

HOLDING THE LINE ON CURRENT LIGHT-DUTY VEHICLE GHG EMISSION REGULATIONS IN CANADA: GOOD FOR THE CLIMATE AND CANADIAN CONSUMERS

Comments Submitted to Environment and Climate Change Canada

By Équiterre

In collaboration with:

Climate Action Network Canada, David Suzuki Foundation, Environmental Defense, Pembina Institute, Alliance Switch, Association des véhicules électriques du Québec, Vancouver Electric Vehicle Association and Érick Lachapelle (Associate Professor, Université de Montréal)

The logo for Équiterre features a stylized orange arch above the word "équiterre" in a lowercase, sans-serif font.

DAVID SUZUKI
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28 September 2018

Équiterre wished to thank Dr. Mark Purdon from IQ Carbone for his contribution to this submission, any omissions or errors are the responsibility of Équiterre.

Contents

Executive Summary	4
List of Figures	6
1. Introduction	7
2. Low Carbon Transportation: A Key Opportunity for Canadian Climate and Clean Growth Objectives	9
3. Background on the Integrated North American Automobile Market and Policy	13
4. Fuel Efficiency Standards in the US	15
US Federal Government Fuel Economy Standards	15
California Greenhouse Gas Vehicle Standards	17
5. Canadian Light-Duty Vehicle (LDV) Fuel Economy and GHG Emissions Standards	19
Evolution of Canadian Fuel Economy and GHG Emission Standards	19
Impact of Canadian Fuel Economy and GHG Emission Regulations	21
6. Specific Recommendations to ECCC	25
Transportation Can contribute a Lot More to Climate Mitigation in Canada	25
Electrification of the Canadian Fleet is Necessary Meet our Climate Commitments	25
Zero Emission Vehicle Policies Needed	25
Other Policy Reforms	27
Stringent Light-Duty Vehicle Regulations are in Canada’s Economic Interests	27
7. Conclusion	29
8. References	30

Executive Summary

We submit these comments to inform the discussion on Canada’s mid-term review evaluation of the regulations of GHG emissions from passenger automobiles and light-duty trucks—referred to as light-duty vehicles¹. Currently, Canadian and US standards are legally entwined, dating to a 2014 decision by the Canadian federal government to formally adopt the standards of the US Environmental Protection Agency (EPA). As is well known, these Obama-era standards are currently being rolled back by the Trump administration. Without reform to Canadian federal regulations, Canadian efforts to reign in emissions from light-duty vehicles—one of the most important sources of emissions in Canada—would similarly be set back.

In this submission, we make the case that the current stringency of Canada’s light-duty vehicle regulations is appropriate, and must be maintained, by starting the regulatory process to remove the reference to the US EPA regulations.

Given that:

- 1) Current Canadian vehicle regulations are essential to meet Canada’s 2030 GHG emission reduction target adopted in the Paris Agreement—we cannot afford losing projected and accounted for GHG emissions reduction, given the current gap to Canada’s 2030 target;
- 2) The current Canadian vehicle regulations confer considerable benefits to Canadians in significant fuel cost savings, in driving innovation and improving the competitiveness of Canadian automobile and parts manufacturers on the global market;
- 3) There have been no compliance issues with Phase I of the Canadian regulations; data released shows that car manufacturers have over complied with the regulations;
- 4) Research by the International Council on Clean Transportation (ICCT) suggests that car manufacturers can meet current regulations through 2025 at low cost, with existing and expected new technologies;
- 5) An important portion of the US car market is currently governed by California’s regulations. California has authority under the US Clean Air Act to set its own emissions standards in lieu of those of the US EPA regulations. Thirteen other states are currently following California’s regulatory lead;
- 6) Asymmetries between Canadian and US regulations for zero-emission vehicles (ZEVs) and heavy-duty vehicles (HDVs) have not had detrimental effects on the Canadian economy, demonstrating Canada can do better;
- 7) The transportation sector needs a predictable long-term investment signal to achieve deep decarbonization by 2050.

¹ Light-duty trucks includes SUVs, pick-up trucks, mini-vans and cross-overs.

Consequently, Équiterre, Climate Action Network Canada, David Suzuki Foundation, Environmental Defense, Pembina Institute, Alliance Switch, Association des véhicules électriques du Québec, Vancouver Electric Vehicle Association and Érick Lachapelle (Associate Professor, Université de Montréal) make the following recommendations to Environment and Climate Change Canada (ECCC):

- 1) That the Minister of the Environment and Climate Change make a determination that the current stringency of the federal light-duty vehicle regulations for model years 2022-2025 are appropriate;
- 2) That the Minister of the Environment and Climate Change initiate immediate regulatory amendments to the light-duty vehicles regulations to remove the alignment with the United States Environmental Protection Agency's standards and maintain the current stringency of the Canadian vehicle regulations through 2025.

