



**ACT TO INCREASE THE NUMBER
OF ZERO-EMISSION MOTOR
VEHICLES IN QUÉBEC IN ORDER
TO REDUCE GREENHOUSE GAS
AND OTHER POLLUTANT EMISSIONS**

2018-2020
IMPLEMENTATION REPORT

JANUARY 2021



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2018-2020 Implementation Report

January 2021

A Word from the Minister of the Environment and the Fight against Climate Change and Minister Responsible for the Laval Region



Since the fight against climate change is a priority for Québec, it has developed numerous tools to reduce its greenhouse gas (GHG) emissions and adapt to the ongoing impact of climate change. One of the principal means of action to address these challenges and enable us to achieve our targets in this area is transportation electrification. According to the most recent inventory, 44.8% of our GHG emissions are linked to the transportation sector, and most of these are specifically attributable to road transport. This means that the reduction of GHG emissions will necessarily involve transitioning fleets to low or zero-emission vehicles.

Fortunately, electric vehicles are more and more popular in Québec. Province-by-province figures on vehicle registration show that Québec currently leads in Canada. The result of our efforts to act on the supply of electric vehicle is that Québec consumers now have access to large numbers and a wider variety of plug-in vehicles.

The zero-emission vehicle standard (ZEV standard) is undoubtedly a key measure of the Government of Québec in this crucial transition. It is part of a range of tools and measures that help promote the use of electric vehicles in Québec. This report bears witness to the commitment of the Government of Québec and its partners in implementing this innovative regulatory environment over the last few years. While it remains difficult to ascertain the effect of the ZEV standard on the total number of electric vehicle registrations, the benefit to the consumer is now obvious. Due to the standard, Québec was supplied with a greater number of ZEV by motor vehicle manufacturers, when compared to states and provinces that do not have this type of regulation.

Challenges remain, as the ZEV standard implementation report clearly states. While the number of zero or low-emission vehicles registered in Québec has risen sharply, the data shows that demand for such vehicles remains greater than supply, which is a sign that the government needs to further foster the development of this market segment.

Our government recently set new light vehicle electrification targets. We aim to have 1.5 million electric vehicles registered by 2030. We also announced that as of 2035, the sale of new gasoline powered vehicles would be prohibited in Québec.

Québec will be able to live up to its commitments. With the combined action of the ZEV standard, the 2030 Green Economy Plan and other government policies related to sustainable mobility, we are confident that we can achieve a greener transportation sector. Over the next decade, Quebecers will witness this transformation and, due to more responsible consumption habits, will have collectively been a part of this phenomenon.

Wishing you a good read!

A handwritten signature in blue ink that reads "Benoit Charette". The signature is fluid and cursive.

Benoit Charette
Minister

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INTRODUCTION

Being heavily dependent on imported fossil energy, the transportation sector in Québec is the main emitter of greenhouse gas (GHG). According to the most recent inventory¹, GHG emissions from transportation in Québec account for 44.8% of the province's total emissions. Improving vehicle and fuel energy efficiency to reduce GHG emissions in this sector was therefore prioritized in many policies and measures adopted by the Government of Québec in recent years. Some of these measures also aimed to push consumers to rethink the way they travel, how they eliminate or reduce the need for single occupant vehicle use and choose less energy-consuming modes, such as public transit and active mobility.

Transportation electrification is also a logical choice for Québec, which has an abundant supply of clean and affordable hydroelectricity. In addition to being a promising solution for reducing GHG emissions, transportation electrification also contributes to improving air quality, leads to better living environments by reducing noise, heat islands and air pollution, and lowers health costs. The electrification of transportation is also an economic niche market for the future, creating quality jobs. Clearly, all of Québec will benefit from the decarbonization of the transportation sector. Reducing Québec's dependence on oil will also have a direct and positive impact on its trade balance.

Starting in 2011, Québec put in place a series of measures aimed at encouraging the use of electric automobiles. Among these measures were buyer incentives, developing a charging station network and non-monetary incentives, such as dedicated lanes. In 2015, seeing that a considerable number electric vehicle models were still unavailable in the Québec marketplace and that waiting lists were growing longer, the Government of Québec decided to act on supply by adding a zero-emission vehicle (ZEV) standard flagship measure to its basket of incentives, as already in use by California and nine other American states.

The *Act to Increase the Number of Zero-Emission Motor Vehicles in Québec in Order to Reduce Greenhouse Gas and Other Pollutant Emissions*, CQLR c A-33.02 (hereinafter, the ZEV Act) was unanimously adopted by the National Assembly on October 26, 2016. Its implementation Regulation (c A-33.02, r. 1) and the Regulation respecting the limit on the number of credits that may be used by a motor vehicle manufacturer and the confidentiality of some information, CQLR c A-33.02, r. 2, were adopted in December 2017. The ZEV Act and these two regulations form the basis of the ZEV standard.

1. MELCC, *Inventaire québécois des émissions de gaz à effet de serre en 2018 et évolution depuis 1990*, 2020. <https://www.environnement.gouv.qc.ca/changements/ges/2018/inventaire1990-2018.pdf>.

On January 11, 2018 (the date when the ZEV standard came into effect), Québec became the first Canadian province to have put in place a regulatory scheme for incentivizing motor vehicle manufacturers to produce more low-carbon, increasingly efficient models, lower their prices and make these high-tech vehicles more widely available in Québec.

The ZEV standard is now part of measures that were implemented to make it possible for Québec to reach its targets regarding the desired number of electric vehicles on Québec roads² and reduce the consumption of petroleum products by 40% for 2030. The standard will also help reduce the province's GHG emissions, Québec having recently reiterated its commitment to reducing its 2030 GHG by 37.5% compared to the 1990 level, aiming for carbon neutrality by 2050.

Under section 66 of the ZEV Act, the Minister of the Environment and the Fight against Climate Change is required to report to the government on the implementation of the Act no later than January 11, 2021. This report describes how the standard works and its operationalization, and sets forth the results that have been achieved since its inception. While the report includes findings and areas for improvement, its purpose is not to suggest proposals for tightening requirements in the future.

2. 100,000 registered electric vehicles on our roads by the end of 2020 per the Transportation Electrification Action Plan 2015-2020 (https://www.transports.gouv.qc.ca/fr/ministere/role_ministere/electrification/Documents/PAET.pdf); 1.5 million electric vehicles in 2030, around 30% of the light-duty vehicle fleet, per the 2030 Plan for a Green Economy (<https://www.quebec.ca/en/government/policies-orientations/plan-green-economy>).



Source : Hydro-Québec

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PRESENTATION OF THE ZEV STANDARD

Since January 11, 2018, automakers who on average sell and/or lease at least 4,500 new light vehicles in Québec annually are subject to the ZEV standard. They earn required credits by selling or leasing electric vehicles, or purchase and exchange credits from other motor vehicle manufacturers. The government determines a motor vehicle manufacturer's credit target using a formula based on its percentage of the total number of new light vehicles sold and/or leased in Québec.

Each sale or lease of an electric vehicle earns credits for the motor vehicle manufacturer, the number varying by type of vehicle and range in full electric mode. The greater the electric range, the more the number of credits earned. At the end of each compliance period, motor vehicle manufacturers need to have earned or otherwise acquired the number of credits they need in order to comply with their requirements as set by the government for the period at issue.

2.1 Target motor vehicle manufacturers and ranking

Motor vehicle manufacturers are ranked in three categories that define whether or not they are subject to the standard and if so, what conditions apply to them.

- Small volume motor vehicle manufacturers (fewer than 4,500 vehicles sold annually on average) are not subject to the ZEV standard but can voluntarily participate in the scheme, and declare the number of their eligible vehicles and exchange or sell earned credits.
- Intermediate motor vehicle manufacturers (4,500 to 19,999 vehicles) are subject to the ZEV standard.
- Large motor vehicle manufacturers (20,000 and more vehicles) are subject to the ZEV standard and have additional requirements starting with model year 2020.

A motor vehicle manufacturer's category is calculated annually on the basis of its average sales and leases over the three preceding years, and may change on the basis of results.

2.2 Vehicles eligible for credits

There are four categories of eligible light vehicles (less than 4,500 kg), each having its own conditions for the allocation and use of credits: ZEV, LEV (Low-emission vehicles), vehicles with a range extender (VRE) and LSV (Low-speed motor vehicles). They can qualify as new or reconditioned vehicles. The list of eligible vehicles³ is published in the *Gazette officielle du Québec* no later than May 1 of each year and is also available on the website of the Ministère (hereinafter MELCC), where it may be updated during the year.

2.2.1 Zero-emission vehicles (ZEV)

ZEVs are either battery electric vehicles (BEV) or hydrogen fuel cell vehicles (HFCV). They emit no GHG when in use, except for air conditioning purposes. The number of credits these vehicles are awarded varies as a function of their electric range, up to a maximum of 4 credits, and is based on the following formula:

► Number of ZEV credits = $(0.01 \times \text{range [in km]} \times 0.6214) + 0.50$

For example, a ZEV whose electric range is 402 km in full electric mode will earn 3 credits. If its range is 161 km, it would earn 1.5 credits.

Starting in 2020, major motor vehicle manufacturers are required to cover their regulatory obligations by means of a set proportion of credits stemming from this category.

2.2.2 Low-emission vehicles (LEV)

LEVs, usually plug-in hybrid electric vehicles (PHEV), are equipped with both an electric and a gasoline motor. They can work in full electric, hybrid or, when their battery is drained, conventional mode. The number of credits these vehicles are assigned varies as a function of their electric range, up to a maximum of 1.10 credits, and is based on the following formula:

► Number of LEV credits = $(0.01 \times \text{range [in km]} \times 0.6214) + 0.30$

For example, a LEV with an electric range of 32 km will earn 0.5 credits.

A bonus of 0.20 additional credits (up to a maximum of 1.30 credits per vehicle) may be awarded if the vehicle passes the EPA US06 test, which is more stringent in line with brisk acceleration and higher speeds than standard test protocols.

2.2.3 Vehicles with a range extender (VRE)

VREs are plug-in electric vehicles that are also equipped with a gasoline engine that recharges the vehicle's battery only when it is drained. Furthermore, the range made possible by the combustion engine is the same, or below, the electric range of the car. The number of credits awarded here varies as a function of the electric range of the vehicle, up to a maximum of 4 credits and uses the following formula, which is identical to the ZEV one:

► Number of VRE credits = $(0.01 \times \text{range [in km]} \times 0.6214) + 0.50$

For example, a VRE with an electric range of 161 km will earn 1.5 credits.

As is the case for ZEV credits, credits earned by sales of these vehicles can be used to fulfill the special regulatory requirements that apply to major motor vehicle manufacturers starting in 2020. However, no more than 50% of credits from this category can be used for that purpose.

