Innovation, Science and Economic Development Canada | Innovation, Sciences et Développement économique Canada

Consumer Confidence in the Accuracy of Clean Fuel Measurement – Wave 2

Executive Summary

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

Supplier Name: Environics Research
Contract Number: CW2346881
Contract Value: $124,865.00 (including HST).
Award Date: 2024-01-23
Delivery Date: 2024-04-12

Registration Number: POR 117-23

For more information on this report, please contact ISED at:
ic.publicopinionresearch-recherchesurlopinionpublique.ic@canada.ca

Ce rapport est aussi disponible en Français

Canada

Consumer Confidence in the Accuracy of Clean Fuel Measurement – Wave 2
Final report

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

May 27, 2024

Permission to reproduce

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 February 27 to March 22, 2024 and the qualitative research was conducted from February 13 to May 10, 2024.

Cat. No. Iu4-417/2024E-PDF

International Standard Book Number (ISBN): 978-0-660-72590-1

Cette publication est aussi disponible en français sous le titre nom *Confiance à l'égard de la mesure des combustibles propres*

N^{o} de cat. Iu4-417/2024F-PDF (Final report, French)

ISBN: 978-0-660-72591-8

1. Executive summary

1.1. 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, Environics Research conducted quantitative and qualitative research in 2022 to provide baseline measures of confidence in the accuracy of clean fuels measurement devices.

This is the second iteration of this research study, intended to highlight any changes in consumer confidence of clean fuel measurement devices over the past few years and track awareness of the role Measurement Canada plays in developing regulations and maintaining standards in the sector. These 2024 results aim to provide tracking data that will support and inform further regulatory development in the Canadian clean fuels sector.

1.2. Methodology

Quantitative phase

Environics Research surveyed 1,268 Canadian EV owners and intenders (aged 18 years and older) between February 27 to March 22, 2024. The sample included 1,030 EV owners, and 238 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	EV Intenders
Canada (Total)	**1,030**	**238**
Atlantic	47	25
Quebec	402	40
Ontario	214	79
MB/SK	42	24
Alberta	59	30
BC/Territories combined	266	40

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 February 13 to May 10, 2024. A total of 187 stakeholders from across the country were invited to participate, with 30 agreeing to be interviewed.

1.3. Cost of research

The cost of this research was $124,865.00 (including HST).

1.4. Key findings

Abbreviations

PHEV	Plug-in Hybrid Electric Vehicle
BEV	Batter Electric Vehicle
FCEV	Fuel Cell Electric Vehicle
ZEV	Zero-Emissions Vehicle
EVSE	Electric Vehicle Supply Equipment

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 (7%). 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 seven in ten of those who intend to purchase an EV in the next two years plan to buy a PHEV (72%).

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, BEV and PHEV owners more commonly use a Level 2 fixed-charging station, followed by a Level 1 standard outlet. PHEV owners (39%) are more likely than BEV owners (25%) to use a standard wall electrical outlet (Level 1) at home, whereas BEV owners are more likely (50%) to use a fixed/hard-wired charging station (Level 2). Around one in ten (9%) say they do not charge at home.

Use of public charging stations

- A majority of eight in ten (80%) PHEV and BEV owners charge their EVs away from where they live, about half of whom use free chargers (53%). Use of other options for charging away from home follow a similar proportion as in 2022, but there has been growth in the use of Tesla Supercharger Stations (32% compared to 21% in 2022).
- Among the 20 percent of PHEV and BEV owners who do not charge their EVs away from where they live, four in ten say it is because they do not leave their home range. Other common reasons include range concerns (26%) and saying their EV takes too long to charge outside of their home (21%).
- Among PHEV and BEV owners, Level 1 and Level 2 public charging stations are most frequently used. Half use a Level 1 station (51%) or Level 2 station (50%) at least every two weeks, compared to three in ten (34%) who say the same about Level 3 stations. This data follows a similar pattern as the 2022 results.

Average cost per charge

- BEV/PHEV owners who charge away from home were asked to estimate the average cost per charge. One third say charging away from home typically costs less than $10. BEV owners were more likely to estimate a cost under $20. PHEV owners were more likely to estimate costs greater than $20 per charge.

