Electricity Demand Forecast:

Do We Need the Power?

Department of Natural Resources

November 2012

Newfoundland Labrador

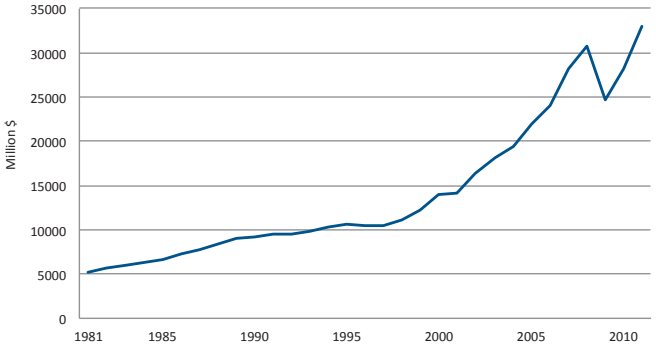
Key Findings

- Electricity demand is strongly linked to economic growth.
- Since 2002, Newfoundland and Labrador has experienced significant economic growth as a result of mining and petroleum developments. GDP has doubled, personal disposable income per person has increased by 62%, and housing starts in the past decade have been, on average, 56% higher than in the previous decade.
- Since 2002, Island residential demand has increased by 16% and Island commercial demand is up 10%. The number of Island residential customers has increased by 12.6% and the average electricity use per residential customer has increased by 3.4%. In 2011, there were approximately 18,600 more residential customers on the Island than there were in 2006. Although population has declined, the number of residential customers has increased.
- Over the same period, approximately 28,800 new homes were constructed with 85% of them using electric heat. While industrial demand has fluctuated, the underlying growth in residential and commercial demand has sustained electricity demand.
- The most recent economic forecast prepared by the Department of Finance indicates that GDP will increase by 1.6% annually over the next 20 years, and that the number of households in the province and new developments in the commercial and industrial sectors are expected to increase.
- Newfoundland and Labrador Hydro's latest electricity demand forecast points to growth in Island electricity demand of 1.4% annually between 2011 and 2031 with 3.1% average annual growth up to 2016 and 0.8% average annual growth post-2016. Industrial demand will be led by the Long Harbour processing facility which will require approximately 85 MW of new supply.
- New generation is required to meet future Island demand. Newfoundland and Labrador Hydro's 2012 Planning Load Forecast indicates that by 2015 the province will be challenged to reliably meet peak demand in the winter months and, post-2019, there will not be sufficient energy supply to reliably meet demand through the year.
- In addition to Island demand, an estimated $10-15 billion of investment in Labrador mining projects may be realized over the next decade, but this is dependent in part on the availability of power at prices which can be supported by the project economics. Based on projects already in construction or near sanction, existing generating capacity to meet winter peak demand in Labrador will be exhausted by 2015-17.

Introduction

Newfoundland and Labrador has been experiencing significant levels of economic growth as a result of mining and petroleum developments and substantial spin-off commercial activities. Figure 1 shows that GDP has doubled from 2002 to 2011.[1] As well, personal disposable income per person has increased from 2002 to 2011 by 62%[2] and housing starts in the past decade have been, on average, 56%[3] higher than in the previous decade.

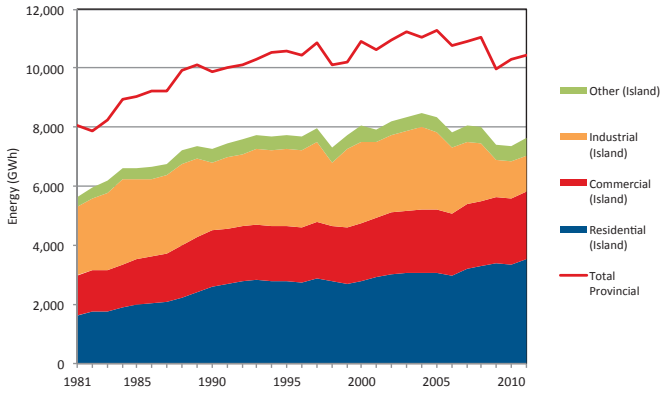
Figure 1: Newfoundland and Labrador GDP at Market Prices



Source: Economics and Statistics Branch (Newfoundland and Labrador Statistics Agency) and Statistics Canada, Provincial Economic Accounts