3. MELCC, list of new or reconditioned motor vehicles that qualify for credits. <https://www.environnement.gouv.qc.ca/changementsclimatiques/vze/liste-vehicules-admis-en.htm>

2.2.4 Low-speed vehicles (LSV)

LSVs are ZEVs with a maximum speed of between 32 and 40 km/h and an electric range of at least 40 km. LSV sales or leases earn 0.15 credits, which can account for no more than 25% of the required total.

2.2.5 Reconditioned Vehicles

Reconditioned vehicles in the four preceding categories originating outside the province can also earn credits when sold or leased and registered in Québec for the first time. The eligibility conditions are set out in the Regulation, and include being under warranty, manufactured less than four years before first registration in Québec and with fewer than 40,000 km on the odometer.

The number of credits awarded per reconditioned vehicle is adjusted on the basis of the number of kilometres listed in the *Société de l'assurance automobile du Québec (SAAQ)* registry when the vehicle was imported into Québec, compared to a new vehicle, as follows:

- ▶ Between 0 and 10,000 km = 80%
- ▶ Between 10,001 and 20,000 km = 75%
- ▶ Between 20,001 and 30,000 km = 60%
- ▶ Between 30,001 and 40,000 km = 50%
- ▶ More than 40,000 km = 0 credits

Credits derived from the sale or lease of reconditioned vehicles can count for a maximum of 30% of the total number of a manufacturer's credit requirements.

The formulas used to calculate ZEV, LEV, VRE and LSV credits are equivalent to California regulations, with one additional factor to use the vehicle's electric range in kilometres rather than miles. The UDDS or Urban Dynamometer Driving Schedule electric range used in the formulae is calculated using the method employed by California for its own ZEV standard. Approximate UDDS values can be estimated by dividing the publicly available Natural Resources Canada electric range values by 0.7.

In order to generate credits, eligible vehicles reported by motor vehicle manufacturers must be registered in Québec when declared. The MELCC checks vehicle identification numbers (VIN) with the SAAQ.

2.3 Credit requirements

In order to determine the requirements that apply to each covered motor vehicle manufacturer, the MELCC applies the percentage of credits required by regulation for a given model year (Figure 1) to average Québec sales and leases by the manufacturer across-the-board for all technologies. Credit requirements increase gradually from 3.5% for 2018 to 22% for 2025. The result of the calculation gives the number of credits the manufacturer needs to earn for a given model year.

As an example, a manufacturer that sold an average of 50,000 vehicles in Québec between 2015 and 2017 must, in order to comply with its regulatory obligations, earn 6.5% in credits for model year 2019, per the following:

- ▶ 50,000 vehicles sold x 6.5% = 3,250 credits needed for compliance in this model year.

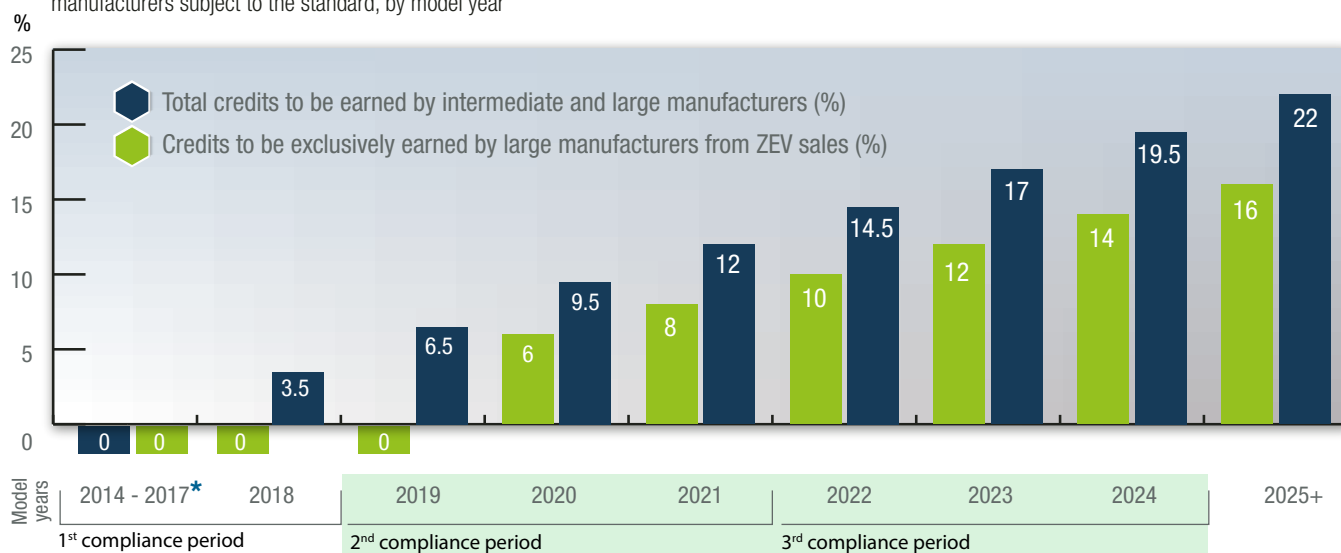
Revisiting the examples of credits shown in sections 2.2.1 and 2.2.2, the 3,250 credits may be comprised of the following:

- 1,084 ZEVs with an electric range of 402 km (3 credits per vehicle)
- 2,167 ZEVs with a range of 161 km (1.5 credits per vehicle)
- 6,500 LEVs with a range of 32 km (0.5 credits per vehicle)
- Any combination of vehicles, such as: 500 ZEVs with a range of 402 km, 1,000 ZEVs with a range of 161 km and 500 LEVs with a range of 32 km
- Purchase of the needed credits from another manufacturer (in part or in whole).

Compliance strategies can therefore vary greatly among motor vehicle manufacturers.

Starting with model year 2020, large motor vehicle manufacturers are required to earn a set percentage of credits derived exclusively from ZEV sales. For model year 2020, these companies need 9.5% in total credits, 6% derived exclusively from ZEV sales. Québec requirements now align with current California ones. The ZEV credit requirement will gradually increase from 6% for 2020 to 16% for 2025 (Figure 1).

Figure 1
Credit requirements as a percentage of average sales by manufacturers subject to the standard, by model year



* bonus years

2.4 Bonus years

Model year 2018 was the first for which credits were required. However, to recognize the proactive efforts made by motor vehicle manufacturers, Québec decided to award ZEV and LEV bonus credits for model years 2014–2017. Motor vehicle manufacturers were then able to use these bonus credits to comply with their requirements for model years 2018 and following.

2.5 Compliance periods

Compliance periods are periods for which motor vehicle manufacturers need to meet predetermined model year vehicle regulatory requirements. Reporting deadlines on credits due to the government are set on September 1st of the calendar year that follows the end of the given compliance period.

Starting with model year 2019, compliance periods have a duration of three years. For example, at the end of the 2019–2021 compliance period on September 1, 2022, motor vehicle manufacturers must have declared all ZEV and LEV sales for model years 2019, 2020 and 2021 in order to earn the credits they need to meet their requirements for those three years (Figure 1).

The first compliance period, relating to the first implementation year of the ZEV Act, covered model year 2018 vehicles sold in Québec. Reporting was due on September 1, 2019, and included credits earned for the 2014–2018 model year vehicles and bonus years. The results of this period are mentioned in section 3 of this report.

As such, even if requirements are set for each year, reporting must cover all three years of a compliance period. This approach enables greater flexibility in applying the ZEV Act and marketing vehicles, and does not unfairly penalize manufacturers for special issues (such as unexpected lower sales for a given model year and model years of different duration, etc.).

2.6 How to use credits acquired by means other than EV sales

Motor vehicle manufacturers can use credits earned in earlier compliance periods to meet their requirements, up to a certain ceiling. So, for example, for the current compliance period (period 2, model years 2019-2021), credits earned earlier by a given manufacturer can fill up to 35% of its regulatory requirements. As a consequence, even if some motor vehicle manufacturers earned a significant number of credits during the first compliance period, they would still need to acquire at least 65% of their needs in new credits to meet the requirements of the current period. They can use their earned credits for up to 25% of the credits required of them for period 3 (2022–2024).

If the credits earned by a motor vehicle manufacturer using the preceding methods are insufficient to comply with the standard, it can acquire credits from other manufacturers that hold excess credits. This also means that small motor vehicle manufacturers, who are not subject to the standard, can participate in the credit market voluntarily and exchange (or sell) credits they earn with motor vehicle manufacturers that are subject to the standard. Aside from the number and the type of credits exchanged, the details of transactions between motor vehicle manufacturers are confidential and not known by the MELCC.

2.7 Charges

At the end of a compliance period, motor vehicle manufacturers that have not earned the number of credits they need to meet their regulatory requirements pay a charge equivalent to \$5,000 for each missing credit.

2.8 Operationalization of the ZEV standard

A number of different systems and databases have been put in place to monitor ZEV standard requirements and communications with motor vehicle manufacturers.

2.8.1 Email

A unique email address was set up for official communication between the MELCC, motor vehicle manufacturers and other external players involved in the implementation of the ZEV standard.

2.8.2 The ZEV information processing system

The ZEV information processing system operates a web-based platform for information sharing. It enables motor vehicle manufacturers to download MELCC documents relating to the functioning of the ZEV standard (reporting forms, user guides, etc.).

This system also provides motor vehicle manufacturers with a secure official way for submitting their mandatory regulatory declarations to remain in compliance. Manufacturers receive a reference number by email for each document they submit for monitoring purposes. The same reference number is also emailed to the MELCC ZEV team and can be used to retrieve the document on the shared platform.

2.8.3 Reporting documents

A variety of Excel and Word forms are made available to motor vehicle manufacturers for informing the MELCC of their activities and for acquiring, exchanging and selling credits. The forms are in French, with user guides available in both French and English.

- Eligible vehicles report: The manufacturer submits technical information (including range in full electric mode) on vehicles likely to be eligible for credits. If, after review, a vehicle is deemed eligible, the MELCC assigns a unique identification number to it and shares that information and the number of credits generated by sales and leases of the model. The list of eligible vehicles⁴ is available on the MELCC website and is regularly updated.
- Detailed sales declaration: The manufacturer reports the sales details for each of its credit-eligible vehicles (VIN, MELCC-assigned number, vehicle status [new or reconditioned], date of sale, kilometres per the odometer, etc.). After reviewing the declaration and comparing it to SAAQ registration data, the MELCC adds the credits to the manufacturer's account.
- Summary report of total vehicle sales: Manufacturers use this form to report the total number of light vehicles sold for each of their five latest model years. The MELCC reviews the classification of the manufacturer and evaluates the number of credits that are required for a given model year on the basis of the declaration.
- Alienation of credits: This form is used by motor vehicle manufacturers for inter-company transfer of credits. It is filled out and signed by both parties under oath, and the seller submits the form via the ZEV information processing system. The MELCC is only informed of the number and type of credits exchanged or sold so that it can adjust the accounts of both motor vehicle manufacturers. All other details of the transaction, including the value of the credits, are not shared.

