8)**	2
Transfers and other	(a)	**(1)**	-
Accrued benefit obligation, end of year		**86**	90

(a) When an employee transfers to a related party, the associated accrued benefit obligation is allocated to each respective party based on years of service.

For the year ended (millions of Canadian dollars)	**2018**	2017
Component of benefit cost		
Current service cost	**4**	3
Interest cost	**3**	3
Total benefit expense for the year	**7**	6

The significant actuarial assumptions used in measuring the accrued benefit obligations and benefit expenses are as follows:

	2018	2017
Discount rate - benefit cost	**3.55%**	3.90%
Discount rate - accrued benefit obligation	**3.90%**	3.55%
Rate of compensation increase	**3.50%**	3.50%

Assumed healthcare trend rates:

	2018	2017
Initial health care expense trend rate	**5.85%**	6.00%
Cost trend decline to	**4.50%**	4.50%
Year that rate reaches the rate it is assumed to remain at	**2028**	2028

A 1% change in assumed health care trend rates would have had the following effects:

Increase (millions of Canadian dollars)	**2018**	2017
Current service and interest cost	**2**	2
Accrued benefit obligation	**14**	15

Decrease (millions of Canadian dollars)	**2018**	2017
Current service and interest cost	**(1)**	(1)
Accrued benefit obligation	**(10)**	(11)

19. ACCUMULATED OTHER COMPREHENSIVE INCOME

The components of, and changes in, accumulated other comprehensive income (loss) are as follows:

Items that may or have been reclassified to profit or loss:

(millions of Canadian dollars)	**2018**	2017
Employee future benefits		
Balance at January 1	**(22)**	(19)
Regulatory adjustment	**-**	-
Other comprehensive gain (loss) from investment in joint arrangement	**1**	(1)
Net actuarial gain (loss) on defined benefit plans	**8**	(2)
Balance at December 31	**(13)**	(22)

20. SHAREHOLDER'S EQUITY

20.1 Share Capital

As at December 31 (millions of Canadian dollars)	**2018**	2017
Common shares of par value of $1 each		
Authorized: 25,000,000		
Issued, paid and outstanding: 22,503,942	**23**	23

20.2 Contributed Capital

As at December 31 (millions of Canadian dollars)	**2018**	2017
Contributed capital, beginning of year	**146**	144
Additions	**2**	3
Amortization	**(1)**	(1)
Contributed capital, end of year	**147**	146

During 2018, Lower Churchill Management Corporation contributed $1.7 million (2017 - $2.7 million) in additions to property, plant and equipment. Pursuant to Board Order No. P.U. 1 (2017), Hydro recognized $1.0 million (2017 - $1.1 million) in amortization as a regulatory adjustment.

20.3 Dividends

For the year ended December 31 (millions of Canadian dollars)	**2018**	2017
Declared during the year		
Final dividend for prior year: $0.06 per share (2017 - $0.02)	**1**	1
Interim dividend for current year: $0.30 per share (2017 - $0.28)	**7**	6
	8	7

21. OPERATING COSTS

For the year ended December 31 (millions of Canadian dollars)	**2018**	2017
Salaries and benefits	**87**	84
Maintenance and materials	**25**	26
Professional services	**8**	6
Travel and transportation	**4**	3
Equipment rental	**3**	2
Insurance	**3**	3
Other operating costs	**6**	7
	136	131

22. NET FINANCE EXPENSE

For the year ended December 31 (millions of Canadian dollars)	**2018**	2017
Finance income		
Interest on sinking fund	**11**	12
Other interest income	**1**	1
	12	13
Finance expense		
Long-term debt	**90**	78
Debt guarantee fee	**7**	4
Accretion	**-**	1
Other	**4**	6
	101	89
Interest capitalized during construction	**(3)**	(11)
	98	78
Net finance expense	**86**	65

23. OTHER EXPENSE

For the year ended December 31 (millions of Canadian dollars)		**2018**	2017
Loss on disposal of property, plant and equipment		**10**	4
Net change in PPA fair value	(a)	**-**	-
Foreign exchange loss (gain)		**2**	(1)
Other		**1**	3
Other expense		**13**	6

(a) Net change in PPA fair value

For the year ended December 31 (millions of Canadian dollars)	**2018**	2017
PPA gains		
Settlement of realized profit	**(49)**	(42)
Mark-to-market of derivative	**18**	(9)
	(31)	(51)
PPA losses		
Amortization of deferral	**31**	51
	31	51
Net change in PPA fair value	**-**	-

24. FINANCIAL INSTRUMENTS AND RISK MANAGEMENT

24.1 Fair Value

The estimated fair values of financial instruments as at December 31, 2018 and December 31, 2017 are based on relevant market prices and information available at the time. Fair value estimates are based on valuation techniques which are significantly affected by the assumptions used including the amount and timing of future cash flows and discount rates reflecting various degrees of risk. As such, the fair value estimates below are not necessarily indicative of the amounts that Hydro might receive or incur in actual market transactions.

As a significant number of Hydro's assets and liabilities do not meet the definition of a financial instrument, the fair value estimates below do not reflect the fair value of Hydro as a whole.

Establishing Fair Value

Financial instruments recorded at fair value are classified using a fair value hierarchy that reflects the nature of the inputs used in making the measurements. The fair value hierarchy has the following levels:

Level 1 - valuation based on quoted prices (unadjusted) in active markets for identical assets or liabilities.

Level 2 - valuation techniques based on inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices).

Level 3 - valuation techniques using inputs for the asset or liability that are not based on observable market data (unobservable inputs).

The fair value hierarchy requires the use of observable market inputs whenever such inputs exist. A financial instrument is classified to the lowest level of the hierarchy for which a significant input has been considered in measuring fair value. For assets and liabilities that are recognized at fair value on a recurring basis, Hydro determines whether transfers have occurred between levels in the hierarchy by reassessing categorization (based on the lowest level input that is significant to the fair value measurement as a whole) at the end of each reporting period. There were no transfers between Level 1, 2 and 3 fair value measurement during the years ended December 31, 2018 and December 31, 2017.

	Level	**Carrying Value**	**Fair Value**	Carrying Value	Fair Value
As at (millions of Canadian dollars)		**December 31, 2018**		December 31, 2017	
Financial assets					
Sinking funds - investments in same Hydro issue	**2**	**55**	**63**	45	56
Sinking funds - other investments	**2**	**164**	**195**	156*	190
Financial liabilities					
Derivative liability	**3**	**21**	**21**	31	31
Long-term debt including amount due within one year (before sinking funds)	**2**	**1,846**	**2,100**	1,534	1,848

* The carrying value of certain financial assets has been restated. Please refer to Note 4.1

The fair value of cash and cash equivalents, trade and other receivables, short-term borrowings, and trade and other payables approximates their carrying values due to their short-term maturity.

The fair values of Level 2 financial instruments are determined using quoted prices in active markets, which in some cases are adjusted for factors specific to the asset or liability. Level 2 derivative instruments are valued based on observable commodity future curves, broker quotes or other publicly available data. Level 2 fair values of other risk management assets and liabilities and long-term debt are determined using observable inputs other than unadjusted quoted prices, such as interest rate yield curves and currency rates.

Level 3 financial instruments include the derivative liability relating to the PPA with Nalcor Energy Marketing and represents the future value provided to Nalcor Energy Marketing through the contract.

The following table summarizes quantitative information about the valuation techniques and unobservable inputs used in the fair value measurement of Level 3 financial instruments as at December 31, 2018:

(millions of Canadian dollars)	Carrying Value	Valuation Techniques	Significant Unobservable Input(s)	Range
Derivative liability (PPA)	21	Modelled pricing	Volumes (MWh)	14-25% of available generation

The derivative liability arising under the PPA is designated as a Level 3 instrument as certain forward market prices and related volumes are not readily determinable to estimate a portion of the fair value of the derivative liability. Hence, fair value measurement of this instrument is based upon a combination of internal and external pricing and volume estimates. As at December 31, 2018, the effect of using reasonably possible alternative assumptions for volume inputs to valuation techniques may have resulted in $nil to $2.3 million change in the carrying value of the power purchase derivative liability.

24.2 Risk Management

Hydro is exposed to certain credit, liquidity and market price risks through its operating, investing and financing activities. Financial risk is managed in accordance with Nalcor's Board approved Financial Management Risk Policy, which outlines the objectives and strategies for the management of financial risk, including the use of derivative contracts. Permitted financial risk management strategies are aimed at minimizing the volatility of Hydro's expected future cash flows.

Credit Risk

Hydro's expected future cash flow is exposed to credit risk through its operating activities, primarily due to the potential for non-performance by its customers, and through its financing and investing activities, based on the risk of non-performance by counterparties to its financial instruments. The degree of exposure to credit risk on cash and cash equivalents and derivative assets as well as from the sale of electricity to customers, including the associated accounts receivable, is determined by the financial capacity and stability of those customers and counterparties. The maximum exposure to credit risk on these financial instruments is represented by their carrying values on the Non-Consolidated Statement of Financial Position at the reporting date.

Credit risk on cash and cash equivalents is minimal, as Hydro's cash deposits are held by a Schedule 1 Canadian Chartered Bank with a rating of A+ (Standard and Poor's).

Credit exposure on Hydro's sinking funds is limited by restricting the holdings to long-term debt instruments issued by the Government of Canada or any province of Canada, Crown corporations and Schedule 1 Canadian Chartered Banks. The following credit risk table provides information on credit exposures according to issuer type and credit rating for the remainder of the sinking fund portfolio:

	Issuer Credit Rating	**Fair Value of Portfolio (%)**	Issuer Credit Rating	Fair Value of Portfolio (%)
	2018		2017	
Provincial Governments	**A- to A+**	**44.98%**	A- to A+	46.25%
Provincially owned utilities	**A- to A+**	**55.02%**	A- to A+	53.75%
		100.00%		100.00%

Credit exposure on derivative assets is limited by the Financial Risk Management Policy, which restricts available counterparties for hedge transactions to Schedule 1 Canadian Chartered Banks, and Federally Chartered US Banks.

Hydro's exposure to credit risk on its energy sales and associated accounts receivable is determined by the credit quality of its customers. Hydro's three largest customers account for 81.8% (2017 - 81.9%) of total energy sales and 62.4% (2017 - 55.8%) of accounts receivable. Energy sales for the three largest customers include $455.9 million (2017 - $409.6 million) for Regulated Hydro, as well as $33.1 million (2017 - $39.9 million) for Non-Regulated Hydro.

Liquidity Risk
Hydro is exposed to liquidity risk with respect to its contractual obligations and financial liabilities, including any derivative liabilities related to hedging activities. Liquidity risk management is aimed at ensuring cash is available to meet those obligations as they become due.

Short-term liquidity is mainly provided through cash and cash equivalents on hand, funds from operations and a $300.0 million promissory note program. In addition, Hydro maintains a $200.0 million (2017 - $200.0 million) committed revolving term credit facility with its primary banker in order to meet any requirements beyond those forecasted for a given period. Long-term liquidity risk is managed by the issuance of a portfolio of debentures with maturity dates ranging from 2026 to 2048. Sinking funds have been established for these issues, with the exception of the issues maturing in 2045 and 2048.

The following are the contractual maturities of Hydro's financial liabilities, including principal and interest, as at December 31, 2018:

(millions of Canadian dollars)	< 1 Year	1-3 Years	3-5 Years	> 5 Years	Total
Trade and other payables	118	-	-	-	118
Short-term borrowings	189	-	-	-	189
Derivative liability	21	-	-	-	21
Long-term debt including sinking funds	7	13	13	1,792	1,825
Interest	92	185	185	1,220	1,682
	427	198	198	3,012	3,835

Market Risk
In the course of carrying out its operating, financing and investing activities, Hydro is exposed to possible market price movements that could impact expected future cash flow and the carrying value of certain financial assets and liabilities. Market price movements to which Hydro has significant exposure include those relating to prevailing interest rates, foreign exchange rates, most notably the USD/CAD, and current commodity prices, most notably the spot prices for fuel, electricity, and No. 6 fuel. These exposures were addressed as part of the Financial Risk Management Policy.

Interest Rates
Changes in prevailing interest rates will impact the fair value of financial assets and liabilities, which includes Hydro's cash and cash equivalents and, short-term investments. Expected future cash flows associated with those financial instruments can also be impacted. The impact of a 0.5% change in interest rates on profit and other comprehensive income associated with cash and cash equivalents and short-term debt was negligible throughout 2018 due to the short time period to maturity. There was no impact on profit and other comprehensive income associated with long-term debt as all of Hydro's long-term debt has fixed interest rates.

Foreign Currency and Commodity Exposure
Hydro's primary exposure to both foreign exchange and commodity price risk arises from its purchases of No. 6 fuel for consumption at the HTGS, and these risks are mitigated through the operation of the RSP.

The components of the change impacting the carrying value of the derivative asset and derivative liability for the years ended December 31, 2018 and December 31, 2017 are as follows:

(millions of Canadian dollars)	**(Level III)**
Balance at January 1, 2018	**(31)**
Purchases	**(21)**
Changes in profit or loss	
Mark-to-market	**(18)**
Settlements	**49**
Total	**31**
Balance at December 31, 2018	**(21)**

(millions of Canadian dollars)	Total
Balance at January 1, 2017	(51)
Purchases	(31)
Changes in profit or loss	
Mark-to-market	9
Settlements	42
Total	51
Balance at December 31, 2017	(31)

25. RELATED PARTY TRANSACTIONS

Hydro enters into various transactions with its parent and other affiliates. These transactions occur in the normal course of operations and are measured at the exchange amount, which is the amount of consideration agreed to by the related parties. Related parties with which Hydro transacts are as follows:

Related Party	Relationship
Nalcor	100% shareholder of Hydro
The Province	100% shareholder of Nalcor
Churchill Falls	Joint arrangement of Hydro
Twin Falls	Joint venture of Churchill Falls
Energy Marketing	Wholly-owned subsidiary of Nalcor
Lower Churchill Management Corporation	Wholly-owned subsidiary of Nalcor
Labrador-Island Link Operating Corporation (LIL Opco)	Wholly-owned subsidiary of Nalcor
Muskrat Falls Corporation (Muskrat Falls)	Wholly-owned subsidiary of Nalcor
Nalcor Energy – Bull Arm Fabrication Inc.	Wholly-owned subsidiary of Nalcor
Nalcor Energy – Oil and Gas Inc.	Wholly-owned subsidiary of Nalcor
PUB	Agency of the Province

Routine operating transactions with related parties are settled at prevailing market prices under normal trade terms. Outstanding balances due to or from related parties are non-interest bearing with settlement within 30 days, unless otherwise stated.

(a) On September 29, 2017, Hydro renewed an intercompany loan with Nalcor in the amount of $225.0 million to Hydro. This loan matured on March 30, 2018 and had an interest rate of 1.845%. The loan was repaid on March 14, 2018.

(b) For the year ended December 31, 2018, Lower Churchill Management Corporation contributed $1.7 million (2017 - $2.7 million) in additions to property, plant and equipment.

(c) For the year ended December 31, 2018, Hydro purchased $41.2 million (2017 - $43.4 million) of power produced by Churchill Falls under long-term power contracts.

(d) Hydro is required to incur the costs of operations, hearings and application costs of the PUB, including costs of any experts and consultants engaged by the PUB. During 2018, Hydro incurred $1.9 million (2017 - $1.8 million) in costs related to the PUB and has included $0.7 million (2017 - $3.0 million) in trade and other payables.

(e) As at December 31, 2018, Hydro has a payable to related parties of $6.2 million (2017 - $5.7 million) and a receivable from related parties for $6.9 million (2017 - $4.6 million). This payable/receivable consists of various intercompany operating costs and power purchases.

(f) The debt guarantee fee for 2018 was $6.9 million (2017 - $4.1 million). It was paid to the Province on March 29, 2018.

(g) For the year ended December 31, 2018, Hydro recovered $2.0 million (2017 - $2.2 million) of operating costs from related parties representing the provision of administrative services.

(h) For the year ended December 31, 2018, Hydro incurred $5.4 million (2017 - $3.9 million) in operating costs from related parties representing the provision of administrative services.

(i) For the year ended December 31, 2018, Hydro has purchased $28.4 million (2017 - $26.3 million) of power generated from assets related to Exploits Generation, which are owned by the Province. In addition, Hydro operates these assets on behalf of Nalcor and recovered costs in the amount of $30.4 million (2017 - $21.9 million).

(j) For the year ended December 31, 2018, Hydro has incurred intercompany labour expense of $1.2 million (2017 - $1.6 million) and recovered intercompany labour expense of $1.6 million (2017 - $1.5 million) for operating and capital labour. Additionally, the fixed charge associated with this labour is $0.1 million (2017 - $0.2 million) incurred and $0.3 million (2017 - $0.3 million) recovered respectively.

(k) Hydro received $0.8 million (2017 - $0.8 million) from Nalcor associated with the Upper Churchill Redress Agreement to be used to reduce the electricity accounts of residential customers in Innu Communities and to Mushuau Innu First Nation.

(l) Hydro recorded $2.0 million (2017 - $1.8 million) as an energy rebate from the Province to offset the cost of basic electricity consumption for Labrador rural isolated residential customers under the Northern Strategic Plan. As at December 31, 2018, there is a balance of $0.4 million (2017 - $0.6 million) outstanding in trade and other receivables.

(m) Hydro received $0.4 million (2017 - $0.5 million) from other lines of business as a contribution in aid of construction for Information Systems assets.

(n) On March 14, 2018, Hydro issued new long-term debt, Series 1A, with face value of $300.0 million (2017 - $300.0 million). The Province issued debt specifically on Hydro’s behalf and lent the proceeds to Hydro.

(o) Hydro recorded $1.4 million as a receivable from Lower Churchill Management Corporation to reimburse costs of running the Holyrood Gas Turbine to accommodate the interconnection of Soldier’s Pond.

25.1 Key Management Personnel Compensation

Compensation for key management personnel, which Hydro defines as its executives who have the primary authority and responsibility in planning, directing and controlling the activities of the entity, includes compensation for senior executives. Salaries and employee benefits include base salaries, performance contract payments, vehicle allowances and contributions to employee benefit plans. Post-employment benefits include contributions to the Province's Public Service Pension Plan in the amount of $0.2 million (2017 – $0.2 million).

For the year ended December 31 (millions of Canadian dollars)	**2018**	2017
Salaries and employee benefits	**2**	2

26. COMMITMENTS AND CONTINGENCIES

(a) Hydro has received claims instituted by various companies and individuals with respect to power delivery claims and other miscellaneous matters. Although the outcome of such matters cannot be predicted with certainty, Management believes Hydro's exposure to such claims and litigation, to the extent not covered by insurance policies or otherwise provided for, is not expected to materially affect its financial position.

(b) Outstanding commitments for capital projects total approximately $21.8 million as at December 31, 2018 (2017 - $38.9 million).

(c) Hydro has entered into a number of long-term power purchase agreements as follows:

Type	Rating	Effective Date	Term
Hydroelectric	3 MW	1995	25 years
Hydroelectric	4 MW	1998	25 years
Hydroelectric	300 MW	1998	43 years
Cogeneration	15 MW	2003	20 years
Wind	390 kW	2004	15 years
Wind	27 MW	2008	20 years
Wind	27 MW	2009	20 years
Wind	300 kW	2010	Continual
Hydroelectric	225 MW	2015	25.5 years
Hydroelectric	175 kW	2017	15 years
Biomass	450 kW	2018	1 year post in-service of Muskrat Falls in-service date

Estimated payments due in each of the next five years are as follows:

(millions of dollars)	2019	2020	2021	2022	2023
Power purchases	80.5	81.9	82.0	82.4	83.0

(d) Through a power purchase agreement signed October 1, 2015, with Nalcor Energy Marketing, Hydro maintains the transmission services contract it entered into with Hydro Québec TransÉnergie which concludes in 2024.

The transmission rental payments for the next five years are estimated to be as follows:

2019	$21.1 million
2020	$21.4 million
2021	$21.6 million
2022	$21.8 million
2023	$22.0 million

(e) In 2013, Hydro entered into a Power Purchase Agreement with Muskrat Falls for the purchase of energy and capacity from the Muskrat Falls Plant. The supply period under the agreement is 50 years and commences at the date of commissioning of the Muskrat Falls Plant. Estimated payments for the next five years have not yet been determined.

(f) In 2013, Hydro entered into the Transmission Funding Agreement (TFA) with LIL Opco, in which Hydro has committed to make payments which will be sufficient for LIL Opco to recover all costs associated with rent payments under the LIL Lease and payments to cover operating and maintenance costs incurred by LIL Opco. Hydro will be required to begin mandatory payments associated with the TFA upon commissioning of the Lower Churchill Project assets. The term of the TFA is anticipated to continue until the service life of the LIL assets has expired.

(g) In 2018, Hydro entered into three additional agreements in order to enable transmission of energy from Labrador to the island; the Labrador Island Link Interim Transmission Funding Agreement (LIL interim TFA); Labrador Transmission Assets Interim Transmission Funding Agreement (LTA interim TFA); and a Minimum Performance Guarantee (the Guarantee). The LIL Interim TFA is between the Labrador Island Link Limited Partnership (Partnership) and Hydro to provide for cost reimbursement, from Hydro to the Partnership, for operating and maintenance costs resulting from the LIL being made available for service earlier than would otherwise be required. The LTA Interim TFA is between the Labrador Transmission Corporation (LTC) and Hydro to provide for cost reimbursement, from Hydro to LTC, for operating and maintenance costs resulting from the LTA being made available for service earlier than would otherwise be required. Both of the Interim TFA's were developed based on existing long-term Transmission Funding Agreement, executed in 2013. The Guarantee is between Nalcor Energy and Hydro and provides Hydro with guaranteed minimum average availability of the LIL and LTA during the term of the Interim TFA's. Should performance deficiencies by either or both of the LIL and LTA result in Hydro realizing a net loss from the use of off-island purchases, Nalcor will reimburse Hydro, in proportion to the contribution of these deficiencies to the net loss, for the operating and maintenance costs of the LIL and LTA.

(h) In 2014, Hydro entered into three Capacity Assistance Agreements, one with Vale Newfoundland & Labrador Limited (Vale) and two with Corner Brook Pulp and Paper Limited (CBPP) for the purchase of relief power during the winter period. In 2016, Hydro also entered into two new Capacity Assistance Agreements, one with Praxair and a second agreement with Vale for the purchase of relief power. The agreements with Vale and Praxair have a supply period defined as December 1 to March 31 for each contract year, concluding March 2018. In November 2017, Hydro entered into a revised agreement with CBPP that expires the earlier of April 30, 2022 or the commissioning of the Muskrat Falls plant. Payment for services will be dependent on the successful provision of capacity assistance for the winter period by Vale, CBPP and Praxair. In December 2018, Hydro entered into a revised agreement with Vale that expires in March of 2019; the agreement with Praxair was not renewed.

27. CAPITAL MANAGEMENT

Hydro's principal business requires ongoing access to capital in order to maintain assets to ensure the continued delivery of safe and reliable service to its customers. Therefore, Hydro's primary objective when managing capital is to ensure ready access to capital at a reasonable cost, to minimize its cost of capital within the confines of established risk parameters, and to safeguard Hydro's ability to continue as a going concern.

The capital managed by Hydro is comprised of debt (long-term debentures, short-term borrowings, bank credit facilities and bank indebtedness) and equity (share capital, shareholder contributions, reserves and retained earnings).

A summary of the capital structure is outlined below:

(millions of dollars)	**2018**		2017 (Restated - Note 4.1)	
Debt				
Sinking funds	**(164)**		(156)	
Short-term borrowings	**189**		369	
Current portion of long-term debt	**7**		7	
Long-term debt	**1,784**		1,482	
	1,816	**65.0%**	1,702	65.0%
Equity				
Share capital	**23**		23	
Contributed capital	**147**		146	
Reserves	**(13)**		(22)	
Retained earnings	**822**		768	
	979	**35.0%**	915	35.0%
Total Debt and Equity	**2,795**	**100.0%**	2,617	100.0%

Hydro’s approach to capital management encompasses various factors including monitoring the percentage of floating rate debt in the total debt portfolio, the weighted average term to maturity of its overall debt portfolio, its percentage of debt to debt plus equity, and its interest coverage.

