# MEMORANDUM
# Special consultations and public hearings on Bill 81, an Act to amend various provisions relating to the environment

Presented by **Electric Mobility Canada**

To the **Committee on Transportation and the Environment**

**February 4, 2025**

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## About Electric Mobility Canada

Founded in 2006, Electric Mobility Canada (EMC) is a national, member-based industry association dedicated exclusively to promoting electric mobility as a means of combating climate change and air pollution while supporting the Canadian economy.

EMC has some 190 member organizations, including electricity suppliers; manufacturers of light, medium, heavy, and off-road vehicles; infrastructure providers; technology companies; mining companies; research centers; government departments and agencies; cities; universities; fleet managers; unions; environmental NGOs; and EV owner groups.

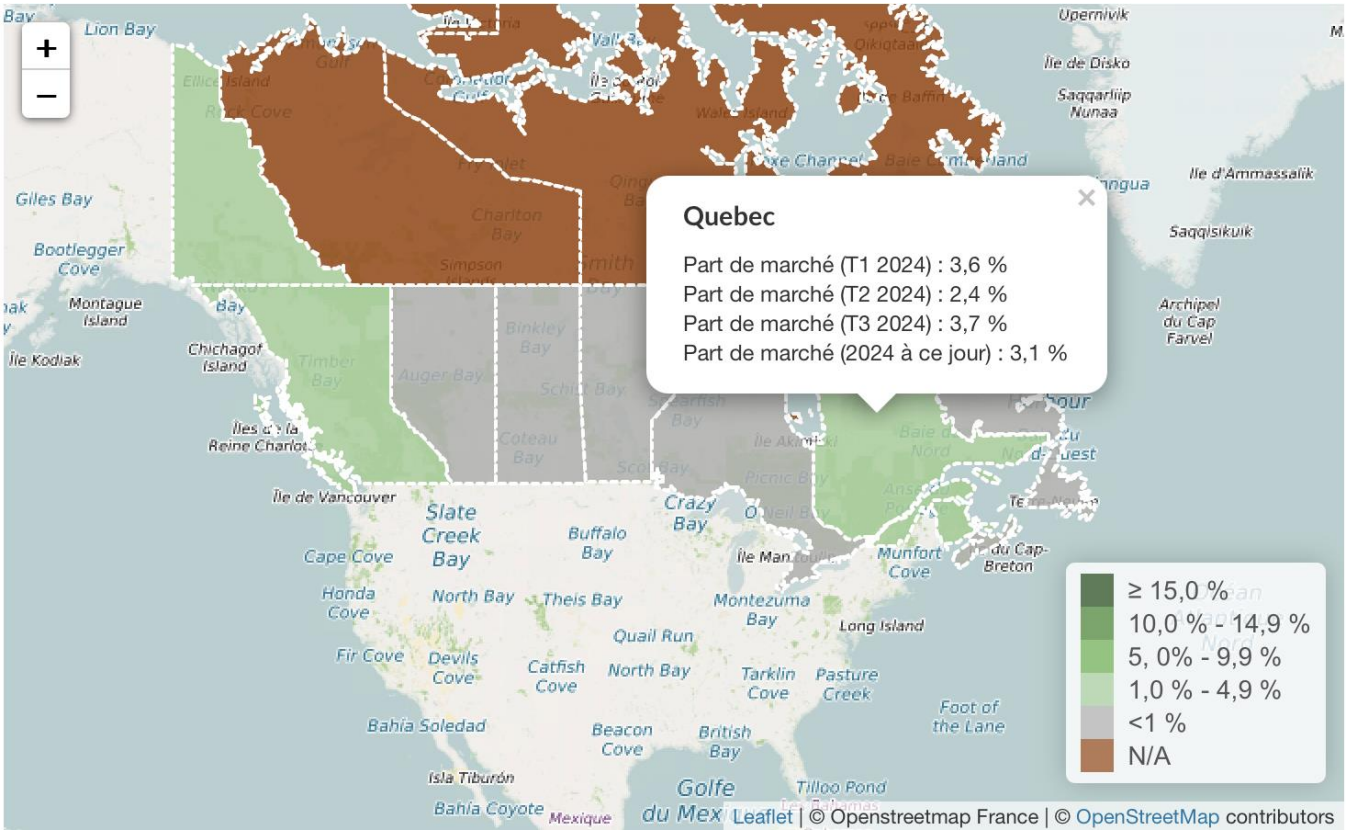
EMC'S mission is to facilitate and accelerate the transition to sustainable electric mobility in Canada through advocacy, collaboration, education and thought leadership, with the ultimate goal of creating a cleaner, healthier and more prosperous future for all Canadians. Electric Mobility Canada supports the activities of its members by:

- Informing members on topics of interest concerning legislation, policies, and technical and operational issues affecting electric mobility - this includes identifying measures needed to meet members' needs and proactively communicating them to policymakers and other stakeholders.
- Establishing partnerships to accelerate the adoption of electric mobility through research, pilot projects, policies, programs, and strategies to increase market penetration.
- Acting as a resource center by publishing relevant and up-to-date information on electric mobility in Canada and elsewhere.

# 1 Introduction

Electric Mobility Canada's comments during this consultation will focus primarily on the content relating to medium and heavy-duty vehicles, as well as waste management. We will also include additional comments and recommendations on the ecosystem of policies and programs supporting the electrification of heavy-duty vehicles, and on the regulatory framework for extended responsibility of EV battery producers.

Between 1990 and 2022, greenhouse gas (GHG) emissions from heavy-duty vehicles rose by 81%, from 4.2 to 7.6 Mt CO2 eq[1]. Today, heavy-duty vehicles are responsible for almost 30% of total emissions of the road transport sector, despite representing just 3.7% of the vehicle fleet. Accelerating the electrification of heavy-duty transport - and of all other vehicle segments - is essential to reduce GHG emissions to combat climate change, and to reduce other pollutant emissions to improve the health of our communities through better air quality.




*(Market share of medium- and heavy-duty VZEs in Quebec)*[2]

