



Electrification Study

Customer Questionnaire, Data Analysis and Results

Background

Electrification is the process of replacing technologies that use fossil fuels (coal, oil and gas) with technologies that use electricity as a source of energy.¹ Electrification is being encouraged through rebates by the BC Government, the Government of Canada and FortisBC to reduce Green House Gas Emissions, reach climate targets, decarbonize the environment, and minimize the impact of climate change. Nelson Hydro customers can receive rebates for many types of fossil fuel conversions as well as electric vehicle charging stations for their homes.

Nelson Hydro generates and supplies about half of the electricity needed by its approximately 11,000 customers within the Service Territory each year. The rest of the electricity needed to meet customer demand is purchased from FortisBC. Every year Nelson Hydro provides electric load forecasts to FortisBC and this forecast does not currently include electrification trends.

There is some Canadian data for EV trends that could be used for electric load forecasting purposes but the data does not represent Nelson Hydro specific customers and their value systems and perspectives.

Nelson Hydro does not have insight into customers' past, present or future personal and business plans for electrification...both in the short and long term. This insight would help determine if the current load forecasting methodology aligns with customer electrification trends.

Objective

Quantify the impact of customer electrification on electric imports and peak demand in the next three to five years to determine if the current methodology of load forecasting accurately reflects our estimated short-term electric demand.

Methodology

Project Plan Step	Timeline
1. Locate secondary electrification data sources (CleanBC, BetterHomesBC, ICBC, FortisBC, etc.) to supplement customer survey data.	March - April 2023

¹ <https://en.wikipedia.org/wiki/Electrification>

2. Design a questionnaire and tools to collect a primary data source from Nelson Hydro customers.	March 13 - July 14
3. Create a webpage and embed information about the study and questionnaire.	March 2023
4. Advertise the study/questionnaire	April – July 2023
5. Analyze the survey data with load forecast to determine if the % growth in the load forecast tool is appropriate	July – August 2023
6. Summarize findings	August 2023

Survey Requirements

- Must be a Nelson Hydro commercial or residential customer.
- Must provide consent to access electric account data for the purposes of analysis.
- Must currently own or intend to own an Electric Vehicle (Battery or Hybrid).
- What time of day do they charge? Where do they charge? Number of times a week they charge?
- Primary or secondary vehicle? General Satisfaction? Future Plans for EVs?
- Commercial Fleet Composition? Volume? Electrification Plan? Electrification Growth? What factors are influencing electrification? What time of day do you charge?
- Fuel Switching Plans....do you own a gas-fueled hot water tank or furnace? And plan to switch it in the next year for an electric heat pump or electric hot water tank?

