



Consumer Confidence in the Accuracy of Clean Fuel Measurement

Executive summary

**Prepared for Innovation, Science and Economic Development Canada (ISED)
and Measurement Canada (MC)**

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Consumer Confidence in the Accuracy of Clean Fuel Measurement

Final report

Prepared for Innovation, Science and Economic Development Canada (ISED) and Measurement Canada (MC) by Environics Research

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This public opinion research report presents the results of quantitative and qualitative research conducted by Environics on behalf of ISED and MC. The quantitative research was conducted online with the general population, from May 16 to June 3, 2022 and the qualitative research was conducted from May 19 to July 15, 2022.

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Executive summary

1. Background and objectives

To encourage Canadians across the country to adopt zero emission vehicles over the next ten to fifteen years, the Government of Canada announced \$56.1 million in the 2021 Federal Budget for Measurement Canada to develop and implement a set of codes and standards for retail zero-emission vehicles (ZEV) charging and fueling stations. This measure is intended to provide regulatory certainty to providers of charging services and facilitate the development of the charging network.

To support the success of this initiative and encourage consumer confidence in the clean fuels market, Measurement Canada sought to gauge investor, business, and consumer confidence in the accuracy of clean fuels measurement devices.

This research directly informs Measurement Canada on the effectiveness and usefulness of the clean fuel measurement devices programs and services it is developing, as well as their utility in building consumer confidence in the clean fuel market. This research is also in direct support of government-wide priorities to advance clean fuels markets and carbon capture, utilization, and storage technologies in Canada.

The study also helps inform baselines against which to measure results and to effectively inform Measurement Canada’s reporting processes, including consumer confidence data around the fairness of charging and/or refueling stations. It also conveys levels of consumer confidence with clean fuel charging and refueling equipment currently in the market.

2. Methodology

Quantitative phase

EnviroNics Research surveyed 1,800 Canadian EV owners and intenders (aged 18 years and older) between May 16 to June 3, 2022. The sample included 1,000 EV owners, and 800 Canadians who are considering the purchase of an EV in the next two years. The survey results offer a reflection of provincial distribution of EV/hybrid car ownership in Canada, as well as Canadians considering this purchase. The survey data also identified owners and senior managers of Canadian small businesses that use ZEV or hybrid vehicles.

Survey respondents were selected from registered members of an online panel. Since the samples used in online panel surveys are based on self-selection and are not a random probability sample, no formal estimates of sampling error can be calculated. The survey obtained the following regional distribution:

Target group	EV Owners (Total)	EV Intenders (Total)
Canada (Total)	1,000	800
Atlantic	29	58
Quebec	408	170
Ontario	224	308

MB/SK	32	50
Alberta	40	86
BC/Territories combined	267	132

More information about the methodology for this survey is included in Appendix A.

Qualitative phase

The qualitative phase consisted of in-depth interviews with investors, fleet owners, manufacturers, and clean fuel service providers. ISED provided Environics with stakeholder lists including members of various working groups, electric vehicles owners, and manufacturers. Environics also conducted desk research to compile a list of contacts at businesses and organizations that qualified for the study. Participants were recruited via email and invited to a telephone or Zoom interview. The interviews took place from May 19 to July 28, 2022. A total of 93 clean fuel stakeholders from across the country were invited to participate, with 32 agreeing to be interviewed.

3. Cost of research

The cost of this research was \$124,945.70 (including HST).

4. Key findings

Results from both the quantitative and qualitative research suggest that standardization within the ZEV space is a step in the right direction for creating a more robust industry and encouraging consumer adoption of ZEVs. While consumers indicate high levels of confidence in the accuracy of clean fuel measurement, it may be that they aren't aware that the chargers are not currently regulated. From an industry stakeholder perspective, accuracy of clean fuel measurement is not a high concern, though implementing billing methods that are fair and equitable is top of mind.

There is work to be done from a communications standpoint on increasing awareness of Measurement Canada outside of industry. This will be important in creating consumer trust in the EV charging and refueling network. At this time, many consumers and industry stakeholders alike assume that EV chargers are built and regulated to specific standards, similar to gasoline pumps. This likely creates the relatively high level of confidence in the accuracy of clean fuel measurement noted in this study. When Measurement Canada moves forward with the new requirements, they should be communicated in a way that is easy for consumers to understand and instills confidence that will aid in adoption.

The requirements in development received an overall positive reaction from all stakeholders, and consumers agreed that many of the statements meant to increase their confidence would do so. While consumers were more concerned with actions such as transparency in billing methods and information being provided to them at the charging stations immediately after charging their vehicles, industry

stakeholders were more focused on standards being put into place as soon as possible that would not disrupt the already growing industry.