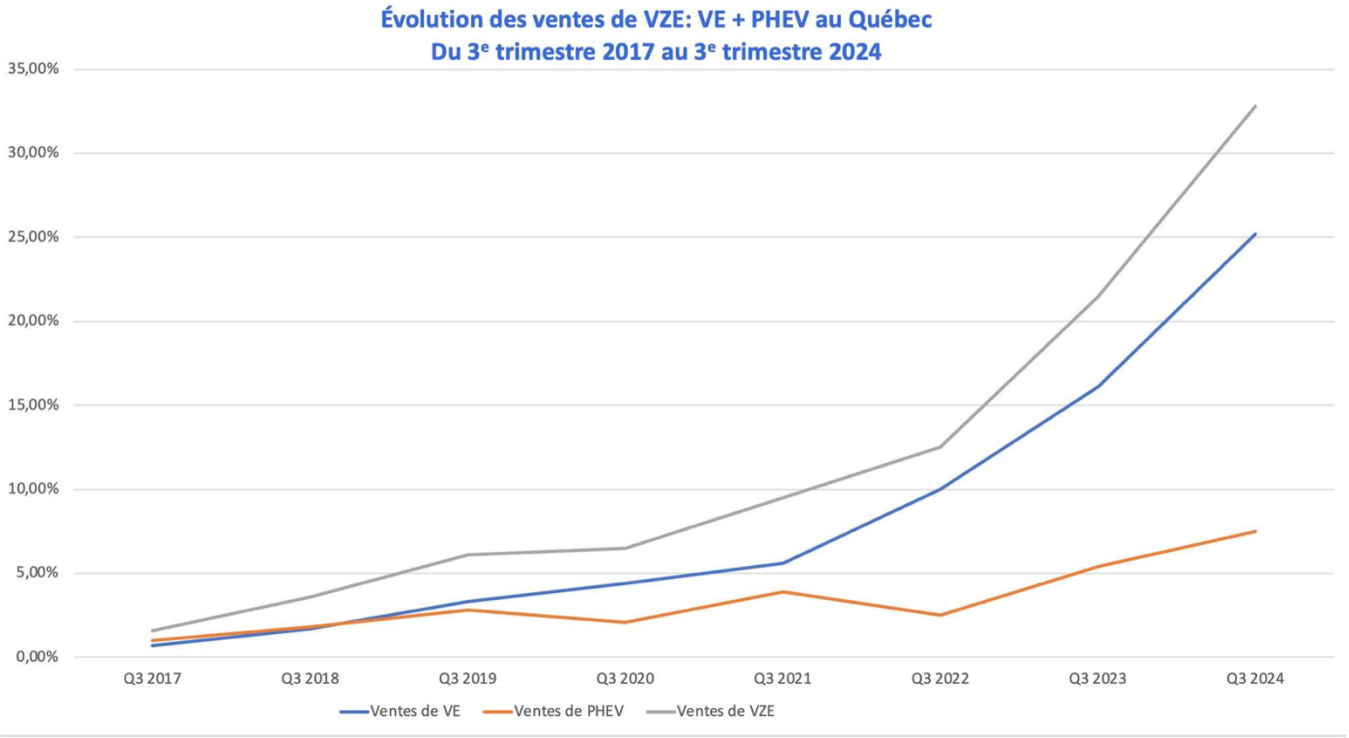
At present, the market share of heavy-duty zero-emission vehicles (HDZEVs) in Quebec remains relatively low (3.7% in Q3 2024) compared with sales of light-duty electric vehicles (EVs) (34.6% in Q3 2024). However, there are currently over 150 different models of heavy-duty vehicles available in Canada: zero-emission options in all classes. Vehicle types available include vans and shuttles, school and transit buses, yard tractors, straight

[1] GES 1990-2022, Inventaire québécois des émissions de gaz à effet de serre en 2022 et leur évolution depuis 1990, MELCCFP, 2024
[2] https://tc.canada.ca/fr/transport-routier/technologies-novatrices/vehicules-zero-emission/tableau-bord-conseil-vze

trucks and tankers, cabs and chassis that can accommodate a multitude of layouts or bodies for different use cases, and tractor-trailers.[3].

THAT SAID, we'd like to remind you that in Q3 2017, less than 8 years ago, the market share of light zero-emission vehicles was just 1.6% and then rose to:

- Q3 2018: 3,6%
- Q3 2019: 6,1%
- Q3 2020: 6,5%
- Q3 2021: 9,5%
- Q3 2022: 12,5%
- Q3 2023: 21,5%
- Q3 2024: 32,8%




**How was this possible?**
**Thanks to a combination of the following 12 factors:**

1) **Upcoming reduction in rebates**: At the end of the first quarter 2024, the Quebec government announced a reduction in rebates from $7000 to $4000, effective January 1, 2025. This certainly played a role in getting consumers excited about EVs. That said, this announcement did little to accelerate the upward curve of EV adoption observed over the past 2 years.

2) **Zero Emission Standards**: Few people know this, but the Zero Emission Standard is helping carmakers offer more and more EV inventory in Quebec, as they have to meet increasing EV sales targets. What's

[3] Zero-Emission Medium- and Heavy-Duty Vehicle Canadian Model Availability Catalogue, Clean Energy Canada, May 2024

more, an EV sold in Quebec is entitled to 1 zero-emission credit from the Quebec government AND 1 early credit (2024 and 2025) from the Canadian government, even if its zero-emission standard doesn't start until 2026.

3) **Lower interest rates**: While interest rates were quite high in 2022 and 2023 (5% to 9%), they have now dropped significantly, with some automakers offering rates of 0% to 3%, which has also had an impact on EV sales.

4) **Rising price of gasoline-powered vehicles**: the significant increase in the sale price of new gasoline-powered vehicles over the past 5 years (from 30% to 60%, depending on the model) has made them less and less competitive vs. electric vehicles, especially when the price of fuel is added to the equation;

5) **Rising fuel prices**: In January 2021, the average price of gasoline was $1.08/litre. By January 2022, it had risen to $1.53/litre. Since then, it has hovered around $1.50/litre.

6) **The public charging network is constantly expanding** Thanks to the tireless work of public charging networks such as Le Circuit électrique, FLO, Tesla, ChargePoint, Electrify Canada, L'Avenue Électrique, etc., people are seeing more and more charging stations everywhere they go, and these networks are becoming increasingly reliable. As the electric vehicle fleet grows, more charging stations will be needed.

7) **Normalization of electric vehicles**: The more electric vehicles there are on our roads, the more likely it is that consumers will consider them as an alternative. In other words, EVs are no longer just a curiosity, but an increasingly normal choice.

8) **Inventory, finally**: Whereas in 2021, most EV and PHEV models were not in stock, and wait time varied from a few months to 2 years, there is now inventory, which is great news for consumers and a positive influence on sales.

9) **More model choice**: compared to just 2-3 years ago, there is an ever-increasing choice of different models for different needs. This growing variety is helping to boost sales.

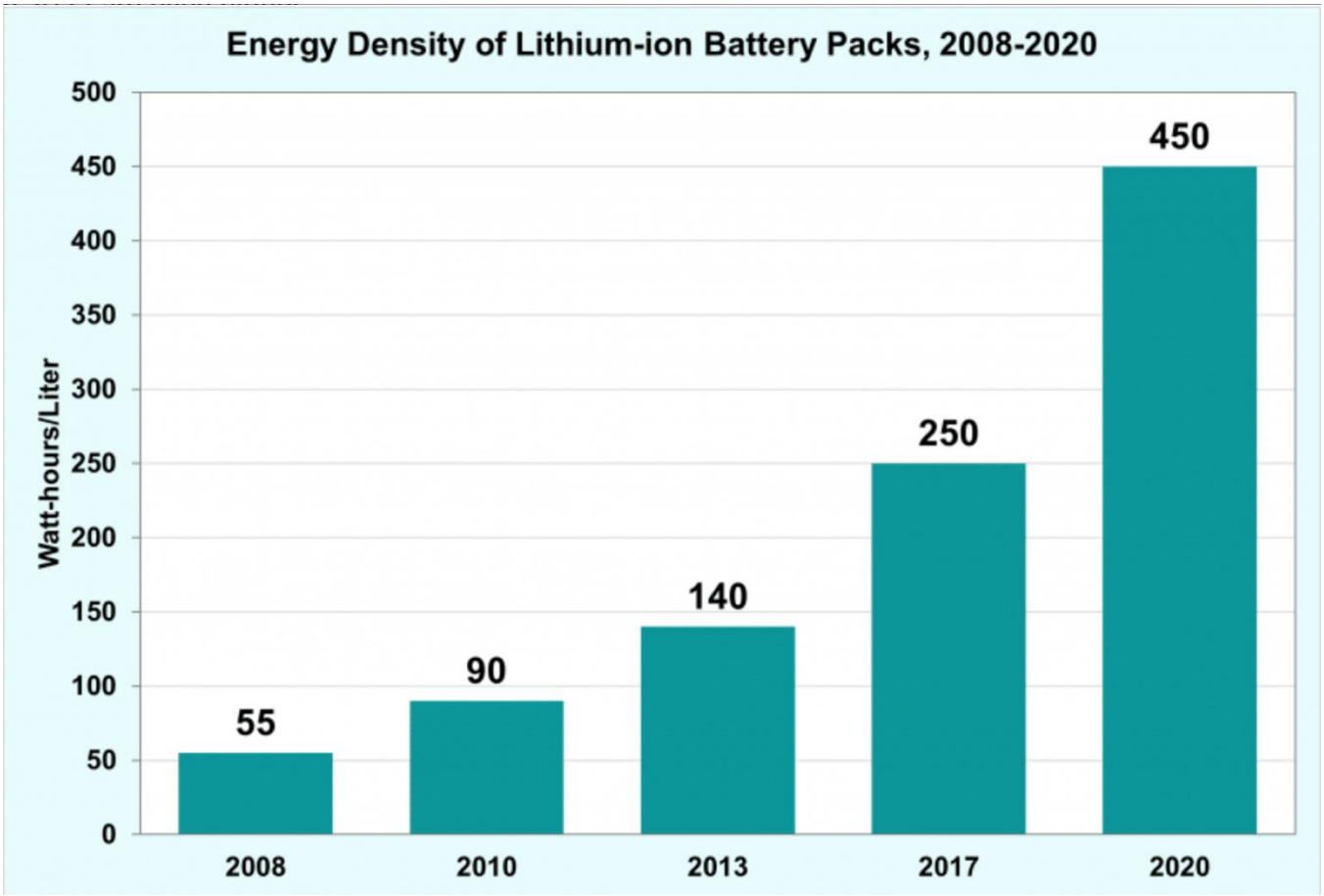
10) **EV technology continues to improve**: While the average EV range continues to improve, charging times are steadily decreasing at the top automakers. EVs are also becoming better adapted to our winters, thanks to the arrival of heat pumps, battery preconditioning, preheating and more.