List of Figures

Figure 1: Emissions trends across Canadian economic sectors and within the Canadian transport sector, 2005-2016 9

Figure 2: Trends in gasoline prices and gross per capita gasoline sales across select Canadian provinces, 2005-2017..... 11

Figure 3: Trends in annual passenger car and light-duty truck sales in select Canadian provinces, 2005-2017 12

Figure 4: CAFE Standards and Achieved Performance 16

Figure 5: Evolution of CAFC targets under the MVFCSA, 1977-2010 20

Figure 6: Lifetime estimated net benefits from model years (MYs) 2017 to 2025 vehicles 23

Figure 7: CO2 emissions from Canada’s light-duty vehicle fleet under scenarios that freeze standards to 2020 levels or maintain the 2025 standards currently in place 23

Figure 8: Historical fleet CO2 emissions performance and current standards (gCO2/km normalized to NEDC) for passenger cars, updated for 2020 CAFE freeze 24

1. Introduction

The adoption of the Paris Agreement in 2015 was the culmination of years of negotiations under the United Nations Framework Convention on Climate Change (UNFCCC). The Agreement includes a commitment by nearly all the world's countries to limit global average temperature rise to well below 2°C pre-industrial levels, and to pursue efforts to limit the increase to 1.5°C. An active participant in the Paris negotiations, Canada ratified the Paris Agreement in 2016 and recently confirmed its commitment to achieve an economy-wide emissions reduction target of 30% below 2005 levels, or 523 MtCO₂e, by 2030 (Government of Canada, 2017).

Any effort to meet Canada's commitment under the Paris Agreement will need to target GHG emissions related to the consumption of energy in the transportation sector. Emissions from the transportation sector stood at 200 MtCO₂e in 2016—or 28% of emissions across the country. Recognizing the sector's significance towards our climate mitigation target, Canada currently aims to reduce 15 MtCO₂e from the transportation sector as part of our plans to meet commitments made under the Paris Agreement. This is not sufficient. In our opinion, the transportation sector in Canada can do a lot more towards our climate mitigation target to 2030 and in the long-term.

One important strategy for reducing emissions in transportation sector has been rules requiring automakers to produce more efficient vehicles. Since the mid-1970s, the Canadian federal government has established fuel economy standards for all cars and light trucks (light-duty vehicles) that mirror US federal government policy. This has made sense given the extent to which Canadian and US automobile markets are integrated. While initially voluntary measures, in 2007 the Canadian federal government began a process to make fuel economy standards mandatory—including the formal legal alignment in 2014 of Canadian regulations with GHG standards implemented by the US Environmental Protection Agency (EPA). Indeed, the decision to formally link Canadian regulations to Obama-era light-duty vehicle standards was one of few climate measures of the previous Progressive Conservative government. The 2014 regulations were designed to significantly increase the average fuel efficiency of vehicles sold between 2017 and 2025 in both the US and Canada, ultimately raising average fuel efficiency to approximately

49 miles per gallon (MPG) for both cars and light-duty trucks combined from the current 35 MPG, as per joint standards issued by the EPA and US National Highway Traffic Safety Administration (NHTSA, 2012: 62640).

Yet there is an emerging headwind. At President Trump's direction, in August 2018 the EPA and NHTSA submitted a proposal to weaken these existing rules for light-duty vehicles—ultimately freezing federal US fuel consumption and emissions regulations at 2020 levels of 37 MPG by eliminating required improvements for 2021-2025 (Sharpe, 2018). The impact of this proposed regulatory change is that there would be little fuel efficiency or GHG emission improvements for new vehicles sold on either the US or—given current Canadian vehicle regulations—Canadian market after 2021. Independent modeling assessments indicate that this will result in an additional 10.7 MtCO_{2e} of GHG emissions to be released from Canada's light-duty vehicle fleet by 2030, than if the regulations were maintained (Posada *et al.*, 2018: 4).

With these proposed changes south of the border, we² welcome Environment and Climate Change Canada's (ECCC's) invitation to comment on proposed changes to the *2014 Regulations Amending the Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations*, hereafter "the Canadian vehicle regulations" (Canadian Ministry of Environment, 2014). Without immediate regulatory changes to Canadian vehicle regulations, Canada's efforts to reign in emissions in the transportation sector will be unnecessarily hobbled by the rollback by the US federal government. While we expect California and many other states to maintain stringent regulations, it is prudent for Canada to chart its own path. Providing regulatory certainty to automobile manufacturers is key to maintaining ongoing capital investments in low carbon technologies in Canada.