4. MELCC list of new or reconditioned motor vehicles that qualify for credits. <https://www.environnement.gouv.qc.ca/changementsclimatiques/vze/liste-vehicules-admis-en.htm>.

- Declaration under oath: All declarations submitted by motor vehicle manufacturers are made as sworn statements before a witness recognized as a Commissioner of Oaths (attorney, notary or other). The MELCC reserves the right to require additional documentation if it questions the veracity of any information.

2.8.4 Database

All information collected from motor vehicle manufacturers is consolidated in a database hosted on government servers and only accessible by MELCC employees working on ZEV standard compliance. The information includes the motor vehicle manufacturer's contact information, its category, total annual sales, details on each credit-eligible model (including the number assigned by the minister, electric vehicle range and number of associated credits) as well as the details of all vehicles it sold or leased for which credits were assigned (VIN, vehicle status, date of registration, number of credits, etc.).

- Data integration: the data stemming from eligible vehicle, detailed sales and summary sales declarations are incorporated into the database using an Excel validation tool that also automates calculations and adjusts the credit accounts of motor vehicle manufacturers.
- Motor vehicle manufacturers credit accounts are viewable by MELCC staff in charge of ZEV standard compliance by means of an Intranet application on MELCC servers, which displays a comprehensive picture of the current situation of each manufacturer with respect to the compliance period and type of credits (for example, new ZEVs or reconditioned LEVs). The application also makes it possible to perform manual adjustments when necessary (alienation of credits between two motor vehicle manufacturers, payment of credit requirements at the end of a compliance period, etc.).

2.8.5 GES-Automobile (GHG reporting portal)

The GHG reporting portal is a second Web platform used by the MELCC within the framework of the ZEV standard. It makes it possible to collect information from motor vehicle manufacturers on GHG emissions of all their light vehicles sold in Québec. This information is useful for the purpose of assessing emission reductions achieved through the gradual replacement of conventional vehicles on the province's roads by electric vehicles. GES-Automobile data is also used to counter-check information on sales provided by motor vehicle manufacturers on their reporting forms.

2.8.6 Agreements with the SAAQ

The following two agreements have been signed with the SAAQ, enabling the validity and accuracy of information submitted to the MELCC by motor vehicle manufacturers, to be checked:

- The first agreement was signed in October 2018. It includes a dollar amount for the initial cost of informatics development and an open-ended agreement for the cost of any required validation of motor vehicle manufacturer declarations (one-off payments). It allows the verification of vehicle registration in Québec (model, date of registration and odometer reading) for every VIN submitted by motor vehicle manufacturers for the purpose of receiving credits.
- The second agreement, negotiated in March 2020, makes it possible to obtain the annual data for light vehicles registered by motor vehicle manufacturers, thereby facilitating counter-checking their sales information.

2.8.7 ZEV credit granting process

The process for granting credits to motor vehicle manufacturers can be summarized in the following steps:

1. Motor vehicle manufacturers submit information on eligible EV sales using the detailed sales declaration form
2. The MELCC verifies that the vehicles were in fact registered in Québec with the SAAQ (required under section 13 of the ZEV Act)
3. Manufacturers receive email confirmation of which vehicles were approved. A letter from the minister follows, stating the intended number of credits to be recorded in the registry and allows motor vehicle manufacturers 15 days to submit observations (section 12)
4. Also, the email and letter from the minister lists which vehicles are not recognized for granting credits (because they were not found in the SAAQ database or information is inaccurate) and allows motor vehicle manufacturers 15 days to submit observations, if any (section 14)
5. Following the receipt of motor vehicle manufacturer observations, or if there were none, the credits are recorded in the registry and the MELCC sends out an administrative notice that confirms the current total of credits in the manufacturer's account.

Section 12 also stipulates that the minister is required to record the credits in the registry (Step 5) within three months of the date of the declaration (Step 1). This period of time is needed to allow a back-and-forth with the manufacturer and checks with the SAAQ.

While the waiting period for receiving SAAQ files may have been long at first, the situation has greatly improved with time and experience. SAAQ responses are now generally received within one or two working days, which makes it possible to finish checking and award credits to motor vehicle manufacturers faster. This also provides a reasonable timeline for motor vehicle manufacturers to exchange or sell credits earned.

2.9 Monitoring mechanisms

2.9.1 Monitoring Committee

The Monitoring Committee, announced on December 18, 2017, is comprised of representatives from the MELCC, the *Corporation des concessionnaires d'automobiles du Québec (CCAQ)*, the *Coalition zéro émission Québec (CZEQ)* and *Équiterre*. Its purpose is to ensure that the ZEV standard is implemented transparently, be informed of participants' concerns and potential issues in the way the standard works on the ground, and, if so required, facilitate the implementation of the standard. The Monitoring Committee met four times between June 2018 and February 2020.

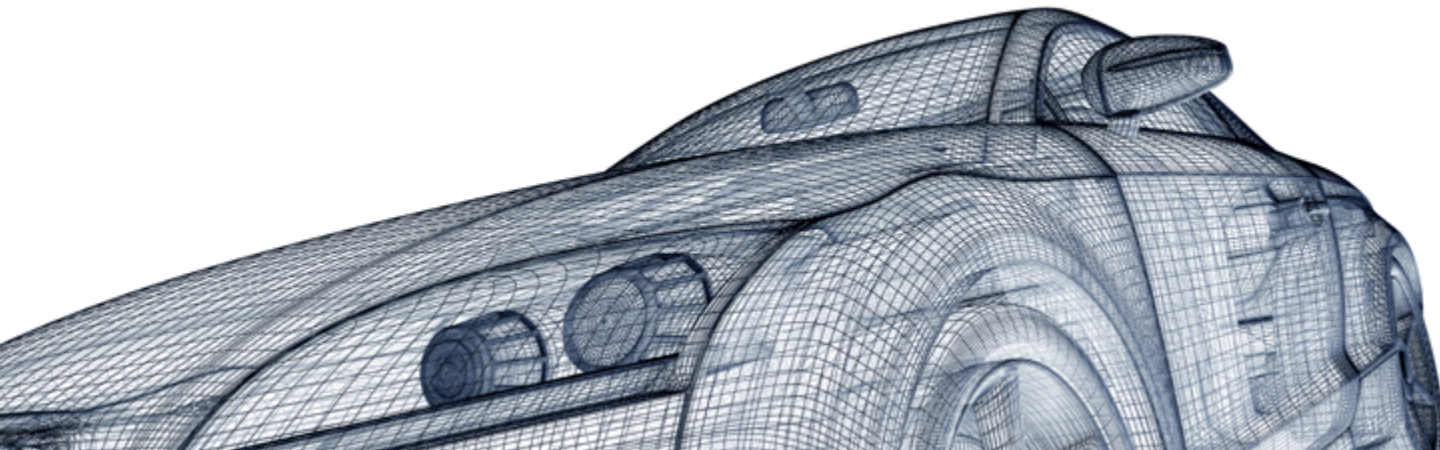
Among the major subjects addressed by the committee were the availability of vehicles at dealerships, the evolution of the Canadian market and electrification of transportation awareness measures such as improved training of dealership personnel, the Running Electric campaign and national electric vehicle weeks. Discussions also involved how government programs work, policy development and the implementation of the ZEV standard, including the presentation of the first compliance period report.

2.9.2 Meetings with the automobile industry

Since the implementation of the ZEV Act, meetings with associations and motor vehicle industry manufacturers took place on various occasions. Webinars enabled conversations to proceed on regulations and requirements, the information sharing platform and the tools used to report ZEV standard information. Meetings were also held individually or collectively with motor vehicle manufacturers and associations with a view to discussing improvements to legislation and tools, or for example, on findings in the first compliance period report. Meetings were also held with industry professionals on more technical matters or with the Minister of the Environment and the Fight against Climate Change, or his cabinet, to make political representations.

Dialogue with the industry led to functional adjustments, notably for the method to use to calculate emissions for category 2b light trucks. It also led to a technical amendment to the ZEV Act by means of Bill 44—*An Act mainly to ensure effective governance of the fight against climate change and to promote electrification*⁵, whose purpose was to ensure that credits from reconditioned vehicles are tagged to the calendar year when they were imported into Québec for first registration, instead of the model year.

5. *An Act mainly to ensure effective governance of the fight against climate change and to promote electrification*, 2020. <http://m.assnat.qc.ca/en/travaux-parlementaires/projets-loi/projet-loi-44-42-1.html>



3

IMPACTS OF THE ZEV STANDARD AND PORTRAIT OF ELECTRIC VEHICLES IN QUÉBEC

3.1 Eligible electric vehicles

Nine manufacturers reported credit-eligible vehicles for model year 2014. **In 2020, 16 motor vehicle manufacturers had at least one eligible vehicle approved by the MELCC.** Motor vehicle manufacturers subject to the standard and three that are not subject to it have so far reported a total of 298 EV versions for model years 2014 to 2021. Inasmuch as the number of credits awarded for a given vehicle is a function of its range in full electric mode, more than one version of the same model may be listed.

Of the total, 196 (66%) are ZEVs (battery electric vehicles or hydrogen fuel cell vehicles); 94 (31%) are LEVs (plug-in hybrid electric vehicles) and 8 (3%) are VREs. As yet, no low-speed vehicles have been submitted for eligibility review.

One of the targets in implementing a ZEV standard was to allow consumers more choice in available electric vehicles (see section 3.2) and a greater number of higher-performance electric vehicles on the market in order to make them more attractive and reduce consumer's range anxiety. Table 1 shows the evolution in the number of credits awarded on average per vehicle declared by manufacturers for different model years (value proportional to average range in electric mode). **The average number of credits rose from 1.27 in 2014 to 2.58 in 2019.** The drop observed in 2017 and 2018 was mainly due to the introduction of new LEV SUVs into the market, as these vehicles were popular with consumers in spite of their lower range in electric mode.

Table 1

Average number of credits awarded
by vehicle type and model year

MY	Number of LEV	LEV credits	Credits/ LEV	Number of VRE	VRE credits	Credits/ VRE	Number of ZEV	ZEV credits	Credits/ ZEV	Total Number	Total credits	Credits/ VE
2014	1,372	1,198.28	0.87	30	49.80	1.66	1,053	1,875.93	1.78	2,455	3,124.01	1.27
2015	1,383	1,307.60	0.95	87	143.26	1.65	2,384	4,491.94	1.88	3,854	5,942.80	1.54
2016	941	883.04	0.94	24	39.84	1.66	2,996	7,029.50	2.35	3,961	7,952.38	2.01
2017	5,729	6,102.58	1.07	91	179.27	1.97	3,335	10,421.43	3.12	9,155	16,703.28	1.82
2018	9,775	8,268.02	0.85	72	141.75	1.97	6,323	20,148.36	3.19	16,170	28,558.13	1.77
2019	8,234	7,289.51	0.89	48	114.72	2.39	15,226	53,167.21	3.49	23,508	60,571.44	2.58
Total	27,434	25,049.03	0.91	352	668.64	1.90	31,317	97,134.37	3.10	59,103	122,852.04	2.08

3.2 Vehicle availability

As previously mentioned, one of the targets of the ZEV standard is to ensure broader model availability and a greater number of vehicles at car dealerships so as to meet the needs of consumers and shorten waiting lists.

