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MIPP COVID-19 RESEARCH BRIEFING

Nova Scotia Power and COVID-19

Observations for Policymakers and Energy Industry Leaders in the age of COVID-19

Purpose of the Note

This briefing note:
• Summarizes Nova Scotia Power's electricity demand and production for the first two quarters of 2020 (January through June).

• Identifies the sectors hardest hit by the government's response to COVID-19, and when demand for electricity began to rise.

• Highlights possible energy security impacts of COVID-19 and electricity supply.

• Considers the impact of the decline on Nova Scotia Power's greenhouse gas emissions obligations.

This briefing note is intended for policymakers who are responsible for energy policy, business and industry leaders wanting to know the impact of COVID-19 on energy use, and members of the public.

About the MacEachen Institute

The MacEachen Institute for Public Policy and Governance at Dalhousie University is a nationally focused, non-partisan, interdisciplinary institute designed to support the development of progressive public policy and to encourage greater citizen engagement.

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Key Observations and Recommendations

• According to Emera's second quarter results for 2020 discussed in its *Management's Discussion & Analysis*, Nova Scotia Power's demand for electricity was affected by a decline in demand in its non-residential sectors (Commercial, Industrial, and Other) due to COVID-19 in Q2-2020. In Q2-2020, all three non-residential sectors experienced significant declines relative to Q2-2019 and the previous four years, whereas the residential sector experienced a slight increase in demand relative to Q2-2019, and a substantial increase relative to the average demand of the preceding four years.

• Emissions fell in Q2-2020, a combination of a reduction of coal and oil/petcoke use and the decline in demand. The difference was offset by the increased use of natural gas.

• To date, Nova Scotians have enjoyed the availability of an uninterrupted supply of electricity despite the prevalence of COVID-19. This could change, increasing the risk to Nova Scotia's energy security if the virus were to affect parts of Nova Scotia Power's supply chain.

• Nova Scotia Power announced a reduction in its 2020 capital improvements budget because of the pandemic. Although the company did not specify where these reductions will take place, the company needs to increase the resilience of its network to improve energy security for all its customers, especially those in the residential sector.

Introduction

Worldwide, most energy providers experienced a decline in demand for their product because of the COVID-19 pandemic (IEA, 2020). Oil producers and distributors were affected by declines in demand for transportation fuels, while many electricity suppliers were affected negatively by a decline in demand for electricity in the industrial and commercial/institutional sectors (although in some cases this was mitigated by an increase in residential demand).

In Nova Scotia, although changes in demand for transportation fuels won't be released by the federal government until next year, anecdotal data suggests that demand did fall because of the province's stay-at-home requirements that began in March 2020 (Currie, 2020). On the other hand, Emera, the parent company of Nova Scotia Power, has released its electricity production and demand numbers for the first two quarters of 2020, which show that both production and demand fell in Q2-2020 (April, May, and June).

Demand

Emera's Q1-2020 *Management's Discussion & Analysis* (MD&A) emphasized the fact that demand for electricity fell in Nova Scotia in Q1-2020 relative to Q1-2019 (Emera, 2020a). While true, it failed to mention that demand for electricity in Q1-2019 was greater than the demand for electricity in the first quarters of 2016 through 2018.

The data from the MD&A for Nova Scotia Power shows that provincial demand for electricity in Q1-2020 by sector (Residential, Commercial, Industrial, and Other sales) was equal to the average of Q1-2016 through Q1-2019 (see Figure 1, left)

In their Q1-2020 report (Emera, 2020b), Emera's management expected Commercial and Industrial demand for electricity to fall in Q2-2020 relative to Q2-2019 because of the province's stop-work and stay-at-home requirements. They also expected a slight increase in Residential demand as many economic activities stopped and people were confined to their homes; the Q2-2020 results reflect this expectation (see Figure 1, right).

