



**National Assembly Committee on  
Transportation and the Environment**

Bill 104

An Act to increase the number of zero-emission motor vehicles in Québec in order to  
reduce greenhouse gas and other pollutant emissions

Submission by the  
**Canadian Vehicle Manufacturers' Association**  
Tuesday August 16, 2016

## **Bill 104**

### **An Act to increase the number of zero-emission motor vehicles in Québec in order to reduce greenhouse gas and other pollutant emissions**

On behalf of its member companies, FCA Canada Inc., Ford Motor Company of Canada, Limited and General Motors of Canada Company, the Canadian Vehicle Manufacturers' Association (CVMA) is pleased to provide the following submission respecting Bill 104 - An Act to increase the number of zero-emission motor vehicles in Québec in order to reduce greenhouse gas and other pollutant emissions. Together these companies produce annually about 60% of all light duty vehicles in Canada. Each one is a full line manufacturer building many different models of passenger vehicles equipped with advance emission reduction and fuel saving technologies, including electric vehicles, to reduce new vehicle greenhouse gas (GHG) and smog-related emissions.

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#### **I. Executive Summary**

The government of Québec has made its decision to regulate manufacturers and mandate the sale of electric vehicles. Bill 104 provides the legislative framework for such a mandate, which has been based on similar legislation in the U.S. North Eastern states and California. For the purposes of this discussion reference to Plug-in electric vehicles (PEVs), means plug-in hybrid electric vehicles (PHEV), pure battery electric vehicles (BEV) and fuel cell electric vehicle (FCEV).

The automotive industry is on record explicitly stating that a non-regulatory cooperative approach which focuses on mutually supportive policies to create consumer demand for PEVs would be more effective and sustainable than forcing an increasing ratio of PEVs versus conventional new vehicles in the market place. However, if the government proceeds, we are committed to work with the Québec government to improve Bill 104 and in essence, make it more effective and practical for all stakeholders to minimize the potential negative consequences. Our objective, like that of the government, is to develop and promote the adoption of lower GHG emitting vehicles and electric vehicles that are accessible and as convenient as conventionally powered vehicles, supported by a broad and readily accessible recharging infrastructure. Recharging infrastructure is critical to the consumer's plug-in value decision and ready use of the vehicle. What is important is that the

environmental benefits accrue not just through the adoption of the electric vehicles but rather the zero emissions kilometers driven that replace the kilometers driven by conventional vehicles. Zero emission kilometers are all the same to the environment regardless of the type of electric vehicle technology. Additional GHG emission reduction opportunities can be realized by accelerating the replacement of older higher emitting vehicles.

A ZEV (zero emission vehicle) mandate does not address the fundamental issue of customer demand and alone, it will not entice consumers to purchase ZEVs at the volumes and timelines announced by the Québec government. This is a reality that the government itself acknowledges in its briefing materials made public only very recently. The development of cost effective public policy must be founded in a fact-based approach and an understanding of the problem. The response in the form of government policies and/or regulation must be supported by a robust cost/benefit analysis that can only be done with input from stakeholders most impacted, among others. As the government develops its regulatory requirements, they must be developed in a manner that is consistent with consumer demand, the state of technology, environmental objectives and be financially sustainable for market participants over the long term. Based on the information released by the government it does not appear that it has satisfied the principles of its own policy for regulatory and administrative relief or the criteria set out in the regulatory impact analysis guidelines.

It is essential that the Government of Québec, vehicle manufacturers and new car dealers work collaboratively to create a successful and economically sustainable market for PEVs. It is also critical that we jointly pursue legislation and regulations, if demonstrated necessary, in a manner that avoids potential market failures that could ultimately impede progress in consumer adoption and actually dissuade consumers from considering electric vehicles as a potential option for their personal transportation needs in the future. Forcing consumers into technology that is still in development and into vehicles that don't yet meet their needs will risk turning consumers off the technology altogether. Therefore, it is critical that legislation and supporting regulations be practical, effective and be consistent with the business practices of the vehicle manufacturers and new vehicle dealerships in the province, reflecting the realities of the EV marketplace.

As Bill 104 was developed in the absence of broad-based industry input. Accordingly, CVMA members are providing necessary information on the significant progress being made in reducing GHG emissions from the on-road light duty fleet to date, the commitment of the industry to the development of electric vehicles and the real world challenges associated with their introduction; commentary on the deficiencies in the regulatory impact analysis conducted; assistance in understanding the history and application a zero emission regulation in the U.S. and its application in Québec; and finally recommendations respecting the proposed legislation should it proceed, along with related policies to promote acceptance and demand for electric vehicles.

## **II. A Record of Real Progress: On-Road Transportation Related GHG Smog-related emission reductions**

Taking into consideration the myriad of very stringent national vehicle emission regulatory actions imposed on both light and heavy duty on-road vehicles, the positive environmental impact for Québec and across the country is remarkable. In fact, the vehicle-related GHG and other smog-related emissions reductions and the resultant benefit to the environment derived from these standards are unparalleled by any other sector.

Automotive technology is advancing at an unprecedented pace and cleaner and more fuel efficient vehicles are being brought to market in an ever increasing array of models and numbers to keep pace with market demands. The progressively more stringent federal regulations require

unprecedented year-over-year improvements to all categories of light duty vehicles from now through 2025 that will result in a reduction of 50% in new vehicle GHG emissions.

The Government of Canada has implemented a number of extremely stringent regulations to address motor vehicle emissions and fuel formulations on a national basis that are aligned with the U.S., effectively creating a single North American standard :

- On-Road Vehicle and Engine Emission Regulations – Tier 2 – 2004-2016 model years
- Passenger Car and Light Duty Truck GHG Emission Regulations – 2011–2016 model years
- Heavy Duty Vehicle & Engine GHG Emission Regulations – 2014–2018 model years
- Passenger Car and Light Duty Truck GHG Emission Regulations – 2017–2025 model years
- On-Road Vehicle and Engine Emission Regulations – Tier 3 – 2017-2025 model years
- Heavy Duty Vehicle & Engine GHG Emission Regulations – 2019–2027 model years (in development).