For the regulated portion of Hydro’s operations, Management targets a capital structure comprised of 75% debt and 25% equity, a ratio which Management believes to be optimal with respect to its cost of capital. This capital structure is maintained by a combination of dividend policy, shareholder contributions and debt issuance. The issuance of any new debt with a term greater than one year requires prior approval of the PUB. Hydro's committed operating facility has a covenant restricting the issuance of debt such that consolidated debt to total capitalization ratio cannot exceed 85%. As at December 31, 2018, Hydro was in compliance with this covenant.

Legislation stipulates that the total of the Government guaranteed short-term loans issued by Hydro and outstanding at any time shall not exceed a limit as fixed by the Lieutenant-Governor in Council. Short-term loans are those loans issued with a term not exceeding two years. The current limit is set at $300.0 million and $189.0 million is outstanding as at December 31, 2018 (2017 - $144.0 million). Issuance of short-term borrowings and long-term debt by Hydro is further restricted by Bill C-24, an amendment to the Newfoundland and Labrador Hydro Act of 1975. The Bill effectively limits Hydro's total borrowings, which includes both short-term and long-term debt, to $2.1 billion at any point in time.

Historically, Hydro Regulated addressed longer-term capital funding requirements by issuing government guaranteed long-term debt in the domestic capital markets. However, in December 2017, Hydro Regulated’s process changed; the Province now issues debt in the domestic capital markets, on Hydro Regulated's behalf, and in turn loans the funds to Hydro Regulated on a cost recovery basis. In 2017, through an Order in Council, the Province was authorized to borrow up to $700.0 million on Hydro Regulated’s behalf, expiring March 31, 2018. On March 14, 2018, the Province issued $300.0 million in debt and lent the proceeds to Hydro Regulated. As at December 31, 2018, $600.0 million had been issued under this borrowing authorization. Any additional funding to address long-term capital funding requirements, will require approval from the Province and the PUB.

28. SUPPLEMENTARY CASH FLOW INFORMATION

For the year ended December 31 (millions of Canadian dollars)	**2018**	2017
Trade and other receivables	**3**	(28)
Inventories	**(1)**	(17)
Prepayments	**(1)**	(1)
Trade and other payables	**(42)**	15
Changes in non-cash working capital balances	**(41)**	(31)
Related to:		
Operating activities	**(20)**	(35)
Investing activities	**(21)**	4
	(41)	(31)

29. SEGMENT INFORMATION

Hydro operates in three business segments. The designation of segments is based on a combination of regulatory status and management accountability.

Hydro Regulated activities encompass sales of electricity to customers within the Province that are regulated by the PUB. Hydro Non-Regulated activities include the sale of recapture energy, purchased from Churchill Falls, to mining operations in Labrador West as well as costs of Hydro that are excluded from the determination of customer rates. Energy Marketing includes the sale of electricity and transmission costs to Energy Marketing.

	Hydro Regulated	Non-Regulated Activities	Energy Marketing	Total
(millions of Canadian dollars)	For the year ended December 31, 2018			
Energy sales	557	34	7	598
Other revenue	7	(1)	21	27
Revenue	564	33	28	625
Fuels	189	-	-	189
Power purchased	71	33	7	111
Operating costs	136	-	-	136
Transmission rental	-	-	21	21
Depreciation and amortization	87	-	-	87
Net finance expense	87	(1)	-	86
Other expense	13	-	-	13
Expenses	583	32	28	643
(Loss) profit for the year from operations	(19)	1	-	(18)
Share of profit of joint arrangement	-	25	-	25
Preferred dividends	-	8	-	8
(Loss) profit, before regulatory adjustments	(19)	34	-	15
Regulatory adjustments	(47)	-	-	(47)
Profit for the year	28	34	-	62
Capital expenditures*	160	-	-	160
Total assets	2,700	565	23	3,288

***Capital expenditures include non-cash additions of $1.7 million contributed by Lower Churchill Management Corporation.**

(millions of Canadian dollars)	Hydro Regulated	Non-Regulated Activities	Energy Marketing	Total
	For the year ended December 31, 2017			
Energy sales	506	40	3	549
Other revenue	5	-	20	25
Revenue	511	40	23	574
Fuels	226	-	-	226
Power purchased	62	39	3	104
Operating costs	130	1	-	131
Transmission rental	-	-	20	20
Depreciation and amortization	78	-	-	78
Net finance expense	65	-	-	65
Other expense	6	-	-	6
Expenses	567	40	23	630
(Loss) for the year from operations	(56)	-	-	(56)
Share of profit of joint arrangement	-	26	-	26
Preferred dividends	-	7	-	7
(Loss) profit, before regulatory adjustments	(56)	33	-	(23)
Regulatory adjustments	(92)	-	-	(92)
Profit for the year	36	33	-	69
Capital expenditures*	344	-	-	344
Total assets	2,582	553	32	3,167

*Capital expenditures include non-cash additions of $2.7 million contributed by Lower Churchill Management Corporation.

30. COMPARATIVE FIGURES

Certain of the comparative figures have been reclassified to conform to the basis of presentation adopted during the current reporting period. The changes have been summarized as follows:

(millions of Canadian dollars)	Previously Reported	Third party contributed capital asset Presentation	**Reclassified Balance**
Property, plant and equipment	2,069	11	**2,080**
Deferred contributions	5	11	**16**

Return 2
Hydro Board and Officer List

Newfoundland and Labrador Hydro
Board of Directors

John Green, Q.C.
Chairperson, Newfoundland and Labrador Hydro
Counsel, McInnes Cooper
202 - 20 Linden Place
St John's, NL A1B 2S8

Donna Brewer
Deputy Minister of Finance (Retired)
Government of Newfoundland and Labrador
161 Magee Drive
Paradise, NL A1L 4G6

Dr. Chris Loomis
Professor (Retired)
Memorial University of Newfoundland
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Chief Executive Officer, Newfoundland and Labrador Hydro
President and Chief Executive Officer, Nalcor Energy
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Brendan Paddick
Chief Executive Officer
Columbus Capital Corp.
62 Queens Road
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David Oake
President
Invenio Consulting Inc.
11 Tracey Place
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Newfoundland and Labrador Hydro
Board of Directors

Fraser Edison
President and CEO
Rutter Inc.
16 Waterford Heights South
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John Mallam
Retired
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William Nippard
President and CEO
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Brian Walsh
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Terry Gardiner
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Jennifer Williams
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Officers of the Company

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Corporate Secretary and General Counsel
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Michael Ladha
Assistant Corporate Secretary
Newfoundland and Labrador Hydro
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Return 3
Computation of Rate Base ($000s)

Newfoundland and Labrador Hydro
Computation of Rate Base ($000)
Year Ended December 31, 2018

	2018	2017
Capital Assets - Return 4	2,494,233	2,342,713
Work in Process[1]	31,655	33,556
	2,525,888	2,376,269
Deduct:		
Accumulated Depreciation - Return 6	386,973	308,470
Contributions in Aid of Construction - Return 7 [1]	42,434	32,477
Total Capital Assets	**2,096,481**	**2,035,322**
Deduct Items Excluded from Rate Base:		
Work in Process [1]	(31,655)	(33,556)
Asset Retirement Obligations (net of amortization)	185	789
Net Capital Assets	2,065,012	2,002,555
Net Capital Assets, Previous Year	2,002,555	1,699,168
Unadjusted Average Capital Assets	2,033,783	1,850,861
Deduct:		
Average Net Capital Assets Excluded from Rate Base	(12,208)	(21,141)
Average Capital Assets	2,021,575	1,829,720
Cash Working Capital Allowance - Return 8	5,415	6,405
Fuel Inventory - Return 10	56,041	43,617
Supplies Inventory - Return 10	37,021	34,719
Average Deferred Charges - Return 11	62,099	65,287
Average Rate Base at Year-End - Return 12	**2,182,151**	**1,979,748**

[1] Contributions of $8.3 million (2017 - $15.1 million) that are related to capital assets that are in work in progress have been excluded from Contribution in Aid of Construction and included in work in progress.

Return 4
Capital Assets - Original Cost ($000s)

Newfoundland and Labrador Hydro
Capital Assets - Original Cost ($000)

	Balance 31-Dec-17	Adjustments During 2018	Additions During 2018	Retirements During 2018	Balance 31-Dec-18
Power Generation					
Steam	152,444	174	17,155	(91)	169,682
Hydro	811,836	(360)	21,350	(84)	832,743
Diesel	76,358	(60)	10,673	(1,542)	85,429
Gas turbine	172,484	(22)	12,194	(6,529)	178,126
	1,213,122	(268)	61,372	(8,246)	1,265,980
Substations	269,365	(808)	42,300	(7,605)	303,252
Transmission	509,441	(423)	42,301	(121)	551,197
Distribution	216,337	(16)	13,331	(187)	229,466
General plant	72,898	18	6,416	(1,866)	77,466
Telecontrol	43,174	(155)	3,801	(23)	46,797
Total depreciable plant	2,324,337	(1,652)	169,520	(18,048)	2,474,157
Non depreciable land	4,609	463	-	-	5,072
Plant investment	2,328,946	(1,189)	169,520	(18,048)	2,479,229
Intangible	13,767	415	822	-	15,004
Total - Return 3	**2,342,713**	**(774)**	**170,342**	**(18,048)**	**2,494,233**

Return 5
Capital Expenditures - Overview ($000s)

Newfoundland and Labrador Hydro
Capital Expenditures - Overview ($000)
Year Ended December 31, 2018

	Total Board Approved Expenditures 2018	Total Actual Expenditures 2018	Variance From 2018 Budget
Generation	65,840	50,434	15,406
Transmission and Rural Operations	128,877	87,860	41,017
General Properties	8,286	6,869	1,417
Allowance for Unforeseen Events	2,000	4,743	(2,743)
Supplemental Projects	7,665	6,765	901
New Projects Less than $50,000	382	315	67
Total Capital Budget	213,050	156,986	56,064

2018 Capital Budget Approved by Board Order No. P.U. 43 (2017) and P.U. 5 (2018)	181,194
New Project Approved by Board Order No. P.U. 11(2017)	327
New Project Approved by Board Order No. P.U. 1(2018)	748
New Project Approved by Board Order No. P.U. 1(2018)	(748)
New Project Approved by Board Order No. P.U. 6(2018)	719
New Project Approved by Board Order No. P.U. 6(2018)	(50)
New Project Approved by Board Order No. P.U. 19(2018)	1,000
New Project Approved by Board Order No. P.U. 23(2018)	1,121
New Project Approved by Board Order No. P.U. 25(2018)	2,560
New Project Approved by Board Order No. P.U. 33(2018)	196
New Project Approved by Board Order No. P.U. 33(2018)	(196)
New Project Approved by Board Order No. P.U. 34(2018)	195
New Project Approved by Board Order No. P.U. 38(2018)	712
2018 New Projects under $50,000	382
Total Approved Capital Budget Before Carryovers	188,160
Carryover Projects 2017 to 2018	24,890
TOTAL APPROVED CAPITAL BUDGET	**213,050**

Return 6
Accumulated Depreciation ($000s)

Newfoundland and Labrador Hydro
Accumulated Depreciation ($000)

	Property, Plant and Equipment	Intangible	Total
Balance, December 31, 2017	301,266	7,204	308,470
Add:			
Depreciation	84,437	1,876	86,313
Deduct:			
Retirements and Transfers	(7,810)	-	(7,810)
Balance, December 31, 2018 - Return 3	**377,893**	**9,080**	**386,973**

Depreciation Rates - 2018

Depreciation is calculated on a straight-line basis over the estimated useful lives of the assets as follows:

Generation Plant	
Hydroelectric	45 to 100 years
Thermal	35 and 65 years
Diesel	25 to 55 years
Transmission	
Lines	30 and 65 years
Terminal Stations	40 to 55 years
Distribution system	30 to 55 years
Other assets	5 to 55 years

Return 7
Contributions in Aid of Construction ($000s)

Newfoundland and Labrador Hydro
Contributions in Aid of Construction ($000)

	Customers	Province/Nalcor	Total
Gross Contributions			
December 31, 2017	3,580	32,037	35,617
2017 Additions[1]	11,048	1,269	12,317
December 31, 2018	14,628	33,306	47,934
Less:			
Accumulated Amortization			(5,500)
Net Balance December 31, 2017 - Return 3			**42,434**

[1] Contributions of $8.3 million (2017 - $15.1 million) that are related to capital assets that are in work in progress have been excluded from Contribution in Aid of Construction and included in work in progress.

Return 8

Working Capital ($000s)

Newfoundland and Labrador Hydro
Working Capital ($000)
Year Ended December 31, 2018

	2018	2017
Calculation of Cash Working Capital Allowance		
Operating Expenses for the Year - Return 9	135,980	130,054
Add: Power Purchases	65,838	61,717
Total	**201,818**	**191,771**
Net Lag %[1]	3.56%	4.63%
Working Capital Allowance	7,185	8,879
Deduct: HST Adjustment	1,770	2,474
Working Capital Allowance - Return 3	**5,415**	**6,405**

[1] Net lag % is calculated as Net Lag Days (Revenue Lag less Expense Lag) divided by 365 days. In 2018, Hydro's revenue lag was 36 days (2017 - 40) and the expense lag was 23 days (2017 - 23) resulting in a Net Lag of 13 days (2017 - 17).

Return 9
Statement of Operating Costs ($000s) &
Significant Operating Expense Variance ($000s)

Newfoundland and Labrador Hydro
Statement of Operating Costs ($000)
Year Ended December 31, 2018

	2018	2017
Salaries and benefits	84,465	81,582
System equipment maintenance	23,947	25,793
Office supplies and expenses	2,351	2,118
Professional services	7,700	6,142
Insurance	3,221	3,175
Equipment rentals	3,859	3,817
Travel	2,392	2,412
Miscellaneous expenses	4,914	5,286
Building rental and safety	905	1,164
Transportation	1,886	1,009
Customer costs	107	86
Cost recoveries	233	(2,530)
	135,980	**130,054**

Newfoundland and Labrador Hydro
Significant Operating Expense Variance ($000)

	2018	2017	Increase (Decrease)
Salaries and benefits	**84,465**	**81,582**	**2,883**

Increase in 2018 is primarily due to salary cost increases and decreased capital labour requirements partially offset by decrease in overtime.

	2018	2017	Increase (Decrease)
System equipment maintenance	**23,947**	**25,793**	**(1,846)**

Decrease in 2018 is primarily due to a reduction in external provider related costs to support the Holyrood CT combined with a reduction in costs associated with decommissioning activities in Long Harbor conducted on behalf of a third party (see cost recoveries).

	2018	2017	Increase (Decrease)
Professional services	**7,700**	**6,142**	**1,558**

Increase in 2018 is primarily due to Intervenor's GRA Hearing costs which were incurred in prior periods but disallowed by the Board in 2017. The disallowance was non-recurring in 2018. The increase in 2018 was partially off-set by a reduction in consulting costs.

	2018	2017	Increase (Decrease)
Building rental and safety	**905**	**1,164**	**(259)**

Decrease in 2018 is primarily due to safety supplies savings due to a reduction in material requirements during the period.

	2018	2017	Increase (Decrease)
Transportation	**1,886**	**1,009**	**877**

The increase in 2018 is primarily related to reduced capitalization of equipment related costs.

	2018	2017	Increase (Decrease)
Cost recoveries	**233**	**(2,530)**	**2,763**

Increased charges related to administration fees related to the Business Systems and other costs and a decrease in external recoveries associated with Long Harbour decommissioning.

Return 10
Inventory ($000s)

Newfoundland and Labrador Hydro
Inventory ($000)
Year Ended December 31, 2018

	Fuel		Supplies	
	2018	**2017**	**2018**	**2017**
Opening Balance	56,402	43,034	36,806	33,164
January	58,656	34,203	36,533	33,570
February	54,850	38,454	36,848	33,602
March	56,898	46,519	37,166	34,098
April	63,286	44,232	37,052	34,373
May	55,830	47,523	37,311	34,987
June	50,682	39,727	37,423	34,953
July	49,752	35,977	37,768	35,004
August	49,067	47,501	37,335	34,796
September	46,315	55,911	37,161	34,800
October	61,428	42,876	36,579	35,023
November	68,366	34,656	36,549	36,167
December	56,995	56,402	36,736	36,806
13 Month Average - Return 3	**56,041**	**43,617**	**37,021**	**34,719**

Return 11
Deferred Charges ($000s)

Newfoundland and Labrador Hydro
Deferred Charges ($000)
Year Ended December 31, 2018

	Board Order No.	2018	2017
Foreign exchange losses	P.U. 7(2002-2003)	49,610	51,767
Foreign exchange on fuel[1]	P.U. 31(2017)	497	(558)
Conservation Demand Program[2]		9,607	9,323
Phase II Hearing Costs[4]	P.U. 13(2016)	1,188	1,133
Asset Disposal	P.U. 13(2016)	349	368
Deferred Lease Costs	P.U. 38(2013)	1,790	3,130
Supply Cost Deferrals[3,4]	P.U. 22(2017)	77,629	52,325
Labrador Refund	P.U. 22(2017)	(189)	(376)
Deferred Power Purchases	P.U. 5(1996-1997)	(281)	(317)
Deferred Industrial Specifically Assigned Revenue	P.U. 7(2018)	(522)	-
2018 Cost Deferral[4]	P.U. 48(2018)	18,528	-
Deferred Charges - Return 1		158,206	116,795
Deduct:			
Deferred Charges Excluded from Rate Base [4]		(97,345)	(53,458)
Deferred Charges, end of current year		60,861	63,337
Deferred Charges, end of prior year		63,337	67,237
Average Deferred Charges for Rate Base - Return 3		**62,099**	**65,287**

1 Costs are included in the monthly actual average no. 6 fuel cost ($can/bbl) for calculating the Fuel Cost Variation under the Rate Stabilization Plan, last approved in P.U. 31(2017).

2 Order No's. P.U. 14(2009), P.U. 13(2010), P.U. 4(2011), P.U. 3(2012), P.U. 35(2013), P.U. 43(2014), P.U. 36(2015), P.U. 49(2016) and P.U. 22(2017).

3 Pursuant to Board Order No. P.U. 22(2017), the Board approved the Supply Cost deferrals which includes the Energy Supply, Holyrood Conversion and Isolated Systems Supply deferral. The recovery of the deferrals is subject to future Board order. In 2018, Hydro recorded a net increase to the deferral of $25.3 million (2017 - $21.3 million).

4 The calculation of Deferred Charges for Rate Base excludes 2018 Cost Deferral of $18.5 million (2017 - $nil), Energy Supply Deferral of $77.6 million (2017 - $52.3 million) and Phase II Hearing Costs of $1.2 million (2017 - $1.1 million). Recovery of these expenditues are subject to approval by the Board.

Return 12
Return on Rate Base ($000s)

Newfoundland and Labrador Hydro
Return on Rate Base ($000)
Year Ended December 31, 2018

		2018	2017
(a)	Corporate Net Income - Return 1	61,766	68,124
	Deduct: Unregulated Earnings	33,923	32,205
	Regulated Net Income	27,843	35,919
	Add: Cost of service exclusions[1]	6,092	4,315
	Add: Regulated Interest - Return 16	88,468	73,270
(b)	Regulated Return	122,403	113,503
(c)	Average Rate Base - Return 3	2,182,151	1,979,748
(d)	Rate of Return on Average Rate Base	5.61%	5.73%
	Lower end of approved range - 0.20	6.41%	6.41%
	Higher end of approved range + 0.20	6.81%	6.81%

1 The Cost of service exclusions are comprised of the disallowed portion of the debt guarantee fee of $4.0 million (2017 - $2.4 million) and depreciation on assets excluded from rate base of $1.4 million (2017 - $1.9 million) and other expenditures of $0.7 million (2017 - $nil).

Return 13
Return on Regulated Average Retained Earnings ($000s)

Newfoundland and Labrador Hydro
Return on Regulated Average Retained Earnings ($000)
Year Ended December 31, 2018

		2018		2017
Total equity - Hydro as per Balance Sheet, Return 1		978,784		948,724
Deduct: Share capital		22,504		22,504
Contributed surplus		146,801		146,090
Accumulated OCI		(12,487)		11,953
Ending Retained Earnings as Per Balance Sheet, Return 1		821,966		768,178
Deduct: Non-Regulated Retained Earnings				
Beginning Non-Regulated Retained Earnings	485,445		459,950	
Non-Regulated Net Income for the year	33,923		32,205	
Non-Regulated Dividends for the year	(7,994)		(6,710)	
Ending Non-Regulated Retained Earnings		511,374		485,445
Regulated Retained Earnings, end of year		310,592		282,733
Add:				
Regulated Contributed Surplus		100,000		100,000
Retained earnings cost of service exclusions		22,870		16,778
Total Regulated Equity, end of year		433,462		399,510
Regulated Equity, beginning of year		399,510		359,277
Regulated Average Equity		416,486		379,394
Add:				
GRA and Supply Deferral Adjustments		11,499		14,940
Regulated Average Equity after GRA and Supply Deferral Adjustments		427,985		394,334
Net income - Return 1		61,766		68,124
Deduct: Non-Regulated Net Income		33,923		32,205
Regulated Earnings		27,843		35,919
Cost of Service Exclusions		6,092		4,315
Regulated Earnings		33,935		40,234
Add:				
GRA and Supply Deferral Adjustments [1]		(3,000)		(3,882)
Regulated Earnings after GRA and Supply Deferral Adjustments [1]		30,934		36,352
Rate of Return on Regulated Equity before GRA and Supply Deferral Adjustments [1]		8.15%		10.60%
Restated Rate of Return on Regulated Equity after GRA and Supply Deferral Adjustments [1]		7.23% [1]		9.22% [1]

[1] In Board Order No. P.U. 39(2017) the Board indicated the GRA may be the most convenient forum to address issues related to recovery. Earnings related to 2018 included Supply Deferral and Phase II adjustments related allowances and recovery adjustments from prior periods. Earnings for 2017 included amounts related to the 2014, 2015 and 2016 Cost and Supply Deferrals. Annual Returns for years 2014 - 2018 will be refiled when issues related to recovery are addressed in a future Board Order.

Return 14
Capital Structure ($000s)

Newfoundland and Labrador Hydro
Capital Structure ($000)
Year Ended December 31, 2018

Hydro

	2018		2017		Average	
	Amount	Percent	Amount	Percent	Amount	Percent
Debt (Return 15) [1]	1,815,775	65.0%	1,701,542	65.0%	1,758,659	65.0%
Equity	978,784	35.0%	914,971	35.0%	946,877	35.0%
	2,794,559	**100.0%**	**2,616,513**	**100.0%**	**2,705,536**	**100.0%**

Hydro Regulated

	2018		2017		Average	
	Amount	Percent	Amount	Percent	Amount	Percent
Debt (Return 15) [1]	1,799,592	77.5%	1,682,253	77.7%	1,740,923	77.6%
Funded Employee Future Benefits	73,770	3.2%	69,425	3.2%	71,598	3.2%
Funded Asset Retirement Obligation	14,503	0.6%	14,548	0.7%	14,526	0.6%
Equity	433,462	18.7%	399,511	18.4%	416,486	18.6%
	2,321,327	**100.0%**	**2,165,737**	**100.0%**	**2,243,533**	**100.0%**

[1] Certain of the comparative figures have been reclassified with presentation adopted during the current reporting period.