When the ZEV Act was adopted in 2016 only 66% of models available in California were also marketed in Québec. **Today, that figure is close to 85%.**

Some motor vehicle manufacturers have clearly stated that they are **prioritizing Québec within the Canadian market** due to the ZEV standard. Not only does Québec have regulatory requirements, but the ability to alienate surplus credits provides manufacturers with business opportunities to incentivize making more vehicles and models available.

This is not to neglect the influence of other tools and measures, whose aim is to promote the use of electric vehicles in Québec, including monetary incentives, developing the charging station network, green licence plates⁶ and educational campaigns. External factors also play a role in motor vehicle manufacturer decisions on vehicles they sell in the Québec market. It is highly likely that the July 2018 decision by Ontario to end incentives had a positive impact on the number of vehicles available at motor vehicle dealerships in Québec.

Whereas access to electric vehicles has been facilitated (Table 1 shows the marked increase in the number of declared vehicles by model year), the **situation is not uniform across all makes and models.** Waiting lists for some vehicles exceed a full year. Additional data on electric vehicle marketing in Québec is discussed in section 3.7.

6. Among the benefits of the green licence plate are access to some reserved lanes, free access to toll bridges and ferries managed by Quebec and free parking in some municipalities. <https://saaq.gouv.qc.ca/en/vehicle-registration/registering-vehicle/electric-or-plug-in-hybrid-vehicle/>.

3.3 Earned credits

For the first compliance period (vehicle model years 2014–2018, but only including requirements for model year 2018), **all motor vehicle manufacturers subject to the standard fulfilled their regulatory obligations**, either by earning credits from the sale or lease of their own electric vehicles or by acquiring credits from other manufacturers.

In fact, 61,821.05 credits were declared⁷ by motor vehicle manufacturers subject to the standard and by two small manufacturers that voluntarily participated in the credit market prior to the September 1, 2019, deadline. Of the total, 15,385.35 credits were removed, corresponding to the number of credits required to meet the ZEV standard for model year 2018. The remaining 46,435.70 credits can be used in the current and future compliance periods, and are included in Table 3, which displays credits earned as of September 1, 2020.

The complete statement of results for the first compliance period is available on the MELCC website⁸.

Credit declarations continued to be received, and as at September 1, 2020:

- 83,812.71 credits have been recorded so far for the current (second) compliance period (model years 2019, 2020 and 2021). Details are shown in Table 2.
- 46,572.59 credits were recorded for the first compliance period (model year 2018 plus bonus model years 2014–2017). These credits can be used to meet requirements for the current and future compliance periods, with some restrictions. Details are shown in Table 3.

As of September 1, 2020, the automobile industry banked 130,385.30 credits in all. If we add in the requirements of the first compliance period—credits that were removed from accounts in the fall of 2019—a total of **145,770.65** credits were earned by motor vehicle manufacturers since the ZEV standard came into effect on January 11, 2018.

7. Differs from data in the report published by the MELCC on April 15, 2020, which showed 58,903.22 credits and includes changes stemming from the declarations submitted by various motor vehicle manufacturers.

8. MELCC, *Report on the Results of the First Compliance Period*, 2020. <https://www.environnement.gouv.qc.ca/changementsclimatiques/vze/bilan-norme-vze-periode-1-en.pdf>.

Table 2

Motor vehicle manufacturers categories and credits earned for compliance period 2019-2021, as of September 1, 2020

Manufacturer		Number of credits earned as of September 1, 2020*						2019 requirements	
		NZEV	RZEV	NLEV	RLEV	NVRE	RVRE		Total
Large	General Motors of Canada Ltd.	20,528.00	65.13	2,910.70	-	-	-	23,503.83	3,179.61
	Ford Canada Ltd.	-	-	776.16	-	-	-	776.16	3,291.77
	FCA Canada Inc.	5,000.00	-	362.70	1.83	-	-	5,364.53	3,147.15
	Honda Canada Inc.	8,000.00	-	594.89	-	-	-	8,594.89	3,148.06
	Hyundai Auto Canada Corp.	10,703.99	-	727.51	-	-	-	11,431.50	2,790.30
	Kia Canada Inc.	1,904.89	-	428.40	-	-	-	2,333.29	1,603.90
	Mazda Canada Inc.	-	-	-	-	-	-	-	1,784.16
	Nissan Canada Inc.	7,802.65	3.77	-	-	-	-	7,806.42	2,625.46
	Toyota Canada Inc.	3,682.61	-	788.54	-	-	-	4,471.15	3,471.50
	Volkswagen Group Canada Inc.	2,304.28	-	-	-	-	-	2,304.28	2,027.74
Intermediate	BMW Canada Inc.	86.40	-	72.16	-	114.72	-	273.28	576.57
	Mercedes-Benz Canada Inc.	692.22	-	34.31	-	-	-	726.53	629.94
	Subaru Canada Inc.	5,600.00	-	-	-	-	-	5,600.00	1,056.64
	Mitsubishi Canada Inc.	-	-	744.00	6.30	-	-	750.30	516.86
Small	Jaguar Land Rover North America LLC	352.00	-	-	-	-	-	352.00	-
	Porsche Cars Canada Ltd.	-	-	-	-	-	-	-	-
	Tesla Motors Canada ULC	9,524.55	-	-	-	-	-	9,524.55	-
Total		76,181.59	68.90	7,439.37	8.13	114.72	-	83,812.71	29,849.66

Notes: Results are incomplete. Other credits will be added by September 1, 2022.

The small motor vehicle manufacturers listed in the table voluntarily participated in credit acquisitions and transactions.

Credits earned as of September 1, 2020, include acquisitions from other motor vehicle manufacturers (credit alienation).

- * ZEV: Zero-emission vehicle
- LEV: Low-emission vehicle
- VRE: Vehicle with a range extender
- N: New
- R: Reconditioned

Table 3

Motor vehicle manufacturers categories and number of credits earned for compliance period 2018, as of September 1, 2020

Manufacturer		Number of credits earned as of September 1, 2020*						Total
		NZEV	RZEV	NLEV	RLEV	NVRE	RVRE	
Large	General Motors of Canada Ltd.	7,726.25	120.72	7,458.08	-	-	-	15,305.05
	Ford Canada Ltd.	1,610.86	-	1.18	-	-	-	1,612.04
	FCA Canada Inc.	121.77	-	-	-	-	-	121.77
	Honda Canada Inc.	6,695.98	-	-	-	-	-	6,695.98
	Hyundai Auto Canada Corp.	327.23	-	-	-	-	-	327.23
	Kia Canada Inc.	1,819.55	-	-	-	-	-	1,819.55
	Mazda Canada Inc.	1,200.00	-	191.58	-	-	-	1,391.58
	Nissan Canada Inc.	8,944.03	118.15	-	-	-	-	9,062.18
	Toyota Canada Inc.	3,125.39	10.00	699.57	-	-	-	3,834.96
	Volkswagen Group Canada Inc.	859.32	-	25.55	-	-	-	884.87
Intermediate	BMW Canada Inc.	162.27	-	-	-	391.53	-	553.80
	Mercedes-Benz Canada Inc.	744.76	66.69	-	-	-	-	811.45
	Subaru Canada Inc.	1,660.29	-	-	-	-	-	1,660.29
	Mitsubishi Canada Inc.	325.74	2.36	1,789.28	-	-	-	2,117.38
Small	Porsche Cars Canada Ltd.	-	-	155.33	-	-	-	155.33
	Tesla Motors Canada ULC	219.13	-	-	-	-	-	219.13
Total		35,542.57	317.92	10,320.57	-	391.53	-	46,572.59

Notes: The small motor vehicle manufacturers listed in the table voluntarily participated in credit acquisitions and transactions.

Credits earned as of September 1, 2020 include acquisitions from other motor vehicle manufacturers (credit alienation).

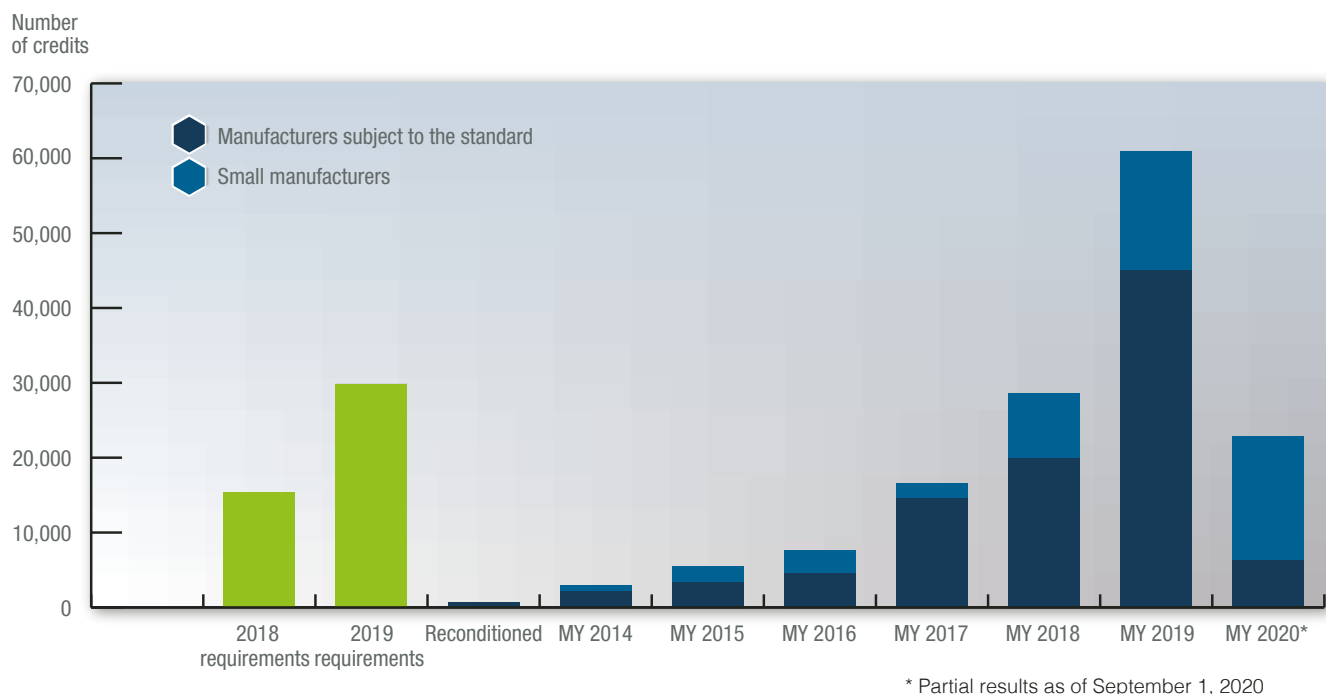
- * ZEV: Zero-emission vehicle
- LEV: Low-emission vehicle
- VRE: Vehicle with a range extender
- N: New
- R: Reconditioned

The MELCC set the total number of credits required to be earned by the industry to meet its requirements for model year 2019 at **29,849.66** (details in Table 2).