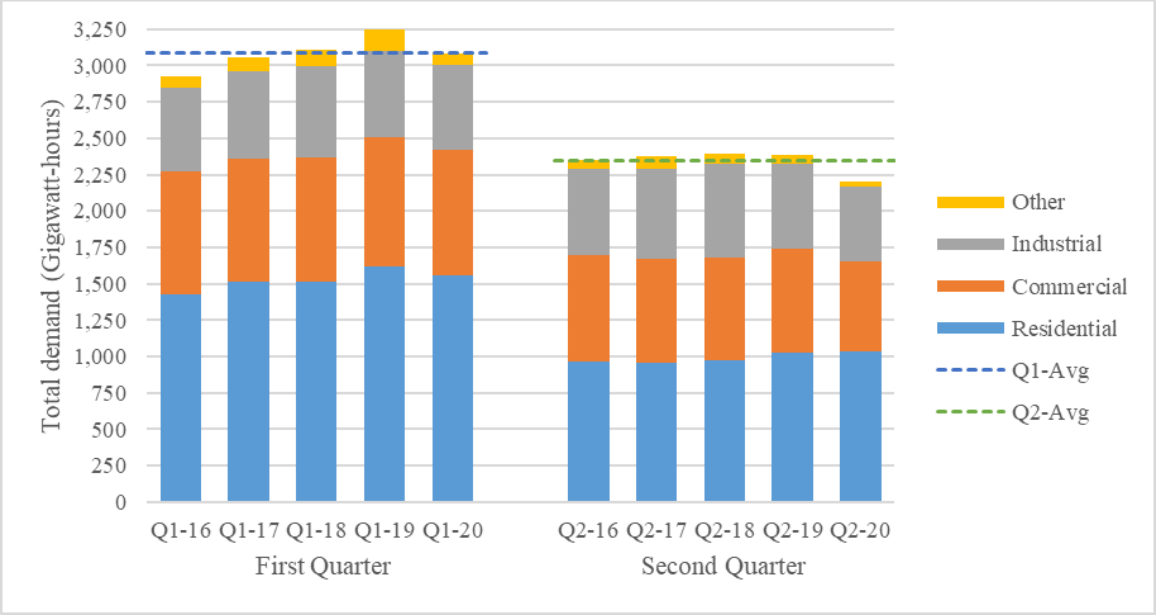


Figure 1: Nova Scotia Power's First and Second Quarter demands by sector for 2016 through 2020

The impact of COVID-19 becomes apparent when looking at the changes in demand in the individual sectors (Table 1).

Q2-2020 residential demand increased slightly (1.2%) compared to Q2-2019 (from 1,023 GWh to 1,035 GWh) but was significantly greater (5.5%) than the 2016-2019 second quarter average (918 GWh). This was the highest second quarter residential demand for electricity ever experienced in the province. The year-over-year residential increase from Q2-2019 to Q2-2020 could simply have been a continuation of the increasing demand for electricity in the residential sector or it could have been due to COVID-19, as more residential customers stayed home (Withers, 2020), doing remote work, teaching their children, watching television/online entertainment, and using more lighting. It is impossible to tell from the quarterly data.

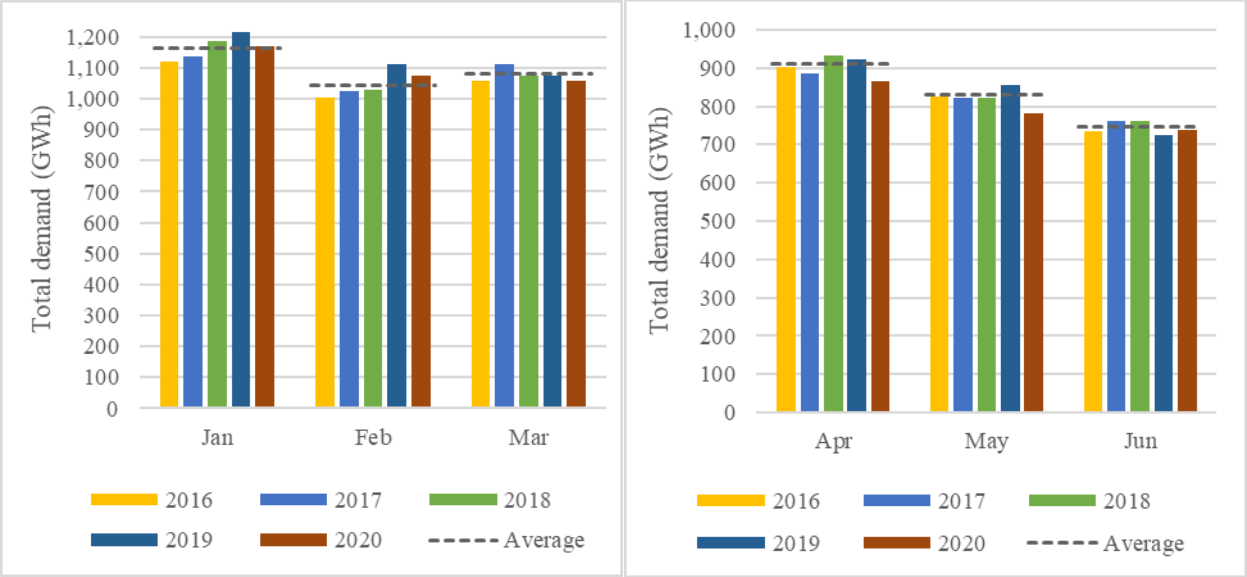
Demand for electricity fell significantly in the other sectors relative to both Q2-2019 and the second quarter average for 2016-2019 as the full force of COVID-19 was felt on the Nova Scotia economy as businesses and industries closed and employees were laid off from March until the gradual reopening of the province in May and June (Nova Scotia, 2020). Commercial and industrial demand declined almost 100 GWh each relative to the four-year average, falling 13.4% and 16.3%, respectively.