Return 15

Cost of Debt ($000s)

Newfoundland and Labrador Hydro
Cost of Debt ($000)
Year Ended December 31, 2018

	2018	2017	Average
Long-Term Debt	1,791,132	1,488,977	1,640,054
Promissory Notes	189,000	369,000	279,000
Sinking Funds as per FS [1]	(164,357)	(156,435)	(160,396)
Total debt	1,815,775	1,701,542	1,758,658
Add back mark to market value [1]	-	-	-
Net debt	1,815,775	1,701,542	1,758,658
Non Regulated Debt Pool [1]	(16,183)	(19,289)	(17,736)
Total Regulated Debt - Return 14	**1,799,592**	**1,682,253**	**1,740,922**
Current Year Interest Expense Return 16			**86,962**
Cost of Debt			**5.00%**

[1] Certain of the comparative figures have been reclassified with presentation adopted during the current reporting period.

Return 16
Interest Expense ($000s)

Newfoundland and Labrador Hydro
Interest Expense ($000)
Year Ended December 31, 2018

	2018	2017
Gross Interest		
Long-Term Debt	90,255	78,232
Promissory Notes and Short Term	3,148	5,454
	93,403	83,686
Amortization of Debt Discount and Financing Expenses	(139)	623
Provision for Foreign Exchange	2,157	2,157
Interest Earned	(11,306)	(12,958)
Debt Guarantee Fee - Hydro[1]	6,853	4,125
Other	(630)	143
	90,338	77,776
(Deduct):		
Cost of Service Exclusions[1]	(4,011)	(2,374)
Non Regulated Interest	635	(135)
Interest for Cost of Debt - Return 15	86,962	75,267
(Deduct):		
Interest Capitalized During Construction	(2,673)	(10,637)
Add:		
Interest charged on RSP	4,179	8,640
Regulated Net Interest - Return 12	88,468	73,270
(Deduct):		
Provision for Foreign Exchange	(2,157)	(2,157)
Add:		
Cost of Service Exclusions	4,011	2,374
Accretion of ARO	358	189
Regulated Interest (PUB Quarterly)	90,680	73,676
(Deduct):		
Interest charged on RSP	(4,179)	(8,640)
Add:		
Non Regulated Interest	(635)	135
Interest (Return 1)	**85,866**	**65,171**

[1] As per Board Order P.U. 49(2016), Hydro has excluded the disallowed portion of the debt guarantee fee.

Return 17
Rate Stabilization Plan - Activity ($000s)

Newfoundland and Labrador Hydro
Rate Stabilization Plan - Activity ($000)
Year Ended December 31, 2018

	Utility						**Industrial**				
Month	Load Variation	Allocation Fuel Variation	Allocation Rural Rate Alteration	Financing Charges	Adjustment	Cumulative Net Balance	Load Variation	Allocation Fuel Variation	Financing Charges	Adjustment	Cumulative Net Balance
Opening balance						(52,440)					(1,609)
January	516	7,127	(6)	(280)	2,608	9,964	49	680	(9)	33	754
February	405	4,067	(7)	(227)	2,323	16,525	41	412	(5)	30	1,231
March	295	3,501	(5)	(192)	2,279	22,403	31	365	(2)	33	1,658
April	196	2,585	2	(161)	1,921	26,945	21	274	0	170	2,122
May	(934)	1,586	6	(136)	1,617	29,083	(95)	110	3	117	2,257
June	(446)	1,206	6	(125)	1,392	31,116	(44)	121	3	147	2,485
July	8	196	-	(114)	(375)	30,831	1	16	5	159	2,666
August	(434)	(16)	-	(116)	(377)	29,889	(42)	(25)	6	139	2,743
September	953	512	-	(121)	(422)	30,810	92	65	6	171	3,077
October	106	1,940	-	(116)	(549)	32,192	11	215	8	185	3,496
November	(97)	1,827	-	(108)	(686)	33,126	(10)	167	10	172	3,835
December	(233)	5,130	-	(103)	(851)	37,069	(22)	533	12	184	4,541
Year to date	**333**	**29,658**	**(4)**	**(1,799)**	**8,880**	**37,069**	**33**	**2,931**	**38**	**1,540**	**4,541**
Hydraulic Allocation						(11,301)					(1,117)
Total						**(26,673)**					**1,816**
						To Return 18					To Return 18

Newfoundland and Labrador Hydro
Rate Stabilization Plan - Activity ($000)
Year Ended December 31, 2018

Year Ended December 31, 2018

	Utility - Surplus			
Month	Industrial Customer Adjustment	Utility Payout	Financing Charges	Cumulative Net Balance
Opening balance				(12,638)
January	-	1,489	(68)	1,422
February	-	-	(60)	1,362
March	-	39	(60)	1,341
April	-	616	(60)	1,896
May	-	74	(57)	1,913
June	-	-	(57)	1,855
July	-	85	(58)	1,883
August	-	13	(58)	1,838
September	-	0	(58)	1,780
October	-	236	(58)	1,958
November	-	636	(57)	2,537
December	-	215	(54)	2,698
Year to date	-	3,403	(705)	2,698
Total	**-**	**3,403**	**(705)**	**(9,940)**
				To Return 18

[1] Consists of a payout to Newfoundland Power for customer refunds of $2.235 million, Hydro customer refunds of $0.952 million, Hydro admin costs of $0.048 million, and NL Power admin costs of $0.168 million.

Return 18
Rate Stabilization Plan - Balances ($000s)

Newfoundland and Labrador Hydro
Rate Stabilization Plan - Balances ($000)
Year Ended December 31, 2018

Month	Hydraulic: Net Hydraulic Production Variation	Hydraulic: Financing Charges	Hydraulic: Cumulative Variation and Financing Charges	From Return 17: Utility Balance	From Return 17: Industrial Balance	From Return 17: Utility Surplus Balance	Cumulative Net Balance
Opening balance	-	-	(7,557)	(52,440)	(1,609)	(12,638)	(74,244)
January	(438)	(41)	(479)	9,964	754	1,422	11,660
February	(3,335)	(43)	(3,857)	16,525	1,231	1,362	15,261
March	(7,960)	(61)	(11,878)	22,403	1,658	1,341	13,523
April	(8,421)	(104)	(20,403)	26,945	2,122	1,896	10,560
May	(6,889)	(150)	(27,442)	29,083	2,257	1,913	5,811
June	(1,745)	(187)	(29,374)	31,116	2,485	1,855	6,082
July	4,349	(198)	(25,223)	30,831	2,666	1,883	10,156
August	1,828	(175)	(23,570)	29,889	2,743	1,838	10,899
September	(932)	(166)	(24,668)	30,810	3,077	1,780	11,000
October	(2,752)	(172)	(27,592)	32,192	3,496	1,958	10,054
November	(7,134)	(188)	(34,914)	33,126	3,835	2,537	4,584
December	(1,988)	(227)	(37,129)	37,069	4,541	2,698	7,178
Year to date	(35,417)	(1,712)	(37,129)	37,069	4,541	2,698	7,178
Hydraulic Allocation	10,744	1,712	12,455	(11,301)	(1,117)	-	37
Total	**(24,673)**	**-**	**(32,231)**	**(26,673)**	**1,816**	**(9,940)**	**(67,029)**

Return 19
Assessable Revenue ($000s)

Newfoundland and Labrador Hydro
Assessable Revenue ($000)
Year Ended December 31, 2018

	2018	**2017**
Electricity Sales	606,394	604,219
Rate Stabilization (Return 17)[1]	(10,420)	(53,042)
CDM Rider	1,246	502
Rural Rate Alteration	4	(2,910)
Energy Sales (Return 1)	597,224	548,769
Other Revenue	27,376	25,044
Total Revenue (Return 1)	624,600	573,813
Deduct Regulated Hydro Revenue That Is Not Assessable:		
Rural Rate Alteration	4	(2,910)
Input Tax Credits	168	177
Contribution in Aid of Construction	1,369	846
Supplier Discounts	(92)	(160)
Deduct Non-Regulated Revenue:		
Recall / Export	6,656	3,174
Iron Ore Company of Canada	33,088	40,017
Tacora & Wabush Mines	652	50
Other Revenue	20,695	20,262
	62,540	61,456
Assessable Revenue	**562,060**	**512,358**

[1] Includes Utility Adjustment ($8,880) and Industrial adjustment ($1,540) from Return 17.

Return 20

NEWFOUNDLAND & LABRADOR HYDRO
2018 Annual Report on the Rural Deficit

	2018 [1]			
	Revenues ($)	Cost of Service Before Deficit and Revenue Allocation ($)	Revenue Credits ($)	Deficit ($)
Rural Deficit Areas				
Island Interconnected	52,871,359	69,718,504	-	(16,847,144)
Island Isolated	1,292,311	10,236,653	-	(8,944,342)
Labrador Isolated	8,471,852	36,094,393	-	(27,622,540)
L'Anse au Loup	2,936,165	6,912,153	-	(3,975,988)
DND Revenue Credit[3]	-	-	-	-
Total	65,571,687	122,961,702	-	(57,390,015)

	2018				
	Number of Communities [2]	Number of Customers	Cost per kWh ($)	Deficit per Customer ($)	Cost Recovery Ratio
Rural Deficit Areas					
Island Interconnected	147	22,945	0.16	(734)	0.76
Island Isolated	7	777	1.68	(11,511)	0.13
Labrador Isolated	15	2,688	0.97	(10,276)	0.23
L'Anse au Loup	8	1,027	0.28	(3,871)	0.42
Total	177	27,437	0.24	(2,092)	0.53

	Forecast Deficit ($)				
	2019	2020	2021[4]	2022[4]	2023[4]
Rural Deficit Areas					
Island Interconnected	(18,425,774)	(13,995,000)	-	-	-
Isolated Systems[5]	(47,370,070)	(48,173,000)	-	-	-
DND Revenue Credit	-	-	-	-	-
Total	(65,795,844)	(62,168,000)	-	-	-

[1] The 2018 Rural Deficit calculation is based on a proforma 2018 Cost of Service Study.

[2] Hydro's definition of Community corresponds to the "Town Code" in its customer information system. Some smaller communities may be combined if they share a single postal code.

[3] Hydro did not receive DND Revenue Credit in 2018.

[4] Hydro has not provided forecast deficit figures for 2021-2023 due to the uncertainty regarding post-Muskrat Falls rates and the outcome of the Cost of Service Methodology Hearing.

[5] Increase in the 2019 forecasted rural deficit is as a result of the increase in the price of diesel fuel.

Return 21

2018 Conservation and Demand Management Report

April 1, 2019

A Report to the Board of Commissioners of Public Utilities

newfoundland labrador hydro
a nalcor energy company

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List of Appendices

List of Attachments

1.0 Introduction

Conservation and Demand Management ("CDM") activities undertaken by Newfoundland and Labrador Hydro ("Hydro") include joint utility programs offered by Hydro and Newfoundland Power (the "Utilities") through the takeCHARGE partnership, and programs specifically targeted to Hydro's customers. This report focuses primarily on the costs and initiatives implemented by Hydro, including Hydro's portion of costs for the joint initiatives for 2018.

Hydro's programs achieved 2,608 MWh of annual incremental energy savings in 2018, and, since 2009, have accumulated energy savings of 43,581 MWh. This is primarily a reflection of the continued growth and enhancement of takeCHARGE initiatives.

2.0 Coordination and Context

2.1 Utility Planning

Starting with the initial CDM plan in 2008, Hydro and Newfoundland Power have designed and implemented a joint utility portfolio of programs for electricity customers in Newfoundland and Labrador. [1] Currently, programs offered through the joint utility model are available for residential, commercial, and industrial customers and provide rebate options to address energy savings for electricity customers.

Hydro has also been developing programs outside the joint utility process to provide customers with additional opportunities to conserve and to provide feedback for expanded offerings of joint utility programs. For example, Hydro's retailer coupon program offered in 2010-2011 was the impetus for the Instant Rebate Program launched provincially in 2014. In 2018 this program provided point-of-purchase rebates for a range of technologies, including LED lighting and draft proofing.

[1] The "Five Year Energy Conservation Plan: 2008-2012" was filed with the Board on June 27, 2008. The "Five Year Energy Conservation Plan: 2012-2016" was filed with the Board on September 14, 2012, and is provided as Attachment 1 to this report.

Other CDM activities for 2018 include the continuation of the residential and commercial rebate programs, the Energy Efficiency Loan Program with the Government of Newfoundland and Labrador,[2] the Isolated Systems Community Energy Efficiency Program, the custom industrial program, and expansion of existing commercial rebates. The description of the programs offered during 2018, both through the joint utility partnership and those specific to Hydro's customers, is provided as Appendix A to this report.

The Utilities continuously evaluate the customer conservation programs and periodically undertake third party program evaluations to refine program design and support future planning.

2.2 Government Engagement

In 2018, Hydro worked closely with the Provincial Government on the Low Carbon Economy Leadership Funding to explore the potential of expanding the insulation and thermostat rebates to oil-heated customers on a full cost recovery basis. [3]

Hydro continues to have a positive working relationship with the Provincial Government, and remains engaged in dialogue on potential programming, policy, and partnership opportunities.

3.0 2018 Conservation and Demand Management Programs Costs and Energy Savings

3.1 Portfolio Level Program Costs and Energy Savings

Table 1 and Table 2 describe Hydro's total CDM program expenses and energy savings from 2009 to 2018 across all of Hydro's systems. Further detail and a breakdown of the costs that will

[2] In 2017, Hydro and Newfoundland Power introduced a new Energy Efficiency Loan Program to help residential customers reduce their home energy consumption. This program is funded by the Provincial Government.

[3] This program was launched in March 2019.

be recovered through the CDM Deferral Account[4] and the associated energy reductions is provided in Section 6, Regulated Program Energy Savings and Program Costs.

Table 1: Hydro's CDM Portfolio Spending ($000) [5]

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Windows	44	48	80	117	169	38	2	-	-	-
Insulation	40	60	140	126	157	92	70	61	102	88
Thermostats	13	19	31	47	51	35	20	22	55	44
Residential Benchmarking	-	-	-	-	-	-	-	49	45	23
Coupon Program	-	140	135	-	-	-	-	-	-	-
Commercial Lighting	13	12	59	20	29	15	18	-	-	-
Industrial	57	221	103	173	89	1,244	(102)	28	41	20
Block Heater Timer	-	-	-	31	8	8	-	-	-	-
Isolated Systems Community	-	-	-	858	871	615	530	451	936	981
ISBEP[5]	-	-	-	-	115	96	7	45	41	99
Heat Recovery Ventilator	-	-	-	-	11	7	6	6	7	10
Instant Rebate	-	-	-	-	1	252	239	247	159	169
Business Efficiency (Prescriptive)	-	-	-	-	-	-	-	22	28	17
Business Efficiency (Custom)	-	-	-	-	45	101	152	183	127	137
Appliance Retirement Pilot	-	-	-	-	-	-	56	(12)	-	-
Isolated Load Control Pilot	-	-	-	-	-	-	6	158	17	5
Total	**167**	**500**	**548**	**1,372**	**1,546**	**2,503**	**1,004**	**1,260**	**1,559**	**1,593**

Table 2: Hydro's CDM Portfolio Annual Energy Savings (MWh)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Life to Date
Windows	13	37	61	136	99	85	10	-	-	-	441
Insulation	35	126	404	382	795	142	105	72	155	139	2,356
Thermostats	9	35	30	53	24	38	34	44	59	62	389
Residential Benchmarking	-	-	-	-	-	-	-	-	131	234	365
Coupon Program	-	64	256	-	-	-	-	-	-	-	320
Commercial Lighting	3	10	227	95	99	79	124	-	-	-	637
Industrial	-	-	165	3,172	-	22,258	-	177	-	162	25,934
Block Heater Timer	-	-	-	-	288	-	-	-	-	-	288
Isolated Systems Community	-	-	-	1,676	1,096	1,357	1,426	512	1,141	1,064	8,272
ISBEP	-	-	-	3	26	111	67	241	24	205	677
Heat Recovery Ventilator	-	-	-	-	-	6	5	5	4	12	32
Instant Rebate	-	-	-	-	-	148	164	191	90	300	894
Business Efficiency Program (Prescriptive)	-	-	-	-	-		22	147	676	248	1,092
Business Efficiency Program (Custom)	-	-	-	-	-	107	775	588	232	182	1,884
Total	**60**	**272**	**1,143**	**5,517**	**2,427**	**24,331**	**2,734**	**1,977**	**2,513**	**2,608**	**43,581**

3.2 Residential Programs

Hydro's residential portfolio included five programs; insulation, thermostats, heat recovery ventilators ("HRV"), instant rebate and the Residential Benchmarking Program offered jointly by the Utilities, and two offered solely by Hydro: the Isolated Systems Community Energy Efficiency Program and Isolated Systems Business Efficiency Program. In addition, the Energy

[4] The CDM Cost Deferral Account is meant to defer Hydro's program costs (excludes program costs for the Labrador Interconnected System).
[5] Credits are due to an overstated accrual in the preceding year.

Efficiency Loan Program, launched in 2017, continued in 2018. Throughout 2018, Hydro continued to promote the takeCHARGE programs and technologies. Local advertising and building strong partnerships with retailers remains a priority and is an integral factor in the promotion of customer rebate programs.

The Kids in Charge school program was also continued in 2018. This is an interactive presentation on saving energy designed for students from kindergarten to grade 6. Trained representatives visited nine schools and delivered presentations to a total of 310 students in isolated communities.

3.3 Commercial Programs

Hydro's Business Efficiency Program, which includes prescriptive product rebates for heating and lighting controls and a custom program for individual customer facilities, continued to be delivered to business customers in the company's interconnected and isolated areas in 2018. These programs provide technical support to identify economical energy efficiency opportunities and provide financial support for capital upgrades. The total energy savings achieved as a result of Hydro's prescriptive and custom business programs in 2018 was 635 MWh.

Hydro continues to engage with lighting distributors to promote the sale of high performance lighting products. Hydro enhanced its Business Efficiency Program in 2018 by expanding the list of energy efficient products eligible for mail-in rebate to include 4 foot LED tubes to replace fluorescent lighting.

Commercial facility audits continue to be utilized to engage customers in the Isolated Systems Business Efficiency Program and the Business Efficiency Program. The intent of the audits is to facilitate opportunity identification, technical analysis and support, and project completion. [6] In

[6] Approximately 95 audits have been conducted in total since 2012.

2018, four commercial facility audits were completed in the interconnected system and 58 facility audits were completed in the isolated systems to inform customers of opportunities for incentives. Further, 18 customers completed projects involving upgrades and improvements in lighting, heating systems, insulation, and thermostats in Hydro's isolated and interconnected service areas.

3.4 Isolated System Community Program

The Isolated Systems Community Energy Efficiency Program is specifically targeted to residential and commercial customers in Hydro's Isolated Diesel systems. The objective of the program is to provide outreach, education, and energy efficient products and installation free of charge to residential and business customers in the diesel system[7] communities within Newfoundland and Labrador. From 2012 to 2018, the program installed 106,397 energy efficient products, saved a total of approximately 8. 2 GWh of electricity, and also provided employment for over 55 residents of these communities.

The Isolated Systems Community Energy Efficiency Program includes residential and commercial direct installations and focuses on building knowledge and capacity in the communities by hiring and training local representatives. These representatives work within their own communities to promote the program, provide useful information on energy use, and provide direct installation of energy efficient products, including low flow showerheads, faucet aerators, LED lamps, specialty size light bulbs, smart power strips, and hot water tank and pipe insulation.

In 2018, 727 residential and business customers received direct installation of 12,147 products consisting of water saving technologies and LED specialty bulbs for lighting needs. While this work was ongoing, information was collected about the type of lighting, heating, and appliances in the homes and businesses, which will be used for future program planning.

[7] From 2012 to 2017 the program operated in 21 diesel systems. As a result of the community relocation of Williams Harbour in 2017, the program now operates in 20 diesel systems.

3.5 Industrial Program

Since 2010, Hydro has delivered the Industrial Energy Efficiency Program, which offers support and financial incentives for Hydro's industrial customers based on projects for lighting retrofits, process improvements, equipment changes, loss prevention (e. g. , heat, steam energy), and funding for energy audit consultant reports. Participation in the Industrial Energy Efficiency Program has been variable as there are few industrial customers in the province. Promotion of the Industrial Energy Efficiency Program is now included under Hydro's Key Account Management framework to support improved project planning, scheduling, and execution. Within the Key Account Management framework, the industrial customers are directly engaged with their Key Account Manager to assist with the Industrial Energy Efficiency Program. This also permits Hydro to better understand the customers' facilities, processes, plans and schedules for potential efficiency improvement projects. In 2018, one industrial customer initiated a lighting retrofit project, which was supported by approximately $20,000 in program funding. This investment will generate approximately 162 MWh of energy savings annually.

4.0 Planning and Evaluation

During 2018, several external evaluations and surveys were completed to measure customer awareness, interest, and uptake in current programs:

- Socket saturation survey - to determine usage of LEDs in lighting sockets in customers' homes, as a means of informing future program planning;

- Annual marketing survey - to assess home energy use and energy saving practices, as well as awareness of, and participation in, the takeCHARGE programs;

- Hydro's home energy use benchmarking program - evaluated to assess program effectiveness, participation uplift, satisfaction and net energy and demand savings versus targeted energy and demand savings. This program allows participating households to compare their net energy usage with similar homes in their neighborhood;

- Instant Rebate program: evaluations involved conducting: (i) a review of the program documentation and databases, (ii) surveys with participants and the general population, (iii) in-depth interviews with participating retailers, (iv) a savings review, and (v) a cost-effectiveness analysis. The program was designed to offer instant cash rebates to customers who purchase eligible energy-efficient products such as LED lamps, ENERGY STAR® light fixtures, high-performance showerheads and weather-stripping; and

- Business Efficiency Program: an external review was initiated in 2017 and completed in 2018, the purpose of which was to validate the energy and demand savings achieved through the programs, and provide recommendations for improving program delivery. The survey established the savings claimed by Hydro were in line with that determined to be correct and appropriate through the external evaluation for both the custom and product rebate streams.

In 2019, the Utilities will complete a new Conservation Potential Study to determine the achievable and economic energy efficiency and demand response potential in the Province. After completion of this study, the Utilities will begin to develop their next multi-year plan for conservation and demand management. With anticipated changes in marginal costs on the electricity system reducing the value of energy saving benefits, some programs may become challenged to pass economic screening, and measures that reduce peak demand will likely become more prominent.

5.0 Outreach and Support

During 2018, Hydro continued to partner with Newfoundland Power to deliver the takeCHARGE program which offers customer education and conservation awareness activities, primarily through promotion of its takeCHARGE rebate programs and outreach activities. Residential and

Business programs are promoted through activities including mass media marketing, targeted promotions, community outreach, school programming, trade ally development, partnerships, and events.

The advertising campaign includes newspaper, radio, online and social media advertisements. Campaigns run throughout the year for insulation, thermostats, HRVs, instant rebates, heat pump education and the Business Efficiency Program. The media is chosen based on the time of year that programs are in market and consumer purchasing behaviours.

The takeCHARGE team is also active in social media through a joint utility Facebook page, YouTube channel, Twitter account, and website. Since 2015, approximately 14,000 Facebook users have "liked" the takeCHARGE Facebook fan page, and YouTube views are continuing to increase through direct links to videos from other takeCHARGE social media channels. In addition, takeCHARGE currently has approximately 3,000 Twitter followers and has sent out 2,424 tweets. The takeCHARGE website views continue to increase year over year. In 2017, there were 629,447 page views, compared to 701,751 in 2018.

Hydro engages with retailers, suppliers, students, and other groups through presentations, and interactive booth displays to promote programs, answer questions and promote energy conservation. The takeCHARGE Town Challenge initiative has awarded $85,000, since 2010, to winning towns. Its purpose is to encourage residents and municipalities to reduce their energy use. Each year, municipalities are invited to submit proposals that will support their efforts to develop or improve energy conservation or energy efficiency projects. Projects have to demonstrate a positive effort to conserve energy that benefits the entire community. The takeCHARGE school contests for kindergarten to grade 6 classes and grade 7 to grade 12 classes were run with a goal to enable students to understand and be able to explain why saving energy is important, and demonstrate what they can do to conserve energy.