11) **Education about EVs is improving**: Although there's still a lot of work to be done, more and more groups and individuals such as the Association des Véhicules Électriques du Québec - AVÉQ, Le Circuit électrique, CCAQ - La Corporation des concessionnaires automobiles du Québec, Electric Mobility Canada / Mobilité électrique Canada, Club Tesla Québec, etc. are doing an excellent job of educating and informing people about EVs, helping to counter the overabundance of misinformation circulating on the subject;

12) **EVs are fun to drive**: The pleasure of driving an electric vehicle is also a factor to consider. Crisp and linear acceleration and a quiet ride are all factors that enhance the driving experience.

## 1.1 Continuous battery development

Between 2008 and 2020, battery density rose from 55 Wh/l to 450 Wh/l, corresponding to an eightfold increase in energy density in 12 years.[4]



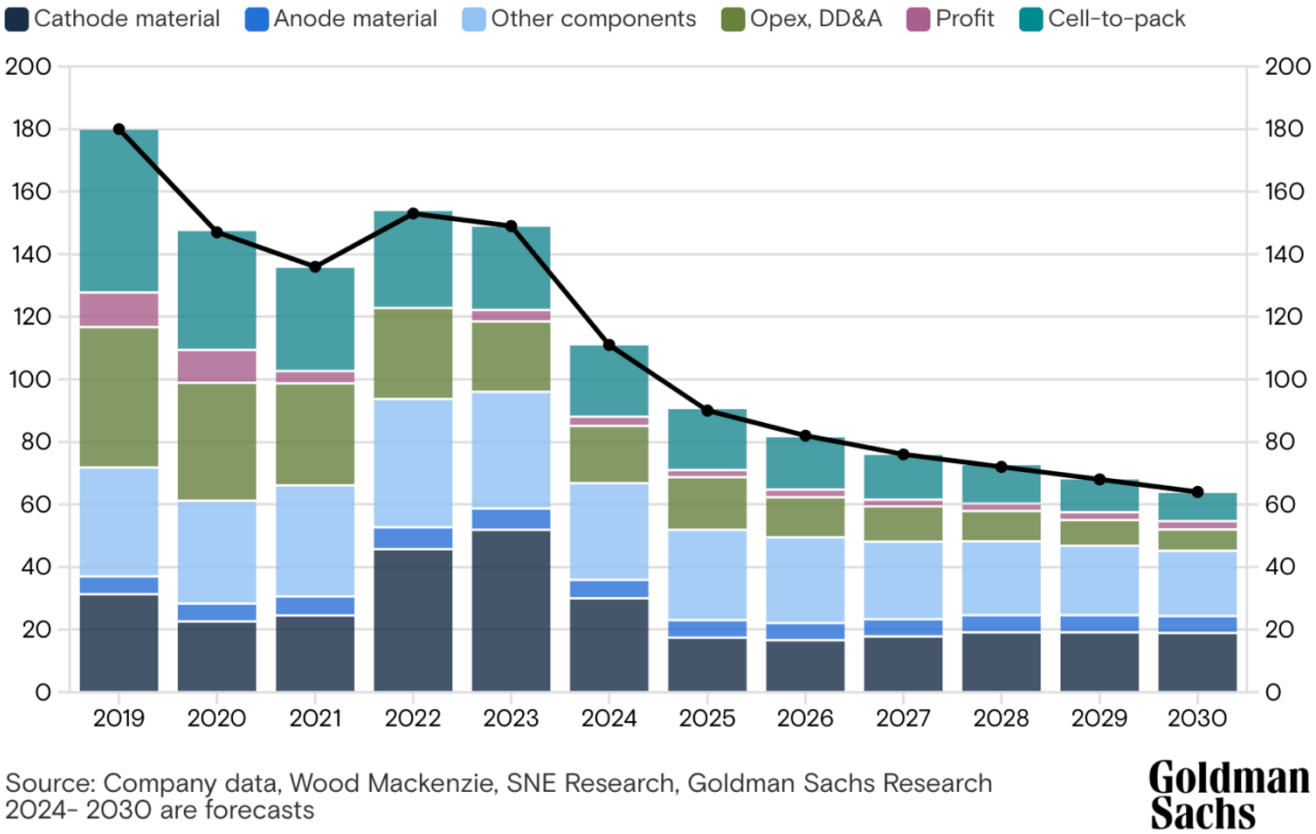

At the same time, the price of batteries for electric vehicles continues to fall. Lithium-ion battery prices will continue to fall rapidly over the next few years, according to a study published by Goldman Sachs in 2024.

The bank's researchers predict that the global average price of batteries will fall to $82 per kilowatt-hour (kWh) by 2026. This is about half the price of batteries in 2023 ($149/kWh). It's also a substantial 26% drop on this year's prices.

Whereas in 2013, the price of a battery was around **US$780/kWh**, it is expected to hover around **US$60/kWh** by 2030[5].

[4] https://insideevs.com/news/581729/volumetric-energy-density-ev-batteries-growth/#:~:text=2010%3A%2090%20Wh%2Fl,2020%3A%20450%20Wh%2Fl

[5] https://insideevs.com/news/737116/battery-prices-ev-study-2026/#:~:text=Goldman%20expects%20a%20gradual%20decline,their%20average%20price%20in%202019




Part of this price drop is the result of the work of many scientists around the world, including that of Dr. Karim Zaghib's team at Hydro-Québec's *Centre d'excellence en électrification des transports*.

With 600 patents to his credit, 393 scientific publications and 26 years' experience at Hydro-Québec, researcher **Karim Zaghib's** reputation in the world of battery storage is firmly established. A leading figure in his field, he is currently involved in R&D via the Volt-age project at Concordia University.

Karim Zaghib

## 1.2 Battery life continues to improve

Worldwide research into batteries is ensuring that their density and longevity will continue to increase.