Coincident with this growth has been an increase in electricity demand in the province. Figure 2 demonstrates that the demand for electricity in Newfoundland and Labrador has increased since 1981 and has included continued growth in the Island residential and commercial sectors. Since 2002, Island commercial electricity demand has increased by 10% and Island residential demand has increased by 16% and the average electricity use per residential customer has increased by 3.4%.[4] Over the same period, the number of Island residential electricity customers has increased by 12.6%.[5]

Figure 2: Newfoundland and Labrador Provincial Electricity Consumption



Source: Newfoundland and Labrador Hydro, System Planning Department

Future growth in electricity demand across the residential, commercial and industrial sectors in the province will be strongly influenced by economic growth. Increasing personal income, capital investment and housing starts are major contributors in continued growth in electricity demand.

The profile for electricity demand growth is developed each year by Newfoundland and Labrador Hydro (NLH) in a long-term Planning Load Forecast (PLF). NLH has had the responsibility for developing the load forecast for the province for the previous 40 years and has used it as a critical tool for determining the timing of new generation supply to meet demand. The electricity demand forecast considers both the peak demand for electricity and average demand throughout the year.

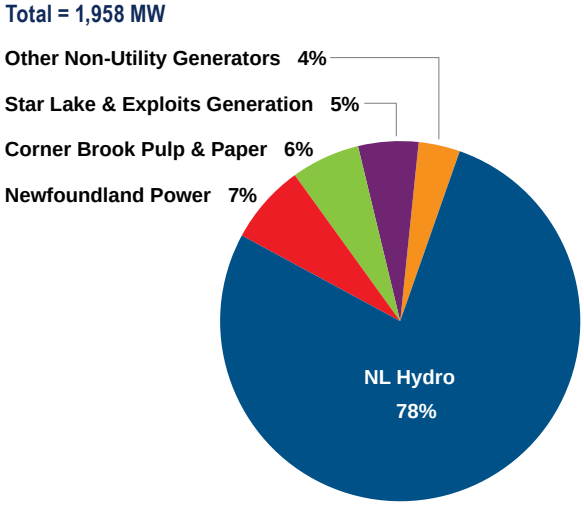
Peak demand refers to the highest level of electricity consumption that the utility can supply at any one time. If supply is not sufficient to meet the forecast demand for either, then NLH makes a recommendation to add new generation. The purpose of this paper is to demonstrate that there is a growing demand for electricity in the province and to provide the information that supports the need for new generation. Information and data used in the preparation of this document was obtained from publicly available information developed by the following sources:

- Newfoundland and Labrador Hydro;
- Nalcor Energy;
- Government of Newfoundland and Labrador, Department of Finance;
- Statistics Canada;
- Canada Mortgage Housing Corporation.

Historic and Current Electricity Demand

The total generating capacity for the Island interconnected system is 1,958 MW, with NLH providing 1,518 MW of this (see Figure 3).[6] The total Labrador interconnected peak demand was approximately 445 MW in 2011[7] and includes Happy Valley/Goose Bay and region, Wabush, Labrador City, and Churchill Falls. The Labrador interconnected load is supplied by the Churchill Falls hydroelectric generating station through capacity available to the province of 525 MW plus a small amount of capacity owned by NLH in Happy Valley Goose Bay of about 35 MW.

Figure 3: Newfoundland (Island) Generation Capacity



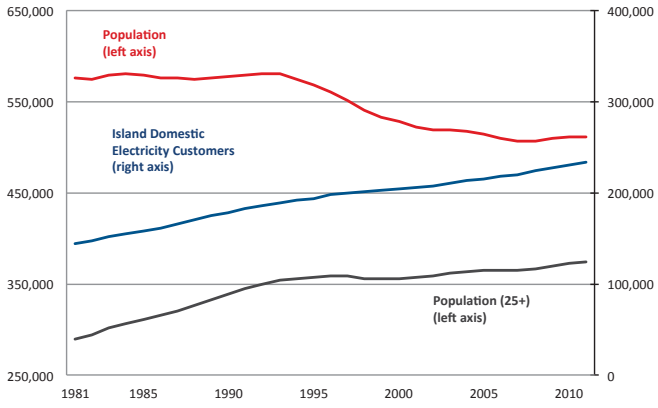
Source: Newfoundland and Labrador Hydro, Generation Planning Issues, July 2010 Update

Island Residential

At the end of 2011, there were approximately 234,000 residential customers[8] on the Island interconnected system representing approximately 95%[9] of the province's residential customer base and accounting for 60%[10] of total retail sales[11] on the Island. Since 2002, there have been some significant changes in this sector.