The tenth annual takeCHARGE Energy Efficiency Week was held from September 24 to 30, 2018. This week is dedicated to providing customers with information to assist them in saving energy and money. During the week, takeCHARGE teams were visible throughout the province at special events and on television advertisements, and a full social media plan was executed.

Hydro, in partnership with Newfoundland Power, launched its inaugural takeCHARGE Luminary Awards in 2018. The awards program provides an opportunity to recognize the progressive work that the Company's energy efficiency partnerships have achieved, while continuing to build valuable relationships with like-minded organizations. Individuals, organizations and communities from all across Newfoundland and Labrador were recognized for their commitments to energy efficiency.

Table 3 provides Hydro's costs to provide education, outreach, support, and planning for its CDM programs from 2009 to 2018.

Table 3: Hydro's Support Costs ($000)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Education	262	106	212	200	135	158	154	138	111	63
Support	53	48	43	53	27	52	68	42	40	47
Planning	176	180	304	127	152	224	442	250	251	128
Total	**491**	**334**	**559**	**380**	**314**	**434**	**664**	**429**	**401**	**238**

6.0 Regulated Program Energy Savings and Program Costs

Table 4 provides the estimated annual energy savings from Hydro customers in relation to programming associated with the annual regulated deferral request.

Table 4: Energy Savings from Island Interconnected and Isolated Systems CDM Program Activities[8] (MWh)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Life to date
Windows	8	14	38	50	43	40	4	-	-	-	197
Insulation	29	63	229	126	123	100	52	40	111	76	949
Thermostats	2	16	16	28	14	16	23	33	43	46	239
Residential Benchmarking	-	-	-	-	-	-	-	-	131	234	365
Coupon Program	-	47	166	-	-	-	-	-	-	-	213
Commercial Lighting	3	-	92	25	19	22	46	-	-	-	207
Industrial	-	-	165	3,172	-	22,258	-	177	-	162	25,934
Block Heater Timer	-	-	-	-	-	-	-	-	-	-	0
Isolated Systems Community	-	-	-	1,676	1,096	1,357	1,426	512	1,141	1,064	8,272
ISBEP	-	-	-	3	26	111	67	241	24	205	677
Heat Recovery Ventilator	-	-	-	-	1	1	-	1	-	1	3
Instant Rebate	-	-	-	-	-	80	71	21	9	86	267
Business Efficiency Program (Prescriptive)	-	-	-	-	-	-	21	131	503	135	790
Business Efficiency Program (Custom)	-	-	-	-	-	73	773	588	98	160	1,692
Total	**42**	**140**	**706**	**5,080**	**1,322**	**24,058**	**2,484**	**1,744**	**2,060**	**2,170**	**39,806**

The costs associated with the delivery of the CDM program portfolio provided in Table 4 include direct costs for advertising, salaries, rebates and other expenses directly associated with a specific program. These costs are recovered from customers through the CDM Cost Recovery Adjustment and vary depending on the uptake of the program and the number of programs offered.

Table 5 provides a breakdown of annual CDM program costs included in the CDM Deferral Account.

[8] Hydro’s CDM Cost Deferral Account does not capture spending associated with CDM programs offered to customers on the Labrador Interconnected system, therefore Table 4 does not reflect energy savings associated with these programs.

Table 5: CDM Program Costs Included in the CDM Deferral Account[9] ($000s)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Windows	44	41	69	102	150	31	1	-	-	-
Insulation	40	53	116	108	112	87	62	57	93	80
Thermostats	13	18	25	43	47	32	19	21	53	43
Residential Benchmarking	-	-	-	-	-	-	-	49	45	23
Coupon Program	-	113	123	-	-	-	-	-	-	-
Commercial Lighting	13	-	43	10	17	10	11	-	-	-
Industrial	57	190	98	170	88	1,243	(115)	27	41	20
Block Heater Timer	-	-	-	-	-	-	-	-	-	-
Isolated Systems Community	-	-	-	858	871	615	530	451	936	981
ISBEP	-	-	-	93	115	96	7	45	41	99
Heat Recovery Ventilator	-	-	-	-	8	3	4	4	5	5
Instant Rebate	-	-	-	-	1	219	186	143	104	130
Business Efficiency (Prescriptive)	-	-	-	-	-	-	-	14	12	7
Business Efficiency (Custom)	-	-	-	-	40	92	134	193	126	134
Isolated Load Control Pilot	-	-	-	-	-	-	6	158	17	5
Appliance Retirement Pilot	-	-	-	-	-	-	56	(12)	-	-
Total	**167**	**415**	**474**	**1,384**	**1,449**	**2,428**	**902**	**1,152**	**1,474**	**1,528**

7.0 Program Participation and Savings

Table 6 provides statistics on participation for each of Hydro's programs. The transaction units are specific to each program. The Residential Energy Star Window, Insulation, Thermostat and HRV Programs reflect approved rebates. The Coupon Program reflects numbers of coupons redeemed. The Commercial Lighting and Instant Rebate Programs each reflect the number of products rebated through the programs. The Block Heater Timer Program reflects the number of timers determined to be installed through post-giveaway surveys or coupon redemption. The Isolated Systems Business Efficiency Program, Business Efficiency Program, and Industrial Efficiency Programs reflect the number of completed retrofit projects. The Isolated Systems Program denotes the number of residential and commercial customer premises that received direct installations. Finally, the Residential Benchmarking Program indicates the number of customers included in the treatment group and the Business Efficiency Program (prescriptive) is the number of product rebates.

[9] Credits are due to an overstated accrual in the preceding year.

Table 6: Life-to-Date Program Participation

Program	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Windows	11	19	41	61	48	24	7	-	-	-	211
Insulation	14	24	104	50	53	22	35	31	39	42	414
Thermostats	4	28	32	45	23	20	15	63	56	66	352
Residential Benchmarking	-	-	-	-	-	-	-	1,000	1,000	1,000	3,000
Coupon Program	-	3,178	5,832	-	-	-	-	-	-	-	9,010
Commercial Lighting	27	74	470	320	339	377	323	-	-	-	1,930
Industrial	-	-	1	1	-	3	-	1	-	1	7
Block Heater Timers	-	-			629					-	629
Isolated Systems Community	-	-	-	1,355	1,153	1,181	965	345	1,007	727	6,733
ISBEP	-	-	-	1	1	4	1	5	3	10	25
Heat Recovery Ventilator	-	-	-	-	1	11	9	8	7	21	57
Instant Rebate	-	-	-	-	-	6,920	4,551	26,601	9,764	19,285	67,121
Business Efficiency Program (Prescriptive)	-	-	-	-	-	-	4	173	2,309	460	2,946
Business Efficiency Program (Custom)	-	-	-	-	-	4	3	10	7	8	32
Total	**56**	**3,323**	**6,480**	**1,833**	**2,247**	**8,566**	**5,913**	**28,237**	**14,192**	**21,620**	**92,467**

8.0 Levelized Utility Costs

Levelized Utility Cost ("LUC") is a method used to compare costs associated with conservation programs to the value of energy saved. The LUC represents the economic cost to the utility (₵ per kWh) to generate energy savings. It is an industry metric which is calculated by discounting future energy savings resulting from conservation programs to a present value. Table 7 provides the LUC for Hydro's 2018 programs. The energy savings represent the annual savings resulting from the individual program participation during 2018.

Table 7: Hydro Program Participation, Savings, and Levelized Utility Cost 2018

Program	Participation	Energy Savings (MWh)	Non-coincident Demand Savings (kW)	Levelized Utility Costs(₵/kWh)	Life to date Levelized Utility Cost(₵/kWh)
Windows	-	-	-	-	15.5
Insulation	42	139	23	6.4	3.9
Thermostats	66	62	-	7.9	9.9
Residential Benchmarking	1,000	234	19	9.9	19.2
Coupon Program	-	-	-	-	-
Industrial	1	162	-	2.8	1.7
Block Heater Timer	-	-	-	-	-
Isolated Systems Community	727	1,064	328	21.0	14.1
ISBEP	10	205	64	6.2	10.4
Heat Recovery Ventilator	21	12	4	9.6	18.5
Business Efficiency Program(Custom and Prescriptive)	468	429	328	5.6	4.3
Instant Rebate	19,285	300	93	9.6	21.0
Total Programs	**-**	**2,608**	**858**	**11.5**	**5.4**

9.0 Conclusion

Hydro has continued its efforts to promote energy conservation and demand management throughout 2018, including the continued work with Newfoundland Power to develop and execute programs that are accessible to all customers of the Utilities. The takeCHARGE programs have been successful in providing education and fostering the development of a culture of energy conservation in the province. In addition, Hydro continues to work with its customers to understand needs and drivers of electrical consumption, to ultimately support the achievement of sustainable energy savings through the various programs described in this report. Hydro will continue to work closely with the Provincial Government on various programs and initiatives. In 2019, the Utilities will complete a Conservation Potential Study to determine the achievable and economic energy efficiency and demand response potential in the Province. After completion of this study, the Utilities will begin to develop their next multi-year plan for conservation and demand management. With anticipated changes in marginal costs on the electricity system reducing the value of energy saving benefits, some programs may become challenged to pass economic screening, and measures that reduce peak demand will likely become more prominent. Overall, Hydro’s efforts supported annual incremental energy savings of 2,608 MWh in 2018 and accumulated energy savings of 43,581 MWh since 2009.

Appendix A

Conservation and Demand Management Program Descriptions

Residential takeCHARGE Rebate Programs

Program incentives are processed primarily through customer applications. The programs are promoted in partnership with trade allies in the retail, home building and renovation industries.

Insulation Rebate Program

The objective of this program is to provide incentives to increase the insulation R-value in residential basements, crawl spaces and attics, thereby increasing the efficiency of the home's building envelope. Eligibility for the programs is limited to electrically heated homes, determined on the basis of annual energy usage. Home retrofit projects are eligible. Customers can receive an incentive of 75% of basement wall and ceiling insulation materials up to $1,000, and 50% of attic insulation material costs up to $1,000.

Thermostat Rebate Program

This program encourages installation of programmable and electronic thermostats to allow customers better control of the temperature in their home and to save energy. These high performance thermostats allow customers to set back the temperature during the night or when they are away. Eligibility for the program is limited to electrically heated homes, determined on the basis of annual energy usage. Home retrofit projects and new home developments are eligible. Incentives of $10 for each programmable thermostat and $5 for each electronic high performance thermostat are offered.

HRV Rebate Program

This program encourages customers to purchase a high efficiency HRV to improve the efficiency of their home. Eligible measures in this program include HRV models that have a Sensible Recovery Efficiency of 70% or more. Customers who purchase a high efficiency HRV can receive a rebate of $175. All customers are eligible for this program regards of age of home or heat source.

Isolated System Community Energy Efficiency Program – Hydro Program

This program includes both residential and commercial components targeting customers in Isolated Diesel and L'Anse au Loup Systems. The focus is on residential customers through the direct install of a kit of technologies, at-cash coupons on small technologies and mail-in rebates on energy efficient appliances. Commercial customers also receive a direct install of a kit of technologies. The kit includes items for water savings, draft proofing, lighting and other measures.

Homeowners receive education on energy efficiency and information on the existing takeCHARGE rebate programs. Community events, social media promotions and exchanges held to promote the program and energy efficiency awareness.

Block Heater Timer Program – Hydro Program

This program targeted customers in the Labrador Interconnected System to encourage the purchase of energy saving Block Heater Timers through in-store discounts offered at partnering retailers. The program launched with a giveaway of the technology to create awareness of the product as there was little or no use of the technology before the program. The incentive was offered over two winter seasons (2012-2013 and 2013-2014) and ended in spring 2014.

Small Technologies Program

Instant Rebates

This program promotes a variety of smaller technologies, such as LED lighting, and smart power bars, through instant rebates available at the cash register of participating retailers. All customers are eligible for this program regardless of age of home or heat source.

Appliances and Electronics

This program encourages customers to purchase high efficiency appliances. Participants receive incentives of $100 for select energy efficient washers, freezers, and $20 for eligible TVs. All customers are eligible for this program regardless of age of home or heat source. This program ended December 31, 2017.

Residential Benchmarking Program

This program encourages customers to adopt energy efficient behavioural changes. Participants receive Home Energy Reports that provide insight into their home's electricity use. The reports help customers understand changes in their usage over time, as well as how they compare to similar homes. They will also include practical tips on how to save energy moving forward. The program also includes an online component that allows customers to engage even further through weekly challenges and personalized saving plans.

Approximately 1,000 customers were randomly selected as participants in this program. Program participants broadly reflect the composition of Hydro's customer base in heating type and geographical distribution. No financial incentive is offered for this program.

Energy Efficient Loan Program

This is a program offered by the Government of Newfoundland and Labrador and takeCHARGE, making it easier to save energy and money. On-bill financing with a reduced interest rate by 2.5% from standard utility financing rates, is available on insulation, heat pumps and home energy assessments. Through EELP, eligible applicants can receive low-interest financing for up to $10,000 over a maximum of five years.

Commercial takeCHARGE Rebate Programs

Business Efficiency Program

The objective of this program is to improve electrical energy efficiency in a variety of commercial facilities and equipment types. The program components include financial incentives based on energy savings, and other financial and educational supports to enable commercial facility owners to identify and implement energy efficiency and demand reduction projects.

This program is available for existing commercial facilities that can save energy or reduce demand by installing more efficient equipment and systems. The program includes custom project incentives and prescriptive rebates for specific measures on a per unit basis.

Isolated Systems Business Efficiency Program (ISBEP) – Hydro Program

The ISBEP was launched in 2012 and targets commercial customers in the Isolated Diesel and L'Anse au Loup Systems. The program provides a custom approach to finding energy efficiency solutions and financial assistance for feasibility studies and for retrofit projects. It has the same program design and offerings as the joint utility Business Efficiency Program, but has higher incentive levels for retrofit work because of the higher avoided cost of generation in these systems.

Industrial Energy Efficiency Program (IEEP)

The objective of this program is to improve electrical energy efficiency in a variety of industrial processes. The program components include financial incentives based on energy savings, and other supports to enable industrial facilities to identify and implement efficiency and conservation opportunities. This program is a custom program to respond to the unique needs of the industrial market, rather than a prescriptive technology approach.

Attachment 1

Five-Year Conservation Plan: 2016–2020

FIVE-YEAR CONSERVATION PLAN: 2016 – 2020

newfoundland labrador hydro
a nalcor energy company

NEWFOUNDLAND POWER
A FORTIS COMPANY

October 2015

CONTENTS

1.0 EXECUTIVE SUMMARY

Newfoundland and Labrador Hydro ("Hydro") and Newfoundland Power have offered customer energy conservation programs on a joint and coordinated basis under the *takeCHARGE* brand since 2009. These programs provide a range of information and financial supports to help customers manage their energy usage.

The joint *Five-Year Conservation Plan: 2016-2020* (the "2016 Plan") builds on this experience, and continues to reflect the principles underlying two previous joint, multi-year conservation plans developed by Hydro and Newfoundland Power (the "Utilities").[1] It reflects refinement of the opportunities identified in a recently updated conservation potential study (the "2015 CPS") through in-depth local market research and program cost benefit analysis.

The 2016 Plan represents both growth and evolution of the Utilities' joint customer energy conservation program portfolio. It includes a new behavioural-based program for the residential sector, expansion of existing commercial programs, and the reshaping or discontinuation of several programs. The approach outlined in this plan will remain flexible to address the changing provincial landscape, in terms of customer expectations, market conditions for energy efficient products, and electrical system costs. The 2016 Plan also addresses customer support and education, program planning and evaluation processes, as well as the Utilities' costs and cost recovery arrangements.

The total estimated energy savings for 2016 through 2020 are 883 GWh.[2] Total estimated costs through this period are $41.1 million.

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1 The *Five-Year Energy Conservation Plan: 2008-2013* was filed with the Board on June 27, 2008. The *Five-Year Energy Conservation Plan: 2012-2016* was filed on September 14, 2012.

2 The energy savings indicated throughout the *Five-Year Energy Conservation Plan: 2016-2020* represent *gross* energy savings achieved by customers. These savings reflect all technologies installed by participating customers since program implementation. *Net* energy savings would reflect adjustments for: (i) the timing of customer installations giving rise to the energy savings; and (ii) program *free ridership* (an estimate of participants who would have chosen the more efficient product without the program).

2.0 BACKGROUND

2.1 Planning Context

Hydro and Newfoundland Power have collaborated on customer energy conservation program planning and delivery for the past 8 years. The programs offered jointly under the takeCHARGE brand have included a variety of information and financial supports which help customers manage their energy usage. The Utilities' provision of energy conservation programming is responsive to customer expectations, supports efforts to be responsible stewards of electrical energy resources and is consistent with provision of least cost, reliable electricity service. Initiatives address conservation opportunities for customers in each sector: residential, commercial and industrial.

The Utilities' practice has been to refresh their joint strategic plans for customer conservation programming every three to four years. This ensures programs achieve long term goals while being responsive to changes in customer expectations, market barriers, technology developments, and economics. Current program offerings are based on the Five Year Energy Conservation Plan: 2012-2016 ("the 2012 Plan").

One of the key inputs into the 2016 Plan was the outcome of the Conservation Potential Study ("CPS"), completed by the Utilities in 2015. The CPS identified cost-effective energy and demand reduction measures, outlined general parameters for program development, and quantified achievable energy savings potential by sector and end-use. The results of the CPS are considered with the Utilities' experience and other factors in the local market to determine potential programs and energy saving targets for the 2016 Plan.

The Utilities' conservation planning is coordinated with overall planning for the electrical system. Significant changes to the Island Interconnected System are anticipated to occur in this planning period. Interconnection of the Muskrat Falls hydroelectric development is forecast for 2018 and will include the Island's first connection to the

North American grid. As a result, there is uncertainty with respect to the marginal cost of energy and capacity on the Island Interconnected System beyond 2017.

Schedule A provides the current forecast marginal cost of energy and capacity for 2015-2035.[3] The forecast indicates a decrease in the marginal cost of energy beginning in 2018. This effectively reduces the value of energy savings arising from customer energy conservation programming, and limits the types of programs that can be cost effectively offered.

Costs of electricity supply additions are expected to be incorporated into customer rates starting in 2018, putting upward pressure on customers' rates. This is expected to increase customers' motivation to conserve energy to manage their electricity costs. Also, the recent economic slowdown is anticipated to continue into this planning period and will influence customer behaviour with regards to conservation.

The 2008 and 2012 Five Year Conservation and Demand Management Plans, delivered jointly by the Utilities, had focused primarily on energy conservation. This reflected the relatively high marginal energy costs (predominantly due to fuel costs at Hydro's Holyrood Thermal Generating Station) which justified such a focus. The events of recent winters have since brought to light issues with peak load and generation capacity on the Island Interconnected System which are anticipated to continue into this planning period. The 2016 Plan therefore considers demand management opportunities as well as energy conservation.

The Utilities have been offering some form of customer energy conservation programming since 1991, and have achieved significant energy savings over this time. The current forecast, particularly for insulation, anticipates diminishing returns. For example, the remaining potential for energy savings through insulation upgrades has

3 The marginal costs used to determine cost effectiveness of the customer energy conservation programs are based on the most recent marginal cost forecast as projected by Hydro in February 2015. These estimates are currently under review by Hydro to incorporate the forecast interconnection with the North American grid. Once more current estimates are available, they will be incorporated in the screening process.

been impacted by changes to the National Building Code requiring basement insulation in new homes, as well as barriers to retrofitting many of the eligible existing homes. This is consistent with experience in other North American jurisdictions where utility programming has harvested the "low hanging fruit" and subsequently has moved on to address more challenging and costly opportunities.

Energy conservation programming has also been affected by technology advancements and changes to standards. Lighting product standards changes have effectively eliminated availability of incandescent bulbs for consumers. At the same time, LED technology has advanced and become more affordable and available. The pace of this change has been even faster than anticipated in the 2012 Plan. This is demonstrated by higher than projected uptake in the Utilities' Instant Rebate component of the Small Technologies program.

The Utilities continue to work with the Provincial Government, through the Office of Climate Change and Energy Efficiency, regarding policy development for energy conservation and efficiency, and particularly potential impacts and approaches to building codes, product standards and broader market transformation objectives.

Many of the influences on the provincial energy conservation market can be seen in other North American jurisdictions. In recent years, many jurisdictions have experienced decreasing marginal costs of energy and increasing program costs due to maturing conservation programs. As a result, utilities and program administrators have revised their approach to economic analysis of energy conservation. The Utilities have conducted research on current economic evaluation practices. A summary of this research is provided in Schedule B. It indicates that Canadian jurisdictions use the Total Resource Cost ("TRC") test as their primary benefit cost test for program screening, with the Program Administrator Cost test as a secondary test. Only one of the seven Canadian utilities researched used Ratepayer Impact Measure as a primary benefit cost test for program screening. In the United States, most jurisdictions follow similar practices with over 70% using TRC as the primary benefit cost test and 2% using Ratepayer Impact Measure for program screening.

2.2 Energy Conservation Programs

Based on the 2012 Plan, the Utilities have jointly offered customer energy conservation programs which provide both information and financial incentives to encourage customer installation of energy efficient technologies.[4] In addition, Hydro has offered programming for its customers, such as incentives for commercial customers in its isolated system service territories, where market conditions and system costs differ.

Table 1 shows, by sector, the portfolio of programs that have been offered under the 2012 Plan.[5]

Table 1
Conservation Programs
By Sector

Residential	**Commercial**	**Industrial**
Insulation Thermostat ENERGY STAR Window[6] HRV Block Heater Timer Small Technologies Isolated Systems Community Program	Lighting Business Efficiency Program Isolated Business Efficiency Program	Industrial Energy Efficiency Program

4 Once installed, these more energy efficient technologies provide energy savings for the customer throughout the life of the product. For example, an HRV has an estimated life of 15 years and will result in energy savings benefits throughout that period.

5 The Utilities also engage in demand management activities, including Newfoundland Power’s Curtailable Service Rate Option and Hydro’s interruptible load arrangements with its Industrial Customers.

6 The ENERGY STAR Window Program concluded at the end of 2014.

Schedule D summarizes the energy savings and costs for the customer energy conservation programs offered by the Utilities from 2009 through 2015.

Residential Programs

Table 2 provides a summary of residential customer energy savings achieved through the Utilities' conservation programs from 2009 through 2015(F).[7]

Table 2
Residential Portfolio Energy Savings
2009 through 2015F
(GWh)

	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015F**	**Total**
Energy Savings	2.5	7.1	18.6	28.5	38.4	51.5	65.7	**212.3**

The takeCHARGE residential programs are expected to result in aggregate energy savings of approximately 212.3 GWh by the end of 2015.[8]

Insulation Program

As a result of the updates to the National Building Code in 2012, several changes were made to the Insulation Program. New homes are no longer eligible and the minimum R-value requirements for existing homes have been increased. As well, the rebate structure was revised to provide a higher, easy-to-calculate rebate. Customers can receive an incentive of 75% of basement wall or ceiling insulation material costs up to $1,000, and 50% of attic insulation material costs up to $1,000.

[7] Energy savings include savings arising from all technologies installed by all participants since program implementation. This reflects the fact that these technologies provide energy savings benefits for the customer throughout the life of the product.

[8] Since implementation in 2009, there have been approximately 36,650 participants and over 638,000 at-the-cash rebates were provided on energy efficient products in the takeCHARGE residential customer programs.

Thermostat Program

High efficiency programmable and electronic thermostat replacements allow customers to conserve energy at relatively low cost and effort. Eligibility for the programs is limited to electrically heated homes, determined on the basis of annual energy usage.