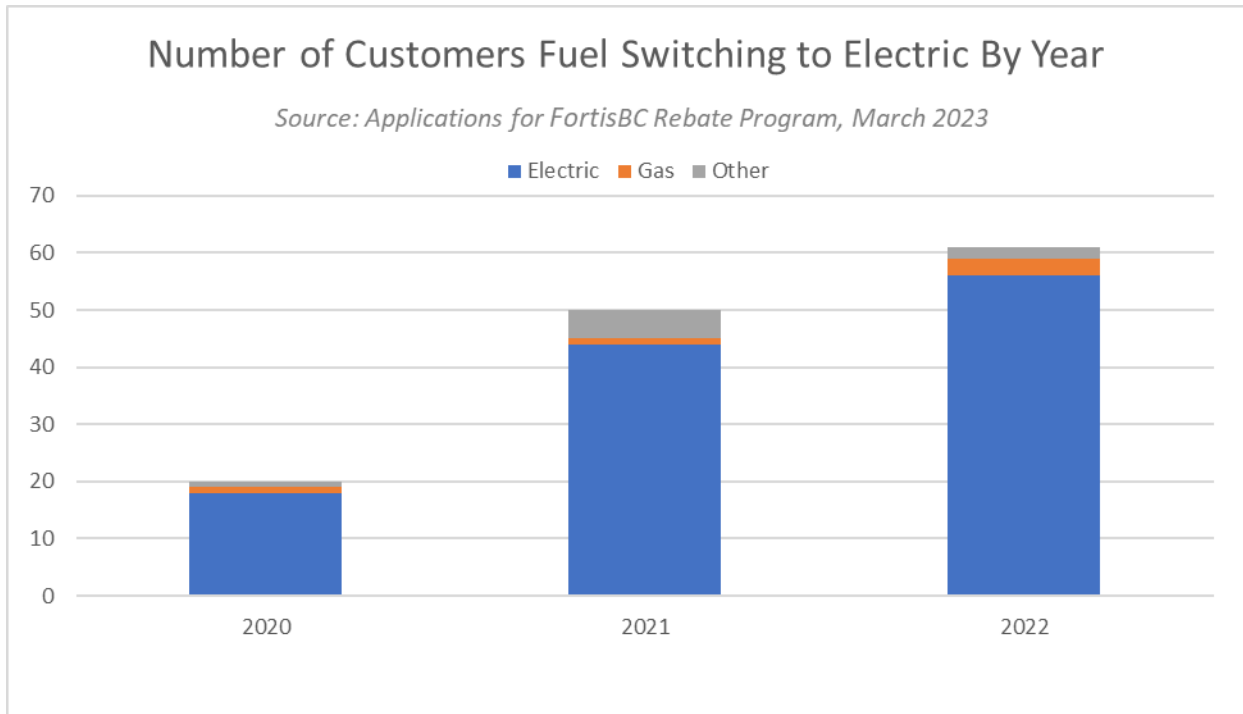
Communication Approach

- Email: notification of study to Nelson Hydro customers.
- Website: create a web page on Nelson Hydro pages and embed the survey link.
- Social Media: advertisement of the survey and redirect to the website.
- City Hall TV: advertisement of the study and redirect them to the website.
- IVR: Call Commercial Customers to remind them to complete the survey.
- Credit: Offer a \$100 credit to a customer who completes the survey.
- Climate Hub Newsletter: advertise the survey.
- Electric Bill Message: advertise the survey.
- Jostle: notify the City of Nelson staff of the Electrification Study.
- Nelson Hydro: notify staff in the monthly meeting of the Electrification Study.