However, no credits will be required before September 1, 2022 because the current compliance period covers model years 2019, 2020 and 2021. In addition, surplus credits from the first compliance period (2014–2018) can be used for up to 35% of requirements for the second period (2019–2021). With respect to the 2022–2024 compliance period, it calls for a maximum of 25% in usable credits from previous compliance periods.

Figure 2 shows the distribution of credits earned by the industry, based on provenance. If average total light vehicle sales remain stable, credits earned to date by the industry as a whole (including bonus credits from the first compliance period) would suffice to meet requirements for the current compliance period, even if motor vehicle manufacturers sell no additional electric vehicles until September 1, 2022. However, credits would need to be exchanged or sold among motor vehicle manufacturers to enable them all to meet their requirements. The majority of banked credits are in fact currently owned by three motor vehicle manufacturers.

Figure 2
Requirements and credits earned according to their origin



The surplus of earned credits in relation to ZEV standard requirements can be explained by enthusiasm for electric vehicles that exceeded 2017 forecasts of the regulatory impact analysis, as well as the accelerated progress of battery technology. ZEVs manufactured since 2018 have, in general, a greater electric range that often allows them to attain the maximum of 4 credits awarded per vehicle (Table 1 shows the evolution of credits earned by type of vehicle declared).

3.4 Credit transaction statement

Since the ZEV standard came into effect and up to September 1, 2020, **40,200.00** credits were exchanged or sold among motor vehicle manufacturers, which corresponds to 27.6% of all credits earned by the industry.

- The volume of transactions for the 2019–2021 period involved six motor vehicle manufacturers and came to 22,843.61 credits (Table 4).
- The difference (17,356.39 credits) corresponds to credit transactions for the first compliance period. A total of eight motor vehicle manufacturers participated in the transactions (Table 5).
- These transactions include the ones that took place prior to the end of the first compliance period (September 1, 2019)⁹.

Table 4

Alienation of credits among motor vehicle manufacturers for the 2019-2021 compliance period, as of September 1, 2020

	Manufacturer	Category of credits*	Number of credits
Manufacturer ceding credits	Tesla Motors Canada ULC	NZEV	22,843.61
Manufacturer receiving credits	FCA Canada Inc.	NZEV	5,000.00
	Honda Canada Inc.	NZEV	8,000.00
	Subaru Canada Inc.	NZEV	5,600.00
	Toyota Canada Inc.	NZEV	3,658.61
	Mercedes-Benz Canada Inc.	NZEV	585.00

* NZEV: New zero-emission vehicle

Table 5

Alienation of credits among motor vehicle manufacturers for the 2018 compliance period, as of September 1, 2020

	Manufacturer	Category of credits*	Number of credits
Manufacturer ceding credits	General Motors of Canada Ltd.	NLEV	1,200.00
	Tesla Motors Canada ULC	NZEV	16,089.70
		RZEV	66.69
Manufacturer receiving credits	FCA Canada Inc.	NZEV	1,500.00
	Honda Canada Inc.	NZEV	8,000.00
	Mazda Canada Inc.	NLEV	1,200.00
		NZEV	1,200.00
	Mercedes-Benz Canada Inc.	NZEV	248.31
		RZEV	66.69
	Subaru Canada Inc.	NZEV	2,200.00
	Toyota Canada Inc.	NZEV	2,941.39

* NLEV: New low-emission vehicles
 NZEV: New zero-emission vehicles
 RZEV: Reconditioned zero-emission vehicles

9. Seven transactions involving seven motor vehicle manufacturers took place for a total of 17,041.39 credits transferred from one manufacturer to another. For details, see the *Report on the Results of the First Compliance Period* <https://www.environnement.gouv.qc.ca/changementsclimatiques/vze/bilan-norme-vze-periode-1-en.pdf>

3.5 Imported reconditioned and low-speed vehicles: rarely used options

The number of credits earned for imported reconditioned vehicles remains, until now, marginal (around 1,000 credits). Furthermore, no manufacturer has taken advantage of the option to import other brands of reconditioned vehicles than its own. Weighting credits according to mileage, in particular with a 40,000 km ceiling at time of import, was evidently a restrictive factor for some motor vehicle manufacturers.

In addition, no manufacturer submitted any request for low-speed vehicles. In fact, only around 60 low-speed vehicles are currently registered in Québec and are essentially not among the brands used by motor vehicle manufacturers under the ZEV standard (Nemo, Zenn, Kargo, etc.). This can explain the lack of interest on the part of motor vehicle manufacturers for taking the trouble to earn credits associated with this type of vehicle, which are limited to 0.15 credits each.

3.6 Mandatory ZEV credits for model year 2020

Starting with model year 2020, large motor vehicle manufacturers will need to use an increasing percentage of required credits that stem from the “zero-emission vehicle” or “vehicle with a range extender” categories (NZEV, RZEV, NVRE and RVRE). While the minimum number of credits earned by major motor vehicle manufacturers is 9.5% for model year 2020, 6% will have to stem exclusively from ZEV sales. Québec will at that point match current California stipulations.

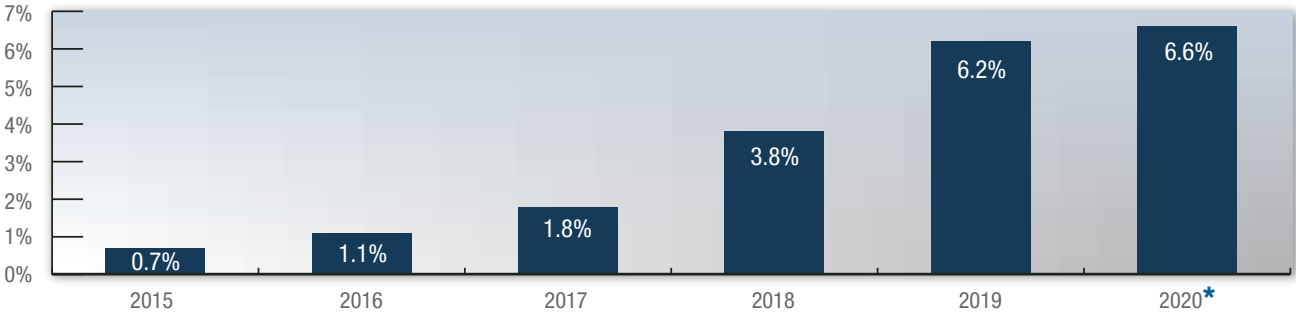
On this point, the automobile industry is in good shape, with 91.1% of current credits (76,365.21 out of 83,812.71) in their accounts meeting this criterion for the current compliance period as of September 1, 2020. Moreover, 77.8% of 2018 credits also meet the criterion (36,252.02 of 46,572.59).

3.7 Profile of electric vehicles registered in Québec

The ZEV standard is only one of a basket of measures put in place by the government for electrifying Québec's light vehicle fleet, others being a rebate on the purchase of a new or pre-owned electric vehicle, a rebate on home, work and multi-unit dwelling charging stations, green licence plate benefits, development of the network of public charging stations, etc.

An analysis dating from the development of the ZEV standard estimated that the automobile industry would need to market nearly 70,000 electric vehicles in Québec by 2020 to meet its credit requirements. It was also estimated that around 1.1% of vehicles sold or leased in 2018 would need to be electric for motor vehicle manufacturers to meet their credit requirements, and this would rise to 2.6% for 2019 and 5.3% for 2020, eventually reaching 10% for 2025. New electric vehicle registration progressed at a greater pace, however, reaching nearly 7% in 2020 (Figure 3).

Figure 3
Electric vehicles ratio versus total new vehicles registered in Québec

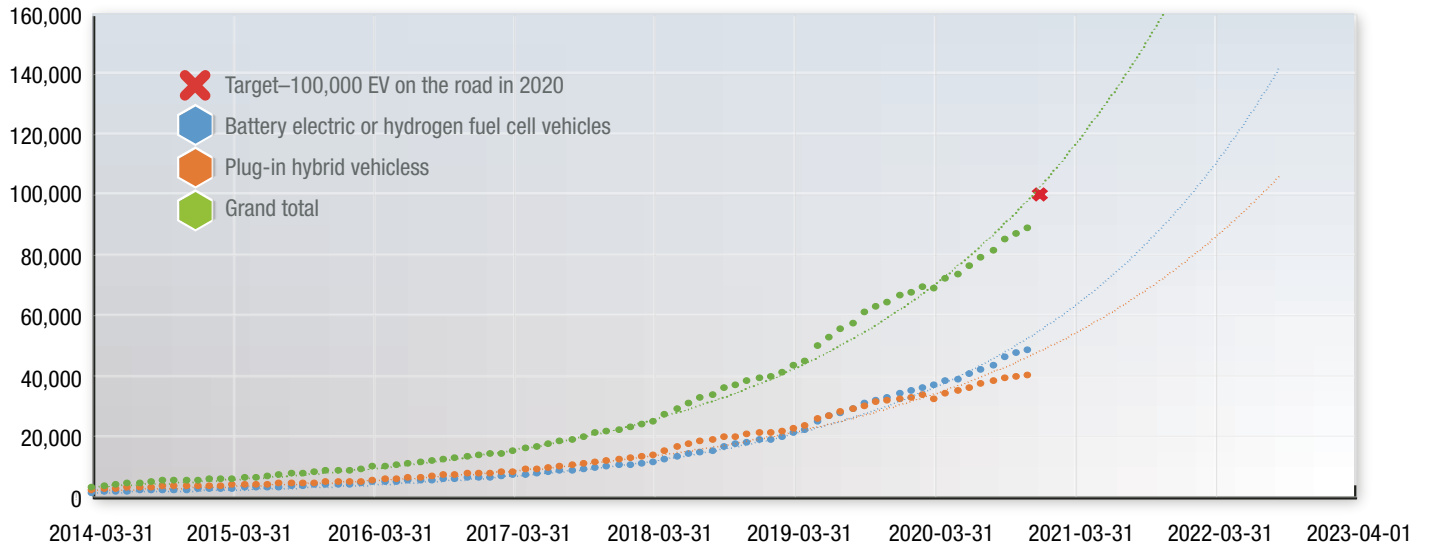


* As of October 31, 2020

Source: SAAQ

This rapid progression put Québec in a good position to reach its target of 100,000 electric vehicles on the road by 2020 (Figure 4). The market slowdown due to COVID-19 did delay the attainment of the target which, however, should be reached in the first quarter of 2021. As of December 31, 2020, 91,363 light electric vehicles were registered in Québec, representing nearly half the number of this type of vehicle on Canadian roads.