ENERGY STAR Window Program

This program concluded at the end of 2014. After 5 years, and over 9,200 participating customers, the program had achieved its objective of making more efficient windows the standard in the local market.

Heat Recovery Ventilator Program

This program promotes the installation of high efficiency heat recovery ventilators ("HRVs"). HRVs have been widely used in new home construction in the province since the 1990s, to control humidity and air quality. The HRV program has experienced lower than projected participation since its launch in late 2013.[9] There has been improvement in 2015, and the Utilities will continue to monitor and evaluate this program in order to find opportunities to increase participation.

Block Heater Timer Program

Hydro provided giveaways and at-the-cash coupons for block heater timers to customers in Hydro's Labrador Interconnected System from 2012-2014. While vehicle engine block heaters are used extensively in this area, timers are rarely used. Instead of using electricity throughout the night, block heater timers allow vehicle owners to reduce the amount of time that electricity is used to warm the vehicle engine. Due to lack of participation this program was not continued past 2014 but commercial customers can take advantage of this technology through the Business Efficiency Program ("BEP") or the Isolated Systems Business Efficiency Program ("ISBEP").

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[9] The Utilities have received feedback regarding low customer knowledge of home ventilation, with many customers being unaware of the purpose of a HRV in their home and how it can save energy. Also, there are complexities in the supply chain for acquiring a high efficiency HRV which can be problematic for potential participants.

Small Technologies

The small technologies program is supported by retail partners and appeals to a broad customer group as it does not involve a major home renovation. The program uses different marketing approaches for two different groups of energy efficient products.

The Instant Rebate component offers relatively small incentives instantly at-the-cash on a variety of low cost, every day energy efficient products for the home.[10] Participation and energy savings results in the first two years of the program have exceeded the forecast in the 2012 plan. The Appliance and Electronics component offers incentives that are relatively higher value and available by mail-in and online application throughout the year.[11]

Isolated Systems Community Program

Following two pilot programs in 2010 and 2011, Hydro launched a full-scale, energy efficiency direct install program in 2012. The program includes direct installations of energy efficient products at no cost to homes and businesses.[12] The program also focuses on customer education and building capacity in the communities by hiring and training local representatives. These representatives work in their own communities to promote the program, provide information on energy use, and install the products.

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[10] Products include LED lighting, motion sensors, timers, dimmer switches, smart power strips and more.

[11] Products include energy efficient clothes washers, full-size refrigerators, full-size freezers and TVs.

[12] Products include low-flow showerheads and aerators, CFLs, smart power strips, and hot water tank and pipe insulation.

Commercial Programs

Table 3 provides a summary of commercial customer energy savings achieved through the Utilities' conservation programs from 2009 through 2015(F).

Table 3
Commercial Portfolio Energy Savings
2009 through 2015F
(GWh)

	2009	2010	2011	2012	2013	2014	2015F	Total
Energy Savings	0.2	0.9	2.4	3.3	3.9	6.5	11.4	**28.6**

The takeCHARGE commercial programs will result in estimated aggregate energy savings of approximately 28.6 GWh by the end of 2015.[13]

Commercial Lighting Program

The Commercial Lighting Program targets reduced energy use through efficient lighting in commercial buildings, including high performance T8 and T5 fluorescent lighting and LED exit signs. This program has primarily been promoted through local lighting distributors by discounting lighting products at time of purchase.

The Business Efficiency Program

The objective of this program is to improve electrical energy efficiency in a variety of commercial facilities and equipment types. The program components include financial incentives based on energy savings from custom projects, and other financial and educational supports to enable commercial facility owners to identify and implement energy efficiency improvement projects. It also includes rebates for specific measures on a per unit basis.

[13] Since implementation in 2009, there have been over 1,050 participants in the takeCHARGE commercial customer programs.

Isolated Systems Business Efficiency Program

This program is targeted toward commercial customers located in Hydro's isolated system communities. This custom program provides incentives based on the energy savings from efficiency improvement projects. This allows customers to implement energy efficient technologies that are suitable for their specific buildings, equipment and operations.

Industrial Programs

Table 4 provides a summary of industrial customer energy savings achieved through Utility customer energy conservation programs from 2009 through 2015(F).

Table 4
Industrial Program Energy Savings
2009 through 2015(F)
(GWh)

	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015(F)**	**Total**
Energy Savings	-	-	0.2	3.3	3.3	25.6	25.6	58.0

The takeCHARGE Industrial Energy Efficiency program will result in estimated aggregate energy savings of approximately 58.0 GWh by the end of 2015.[14]

The Industrial Energy Efficiency Program is a custom program that responds to the unique needs of Hydro's transmission level industrial customers. This program provides financial support for engineering feasibility studies of efficiency projects and for project implementation costs. The Industrial program was initially launched as a three-year pilot program in 2009, with the first project applications being submitted in 2011 and the last being submitted in 2013. No projects were completed in 2013 as focus was put on feasibility studies for work to be completed in 2014. The program then underwent an assessment by an external third party in 2014 and was re-launched as a full program in 2015.

[14] Since implementation in 2009, there have been 5 projects completed under the takeCHARGE Industrial Energy Efficiency Program.

2.3 Education & Support

The Utilities continue to provide energy efficiency education and support to customers through a variety of channels, which include a joint website, outreach activities, school presentations and partnerships with other organizations.

Table 5 shows the number of customer-initiated contacts with the Utilities for energy conservation information from 2010 through 2015 YTD.

Table 5
Customer Contacts for
Energy Conservation Information

	2010	2011	2012	2013	2014	2015YTD
Contact Centre Inquiries	11,704	12,624	9,793	9,630	10,830	5,328
Website Visits	52,013	72,996	49,202	76,278	186,003	197,973

The majority of customers chose electronic means of communication with the Utilities to obtain information on energy conservation and rebate programs. This is consistent with promotion of the takeCHARGE website as the primary resource for customer inquiries and information. Customer visits to the takeCHARGE website grew by 144% from 2013 to 2014. Activity in the first eight months of 2015 shows continued growth, with approximately 80% of website visits via a mobile device. This increase is related to increased promotion, changes to existing programs, and addition of new programs.

The Utilities have participated in an average of 214 community outreach events each year since 2012. This included presentations to retailers and suppliers, senior citizens, trade allies and other groups. takeCHARGE information booths were displayed at home shows, trade fairs, and retail stores across the province. The Utilities also offer a number of outreach events, such as the annual takeCHARGE of Your Town Challenge and Energy Efficiency Week. Through these outreach activities, members of the takeCHARGE team assisted customers with their energy efficiency questions, while raising awareness of energy conservation and the takeCHARGE rebate programs.

Over the last three years the takeCHARGE *Kids in Charge* K-I-C Start school program, has provided energy efficiency and conservation education support to students throughout Newfoundland and Labrador. This has included delivering in classroom presentations and an annual contest for primary and elementary students. In 2014, takeCHARGE partnered with the Provincial Office of Climate Change and Energy Efficiency to extend this program through the Hotshots pilot program.[15] As a result, in 2014-15 school year, over 11,000 students in 106 schools throughout the province participated in 448 presentations about energy conservation.

Trade allies play an integral role in helping customers make knowledgeable decisions regarding energy conservation and related home improvements. Retail partners display information about takeCHARGE programs and energy efficiency products in their stores and in flyers, as well as during special promotional events.[16] Similarly, the Utilities are continuing to grow a network of business to business service providers and suppliers that support the commercial and industrial sectors.[17]

The Utilities have also developed partnerships with a variety of other organizations that share common goals for the province's conservation market, including the Association of Newfoundland and Labrador Realtors, the Canadian Home Builders Association, Newfoundland and Labrador Housing Corporation, and the Canadian Mortgage and Housing Corporation.

[15] Through the HotShots pilot, the Province provided funding and support for additional in-class presentations, curriculum linked teacher materials, and a contest for high school students.

[16] The Utilities continue to work with over 160 retail store partners, 11 manufacturers/distributors, and approximately 50 HRV installers.

[17] These include lighting equipment manufacturers and distributors, electrical and HVAC contractors, and engineering firms.

Table 6 shows costs for education and support for the period 2009-2015(F).

Table 6
Conservation Education & Support
Costs 2009-2015(F)
($000s)

	2009	2010	2011	2012	2013	2014	2015(F)	Total
Education	666	486	428	426	501	647	693	3,847
Support	236	206	219	222	186	174	158	1,401
Total	**902**	**692**	**647**	**648**	**687**	**821**	**851**	**5,248**

2.4 Planning & Evaluation

Planning

The focus of the Utilities' CDM planning process is to develop a 5-year plan for the implementation of comprehensive customer energy conservation and demand management programs around the technologies that were determined to have conservation potential in the provincial market. The completion of the CPS in 2015 effectively initiated the development of the 2016 Plan.

Programs are developed and revised through consultation with the various market stakeholders, such as government, trade allies and local interest groups, to gather feedback on program delivery strategy.

Table 7 shows costs for conservation planning for the period 2009-2015(F).[18]

Table 7
Conservation Planning
Costs 2009-2015(F)
($000s)

	2009	2010	2011	2012	2013	2014	2015(F)	Total
Planning	401	429	509	404	462	958	1,202	4,365

Variations in annual conservation planning costs primarily reflect the periodic nature of the Utilities' program planning and research activities.

Research

In 2013, the Utilities completed a joint Commercial Facility Equipment Inventory ("CFEI") on 54 commercial facilities.[19] This research provided information on how commercial customers use electricity, through an inventory and analysis of all mechanical and electrical equipment in each facility.[20] This data was used as a direct input into the CPS conducted in 2015.

In 2014, Newfoundland Power and Hydro jointly conducted a survey to gather information regarding electricity end uses in the residential sector. The information gathered was used to assess potential electricity savings opportunities, and was used as a direct input into the current planning cycle. These results are also being taken into account in making adjustments to the *takeCHARGE* programs. For example, because

18 Conservation planning costs include costs related to surveys and research, development of the potential study and the five-year plan, and general administration.

19 The CFEI was completed by CBCL Limited, a consultant that conducted on-site facility audits for participating commercial customers. CBCL Limited is a leading employee owned multidisciplinary engineering and environmental consulting firm in Atlantic Canada.

20 The CFEI found, for example, that the food retail sector are the largest users of electricity on a square footage basis of the customers audited, followed by the manufacturing/fish processing sector.

of survey findings regarding the prevalence of CFLs, these have been removed from the Instant Rebates Program beginning in the fall of 2015.[21]

Newfoundland Power completed research on ductless mini-split heat pumps ("MSHP") from 2013 to 2015. The objectives of this research were to assess the current MSHP market in Newfoundland, the use of the MSHP as a supplementary heat source and the potential impact of MSHPs on the electricity system. The results indicate that MSHP are more efficient and do save energy compared to electric baseboard heat.[22] This analysis also shows that there is not likely to be peak demand reduction on the electricity system from installation of MSHPs.[23] Customer demand for MSHP products has grown significantly in recent years and continues to be strong. However, there are issues with availability of qualified installers and customer understanding of product quality requirements.

In the fall of 2014, Newfoundland Power launched a pilot program to assess the economic, market, and technical feasibility of direct load control to reduce overall peak demand. This pilot was initiated in response to the constraints on system capacity that became evident after the events in January of 2013 and 2014. The pilot involved controlling hot water tanks in approximately 500 customer homes in Paradise and Mount Pearl. Demand reduction achieved by the direct load control events on average was 0.6 kW per participant, and for events that included all participants, approximately

[21] Customers were asked what types of lighting they use in areas of their house where they spend the most time: 63% reported that they use incandescent bulbs, 53% CFLs, and 18% LEDs (multiple responses allowed). In another question, 31% of respondents claimed to have changed all their bulbs to more energy efficient types, and 45% indicated that they have begun to change to more energy efficient types.

[22] Approximately half of the homes in the study recorded energy savings after installation of the MSHP. In these homes, electricity usage declined by an average of 5,300 kWh or 19% per year, with savings ranging from 7% to 50%. The remaining homes recorded an increase or no change in energy usage. This appears to reflect factors such as heating of additional living space, fuel switching, or operational issues with the MSHP.

[23] Savings at time of system peak are dependent on a number of factors such as the efficiency and defrost cycle of the MSHP system, and temperature. A high efficiency MSHP may be capable of providing peak savings in warmer parts of the province but not in colder regions, while a less efficient MSHP may not be capable of providing peak savings in any region. On colder weekdays, the study observed little difference in the load profile of the MSHP homes vs. electric baseboard homes, and occasionally the MSHP homes' peak load was slightly higher.

298 kW of demand reduction was achieved. The Pilot results also indicate that a full scale provincial program does not meet the economic requirements.

The Provincial Office of Climate Change Home Energy Monitoring Pilot Project, which is supported by the Utilities and administered by Hydro, began in September 2014 and aims to assess whether real time display of energy use has a positive effect on electricity conservation behavior. The pilot involves approximately 750 customers: 250 with an in-home display device, 250 with an in-home display device as well as electricity conservation information in a monthly mail out, and 250 with only the electricity conservation information. Monitoring of participants will continue until January 2016 and the final report will be submitted to Government by end of March 2016.

Evaluation

The customer energy conservation programs are continuously evaluated by the Utilities on their energy savings, market impacts and delivery process effectiveness. Additional review by external third party evaluators has also been conducted. Program evaluation findings are used to refine program design and implementation details on an ongoing basis, as well as support further planning.

For example, the third party residential program evaluation in 2013 found that two-thirds of windows sold in the province were ENERGY STAR, which supported the Utilities' decision to conclude the ENERGY STAR Windows Program.[24]

Economic and energy savings evaluation of the customer energy conservation programs is performed annually. Program participants are required to provide certain information on program rebate applications. This information ranges from technical data, such as the R-value of installed insulation, or efficiency rating of a HRV to the type of heating in the home and its geographic location. Analysis of this data allows the

[24] The 2013 residential program evaluation was conducted DNV GL- Energy, headquartered in Burlington, Massachusetts, and specializing in evaluating programs that promote energy efficiency, demand response, and distributed generation.

Utilities to accurately estimate the energy savings for each program and perform industry standard economic cost-benefit tests.

2.5 CDM Costs & Cost Recovery

Table 8 provides a summary of the customer energy conservation program and general costs of the Utilities from 2009 through 2015(F).[25]

Table 8
Conservation Costs
2009 through 2015 (F)
($000s)

	2009	2010	2011	2012	2013	2014	2015F	Total
Programs								
Residential	1,386	2,322	3,473	3,436	3,921	4,277	5,188	24,003
Commercial	79	95	216	214	355	926	1,388	3,273
Industrial	57	226	103	173	89	1,244	19	1,910
Total Programs	1,522	2,643	3,791	3,823	4,365	6,447	6,595	29,186
General	1,303	1,121	1,156	1,052	1,149	1,779	2,054	9,614
Total	**2,825**	**3,764**	**4,947**	**4,875**	**5,514**	**8,226**	**8,649**	**38,800**

The Utilities' costs related to conservation programs have increased from approximately $2.8 million in 2009 to $8.6 million in 2015. This primarily reflects the addition of new customer energy conservation programs in 2013, specifically the Small Technologies Program and the Business Efficiency Program. This also reflects the increased levels of customer participation and rebates related to the joint takeCHARGE program portfolio. The expansion of customer programs has also resulted in increasing energy savings.

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25 This cost summary does not include (i) costs related to programs offered independently by the Utilities prior to June 2009; (ii) costs related to Newfoundland Power's demand management activities (Curtailable Service Rate Option and facilities management); and (iii) costs related to Hydro's interruptible service arrangements with its Industrial Customers.

Details of the Utilities' customer energy conservation program and general costs are provided in Schedule C.

The Utilities each bear the costs related to the provision of customer energy conservation programming in their own service territory. General conservation and program costs, such as customer rebates and costs related to responding to customer inquiries are incurred directly by each utility. Costs which are incurred jointly, such as provincial mass media advertising, are split on an 85% / 15% basis between Newfoundland Power and Hydro, respectively.[26]

Cost Recovery

Newfoundland Power's current conservation cost recovery practice reflects Board Order No. P.U. 13 (2013). Conservation program costs are deferred and amortized over a seven-year period. Through the annual operation of the Company's Rate Stabilization Adjustment, customer rates are adjusted to reflect any difference between the conservation program costs included in the most recent test year and the costs actually incurred. Newfoundland Power's annually recurring general conservation costs related to providing general customer information, community outreach and planning are expensed in the year in which the costs are incurred.

Hydro's current customer rates, as approved by the Board in Order No. P.U. 8 (2007), include recovery of approximately $0.4 million in costs related to management and planning of conservation programming. In each year from 2009 to 2014, inclusive, Hydro has deferred recovery of direct program costs related to the expansion of customer energy conservation programming under the 2008 Plan and 2012 Plan.[27] As of August 14, 2015, associated with a general rate application filed by Hydro on July 30, 2013, and an amended general rate application filed by Hydro on November 10, 2014,

[26] This approach to division of jointly incurred costs reflects the proportion of customers served by each utility.

[27] The deferred recovery of these costs in 2009, 2010, 2011, 2012, 2013, and 2014 were approved by the Board in Order Nos. P.U. 14(2009), P.U. 13(2010), P.U. 4(2011), P.U. 3(2012), P.U. 35(2013), and P.U. 43(2014), respectively.

the Consumer Advocate, Newfoundland Power, the Industrial Customer Group and Vale, with participation by Board Hearing Counsel, have engaged in negotiations with Hydro. As a result, these parties agreed that "Hydro's proposal to defer and amortize annual customer energy conservation program costs, commencing in 2015, over a discrete seven year period in a Conservation and Demand Management (CDM) Cost Deferral Account should be approved."[28]

3.0 PLAN: 2016-2020

3.1 Conservation Potential & Program Selection

The programs included in the 2016 Plan have been selected based on a number of considerations. Opportunities identified in the 2015 CPS are a key input and these have been further assessed by the Utilities in terms of engineering, market and economic viability. Consideration has also been given to the experience of the Utilities and others in the local marketplace, feedback from customers, as well as experience shared from other Canadian jurisdictions.

Conservation Potential Study

In June 2015, a comprehensive study was completed of electricity conservation and demand management potential for the province.[29] This Conservation Potential Study estimated the potential for electrical energy and demand savings by sector and by electricity system from 2015-2029. It also identified specific technologies available to assist in achieving that potential. The CPS essentially provides a framework, consistent with current North American practices, within which to assess conservation programming. The findings enabled the Utilities to quickly focus on cost effective technologies and begin assessment of market characteristics to guide program concept development.

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[28] Newfoundland and Labrador Hydro – Amended General Rate Application – Parties' Settlement Agreement dated August 14, 2015.

[29] ICF International (previously called Marbek) conducted Conservation Potential Studies for the Utilities in 2007 and 2015. ICF International is a leading environmental and energy management consultancy and has extensive experience conducting Conservation Potential Studies in Canada.

Electrical system marginal costs of supply are used in the CPS to screen the economic viability of more efficient technologies.[30] For the current CPS, these costs were based on the most recent marginal cost forecast as projected by Hydro in February 2015.[31] These estimates are currently under review. Once Hydro's marginal cost study is completed, the CPS results will be reassessed. If such a review results in changes to the list of cost effective technologies with conservation potential, these will be considered in future updates to the 2016 Plan.

Figure 1 shows the baseline provincial energy usage forecast which was input to the 2015 CPS (the reference case), and the upper and lower achievable potentials estimated by the Potential Study.[32]

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30 Technologies are considered to be economically viable when the cost of saving one kWh or kW of electricity is equal to, or less than, the marginal cost of supplying the electricity.

31 The 2015 CPS included an analysis of the sensitivity of potential technologies to changes in marginal costs. The analysis was based on a range of + 30% to – 10% of the February 2015 forecast marginal costs. It indicated a modest level of variability in technology viability and resulting conservation results. Please see CPS, section 7.5 Energy Efficiency Supply Curve, filed with the Board September 15, 2015.

32 The reference case is based on the provincial energy usage forecast from 2014. After this study was completed the energy usage forecast decreased due to the economic downturn, mainly in the industrial sector. The achievable potential is defined as the portion of the economic conservation potential that is achievable through utility interventions and programs given institutional, economic and market barriers. The upper achievable potential is considered to be the best case scenario with all market barriers removed, such as capital cost and product accessibility. The lower achievable potential is considered a business as usual scenario with the existing market barriers remaining in place.

Figure 1
Conservation Potential Study Results
Provincial Electrical Consumption
2014-2029

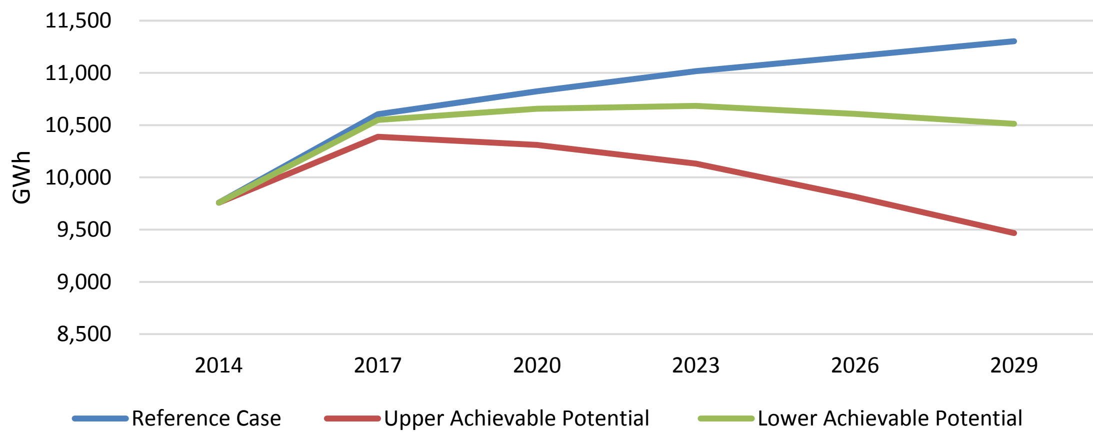


Figure 1 shows that, over time, the cumulative effects of implementing cost effective efficient technologies can significantly reduce forecast growth in electricity usage.[33]

Figures 2 and 3 show the results of the CPS regarding achievable demand reduction potential from energy efficiency measures ("Energy Efficiency") and from demand response specific measures ("Demand Response") by 2020.[34]

33 At the end of the first estimation interval, in 2017, the CPS shows a range of 55 GWh for the lower achievable potential savings and 215 GWh for the upper achievable potential savings. This compares with annual savings of approximately 116 GWh currently estimated in the Plan for the same timeframe.

34 The Commercial and Industrial sector includes Hydro's large transmission level Industrial customers as well as Newfoundland Power's general service customers.

Figure 2
Lower Achievable Demand
Reduction Potential
Island Interconnected System
2020
(MW)

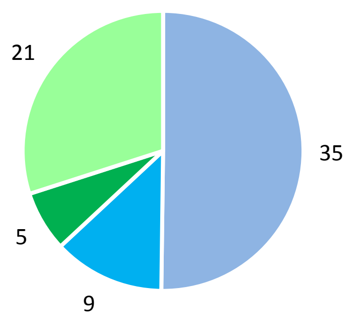
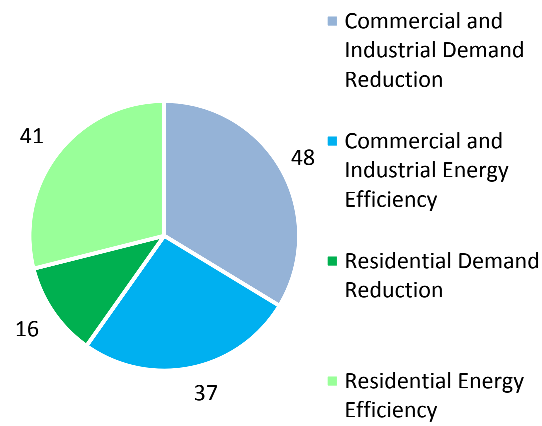


Figure 3
Upper Achievable Demand
Reduction Potential
Island Interconnected System
2020
(MW)



Figures 2 and 3 show 70 MW for the lower potential and 142 MW for the upper potential demand reduction on the Island Interconnected System.[35] Installation of energy efficiency measures that reduce consumption during times of peak demand account for approximately 43% and 55% of the lower and upper achievable demand reduction, respectively, by 2020.[36]

The majority of the demand reduction potential was identified in the Commercial and Industrial sectors. Specifically, the Industrial sector represents about 87% and 74% of the total lower and upper achievable demand reduction, respectively. The demand reduction technologies identified through the CPS as having the most potential included curtailable load arrangements with commercial and industrial customers and direct load control of residential hot water tanks.