For example, in December 2024, researchers at Dalhousie University used the Canadian Light Source (CLS) at the University of Saskatchewan to analyze a new type of lithium-ion battery material - called a monocrystalline electrode - that had been continuously charged and discharged in a Halifax laboratory for over six years.

The researchers found that it lasted more than 20,000 cycles before reaching the limit of 80% of its capacity. This corresponds to **eight million kilometers travelled.**

Their research, published recently in the Journal of The Electrochemical Society, compares this new type of battery, which has only recently come onto the market, with an ordinary lithium-ion battery that lasted 2,400 cycles (around 960,000 km) before reaching the 80% capacity limit.[6]

According to Dr. Pierre Langlois [7] "Between now and 2034, ten years from now, we can therefore expect significant and highly beneficial changes in the world of high-performance batteries for electric mobility, in terms of both performance and reduced environmental footprint.

Many of the new batteries in the pipeline will eliminate critical materials such as nickel, cobalt, manganese, lithium, or graphite, in favor of abundant, inexpensive, and more environmentally benign materials such as sulfur, iron and sodium.

[6] https://www.dal.ca/news/2024/12/20/ev-battery-longer-lasting.html
[7] https://roulezelectrique.com/les-technologies-de-batteries-de-2024-a-2034-une-synthese/

As we have seen, these new batteries are not theoretical but real and are at various stages of development: laboratory prototype, pilot production plant or just starting to be marketed. Here's a summary of the features we can expect to see, and the likely timeframe for commercialization.

**Iron phosphate batteries (LFP)** are increasingly used by Chinese carmakers and Tesla, which has equipped over 50% of its vehicles with them. They have a lower energy density of 170 Wh/kg, suitable for ranges of around 400 km. They have the advantage of not using nickel, manganese, or cobalt, but iron and phosphate, which are very abundant. In January 2024, we learned that the price of LFP batteries from CATL (the world's largest manufacturer) would drop to US$56 per kWh in summer 2024, compared with $120 per kWh in January 2023. That's a 50% reduction in 18 months! LFP batteries will therefore become the most widely used by 2025. Most carmakers are keen to follow suit.

**Iron phosphate-manganese (LMFP) batteries** are due to come onto the market in 2024-2025, with an energy density of 240 Wh/kg, instead of the 170 Wh/kg of iron phosphate (LFP) batteries. This is higher than NMC batteries, but without nickel or cobalt. The Chinese company Gotion High Tech has announced 4,000 recharging cycles, giving a life of 1,600,000 km for a battery with a range of 500 km! These batteries can be recharged to 80% in 18 minutes.

**Sodium-ion (Na-ion) batteries** are expected to equip some EVs as early as 2024 in China. Their energy density is lower (160 Wh/kg), but they use no lithium, nickel, cobalt, or graphite. Let's not forget that sodium is 1,000 times more abundant than lithium on earth, being an atom found in table salt (NaCl). These batteries aren't ideal for long journeys, but they're very functional for small urban electric cars, with a battery range of 300 km or 350 km. The fact that they can be charged to 80% in 15 minutes means they can still be used for long journeys. With a range of 3,000 charges, an EV with a Na-ion battery can achieve a mileage of over 700,000 km. What's more, they work very well at cold temperatures, losing just 10% of their storage capacity at -20°C.

**Batteries with lots of silicon in the anode**. Several companies have succeeded in managing the swelling of silicon, which can store far more lithium ions in an anode than graphite. Most have developed a composite powder containing more than half silicon that can replace conventional graphite powder in any proportion and requires no modification to current Li-ion battery production equipment. Commercial plants are already under construction to manufacture these composite powders, and we should see Li-ion batteries with more and more silicon in the anode gradually entering the market, from 2025 onwards. The Group14 company has demonstrated a 30% increase in energy mass density (Wh/kg) for NMC cells, by replacing 20% of the graphite in the anode with their silicon composite powder, while maintaining 1,000 recharge cycles. Recharging time to 80% is then reduced to 10 minutes.

**Lithium-sulfur (Li-S) batteries** are undoubtedly one of the most interesting options for future batteries. They have a minimal ecological footprint, requiring no extraction and refining of nickel, manganese, cobalt, or graphite, while offering the potential to **reduce the weight of Li-ion batteries by a factor of 3!** The young company Zeta Energy has already demonstrated an energy density of 450 Wh/kg, which means batteries twice as light as the NMC batteries currently in use. The cells they produce accept over 1,000 recharge cycles and charge in less than 10 minutes! Commercial production is scheduled for 2028. Meanwhile, researchers at Drexel University in Philadelphia made a major breakthrough for Li-S batteries in 2022. They produced Li-S cells that are three times lighter than today's NMC cells and can be recharged 4,000 times, giving an EV a mileage of 1,600,000 km. These batteries could be commercialized around 2030, with a commercial partner.

**Solid-state Li-ion batteries** get their name from the fact that their electrolyte is solid rather than liquid. They have a lithium metal anode, like Li S batteries, and are therefore lighter and more compact, while being able to recharge faster than conventional Li-ion batteries. Another advantage is that these batteries are virtually fireproof. Several companies are approaching commercialization, including Prologium Technology, WeLion, QuantumScape and Solid Power. They have prototyped solid-state batteries with a mass energy (Wh/kg) 30% (QuantumScape) to 90% (WeLion) higher than conventional NMC batteries, with over 1,000 recharge cycles, very safe, and recharging in less than 15 minutes. They are due to come onto the market around 2027-2028, possibly earlier, on a small scale.

**Lithium-air batteries offer enormous potential**. Researchers at the Illinois Institute of Technology in Chicago, in collaboration with researchers at Argonne National Laboratory, have succeeded in producing a functional, high-performance lithium-air cell in 2023, three times lighter than NMC batteries (685 Wh/kg) and capable of recharging 1,000 times. By optimizing parameters, researchers are confident of achieving 1,000 Wh/kg, which means a battery four times lighter than today's high-performance Li-ion batteries (NMC and NCA). This is quite a technological breakthrough, opening the door to the commercialization of ultralight, small super-batteries for EVs, but also for electric aircraft and boats, as well as trains and heavy electric vehicles! But moving from the laboratory to industrial production could take another 7 to 8 years.

**Artificial intelligence (AI)** could surprise us by discovering new battery chemistries, as is already underway. AI's iPhone moment was undoubtedly ChatGPT. That's when ordinary people realized just how powerful this tool is, and it's only the beginning. Several laboratories have begun using simulation tools and AI to explore millions of combinations of molecules to arrive at a high-performance battery with abundant materials, the supply of which is not a problem. Who knows what could happen between now and 2030?