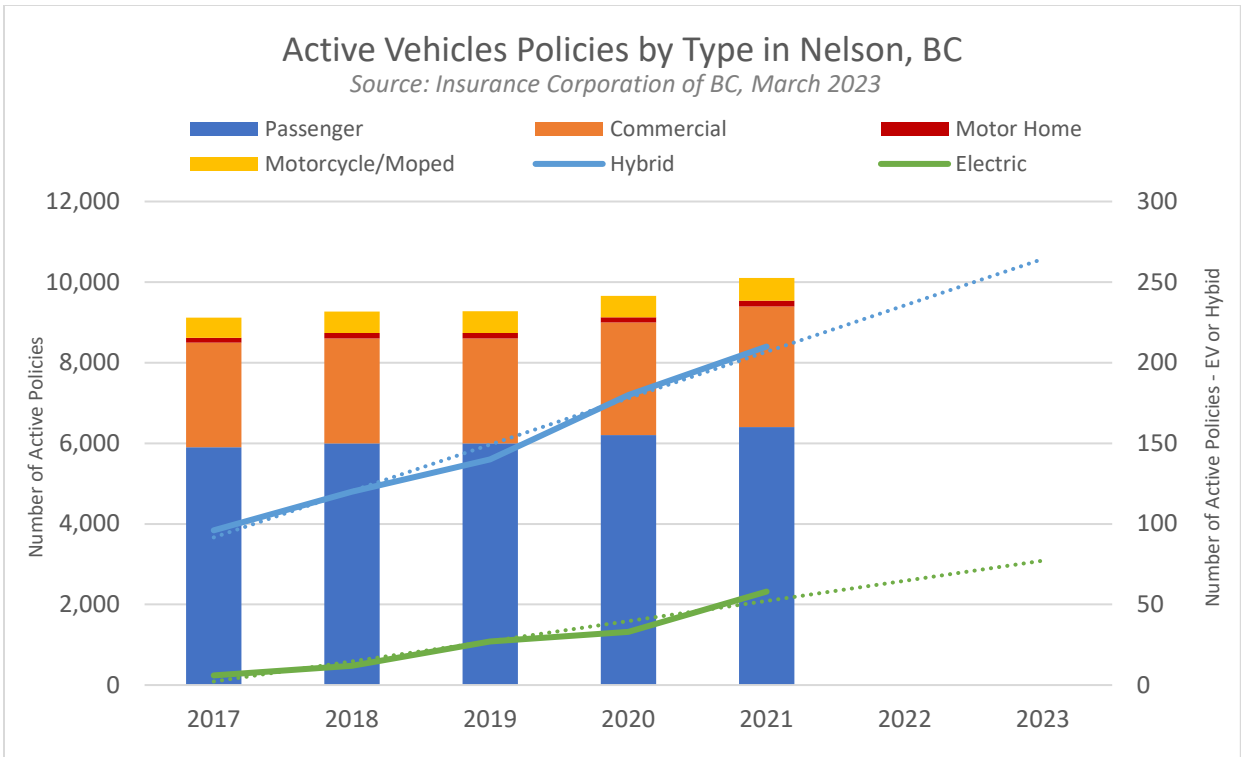
Analysis and Results

The results of the secondary dataset analysis for EV Registrations from ICBC and Fuel Switching Rebates from FortisBC showed low levels of electric demand growth in the short term.

- FortisBC: 131 Nelson Hydro customers applied for Fuel Switching Rebates from FortisBC over 3 years. Only 5 customers were switching from gas fuel to electric fuel. This will not have an impact on the electric load growth and demand of electricity.