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[35] 21+35+9+5=70 and 41+16+37+48= 142
[36] (21+9)/70=43% and (37+41)/142=55%.

Selection

The technologies that passed the economic screening of the CPS were reviewed in detail to assess their possible inclusion in the 2016 Plan. Local market research was conducted to identify barriers to broader adoption of more efficient technologies, such as capital cost, market availability and awareness. This included consultation with market stakeholders and trade allies, as well as discussions with other utilities.

Once existing market barriers were identified, a program strategy was then developed to attempt to overcome those barriers. Costs associated with the program were considered and the cost effectiveness of the program determined.[37] This more detailed review of program costs and benefits can cause a technology that had passed economic screening in the CPS to fail the economic tests required of CDM programs.

Economic Screening

The Utilities' economic screening of the customer energy conservation programs has previously required a positive result for both the Total Resource Cost ("TRC") and Ratepayer Impact Measure ("RIM") cost-benefit tests.[38] Recent research indicates Canadian and U.S. utility practice has changed to focus on the TRC and Program Administrator Cost ("PAC") tests.[39]

The Utilities recommend adoption of the TRC as the primary means of program economic screening, and the PAC as a secondary means. This is consistent with current North American practice, and is appropriate based on the electrical system marginal costs and program objectives in this jurisdiction. Based on this recommendation the programs included in the 2016 Plan passed economic screening

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37 Program cost estimates include marketing, delivery and administration, incentives, measurement and verification, and evaluation.

38 In Order No. P.U.7 (1996-97), the Board required customer conservation programs to be evaluated with respect to rate impact, as well as the total resource costs. The Utilities' have interpreted this Order to require a TRC of 1.0 and a RIM of 0.8 as described in *Newfoundland Power Inc. – 2009 Conservation Cost Deferral Application, Section 2: Proposed Customer Program Portfolio* filed with the Board October 29, 2008.

39 See Section 2.1, page 4, and Schedule B.

based on the TRC and PAC.[40] The Utilities' will continue to monitor changes to economic screening practices to appropriately reflect evolving program characteristics and electrical system costs.

3.2 Conservation & Demand Management Programs

The 2016 Plan builds on the outcomes of the 2012 plan as well as the experience of the Utilities. Programs included in the 2016 Plan address conservation opportunities in all three sectors: residential, commercial, and industrial. The 2016 Plan includes a new behavioural-based program for the residential sector, expansion of existing commercial programs, and the reshaping or discontinuation of several programs. These conservation programs are broadly consistent with programs offered by utilities in other jurisdictions.

Table 9 shows, by sector, the portfolio of programs to be offered under the 2016 Plan.

Table 9
Conservation Programs
By Sector

Residential	**Commercial**	**Industrial**
Insulation Thermostat HRV Small Technologies Isolated Systems Community Program Benchmarking	Business Efficiency Program Isolated Business Efficiency Program	Industrial Energy Efficiency Program

40 Application of the RIM test would result in elimination of a number of programs, including Benchmarking, HRV, and Small Technologies.

Residential Programs

Insulation, Thermostat and HRV Programs

These existing joint incentive programs primarily target space heating energy savings, and will continue to be offered as part of the 2016 Plan. The remaining eligible market for the Insulation and Thermostats programs has been declining in recent years. The HRV program has had limited participation due to barriers related to customer understanding and market complexity. These programs will be continuously evaluated to ensure program cost effectiveness.

Small Technology Program

The jointly offered Small Technologies program will continue to use different marketing approaches for the two different groups of energy efficient products.

The Instant Rebate component will continue to offer relatively small incentives instantly at-the-cash on a variety of low cost, every day energy efficient products for the home. As part of the 2016 Plan, Instant Rebates will include additional technologies.[41] It is anticipated that this component will end during 2018 as LED lighting becomes the norm in the residential lighting market.[42] Most of the energy savings benefits in this program are related to customers' early adoption of LED lighting from less efficient technologies, and energy savings from non-lighting products are not expected to be sufficient to offset the program delivery costs.

Incentives for the Appliance and Electronics component will continue to be available through 2017. At that time, anticipated reductions in marginal costs on the electricity system will effectively reduce the value of energy saving benefits, causing the program to fail economic screening.

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[41] As part of the 2016 Plan, Instant Rebates will include additional technologies, such as faucet aerators, door bottom weather stripping, door adhesive weather stripping, window insulation kits, electrical outlet gaskets, and caulking.

[42] The uptake of LEDs will be monitored and evaluated to confirm the market saturation rate in 2017.

Isolated Systems Community Program

The existing format for this program will continue to be offered to customers in Hydro's isolated system communities through 2017. Information and feedback collected in 2014 and 2015, particularly for the direct install component, will be used to evaluate and plan for the Isolated Systems Community Program beyond 2017.

An Appliance Retirement component will be added to this program beginning in 2016, targeting at least one community. Older inefficient appliances will be removed from participating homes and routed for appropriate disposal.[43]

Benchmarking

This new joint program will promote customer behaviour changes to encourage more efficient energy use. Benchmarking involves using social norms to encourage neighbourly competition to reduce electricity consumption. This program will include comparison of participant households' energy consumption with their energy history and that of similar households. Participants will also receive personalized home energy reports that provide household specific electricity usage information and savings tips to help them reduce energy use and lower their electricity bills. This program will be available to customers from 2016 to 2019.

Commercial Programs

Lighting Program

Beginning in 2016, existing commercial lighting program products will become prescriptive rebates under the Business Efficiency Program, including the fluorescent high bay, high performance T8 fluorescent lamp and LED exit sign. This change will allow for more specific marketing initiatives and increased awareness of the rebates available for these technologies.

[43] This component will be evaluated to determine whether a broader program would be cost effective.

Electronic ballasts will no longer be available for incentive as of 2016 because these ballasts have become the market standard. Industry partners indicate that approximately 55% of ballasts sold in the province in 2014 meet the program efficiency criteria.[44]

Business Efficiency Program

The Business Efficiency Program, offered jointly by the Utilities, will continue to provide custom and prescriptive incentives to commercial customers for energy efficiency improvements. Continued growth in customer participation and energy savings are anticipated for this program. The Utilities will increase the customer education and awareness component of this program to include sector-based identification of energy efficiency opportunities. New technologies will also be added to the program's list of prescriptive incentives.[45]

Isolated Systems Business Efficiency Program

This program will continue through 2020, and will be offered to Hydro's commercial customers located in isolated system communities. The program will continue to provide incentives based on the energy savings of customer projects, similar to the Business Efficiency Program.

Industrial Programs

Industrial Energy Efficiency Program

Through 2020, this customized program will continue to offer support and financial incentives based on energy savings for retrofit of industrial process equipment for Hydro's transmission level industrial customers.[46]

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[44] Note that U.S. Federal Regulations are now equivalent to this ballast efficiency specification.

[45] These include: LED screw-in lamps, high bay LED fixtures, electrically commutated motors for evaporator fans, cold climate air source heat pump systems, and low flow pre-rinse spray valves.

[46] The Industrial Energy Efficiency Program's cost effectiveness and potential energy savings will be evaluated on a year to year basis.

Customer Energy Savings

Table 10 shows forecast customer energy reduction estimates for the programs in the 2016 Plan, by sector, from 2016 through 2020.

Table 10
2016 Plan Energy Reduction Estimates
2016 through 2020
(GWh)

	2016	2017	2018	2019	2020	Total
Residential	80.4	102.7	118.1	123.5	111.7	536.4
Commercial	18.7	27.6	37.5	48.6	61.4	193.8
Industrial	30.6	30.6	30.6	30.6	30.6	153.0
Total	129.7	160.9	186.2	202.7	203.7	883.2

The programs in the 2016 Plan will result in estimated aggregate customer energy savings of approximately 883.2 GWh from 2016 through 2020. Customer energy savings are forecast to increase annually through 2020, due to expansion of the program portfolio and the addition of program technologies for the residential and commercial sectors.

Several program offerings are expected to be concluded during the planning period. These include the Small Technologies program and the Benchmarking program. Design of alternate programming for the residential sector is anticipated through the Utilities' program planning in 2018.

Demand Management

The previous conservation and demand management plans have focused primarily on energy conservation.[47] However, the Utilities' customer energy conservation programs have resulted in quantifiable demand savings.

The technologies identified through the CPS as having the most potential for demand reduction included direct load control of residential hot water tanks and curtailable load arrangements with commercial and industrial customers. Recent research has identified issues with the cost effectiveness of residential load control on the Island Interconnected System. As a result, this measure is not included in the 2016 Plan.[48] The Utilities will continue to pursue curtailment opportunities with their larger customers.[49]

A new component will also be added to the Business Efficiency Program ("BEP") to include a custom incentive for demand reduction measures that are economically viable and that provide measureable demand reduction during peak times.[50]

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[47] This reflected the relatively high marginal energy costs (predominantly due to fuel costs at Hydro's Holyrood Thermal Station) which justified such a focus.

[48] Although residential load control on the Island Interconnected System does not make economic sense, Hydro's isolated communities served by diesel generation have higher marginal costs which may make the program cost effective.

[49] Hydro currently has interruptible load arrangements with its Industrial Customers which have potential for more than 90 MW of capacity assistance. Newfoundland Power currently has 16 customers participating in its Curtailable Rate Option, providing 10.4 MW of potential load reduction.

[50] More information on the custom demand component of the BEP can be found in Schedule C.

Table 11 shows forecast customer demand reduction estimates for the customer energy conservation programs in the 2016 Plan, by sector, from 2016 through 2020.

Table 11
2016 Plan Demand Reduction Estimates
2016 through 2020[51]
(MW)

	2016	2017	2018	2019	2020	Total
Residential	3.3	4.7	5.0	4.3	1.4	18.6
Commercial	2.1	2.0	2.3	2.5	2.8	11.7
Total	5.4	6.7	7.3	6.8	4.2	30.3

The Utilities' takeCHARGE customer energy conservation programs are forecast to achieve approximately 30.3 MW in peak demand reduction through 2020. This demand reduction will occur annually for the life of the installed technologies.[52]

[51] Hydro does not forecast demand reduction for their transmission level industrial customers.
[52] For example, a customer who installs basement insulation in 2014 will achieve approximately 0.9 kW of annual peak demand reduction for the next 20 years.

2016 Plan Program Costs

Table 12 shows forecast costs for the programs in the 2016 Plan, by sector, from 2016 through 2020.

Table 12
2016 Plan Program Costs Estimates
2016 through 2020
($000s)

	2016	2017	2018	2019	2020	Total
Residential	5,987	6,308	4,540	3,048	2,042	21,925
Commercial	1,628	1,906	1,933	2,258	2,301	10,026
Industrial[53]	667	10	10	10	10	707
Total	8,282	8,224	6,483	5,316	4,353	32,658

The Utilities' costs related to programs in the 2016 Plan are forecast to be approximately $32.7 million over the five-year planning period. Forecast changes in program costs primarily reflect the expansion of programs and additional technology offerings anticipated from 2016 to 2018, and the conclusion of certain programs through the planning period.

3.3 Education & Support

The Utilities' customer education and support activities will continue to evolve to support changes in customer energy conservation programs and in the broader conservation market. The Utilities will continue to provide customer support and be responsive to customer expectations. Current activities, including customer outreach events, the takeCHARGE website and partnerships with industry stakeholders will be key elements of customer education.

[53] Forecasted Industrial program costs after 2016 are associated with program promotion and customer engagement. Given the small number of transmission level customers in the province, there is a high degree of uncertainty for participation in the program year to year. The forecasted amounts after 2016 will increase if customers avail of the program for feasibility assessments or incentives for energy efficiency retrofits. Projects will continue to be screened based on cost effectiveness to ensure the program remains above minimum economic thresholds.

The Utilities' educational initiatives will be expanded to include a program promoting mini-split heat pumps. The program components will include financing, education and marketing initiatives directed towards customers, and direct engagement with certified installers and suppliers. A marketing campaign will be launched to raise customer awareness of the benefits of this technology, how to choose a high quality product, as well as the necessity of having the system installed by qualified contractors. The eligibility criteria for on-bill financing of these systems will encourage the installation of high efficiency units, installed by qualified contractors.[54]

The Utilities will continue to build upon their experience offering the takeCHARGE K-I-C Start School Program. Marketing will continue to build awareness of the program amongst school boards and teachers. Teaching aids will be developed and be made available on the takeCHARGE website to assist in furthering conservation education after presentations are conducted. Updates will also be made to strengthen the message of conservation for younger students, and awareness-building contests will be offered for all age groups.

Table 13 shows forecast costs for conservation education and support for the period 2016 to 2020.

Table 13
Conservation Education & Support
Costs 2016 through 2020
($000s)

	2016	**2017**	**2018**	**2019**	**2020**	**Total**
Education	770	791	827	851	873	4,112
Support	171	175	181	184	191	902
Total	941	966	1,008	1,035	1,064	5,014

54 Financing has been offered by Newfoundland Power since the 1990s and Hydro will have financing available beginning in 2016.

3.4 Planning & Evaluation

Planning

The 2016 Plan incorporates research and analysis required for the next iteration of multi-year conservation portfolio planning by the Utilities.

Table 14 shows forecast planning costs included in the 2016 Plan.

Table 14
Conservation Planning Costs 2016-2020(F)
($000s)

	2016	2017	2018	2019	2020	Total
Planning	527	596	767	863	644	3,397

Variability in annual planning costs reflects the Utilities' multi-year planning cycle for customer conservation programs.

The Utilities anticipate development of the next multi-year plan for customer energy and demand conservation programming in 2018. Further clarity regarding electrical system cost dynamics is expected to be a factor in the next planning cycle.[55] Further assessment and adjustments to the programming contained in the 2016 Plan may also be required within the next three years as marginal cost forecasts are updated.

Research

The next update of the study of conservation potential in the province is being planned for 2020. In advance of this study, the Utilities will undertake a number of research projects regarding electricity end-use trends and the state of the local market for efficient technologies. For the residential sector, customer surveys will gather details on

[55] An updated marginal cost study is expected to be a key input to the next conservation plan in 2018 and the next CPS in 2019-2020.

the type of electrical equipment that customers have in their homes, as well as their energy-related behaviour and motivation. Research for the commercial sector will include on-site facility audits to collect data on mechanical and electrical equipment being used.

The residential lighting market will be evaluated in 2017 to determine whether the Small Technologies program should continue. This research is expected to include a socket saturation study, with onsite inventories, as well as customer surveying. This will provide the Utilities with detailed data regarding the remaining potential for energy efficient lighting replacements.

Hydro is currently investigating the implementation of an Isolated System Direct Load Control Pilot in the community of Postville, Labrador.[56] The community of Postville is served by diesel generation. The objective of this pilot will be to reduce the peak load in the community and defer investment in electrical system upgrades. The Utilities will also continue to coordinate conservation planning with electrical system planning, and will evaluate potential for conservation initiatives targeted in specific areas or communities that may provide a lower-cost alternative to electrical system upgrades.

The Provincial Office of Climate Change Home Energy Monitoring Pilot Project is ongoing and the final report will be submitted to Government by end of March 2016. The results of this pilot project will be used to assess whether this type of technology may be considered as part of future energy conservation programming.

During this planning period, the Utilities will also monitor developments in North American practices for economic evaluation and screening of conservation programs.[57]

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[56] The pilot will involve commercial and residential customers. It will include installing load controllers on hot water tanks, and commercial electric heating circuits, for commercial customers. Load controllers will only be activated during maximum system peak events. The customers that participate will receive incentives such as credits at the local store in Postville.

[57] While reliance on the TRC and PAC tests for primary economic screening is currently the norm in North American jurisdictions, modifications to the TRC methodology are being considered in a number of cases. These modifications primarily involve inclusion of customers' non-energy benefits from efficiency upgrade projects.

Evaluation

The customer program portfolio will continue to be evaluated in terms of its energy savings, market impacts and delivery process effectiveness. Additional review by third party evaluators is expected, reflecting the expanded program portfolio and delivery methods.[58] Program evaluation findings will be used to refine program design and implementation details on an ongoing basis, as well as support further planning.

Specific evaluation objectives in the 2016 Plan are to monitor market saturation of particular technologies as well as cost effectiveness of the programs. For example, the Instant Rebates component of the Small Technologies program will be evaluated and an exit strategy designed based on research into the pace and impact of LED sales growth in the local lighting market.

Similarly, the Utilities will continue to closely monitor the Insulation, Thermostat and HRV programs. These programs have unique challenges and barriers to program participation.[59] Evaluation of these programs will ensure they continue to satisfy cost effectiveness requirements.

In the case of new program introductions, post-implementation evaluations will be conducted within 12 months of program launch to ensure full assessment of program design assumptions, as well as marketing and delivery process effectiveness.

[58] Evaluation costs are primarily reflected in the costs for each specific program.

[59] For the Insulation and Thermostat Programs, these barriers primarily reflect the inherent difficulty in renovating existing living spaces and the remaining market being increasingly hard-to-reach. For the HRV program, this reflects the low level of customer understanding and slow adoption by the supply chain.

3.5 Costs & Cost Recovery

Table 15 provides a summary of the Utilities' customer energy conservation program and general costs from 2016 through 2020.[60]

Table 15
Conservation Costs
2016 through 2020
($000s)

	2016	2017	2018	2019	2020
Program					
Residential	5,987	6,308	4,540	3,048	2,042
Commercial	1,628	1,906	1,933	2,258	2,301
Industrial	667	10	10	10	10
Total Programs	8,282	8,224	6,483	5,316	4,353
Education	770	791	827	851	873
Support	171	175	181	184	191
Planning	527	596	767	863	644
Total General Costs	1,468	1,562	1,775	1,898	1,708
Total	9,750	9,786	8,257	7,214	6,061

Costs related to the customer energy conservation programs outlined in the 2016 Plan are forecast to be $9.8 million in 2016 and 2017.[61] This increase primarily reflects the addition of a new program, and enhanced program technology offerings. Costs begin to decrease in 2018 from $8.3 million to $6.0 million in 2020. This decrease primarily reflects the conclusion of the Small Technologies program in 2018 and the conclusion of the Benchmarking program in 2019.

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[60] This cost summary does not include costs related to Newfoundland Power's demand management activities (Curtailable Service Rate Option and facilities management) and costs related to Hydro's interruptible load arrangements.

[61] All customer energy conservation programs outlined in the 2016 Plan are cost effective, and are justified on a cost of service basis.

Schedule E provides a summary of forecast energy savings, cost estimates and cost effectiveness analysis results for the programs in the 2016 Plan.[62]

Cost Recovery

The Utilities propose conservation cost recovery based on amortizing customer energy conservation program costs over seven years.[63] The amortization of program costs over a seven-year period is considered appropriate because of the extended nature of the energy savings benefits provided by program technologies.

The Utilities' annually recurring general conservation costs would continue to be expensed as incurred.[64]

4.0 OUTLOOK

The Utilities anticipate significant changes in the electrical system serving the province within the five years considered in this plan. The Muskrat Falls hydroelectric development and related interconnection to the North American grid will affect system operations and costs, as well as customer prices. The next iteration of multi-year conservation program planning is anticipated in 2018, to coincide with these events.

In the interim, the approach outlined in the 2016 Plan will remain flexible to address ongoing changes. The initiatives in the 2016 Plan are cost effective based on current information, and were assessed for sensitivity to changes in system costs. As the Utilities implement the program changes outlined in this Plan, they will continue to evaluate program offerings to ensure they create economic benefits and are responsive to evolving customer expectations and market conditions.

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62 Cost forecasts can be expected to be refined as detailed program design progresses in 2016.

63 Newfoundland Power has used this approach since 2013, based on Order No. P.U. 13 (2013). Hydro has proposed this approach in its ongoing general rate application, and the proposal has been agreed to by the parties to settlement negotiations in that matter.

64 While general customer energy conservation costs provide benefits to customers in terms of information, knowhow and advice, those benefits are not transparently quantifiable in the same manner as program benefits.

With growing customer awareness of conservation, and of the takeCHARGE brand, the Utilities will continue to seek opportunities to partner with complementary organizations and trade allies for customers' advantage. Information sharing and policy coordination with the Province will also continue, primarily through the Office of Climate Change and Energy Efficiency.

Table A-1 shows most recent marginal cost forecast as projected by Newfoundland and Labrador Hydro in February 2015.

Table A-1
Marginal Cost Projection
for the
Island Interconnected System
2015 - 2035

	Energy ($/MWh)	Capacity ($/KW – Yr)
2015	108	51
2016	133	70
2017	134	74
2018	47	98
2019	50	99
2020	54	108
2021	56	112
2022	59	115
2023	62	119
2024	65	123
2025	68	126
2026	70	126
2027	73	125
2028	76	125
2029	78	124
2030	81	124
2031	85	121
2032	88	118
2033	92	116
2034	96	113
2035	100	110

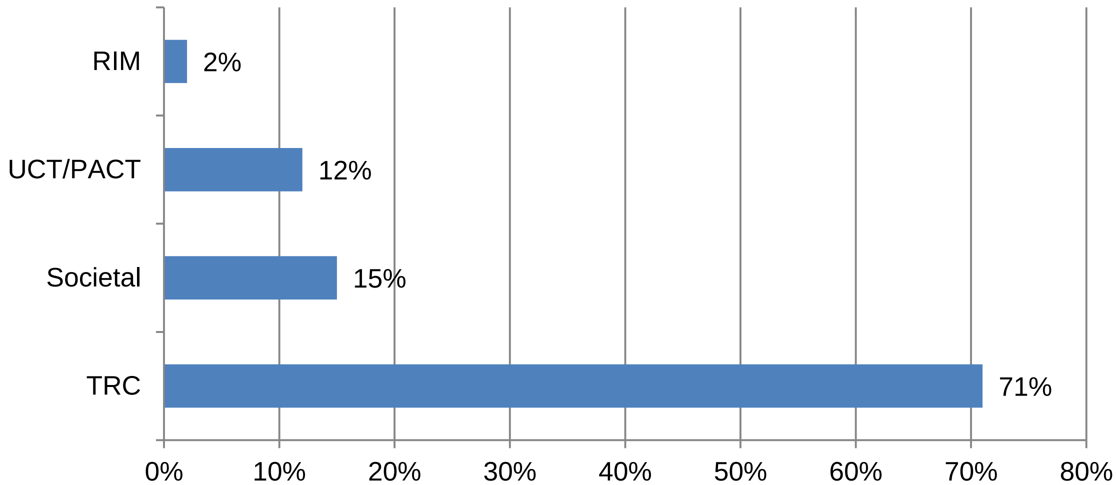
Notes:
1. Modeled as per NERA Economic Consulting marginal cost approach (2006).
2. Fuel costs per NLH corporate assumptions, January 2015.
3. Excludes transmission marginal costs.
4. Projection is at customer bulk delivery point.
5. Island Interconnected costs beyond 2017 reflect opportunity cost as per NERA approach.