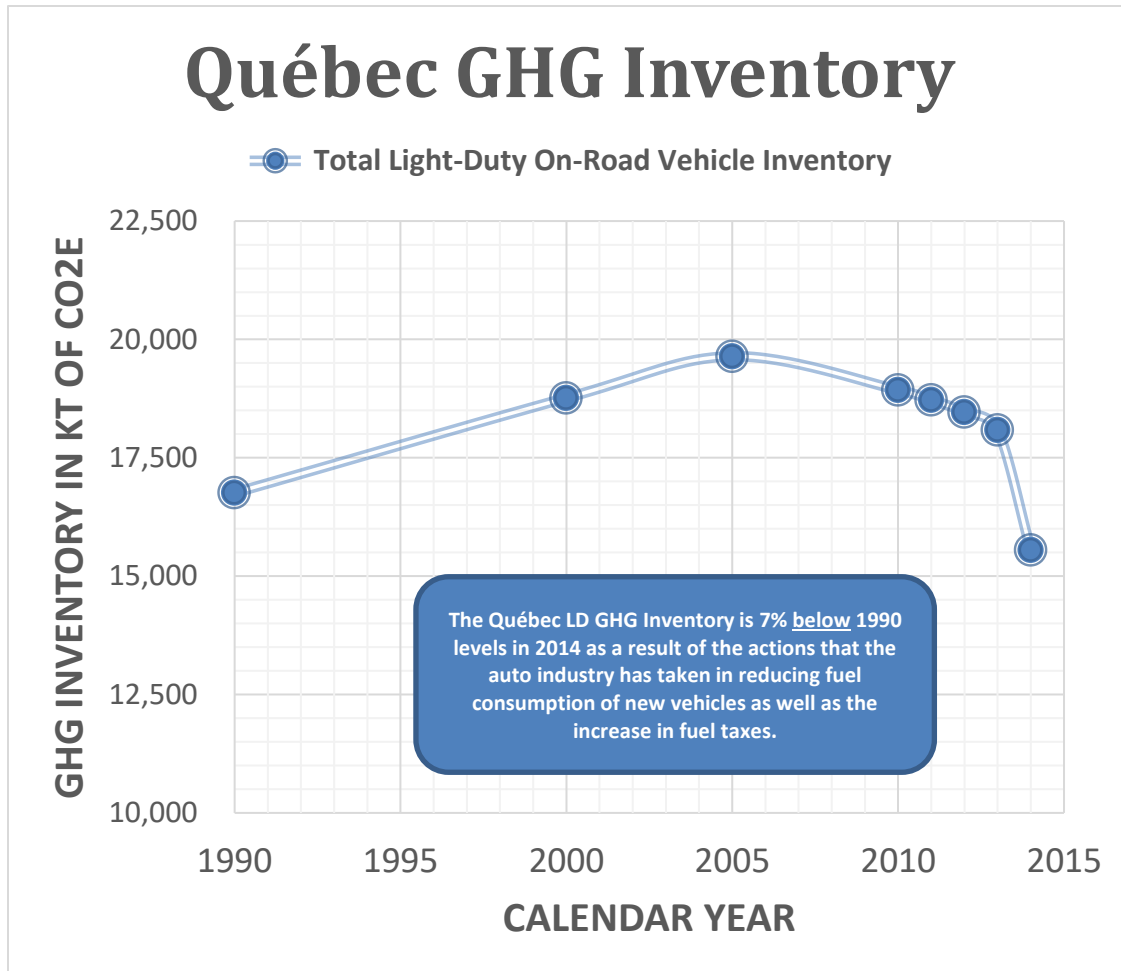
A more detailed account of these progressively stringent regulations appear in Appendix A.

## **II. a. What does this mean for Québec?**

Based on the most recent Environment and Climate Change Canada (ECCC) National GHG inventory report from 2014 CY for Québec<sup>1</sup>, light duty vehicle fleet GHGs are now 7% below 1990 levels and down 21% from the peak in 2005; this is illustrated in Figure 1 below. This GHG emission reduction trend will continue its downward direction as increasing numbers of new and increasingly more fuel efficient vehicles that meet the new more stringent GHG emission regulations enter the market through 2025 and beyond.

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<sup>1</sup> Table A11-10 from the ECCC 2015 GHG report to the IPCC

*Figure 1.*

### III. Electric and Fuel Cell Vehicle Development – A Committed Automotive Industry

The North American auto industry is investing over \$200 Billion in technologies to meet the 2012 to 2025 Federal GHG Regulations with over \$100 Billion in developing vehicle electrification technologies – the auto industry is indeed committed to electric vehicle technology.

The rate of new model introduction is unprecedented in the history of the automotive industry. Since 2011, 25 new plug-in electric vehicles have been introduced across a growing number of vehicle segments in Québec (growing to 29 models in 2017); one of the most recent being the FCA minivan produced in Windsor, Ontario, for the global market. More models are planned and this rapidly increasing the number of new PEV product offerings in the province has been made available in the absence of a legislative mandate. A list of currently available electric vehicles in Appendix B.

PEVs will be an increasingly important technology moving forward as the industry and consumers make the transition to lower carbon transportation options. While the high cost of this vehicle technology has started to decline, plug-in electric vehicle technology continues to have a significant cost premium over comparable conventional vehicles and consumers must be able to make a value judgement when selecting the most cost effective vehicle choices to meet their family and business

needs. At this time, the sale prices for PEVs, particularly battery electric vehicles, are still far below the cost to produce these vehicles for manufacturers. In effect, manufacturers are already incentivizing the vehicle to consumers at a level that actually far exceeds current governmental consumer incentives per vehicle. That is why ensuring a balanced approach in the near term is essential in order to allow the necessary further development and cost reduction of this technology that is critical for a successful longer term PEV market in the future.

The extensive investments being made in PEV development will all be for not, in the absence of a vibrant and strong commercially viable PEV market. Contrary to certain opinion, automakers want to ultimately further develop the technology to have a successful and financially sustainable PEV market. For this purpose, this means expanding beyond early adopters of first and second generation PEV technology to develop third and fourth generation vehicles which will be more cost effective for consumers and have much higher mass appeal. Aside from the needed product development to further reduce PEV costs, the automotive industry is undertaking many steps as individual companies and in conjunction with their dealer organizations to promote consumer acceptance and fostering demand for electric vehicles. This is being done through public education, product promotion campaigns, partnerships in vehicle demonstration and pursue ways to enhance the EV customer purchasing experience. As one example, the CCAQ has introduced a comprehensive website for consumers to assist them understanding the environmental and economic benefits of PEV and most importantly, what models are available and at what dealerships in the province. It is an extremely valuable to for consumers in the EV market.

Advancing the transition to a successful PEV market will require several success factors to be pursued in collaboration with government and all key stakeholders. Please see additional comments below.

#### **IV. Regulatory Impact Analysis**

The Québec government has made an effort to assess the benefits and the costs of establishing a ZEV mandate as it applies to the environment, the government, consumers, and each economic sector, including car manufacturers and car dealerships. Based on its analysis, the government suggests that the ZEV standard would generate less benefits than costs (a negative cost vs benefit ratio) in model years 2018 to 2024 and only a marginal positive cost/benefit in model year 2025 (ratio of 1.01). This alone questions the basis on which Québec is proceeding with its legislation.

The analysis conducted by the Ministry significantly understates costs and makes assumptions and conclusions that are characterized by a high degree of speculation. The analysis seems to have ignored the work of other regulatory agencies that have attempted to assess the cost of PEV technologies, developed in conjunction with the U.S. LDV GHG regulations for the period of 2017-2015. Québec's analysis was completed without any input from manufacturers and new car dealers who know their business best.

By understanding the incremental cost per vehicle of PEV technologies, the cost to the consumer is not accurately captured in the Québec analysis. The NHTSA table below provides the cost of technology for a plug-in hybrid vehicle (30 mile/48 km range) and electric vehicle (150 mile/240 km range). The cost of these technologies based on the table below would far exceed the government's reported net cost to manufacturers of \$16.7 million in the increase cost of production of plug-in electric vehicles. By using the estimate of the total incremental cost of PHEV and BEV vehicles using an average vehicle technology cost of \$10,000 (\$U.S.) per unit based on the NHTSA data and the Québec 2020 volume of 100,000 units, the true cost to manufacturers is approximately \$1 Billion. The total cost of this program at 2020 far exceeds the benefit calculated over the entire timeframe of the legislation. Industry believes that the incremental technology costs are actually much higher than the NHTA estimates.

Despite the cost impacts, individual manufacturers are already making business decisions to heavily incent the price of PEVs in the market in an effort to create early consumers demand for these products, at significantly higher levels than what the Québec government currently provides in consumer purchase incentives; estimated vehicle manufacturers losses are in the range of \$12,000 to \$20,000 per PHEV or BEV. The sale of electric cars currently and for the foreseeable future will require significant automaker subsidies (in addition to government consumer incentives already in place). As with any business or industry, there is only so much subsidization that can occur before the underlying economics of designing, manufacturing and selling automobiles in the market is compromised and unsustainable.