Quantitative findings

EV ownership and intention

Owners of Zero-Emission Vehicles (ZEVs) and those considering purchasing ZEVs were asked about their current vehicle or the vehicle they plan to purchase.

- Electric vehicle owners in Canada are most likely to own a Plug-in Hybrid Electric Vehicle (PHEV) (54%), and least likely to own a Hydrogen/Fuel Cell Electric Vehicle (FCEV) (5%). About four-in-ten own a Battery Electric Vehicle (BEV). Owners of EVs are likely to drive a 2020 model or newer and have an approximate range of 200-400 km. More than half of those who intend to purchase an EV in the next two years plan to buy a PHEV (60%).

Charging behaviour - BEV/PHEV owners

Owners of BEVs and PHEVs were asked a series of questions related to their patterns and experiences with charging at home and at public charging stations.

Charging at home

- When charging at home, it is most common for BEV and PHEV owners to use a standard wall electrical outlet (Level 1) or a fixed/hard-wired (Level 2) charging station. PHEV owners are more likely to use a standard wall electrical outlet (Level 1) at home (41% vs. 29%), whereas BEV owners are more likely to use a fixed/hard-wired charging station (Level 2) (46% vs. 33%). Around one in ten (11%) say they do not charge at home.

Use of public charging stations

- A majority of eight in ten (81%) PHEV and BEV owners charge their EVs away from where they live, more than half of whom use free chargers (56%). Close to one third use ChargePoint locations (30%), with smaller proportions using Circuit électrique (25%) and FLO locations (22%).
- Among those who do not charge away from home, BEV owners are more likely (63%) to point to not leaving their home range as their reason, while PHEV owners are more likely to say it takes too long to charge (31%) or that it is difficult to locate chargers (28%).
- PHEV owners use Level 1 and Level 2 public charging stations most frequently, with close to half (45%-48%) saying they use one or the other at least every two weeks. BEV owners are more likely to use Level 2 and Level 3 charging stations occasionally throughout the year.

Experience with billing at public charging stations

- When using public charging stations, PHEV and BEV owners most commonly have experience being billed based on time connected to the charger (\$/min).

- General confidence in billing accuracy is high among both PHEV and BEV owners, with close to eight in ten (79%) feeling at least somewhat confident in all aspects of their charging experience, including billing fairness and accuracy. Compared to other regions, BEV/PHEV owners in Quebec are the most confident in billing accuracy at public charging stations. The majority of PHEV and BEV owners have not experienced an issue, disagreement or dispute related to billing at public charging stations.

Confidence in public charging stations

- When considering statements related to BEV/PHEV experience at public charging stations, agreement is generally soft. For instance, while over seven in ten (72%) agree that they will be billed fairly when using a public electric charger, only two in ten (21%) of those strongly agree, while over half (52%) somewhat agree. Feeling satisfied with the billing methods employed by public EV charging systems is highest in Quebec (69%) compared to the other regions.

Fuelling behaviour – Hydrogen/Fuel Cell EV owners

Owners of FCEVs were asked as a series of questions related to purchasing hydrogen, as well as their experiences with hydrogen fuel dispensing stations.

- Almost six in ten (58%) FCEV owners purchase hydrogen fuel at least every two weeks, with a proportion of thirty-seven percent billed by fixed charge per use. Overall, confidence in billing accuracy of hydrogen filling stations is quite high at eighty one percent, though this proportion is made up largely of owners who are just somewhat confident in billing accuracy.
- While close to seven in ten (68%) FCEV owners and intenders believe they will be billed fairly at fuelling stations and more than half (55%) are satisfied with billing methods there, a proportion of fifty-one percent consider it difficult to know how much hydrogen their car actually receives.

Attitudes and perceptions - BEV/PHEV Owners and intenders

Both BEV/PHEV owners and intenders were asked a series of questions to understand their attitudes and perceptions towards public charging stations.

Information on receipt

- When considering information on a receipt, PHEV and BEV owner majorities consider items such as total cost (83%), rate (71%), total charging time (64%) and any fixed charges (62%) as *very* important. Less than half say the same about items such as name and location of EV charger, official language of choice, maximum rate of energy transfer, type of current plug types, and transaction number. EV intenders are more likely than EV owners to consider most of the information very important.
- When considering how their confidence in accuracy at public stations might be positively influenced, the idea that billing details would be provided immediately following the transaction is at the higher end of the spectrum (65%), while having knowledge that there is an independent dispute resolution mechanism in place is at the lower end (46%) of the spectrum. Between owners and intenders, the latter are always more likely to consider the options to have a strong positive influence on their confidence. This is important to note from a perspective in increasing

adoption, as these types of confidence-enhancing mechanisms are what will encourage more people to purchase EVs.