Table B-1
Current Canadian
Utility Practice
Economic Evaluation Practices

Province	Economic Test				
	TRC	PAC	RIM	PCT[1]	SCT[2]
British Columbia	X[3]				
Ontario	X	X			
Nova Scotia	X	X			
Manitoba[4]	X		X	X	X
Saskatchewan	X	X			
Quebec	X		X[5]		
Prince Edward Island	X	X[6]		X	X[6]

1 Participant Cost Test (“PCT”).
2 Societal Cost Test (“SCT”).
3 British Columbia uses a modified TRC that includes non-energy benefits that are not traditionally included in the TRC.
4 Manitoba also considers the levelized resource cost, net utility benefit, utility net present value, levelized utility cost, and simple customer payback calculation.
5 Quebec considers the RIM as a secondary test.
6 Prince Edward Island considers the PAC and SCT as secondary tests.

Chart B-1
Current American Utility Practice
Economic Evaluation Practices
(Percent of States)



[7]

n=43

[7] Research conducted by the American Council for an Energy Efficient Economy (February 2012) “A National Survey of State Policies and Practices for the Evaluation of Ratepayer-Funded Energy Efficiency Programs”.

Insulation Program

Program Description
The objective of this program is to increase the insulation level in residential basements, crawl spaces and attics. Increasing the insulation R-value in a home will result in space heating energy savings. The program components include rebates and financing, and a variety of education and marketing tools. This program has been offered through takeCHARGE since 2009.
Target Market: Residential
This program targets residential customers completing retrofit projects. Changes to the National Building Code of Canada implemented in December 2012 mandated that all new homes install basement insulation and increased the R-Value requirements in the attic. As a result, this program is only offered to existing homes (i.e. connected to the electricity grid before January 1, 2014) to exclude minimum building code compliance in new homes. Eligibility will continue to be limited to electrically-heated homes.
Eligible Measures
Eligible measures in this program include insulation upgrades to basements, crawl spaces and attics. Technical requirements will be approximately aligned with National Building Code of Canada.
Delivery Strategy
Delivery of this program will continue to be bundled with Thermostat, Instant Rebates, Appliance & Electronics and HRV programs as part of the takeCHARGE residential portfolio. Marketing initiatives include partnering with retailers and trade allies in the renovation industry, and target both do-it-yourself and professional installers. Tools and tactics will include retail point-of-sale materials, advertising, website, tradeshows, community outreach and trade ally activities. Rebates and financing will be processed through mail and online customer applications.

Insulation Program

Market Considerations

Barriers to increased market penetration include initial cost, awareness of the impact on space heating energy, the practical difficulties of renovating an existing living space and a decreasing number of eligible participants. Experience with the existing program has shown participation to be responsive to awareness-building marketing activities.

Incentive Strategy

Incentives for this program include rebates and financing. In August 2014, the rebate structure was simplified and increased. Customers can now get a rebate of 75% of the cost of materials installed in the basement and 50% of the cost of materials in the attic. Rebates amounts are capped at $1,000.

Program Monitoring & Evaluation

The program will be monitored for participation level, service quality, market saturation and cost effectiveness. A representative sample of installations will be inspected. Formal external evaluations will be conducted every two years during operation.

Estimated Costs & Energy Savings

	2016	**2017**	**2018**	**2019**	**2020**	**Total**
Estimated Costs ($000s)	1,187	1,207	1,202	1,197	1,223	6,018
Estimated Cumulative Energy Savings (GWh)	30.0	33.1	36.1	38.9	41.8	180
Total Resource Cost						**2.5**

Thermostat Program

Program Description

The objective of this program is to encourage installation of programmable and high performance electronic thermostats in homes. Programmable and high performance electronic thermostats allow customers to better control the temperature of their homes and to set back the temperature during the night or while away. The program components consist of rebates, financing options, and a variety of education and marketing tools. This program has been offered through takeCHARGE since 2009.

Target Market: Residential

This program targets residential customers, including home retrofit and new home construction. Eligibility will continue to be limited to electrically-heated homes.

Eligible Measures

Eligible measures in this program include both programmable and high performance electronic thermostats. All thermostats must have a setting precision of +/- 0.5 degrees Celsius or less.

Delivery Strategy

The delivery strategy for this program remains unchanged. Delivery of this program will continue to be bundled with the Insulation, Instant Rebates, Appliance & Electronics and HRV programs as part of the takeCHARGE residential portfolio.

Marketing initiatives include partnering with retailers, electrical contractors, homebuilders and real estate professionals, to educate consumers regarding the energy savings and comfort benefits of programmable & high performance electronic thermostats. Tools and tactics include retail and model home point-of-sale materials, website, tradeshows, community outreach and trade ally activities. Rebates will be processed through mail and online customer applications.

Thermostat Program

Market Considerations

Barriers to installation of programmable and high performance electronic thermostats include lack of awareness of the potential for energy savings, difficulty programming, and reluctance to pay for an electrician to install the thermostats, and a decreasing number of eligible participants.

Incentive Strategy

Incentives for this program include rebates and financing. The rebate value is $5 per high performance electronic thermostat and $10 per programmable thermostat. This continues to reflect incremental cost of the more efficient options. A time limit is no longer required for incentive redemption.

Program Monitoring & Evaluation

The program will be monitored for participation level, service quality, market saturation, and cost effectiveness, and a representative sample of installations will be inspected. Formal evaluations will be conducted every two years during program operation.

Estimated Costs & Energy Savings

	2016	**2017**	**2018**	**2019**	**2020**	**Total**
Estimated Costs ($000s)	517	555	539	557	552	2,720
Estimated Cumulative Energy Savings (GWh)	9.7	11.1	12.5	13.8	15.2	62
Total Resource Cost						**2.8**

Small Technologies Program

Program Description

The objective of this program is to increase home energy efficiency and awareness by offering instant rebates on a variety of energy efficient technologies as well as online and mail in rebates for eligible appliances and electronics. This program also includes promotional events to raise awareness of the technologies and to engage the public.

Target Market: Residential

This program is marketed toward all residential customers province wide. All customers are eligible to participate regardless of age of home or heat source. A variety of marketing techniques such as TV news sponsorships, print, radio, online, website, as well as social media channels are used to engage customers.

Eligible Measures

Eligible measures in this program will vary over time and will be selected based on cost effectiveness, energy saving potential and market conditions. Instant rebates are available for small energy efficient items such as LEDs and smart power bars, and online and mail in customer applications are required for qualifying models of full-size refrigerators, clothes washers, TVs and full-size Energy Star freezers.

Six new measures will be added to the technology list in 2016. They are:

- Faucet aerators
- Door bottom weather stripping
- Door adhesive
- Window insulation kit
- Electrical outlet gaskets
- Caulking

Small Technologies Program

Delivery Strategy

Partnerships have been made with both chain and independent retailers to offer instant rebates to customers on a number of energy efficient products. Efforts to engage both urban and rural retailers have been made in order to ensure rebated products are available in all areas of the province.

Campaigns are held in the spring and fall each year. During each campaign, the Utilities set up in-store events at the participating locations to raise customer's awareness of the rebates and encourage use of energy efficient products.

Market Considerations

The technologies included in the program do not involve a major renovation. This program will allow the Utilities to reach customers that may not have been able to participate in the other incentive programs.

Incentive Strategy

Incentives for this program include instant rebates for small energy efficient items that will vary by year and campaign. Online and mail in customer applications are available for eligible appliances and electronics. The rebate value will be different for each technology offered, and will reflect incremental cost of the more efficient options.

Program Monitoring & Evaluation

The program will be monitored for participation level, service quality, and cost effectiveness. Exit interviews will be conducted during selected retail events. Formal evaluations will be conducted after the first year of implementation, and biannually during operation.

It is anticipated that this program will end after 2018. The Utilities expect that LEDs will make up the majority of bulbs that are sold in the province. If this occurs, the economics of the program will no longer be cost effective. The uptake of LEDs will be monitored and evaluated to confirm the market saturation rate in 2017.

Small Technologies Program

Estimated Costs & Energy Savings

	2016	2017	2018	2019	2020	Total
Estimated Costs ($000s)	3,113	2,879	1,578	-	-	7,570
Estimated Cumulative Energy Savings (GWh)	23.8	33.3	38.2	37.4	36.5	169
Total Resource Cost						**1.3**

HRV Program

Program Description

The objective of this program is to increase the installation of higher efficiency Heat Recovery Ventilators (“HRV”). The program components include rebates and financing, and a variety of education and marketing tools.

Target Market

This program targets all residential customers regardless of heat source or age of home. Eligibility is available to all homes that install or replace an HRV.

Eligible Measures

Eligible measures in this program include all HRV models that have an SRE of 70% or more and meet the minimum fan efficacy requirements.

Delivery Strategy

Delivery of this program will be bundled with other takeCHARGE residential programs as part of the overall portfolio. Marketing initiatives include partnering with trade allies in the home building and renovation industry, particularly Heating Refrigeration and Air conditioning Institute certified installers. Tools and tactics include website presence, tradeshows, and trade ally activities. Rebates and financing will be processed through customer application.

Market Considerations

The market includes new construction and existing HRV replacement with an emphasis on existing replacements. Early HRV installations of the 1990s are at or near the end of their useful life, so many of these require replacement.

This program has faced a number of barriers such as understanding of what a HRV is and its purpose in the home, initial cost, and awareness of the benefits of selecting more efficient HRVs.

HRV Program

Incentive Strategy

Incentives for this program include rebates and financing. The rebate value is $175 for qualifying HRV units. This reflects the incremental cost of the more efficient options.

Program Monitoring & Evaluation

The program will be monitored for participation level, service quality, and cost effectiveness. This program has experienced challenging barriers to program participation. Attempting to overcome these barriers can be administratively costly and may outweigh the benefits of program delivery. This program will be monitored to ensure that the participation goals are being met in each year to ensure the program remains cost effective. A representative sample of installations will be inspected. Formal evaluations will be conducted every two years during operation.

Estimated Costs & Energy Savings

	2016	**2017**	**2018**	**2019**	**2020**	**Total**
Estimated Costs ($000s)	223	218	232	231	267	1,171
Estimated Cumulative Energy Savings (GWh)	0.7	1.0	1.3	1.6	2.0	7
Total Resource Cost						**1.3**

Benchmarking Program

Program Description
Energy social benchmarking is the analysis of a household's energy consumption and the comparison of its performance with its energy history and that of other similar households. Historic consumption information, tracking over time and comparisons with other households can encourage customers to reduce energy consumption. A printed paper report is delivered to participating customers via mail. These reports include a normative comparison that compares the customer to similar neighbors. The printed Home Energy Report is supplemented by access to an online web portal allowing for increased customer energy usage information and tips and resources to facilitate energy use reduction.
Target Market: Residential
The Benchmarking program is marketed to residential customers across the province. Customers will be selected into the program and can withdraw (opt-out) at any time.
Eligible Measures
A home's energy use is compared anonymously to the usage patterns of other homes in the vicinity that are of similar size, age, heating type, etc. The Home Energy Report is designed to provide new information to help home owners understand their energy use and find ways to make the home more efficient.
Delivery Strategy
The program is delivered largely by a third party service provider that develops and issues the Home Energy Report and maintains the online web portal. takeCHARGE will oversee all aspects of the program to ensure greater customer insight into their home energy use. The program is available year round and will be supported with takeCHARGE marketing and communication efforts.

Benchmarking Program

Market Considerations

This program will allow the Utilities to reach customers that have not been able to participate in the other incentive programs. It will also allow takeCHARGE actively engage with customers using direct home energy consumption information. This program also allows for the cross promotion of existing takeCHARGE rebate programs as methods to reduce household consumption and to drive participation in these programs.

Incentive Strategy

No monetary incentive will be offered. It has been demonstrated that for this type of program that using social norm comparisons drives the greatest and longest lasting changes to household energy consumption.

Program Monitoring & Evaluation

The program is monitored for participation levels, service quality and cost effectiveness. Formal evaluation will be conducted very two years during operation.

Estimated Costs & Energy Savings

	2016	2017	2018	2019	2020	Total
Estimated Costs ($000s)	530	1,034	989	1,063	-	3,616
Estimated Cumulative Energy Savings (GWh)	0.3	8.0	13.8	15.6	-	38
Total Resource Cost						**1.0**

Mini Split Heat Pump Educational Initiative

Program Description

The objective of the program is to encourage customers to choose high efficiency mini split heat pumps (MSHP), installed by qualified contractors. When installed correctly, a high efficiency MSHP will provide space heating energy savings. The program components include financing, education and marketing initiatives directed towards customers, and direct engagement of certified installers. Financing has been offered by Newfoundland Power since the 1990s and Hydro will have financing available beginning in 2016, however the eligibility criteria for MSHP will be updated to support the uptake of high efficiency units.

Target Market

This program targets residential customers. New home construction and retrofit customers with electric baseboard heat are considered to have the greatest potential for participation, however customer eligibility to participate in financing will not be limited by heating fuel, age or type of dwelling.

Eligible Measures

Financing will now be limited to MSHP with an estimated Heating Seasonal Performance Factor (HSPF) of 9.6 or higher. This is aligned with the minimum HSPF required for certification of units meeting the “ENERGY STAR® Most Efficient 2015” designation. To qualify for financing the installation must be performed by a contractor that has the necessary permits and certification to perform electrical and refrigeration work in the province.

Delivery Strategy

Delivery will be a two pronged approach including marketing to customers and engaging eligible installers.

Marketing initiatives will include information on the takeCHARGE website as well as bill inserts and mass media advertising regarding the benefits of choosing the right heat pump and installer. Installer engagement will include information sessions, contests, and maintaining relationships with qualified installers.

Financing applications will be processed through customer application via the existing customer service channels (online or by phone).

An incentive could not be offered for this program because it does not pass the economic analysis.

Mini Split Heat Pump Educational Initiative

Market Considerations

One of the biggest barriers is a lack of customer awareness and availability of certified installers in rural areas. In order to achieve significant energy savings, the unit must be appropriate for the Newfoundland climate, properly installed and operated.

Other major barriers include identifying what to look for in an installer (i.e. what certification should be required) and difficulty of customers to find qualified installers. The upfront cost of highly efficient units is also a barrier for some customers.

Program Monitoring & Evaluation

This program will be monitored for participation level, and service quality. The criteria for eligible models and installers will also be continually reviewed to ensure the program is promoting units and installers that will provide customers the highest achievable energy savings at a reasonable cost.

Estimated Costs & Energy Savings

	2016	2017	2018	2019	2020	Total
Estimated Costs ($000s)	119	100	103	102	104	529

Business Efficiency Program

Program Description

The objective of the Business Efficiency Program is to help commercial customers increase their electrical energy efficiency by providing incentives on energy efficient options for existing facilities. The program provides supports to encourage customers to implement projects customized to their own facilities.

Target Market: Commercial

This program targets business owners and property managers who have an interest in making their businesses more energy efficient. The program includes a custom project approach which appeals primarily to large commercial customers. In 2016, the program will also include rebates for specific measures, such as LED lighting, Air Source Heat Pumps and High performance T8 Lighting, which appeal to small and medium sized customers as well.

Eligible Measures

The custom stream allows customers to obtain rebates for almost any energy efficiency measures that result in electrical energy and demand savings. The program excludes alternative energy and fuel switching.

Beginning in 2016 the custom stream of the Business Efficiency Program will also include incentives for demand reduction based on the options available at the customer's facilities as well as the amount of demand they are able to reduce during peak times.

Also beginning in 2016, the existing fluorescent High Bay program and the current Commercial lighting program (including high performance T8 fluorescent lamps and LED exit signs) will become prescriptive rebates under the Business Efficiency Program.[1] Electronic ballasts will no longer be available for incentive as of 2016 because these ballasts are now considered to be the market standard.

The specific measures eligible for per unit rebates have included programmable thermostats, occupancy sensors, high performance showerheads, and LED wall packs. In 2016, LED screw-in lamps, High Bay LED fixtures, electrically commutated motors for evaporator fans, cold climate air source heat pump systems and low flow pre-rinse spray valves will be added to the prescriptive list of incentives.

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[1] Prescriptive incentive program are customer energy conservation programs that have per unit rebates for installing certain defined technologies. For example, providing a predefined rebate amount for a LED light bulb;

Business Efficiency Program

Delivery Strategy

The delivery strategy for this program is mainly through individual customer interactions. A walk through audit can help customers identify efficiency opportunities.

Marketing for this program includes partnering with lighting manufacturers, distributors, electrical contractors and lighting service providers as key market influencers and allies. The program will create business opportunities for trade allies to sell more efficient products.

The program will also target commercial property owners through direct marketing and through industry associations such as the Building Owners and Managers Association. Tools and tactics will include trade ally and business association activities, such as workshops for distributors, contractors and building operators, retail point-of-sale materials, website and advertising in trade publications. Demonstration projects will be selected from program participants.

Market Considerations

Barriers to increased market penetration include initial cost, awareness of the program and available incentives, budget & planning cycles, technical know-how, and customer time constraints.

Incentive Strategy

Incentives for this program are designed to reduce the cost barrier, attract customer attention and provide technical and financial support for energy audits and feasibility studies. The custom stream provides incentives based on project energy savings at 10 cents/kWh for first year savings or project demand savings at $100 per kW per month over the December to March period. Demand saving projects require a minimum of 50 kW savings and be sustainable over 5 years. Incentives of up to $50,000 per site help garner interest and lower customer project costs.

Incentives vary for the prescriptive measures. Rebates will be processed through mail-in and online submissions.

Program Monitoring & Evaluation

The program will be monitored for participation level, service quality, and cost. Each incented project will have a measurement and verification plan to confirm energy or demand savings achieved are consistent with incentives paid.

Business Efficiency Program

Estimated Costs & Energy Savings						
	2016	**2017**	**2018**	**2019**	**2020**	**Total**
Estimated Costs ($000s)	1,519	1,791	1,813	2,133	2,171	9,427
Estimated Cumulative Energy Savings (GWh)	18.2	26.9	36.7	47.6	60.2	190
Total Resource Cost						**2.4**

Industrial Energy Efficiency Program

Program Description

The objective of this program is to improve electrical energy efficiency in a variety of industrial processes. The program components include financial incentives based on energy savings and other supports to enable industrial facilities to identify and implement efficiency and conservation projects. This program is a custom program to respond to the unique needs of the Newfoundland and Labrador industrial market, rather than a prescriptive technology approach.

Target Market: Industrial

This program targets existing, transmission level, industrial customers served by Newfoundland and Labrador Hydro.

Eligible Measures

Eligibility of projects is based on engineering review and confirmation of estimated energy savings impact. Technologies include, but are not limited to, compressed air, pump systems, process equipment and process controls.

Delivery Strategy

The program is managed internally, with external engineering services used as required. The utility takes the role of facilitator and consultant in providing methods for industrial customers to complete project proposals and implement approved projects.

This program was initially launched as a three-year pilot program in 2009, with the first project applications being submitted in 2011, and closed to new projects in 2013. The industrial pilot was reviewed in 2014 by an external party for performance; the review indicated the program matched or exceeded performance of comparable industrial CDM programs relative to the size of the industrial sector in the Newfoundland and Labrador market. The program was officially re-launched as an ongoing program in 2015, with the same structure as the pilot program.

Industrial Energy Efficiency Program

Market Considerations

This market requires a one-on-one approach to project design and delivery. The program builds on the work already completed by the industrial customers, and addresses their unique barriers to improved efficiency, which include, but are not limited to, access to capital and human resources.

The lifecycle for each program transaction will be measured in months rather than weeks because of the need for review, contract development, budgeting and implementation timelines, and post-installation evaluation. This type of program requires that facilities have financial and business stability to continue operations for a time period appropriate to achieve cost effective savings.

Incentive Strategy

Incentives for this program include an initial comprehensive energy audit for the site, funding assistance for feasibility studies, and financial assistance for project implementation based on energy savings.

Program Monitoring & Evaluation

The program will be regularly monitored for participation level, service quality, and cost effectiveness, including engineering review and inspection of all projects and assessment of long-term impact on customer processes.

Industrial Energy Efficiency Program

Estimated Costs & Energy Savings[2]						
	2016	**2017**	**2018**	**2019**	**2020**	**Total**
Estimated Costs ($000s)	667	10	10	10	10	707
Estimated Cumulative Energy Savings (GWh)	30.6	30.6	30.6	30.6	30.6	153
Total Resource Cost						**1.7**

2 While Customer audits have confirmed that there are several potential projects at Hydro's customers' sites, savings for the Industrial Energy Efficiency Program (IEEP) have only been forecasted for 2016 because there are only five transmission level industrial customers in Newfoundland and Labrador and participation depends on each company's capital budgets and focus for the year. As a result of such a small market and budget considerations, participation is extremely variable from year to year and difficult to forecast. The costs from 2017-2020 are the fixed administration costs associated with program promotion and customer engagement in the IEEP. The majority of costs are incurred after a project is submitted and passes economic screening. Projects for the Industrial EE Program will be evaluated on a yearly basis and projects with a TRC of 1.0 or greater will be completed.

Isolated Business Efficiency Program

Program Description

The objective of the Isolated Business Efficiency Program is to help commercial customers increase their electrical energy efficiency by providing incentives on energy efficient options for existing facilities. The program provides supports to encourage customers to implement projects customized to their own facilities.

Target Market: Commercial

This program targets business owners and property managers in Hydro's isolated diesel and L'Anse au Loup systems who have an interest in making their businesses more energy efficient. The program includes a custom project approach and also rebates for specific measures, such as LED lighting, Air Source Heat Pumps and High performance T8 Lighting.

Eligible Measures

The custom stream allows customers to obtain rebates for almost any energy efficiency measures that result in economical electrical energy savings. The program excludes alternative energy and fuel switching. The specific measures eligible for per unit rebates have included programmable thermostats, occupancy sensors, high performance showerheads, and LED wall packs. In 2016, LED screw-in lamps, High Bay LED fixtures, Electrically Commutated Motors for Evaporator fans, Cold climate air source heat pump systems and Low Flow Pre-rinse spray valves will be added to the prescriptive list of incentives.

Isolated Business Efficiency Program

Delivery Strategy

The delivery strategy for this program is mainly through individual customer interactions. The custom track involves a walkthrough audit and feasibility analysis to determine savings and eligible incentive. This allows for a wide range of eligible technologies and projects.

Marketing for this program includes partnering with lighting manufacturers, distributors, electrical contractors and lighting service providers as key market influencers and allies. The program will create business opportunities for trade allies to sell more efficient products.

The program will also target commercial property owners through direct marketing. Tools and tactics will include trade ally and business association activities, such as workshops for distributors, contractors and building operators, and a website. Demonstration projects will be selected from program participants.

Market Considerations

Barriers to efficiency in the commercial market include financial and human resource concerns. Incentives will assist in making energy efficiency upgrades more accessible. Human resource concerns are around awareness and knowledge of the technology options as well as time to develop the business case for retrofit projects.

The isolated systems have additional challenges with access to products and access to specific technical skill sets in the evaluation of projects and technology. Hydro’s program staff will assist in addressing these gaps.

Incentive Strategy

Incentives for this program are designed to reduce the cost barrier, attract customer attention and provide technical and financial support for energy audits and feasibility studies. The custom stream provides incentives based on project energy savings at the lesser of $0.4/kWh for first year savings or 80% of eligible project costs.

Incentives vary for the prescriptive measures. Rebates will be processed through mail-in and online customer applications.

Isolated Business Efficiency Program

Program Monitoring & Evaluation

The program will be monitored for participation level, service quality, and cost. Each incented project will have a measurement and verification plan to confirm energy savings achieved are consistent with incentives paid.

Estimated Costs & Energy Savings

	2016	**2017**	**2018**	**2019**	**2020**	**Total**
Estimated Costs ($000s)	106	112	117	122	128	585
Estimated Cumulative Energy Savings (GWh)	0.5	0.7	0.8	1.0	1.2	4
Total Resource Cost						**1.6**

Isolated Systems Community Program

Program Description

The objective of this program is to provide a portfolio of technologies and opportunities to help residential and commercial customers in isolated diesel communities save electrical energy and to promote energy efficiency awareness.