In the Final Rule for 2017 and Later Model Year Light-Duty Vehicles the National Highway Traffic and Safety Administration (NHTSA) provides the following estimates (\$USD) of plug-in hybrid and electric vehicle estimated costs for a mid-size passenger car for 2012-2025 model year<sup>2</sup>;

TABLE IV-73—NHTSA ESTIMATED NET (ACCUMULATED) TECHNOLOGY COSTS, MIDSIZE PC

| Final technology (as compared to baseline vehicle prior to technology application) |             | MY Baseline | 2012            | 2017            | 2021           | 2025           |
|--|-------------|-------------|-----------------|-----------------|----------------|----------------|
| Plug-in Hybrid—30 mi range .....   | PHEV1 ..... | 2008 .....  | \$17,415- ..... | \$13,060- ..... | \$9,727- ..... | \$7,772- ..... |
|  |             | 2010 .....  | \$17,915 .....  | \$13,449 .....  | \$10,019 ..... | \$8,015 .....  |
| Electric Vehicle (Broad Market)—150 mile range.                                    | EV4 .....   | 2008 .....  | \$14,970- ..... | \$10,526- ..... | \$7,682- ..... | \$5,640- ..... |
|  |             | 2010 .....  | \$15,145 .....  | \$10,648 .....  | \$7,771 .....  | \$5,705 .....  |

The California Air Resources Board (CARB) has also spoken to the issue of the incremental costs of ZEVs. In the 7-Dec-2011 Initial Statement of Reasons (ISOR), page 60, ARB estimates the incremental costs of various ZEVs (PHEVs, BEVs, and FCEVs) compared to a similar gasoline vehicle. For example and looking at the highlighted line below, if a mid-size gasoline car cost \$25,000 in 2016, the equivalent electric vehicle, including residential recharging equipment with a 75-mile range (BEV75) would cost \$42,562. In 2025, the equivalent BEV75 would cost \$34,794.

<sup>2</sup> **Reference: Federal Register** / Vol. 77, No. 199 / Monday, October 15, 2012 – 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards; Final Rule

**Table 5.4: Incremental technology package prices above average MY2016 baseline technology (2009\$)<sup>1</sup>**

| Vehicle Class           | Technology Package (energy capacity) <sup>2</sup> | Incremental Vehicle Price in 2016 | Incremental Vehicle Price in 2025 |
|-------------------------|---|-----------------------------------|-----------------------------------|
| Subcompact              | PHEV20 <sup>3</sup> (6.6 kWh)                     | 13,233                            | 8,448                             |
|                         | PHEV40 (13.4 kWh)                                 | 16,580                            | 10,259                            |
|                         | BEV75 <sup>4</sup> (23 kWh)                       | 17,010                            | 9,405                             |
|                         | BEV100 (30 kWh)                                   | 19,655                            | 10,829                            |
|                         | FCV <sup>5</sup> (3.3 kg H <sub>2</sub> )         | 19,060                            | 7,513                             |
| Midsize car / Small MPV | PHEV20 (7.7 kWh)                                  | 13,807                            | 8,876                             |
|                         | PHEV40 (15.5 kWh)                                 | 17,818                            | 11,043                            |
|                         | BEV75 (27 kWh)                                    | 17,562                            | 9,794                             |
|                         | BEV100 (35 kWh)                                   | 20,785                            | 11,551                            |
|                         | FCV (3.8 kg H <sub>2</sub> )                      | 23,472                            | 9,334                             |
| Large Car               | PHEV20 (9.1 kWh)                                  | 17,280                            | 11,205                            |
|                         | PHEV40 (18.7 kWh)                                 | 23,134                            | 14,390                            |
|                         | BEV75 (30 kWh)                                    | 20,820                            | 11,628                            |
|                         | BEV100 (40 kWh)                                   | 23,959                            | 13,363                            |
|                         | FCV (4.3 kg H <sub>2</sub> )                      | 33,238                            | 13,406                            |

<sup>1</sup> Refer to the LEV/III ISOR Section III-A-4.3 and Appendix R for additional vehicle packages

<sup>2</sup> Energy capacity for BEV/PHEV is kWh rated battery pack capacity, kg H<sub>2</sub> for FCV

<sup>3</sup> EPA and NHTSA designation for a PHEV is a "range extended electric vehicle" or REEV.

<sup>4</sup> For BEVs and PHEVs, the residential charging equipment costs are included in these technology packages.

<sup>5</sup> FCV costs include the fuel cell system (as shown in later figures), the hydrogen storage system, the hybrid battery module, and other EV components and power electronics similar to the BEV technology package.

The date on which the analysis was conducted is also an indication of how far in advance the U.S. federal and state jurisdictions have studied the program design issues recognizing the complexities and industry's need for reasonable lead time to develop and commercialize these technologies to a point where they meet customers' needs and that they are financially sustainable. While designing its legislation after the California program, Québec has neither consulted with industry, nor is it providing industry with a similar period of advance notice before the coming into force of its program.

## V. Québec New Vehicle Dealer Impacts

The province's impact assessment indicates that new vehicle dealers selling passenger cars and light-duty vehicles are not subject to the draft standard, but can be indirectly affected by it. The CCAQ, representing 860 dealerships in the province (96%), expresses great concern over the impact of the legislation on dealers businesses and have questioned why the legislation should proceed given the very positive PEV market in Québec. CVMA support the CCAQ's position.

The province makes no estimate of the costs relating to investments needed to become certified PEV sales and service dealerships. However, in order to become certified, it is estimated that a dealer would incur the investment costs of special EV tools and technician training estimated to be in the range of \$10,000 to \$20,000 per dealer. There is also no estimate for the increased inventory costs that dealers will potentially face as they hold increased PEV vehicle inventories as a result of supply that exceeds market demand.

The CVMA also suggests that the impact assessment makes no account of lost sales tax revenues, missed sales opportunities and sales leakage impacts for Québec dealers due to the potential constraints incurred on the sale of new non-electric vehicles because of the forced sales quotas under the legislation. Under a ZEV mandate, the manufacturer sale of non-plug-in vehicles to dealers would likely need to be reduced in order to attain the prescribed plug-in to non-plug-in vehicle sales ratio. It is estimated that between 100,000 & 200,000 consumers a year may not be able to buy the vehicles they need to meet their family or business needs. In such a case, the government would not realize the commensurate sales tax revenues associated with lost vehicle sales, nor would dealers realize the sales opportunity of such vehicles and the related economic benefit to their business.