Figure 4
Number of electric vehicles registered in Québec



Source: SAAQ

Table 6 shows that most electric vehicles are located in the Montérégie administrative region. The table also shows that battery electric vehicles (BEV) are found in a greater proportion close to large urban centres, while outlying regions have more plug-in hybrid electric vehicles (PHEV). Hydrogen fuel cell vehicles are almost exclusively found in the Capitale-Nationale region, which has the only public charging station for this type of fuel in Québec.

Table 6

Number of electric vehicles registered by region, as of December 31, 2020

Administrative Region		Electric vehicles*				
		BEV	PHEV	HFCV	LSV	Total EV
01	Bas-Saint-Laurent	767	896		1	1,664
02	Saguenay-Lac-Saint-Jean	788	1,053		3	1,844
03	Capitale-Nationale	3,577	4,373	49	11	8,010
04	Mauricie	1,420	1,453		3	2,876
05	Estrie	2,836	2,102			4,938
06	Montréal	8,210	5,343	3	17	13,573
07	Outaouais	1,623	1,476		1	3,100
08	Abitibi-Témiscamingue	323	652			975
09	Côte-Nord	124	222		3	349
10	Nord-du-Québec	15	42			57
11	Gaspésie-Îles-de-la-Madeleine	156	191			347
12	Chaudière-Appalaches	1,543	1,492			3,035
13	Laval	3,073	2,011		1	5,085
14	Lanaudière	4,857	4,030		1	8,888
15	Laurentides	5,007	3,514		6	8,527
16	Montérégie	14,543	10,367		12	24,922
17	Centre-du-Québec	1,582	1,343			2,925
00	Undetermined**	128	113	7		248
Total		50,572	40,673	59	59	91,363

Source: SAAQ

* BEV: Battery electric vehicle
PHEV: Plug-in hybrid electric vehicle
HFCV: Hydrogen fuel cell vehicle
LSV: Low-speed motor vehicle

** The region is undetermined if the vehicle was registered in Québec, but purchased by an individual or company domiciled outside the province.

According to March 31, 2020¹⁰ data from the *Institut de la Statistique du Québec (ISQ)*, there has been a major increase in the number of electric vehicles in all regions of Québec over the last five years, in the order of 680% on average. The ISQ figures suggest that whereas the highest proportion of electric vehicles is found in the Montérégie region, the highest number of electric vehicles proportional to the population (107 electric vehicles per 10,000 inhabitants, 15 years of age and older) is in the Lanaudière region and the greatest progression recorded over the last five years (1,156%) is in the Gaspésie-Îles-de-la-Madeleine administrative region.

10. *Institut de la statistique du Québec (ISQ), Panorama des régions du Québec – Édition 2020.* <https://statistique.quebec.ca/fr/fichier/panorama-des-regions-du-quebec-edition-2020.pdf>.

Electric Mobility Canada reports that 159,000 electric vehicles were registered in Canada as of March 31, 2020, of which 70,500 were registered in Québec¹¹ (Table 7). As such, Québec's electric motor vehicle fleet accounted for 44% of the total in Canada, while its population and total motor vehicle fleet share was 23%.

Table 7

Electric vehicle (EV) fleets and share of totals, by province, as of December 31, 2020

Province/Territory	Approximate EV registration	Vehicles on the road	EV share
Alberta	3,700	3,105,000	0.1%
BC	38,000	3,068,000	1.2%
Manitoba	700	803,000	0.1%
NB	350	550,000	0.1%
N-L	100	354,000	0.0%
NT	10	23,600	0.0%
Nova Scotia	400	616,000	0.1%
Nunavut	1	4,900	0.0%
Ontario	45,000	8,358,000	0.5%
PEI	90	100,000	0.1%
Québec	70,500	5,310,000	1.3%
Saskatchewan	400	811,000	0.0%
Yukon	12	35,000	0.0%
Canada (total)	159,000	23,137,000	0.7%

Source: Electric Mobility Canada, May 2020.

The figures were rounded by the source; Canadian total of provincial data might not add up.

According to a study estimating the availability of plug-in vehicles at dealerships in Canada, Québec had the biggest inventory in the country, with 57% of the total in stock (February 2020)¹². One of the reasons suggested to explain this situation is the Québec ZEV standard.

11. Electric Mobility Canada, *Electric Vehicle Sales in Canada – Q1 2020*, May 2020, <https://emc-mec.ca/>. Data shown as is and may differ from SAAQ data.

12. Dunsky Energy Consulting, *Plug-In Electric Vehicle Availability – Estimating PEV Sales Inventories in Canada: Q1 2020 Update*. https://www.dunsky.com/wp-content/uploads/2020/07/DunskyZEVAvailabilityReport_Availability_20200805.pdf.

Figure 5 shows the retail price and electric range evolution for the five models with the highest registration numbers in Québec: Chevrolet Bolt (BEV) and Volt (PHEV), Nissan Leaf (BEV), Tesla Model 3 (BEV) and Toyota Prius (PHEV)¹³. In spite of the constant decrease in the cost of batteries, which dropped from more than \$1,200 USD/kWh in 2010 to \$137 USD/kWh in 2020¹⁴, motor vehicle manufacturers, generally speaking, have chosen to increase their vehicles' electric range and quality rather than lower prices. This suggests that greater electric range is preferred by consumers. Motor vehicle manufacturers also benefit from offering higher-performance vehicles, which receive more credits under the ZEV standard.

Figure 5

Electric range and most affordable price among the five most registered electric vehicles in Québec, model years 2015, 2017 and 2019



Sources: AVEQ, *Guide de l'auto*, 2015-2020.

13. Registration data compiled by the AVEQ. <https://www.aveq.ca/actualiteacutes/statistiques-saaq-aveq-sur-lelectromobilite-au-quebec-en-date-du-30-septembre-2020-infographie>.

14. BloombergNEF, *Battery Pack Prices Cited Below \$100/kWh for the First Time in 2020, While Market Average Sits at \$137/kWh*. <https://about.bnef.com/blog/battery-pack-prices-cited-below-100-kwh-for-the-first-time-in-2020-while-market-average-sits-at-137-kwh/>.

3.8 Major findings and areas for improvement

Implementation of the ZEV standard has been smooth since the Act and its regulations came into effect in January 2018, but our experience in managing the standard and its results have enabled us to generate findings and define areas where improvement is possible.

Finding 1: The available tools used for the operationalization of the standard, while functional, could be optimized.

Area for improvement: Assess how data processing tools could be improved in the following areas:

- Facilitate information sharing between motor vehicle manufacturers and the MELCC
- Examine the possibility of allowing motor vehicle manufacturers to access their account and transaction history in real time
- Accelerate the process for checking and processing motor vehicle manufacturer declarations by the MELCC, both before and after validation with the SAAQ, particularly for special cases. The target would be to halve processing time over the coming year (currently from one to two weeks) by improving the quality of data submitted by motor vehicle manufacturers (examples could be eliminating duplicate data and information on already-credited vehicles) and optimizing the automation of the reporting process.

Finding 2: Information currently gathered from motor vehicle manufacturer declarations and various external sources (SAAQ, Institut de la statistique du Québec, DesRosiers Automotive Consultants, Natural Resources Canada, etc.) are used to monitor the standard and enable monitoring regulatory requirement compliance, but cannot detail the effects of the standard on the motor vehicle market.

Area for improvement: It would be pertinent to require more information directly from motor vehicle manufacturers regarding the state of the market for electric vehicles while guaranteeing that sensitive information would remain private, when appropriate. For example, this could mean:

- Knowledge of the cost of credit transactions among motor vehicle manufacturers would be a good indicator of the ease or difficulty of motor vehicle manufacturer experience in meeting regulatory requirements.
- Holding additional data on vehicle availability (inventories, average waiting time lists, if they exist, manufacturer's suggested retail price for different models, etc.) would make it possible to better document the effect of the transportation electrification measures put in place in Québec.

Finding 3: The credits earned to date by the industry as a whole (including bonus credits for the first compliance period) would suffice to meet the requirements of compliance period 2019-2021, even if motor vehicle manufacturers sold no more electric vehicles between now and September 1, 2022, on condition that credits continue to be exchanged or sold between motor vehicle manufacturers. This situation shows that motor vehicle manufacturers are able to comply to the standard in advance.

Area for improvement: The abundance of credits earned raises the question of a potential tightening of the standard and higher credit requirements.

- However, this question should be examined in the light of the gradual increase of requirements that already exists in the standard and in the ambitious targets set by the government.
- A future amended ZEV standard could also look at the possibility for the government to adjust to rapidly changing market conditions while still ensuring predictability for the industry.

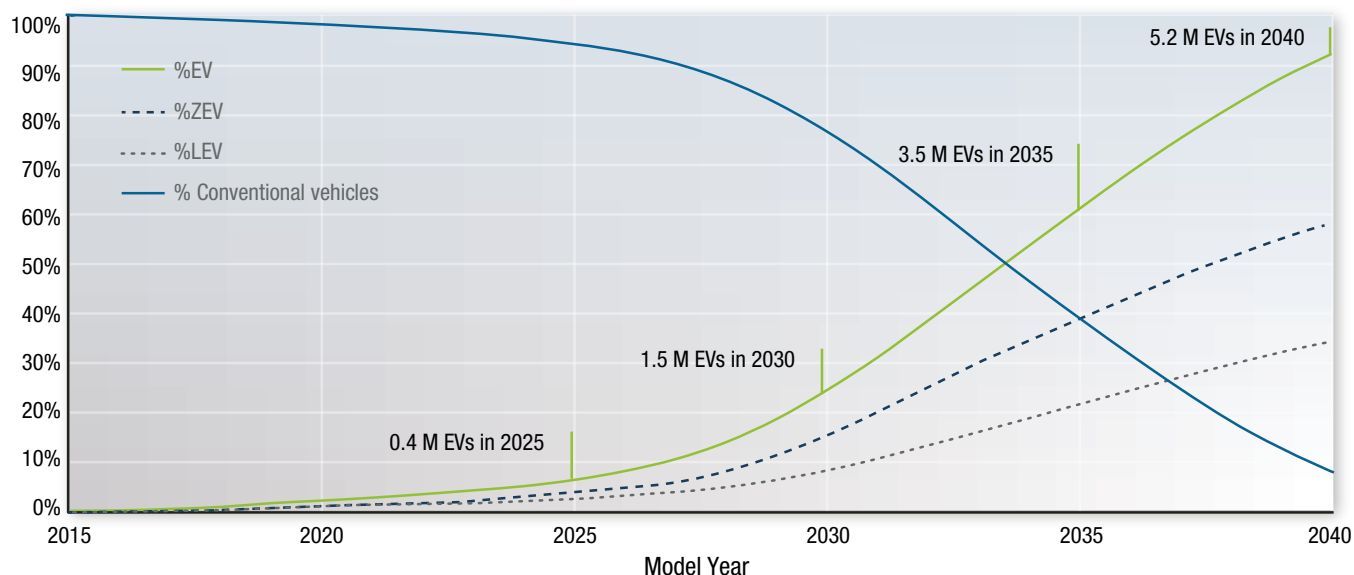
Finding 4: The electrification of the light vehicle sector has progressed greatly in Québec since the ZEV standard came into effect, enabling the government to come close to its target of seeing 100,000 electric vehicles on the road by the end of 2020 (the COVID-19 pandemic and other factors have slowed this down). Québec also remains the Canadian province with the most electric vehicles on its roads and the highest ratio of electric vehicles to its total light vehicle fleet.