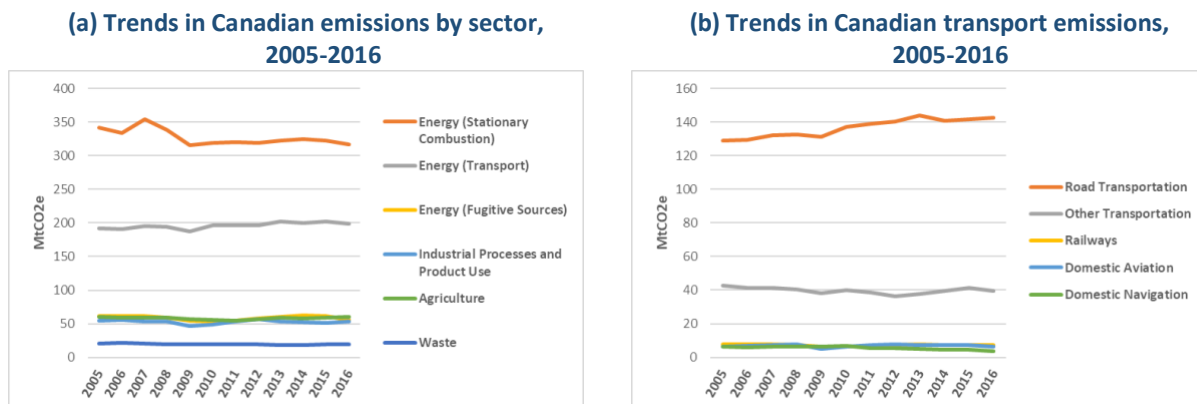
² Climate Action Network Canada, David Suzuki Foundation, Environmental Defense, Pembina Institute, Alliance Switch, Association des véhicules électriques du Québec, Vancouver Electric Vehicle Association and Érick Lachapelle (Associate Professor, Université de Montréal)

2. Low Carbon Transportation: A Key Opportunity for Canadian Climate and Clean Growth Objectives

Achieving deep emissions reduction in the transportation sector is essential to meeting Canada’s commitments under the Paris Agreement.

Constituting 28% of GHG emissions across the country in 2016, the transportation sector is Canada’s second largest source of emissions (Figure 1a). GHG emissions in the transportation sector have seen considerable increases since 2005. This is largely due to rising road transport emissions, which constitute the majority of Canada’s transport-related emissions (Figure 1b), despite emissions in other transportation sectors holding steady, and showing some recent reductions. We observe three trends in road transportation emissions: a modest 2% increase in road transportation emissions from 2005-2009, an increase of 10% from 2009-2013 and relative stabilization from 2013-2016.

Figure 1: Emissions trends across Canadian economic sectors and within the Canadian transport sector, 2005-2016



Source: (ECCC, 2018: Table A9-2)

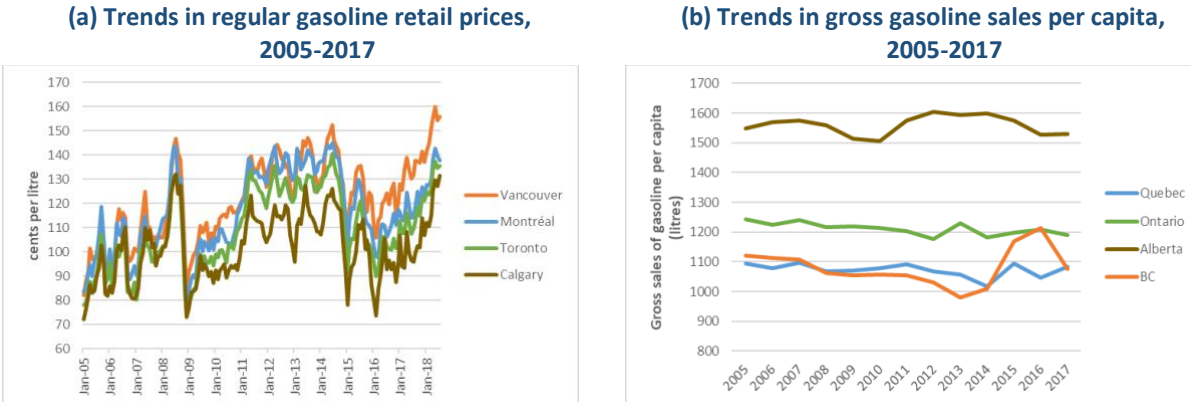
Key to the government’s effort to reach its emissions reduction target under the Paris Agreement is the Pan-Canadian Framework on Clean Growth and Climate Change (PCF), which was adopted in late 2016 (Government of Canada, 2016). Without the PCF and other measures, economic modeling indicates that Canadian emissions will grow to 742 MtCO₂e in 2030 from 704 MtCO₂e in 2016 (ECCC, 2017). Recall that Canada’s 2030 emission reduction target under the Paris

Agreement is 523 MtCO₂e. With adoption of all proposed PCF policies, Canada will still have a gap of 66Mt to its 2030 target (ECCC, 2018b). Clearly, we need to do more.