Experience with billing at public charging stations

- Consistent with 2022 data, PHEV and BEV owners are most likely to have experience with charge based on time connected to the EV charger ($/min) when billing at public charging stations.
- BEV owners are more likely than PHEV owners to have experience with charge based on energy delivered to the vehicle (33%). On the other hand, PHEV owners are more likely to experience fixed charge per use ($/charge) (37%) and flat rate charge ($/month) (25%).

Confidence in public charging stations

- Confidence in billing accuracy is high and growing among both PHEV and BEV owners. Over eight in ten (85%) BEV and PHEV owners feel at least somewhat confident about the billing accuracy of public EV charging stations; one-third of which are ‘very’ confident, representing an increase of six percentage points since 2022 (79%).
- BEV and PHEV owners were asked more specifically about their confidence levels in different billing methods. Confidence is high, at eighty percent or more for each of the billing methods presented. BEV and PHEV owners are most confident in flat rate charge ($/month) (90%), closely followed by charge based on time connected to the EV charger ($/min).
- Overall confidence in various aspects of the charging experience is also high, with over three-quarters feeling confident about each aspect they were asked about. Confidence levels in each aspect have slightly increased since 2022. BEV owners are more likely to be confident that the amount paid to charge their vehicle matched the amount of charge they received (84%) and that the charging services are accurate (82%) compared to PHEV owners.

Fuelling behaviour – Hydrogen/Fuel Cell EV owners

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

- Two-thirds (67%) of FCEV owners report purchasing hydrogen fuel at least every two weeks. The proportion of FCEV owners purchasing hydrogen fuel more frequently (3 times per week or more) has almost doubled since 2022.
- Confidence in billing accuracy of hydrogen filling stations is high and growing favourably, but is still largely driven by owners who feel somewhat confident rather than very confident. A majority of eight in ten FCEV owners are generally confident (86%) in the billing accuracy of public hydrogen dispensing stations, a slight increase since 2022.
- Overall confidence in various aspects of the hydrogen fuelling experience is high, with at least three-quarters feeling confident about each aspect they were asked about. Confidence levels in each aspect have slightly increased since 2022.

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

- Similar to previous results, all information is at least somewhat important, but a majority of BEV/PHEV owners and intenders find the total cost, rate, charge time and fixed charges to be “very important” on a receipt.

Preferences for displays of billing information

- Most (92%) BEV and PHEV owners and intenders feel it is at least somewhat important to be aware of the cost of charge prior to charging their vehicle. Intenders are more likely to say it is very important (71%) compared to owners (56%).
- Nearly two-thirds of owners and intenders are comfortable with a charger that provides relevant billing information remotely rather than using a visual display on the charger. Comfort with remote displays of information is higher among owners (70%) than intenders (39%).
- Owners feel very confident seeing information in an emailed receipt (47%), a cell phone app (45%), paper receipts (45%) as well as on the charger itself (42%). Intenders express greater confidence in paper receipts (58%) than owners (44%).

Factors affecting confidence

- When considering how their confidence in accuracy at public stations might be positively influenced, between eighty-five and ninety-three percent expressed that the proposed options would have a moderate to strong positive influence. Consistent with previous results, immediate billing details is higher (93%), while knowledge that there is an independent dispute resolution mechanism in place is at the lower end (85%). Between owners and intenders, the latter are more likely to consider the options involving accreditation as having a strong or moderate positive influence on their confidence levels.

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.

- Similar to previous results, when asked about important information to see on a receipt, the total cost in dollars was viewed as most important (89%). The amount of hydrogen dispensed (88%), fixed charges (88%), rate (86%) and sales tax (86%) were all seen as very important to include.
- While many FCEV owners and intenders are satisfied with billing methods at public hydrogen stations, over half consider it difficult to know how much hydrogen their car receives.
- According to FCEV owners and intenders, having billing details provided to the consumer immediately following the transaction and knowing accuracy and performance of retail hydrogen fuel dispensers are reverified periodically by accredited officials would impact confidence levels most positively (57% strong positive influence each).