Area for improvement: To continue and even accelerate the electrification of Québec's light vehicle fleet and maintain its leading position, Québec needs to go on taking strong measures.

- With the 2030 Plan for a Green Economy's (2030 PGE) 2021-2026 Implementation Plan (2021-2026 IP), the government has set new light vehicle electrification targets: 1.5 million electric vehicles in circulation in 2030 and the prohibition of new sales of gasoline-powered vehicles by 2035.
- The surplus of credits earned to date by motor vehicle manufacturers suggest that tightening the ZEV standard could be one way of enabling Québec to reach these targets. The modelling of a potential scenario is illustrated in Figure 6.
- The 2021-2026 IP also anticipates that demand-side EV incentives will continue, as will the development of the charging station network and consumer education and awareness efforts.

Figure 6

Modelling of a potential scenario for reaching the 2030 PGE target of seeing 1.5 million registered electric vehicles in Québec by 2030 and prohibiting the sale of new gasoline powered vehicles starting in 2035





4

ELSEWHERE IN THE WORLD

4.1 American states and Canadian provinces with a current ZEV standard

In North America, California leads with respect to air quality requirements and has put in place a basket of programs and regulations for reducing air pollutants and GHG emissions, enabling it to achieve its objectives. The California measures include a ZEV standard requiring motor vehicle manufacturers to market vehicles equipped with the cleanest available technology, in particular electric batteries, hydrogen fuel cells and plug-in hybrid vehicles. California ZEV regulations were first adopted in 1990 as part of the California Low-Emission Vehicle standards—LEV I and have seen significant periodic amendments since then¹⁵.

The Québec ZEV standard was greatly inspired by the current California ZEV standard. Both debuted with model year 2018, and their credit requirements, practically identical, are known until 2025. The California ZEV standard deals with challenges that are identical to Québec's, such as a very large number of credits already earned by manufacturers. A tighter California standard, set to come into effect for 2026 and subsequent model years, is meant to assist the state in attaining its new objectives that were published in September 2020 that include a requirement that all sales of passenger vehicles be ZEV by 2035¹⁶. More details are expected to be announced by the end of 2021¹⁷.

Other jurisdictions use section 177 of the *Clean Air Act* to adopt the California standards. Nine states (Connecticut, Maine, Maryland, Massachusetts, New York, New Jersey, Oregon, Rhode Island and Vermont) have adopted the California ZEV standard and low-emission vehicle regulatory environment. These states and California account for nearly 30% of all new light vehicle sales in the United States¹⁸.

15. TransportPolicy.net, *The California Zero Emission Vehicle (ZEV) Program*, 2018. <https://www.transportpolicy.net/standard/california-zev/>.

16. California Air Resources Board (CARB), *Governor Newsom announces California will phase out gasoline-powered cars*, 2020. <https://ww2.arb.ca.gov/news/governor-newsom-announces-california-will-phase-out-gasoline-powered-cars-dramatically-reduce>.

17. Workshop Discussion Draft, CARB, *2020 Mobile Source Strategy*, 2020. https://ww2.arb.ca.gov/sites/default/files/2020-09/Workshop_Discussion_Draft_2020_Mobile_Source_Strategy.pdf.

18. CARB, *Zero-Emission Vehicle Program*, 2020. <https://ww2.arb.ca.gov/our-work/programs/zero-emission-vehicle-program/about>.

In June 2020, California unveiled a heavy vehicle program, whose requirements are to start in 2024, with ZEV sales targets for 2035 of 55% for Class 2b-3, 75% for Class 4-8 and 40% for tractor-trailers^{19,20}.

A ZEV regulation for light vehicles in British Columbia was made official in July 2020. This is the very first time that a government chose to use a legally binding mandate instead of announced objectives, as is the case elsewhere in the world, in order to reach a target of 100% electric vehicles in new light vehicle sales. The province's credit award calculations are similar to what is used in Québec and California, but it chose to push credit requirements to reach 259% in 2040 which, in their models, equates to 100% of sales in ZEVs and LEVs²¹.

Outside of North America, China (the biggest emitter of GHG) is currently the only place in the world that uses a ZEV mandate-like system. There, the law requires credits as a function of EV sales but also as a function of GHG emissions. In October 2020, China announced that its plans called for all new vehicles sold in the country in 2035 to be eco-responsible. This means that at least 50% of vehicles sold would need to be powered by what China calls "new energy"—electric, plug-in hybrid or fuel cell propulsion. Non-plug-in hybrids would then account for the other 50%²². In November 2020, Nissan announced that all of its vehicles destined for the Chinese market would be electric (EV and hybrid) by 2025²³.

4.2 Worldwide EV sales forecasts and certain policies announced aimed at accelerating electrification

A recent Bloomberg market study predicts that electric vehicles would account for 10% of light vehicle sales worldwide in 2025 (compared to 2% in 2018), reaching 28% in 2030 and 58% in 2040²⁴. Of the totals, 28% would be plug-in hybrids in 2025, 26% in 2030, then rapidly falling as the cost of batteries drops to below \$100 US/kWh in 2024, reaching \$61 US/kWh in 2030.

19. CARB, *Advanced Clean Trucks Fact Sheet*, 2020. <https://ww2.arb.ca.gov/resources/fact-sheets/advanced-clean-trucks-fact-sheet>.

20. Note: The Quebec ZEV standard regulates light duty vehicles, which are defined here as having a gross vehicle weight rating inferior to 4,500 kg, while the California ZEV standard excludes vehicles whose gross vehicle weight rating is greater than 3,856 kg. A segment of vehicles that will be regulated by California as heavy vehicles starting in 2024 (with few exceptions, identical to our own 2b or light/medium trucks from 3,856 to 4,536 kg) are therefore already subject to the Quebec standard.

21. Province of British Columbia. *Zero-Emission Vehicles Regulation*, 2020. https://www.bclaws.ca/civix/document/id/oic/oic_cur/0448_2020.

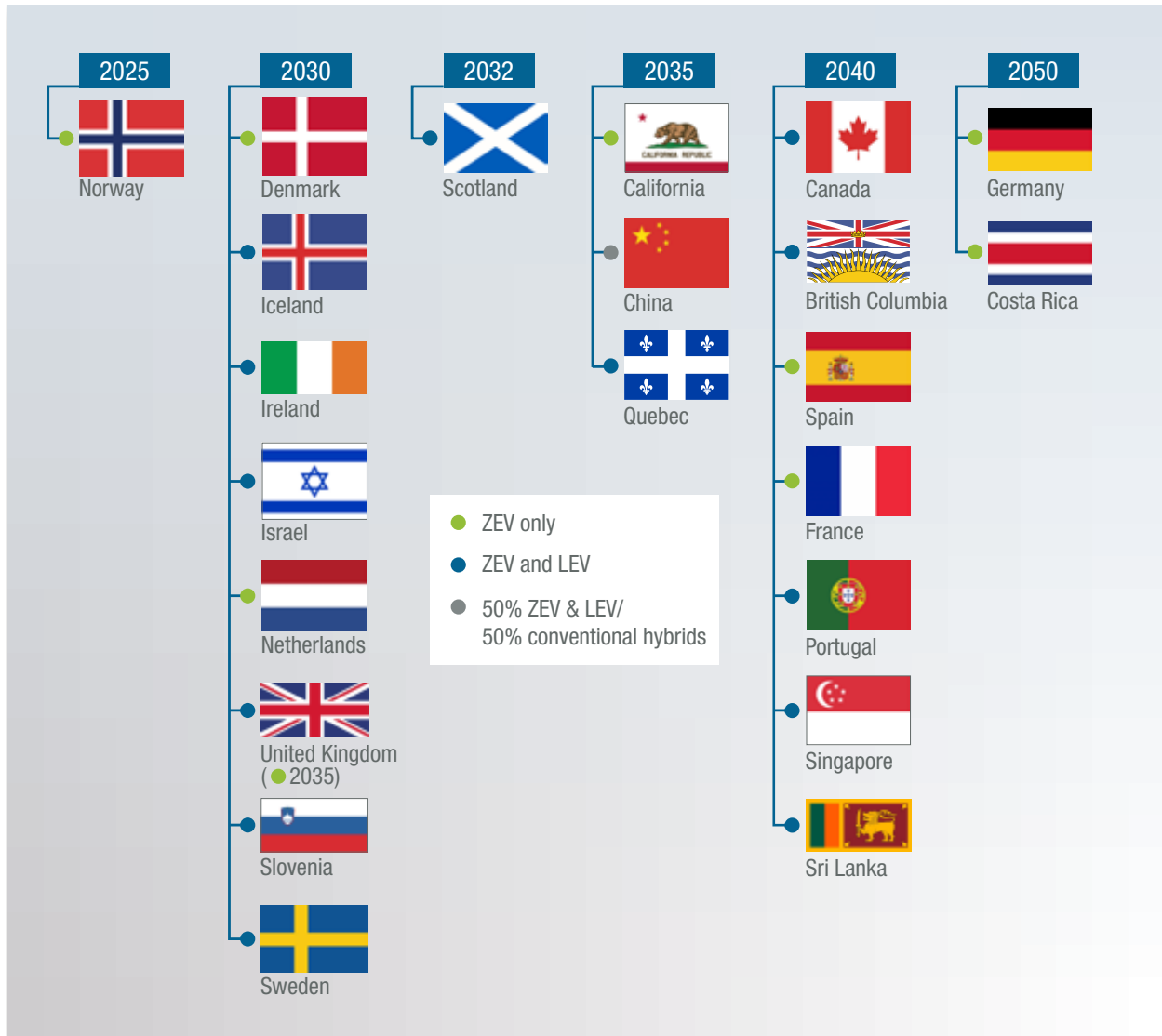
22. S. Tabet, "China plans to phase out conventional gas-burning cars by 2035," *Nikkei Asia*, 2020. <https://asia.nikkei.com/Business/Automobiles/China-plans-to-phase-out-conventional-gas-burning-cars-by-2035>.

23. C. Morris, "Nissan to sell only electrified cars in China by 2025," *Charged electric vehicles*, 2020. <https://chargedevs.com/newswire/nissan-to-sell-only-electrified-cars-in-china-by-2025/>.