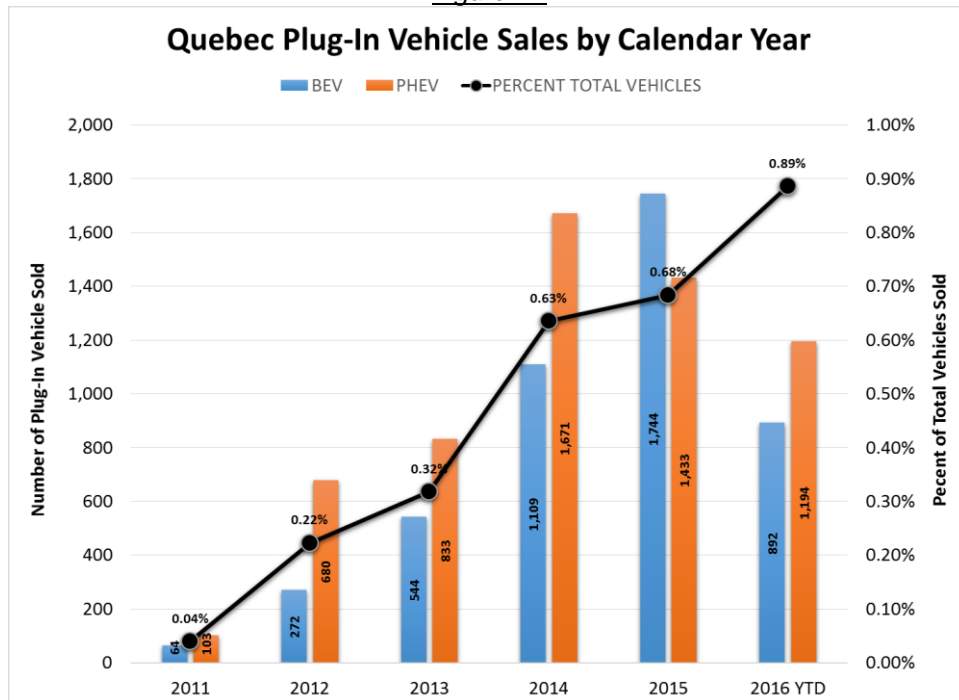


## VI. Québec's Electric Vehicle Market and Product Availability

Consumer support programs implemented by Québec to stimulate the purchase of plug-in vehicles and develop the charging infrastructure have ensured that Québec is leading the pack in Canada with roughly 60% of sales of electric vehicles, while its population amounts to 23% of that of Canada. In 2013 there were 2,496 registered sales of PEVs on Québec roads which has grown significantly to 10,539 by mid-June 2016 – this represents a remarkable increase of 322% over this period (see Figure 2.). This level of growth has been achieved because of Québec's leadership in introducing supportive and coordinated policies aimed at promoting consumer acceptance for these vehicles, not by legislative means. In fact, this growth rates exceeds many of the North Eastern U.S. states that have instituted ZEV mandates consistent with the state of California for more than a decade.

To its credit Québec has and continues to pursue a multitude of mutually supporting policies which have and will contribute to increasing consumer demand for PEVs, without regulation. The results of these efforts can be further enhanced by collaborating and coordinating with industry in its efforts to promote the acceptance and adoption of the EVs.

Figure 2<sup>3</sup>.



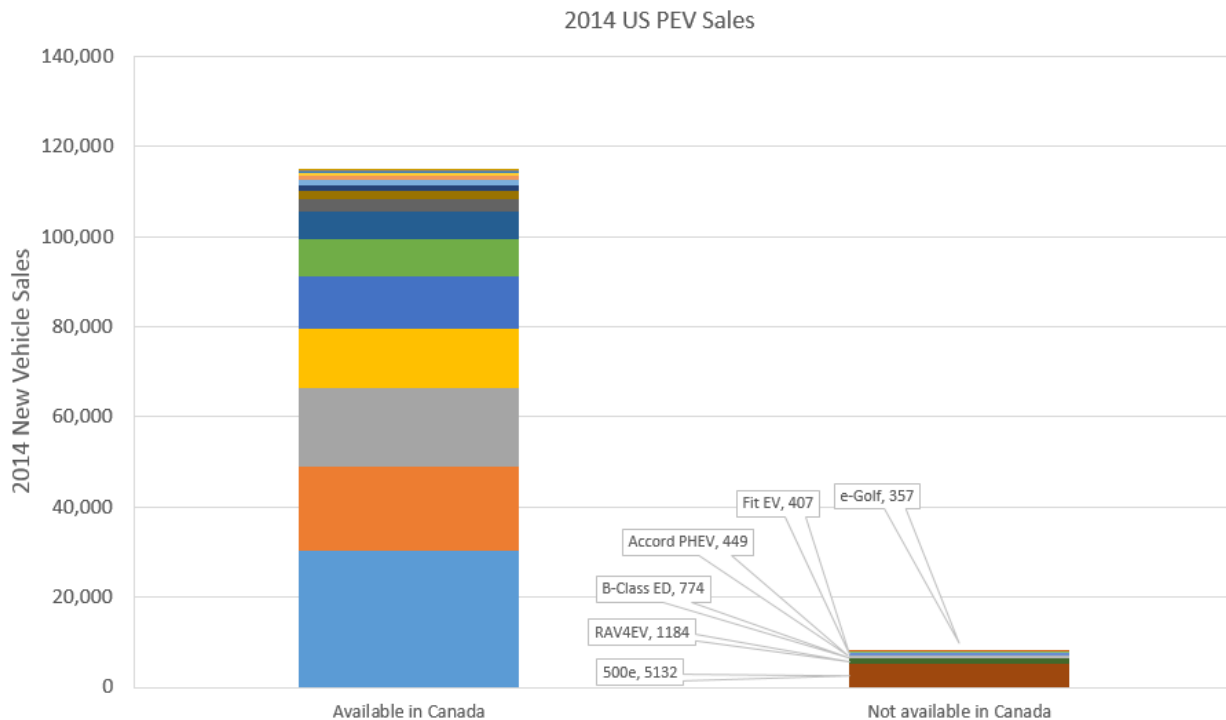
Notwithstanding Québec's remarkable success in the PEV market, it has chosen to introduce a ZEV mandate that will regulate manufacturers' to force the supply of electric vehicles to its dealers over and above expected customer demand under a credit percentage system similar to what is adopted in the NE U.S. states and California, starting in 2018. It has chosen this approach as it believes that this will lead to more electric model availability for consumers given that a few products are available in other jurisdictions; it is the government's belief that this will help the government achieve its goal of 100,000 PEVs in 2020 and ultimately 1 million in 2030.

<sup>3</sup> Source: IHS Polk Sales Registration Data

The chart below (Figure 3.) illustrates the number of models of PEVs for sale in California but not presently available in Québec or in some instances in the NE U.S. states. At this time, Québec is receiving all but 6 models identified in the graph which cumulatively represent only 6.7% of all US PEV sales in 2014. Even this list of 6 products not available in Québec will be reduced to 5 by 2017. Additional announcements are forthcoming and new PEVs continue to be introduced in the province.

*Figure 3.*

### US Vehicles Sales of Models Sold and Not Sold in Canada



**Source:** *Ease of Purchasing EVs in Canada*, Final Report for Environment Canada, FleetCarma, Report Issued: 10.11.2015

Environment and Climate Change Canada has also conducted an assessment of electric vehicle models available in several countries abroad. It must be noted that manufacturers selling vehicles in Canada must meet all applicable safety and emissions standards and regulatory requirements. In the interest of safety and the environment, CVMA does not support reducing the applicable Canadian consumer safety or emission requirements to simply accommodate some additional PEVs models that may be available in another country with less stringent consumer safety standards.

Concern has also been expressed over the lack of PEV models available at dealerships for test drives or in other instances, perceived delays in delivery. As Québec considers its new law, it must recognize the business practices of the vehicle manufacturers and their business relationship with their dealers in terms of how vehicles are sold to dealers in response to consumer demand. Dealer inventory is monitored and managed in response to consumer demand for a given product. Dealers order electric vehicles from the manufacturer on that basis, like any other conventional vehicle. It is a balancing act as no dealer wants to carry or can afford to carry excessive inventory for many months without sales. And like any new model introduction or during a new model turnover, delivery time may be impacted by a number of factors, similar to those impacting delivery times for conventional vehicles as well.