- There were approximately 28,800 new households constructed in the province from 2002 to 2011.[12] While the overall population of the province has not grown substantially in this period, there has been an increase in population in the +25 year old age group which coincides with the increased number of households and domestic electricity customers (Figure 4).[13] The increase in the number of new homes results in more residential customers and an increase in the demand for electricity.

Figure 4: Newfoundland and Labrador Population and Island Residential Electricity Customers



Source: 1) Island Domestic Electricity Customers from Newfoundland and Labrador Hydro, System Planning Department
2) Population from Economics and Statistics Branch (Newfoundland and Labrador Statistics Agency) and Statistics Canada

- There have been approximately 2,877 new housing starts annually between 2002 and 2011,[14] 80% of these were typically single-detached homes[15] with 85% of new homes choosing electric heat[16] as their heating source. Since 2006 the number of housing starts has increased, averaging over 3,000 new homes annually, with housing starts peaking in 2010 at over 3,600 new homes.[17]

- In addition to continued housing starts in the province, the historical trend in the last 20 years has been fewer people occupying each household and homes that are larger (ie. increased floor space per household).[18] More homes and more space means more electricity is required to power and heat these homes.

- The increase in the number of new homes has resulted in more residential customers (or electricity consumers) and an increase in the demand for electricity. At the end of 2011, there were approximately 18,600[19] additional residential customers on the Island system compared to the beginning of 2006.

The Government of Newfoundland and Labrador, Department of Finance's latest economic outlook forecasts GDP and personal disposable income to increase annually by approximately 1.6% and 3.3%, respectively, over the next 20 years.[20] As well, the outlook anticipates continued new housing starts in the residential sector through the forecast period resulting in increased electricity demand.

Island Commercial

Commercial electricity sales account for about 40%[21] of total retail sales on the Island and are dependent on changes in provincial GDP, personal income, building stock and heating requirements. Demand from this sector has grown over the past twenty years, including that related to spin-off activity from the mining and petroleum sectors as well as other commercial developments. Both GDP and personal disposable income have risen in the last 20 years[22], and the forecast of longer term economic growth will help drive commercial development and commercial demand for electricity.

Island Industrial

On the Island interconnected system, closure of the newsprint mills in Stephenville and Grand Falls-Windsor as well as reduced paper production at the Corner Brook mill resulted in a total reduction in industrial average demand of approximately 182 MW[23] since 2004. By 2011, about 40% or 76 MW of average demand of this reduced industrial consumption has been utilized by other Island consumers.

Labrador Industrial

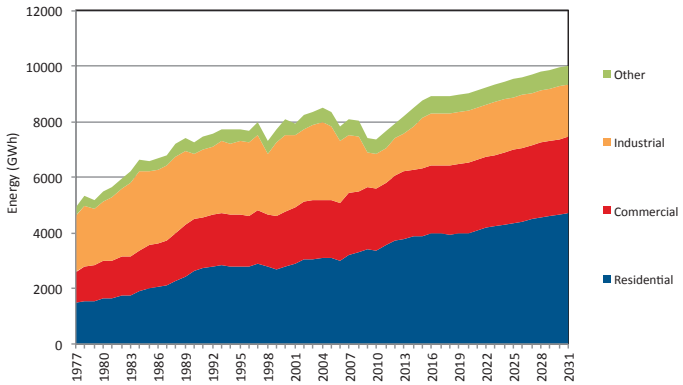
Current mining operations in Labrador have a combined electrical peak demand requirement of nearly 300 MW and include the Iron Ore Company of Canada (IOC) and Wabush Mines. A separate paper, "Labrador Mining and Power: How Much and Where From?" demonstrates the potential increasing demand requirement in Labrador and the need for additional supply.