Of course, carbon pricing is a key element of the PCF and efforts to put a price on carbon in certain provinces have reduced emissions in the transportation sector by raising the relative price of gasoline. But it would be imprudent to put all our eggs in one basket. Carbon prices as proposed are likely insufficient to drive significant changes in consumer behavior in the Canadian transportation sector. There are two reasons for this.

First is the low saliency of carbon prices currently found in Canada. For example, in 2018, the carbon tax in B.C. added an additional 7.8¢ to a litre of regular gasoline while under Quebec's cap-and-trade system, gasoline costs an estimated 4.4¢ per litre more than it otherwise would be (Bowes, 2018: 10). These additional carbon costs are expected to increase, but relatively slowly. Under the PCF, the federal carbon price (the back stop) is expected to rise 11.6¢ per litre by 2022 (ECCC, 2017: 6)—though the actual carbon price will depend on the type of carbon pricing strategy that each province will adopt. Currently, the highest gasoline prices in Canada are found in Vancouver, though much of this is related to the city's 17¢ per litre tax levied by TransLink in support of public transportation tax. Trends in regular gasoline prices in select Canadian cities can be found in Figure 2a below while trends in gross gasoline sales per capita in select Canadian provinces can be found in Figure 2b. It is worth highlighting that, while the BC carbon tax has driven reductions in gasoline sales (Murray and Rivers, 2015), total emissions in the province have continued to grow because of emissions growth in other sectors that have only been partially covered by the carbon tax (Houle *et al.*, 2015; Wolinetz, 2016) and the tax was frozen at \$30 per tonne from 2012 until April 1st of 2018.

Figure 2: Trends in gasoline prices and gross per capita gasoline sales across select Canadian provinces, 2005-2017



Source: (Statistics Canada, 2018a; b)

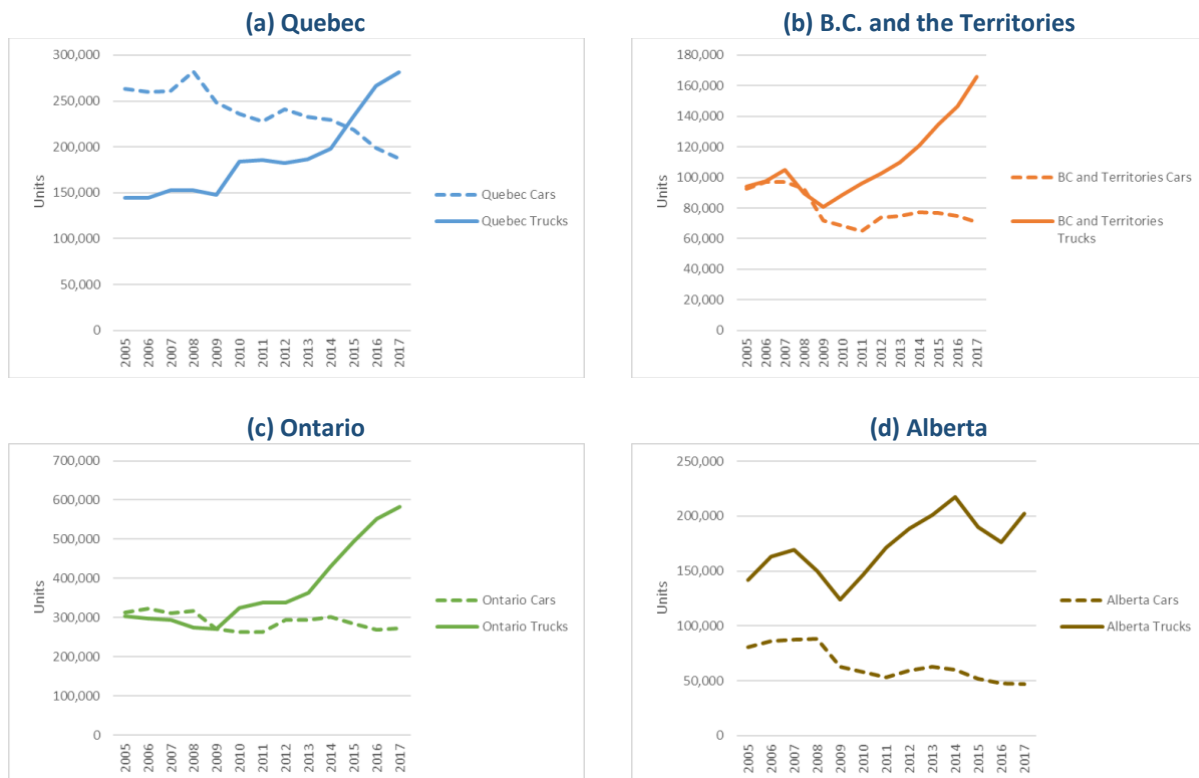
A second reason why carbon pricing alone is insufficient is that human beings rarely fit the model of a rational economic actor used by many by economists. There is considerable empirical evidence that when purchasing a new vehicle, consumers do not fully integrate fuel economy costs into their decision-making (Allcott and Knittel, 2017; Allcott and Wozny, 2014; Turrentine and Kurani, 2007)—a phenomena observed in behavior towards other energy-using durable goods (Hausman, 1979). Indeed, other factors can inform vehicle purchase decisions more than gasoline prices, including power and safety features but also such minutiae as the type of vehicle cup holders. Advertising campaigns by auto manufacturers sell vehicles as status symbols and link them to emotions and desires, downplaying more pragmatic considerations such as efficiency, operating costs, and greenhouse gas emissions. Indeed, the GHG emission reductions are also threatened because of the change in the Canadian fleet, where high emitting light trucks and SUVs now constitute a larger share of new sales than the more fuel-efficient cars. In 2017, those heavier - higher emitting vehicles, dominated the Canadian automotive market with 1,4 M sales, an increase of 8.7%, representing a market share of 68% (CBC, 2018).