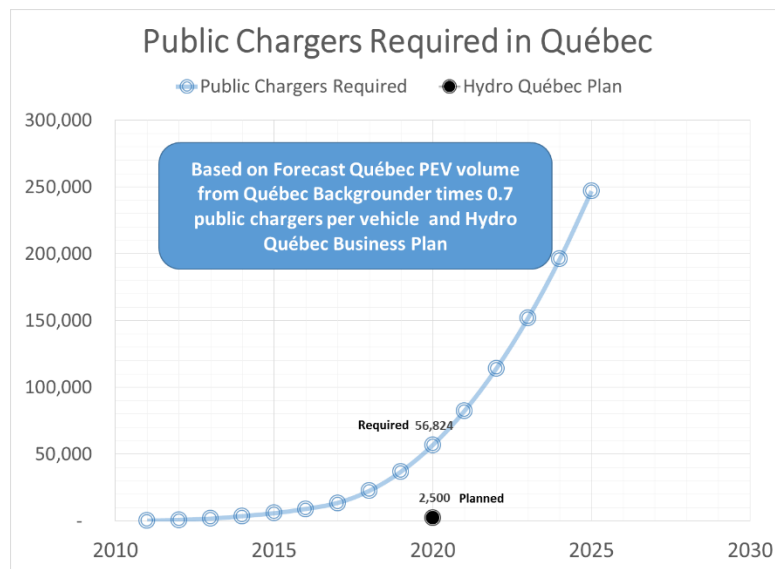
As mentioned the ZEV mandate may force supply/sale by the manufacturer to its dealers but it is the dealer, an independent business entity that must make the retail sale to the consumer to ensure a registration for ZEV vehicle credit. Forced excess supply to the dealer does not guarantee consumer demand or a sale. It is certain however that vehicle manufactures and their dealers will respond to the consumer demand for these vehicles as they have done over the last number of years which has resulted in significant year over year sales increases of PEVs in the province. A ZEV regulation will not change this reality, nor will it change the trajectory of electric vehicle technology development.

## **VII. Recharging Infrastructure**

Québec's ready supply of clean and abundant hydroelectric power provides a renewable transportation fuel option. However, expanding the on-road fleet of plug-in vehicles is still a challenge. As previously mentioned: plug-in vehicles will be significantly more costly to produce until technology evolves over multiple design iterations and the production scale of more cost effective future designs reach global levels. BEVs also have range limitations particularly in cold or adverse weather conditions and a limited charging infrastructure be it for home, work or public access.

Each of these challenges can be addressed through public policy, but each will require significant investment. Québec has been considering a variety of options to help develop recharging infrastructure including: changing building codes to require home, workplace, and other charging locations, or at a minimum, building requirements to allow for future charging station installation. Workplaces, condominiums, public parking and shopping malls are all opportunities for convenient mass charging.

Future trends in ZEV markets are highly uncertain, as are the development patterns for corresponding electric vehicle recharging infrastructure. However, what is certain is that expanding the network of readily accessible charging stations is critically important for customers to make the PEV value decision and increase the demand for PEVs. Despite infrastructure investment and Hydro Québec's business plan to introduce an additional 2,500 recharging stations, this planned number of charging stations is well below what will be required to service the present and anticipated fleet growth in the EV market at a level of efficiency and user satisfaction. The attached chart illustrates the anticipated level of recharging stations needed to service the forecasted growth in EVs.

Figure 4.

As concluded in the National Renewable Energy Laboratory (NREL), May 2014 report: California Statewide Plug-in Electric Vehicle Infrastructure Assessment, it is too early at this stage in the electric vehicle market development to prescribe detailed plans for infrastructure deployment, however, it is possible to outline a range of infrastructure expansion scenarios based on various market conditions. While a number of studies have been occupied with this question, it is likely that a range of 1.25 to 1.7<sup>4</sup> <sup>5</sup> recharging stations per PEV can be estimated to adequately service the EV owners' recharging needs. This study includes the assumption that each PEV consumer will have home charging station installed.

As new recharging station projects continue to be funded and installed, additional empirical and statistical data will need to be collected on an ongoing basis to better calibrate planning and ZEV market projections. The need for additional data and market experience has been a recurring theme expressed by many PEV stakeholders and research organizations with respect to charging infrastructure planning.

### **VIII. Understanding the California (and NE State) ZEV Mandate**

The "California ZEV" program has been revered by many, including Québec, as a success story. What is not well understood is that the original California's ZEV program began as part of the Low Emission Vehicle (LEV I) regulations in 1990 to address significant local air quality issues associated with smog. Subsequently, requirements were added that called for specified percentages of 1998 and subsequent model passenger cars and light-duty trucks be certified as ZEVs. More specifically, manufacturers were required to produce and sell ZEVs to dealers. Surprisingly, the resultant

<sup>4</sup> Report to municipalities in the State of Missouri author by Luke Hagedorn - a regulatory and transactional attorney in the Energy Practice Group at Polsinelli Shughart), „Preparing for Electric Vehicles: How Missouri Communities Can Get Ready; by Luke Hagedorn

<sup>5</sup> Long-Range EV Charging Infrastructure Plan for Western Washington; DRAFT Version 2.0 ,June 2010, ECotality North America

improvements to air quality were not from the very small number of ZEV electric vehicles but by all the new gasoline vehicles that were required to meet the more stringent criteria emission standards associated with the original ZEV standards.

As originally adopted in the 1990-1991 LEV I rulemaking, the percentages of ZEVs were 2% for 1998-2000 model vehicles, 5% for 2001-2002 model vehicles, and 10% for 2003 and subsequent model vehicles. The LEV I and subsequently LEVII and LEVIII iterations were extremely complex but provided flexibilities and options to assist manufacturers with compliance. Despite these flexibilities, the credit based ZEV program has been revised 6 times since its original inception – in 1996, 1998/1999, 2001, 2003, 2008, and most recently in 2012 recognizing of the fact that targets set were unrealistic. Nine additional states (CAA Section 177)<sup>6</sup>, including a number of U.S. NE States, did not join the program until later dates. These states adopted elements of the California program and some additional flexibilities. For example, the “Travel Provision” provision in the ZEV regulations allows a manufacturer to deliver a ZEV in one Section 177 State and count it as though it were proportionally produced and delivered in ALL section 177 states. The net effect of the traveler provision was that the number of ZEV credits a manufacturer needed to accumulate in each section 177 state was significantly reduced.

In total after 25 years, California with a new vehicle market of 2 million in 2015 has a ZEV adoption rate of 3.1%, with BEVs being 1.7% and PHEVs being 1.4%<sup>7</sup>.

California (and Section 177 states) will now be introducing a revised ZEV mandate regulation from 2018-2025 focused on reducing GHG emissions and criteria emission from light duty vehicle fleet. The regulation includes sweeping modifications and substantially increased requirements compared to the previous regulation. Québec legislation is based on the untested 2018 plus California ZEV regulation, specifically the requirements of the U.S. NE states, adopting the same ZEV credit approach but without the additional flexibility of credit banks, longer phase-in periods and, travel credits etc.

Similar to that in California and the NE U.S. states, Bill 104 would require medium and large volume vehicle manufacturers, as defined, to sell the percentage of plug-in vehicles (PEVs and HFEV) dictated by the legislation. In very simple terms, a vehicle manufacturer must sell a certain percentage of PEVs to their dealers using a sales quota/credit system and/or restrict the sale of non-electric vehicles in order to meet the specified percentage sales targets. As mentioned and contrary to assertions that Québec dealers will not be impacted, the sales ratio requirements will likely significantly diminish the overall market for non-electric vehicles, resulting in lost sales opportunities, and lost revenues for their businesses and a greater number of Québec consumers that will likely not be able to purchase vehicles meeting their family and business needs. This could also result in consumers retaining their older higher emitting vehicles and slow down the turnover of the on-road fleet and in the end, actually increasing on road vehicle fleet GHG emissions!