Table 1: Second Quarter Sectoral Electricity Demand

Sector	2020	2019	2020 vs. 2019	Average 2016-19	2020 vs. Average
Residential	1,035	1,023	1.2%	981	5.5%
Commercial	621	714	-13.0%	717	-13.4%
Industrial	510	591	-13.7%	610	-16.3%
Other	36	57	-36.8%	70	-48.8%
Total	2,202	2,385	-7.7%	2,378	-7.4%

Nova Scotia Power's hourly demand data gives an indication of when demand occurs in a quarter (Nova Scotia Power, 2020a), but gives no indication which sectors are using the electricity. Figure 2 (left) shows January and February 2020 at and above the 2016-2019 average for the same months, respectively, unaffected by COVID-19. March 2020 was below the average but equal to March 2016. This would appear to confirm that the impact of COVID-19 was beginning to be felt in March with demand being 2.2% below the 2016-2019 average.

The months most affected by COVID-19 are apparent in the monthly demand data for Q2-2020 when compared to the 2016-2019 average (Figure 2, right): in April, May, and June 2020, demand was down 5.1%, 5.8%, and 1.2%, respectively. The small decrease in June could be related to the gradual reopening of the economy.



Q1 2016-2020 Q2 2016-2020

Figure 2: Nova Scotia Power's monthly demand for Q1 and Q2 for 2016 through 2020

An examination of the hourly data for June 2020 shows that demand grew from the start to the end of the month mirroring the easing of the province's restrictions on activities.

Future demand

After the release of the second quarter report, Scott Balfour, CEO of Emera, suggested that demand for electricity in Nova Scotia will increase without indicating when he expects this to occur (Taylor, 2020).

Historically, demand for electricity in Nova Scotia falls in Q2 and continues to decline into Q3 (July to September) because electricity demand in the residential sector continues to decline in the summer months. As in previous years, Q1-2020 and Q2-2020 are following this pattern (see Figure 3).

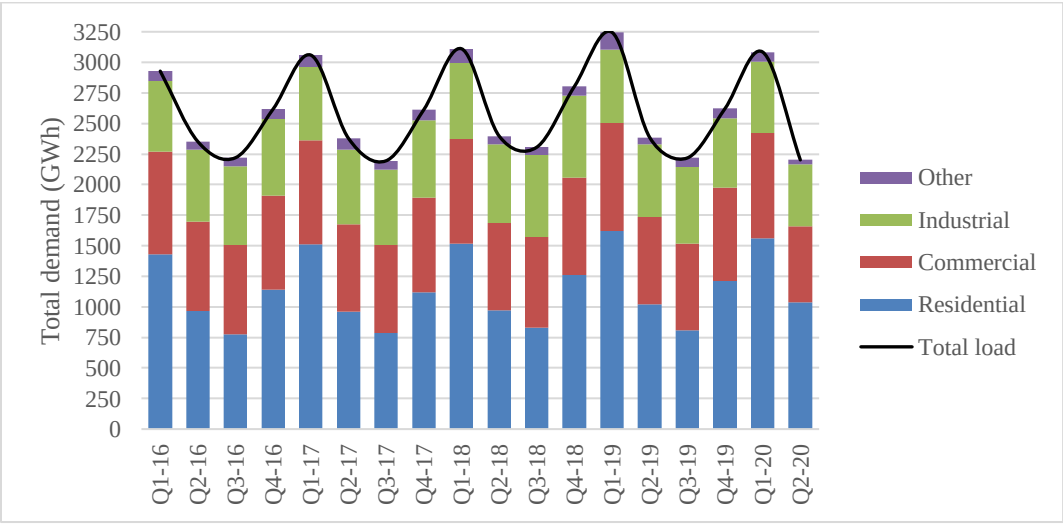


Figure 3: Nova Scotia Power's Quarterly demand by sector for 2016 through 2020

Q2-2020's demand (2,202 GWh) was below the average Q3 demand for 2016 through 2019 (2,235 GWh). Q3 demand is typically less than Q2 demand; however, the reopening of the provincial economy, the travelling permitted inside the Atlantic Bubble (Ross, 2020), the rise of staycations, and the opening of some universities could result in Q3-2020's demand exceeding Q2-2020's demand. While unlikely, the size of the decline in June-2020's demand could indicate the start of a reversal, however small.