There is emerging evidence that current and proposed carbon prices in Canada will have little incidence on vehicle purchase decisions. Perhaps the most striking is evidence is the changing constitution of the Canadian light-duty vehicle fleet. High-emitting light-duty trucks now constitute a larger share of new sales than more fuel-efficient cars, even in provinces with longest experience with carbon pricing. In Quebec, despite rising carbon prices, sales of light-duty trucks

sales have almost doubled since 2005 reaching over 280,000 in 2017 (Figure 3a). Similarly, sales of light-duty trucks have increased by 75% in B.C. since 2005 (Figure 3b). These results are even more striking given that most of this growth occurred after the 2008 carbon tax was introduced. In both provinces, however, sales of passenger cars have been on the decline. Similar trends are found in Ontario and Alberta (Figures 3c & 3d). In contrast, sales of new electric vehicles sold at 0.5% of new vehicle sales in 2016, or just under 100,000 units (ECCC, 2018: 9)³.

Trends in vehicle sales and the changing composition of the Canadian vehicle fleet described above are sobering. While efforts should continue to put a price on carbon pollution in Canada, the results above indicate that smart regulations have an important role to play by increasing the availability of low-emissions light-duty vehicles on the Canadian market.

Figure 3: Trends in annual passenger car and light-duty truck sales in select Canadian provinces, 2005-2017



Source: (Statistics Canada, 2018c)

³ 2.2% of all vehicles sold in Quebec being an electric vehicle. B.C. saw an expanding vehicle and electric vehicle market which leaves total adoption even compared to last year, an average of 1.9%. Source : FleetCarma, 2018

3. Background on the Integrated North American Automobile Market and Policy

Canada must decide on the future of its automobile sector in light of a changing global auto market that includes ambitious electric vehicle production quotas, bans on sale of internal combustion engine vehicles and increased use of shared mobility services.

One of the advantages of maintaining high standards for greenhouse gas emissions in the Canadian auto sector is that this regulatory approach harnesses the competitive instincts of the private sector as well as broader market forces to drive innovation and emission reductions. Since the 1960s, Canada and the US have established one of the most integrated markets for automobiles and auto-parts in the world. The significance of the degree of integration of the North American automobile market explains the harmonization of Canadian and U.S. GHG emission standards. But with the global auto market becoming increasingly competitive, it is important that Canada make the right decision about the future of its automobile sector and broader trends in the transport sector worldwide such as ambitious electrification of transport policies, bans on sale of internal combustion engine vehicles and increased use of shared mobility services. The Canadian light-duty vehicle regulations to 2025 must be discussed in this global context.

Efforts to integrate markets began with the 1965 Canada-US Auto Pact, which essentially constituted a selective free-trade agreement that was only superseded by the 1989 Canada-US Free Trade Agreement and later NAFTA (Carrillo, 2004). While the impetus for Americans to seek regional economic integration was increasing foreign competition, in the 1960s Canada's auto industry was struggling and running a persistent automotive trade deficit with the US despite operating behind high tariffs. By many measures the Auto Pact increased productivity and regional trade, with Canadian exports of automotive products to the US increasing from \$250 million in 1965 to \$5,903 million in 1975 (Holmes, 1992: 98). With NAFTA, cross-border trade in the auto sector has deepened (Hufbauer, 2005: 21). The most recent data, from September 2016 to August 2017, indicate that approximately 2.3 million of the vehicles assembled in Canada were sold in the US while just under 270,000 were sold in Canada (Luria *et al.*, 2018: 3).