Small business owners with EVs

- Consistent with previous results, SME owners who own BEVs or PHEVs are split between using their vehicle for business, with about half who do and half who do not.
- The proportion of small business owners who use public charging stations has slightly grown since 2022, with over eight in ten (85%) saying they use public chargers for business EVs. When doing so, over half report using free chargers (57%), and almost four in ten report using Tesla Supercharger Stations (37%), with three in ten using ChargePoint locations (31%). These results follow a similar pattern as previous results from 2022.

Awareness of Measurement Canada

- EV owners and intenders are most aware of Measurement Canada's responsibility to approve, verify and inspect gas pumps, but are least aware of the organizations role in regulating hydrogen fueling dispensers. Four in ten are aware of their responsibility for EV chargers. Three in ten are not aware that Measurement Canada is responsible for any of the devices.
- Seven in ten have at least seen the Measurement Canada sticker; nearly four in ten are more familiar with it.

Interest in other clean fuel vehicle types

- Current EV owners and intenders are most interested in battery electric vehicles (66%), followed by plug-in hybrid electric vehicles (56%). EV intenders are most interested in plug-in hybrid electric vehicles (75%). Interest in hydrogen fuel cell EVs sits at around four in ten. Interest in other engine types is two in ten or less.

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 – Measurement Canada and Accuracy and Performance Standards

Representatives from the ZEV sector are largely aware of Measurement Canada and its responsibility for regulatory oversight of fair billing and accurate measurement of electric vehicle charging, hydrogen dispensing and other renewable fuels dispensing. Typically, representatives are most aware of regulatory oversight within their own sector and assume regulatory oversight occurs in other sectors (i.e., electric vehicle supply equipment manufacturers understand oversight within the EV space, but mostly assume there is similar oversight related to hydrogen dispensing).

The accuracy and performance standards being developed by Measurement Canada are a top-of-mind issue for charging/fuelling service providers and manufacturers of charging equipment, metering devices and other electric vehicle supply equipment (ESVE). All stakeholders interviewed were acutely aware of and closely following the development of the standards and requirements; many belonged to working groups related to this issue, thereby increasing their awareness and level of involvement.

General reactions

Reactions to the standards being developed by Measurement Canada vary by organization type but are generally positive – all stakeholders interviewed support some form of standardization within the industry, stating it is necessary, and are happy to see standards and requirements moving toward fruition. The common view is that the standards need to be fair and realistic (to consumers and stakeholders), ensure no bureaucratic bottlenecks and work to move the industry forward. The standards being developed are said to be generally aligned with what is being developed in other jurisdictions, which is a positive step.

Stakeholders feel that standardization and regulation within the sector will increase market and consumer confidence as it ensures fairness and transparency. That said, there were differing views on what the accuracy standards and performance requirements should look like in practice. Key themes are outlined below.

Testing, approval and recertification requirements should be realistic and feasible to avoid a backlog in the approval process.

- It is important to ensure chargers/fuel dispensers that exist in the market are tested and approved to be accurate and reliable, particularly if consumers are going to be charged volumetrically. This is something stakeholders feel is long overdue and will impact market and consumer confidence.
- Some representatives feel that the testing and recalibration requirements being proposed by Measurement Canada are not realistic or feasible; most notably, there is a concern that Measurement Canada does not have adequate lab space/testing equipment to conduct testing at scale.
- Further, manufacturers feel testing every individual unit for accuracy is expensive and onerous. This is important when considering testing and approval of chargers entering or currently in the market in that too stringent requirements could delay in-field operability of chargers, slowing adoption.

- Participants suggest solutions to mitigate a backlog in testing and approval processes, such as allowing for type testing rather than individual unit testing, allowing third party accuracy testing, or allowing manufacturers to conduct their own testing.

Stakeholders stress the need to balance consumer protection with efficient roll-out of accuracy standards.