Future Electricity Demand

Since 1977, there has been a continual increase in electricity demand in the residential and commercial sectors as demonstrated in Figure 5[24]. Industrial demand has seen both high growth and contraction over this period and was particularly impacted in 2006 and 2009 with the closure of the pulp and paper mills. Looking forward, the load requirement for the Island Interconnected system is expected to increase by 1.4% annually between 2011 and 2031 (approximately 3.1% average annual growth up to 2016 and 0.8% average annual growth post 2016) driven by continued growth in the residential and commercial

sectors. NLH estimates peak demand on the Island system at 1,581 MW in 2012. Looking ahead, NLH is forecasting that the Island peak demand will increase to 1,766 MW in 2020 and 1,942 MW in 2030. (See Appendix 1 for additional details of NLH's 2012 Planning Load Forecast)

Figure 5: Island Interconnected Electricity Requirements



Source: Newfoundland and Labrador Hydro, System Planning Department

The most recent economic forecast prepared by the Department of Finance shows continued growth in the economy driven by major investments in natural resource projects. These projects also support indirect capital investments in new commercial and light industrial enterprises. As well, the outlook anticipates continued new housing starts in the residential sector through the forecast period that will result in increased electricity demand.

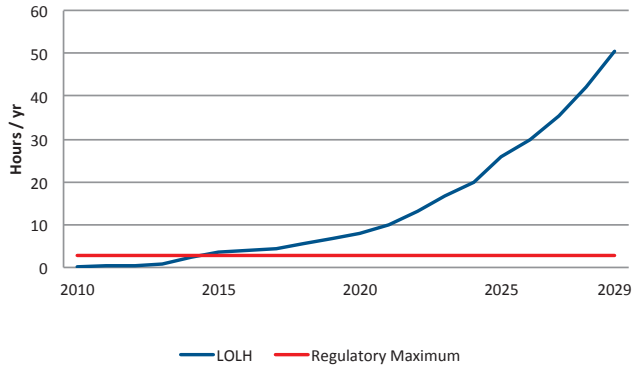
The latest electricity demand outlook anticipates that total Island consumption in the 2013/2014 time frame will surpass the 2004 level and the 182 MW noted above, formerly consumed by the pulp and paper mills, will be entirely utilized with continued residential and commercial sector growth and the addition of the nickel processing facilities at Long Harbour (which will require approximately 76 MW average demand through the year with about 85 MW at peak demand). Corner Brook Pulp and Paper will require approximately 23 MW at current operational levels in addition to their own generation capabilities. North Atlantic Refining Ltd., which operates an oil refinery at Come-By-Chance, has a peak demand of 31 MW.[25] Teck copper-zinc mine and mill near Millertown, is expected to remain in operation through 2014, with a peak demand of 10 MW.[26]

In addition to Island demand, the Labrador interconnected system's demand is forecast to grow by 0.8% annually on average.[27] However, it is important to note that this forecast does not include the additional demand from the potential $10-15 billion in industrial mining growth that may occur which could create additional demand. Should these projects materialize, then there will be insufficient supply available from CFLCo and other NLH sources to meet the full peak demand. New generation will be required as the Holyrood plant cannot serve new industrial load in Labrador.

When Is New Supply Required?

To ensure that all levels of demand can be met, the PUB has approved the reliability standards for the Island electricity generation. The reliability standard requires that NLH install enough generation capacity to result in 2.8 hours (or less)[28] per year with insufficient generation available. This equates to having enough generation capacity available at least 99.95% of the time. NLH is the main supplier of electricity on the Island Interconnected System, providing 78%[29] of the capacity. Peak demand is the highest level of electricity consumption that the utility can supply at any one time while firm capacity is the amount of energy available for production or transmission which can be guaranteed to be available at any given time. In order to meet the PUB approved standard and ensure there is an adequate supply of generation to reliably meet peak system demand, NLH maintains capacity and energy reserves (effectively a generation "buffer" in case one or more units is unavailable on a planned or unplanned basis). This buffer size depends on the reliability of the units in use, but is approximately 15% in the current Island system. In 2012, for example, the Island's 1,958 MW of installed generation capacity is sufficient to meet an expected peak demand of 1,581 MW, well within the approved reliability standard as approved by the PUB.