**Meanwhile, the percentage of heavy trucks has risen faster than the percentage of light trucks.**

## 1.3 Increase in the heavy vehicle fleet

Many people are (rightly) concerned about the significant increase in the number of light trucks on Quebec roads, with a 24% rise between 2014 and 2022. However, the increase in the number of trucks and tractors in Quebec was even greater, with an increase of 29% over the same period.[8]

| Type d'utilisation | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|
| Type de véhicule | n | | | | | | | | |
| **Utilisation institutionnelle, professionnelle ou commerciale** | | | | | | | | | |
| Automobile et camion léger | 450 159 | 452 338 | 457 825 | 464 698 | 471 868 | 480 083 | 475 722 | 492 068 | 511 840 |
| ..Automobile | 117 731 | 115 922 | 109 198 | 108 593 | 107 993 | 104 019 | 99 673 | 99 707 | 99 736 |
| ..Camion léger | 332 233 | 336 077 | 348 541 | 356 015 | 363 792 | 375 987 | 375 977 | 392 291 | 412 020 |
| ..Non précisé | 195 | 339 | 86 | 90 | 83 | 77 | 72 | 70 | 84 |
| Motocyclette | 2 085 | 2 167 | 2 217 | 2 322 | 2 357 | 2 331 | 2 286 | 2 342 | 2 399 |
| Cyclomoteur | 435 | 398 | 432 | 433 | 451 | 439 | 400 | 394 | 425 |
| Habitation motorisée | 459 | 416 | 443 | 416 | 427 | 458 | 406 | 553 | 644 |
| Taxi | 8 304 | 8 312 | 8 308 | 8 309 | 8 296 | 8 240 | 644 | 0 | 0 |
| Autobus | 8 379 | 8 346 | 8 576 | 8 851 | 8 897 | 9 214 | 8 625 | 8 846 | 9 073 |
| Autobus scolaire | 10 357 | 10 344 | 10 370 | 10 557 | 10 650 | 10 784 | 10 929 | 11 438 | 11 411 |
| Camion ou tracteur routier | 135 392 | 138 207 | 141 737 | 149 294 | 153 235 | 157 979 | 162 064 | 169 405 | 175 190 |
| Véhicule-outil | 46 262 | 46 350 | 48 136 | 50 192 | 51 815 | 54 506 | 56 648 | 59 667 | 61 681 |
| Autre véhicule | 20 322 | 20 773 | 21 210 | 21 859 | 22 404 | 22 782 | 23 013 | 23 392 | 24 161 |

[8] https://bdso.gouv.qc.ca/pls/ken/ken213_afich_tabl.page_tabl?p_iden_tran=&p_lang=1&p_m_o=SAAQ&p_id_raprt=3372#tri_age=1&tri_tertr=0

## 1.4 Diesel fuel consumption not going down

According to Statistics Canada, **net sales of gasoline are expected to fall by 9%** in 2022 compared with 2017, despite a 10% increase in the number of cars and light trucks registered in Quebec between 2017 and 2022, thanks in part to more fuel-efficient vehicles and the growing number of electric vehicles on Quebec roads. During the same period, net diesel sales increased by 10%.[9]

| Géographie | Québec (carte) | | | | | |
|---|---|---|---|---|---|---|
| Type de ventes de carburants | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
| | Litres | | | | | |
| Ventes nettes d'essence[3] | 8 820 509 | 8 727 383 | 8 621 760 | 7 241 361 | 7 878 877 | 8 027 145 |
| Ventes nettes de carburant diesel[3] | 3 042 434 | 3 201 096 | 3 359 760 | 2 962 120 | 3 629 139 | 3 314 546 |

## 1.5 Nearly $4 billion a year in capital flight

During the week of January 27, 2025, the average selling price of diesel used by medium and heavy trucks in Quebec was $1.87/litre[10]. If we subtract Quebec taxes, we're talking about $1.20/liter. Since net diesel sales in Quebec were 3.3 billion litres in 2022, that's **nearly $4 billion a year**[11] leaving Quebec. If we extrapolate this sum to 2040, we're talking about a potential capital outflow of **$60 billion**.

It's a colossal sum of money that represents a recurring capital drain... unless we speed up the transition to less energy-intensive and polluting medium and heavy-duty transport modes such as electric medium and heavy-duty vehicles.

Bulletin d'information sur les **PRIX DES PRODUITS PÉTROLIERS** au Québec

**ESSENCE ET CARBURANT DIESEL**

**Relevés des prix à la pompe**

**Tableau 3**

**Carburant diesel : Prix moyen affiché à la pompe et Indicateur quotidien du coût d'acquistion (IQCA) (¢/litre)**

| Régions | 2025-01-20 | 2025-01-27 | | Variations p/r semaine précédente | Marge de détail estimée (hors taxes) |
|---|---|---|---|---|---|
| | Moy | Moy | IQCA | | MOY-IQCA |
| 1. Bas-Saint-Laurent | 188,7 | 187,7 | 179,1 | -1,0 | 7,5 |
| 2. Saguenay–Lac-Saint-Jean | 182,3 | 182,8 | 176,4 | 0,4 | 5,6 |
| 3. Capitale-Nationale | 189,1 | 188,6 | 179,3 | -0,5 | 8,1 |
| 4. Mauricie | 185,1 | 185,0 | 179,6 | -0,1 | 4,8 |
| 5. Estrie | 184,0 | 185,0 | 179,7 | 1,0 | 4,6 |
| 6. Montréal | 191,6 | 190,1 | 178,9 | -1,6 | 9,7 |
| 7. Outaouais | 185,7 | 185,0 | 178,4 | -0,7 | 5,8 |
| 8. Abitibi-Témiscamingue | 189,8 | 190,8 | 179,6 | 1,0 | 9,8 |
| 9. Côte-Nord | 187,9 | 188,7 | 179,9 | 0,8 | 7,7 |
| 10. Nord-du-Québec | 203,3 | 204,1 | 182,2 | 0,8 | 19,0 |
| *Jamésie* | 203,3 | 204,1 | 182,2 | 0,8 | 19,0 |
| *Nunavik* | 274,3 | 274,3 | n/d | 0,0 | n/d |
| 11. Gaspésie–Iles-de-la-Madeleine | 191,4 | 190,9 | 181,1 | -0,5 | 8,5 |
| 12. Chaudière-Appalaches | 186,4 | 186,0 | 179,6 | -0,4 | 5,6 |
| 13. Laval | 190,9 | 189,4 | 178,9 | -1,5 | 9,1 |
| 14. Lanaudière | 185,2 | 185,2 | 179,1 | 0,0 | 5,3 |
| 15. Laurentides | 187,3 | 186,7 | 179,0 | -0,6 | 6,7 |
| 16. Montérégie | 187,7 | 186,6 | 179,2 | -1,1 | 6,4 |
| 17. Centre-du-Québec | 183,6 | 183,6 | 179,6 | 0,0 | 3,5 |
| Québec (Moyenne pondérée) | 187,3 | 186,9 | 179,2 | -0,4 | 6,7 |

[9] https://www150.statcan.gc.ca/t1/tbl1/fr/tv.action?pid=2310006601&pickMembers%5B0%5D=1.6&cubeTimeFrame.startYear=2017&cubeTimeFrame.endYear=2022&referencePeriods=20170101%2C20220101

[10] https://www.regie-energie.qc.ca/storage/app/media/consommateurs/informations-pratiques/prix-petrole/publications/Publications-hebdomadaires/Bulletin/bulletin.pdf

[11] https://cffp.recherche.usherbrooke.ca/wp-content/uploads/2023/06/cr_2023-10_taxation_carburants.pdf

## 1.6 Air pollution emissions from light and heavy transport

According to a report published in 2022 by Health Canada entitled "Health Impacts of Traffic-Related Pollution in Canada", Canadians are exposed to several air pollutants from transportation: CO, NOx, VOCs, PM2.5, NO2, O3 and more.[12]

> This report estimates that TRAP was associated with over 1,200 premature deaths in Canada in 2015. Of these, it was estimated that exposure to $PM_{2.5}$, $NO_2$ and $O_3$ contributed to 800, 340 and 85 premature deaths, respectively. Non-fatal health outcomes included 2.7 million acute respiratory symptom days, 1.1 million restricted activity days and 210,000 asthma symptom days per year. The total annual monetary value of the health burden was estimated at $9.5 billion (CAD 2015), with $9 billion being associated with premature deaths. Analysis also found that light-duty vehicles (e.g. passenger vehicles) contributed to approximately 37% of premature deaths, while heavy-duty vehicles (e.g. commercial trucks and buses) contributed to approximately 63% of premature deaths. In terms of the geographic distribution of the air pollution burden, the results indicated greater adverse health impacts in more populous provinces and census divisions (CDs): 500 premature deaths were estimated in Ontario, 410 in Quebec, 170 in British Columbia and 82 in Alberta. At the CD level, 170 premature deaths were estimated in Toronto, 150 in Montreal, and 110 in Vancouver. The results from this analysis are available for all CDs and can be obtained upon request from Health Canada.[13]