In considering GHG vehicle regulations, it is not just the number of Canadian-assembled vehicles that is important, but the types of vehicles and where they are sold. Canada currently assembles twelve different types of light-duty vehicles, including those produced by the Big Three Detroit automakers but also two Japanese firms. The most recent data indicate that those vehicles assembled in Canada with higher fuel economy (Honda and Toyota) sold in larger numbers than the more polluting vehicles produced by the Big Three automakers (Luria *et al.*, 2018: 3). Furthermore, of the vehicle models produced in Canada and sold in the US, nearly 40% are sold into California and the thirteen states adhering to its fuel economy standards (Luria *et al.*, 2018: 3). These states represent a sizeable market and this market is likely to grow as additional states continue to announce they will maintain the current standards (for example, Joselow, 2018). California alone saw 2.05 million new vehicle registrations in 2017—nearly 12% of the US national total (CNCDA, 2018). The destination for Canadian auto sales is important because, as we discuss below, there is a very real possibility of a bifurcation in the US auto market between U.S. federal and California fuel economy standards.

4. Fuel Efficiency Standards in the US

When discussing efforts to improve fuel efficiency standards in the US, one needs to be aware of US federal system and the complex interaction between different levels of government (Dwyer, 1995; Goulder and Stavins, 2011; Rabe, 2010). We briefly discuss efforts by the US federal government first before briefly discussing California's special regulatory status. California's powers in this domain are important. Despite the recent announcement by the Trump administration of its intention to freeze the federal CAFE standard, California and thirteen other states announced they would continue with the original standard (CARB, 2018).

US Federal Government Fuel Economy Standards

Efforts to improve fuel economy at the US federal level were first established to address energy concerns, not environmental ones. In 1975, the Energy Policy and Conservation Act was passed in the wake of the 1973 oil crisis. It directed the Department of Transportation (DoT) to set fuel economy standards separately for light-duty vehicles (EPA, 2016: 1-3). While the Act itself set standards for model years (MYs) 1978-1980⁴, DoT delegated responsibility for future MYs to what came to be called Corporate Average Fuel Economy (CAFE) standards to the National Highway Traffic Safety Administration (NHTSA). With the adoption of the 1977 Amendments to the Clean Air Act, responsibility for addressing emissions of air pollutants from motor vehicles was granted to the newly established EPA—though the EPA was not recognized to have authority for the regulation of GHG emissions until 2007. We thus briefly discuss the evolution of CAFE standards under the NHTSA first before discussing the parallel set of GHG emission standards that have emerged at the EPA since 2007.

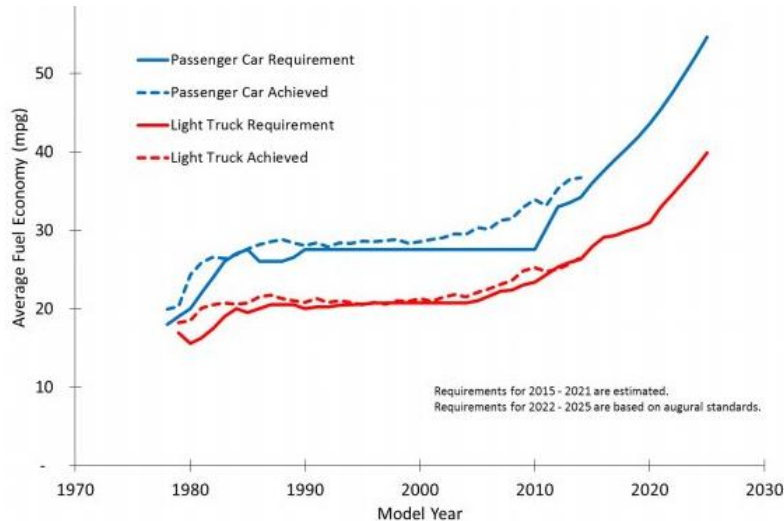
CAFE standards have evolved since they first took effect in MY 1978 (EPA, 2016: 1-3-4). In the late 1970s, their stringency was increased through 1985 though flatling thereafter at 27.5 miles per gallon (MPG) for passenger cars until 2011. In 2007, the Bush administration adopted the Energy Independence and Security Act (EISA) which sought an increase in average automobile

⁴ The Energy Policy and Conservation Act (P.L. 94-163, 42 U.S.C. 6201), Part A of Title III at Section 502.

fuel economy to 35 MPG by 2020 as well as in the share of biofuel blended into gasoline (Anderson *et al.*, 2009; Sissine, 2007). As part of the process of implementing EISA, in April 2008, still under the Bush Administration, the DoT proposed to established new CAFE standards for both passenger cars and light trucks for MYs 2011-2015, though the DoT withdrew the rule as the financial crisis unfolded.