Regardless of what happens in Q3, a demand increase in Q4 (October to December) can be expected as the number of hours of daylight decreases, people spend more time indoors, and demand for heating and lighting increases. This is apparent from the historical data. The size of the Q4 increase will depend on factors such as whether a second wave of COVID-19 hits the province and how quickly Nova Scotians can return to work.

Production

Nova Scotia Power's production meets its customers' demand for electricity from a variety of sources, both dispatchable (coal, oil and petroleum coke [petcoke], natural gas, hydroelectricity, and purchased [from outside the province]) and non-dispatchable sources (wind, biomass, and solar).

Nova Scotia Power's energy mix is determined by a range of factors, including demand, the cost of its fuel sources, the availability of variable renewables, and the regulations it is required to follow. These factors were at play in 2020 with both demand and renewable production declining. As a result, Nova Scotia Power made several significant changes to its non-renewable production by reducing coal and petcoke consumption and increasing that of natural gas (see below, Renewable Electricity Regulations).

Nova Scotia Power's energy mixes for Q1 and Q2 between 2016 and 2020 are shown in Figure 4. Coal consumption was at its lowest for Q2 and for Q1 and Q2 combined since at least 2010 (see Table 2).

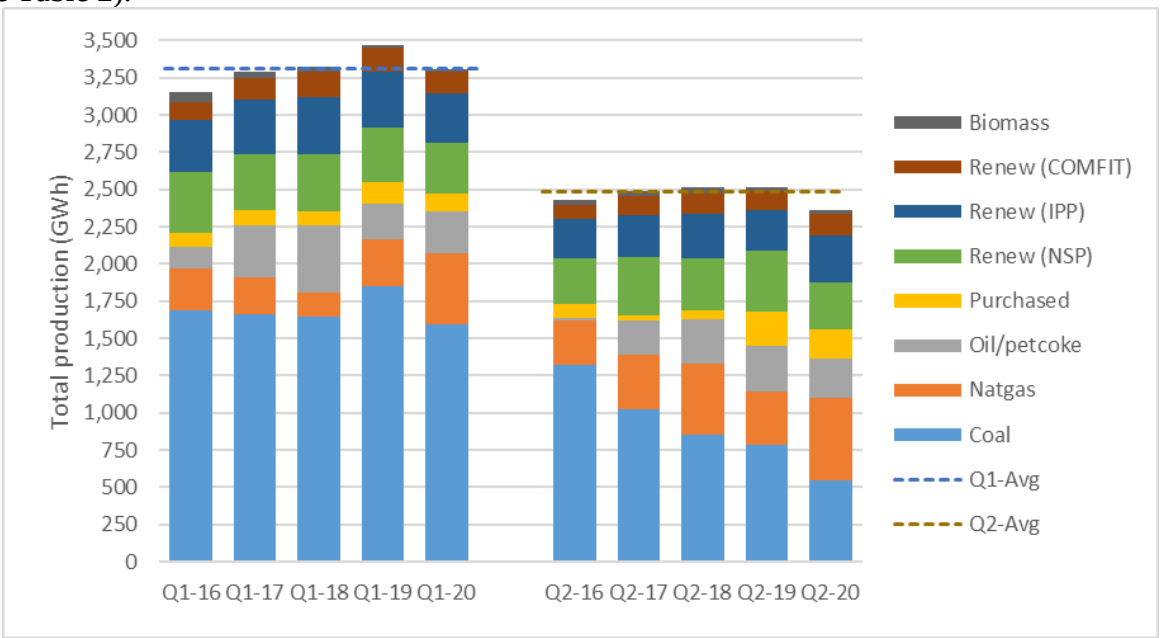


Figure 4: Nova Scotia Power's Q1 and Q2 production for 2016 through 2020

The year-to-date results (January to June) show that Nova Scotia Power's total production volumes, coal consumption, and renewables were at their lowest since 2016 (Table 2). The decline in renewables was almost entirely due to Nova Scotia Power's 121 GWh drop in its production from wind and hydroelectricity. Since Emera's Q2-2020 *Management's Discussion & Analysis* gives no indication which declined, we have no way of telling the cause of the decline; for example, equipment maintenance, a lack of water in hydroelectric reservoirs, or keeping the reservoirs for use in later quarters in the year (see below, Energy Security).