***Thus, even though there are 25 times more light vehicles than trucks, buses and school buses in Canada, heavy vehicles caused 2 times more premature deaths than light vehicles due to the air pollution they emit. Added to this is a monetary value of at least $1.5 billion for the impacts of TRAP in Quebec.***

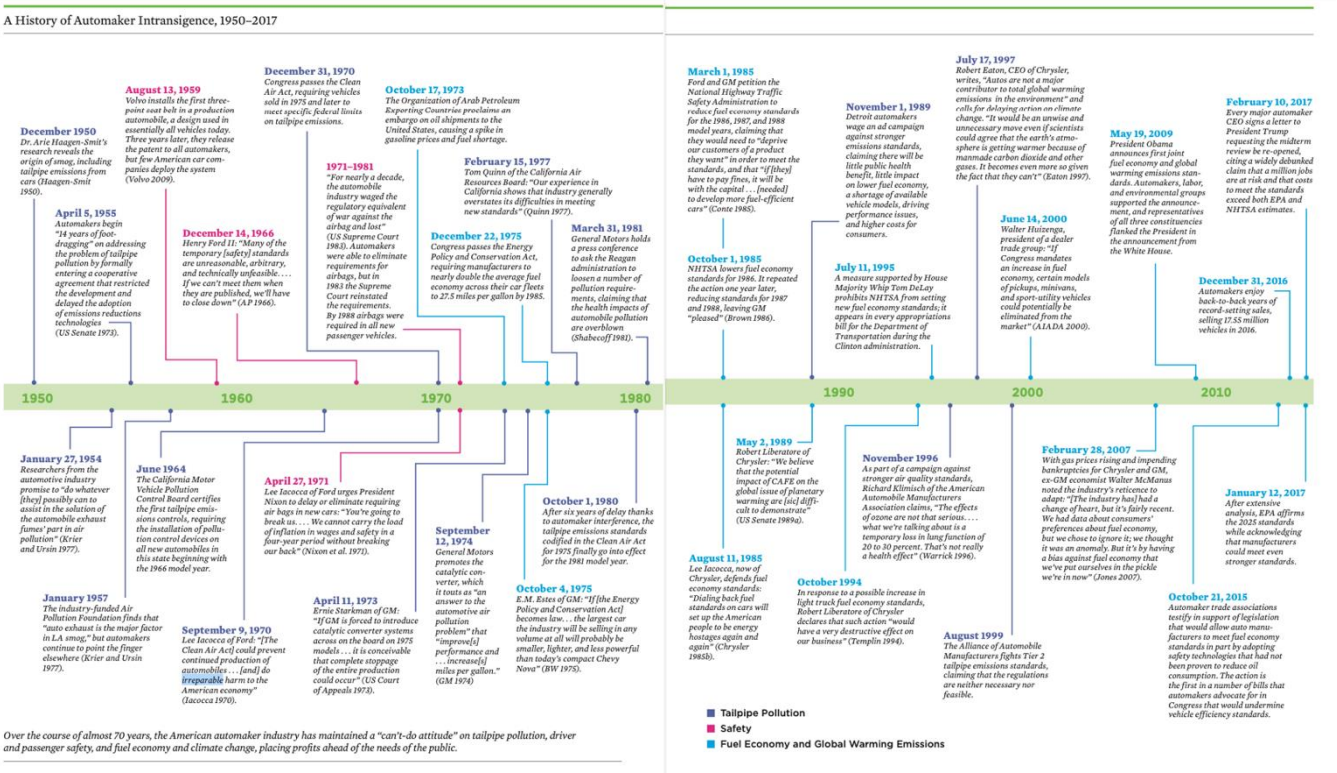
## 1.7 For or against a ZEV Mandate?

While some stakeholders are calling on the Quebec government not to adopt zero-emission standards for medium- and heavy-duty vehicles, while emphasizing that they are not opposed to doing more to fight climate change, history shows that many manufacturers have fought tooth and nail against regulations, whatever the regulations, for over ¾ of a century.

In this regard, the excellent report published in 2017 by the Union of Concerned Scientists entitled "Time for a U-Turn: Automakers history of intransigence and an opportunity for change" tells us a great deal about the delaying tactics used by certain automakers to fight laws and regulations aimed at protecting consumer health and safety, not to mention environmental protection. The following table describes the winding road of advances and setbacks in the areas of seatbelts, emission control systems, airbags, fuel consumption and GHG standards.

According to UCS scientists, "For nearly 70 years, the U.S. auto industry has maintained a 'standoffish attitude' toward tailpipe pollution, driver and passenger safety, fuel economy and climate change, putting profits ahead of public needs."

[12] https://www.canada.ca/en/health-canada/services/publications/healthy-living/health-impacts-traffic-related-air-pollution.html
[13] https://www.environnement.gouv.qc.ca/air/inventaire/inventaire-contaminants-2022.pdf




According to UCS, "In response to proposals aimed at improving passenger vehicles, automakers have deployed a consistent line of attack to scare policymakers."

- **It's not possible**: Automakers exaggerate the technical challenges of complying with new regulations.
- **It will be too expensive**: They claim that meeting the new standards will cost far more than the federal budget.
- **It will destroy the industry and eliminate jobs**: They present each new requirement as a potential apocalypse for automakers, leading to massive layoffs and factory closures.
- **Consumers don't want it**: Industry groups suggest that automakers must choose between producing vehicles that customers want or those mandated by regulations.
- **The science isn't clear**: On issues such as air pollution, climate change, and the effectiveness of safety measures, automakers and trade groups attack the science, amplify uncertainty, and deny or question established facts.
- **The market will solve the problem**: Regardless of the issue, automakers argue that voluntary compliance is sufficient.

## 1.8 In 2005, a voluntary agreement was signed between the Canadian government and automakers

In 2005, the federal government signed a voluntary agreement to reduce GHG emissions.[14]

According to the press release at the time, “An historic agreement on measures to address climate change was signed today by the Government of Canada and the Canadian automotive industry. Under a memorandum of understanding, automakers committed to voluntarily reducing greenhouse gas (GHG) emissions from vehicles on Canadian roads, with the goal of achieving annual emission reductions of 5.3 megatonnes by 2010.”

However, since the agreement was voluntary, automakers missed their 2010 GHG reduction target by nothing less than… 95%.

## 1.9 Regulation Has Already Saved Thousands of Lives

Seat belts, catalytic converters, and airbags have together saved more than 525,000 lives in the United States alone since the 1970s. These technologies were adopted thanks to regulation—not the "market." The same applies to regulations on zero-emission vehicle (ZEV) sales, which will also help save lives… and billions of dollars. [15] [16] [17]

## 1.10 The Arrival of Donald Trump? More Like the RETURN of Donald Trump

In 2017, Donald Trump was elected for the first time.

At that time, he:
- Initiated a rollback on EPA standards, which took place in 2019.
- Did not end incentives for electric vehicles.
- Demanded the withdrawal of exemptions for ZEV states, which was unsuccessful.

These decisions had no impact on electric vehicle sales in Quebec. In fact, the rollback in other jurisdictions (such as Ontario in 2018) created an opportunity for Quebec to have access to more electric vehicles.

In 2025, Donald Trump was re-elected.