However, the standards anticipated by the Bush administration were considerably lower than those finally adopted for MYs 2012-2016 under President Obama in 2009. The 2009 standards ultimately required an increase to 39 MPG for passenger cars by 2016—higher than what was anticipated under EISA for 2020. In 2012, the Obama administration, introduced new CAFE regulations for MYs 2017–2025 vehicles that ultimately sought a fuel economy standard of 54.5 MPG for passengers cars by 2025. While the CAFE standards have always been controversial, it is worth pointing out that automakers have historically been able to meet and exceed the standard (Figure 4).

Figure 4: CAFE Standards and Achieved Performance



Source: (EPA, 2016: 1-4)

What about the EPA? After the 2007 Supreme Court decision which recognized EPA’s jurisdiction over GHG emissions, the DoT and EPA were tasked with harmonizing their fuel economy and GHG standards, respectively. The DoT and EPA are now mandated to coordinate the CAFE and GHG

emissions standards as a National Program for 2017-2025. Essentially, the metrics used in the two standards have been harmonized under the National Program. For example, an average industry fleetwide level of 163 gCO₂e/mi under GHG standards equates to 54.5 MPG under CAFE if achieved exclusively through fuel economy improvements (NHTSA, 2012: 62627). Note however that the National Program extends beyond the 5-year regular window for CAFE regulations. Consequently, NHTSA requires a new rulemaking to set CAFE standards for MYs 2022-2025. Similarly, the EPA was required to determine by April 2018 whether the MYs 2022-2025 GHG standards were still appropriate—an opportunity that the Trump administration has used to freeze US federal fuel efficiency standards.

California Greenhouse Gas Vehicle Standards

The regulation of emissions in the transportation sector in the US is considerably more complex because of the special powers accorded to California. Because of California's early efforts to tackle air pollution, the state has retained the authority under the 1970 CAA to implement stricter vehicle air pollution regulations than the federal government (Berck and Xie, 2010; Corman, 2004; Hanemann, 2007). In formal terms, the EPA is to waive federal pre-emption upon receiving an application from California "provided that the application is not arbitrary and capricious, it is at least as stringent as the national standard, and it is needed to meet California's 'compelling and extraordinary conditions'" (Hanemann, 2007: 4).

While California's efforts to tackle local air pollution dates to the 1960s, California's efforts to tackle emissions in the transport sector also precede those of the US federal government. In 2002 the state legislature passed assembly bill 1493 (AB 1493) which directed California Air Resources Board (CARB) to adopt the maximum feasible and cost-effective reductions in GHG emissions from passenger cars and light-duty trucks—the so-called Pavley standard. In 2007, the Bush Administration denied an EPA waiver for California—a first for the EPA—and carried through instead with standards under the EISA amendments (Berck *et al.*, 2010: 50-52). However, the Obama administration granted a waiver in 2009, allowing California to move ahead with the implementation of the Pavley standards for MYs 2009-2016. In January 2012, the California

government adopted additional light-duty vehicle requirements for MYs 2017-2025, which were developed in a joint effort with EPA and NHTSA.

It is worth pointing out that, despite attention to California's efforts to implement a carbon market linked to other jurisdictions (Houle *et al.*, 2015; Klinsky, 2013), so-called "complementary policies" including the low-carbon fuel standard are at the heart of its overall climate strategy and expected to drive 70-80% of reductions (CARB, 2017: 41). The significant role of regulatory measures in California has raised concerns as they tend to dampen market price signals (Bang *et al.*, 2017; Fischer *et al.*, 2017; Fischer and Preonas, 2010). However, given the modest impact of carbon pricing at current prices—including evidence from the Canadian auto sector discussed above--there are good reasons to maintain a combination of smart regulations and carbon pricing.

5. Canadian Light-Duty Vehicle (LDV) Fuel Economy and GHG Emissions Standards

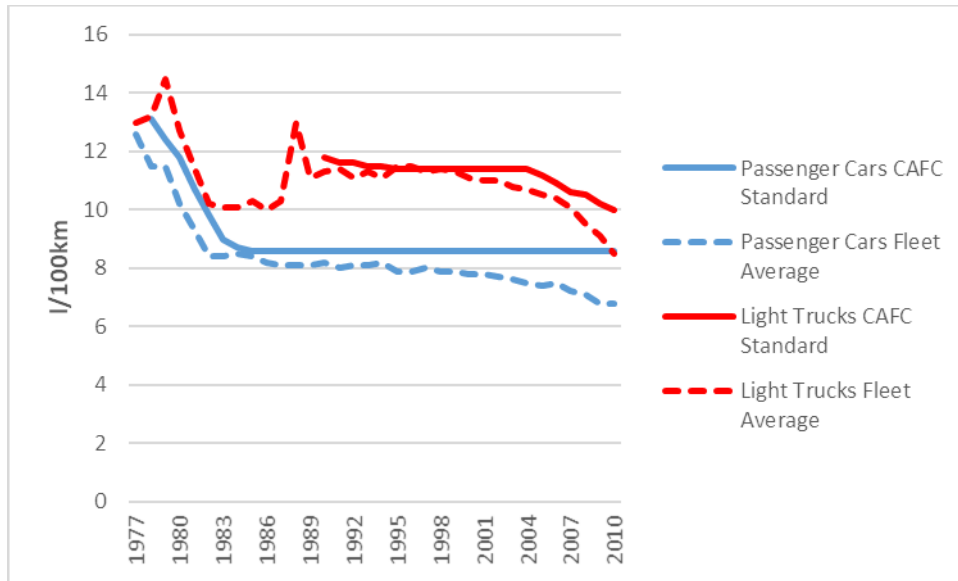
Evolution of Canadian Fuel Economy and GHG Emission Standards