Target Market

This program targets both residential and commercial customers in Hydro's isolated systems. This includes Isolated Diesel systems on the Island, in Labrador, and the L'Anse au Loup system.

Eligible Measures

Measures will range from efficient lighting products, hot water saving products, pipe insulation, hot water tank insulation, commercial LED exit signs, and others that may be applicable.

An Appliance Retirement program is being planned for at least one community. Old inefficient appliances will be removed from participating homes and routed for appropriate disposal. This will save energy and money for the homeowner. This component will be evaluated to determine if it is economic to develop into a broader program.

The Isolated systems T12 replacement program will take place in 2-3 Isolated communities. This project will offer, free of charge to commercial customers, the supply and install of new High Performance T8 lamps and ballasts.

Delivery Strategy

Hydro has engaged Summerhill Group to deliver this program. They are using a number of delivery strategies, including hiring and training local representatives, to engage residential and commercial customers. Direct installs will be completed, whereby the customer receives the technology in their home or business at no cost. During the direct install visit, customers also receive information on energy usage and efficiency options.

Isolated Systems Community Program

Market Considerations

Availability and awareness of energy efficient technologies continues to be an issue in rural communities and often technologies available are at a higher price than in urban markets. This program will address the barriers of availability. There is a heavy electric hot water heating penetration and opportunities exist in plug load and behavior based areas.

Commercial customers tend to be smaller businesses and as such find it challenging to find the time and resources to address energy consumption issues; this program will provide the one on one interaction needed to assist these customers. The technologies included in the program do not involve a major renovation. This program will allow the utility to reach customers that may not have been able to participate in the other incentive programs.

Following the 2015 direct install component, information collected in 2014 and 2015 will be used to plan for Isolated Systems Community programming beyond 2017. Costs and energy savings will be estimated once the technologies have been determined.

Program Monitoring & Evaluation

The program will be monitored for participation level, service quality, and cost effectiveness. A representative sample of direct installs will be surveyed for confirmation of continued installation and use. Formal evaluations will be conducted after each year of operation.

Estimated Costs & Energy Savings

	2016	**2017**	**2018**	**2019**	**2020**	**Total**
Estimated Costs ($000s)	415	415	-	-	-	830
Estimated Cumulative Energy Savings (GWh)	5.2	5.5	5.5	5.5	5.5	27
Total Resource Cost						**2.7**

Table D-1
Conservation Programs
Energy Reductions: 2012 – 2015(F)
by Sector
(GWh)

	2012	2013	2014	2015F	Total
Residential					
Insulation Program	15.8	20.6	24.0	27.0	87.4
Thermostat Program	4.5	5.8	7.0	8.4	25.7
ENERGY STAR Window Program	6.1	8.6	10.1	10.1	34.9
Coupon Program	0.3	0.3	0.3	0.3	1.2
HRV	0.0	0.0	0.2	0.4	0.6
Small Technologies	0.0	0.0	5.5	14.4	19.9
Isolated Systems Community Program	1.7	2.8	4.1	4.8	13.4
Block Heater Timer Program	-	0.3	0.3	0.3	0.9
Total Residential Portfolio	**28.4**	**38.4**	**51.5**	**65.7**	**184.0**
Commercial					
Lighting Rebate Program	3.3	3.9	5.8	6.5	19.5
BEP	-	-	0.6	4.5	5.1
Isolated Systems Business Efficiency Program	-	-	0.1	0.4	0.5
Total Commercial Portfolio	**3.3**	**3.9**	**6.5**	**11.4**	**25.1**
Industrial					
Industrial Energy Efficiency Program	3.3	3.3	25.6	25.6	57.8
Total Portfolio	**35.0**	**45.6**	**83.6**	**102.7**	**266.9**

Table D-2
Conservation Programs
Program Costs: 2012 – 2015(F)
by Sector
($000s)

	2012	2013	2014	2015F	Total
Residential					
Insulation Program	882	1,092	796	1,039	3,809
Thermostat Program	492	253	227	454	1,426
ENERGY STAR Window Program	1,173	1,634	698	7	3,512
Coupon Program	-	-	-	-	-
HRV	-	59	56	225	340
Small Technologies	-	4	1,877	2,884	4,765
Isolated Systems Community Program	858	871	615	579	2923
Block Heater Timer Program	31	8	8	-	47
Total Residential Portfolio	**3,436**	**3,921**	**4,277**	**5,188**	**16,822**
Commercial					
Lighting Rebate Program	121	128	373	790	1,412
BEP	-	112	457	532	1,101
Isolated Systems Business Efficiency Program	93	115	96	66	370
Total Commercial Portfolio	**214**	**355**	**926**	**1,388**	**2,883**
Industrial					
Industrial Energy Efficiency Program	173	89	1,244	19	1,525
Total Portfolio	**3,823**	**4,365**	**6,447**	**6,595**	**21,230**

Table E-1
Conservation Programs
Energy Reduction Estimates: 2016 – 2020
by Sector
(GWh)

	2016	2017	2018	2019	2020	Total
Residential						
Insulation Program	30.0	33.1	36.1	38.9	41.8	179.9
Thermostat Program	9.7	11.1	12.5	13.8	15.2	62.3
ENERGY STAR Window Program	10.1	10.1	10.1	10.1	10.1	50.5
Coupon Program	0.3	0.3	0.3	0.3	0.3	1.5
Isolated Systems Community Program	5.2	5.5	5.5	5.5	5.5	27.2
Small Technology Program	23.8	33.3	38.2	37.4	36.5	169.1
HRV Program	0.7	1.0	1.3	1.6	2.0	6.6
Benchmarking	0.3	8.0	13.8	15.6	-	37.7
Block Heater Timer Program	0.3	0.3	0.3	0.3	0.3	1.5
Total Residential Portfolio	**80.4**	**102.7**	**118.1**	**123.5**	**111.7**	**536.4**
Commercial						
Isolated Systems Business Efficiency Program	0.5	0.7	0.8	1.0	1.2	4.3
Business Efficiency Program	18.2	26.9	36.7	47.6	60.2	189.6
Total Commercial Portfolio	**18.7**	**27.6**	**37.5**	**48.6**	**61.4**	**193.8**
Industrial						
Industrial Energy Efficiency Program	30.6	30.6	30.6	30.6	30.6	153.0
Total Portfolio	**129.7**	**160.9**	**186.2**	**202.7**	**203.7**	**883.2**

Table E-2
Conservation Programs
Program Cost Estimates: 2016 – 2020
by Sector
($000s)

	2016	2017	2018	2019	2020	Total
Residential						
Insulation Program	1,189	1,207	1,202	1,197	1,223	6,018
Thermostat Program	517	555	539	557	552	2,720
Isolated Systems Community Program	415	415	-	-	-	830
Small Technology Program	3,113	2,879	1,578	-	-	7,570
HRV Program	223	218	232	231	267	1,171
Benchmarking Program	530	1,034	989	1,063	-	3,616
Total Residential Portfolio	**5,987**	**6,308**	**4,540**	**3,048**	**2,042**	**21,925**
Commercial						
Isolated Systems Business Efficiency Program	106	112	117	122	128	585
Business Efficiency Program	1,522	1,794	1,816	2,136	2,173	9,441
Total Commercial Portfolio	**1,628**	**1,906**	**1,933**	**2,258**	**2,301**	**10,026**
Industrial						
Industrial Energy Efficiency Program	667	10	10	10	10	707
Total Programs Portfolio	**8,282**	**8,224**	**6,483**	**5,316**	**4,353**	**32,658**

Table E-3
Conservation Programs
Total Resource Cost Test Results
by Sector

	TRC Results
Residential	
Insulation Program	2.5
Thermostat Program	2.8
Isolated Systems Community Program	2.7
Small Technology Program	1.3
HRV Program	1.3
Benchmarking	1.0
Commercial	
Isolated Systems Business Efficiency Program	1.6
Business Efficiency Program	2.4
Industrial	
Industrial Energy Efficiency Program	1.7

2018 Rural Deficit Annual Report Summary of Specific Initiatives

April 1, 2019

A Report to the Board of Commissioners of Public Utilities

Table of Contents

1.0 Introduction

Newfoundland and Labrador Hydro ("Hydro") provides electrical service to approximately 27,500 customers on the Hydro Rural Interconnected System and Hydro Rural Diesel System at an operating loss ("Rural Deficit"). Additionally, Hydro serves approximately 11,300 rural customers on the Labrador Interconnected System, whose rates recover costs and contribute to funding a portion of the Rural Deficit.

Hydro's mandate to provide safe, reliable, and least-cost power to all its customers remains its primary focus. This report provides an overview of Hydro's Rural Deficit, as well as the operating and capital initiatives undertaken by Hydro to manage costs and mitigate the Rural Deficit.

2.0 Rural Deficit Overview

Table 1 provides the deviation of the estimated Rural Deficit for 2014 to 2018. The Rural Deficit for 2018 was calculated using actual revenues and expenses allocated to Hydro's Rural Deficit areas based on the proposed 2018 Test Year Cost of Service Study.

Table 1: Hydro Rural Deficit Estimates ($ millions)

	Annual Amounts					Year over Year			
	2014	**2015**	**2016**	**2017**	**2018**	**2015/ 2014**	**2016/ 2015**	**2017/ 2016**	**2018/ 2017**
Revenues (A)	62.6	63.7	59.8	58.6	65.6	1.1	(3.9)	(1.2)	7.0
Costs[1]									
Operating Expenses	47.4	52.3	43.8	43.6	42.7	4.9	(8.5)	(0.2)	(0.9)
Fuel	35.7	26.8	26.8	27.8	28.1	(8.9)	0.0	1.0	0.3
Purchased Power	7.9	7.3	7.3	7.2	8.5	(0.6)	0.0	(0.1)	1.3
Depreciation	12.7	14.2	14.2	17.3	19.2	(0.6)	0.0	(0.1)	1.9
Return	23.0	24.8	25.1	23.1	24.5	1.8	0.3	(1.8)	1.4
Total Costs (B)	126.7	125.4	117.2	119.0	123.0	1.3	(8.2)	1.5	4.0
Rural Deficit (A-B)	**64.1**	**61.7**	**57.4**	**60.4**	**57.4**	**(2.4)**	**(4.3)**	**3.0**	**(3.0)**

[1] Table 1 does not include the costs incurred for Conservation Demand Management ("CDM") programs offered in rural communities as they are captured in Hydro's CDM Cost Deferral Account, approved in P.U. 49(2016).

The $57.4 million Rural Deficit in 2018 represents a decrease of approximately $3.0 million, or 5.0%, from 2017. The decrease is primarily related to:

- Increased revenues as a result of the July 1, 2017[2] and July 1, 2018 rate increases for domestic customers (approximately 8.1% and 6.6%, respectively);[3]

- Increased depreciation costs largely related to capital investment to serve Hydro's Rural Deficit areas (e.g., generation additions, replacements, and overhauls);

- Fuel costs and purchased power costs increased mainly as a result of an increase in the diesel fuel price in 2018 by 5.1¢/kWh relative to 2017. Power purchase costs from Hydro-Québec to serve L'Anse au Loup also increased as a result of the increased costs of diesel fuel; and

- Higher return in 2018 than 2017 due to increased capital investment.

Chart 1 compares the total Rural Deficit with the Rural Deficit excluding fuel costs. Fuel costs are consistently one of the primary cost drivers in Rural Deficit areas. As fuel prices are volatile and vary considerably from year to year, it is appropriate to isolate fuel costs when considering the management of the Rural Deficit.

[2] More of Hydro's sales occur in the first half of the year than the second half; therefore, the July 1, 2017 rate change had a more substantial impact on Hydro's 2018 revenues than 2017 revenues.

[3] Overall, load remained stable between 2017 and 2018 in Hydro's Rural Deficit areas.

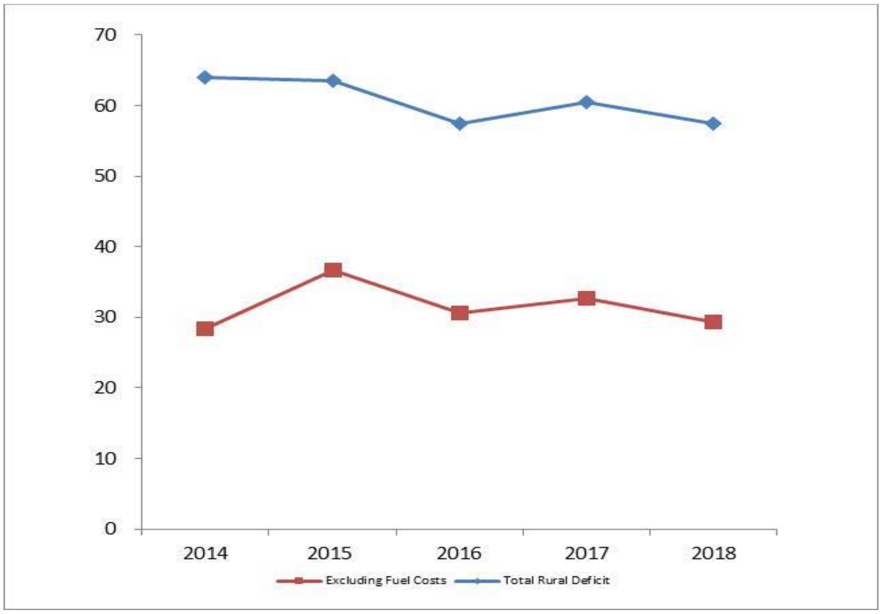

Chart 1: Five-Year Rural Deficit ($ millions)

3.0 Operating Initiatives

3.1 Internal Energy Efficiency Initiatives

In 2008, Hydro focused on improving internal energy efficiency. This program, which continued into 2018, targets reduction in energy usage in all facilities including diesel plants, offices, and line depots within the areas contributing to the Rural Deficit. Since it began in 2008, the program has provided cumulative energy savings of 17,460 MWh.

Throughout 2018, Hydro completed or launched operating initiatives through its internal energy-efficiency program. Such initiatives are part of a multi-year project and contribute to overall cost containment, a portion of which is allocated to Rural Customers and therefore contributes to deficit reduction. Initiatives completed in 2018 include:

- Installation of energy-efficient lighting at the Grey River, St. Lewis, and Nain diesel plants, resulting in a combined savings of 83 MWh;

- Installation of energy-efficient high bay LED lighting in the Bay d'Espoir powerhouses, resulting in energy savings of 195 MWh; and

- Retrofit of general indoor and exterior light fixtures to more energy-efficient fixtures at various Hydro generation sites, resulting in energy savings of 122 MWh.

In addition, Hydro has continued with the following initiatives in an effort to manage the Rural Deficit:

- Capturing waste heat in several of Hydro's diesel plants to heat Hydro premises;

- Planning diesel units' replacement sizes to optimize fuel efficiency;

- Monitoring diesel system fuel efficiency to identify poor performers so that corrective action may be taken;

- Utilizing commercial air flights during regular work hours where practical, rather than more expensive helicopter use;

- Choosing the most fuel-efficient mix of engines, where possible,[4] to supply the community load;

- Having running maintenance (e.g., oil changes) completed by diesel system representatives rather than deploy maintenance crews to diesel communities; and

- Participating in the Canadian Off Grid Utilities Association to work with other Canadian utilities with diesel plants for comparison of operating procedures and new technology to enhance efficiency in operations and maintenance.

[4] Done automatically in some plants.

Hydro has also focused on effective planning and scheduling, including a significant coordination effort in the upfront planning process to ensure that delays and duplicate asset outages are minimized. Effective planning and scheduling where the planner ensures the available weekly capacity of each crew is matched to the estimated weekly work results in better utilization of the workforce. Overall, improved planning and scheduling supports the most efficient performance of maintenance activities.

Hydro continues to perform life cycle cost analyses when analyzing tenders for the purchase of new diesel engines to help ensure the overall least-cost option is chosen. The life cycle cost analysis includes items such as capital, overhaul, fuel (based upon fuel efficiency data), and routine operation and maintenance costs. Besides diesel engine replacement, life cycle cost analyses are performed on all capital projects when appropriate.

In 2010, Hydro introduced e-billing to its customers to further reduce costs and encourage environmental efficiency. As of December 31, 2018, 8,734 of Hydro's customers use e-bills as their method of billing, compared to 7,264 in 2017,[5] an increase of 20%.

3.2 Conservation and Demand Management Program Initiatives

The high cost of generation in isolated diesel communities and growing system load in the L'Anse au Loup area provides an opportunity for Hydro to implement energy-efficiency programs specific to these areas. In 2012, two programs were launched to offer energy-efficiency incentives for residential and commercial customers located in Hydro's isolated diesel communities. These programs continued in 2018 and are further detailed below.

3.2.1 Isolated Systems Community Energy Efficiency Program

The Isolated Systems Community Energy Efficiency Program is a program specifically targeted to residential and commercial customers in Hydro's Isolated Diesel Systems. The

[5] The number of customers for 2017 included 1,698 inactive accounts. This number has been updated to reflect only active accounts to be comparable to 2018.

objective of the program is to provide outreach, education, and energy-efficient products and installation free of charge to residential and business customers in the diesel system communities within Newfoundland and Labrador. [6] From 2012 to 2018, the program installed 106,397 energy-efficient products. The program achieved over 1.0 GWh in energy savings in 2018 and a cumulative 8.2 GWh of energy savings since its inception. Overall, the program has been successful in achieving energy savings and educating customers on the benefits and importance of energy efficiency.

The Isolated Systems Community Energy Efficiency Program includes residential and commercial direct installations and focuses on building knowledge and capacity in the communities by hiring and training local representatives. These representatives work within their own communities to promote the program, provide useful information on energy use, and provide direct installation of energy-efficient products, including low flow showerheads, faucet aerators, LED lamps, specialty size light bulbs, smart power strips, and hot water tank and pipe insulation. In addition to offering direct installations, the program includes retail rebates on energy-efficient products while working with local retailers to expand their selections of energy-efficient products.

In 2018, 727 residential and business customers received direct installation of 12,147 products consisting of water saving technologies and LED specialty bulbs for lighting needs. While this work was ongoing, information was collected from customers about the type of lighting, heating, and appliances in the homes and businesses, which will be used for future program planning.

3.2.2 Isolated Systems Business Efficiency Program

The Isolated Systems Business Efficiency Program was launched in 2012. The program provides rebates and technical assistance for commercial customers in isolated diesel communities on coastal Newfoundland and Labrador. Hydro's energy efficiency team works

[6] From 2012 to 2017 the program operated in 21 diesel systems. As a result of the community relocation of Williams Harbour in 2017, the program now operates in 20 diesel systems.

one-on-one with customers to create a plan to address their energy efficiency needs and provides ongoing technical support for projects undertaken. This custom approach has encouraged customers to undertake projects to improve the energy efficiency of lighting, refrigeration, motor controls, and other building systems. In 2018, 58 facility audits were completed providing information for future projects. Further, 10 customers completed projects involving upgrades and improvements to LED lighting, heating systems, insulation, and thermostats in Hydro's isolated areas. This program deals primarily with small business customers and has achieved 677 MWh of annual energy savings since 2012.

3.2.3 Postville Direct Load Control Pilot

In 2017, Hydro initiated a pilot project in Postville to test whether a Direct Load Control ("DLC") strategy could automatically and reliably maintain an isolated diesel system below a pre-set demand threshold without negatively impacting customers. The pilot project involves the direct installation of domestic hot water tank controllers for residential customers and electric thermal storage space heaters for commercial customers. The DLC system was installed in 2017. Throughout 2018, the DLC software system demonstrated that it could successfully reduce the total system load on command; however, the software has experienced reliability issues, resulting in instances where the electric thermal storage space heaters did not function properly for short periods of time. The manufacturer is engaged; however, the issues have persisted.

Hydro is currently evaluating whether to relocate the pilot to a more accessible area to facilitate troubleshooting and reduce the potential impacts to customers as the system is refined. Hydro believes there is potential to successfully leverage DLC technology to improve the cost-effectiveness of managing capacity requirements in diesel systems.

3.3 Hydro-Québec Power Purchase Contract Renewal

Hydro is currently in negotiations with Hydro-Québec to renew the Power Purchase Agreement for the provision of energy to Hydro's customers in the L'Anse au Loup area. The existing contract, which resulted in savings of approximately $5.0 million in 2018,[7] expires in 2020. If the contract is not extended, the Rural Deficit will increase as Hydro will be required to supply the area with diesel generators.

3.4 Innovation and Productivity Team

Hydro's Innovation and Productivity Team was established in 2017 to identify ways to make the operations, management, and administration of Hydro more innovative, efficient, and productive. Its efforts may effect changes in policies, practices, processes, activities, and programs throughout Hydro's organization and facilities, including Isolated Systems, thus assisting with the management of the Rural Deficit.

3.5 Mary's Harbour Mini Hydro Facility

During 2018, work advanced toward the commissioning of the Mary's Harbour mini hydro facility, which is expected to be complete in the spring of 2019. This facility will generate approximately 1.0 GWh annually, thus contributing to reduced fuel expenses in the area.

4.0 Capital Initiatives

4.1 Energy-Efficient Lighting in Diesel Plants

In Hydro's 2018 Capital Budget Application, a three-year project to install LED lighting fixtures in nine diesel plants located in Cartwright, Charlottetown, Francois, Grey River, Makkovik, McCallum, Nain, Norman Bay, and St. Lewis was approved. A cost-benefit analysis of the status quo versus replacing the lighting determined that replacement of the lighting had positive net present value and would provide a total savings of $374,429. In 2018, lighting retrofits were completed at Grey River, St. Lewis, and Nain diesel plants as part of phase 1 of the multi-year project.

[7] Compared to supplying the service area with diesel generators.

4.2 LED Street Lights in Isolated Systems

The Nain LED street light pilot project[8] was a success and had positive customer feedback. As a result, Hydro converted the street lights in the community of Ramea to LED street lights in 2018. Hydro submitted a two-year capital proposal in its 2019 Capital Budget Application to convert street lights to LED in the remaining diesel systems. The proposal was approved and execution of the conversion plan is expected to begin in 2019. When complete the conversion to LED street lights in all diesel systems is expected to produce approximately $110,000 in savings per year.[9] LED street lights may also contribute to lower operating and maintenance costs than high-pressure sodium street lights due to the elimination of re-lamping requirements, and longer life.

5.0 Conclusion

During 2018, Hydro continued to pursue activities to manage the Rural Deficit, including cost-reduction and energy conservation initiatives. As a result of increased revenues more than offsetting the capital investment, the Rural Deficit decreased by $3.0 million in 2018 to $57.4 million. Hydro remains committed to reducing the Rural Deficit and will continue to pursue opportunities to manage costs and increase energy efficiency savings going forward.

[8] In 2015, Hydro initiated a pilot LED street light replacement project for the Town of Nain. A total of 125 high-pressure sodium street light fixtures were replaced with LED street light fixtures. The street light retrofit yields savings of approximately 45 MWh annually, which offsets approximately 12,000 litres of fuel consumption.
[9] Savings were estimated based on a combination of reduced fuel cost, and reduced purchased power expense.

IN THE MATTER OF the *Public Utilities Act,*
(the "Act"); and

AND IN THE MATTER OF an Annual Return for 2018
filed by Newfoundland and Labrador Hydro pursuant to
Section 59(2) of the Act.

AFFIDAVIT

I, Carol Anne Lutz, Certified Professional Accountant, of St. John's in the Province of Newfoundland and Labrador, make oath and say as follows:

1. I am the Controller, Newfoundland and Labrador Hydro, and as such I either have personal knowledge, or I have been so informed and so verily believe, of the matters and things contained within the Newfoundland and Labrador Hydro 2018 Annual Return.

2. I have read the contents of the within Annual Return and they are correct and true to the best of my knowledge, information and belief.

SWORN at St. John's in the)
Province of Newfoundland and)
Labrador, this 1 day of April)
2019, before me:)

Barrister – Newfoundland and Labrador

Carol Anne Lutz