He announced that he would:
- Start a rollback on EPA standards, which will take at least two years.
- **Consider** ending incentives for electric vehicles.
- Demand the withdrawal of exemptions for ZEV states, reigniting the legal battle.

[14] https://www.canada.ca/fr/nouvelles/archive/2005/04/industrie-automobile-gouvernement-entendent-mesures-destinees-aborder-changements-climatiques.html
[15] https://www.nhtsa.gov/vehicle-safety/seat-belts#:~:text=Your%20seat%20belt%20is%20crucial,saved%20an%20estimated%20374%2C276%20lives
[16] https://www.basf.com/us/en/media/featured-articles/Sustainability/BASF-celebrates-400M-catalytic-converters
[17] https://www.nhtsa.gov/vehicle-safety/air-bags#:~:text=Overview,defense%20for%20drivers%20and%20passengers

Thus, according to President Trump, he wants to encourage “freedom of choice” … as long as the vehicles don't come from Canada, Mexico, China, Europe, etc.

***It is, therefore, both inappropriate and illogical to use Donald Trump as an excuse to backtrack on the 2035 zero-emission standards… since he won’t be around in 2035.***

## 1.11 “The Market” vs. Elected Officials

We find it deplorable to hear industry representatives tell elected officials, “Don’t adopt your own laws and regulations. Instead, align with the lowest possible standards and ensure there’s one standard for the North American market.” It seems that in the eyes of some, Quebec and Canada are merely markets. However, they are first and foremost territories with their own cultures, histories, laws, and regulations.

As elected officials, it is your responsibility to adopt laws and regulations. Your contribution is certainly more significant than simply following the laws and regulations of other jurisdictions, especially those of other countries.

**Let’s be masters of our own land!**

## 1.12 Light, Medium, and Heavy Trucks Are ALREADY on Our Roads

Ten years ago, there were no electric light trucks on the roads of Quebec, Canada, or the United States. Today, the number of these vehicles is steadily increasing. In fact, during consultations in 2016 in Quebec regarding the first version of the zero-emission standard, some stakeholders argued that such a standard was impossible to adopt due to the lack of light trucks in general, and pickup trucks in particular. Yet, less than 10 years later, several automakers, including Ford, GM, Tesla, Rivian, and others, now offer such vehicles, and more will soon join the growing selection.

That’s why it is somewhat surprising to see some representatives of the old industry use the same argument to highlight the difficulty of transitioning to electric medium and heavy trucks, when we are already beginning to see them on the road—10 to 15 years before their respective deadlines.

Indeed, brands such as Peterbilt, Tesla, Volvo, Hino, Daimler, Kenworth, and others are already traveling the roads of North America. The organization NACFE[18] is also collaborating with Electric Mobility Canada to advance the discussion and exchange on progress and trials with medium and heavy vehicles.[19].

In tests conducted over the past 2 to 3 years:

- **The Volvo** FH Electric maintained an average speed of 80 km/h throughout the entire route, which is comparable to the Volvo FH with a diesel engine equipped with the I-Save energy efficiency package. Based on an energy consumption of only 1.1 kWh/km, the electric truck had a total range of 345 km on a single charge. "These results demonstrate that it is possible to travel up to 500 km during a normal

[18] https://nacfe.org
[19] https://emc-mec.ca/fr/evenement/flottes-de-camions-electriques-une-plongee-en-profondeur-avec-la-nacfe/

workday, with a short break for recharging, such as at lunchtime," says Tobias Bergman, press testing director at Volvo Trucks.[20]

- During a two-week trial this summer, DHL Supply Chain USA took a close look under the hood of the **Tesla Semi**, integrating the electric truck into 5,000 km of normal operations starting from Livermore, California. The trial included a long trip of 390 miles (625 km) – fully loaded with a gross combined weight of 75,000 pounds (34 metric tons) – confirming the Tesla Semi's ability to carry DHL's typical payloads over long distances on a single charge. During the trial, the test vehicle consumed an average of 1.72 kWh/mile at speeds over 80 km/h for more than half of the time spent on the road. The result exceeded our expectations and even Tesla's own evaluation.[21]

As more and more companies begin or plan to transition to electric vehicles, a significant challenge remains the actual availability of these vehicles, which slows down the transition. Eleven (11) U.S. states have officially adopted the California Advanced Clean Truck rule, which requires manufacturers to meet ambitious zero-emission vehicle adoption targets. As with light-duty vehicles, manufacturers prioritize regulated markets for the distribution of their limited production. Therefore, without Quebec regulations that stimulate the availability of heavy-duty vehicles in the Quebec market, across all sectors of use—including passenger transport and freight—the access to heavy-duty vehicles in Quebec is likely to be delayed, hindering adoption by operators who are ready to take the next step.

In addition to stimulating the supply of vehicles, Quebec must also establish an ecosystem of complementary policies and incentive measures to support businesses in the sector: solutions to overcome obstacles in the heavy-duty transport segment, particularly regarding financial accessibility, the transition to electric public transport, and the fleets of school buses and trucks.

# 2 Recommendations and comments

Among a series of recommendations aimed at accelerating the electrification of transport, Electric Mobility Canada advocates for the following measures:

1- **Adopt a ZEV standard for trucks and buses requiring the sale of 100% zero-emission vehicles by 2040 at the latest.**
The government of Quebec can set a target of 100% electric truck and bus sales by 2040 at the latest, with intermediate milestones along the way. The ambition should be increased as technology and available products improve. Electric Mobility Canada (EMC) supports the inclusion of medium and heavy-duty vehicles in the ZEV Standard. The regulation applying to medium and heavy-duty vehicles should undergo public consultation and include sales targets for different classes of heavy-duty vehicles. As an industry association, Electric Mobility Canada can advise the government on targets for each vehicle class. It will be crucial to establish targets for all vehicle classes, from 3 to 8, in order to stimulate the supply of medium and heavy-duty ZEVs in Quebec.

[20] https://www.volvogroup.com/en/news-and-media/news/2022/jan/news-4153093.html#:~:text=The%20Volvo%20FH%20Electric%20kept,345%20km%20on%20one%20charge
[21] https://www.dhl.com/global-en/delivered/responsibility/dhl-tests-tesla-semi-electric-truck.html#:~:text=During%20the%20trial%2C%20the%20trial,and%20even%20Tesla's%20own%20rating

2- **EMC opposes the exclusion of buses and minibuses from the law** (paragraph added at the end of Article 2) because this will require a new legislative amendment if the government later wishes to regulate the sale of these vehicles. We understand that the transition of these vehicles is currently encouraged or mandated by various measures, but we believe that the required flexibility is already included in the provision granting the ministry the power to decree exemptions for certain types of vehicles (Article 3.2).

3- **Accelerate the integration of electric trucks into commercial fleets.**

Accelerate the cost-effectiveness analyses of heavy-duty vehicle fleets through dedicated funds for transition planning and vehicle purchasing.

4- **Offer financing programs for charging infrastructure for medium and heavy-duty vehicles.**

Develop a financial assistance program to support the installation of high-power charging facilities and the modernization of electrical services to encourage the heavy-duty vehicle sectors, particularly the trucking subsector, as well as electric buses and electric school buses. The new program should support the design and implementation of charging infrastructure for commercial and public fleet depots, including funding for urban centers, highway locations, and rest areas. Service offerings that shift charging solutions from Capex to Opex should be considered eligible for funding.

5- **Accelerate the training of technicians specialized in electric vehicle maintenance.**

Electric vehicles are much less complex than gasoline vehicles. Collaborate with the education sector to reorganize the vehicle mechanic training program to prioritize electric vehicles by accelerating the training of EV technicians and providing them with more learning opportunities.