Attitudes and perceptions - FCEV Owners and intenders

FCEV owners and intenders were asked a series of questions to understand their attitudes and perceptions towards hydrogen dispensing stations.

- When asked about important information to see on a receipt, a majority of FCEV owners and intenders consider total cost, rate and sales taxes to be very important. Similar to patterns among BEV/PHEV owners and intenders, FCEV intenders consider most information to be very important more often than owners.
- According to FCEV owners and intenders, ensuring public hydrogen dispensers are approved and inspected by accredited officials and designed and built to perform in accordance with Canadian standards would have strong positive influences on their level of confidence (55% each).

Small business owners with EVs

- SME owners who own BEVs or PHEVs are split between using their vehicle for business, with about half saying they do (51%) and half saying they do not (49%).
- Among SME owners who do use their EV for business, a majority of eighty percent use public chargers for their vehicle, with half taking advantage of free chargers. Level 1 public charging stations are used the most frequently, with a majority (84%) of SME owners using it to charge their vehicle at least every two weeks, including forty percent within that group who use it once per week and thirty-one percent who use it 3 or more times per week.

Awareness of Measurement Canada

- EV owners and intenders across Canada are mostly aware of Measurement Canada's responsibility for gas pumps, but are less aware of its responsibility for natural gas and electricity meters. This points to another reason for a robust communications plan when implementing new standards.

Qualitative findings

The qualitative research was aimed at assessing awareness of Measurement Canada and its role within the clean fuels industry, as well as awareness and perceptions of the measurement accuracy and performance requirements for electric vehicle charging and hydrogen dispensing stations currently being developed in Canada.

Awareness of Measurement Canada

- The results suggest that among key stakeholders within the clean fuels industry, Measurement Canada is relatively well-known. There is an opportunity to increase awareness among stakeholders such as prospective investors and businesses newer to the industry, like fleet owners. In fact, increased communications across all groups is essential at this time. Manufacturers and service providers alike emphasized a need to be kept aware of developments related to regulatory issues, and further agreed that open communication and transparency with consumers will be crucial moving forward.

Reactions to new requirements in development

- The release of the upcoming requirements is an important issue that is top-of-mind for charging/fuelling service providers and manufacturers of both charging equipment and ZEVs. The subject is being discussed across the industry as stakeholders await guidance from Measurement Canada. Two groups that had lower awareness of the impending requirements and consequently no strong opinion about them were fleet owners and investors.
- There was overall support for the new requirements being developed by Measurement Canada, with several participants emphasizing the need for regulations to be implemented as quickly as possible, especially allowing energy-based billing in place of the current standard of time-based billing. Participants stated that time-based billing is extremely inconsistent and inaccurate, particularly for Level 3 or DC-Fast Charging (DCFC) stations.
- While there was broad support for the development of requirements, some participants were wary of too much government oversight creating bottlenecks in the industry, and new standards effectively nullifying current equipment. The consensus was that government involvement is necessary in the way of financial aid and standardizations to maintain momentum and confidence within the industry, though with as few limitations on the market as possible.
- Charging/fueling service providers and manufacturers were quick to highlight the importance of the implementation plan, including a need for increased communications about timelines, a retrofitting plan for equipment currently in the market, possible government subsidies, and information about the allocation of carbon credits. The hydrogen fuel cell industry is still quite nascent but faces similar challenges as the electric vehicle industry in that there are no approved metering devices on the market.

Concerns and perceptions about accuracy

- Most manufacturers and service providers are highly confident in the functionality of the charging / dispensing equipment they currently produce, own, or lease and for the most part have not experienced many issues related to the billing methods.

- When asked directly about their concerns with accuracy, most participants indicated a low level of concern with the accuracy of clean fuel measurement. Interviewees were also asked if the new regulations would affect consumer and market confidence in EV charging and hydrogen dispensing stations. There is a perceived high level of consumer trust in the current stations, likely coming from a belief that the chargers are regulated already. While consumer confidence may not be low to begin with, it was suggested that introducing regulations around charging stations will likely increase that level of confidence.

Increasing confidence in EV fueling accuracy

- Participants were asked to describe how specific protocols would affect confidence in accuracy of clean fuel charging/dispensing stations. The consensus was that the four requirements would increase consumer and market confidence in the accuracy of clean fuel measurement, though they did not have a strong impact for many stakeholders already in the industry.

5. Political neutrality statement and contact information

I hereby certify as a senior officer of Environics that the deliverables fully comply with the Government of Canada political neutrality requirements outlined in the Communications Policy of the Government of Canada, and Procedures for Planning and Contracting Public Opinion Research. Specifically, the deliverables do not include information on electoral voting intentions, political party preferences, standings with the electorate, or ratings of the performance of a political party or its leaders.



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