At this time, without substantial incentives, the cost of plug-in vehicles can be prohibitive to the average consumer. Plug-in models, particularly all electric (or battery electric) are typically only small to midsize vehicles and have other limitations such as reduced utility, short driving ranges, climate sensitivity, and significant recharge times. Contrary to the U.S., Québecers average only one vehicle per household which must meet all of their needs. In the U.S., despite various state sales incentives, there are concerns that the future ZEV sales requirements cannot be met in the time prescribed, particularly in the colder, less-populous Northeast states that have adopted the ZEV

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<sup>6</sup> Section 177 ZEV State: a state that is administering the California ZEV requirements pursuant to section 177 of the federal Clean Air Act (42 U.S.C. Sec. 7507)

<sup>7</sup> <http://www.hybridcars.com/california-plug-in-sales-led-us-last-year-with-nearly-five-times-greater-market-share/>

requirements. Importantly, many of the compliance flexibilities available in previous ZEV program have been removed making compliance more difficult. Without a similarly, long-established program, excluding these flexibilities in Québec will negatively impact the industry and the economy even more significantly.

### **IX. Why is Québec's ZEV mandate more onerous than the NE States and California?**

The state of California has had over quarter of a century of experience and efforts associated with promoting zero emission vehicles to consumers, with government officials holding countless public consultation meetings and biannual program reviews over the years with the auto industry and other stakeholders seeking valuable input. Québec, which has not held any formal consultation to date, has scribed legislation somewhat based on California's 2018-2025 regulation, without making adjustments to reflect Québec's new vehicle market size which is only a quarter the size of California. The legislation is also inconsistent with the province's existing vehicle GHG emission regulation and vehicle categorization, and it creates impractical company reporting requirements and timing, just to mention a few of the more administrative-related concerns, let alone the more substantive issues. To this end, we are pleased that the Parliamentary Commission is now holding hearings on Bill 104 and we remain committed to providing input and assistance in finalizing the legislation and future development of the supporting regulations.

As mentioned above, the 2018 plus ZEV regulations in California and the US NE States includes sweeping modifications that substantially increased the stringency of the requirements compared to the previous regulation after 25 years of credits banking and program development. A direct adoption of these more stringent U.S. regulations will be very challenging when starting a new program in Québec. Several differences in Bill 104 also exist relative to the regulations in the NE States making the compliance task for vehicle manufacturers even more onerous in Québec. The following is not exhaustive list and thus demonstrates the need for significant consultation with industry:

- U.S. states that adopted the California ZEV requirements provided industry with 2 full years lead time from the date on which the regulations became effective, enabling manufacturers to adjust product mix, train and equip dealerships to sell and service. Also many U.S. North Eastern States provided an average of 5 years of early action credits where manufacturers could collect and bank for sales in years prior to the start of their original regulatory ZEV programs. It should also be acknowledged that progress in the U.S. NE States is significantly behind California in terms of sales rates of PEVs with those credit banks anticipated to be depleted in approximately 2021. In Québec, the lead time indicated in the legislation is inadequate for vehicle manufacturers to plan and adjust product plans for compliance with the legislation. In addition, the early action credits for sales of PEVs prior to the potential start of the regulation, are for only 2 years prior to the start of the regulations, whereas, NE States provided 5 years of early action sales credits and many also provided a multiplier to the earliest of these credits.
- There is no definition or specification in the legislation respecting the level of credits assigned to the type of qualifying technology. This definition should appropriately be detailed in the regulation. However, this makes the task of planning even more difficult given that 2016 model year is more than half over and the 2017 model year has already commenced.
- Motor vehicle definition: the designation of 4500 kg GVW for light duty vehicles. Québec must align vehicle categories with existing Québec GHG vehicle regulations, Canadian vehicle GHG regulations, and the US federal or California definitions; it should be 3855 kg GVW; vehicles in excess of 3855 kg GVW should be excluded from the requirements of the legislation.

- The definition of small volume manufacturer's exemption limit seems to have been inappropriately copied from the California regulation at 4,500 vehicles sales per year, even though the Californian new vehicle market is 4 times the size of the Québec new vehicle market. In order to have a comparable and proportional small vehicle exemption limit in Québec vs California, the Québec legislation and regulations should reduce the California vehicle sales manufacturer thresholds by a factor of 4. Thereby making the small volume manufacturer threshold in Québec 1,200 vehicle sales per year. This would ensure that the Québec program defines OEMs comparably/proportionately to California.
- The legislation states that only by registering vehicles that meet the government's prescribed criteria may a vehicle manufacturer accumulate credits under the Act. The language as written does not appear to comprehend the reality of the business relationship between dealers and manufacturers. Vehicle manufacturers sell wholesale to the dealer and have no legal or other control over a dealer who is responsible for the retail sale of the vehicle to the retail customer. The Québec new vehicle GHG regulation already comprehends this factor and requires the reporting and measurement of manufacture to produce and deliver to dealers for sale (wholesale). This is consistent with comparable California regulations under which the Québec new vehicle GHG regulations was modeled under. Québec must define the term "sale" in a manner consistent with Québec existing new vehicle GHG regulation, as manufacturers have no control over the independent dealer's retail sale to the customer.

#### **X. Bill 104: Recommended Revisions**

Legislation such as Bill 104 should ideally provide government with the enabling authority to meet the public policy goals it has set out but also ensure it affords the government maximum flexibility to set regulations that more appropriately set out the specific requirements for compliance, reporting and enforcement. Upon review of Bill 104, CVMA makes the following recommendations for revision which we believe will make the legislation more effective and responsive to the objectives it was drafted to achieve:

1. Full flexibility with regards to compliant electrified vehicle type mix
  - Allow the accumulation of credits for defined PHEVs and BEVs with no restriction on minimum or maximum credit levels in these categories. Allow full compliance with PHEVs with no minimum requirement for specific technology types.
2. Delay implementation for the first effective model year
  - At a minimum two calendar years following the calendar year in which the regulations are finalized; an alternative is to make the first few years reporting only.
3. Incentives for early actions and the establishment of the Credit Bank
  - Support early credit banking model years and expand the time period in legislation, beyond 2016-2017 period currently specified in the proposed Québec legislation. The US NE States provided an average of 5 years of early action credits in advance of the start of the original ZEV regulations. These early actions often included multipliers of the earliest years of PEVs sales.

- Allow the regulation to establish credit multipliers by providing provisions for higher credits per vehicle; credits for fleet actions; credits for investment in supporting policies and credits at California values or,
  - Provide a bank of credits for each vehicle manufacturer proportional to California, similar to that which some NE States instituted at the beginning of their program.
4. Incorporate program reviews at a more frequent interval than the legislative proposal of every 5 years
    - Initial program review after 2 years at first and then every 5 years once experience has been gained, or every two years like California
  5. Minimize penalty risk
    - Suspend penalty provisions during the first 3 full years of the program and permit greater flexibility to purchase credit balances from the government to cover any deficit, as well as unlimited carry forward and carry backward provisions
  6. Fleet phase-in flexibility
    - Flexibilities are essential under regulation to phase in the electric vehicle fleet; options could include.
      - Limit application to major urban areas. Analysis of the Québec automotive market indicates that approximately 65% of the fleet is sold in the 15 largest urban market areas in Québec. By initially requiring 65% of the light duty fleet to be regulated in the first year of the ZEV program and gradually increasing the percentage of the fleet in subsequent years, the regulations could allow the Québec charging infrastructure and consumer demand to mature
      - Elimination of Work Trucks over 3855 kg (8500 lb) GVWR; The California and North East US State ZEV programs clearly exclude work trucks (heavy duty pickups and vans whereas Bill 104 does not. This needs to be corrected in the Bill to ensure that the same vehicles are addressed. The wording from California regulation Title 13, California Code of Regulations, would be more appropriate. Work trucks under 3855 kg GVWR should also be excluded given the special utility they provide to consumers who may be able to afford only one the vehicle.