Table 2: Year-to-date production (Gigawatt-hours)

Source	YTD-16	YTD-17	YTD-18	YTD-19	YTD-20	Change (19-20)
Coal	3,011	2,685	2,502	2,633	2,144	-489
Natgas	585	618	638	667	1,026	359
Oil/petcoke	153	576	754	557	546	-11
Purchased	189	136	148	370	314	-56
Total non-renewables	**3,938**	**4,015**	**4,042**	**4,227**	**4,030**	**-197**
Renewables (NSP)	718	763	734	781	660	-121
Renewables (IPP)	614	652	681	636	644	8
Renewables (COMFIT)	210	272	299	293	293	0
Biomass	106	80	82	45	41	-4
Total renewables	**1,648**	**1,767**	**1,796**	**1,755**	**1,638**	**-117**
Total production volumes	**5,586**	**5,782**	**5,838**	**5,982**	**5,668**	**-314**

Emissions

Based on Nova Scotia Power's year-to-date energy mix for 2020, it appears that emissions fell in the first six months of 2020 by about 6% compared to 2019. This was the result of a decline in the use of emissions-intensive coal and oil/petcoke (see below, Energy Security). Renewables also declined, although by a lesser amount than non-renewables. These declines were offset by a significant increase in the use of natural gas which, by displacing coal, contributed to the fall in emissions.

Renewable Electricity Regulations

The province's Renewable Electricity Regulations require Nova Scotia Power to achieve a ratio of total renewables production to total sales (demand) of 25% for calendar years 2015 through 2019. Starting in calendar year 2020, this is to increase to 40% (Nova Scotia, 2013). However, because of COVID-19 related delays to the Muskrat Falls project (Saltwire Network, 2020), this target cannot be met (Emera, 2020b). In response, the provincial government has relaxed the regulations and now requires Nova Scotia Power to have an average ratio of 40% between 2020 and 2022. This should be achievable by Nova Scotia Power increasing the number of "blocks" of electricity it purchases from the Muskrat Falls project when finally commissioned (VOCM, 2020).

Although the ratio is an annual requirement, an examination of the mid-year YTD ratio of renewable supply and electricity sales shows that the fall in demand and production are almost in lockstep meaning that ratio has barely changed, despite the pandemic (see Table 3).

Table 3: Year-to-date ratio of renewables to sales

	YTD-16	YTD-17	YTD-18	YTD-19	YTD-20
Total renewables (GWh)	1,648	1,767	1,796	1,755	1,638
Annual sales (GWh)	5,279	5,437	5,508	5,630	5,286
Regulations ratio	31.2%	32.5%	32.6%	31.2%	31.0%

Energy Security

Nova Scotians have been fortunate that energy suppliers such as Nova Scotia Power have not been directly affected by COVID-19. However, the pandemic does pose a risk to the availability of the province's electricity supply: if COVID-19 were to disrupt its supply of coal (by the producers or the shippers of the coal), petcoke, or natural gas, or infect essential workers.

Of course, Nova Scotia Power *was* affected by COVID-19 with the delay in construction of Muskrat Falls. Had first power reached the province this year from Muskrat Falls, an additional source of electricity would be available to Nova Scotia Power and it would have reduced its emissions.

Although not mentioned in the *Management's Discussion & Analysis* for Q2-2020, Nova Scotia Power's decision to replace coal with natural gas in Q2 could have been done to ensure sufficient coal stocks in Q4-2020 and Q1-2021 should the supply of coal be disrupted by a COVID-19 outbreak in a coal producer or shipper. One could surmise that the same action was taken with respect to their hydroelectric reservoirs.

The declining use of coal and the increase in natural gas is in keeping with Nova Scotia Power's recently released Integrated Resource Plan (Nova Scotia Power, 2020b).

Policy Recommendation

Nova Scotia Power has forecast its 2020 capital investments to decline from $375 million to about $305 million, the result of its actions to limit the spread of COVID-19. While this is clearly understandable, the rise in residential demand makes reducing the risk of power outages in this sector even more important with the expected rise of climate-related extreme weather events (C2ES, 2020). Although specific expenses are not mentioned in its Q2-2020 *Management's Discussion & Analysis*, the company needs to increase the resilience of its network to improve energy security for all its customers, especially those in the residential sector.

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