Figure 6: Threshold for New Electricity Supply - Loss of Load Hours -

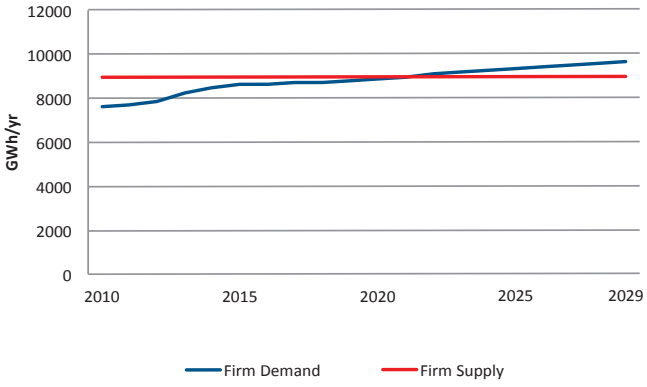


Source: Newfoundland and Labrador Hydro

The electricity demand forecast indicates that by 2015, there will be a capacity deficit on the Island as per the PUB approved criteria.[30] NLH likely will exceed its maximum allowable reliability standard of 2.8 hours in 2015 (Figure 6).

Post-2019, NLH forecasts an energy deficit on the Island (Figure 7).[31] This means there will not be enough energy production capability on the Island to meet the total average energy requirements over the year.

Figure 7: Threshold for New Electricity Supply - Energy Supply -



Source: Newfoundland and Labrador Hydro

The energy production capability is based on the amount of precipitation which is available to the hydroelectric stations on the Island during an extended dry period plus the Holyrood thermal plant operating year round at its full capability. Additional power is therefore required by 2015 to satisfy demand and ensure continued system reliability for consumers.

Future of the Holyrood Generating Station

The Holyrood Thermal Generating Station is a major source of electrical energy supply to the Island Interconnected System, currently generating between 15 and 25%, on average, of the island's electricity annually. The Holyrood plant has a total generating capacity of 490 MW and supplies power for heating in winter as well as meeting system reliability requirements. Holyrood does not produce large quantities of power during the summer months but the plant must be available to produce its full capacity in the event that conditions require it. At peak production, the plant can burn 18,000 barrels of fuel oil per day.[32]

In the 2007 Energy Plan, the Provincial Government stated that the Holyrood thermal generating plant represents a significant challenge for the Island Interconnected System.[33] As discussed in the "Electricity Rates Forecasting: Muskrat Falls Will Stabilize Rates" paper, the cost of operating Holyrood has increased with world oil prices (given its reliance on burning fuel oil to produce electricity), with the result being significant electricity rate increases for Island customers. In addition, Holyrood emits greenhouse gases and other pollutants with an impact on the environment.

Nalcor Energy and NLH investigated the long-term options for the Holyrood plant. An estimated investment of more than $800 million will be required in the 2015 to 2019 time period to help extend the plant's life and install equipment upgrades to reduce pollutant emissions.[34] These investments will not significantly impact greenhouse gas emissions. If the plant is used to accommodate growing demand in the current forecast then greenhouse gas emissions will increase and electricity rates will rise due to the volume of oil used and higher oil prices that are forecast in the long-term.

To avoid the significant investments at Holyrood noted above, that would be necessary to continue its operation, as well as the future electricity rate increases due to oil costs, a decision is required in the near term on the options to enable the retirement of the facility.

Conclusions

- It is clear that we need the power. With residential sector growth expected to continue, new commercial development associated with increased economic activity and a number of potential mining developments in Labrador, additional power will be required to meet this new demand. Demand is expected to continue to rise as the province's economy continues to flourish.

- To ensure that power is available to all customers, the development of Muskrat Falls will ensure that all sectors have access to reliable and least-cost electricity. Muskrat Falls will facilitate the retirement of the Holyrood generating plant and the virtual elimination of green house gas emissions in the production of electricity for most of the province's consumers.

- Without the addition of new generation from Muskrat Falls, the province will have to rely on more expensive electricity supply options to power homes and industry. Power from the Muskrat Falls project will be available to meet much of the incremental demand growth that would be possible from future Labrador mining opportunities. Without the Muskrat Falls power supply, the result could be a loss of these mining investments and associated economic opportunities.

It is critical that sufficient generation supply exists to ensure that homes and residences have access to electricity for heating and other household requirements and that business and industry have the power they need to grow. Muskrat Falls will ensure that this demand is met with a clean least-cost source.