24. BloombergNEF, *Electric Vehicle Outlook 2020*, 2020. <https://www.bnef.com/core/news/823777>.

The 2030 PGE, unveiled by the Government of Québec on November 16, 2020, set out its target of prohibiting the sale of new gasoline powered light vehicles starting in 2035. Even without a ZEV standard, other countries have announced similar objectives, using a variety of other tools to achieve this result (Figure 7)²⁵.

Figure 7
Countries, states and provinces
that have set 100% EV sales goals



25. BloombergNEF, *EV Policy: From Carrots to Sticks*, July 6, 2020.

Rather than choosing a ZEV standard, the European Union has, since 2020, put in place a new set of CO₂ targets based on fleet-wide sales, which the automobile industry was required to meet. Manufacturers must comply with the industry-wide CO₂ emission level of 95 grams per kilometre by 2021 to avoid major monetary penalties. This requirement puts additional pressure on motor vehicle manufacturers to give precedence to electric vehicles in the marketplace²⁶. By comparison, the Canadian GHG standard with comparable functionality requires performance of around 137 grams/km for the light motor vehicle fleet by the same year²⁷. Due to various measures that were put in place, the EV market share in Europe reached 16% in November 2020 (8% for ZEVs)²⁸.

4.2.1 Canada

At a January 2019 press conference, the federal Minister of Transport announced that the Government of Canada wanted the share of ZEV and plug-in hybrid vehicles to reach 10% of new vehicle sales in Canada by 2025, 30% by 2030 and 100% by 2040. Reaching these goals would also help achieve the government's GHG reduction target²⁹.

In 2019, the Government of Canada also announced an investment of \$300 M over three years as a new incentive to purchase zero-emission vehicles³⁰. The federal incentive is additional to Québec's.

26. McKinsey Center for Future Mobility, *The road ahead for e-mobility*, 2020. <https://www.mckinsey.com/~media/mckinsey/industries/automotive%20and%20assembly/our%20insights/the%20road%20ahead%20for%20%20mobility/the-road-ahead-for-e-mobility-vf.pdf>.

27. Environment and Climate Change Canada, discussion paper.

28. J. Pontes, "Record Electric Vehicle Sales In Europe!," *CleanTechnica*. <https://cleantechnica.com/2020/12/29/record-electric-vehicle-sales-in-europe/>.

29. Clean Energy Canada, *Canada targets 100% zero-emission vehicle sales by 2040*, 2019. <https://cleanenergycanada.org/canada-targets-100-zero-emission-vehicle-sales-by-2040/>.

30. Transport Canada, *Government of Canada invests in zero-emission vehicles*, 2019. <https://www.canada.ca/en/transport-canada/news/2019/04/government-of-canada-invests-in-zero-emission-vehicles.html>.



5 CONCLUSION

The ZEV standard is one of a group of tools and measures that the Government of Québec put in place to accelerate the use of electric vehicles in Québec. The measures are complementary and act in synergy. If the ZEV standard incentivizes motor vehicle manufacturers to market electric models in the province and meet growing consumer demand, other measures and tools remove barriers to purchasing. Improving the charging station network and providing incentives to reduce the added cost of purchasing a ZEV compared to an internal combustion engine model facilitate the transition to electric propulsion.

If it remains impossible to precisely quantify the number of registered electric vehicles on our roads due to the ZEV standard, its adoption played an important role in improving supply in recent years. The clear volition of the government, materialized in legislative tools, contributed to prioritizing the Québec market for some vehicle models, increasing the number of ZEVs on offer to consumers and making a greater number of models available.

The tools, procedures and information sharing mechanisms that were put in place successfully ensured implementation efficiency. All motor vehicle manufacturers that were subject to the standard and various small manufacturers that chose to join the credit market, cooperated fully with the MELCC.

As shown for the first compliance period, the results are evident, with all motor vehicle manufacturers meeting their 2018 model year requirements. The credits earned so far by the industry as a whole (including first compliance period leftover credits) would be sufficient to meet requirements for the 2019–2021 compliance period even if motor vehicle manufacturers sell no more electric vehicles between now and September 1, 2022, on condition that credits are exchanged or sold among them. This shows that motor vehicle manufacturers are able to comply to the standard in advance.

This observation, as well as current indications that demand still outpaces supply for certain vehicle models and leads to waiting lists that can sometimes be very long, raises the question of a potential tightening of the standard and increasing credit requirements. However, the standard tightening issue should be examined in the light of the existing gradual increase in requirements already set out in the standard and in the government's ambitious targets.

The credit market clearly works, because the potential for exchanging or selling credits has been used by motor vehicle manufacturers. This is especially true for automakers that market no electric models in Québec. The monetary impact on motor vehicle manufacturers remains unknown since the value of inter-company transactions is not currently shared with the MELCC. However, manufacturers use this option in tandem with marketing a diversity of vehicle models in order to ensure compliance. For other manufacturers, the credit market is a source of income that increases the appeal of Québec for the distribution of their vehicles.

The electrification of 91,363 light electric vehicles (December 31, 2020) puts Québec solidly at the front of the pack in Canada. The market slowdown, due to the COVID-19 pandemic, delayed the attainment of the 2020 target of 100,000 registered electric vehicles that was set out in the Transportation Electrification Action Plan. Nevertheless, this objective is likely to be reached during the first quarter of 2021. The share of electric models in new vehicle sales, which was 0.7% in 2015, increased to 6.6% in 2020.

The will to significantly electrify the transportation sector is stronger now throughout the world. Numerous countries have set a goal of 100% electric new vehicle sales for years that vary between 2025 and 2050. In particular, in September 2020 California announced its intention to completely prohibit the sale of non-ZEVs as of 2035. Additionally, the California Air Resources Board (CARB) intends next year to propose amendments to its own ZEV standard on which the Québec standard is based. Other States, which traditionally align their standards with California, will probably follow suit.

The PGE 2030, unveiled by the Government of Québec on November 16, 2020, clearly sets out two targets for light vehicles:

- 1.5 million electric vehicles on Québec roads in 2030 (around 30% of the light motor vehicle fleet)
- Sales of new gasoline powered vehicles prohibited starting in 2035

To reach these targets, it was announced that one of the levers in the basket of measures aimed at the electrification of individual mobility could be tightening the Québec ZEV standard.

The findings reported here will make it possible to improve the implementation of the ZEV standard and will be taken into account in future guidelines. In the summer of 2020, the MELCC began a series of stakeholder consultations that dealt with both results achieved so far by the ZEV standard and potential future improvements. Comments received are one of the sources of information feeding reflections on what is to come. The MELCC also intends to begin consultations in 2021 on defining a heavy-duty vehicle ZEV standard, as anticipated in the 2021-2026 Implementation Plan of the 2030 PGE.

It is certain that in the current state of the automotive market, the ZEV standard will continue to be accompanied by other measures to stimulate the adoption of electric vehicles and ensure that Québec succeeds in decarbonizing its transportation sector. The 2021-2026 Implementation Plan of the 2030 PGE still looks to supporting demand through incentives, charging network development and consumer education and awareness.

5.1 Next steps

In its 2021-2026 Implementation Plan of the 2030 PGE, the Government of Québec committed to tightening the requirements of the ZEV standard for light vehicles and to defining a ZEV standard for heavy-duty vehicles. The next steps in the process of implementing this law are as follows:

Administrative steps

- Continue regular current ZEV standard activities
- Table potential guidelines for the evolution of the ZEV standard, for approval
- Development of the future operation of the strengthened ZEV standard
- A Regulatory impact analysis with detailed cost-benefit analysis of the measure
- Writing a draft regulation and obtaining government prepublication approval

Public steps

- Prepublication, including a period of stakeholder consultations, and adoption (fall 2021)
- Public consultations to feed reflections on a heavy-duty vehicle ZEV standard (TBD, 2021)
- Report to the Government on the implementation of the ZEV Act by January 11, 2024. The report must also be tabled with the National Assembly within the next 15 days or, if the National Assembly is not sitting, within 15 days of resumption (required by section 66 of *ZEV Act*).

The implementation schedule for the new requirements remains to be determined.

Glossary, abbreviations and acronyms

- AVEQ: Association des véhicules électriques du Québec/Québec Electric Vehicle Association
- BEV: Battery electric vehicle
- CARB: California Air Resources Board
- CCAQ: Corporation des concessionnaires d'automobiles du Québec
- CZEQ: Coalition zéro émission Québec
- EPA: Environmental Protection Agency
- EV: Electric vehicle, comprehensive term that includes all zero-emission vehicles (ZEV) and low emission vehicles (LEV)
- GHG: Greenhouse gas
- HFCV: Hydrogen fuel cell vehicle
- IP 2021-2026: 2021-2026 Implementation Plan
- ISQ: Institut de la statistique du Québec
- km: kilometre
- kWh: kilowatt-hour
- LEV: Low-emission vehicle, category that includes plug-in hybrid electric vehicles (PHEV) and vehicles equipped with a range extender (VRE)
- LSV: Low-speed vehicle
- MELCC: Ministère de l'Environnement et de la Lutte contre les Changements climatiques
- PGE 2030: 2030 Plan for a Green Economy
- PHEV: Plug-in hybrid electric vehicle
- SAAQ: Société de l'assurance automobile du Québec
- SUV: Sport/utility vehicle
- TEAP: Transportation Electrification Action Plan
- UDDS: Urban Dynamometer Driving Schedule test protocol
- VIN: Vehicle identification number
- VRE: Vehicle equipped with a range extender
- ZEV Act: *Act to increase the number of zero-emission motor vehicles in Québec in order to reduce greenhouse gas and other pollutant emissions*
- ZEV Regulation: *Regulation respecting the application of the Act to increase the number of zero-emission motor vehicles in Québec in order to reduce greenhouse gas and other pollutant emissions*
- ZEV standard: Zero-emission vehicle standard
- ZEV: Zero-emission vehicle, category that includes battery electric vehicles (BEV) and hydrogen fuel cell vehicles (HFCV)

References

- Zero-emission vehicle standard
<https://www.environnement.gouv.qc.ca/changementsclimatiques/vze/index-en.htm>
- *Act to increase the number of zero-emission motor vehicles in Québec in order to reduce greenhouse gas and other pollutant emissions*
<http://legisquebec.gouv.qc.ca/en/ShowDoc/cs/A-33.02>
- Regulation respecting the application of the *Act to increase the number of zero-emission motor vehicles in Quebec in order to reduce greenhouse gas and other pollutant emissions*
<http://legisquebec.gouv.qc.ca/en/ShowDoc/cr/A-33.02.%20r.%201>
- Regulation respecting the limit on the number of credits that may be used by a motor vehicle manufacturer and the confidentiality of some information
<http://legisquebec.gouv.qc.ca/en/ShowDoc/cr/A-33.02.%20r.%202>
- List of credit-eligible new and reconditioned motor vehicles
https://www.environnement.gouv.qc.ca/changementsclimatiques/vze/ListeVZE_admissibles.pdf

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