6- **Support the circular economy of EV batteries**

Modernize the legislative and regulatory framework to facilitate the transport of used and end-of-life batteries and to encourage the recovery, reuse, remanufacturing, and recycling of batteries in an integrated North American market.

Quebec would benefit from reviewing the regulatory obstacles that complicate, slow down, and increase the costs of circular economy initiatives. By facilitating practices such as remanufacturing, reuse, repurposing, and recycling of electric vehicle batteries, it would be possible to maximize the environmental and economic benefits of transportation electrification. Additionally, to support the development of a circular economy for EV batteries, Quebec must quickly establish appropriate regulations for the collection and valorization of large batteries.

7- **EMC supports increasing the maximum weight in the definition of light-duty vehicles (from 4,500 to 4,536 kg)** in order to include all Class 2B vehicles in the zero-emission vehicle standard for light-duty vehicles.

8- **EMC supports a financing program for the purchase of medium and heavy-duty vehicles**
While the regulation of zero-emission vehicle sales is essential to stimulate supply, it should also be accompanied by complementary support measures that drive demand and enable businesses to plan

the transition, such as purchase or leasing rebate programs (e.g., Ecocamionnage) OR even better: a bonus-malus program where the most polluting vehicles will help fund zero-emission vehicle purchase rebate programs. The granting and administration of this financing program should be regular, consistent, and predictable.

Quebec should establish a progressive taxation system where the purchase of more polluting heavy-duty vehicles would gradually be subject to a polluter-pays fee that would finance incentives for the purchase of medium and heavy-duty electric vehicles. Vehicles that pollute less than the average would not be subject to any fees. This approach would offer businesses a choice: buy a zero-emission model and benefit from an incentive or choose a more polluting model and support electrification efforts through a fee.

Like several other countries, Canada has already used a rebate-fee program to fund its less-polluting vehicles. In fact, in 2007 (18 years ago), the Conservative government of Stephen Harper adopted the following...[22] :

> **"Purchasing incentives for more fuel-efficient vehicles**
>
> Canadians purchase about 1.5 million new passenger vehicles each year, and approximately 12% of Canada's total greenhouse gas emissions are generated by daily driving. Everyone has a role to play in reducing the amount of emissions from vehicle fuel consumption. The industry has a role in improving transportation efficiency and promoting the development and adoption of cleaner transportation technologies. For its part, the government has committed to introducing stricter fuel consumption standards for new passenger vehicles and vans that will be sold in Canada starting with the 2011 model year.
>
> Canadians have the choice to contribute to a cleaner environment when they select the type of vehicle that best meets their needs. Offering a financial incentive to help Canadians make environmentally friendly choices is a wise investment in the future of Canada and the health of Canadians.
>
> To encourage consumers to purchase more efficient, advanced technology vehicles before the new fuel consumption standards take effect in 2011, the 2007 budget proposes a new Vehicle Efficiency Incentive (VEI) structure that will cover the entire range of passenger vehicles available today. The VEI will have three distinct components and will take effect on March 20, 2007:
>
> ***a) A rebate program based on performance offering up to $2,000 for the purchase of a new fuel-efficient vehicle.***
> ***b) Neutral treatment of a wide range of vehicles with average fuel efficiency that are commonly purchased by Canadians.***
> ***c) A new eco-tax of up to $4,000 on fuel-inefficient vehicles.***
>
> These measures, along with a new initiative to encourage Canadians to retire older, more polluting vehicles, will have no overall impact on revenues.

[22] https://www.budget.canada.ca/2007/plan/bpc3-eng.html

**New Rebate for Fuel-Efficient Vehicles**

Manufacturers now offer several vehicles eligible for the performance-based rebate program. Current models eligible for the rebate include hybrid electric vehicles, conventional low-fuel-consumption vehicles, and the most efficient E-85 and flexible-fuel vehicles. The list of eligible vehicles will be established by Transport Canada, combining fuel consumption ratings for city and highway driving.

The thresholds will be based on a combined fuel consumption of 55% in the city and 45% on the highway. Initially, new cars with a combined fuel consumption of 6.5 L/100 km or less, and minivans, SUVs, and other trucks with a consumption of 8.3 L/100 km or less, will be eligible for a rebate. These thresholds will be reviewed periodically. The base rebate amount will be $1,000, with an additional $500 added for every half-liter improvement per 100 km in combined fuel consumption below these thresholds. The maximum rebate amount will be $2,000. E-85 fuel-efficient vehicles will be eligible for a $1,000 rebate. New vehicles purchased or leased starting from March 20, 2007, will be eligible for this rebate."

**9- Programs to support transition planning in businesses.**

It is essential that the programs consider the different business models available: purchase, lease, or service contract. Additionally, the goal should be to minimize the administrative burden on businesses that wish to access them: simplified processes and a known, respected follow-up schedule. Finally, the predictability of the programs is also crucial. An abrupt suspension of a program, even temporarily, leads to dramatic consequences for the entire ecosystem. In a predictable program, the timeline for gradual phase-out is known in advance, so that manufacturers, retailers, and buyers can plan accordingly.

**10- Extension of powers for various EPR (Extended Producer Responsibility) programs regarding electric vehicle batteries.**

The specific objectives of this measure remain unclear, making it difficult to assess its effects. However, if the government intends to grant new powers that impact potential extended producer responsibility (EPR) for electric vehicle batteries, we would like to reiterate the importance of regulations adapted for their optimal management.

This regulation should include a requirement for producers to take back unwanted batteries from the secondary market (reuse, repurposing, refurbishment). It should not encourage premature recycling but rather promote refurbishment and repurposing for second life when possible and relevant, before ensuring their recycling at the end of life. To achieve this goal, it is essential that the regulation provides a mechanism for transferring responsibility from the original producer to the one who modifies the battery for second-life use.

Additionally, to promote the development of the electric vehicle battery circular economy and accelerate its implementation in Quebec, it is essential to include an exemption power from the

"residual hazardous material" category in Article 136 of Bill 81 and continue efforts for regulatory simplification.

***We recommend that Quebec adopt a specific regulatory framework for residual hazardous materials (RHM) of interest, such as electric vehicle batteries, considering their intrinsic value. Such an exemption mechanism would facilitate their repurposing and contribute to accelerating the development of the circular economy.***

- Like Ontario, the Quebec government could be granted the power to exclude certain materials, such as batteries and their production waste, from the definition of RHM.
- Additionally, drawing inspiration from the United States, Quebec should establish a program specific to RHMs of interest, similar to the "universal waste" concept, to support circular economy businesses and accelerate their expansion.

**11- Tracking Register for Hazardous Residual Materials (HRM) - Article 137**

Replacing the HRM production register with a computerized tracking system to align with Ontario may increase the administrative burden on the affected businesses. In practice, this measure creates discrepancies rather than alignment, as the federal and provincial systems remain disconnected. We recommend prioritizing alignment with existing federal tools to avoid redundancies.

**12- Additional Comment on Charging Infrastructure**

In the Quebec Electric Vehicle Charging Strategy (September 2023), the government announced that "regulations will be adopted, starting in 2024, to require the installation of charging infrastructure in new multi-unit buildings with five or more units" (page 24). However, as of 2025, this regulation is still pending. We emphasize that access to home charging facilitates the adoption of electric vehicles by those living in multi-unit buildings (3.2 million people in Quebec) while reducing the need for public charging infrastructure. In addition to supporting the adaptation of parking spaces in existing multi-unit buildings, the government must ensure that parking facilities in new buildings are ready to accommodate electric vehicle charging stations, or else retrofitting will eventually be necessary at a higher cost.

# 3 Contact information

For any questions regarding this submission, please contact:

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