- Measurement accuracy is especially important when it comes to consumer protection and transparency. All stakeholders agree that an accuracy standard must be put in place by Measurement Canada to support further adoption of clean fuels.
- Manufacturers feel that measurement accuracy standards that are too strict could be a hinderance and slow down the industry (e.g., minimum resolution of 0.001 kWh). One concern is that the accuracy standard being too strict and imposing further costs on the manufacturer to meet the standards can eventually pass costs onto consumers.
- Representatives from electric utilities, however, note manufacturers are asking for too much flexibility from Measurement Canada. Utility companies have always met and continue to meet high standards set by Measurement Canada and the clean fuel sector should be held to a similar standard.
- Stakeholders suggest looking at accuracy requirements in other jurisdictions to emulate what has worked.

Registration to meet requirements may impact some organizations more negatively than others.

- For large organizations such as EVSE manufacturers and major electric utilities, the time it takes to complete the paperwork required to register as a manufacturer, contractor, or service provider is inconsequential. However, for small business owners (i.e., potential contractors) and multi-unit residential boards, the requirements are burdensome and a potential barrier to entry into the market.
- Multiple stakeholders are concerned about the requirements for multi-unit residential buildings, again noting the standards are difficult to navigate with low capacity. This view comes from strata associations as well as electric utilities that work with condo boards to implement charging/fuelling solutions.
- Some suggest that the more paperwork and effort manufacturers, utilities, contractors and other stakeholders need to put into meeting accuracy standards and performance requirements, the higher the cost could be for consumers in the end. The key is finding the balance between what is necessary for consumer protection and what will end up a detriment rather than a benefit.

Stakeholders note a need for modernization of the Electricity and Gas Inspection Act (EGIA) in order to be more suitable for clean fuel technology.

- Some participants highlight the notion that the EGIA needs to be modernized in order to catch up to the ZEV market. It is stated that the framework under which the new standards and requirements are being developed is not suitable in that it was designed around vertically integrated utilities, not the multiple stakeholder market that exists in the ZEV space.
- Modernization of the act also relates to the definition of ‘contractor’. Stakeholders mention the challenge of navigating responsibility when it comes to defining a ‘contractor’, handling disputes, recalibration, and recertification, noting there needs to be clarity around onus and responsibility in the developed regulations.

Harmonization of standards and requirements across borders would create efficiencies for electric vehicle supply equipment manufacturers, enabling a smoother process for deploying equipment.

- Some charging manufacturers discuss the need to harmonize standards across jurisdictions – that is, requirements should be the same across Canada, and ideally should align with requirements in the United States. Many charging manufacturers develop chargers for both markets, so meeting two sets of requirements presents a challenge.

Concerns and perceptions about accuracy of clean fuel measurement

At this time, there is very little concern about the accuracy of clean fuel measurement among industry stakeholders. Manufacturers are confident in the equipment they produce, many building to meet requirements in other jurisdictions as a best practice (e.g., California Type Evaluation Program) or including functionality in their equipment to meet eventual or anticipated standards.

Stakeholders typically believe there is little concern about accuracy of clean fuel measurement among ZEV drivers themselves. This is thought to be due to a lack of understanding that the industry is not regulated combined with an apathy toward the actual cost to use clean fuel – ultimately, the cost is lower than gasoline, so consumers are satisfied. While there is not a lack of confidence, stakeholders still feel that any sort of transparency and oversight within the clean fuel sector will be a positive development toward securing consumer confidence.

Increasing confidence in clean fuel measurement

Overall, transparency is essential, and stakeholders believe standardization will increase market and consumer confidence in clean fuel measurement. As the industry continues to grow, it will be important for consumers to understand how they are being charged for clean fuels in order to maintain momentum.

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. Requirements that would have the most impact include charging and fuelling equipment being designed and built to perform in accordance with Canadian standards, and approved and inspected by accredited officials. Participants felt less strongly about requirements to display charging/dispensing information during the transaction, and making information about the charging stations/dispensers and the fueling process is easily available to consumers.

1.5. 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.

Tony Coulson
Group Vice President, Corporate & Public Affairs
Environics Research Group
tony.coulson@environics.ca
613-699-6882

Supplier name: Environics Research Group

PWGSC contract number: CW2346881

Original contract date: 2024-01-23
For more information, please contact ISED at:
ic.publicopinionresearch-recherchesurlopinionpublique.ic@canada.ca