## **XI. Recommendations In Support of Adoption of PEVs and Reducing GHG emissions from the Light Duty Vehicle Sector**

There are multiple strategies available to increase consumer demand for PEVs, while concurrently accelerating GHG reduction:

- Québec to provide ongoing support, along with Hydro Québec to greatly enhance the recharging/refuelling infrastructure requirements at Home, Workplaces and on Highways. Charging infrastructure requirements must lead PEV increased introduction on the market by 2-3 years in order for the consumers to see that there is adequate infrastructure in place and available in support of the PEV purchase.
- Accelerate fleet turnover: utilize supporting policies to help remove older polluting and less fuel efficient vehicles and replace them ideally with PEVs or more fuel efficient gasoline or alternate fuel vehicles where they are needed to meet consumers' transportation needs.



According to the Société de l'assurance automobile du Québec (SAAQ), the average life of a light duty vehicle in Québec is estimated at 12.3 years based on the number of vehicles in circulation from 2006 to 2011. In Québec 33% of vehicles on the road are 12 years or older and emit 20% to 30% more GHGs per kilometer than similar new vehicles.

- Government:
  - Maintain and potentially increase Electrified Vehicle (EV) purchase incentives
  - Sales tax relief
  - Increased EV procurement in government and private fleets
  - Pursue additional mutually supportive policies that strengthen the value equations for consumers to consider purchase PEVs and develop infrastructure availability that support consumer use of PEVs.
- Industry:
  - Ongoing annual new light duty vehicle GHG emission improvements;
  - Ongoing expansion of EV product availability
  - EV Promotion (via Advertising; Media; Ride & Drives; Public Education)
  - Expanded Dealer EV certification & sales training.

## **XII. Conclusion:**

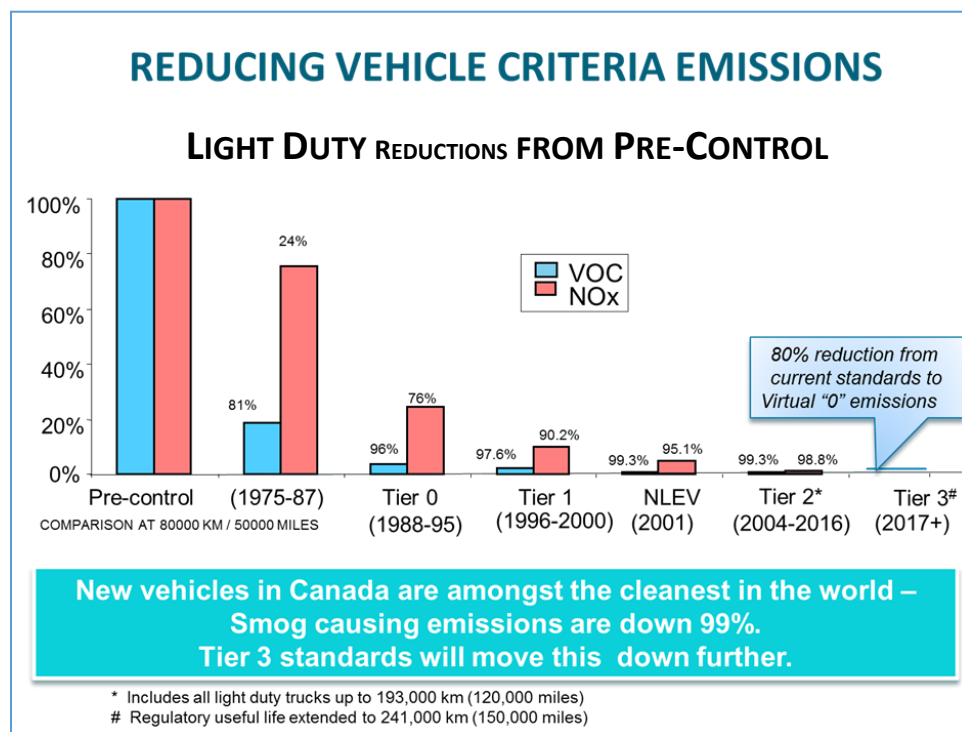
- Bill 104 does not address the demand for electric vehicles nor will it change the trajectory of electric vehicle technology development.
- The Québec government has underestimated the economic impact on dealers and vehicle manufacturers and ultimately, the impact on consumer choice.
- The government does not appear to have satisfied the principles of its own policy for regulatory and administrative relief or the criteria set out in the regulatory impact analysis guidelines.
- Ongoing consumers incentive are critical to the adoption of PEVs, along with coordinated and mutually supporting policies that enhance the environmental and economic equation of consumers to purchase PEVs are essential to increasing acceptance and adoption
- If the government proceeds with Bill 104, the program must provide industry with maximum flexibilities to ensure long term success and avoid the implications of market failure.
- Québec's remarkable success as a leader in EV sales does not warrant a legislative approach.

## Appendix A

### Criteria Emissions (Air quality)

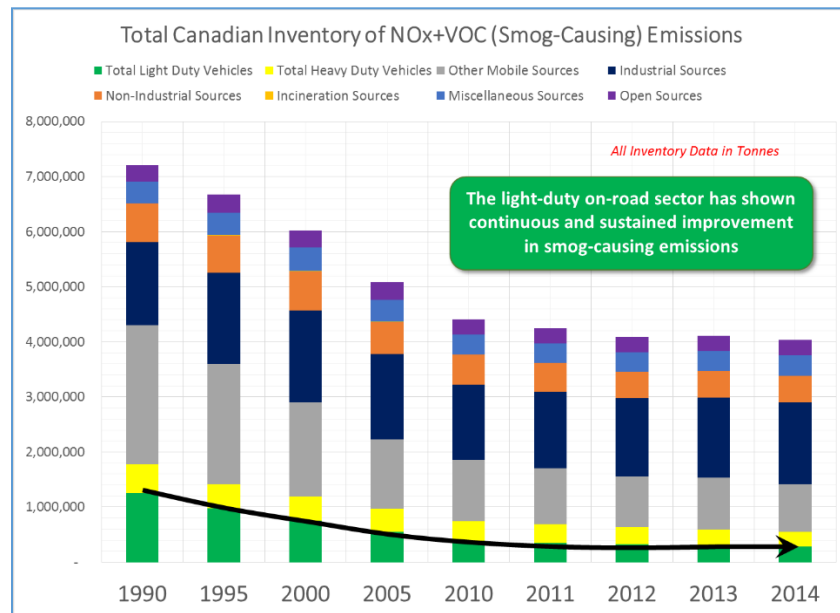
In 2004, Canada adopted the most stringent national smog related emissions standards in the world on a harmonized basis with the United States (Tier 2), thereby reducing emissions by 99% from pre-controlled times. Commencing in 2017, even more stringent smog related standards, Tier 3, will be introduced reducing these small remaining emissions by yet another 80% [Figure A1.]. These standards are fuel neutral, which means each vehicle must comply with the same smog related standards regardless of the fuel used or vehicle size. As a result of these previous accomplishments and planned additional actions, the light duty vehicle sector has been the only sector to reduce smog causing emissions year over year. These virtually zero smog-related emission vehicles will be supported in the market place with further reductions of sulphur in gasoline, or ultra-low sulphur gasoline (10 ppm sulphur), both of which contribute significantly to achieving these dramatic vehicle emission reductions.