Appendix 1 – Load Forecast from NLH's 2012 PLF

Table 1: Island Interconnected Load Forecast

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Domestic (GWh)	3,543	3,723	3,791	3,852	3,893	3,954	3,961	3,936	3,952	3,997	4,067	4,168	4,223	4,297	4,366	4,413	4,483	4,546	4,584	4,638	4,692
Annual Growth Rate (%)	5.1	5.1	1.8	1.6	1.1	1.6	0.2	-0.6	0.4	1.1	1.8	2.5	1.3	1.8	1.6	1.1	1.6	1.4	0.8	1.2	1.2
General Service (GWh)	2,232	2,312	2,356	2,361	2,400	2,410	2,423	2,438	2,455	2,473	2,493	2,514	2,536	2,558	2,576	2,597	2,619	2,641	2,663	2,686	2,709
Annual Growth Rate (%)	3.0	3.6	1.9	0.2	1.7	0.4	0.6	0.6	0.7	0.8	0.8	0.8	0.9	0.9	0.7	0.8	0.8	0.8	0.9	0.9	0.8
Industrial (GWh)	1,206	1,310	1,367	1,591	1,804	1,889	1,886	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890
Annual Growth Rate (%)	-4.1	8.5	4.4	16.4	13.4	4.7	-0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Street Lighting (GWh)	39	39	39	40	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39
Total Losses (GWh)	631	559	616	628	608	611	612	610	612	617	623	631	637	644	650	655	661	667	671	677	682
Total Island (GWh)	**7,652**	**7,942**	**8,169**	**8,472**	**8,745**	**8,902**	**8,921**	**8,914**	**8,949**	**9,016**	**9,113**	**9,243**	**9,325**	**9,429**	**9,522**	**9,595**	**9,692**	**9,783**	**9,848**	**9,930**	**10,012**
Annual Growth Rate (%)	4.0	3.8	2.9	3.7	3.2	1.8	0.2	-0.1	0.4	0.7	1.1	1.4	0.9	1.1	1.0	0.8	1.0	0.9	0.7	0.8	0.8
Peak Demand (MW)	1,544	1,581	1,632	1,691	1,721	1,736	1,755	1,757	1,760	1,766	1,781	1,801	1,824	1,841	1,861	1,879	1,894	1,912	1,929	1,942	1,958
Annual Growth Rate (%)	4.5	2.4	3.2	3.6	1.8	0.9	1.1	0.1	0.2	0.3	0.8	1.1	1.3	0.9	1.0	1.0	0.8	1.0	0.9	0.7	0.8

Table 2: Labrador Interconnected Load Forecast

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Total (GWh)	**2,590**	**2,872**	**3,019**	**3,052**	**3,052**	**3,047**	**3,004**	**2,971**	**3,002**	**3,005**	**3,008**	**3,011**	**3,013**	**3,016**	**3,018**	**3,020**	**3,023**	**3,025**	**3,027**	**3,029**	**3,031**
Annual Growth Rate (%)		10.9	5.1	1.1	0.0	-0.1	-1.4	-1.1	1.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Peak Demand (MW)	445	475	495	500	504	499	500	481	481	482	482	483	483	484	484	485	485	486	486	487	487
Annual Growth Rate (%)		6.7	4.2	1.0	1.0	-1.1	0.2	-3.8	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Table 3: Island Isolated Load Forecast

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Total (GWh)	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**
Annual Growth Rate (%)		1.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Peak Demand (MW)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Annual Growth Rate (%)		-0.8	-0.2	-0.4	-0.4	-0.4	-0.3	-0.2	-0.3	-0.3	-0.3	-0.3	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4

Table 4: Labrador Isolated Load Forecast

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Total (GWh)	**71**	**73**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**
Annual Growth Rate (%)		3.5	3.8	1.6	1.2	1.3	1.1	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1
Peak Demand (MW)	16	17	17	18	18	18	18	18	19	19	19	19	20	20	20	20	21	21	21	21	21
Annual Growth Rate (%)		1.7	3.2	1.6	1.2	1.3	1.1	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1