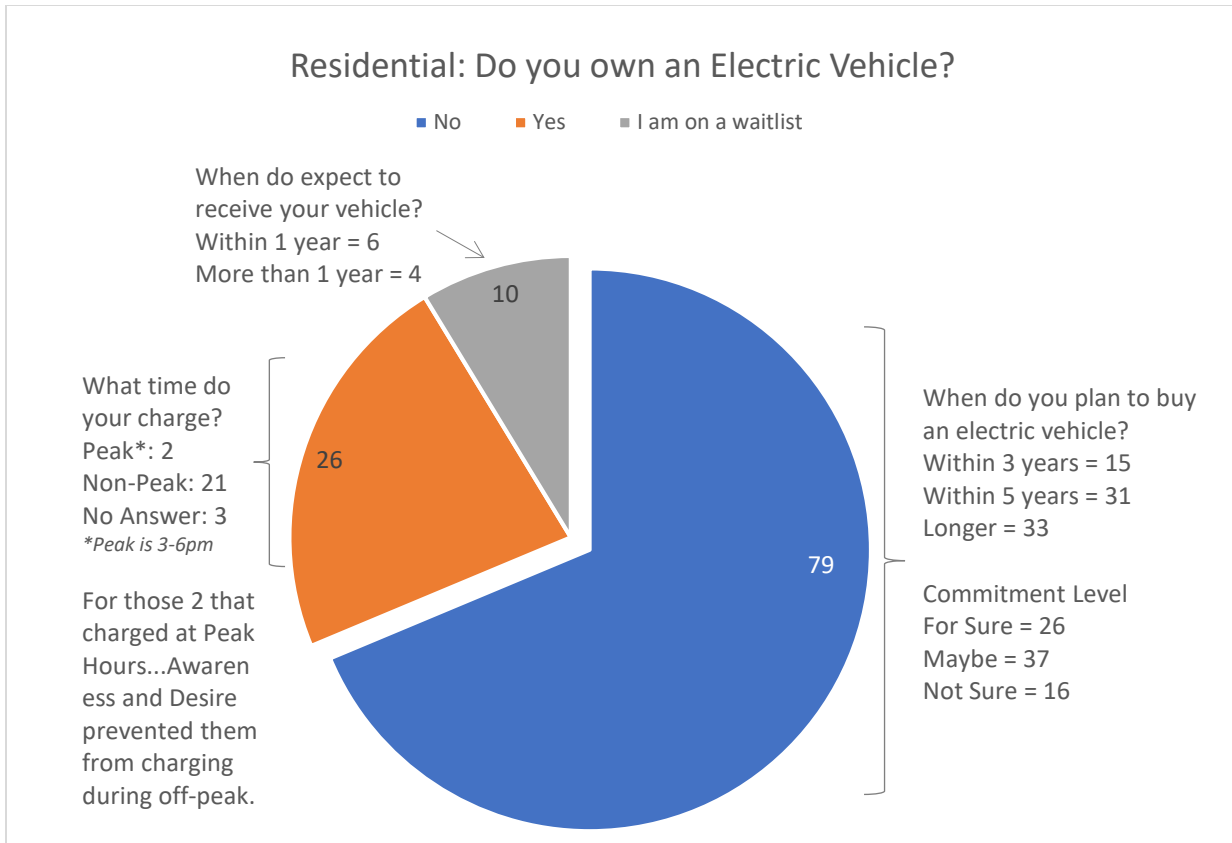


- ICBC: There were 882 hybrid (746) and electric (136) vehicles registered to owners who had a Nelson address from 2017-2021. While there are more hybrid vehicles in town, the average percentage rate of growth during this time was higher for electric vehicles at 81% compared to that of 22% for hybrid vehicles.



The result of the primary dataset analysis for electrification intents of Nelson Hydro customers showed low levels of electric demand growth in the short term.

- There were 132 respondents to the survey. 119 of which were customers; 115 residential and 4 commercial.



- The above chart indicates that 79 of residential respondents (69%) indicated that they do not own an EV currently. Of those 79 respondents, 33 said that they were going to wait longer than five years to buy one. Of those 33 who said they would wait longer than five years, 16 weren't really confident that they would buy an EV and 15 said they might. These trends do not indicate a risk of electric peaks in demand from EV charging in the short term.
- The 4 respondents from the Commercial sector showed that...
 - 2 of the 4 respondents were creating an Electrification Plan for their fleet with the price of gasoline, financial incentives and environmental targets as their main drivers for converting their fleet to electric.
 - 3 of the 4 respondents had 1-6 light-duty vehicles within their fleet and 1 respondent had 1-3 heavy-duty vehicles within their fleet.

Lessons Learned

- A lot of advertising was completed for very few respondents. It is worth considering incorporating these questions into a generic annual survey so the marketing can be done once for multiple purposes.
- The majority of respondents were residential. An IVR system was used to target commercial customers, but it did not get the increase in survey respondents to a level

that gave meaningful data. It is worth considering just targeting commercial customers going forward as their fleet electrification plans would have a significant impact to electric load and peak demand for Nelson Hydro.

- When using the Regional Energy Efficiency Program customer data, it is important to double-check that the data is only for Nelson Hydro customers to avoid breach of privacy concerns.
- The FortisBC and ICBC data provided some value but it did not have the depth as anticipated.

Conclusions

- There will be a slow uptake of electric or hybrid electric vehicles within the Nelson Hydro service territory in the short term for **residential customers**. This slow growth will not have an impact on residential demand and therefore the existing load growth methodology is sufficient to forecast this low level of growth.
- The survey results from commercial customers were inconclusive. It is recommended that Nelson Hydro collect more information from the 190 **large commercial customers** about their fleet electrification plans using tools like the UtilityPulse Customer Survey being considered for 2024.