Figure A1<sup>8</sup>



The impact on the total Canadian inventory of criteria air contaminant (CAC) emissions has been dramatic. Since 1985 the on-road light duty vehicle sector has demonstrated a sustained and continuous reduction in smog-causing emissions as older vehicles are retired from the fleet. As of the latest available data (2014 calendar year) the auto sector is now under 7% of the total inventory of all man-made sources of smog-causing emissions [Figure A2.].

<sup>8</sup> Source CVMA

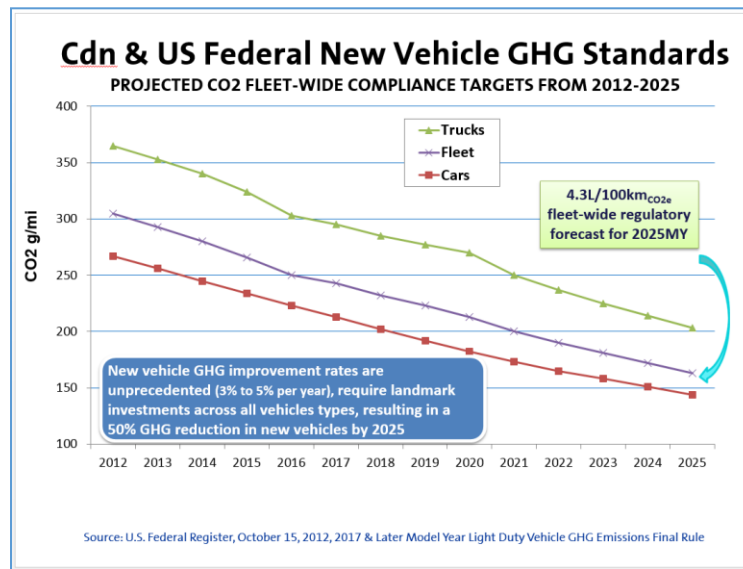
Figure A2<sup>9</sup>

## Greenhouse Gas Emissions

The auto industry in Canada has been federally regulated to reduce vehicle greenhouse gas emissions year over year beginning the 2011 model year, across the entire range of new passenger cars and light duty trucks. This very stringent regulation has been adopted on a harmonized basis with the U.S., creating a single and efficient standard on a North American basis (including California) to the benefit of the environment and consumers. Canada and the US have now implemented the second phase of even more stringent vehicle GHG emissions standards for 2017-2025 model years [Figure A3].

<sup>9</sup> NOx+VOC Emissions - Source Tables 2-5 & 2-6 National Summary of Annual Emissions  
Air Pollutant Emission Inventory Report - Environment and Climate Change Canada, 2016

Figure A3

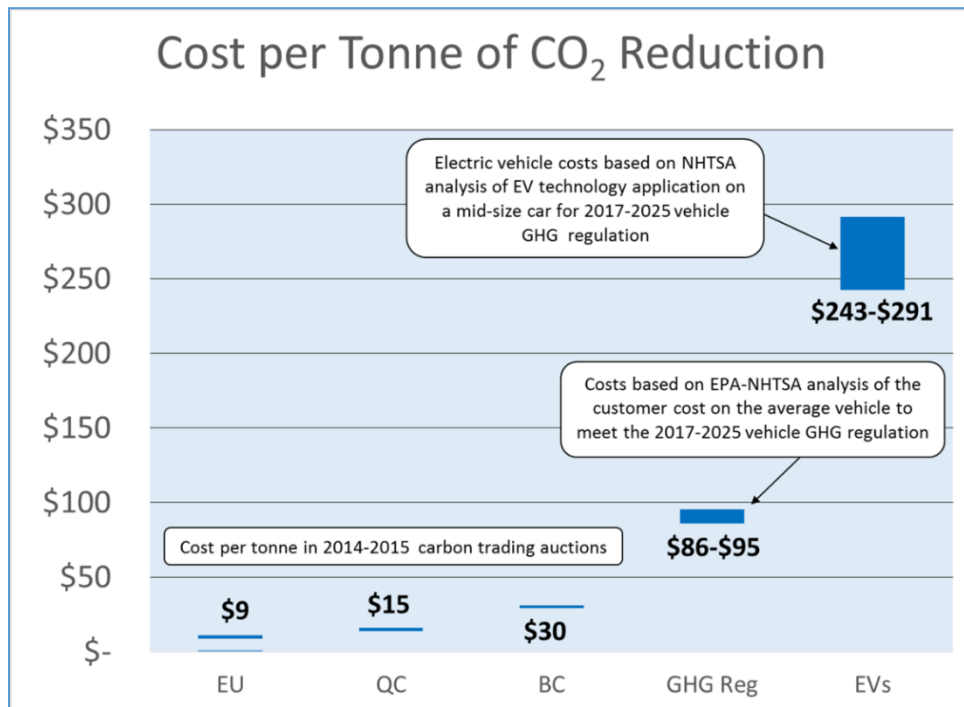


These regulations require manufacturers to adopt a multi-technology pathway for compliance in which electric vehicles, plug-in hybrid and battery electric, will become increasingly more prominent during this period of rapid technology deployment of new fuel consumption and GHG reducing technologies. Through an unprecedented 3 to 5% year over year improvement requirement, 2025 model year (MY) light duty vehicles are projected to consume 50% less fuel than 2008 MY vehicles. From 2011 MY, this will result in an estimated cumulative reduction of 266 mega-tonnes<sup>10</sup> (Mt) of carbon dioxide equivalent (CO<sub>2</sub>) GHG emissions from the LDV fleet. To put this into perspective the annual year over year improvement prior to this regulation averaged from 1.1 to 1.3% per year.

Ultra-low sulphur in gasoline and other fuel parameter improvements, like higher gasoline octane, will also support and enable further GHG reducing performance from new internal combustion engine technologies

These technology cost estimates for a typical mid-size car can be converted to a cost per tonne of CO<sub>2</sub> reduced. Using the range of the NHTSA cost estimates from the 2012 model year and the typical fuel consumption and lifetime of a mid-size car, the total GHG emissions reduced are found to be slightly under 4 tonnes per year and approximately 60 tonnes for the average vehicle lifetime. Therefore, the range of cost to reduce these emissions using plug-in electric vehicles lies between \$243 and \$291 dollars per tonne. This cost for GHG reduction is an order of magnitude above the typical cost per tonne of \$25 to \$30 for other sectors.

<sup>10</sup> SOR/2014-207 RIAS – 174 Mt from 2017MY to 2025 MY and SOR/2010-201 RIAS – 92 Mt from 2011MY to 2016MY

*Figure A4.*

**Appendix B****PEV Models Available in Québec**

1. Audi A3 Sportback e-tron Hatchback
2. BMW 330e
3. BMW i3 BEV
4. BMW i8
5. BMW X5 40e
6. BMW i3 REX (range extender
7. Cadillac ELR
8. Chevrolet Spark EV
9. Chevrolet Volt
10. Ford C-Max Energi
11. Ford Focus Électrique
12. Ford Fusion Energi
13. Hyundai Sonata Plug-in Hybrid Ultimate
14. Hyundai Ioniq
15. Kia Soul EV
16. Kia Optima Plug-in Hybrid
17. Mercedes-Benz S550e Plug-in Hybrid
18. Mitsubishi i-MiEV
19. Nissan Leaf
20. Porsche Cayenne S e-Hybrid
21. Porsche Panamera S e-Hybrid
22. Porsche 918 PHEV
23. Smart fortwo electric drive
24. Tesla Model S
25. Tesla Model X
26. Tesla Roadster
27. Toyota Prius Prime
28. Volvo XC90 Excellence
29. Volkswagon eGolf