Table 5: Total Provincial Load Forecast

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Total (GWh)	**10,320**	**10,895**	**11,272**	**11,609**	**11,883**	**12,037**	**12,013**	**11,973**	**12,041**	**12,112**	**12,213**	**12,346**	**12,432**	**12,539**	**12,635**	**12,712**	**12,813**	**12,907**	**12,975**	**13,060**	**13,145**
Annual Growth Rate (%)		5.6	3.5	3.0	2.4	1.3	-0.2	-0.3	0.6	0.6	0.8	1.1	0.7	0.9	0.8	0.6	0.8	0.7	0.5	0.7	0.6
Peak Demand (MW)	2,008	2,075	2,146	2,210	2,245	2,256	2,276	2,259	2,262	2,269	2,285	2,305	2,329	2,347	2,367	2,387	2,402	2,421	2,439	2,452	2,468
Annual Growth Rate (%)		3.3	3.4	3.0	1.6	0.5	0.9	-0.7	0.1	0.3	0.7	0.9	1.0	0.8	0.9	0.8	0.6	0.8	0.7	0.6	0.7

ECONOMIC INDICATORS

	2011e	2012f	2013f	2014f
GDP at Market Prices ($ M)	33,026	33,769	34,859	34,025
% Change	17.1	2.2	3.2	-2.4
% Change, real	4.3	0.1	4.1	-3.4
Final Domestic Demand* ($ M)	28,608	31,222	32,798	32,590
% Change	6.6	9.1	5.0	-0.6
% Change, real	4.7	6.1	2.7	-2.4
Personal Income ($ M)	18,469	19,463	20,467	21,283
% Change	6.3	5.4	5.2	4.0
% Change, real	2.8	3.1	3.0	1.7
Personal Disposable Income ($ M)	14,891	15,696	16,503	17,172
% Change	6.3	5.4	5.1	4.1
% Change, real	2.8	3.2	3.0	1.7
Retail Sales ($ M)	7,833	8,149	8,653	8,973
% Change	5.1	4.0	6.2	3.7
% Change, real	1.4	2.7	4.8	1.9
Consumer Price Index (2002=100)	121.4	124.0	126.6	129.5
% Change	3.4	2.2	2.1	2.3
Capital Investment ($ M)	7,376	9,598	10,345	9,302
% Change	21.9	30.1	7.8	-10.1
% Change, real	24.4	24.3	4.6	-11.0
Housing Starts (units)	3,488	3,371	3,363	3,176
% Change	-3.3	-3.4	-0.2	-5.5
Employment (000s)	225.4	229.4	233.4	234.3
% Change	2.7	1.8	1.7	0.4
Labour Force (000s)	258.0	261.5	264.6	265.6
% Change	0.7	1.4	1.2	0.4
Unemployment Rate (%)	12.7	12.3	11.8	11.8
Population (000s)	510.6	513.0	515.6	517.3
% Change	-0.1	0.5	0.5	0.3

* Final domestic demand measures demand in the local economy by summing consumption, investment and government expenditures; it excludes net exports.
e: estimate; f: forecast, Department of Finance, April 2012
Source: Statistics Canada; Department of Finance

Source: The Economy 2012, NL Department of Finance

Footnotes

1 Calculated from GDP data published by NL Department of Finance (Economics and Statistics Branch) and Statistics Canada, Provincial Economic Accounts available at http://www.stats.gov.nl.ca/Statistics/GDP/PDF/GDP_Current_Prices.pdf and http://www.economics.gov.nl.ca/E2012/TheEconomy2012.pdf

2 Calculated from personal income data published by NL Department of Finance (Economics and Statistics Branch) and Statistics Canada, Provincial Economic Accounts available at http://www.stats.gov.nl.ca/Statistics/GDP/PDF/Personal_Income.pdf and http://www.economics.gov.nl.ca/E2012/TheEconomy2012.pdf

3 Calculated from housing starts data published by NL Department of Finance (Economics and Statistics Branch), Canada Mortgage and Housing Corporation (CMHC) and Statistics Canada available at http://www.stats.gov.nl.ca/Statistics/Industry/PDF/Housing_Starts.pdf

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11 Retail sales of electricity do not include industrial sales.

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17 Housing Now: Atlantic Region, published by the Canada Mortgage Housing Corporation (p.11) available at http://www.cmhc-schl.gc.ca/odpub/esub/64135/64135_2012_Q02.pdf?lang=en

18 Based on household information from Natural Resources Canada, Office of Energy Efficiency available at http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/trends_res_nf.cfm and population data from NL Department of Finance (Economics and Statistics Branch) and Statistics Canada available at http://www.stats.gov.nl.ca/Statistics/Population/PDF/PopAgeSex_BS.PDF .

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