As in the US, the Canadian federal government's initial interest in improving light-duty vehicle fuel economy standards were not tied to concerns about climate change, but grew out of the effects of the 1973 oil crisis. Fuel economy standards also attracted attention as part of efforts to integrate the Canada-US auto market. The main difference between Canada's fuel economy standards and the US CAFE program was that Canada's standards remained voluntary until 2007. We describe Canada's experience with setting fuel economy standards below, drawing on the available literature (Probe, 2009; TransportPolicy.Net, 2018) as more recent developments.

In 1976, the federal government established Company Average Fuel Consumption (CAFC) targets under the authority of Transport Canada and harmonized them with the just released CAFE standards in the US. Attempts to make CAFC targets mandatory were not fulfilled, despite passage of the Motor Vehicle Fuel Consumption Standards Act (MVFCSA) in 1982. The MVFCSA would have set legally binding standards similar to US CAFE regulations, but because auto manufacturers were already striving to meet CAFE standards in the US, they agreed to meet the Canadian standards voluntarily.

However, the Canadian federal government began to shift towards mandatory fuel economy standards in 2007 as the Bush administration signaled an interest in promoting American energy independence through EISA discussed above. The Canadian federal government initially signaled this shift in 2007 by finally proclaiming the 1982 MVFCSA, effectively making fuel economy standards mandatory. Figure 5 maps the evolution of MVFCSA standards and the performance of Canada's light-duty vehicles through 2010. The reader will note the similarity to the American CAFE standards presented in Figure 4 above.

Figure 5: Evolution of CAFC targets under the MVFCSA, 1977-2010



Source: (TransportPolicy.Net, 2018)

The province of Quebec was the first jurisdiction to officially adopt and harmonize its vehicle standards with the CAFE standards, ahead of the Canadian federal government (Gouvernement du Québec, 2018). The Canadian federal government replaced the CAFC in 2010 with the *Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations* for MYs 2011-2016. These new regulations were also significant in that they constituted the first time that the Canadian government sought to limit GHG emissions from the automotive sector under the Canadian Environmental Protection Act (CEPA). In 2012, in lockstep with Obama administration, the Canadian government proposed progressively more stringent annual fleet average GHG emission standards for MYs 2017 to 2025. Canadian vehicle regulations were significant in that they formally incorporated those of the EPA by reference in the Canadian vehicle regulations (*2014 Regulations* at Section 17).

The Canadian vehicle regulations are also significant in that they include flexibility measures to facilitate compliance but also incentivize the adoption of advanced technology vehicles. First, when calculating their fleet average emissions, car makers can multiply the total number of zero-emission electric vehicles and plug-in hybrid vehicles in their fleets by a set of so-called “advanced

technology multipliers” (2014 Regulations at Section 18.1). In addition, under Canadian vehicle regulations, automakers might calculate an allowance for the reduction of the leakage of air conditioning refrigerant as well as for the use of certain innovative technologies that result in a measurable CO2 emission reductions (2014 Regulations at Sections 18.2 & 18.3).

These latter aspects of the Canadian vehicle regulations may eventually overlap with other existing initiatives to increase the number of zero-emission electric vehicles and plug-in hybrid vehicles, including both other federal and provincial efforts. At the federal level, the PCF also included a commitment to develop a Canada-wide strategy to increase the deployment of zero-emission vehicles. At the same time, the federal government provided initial funding for electric vehicle charging infrastructure and alternative fuels stations through Budget 2017. Provinces are also making efforts to encourage the uptake of zero-emission vehicles. In 2018, Quebec published regulations (a Zero Emission Vehicle Mandate) requiring manufacturers to generate zero emission vehicle credits through the sale or lease of plug-in hybrid and battery electric vehicles (Gouvernement du Québec, 2016; Government of Quebec, 2018). British Columbia has also developed a program designed to provide incentives for the supply of lower carbon fuels for the purchase of electric vehicles (Government of British Columbia, 2018).

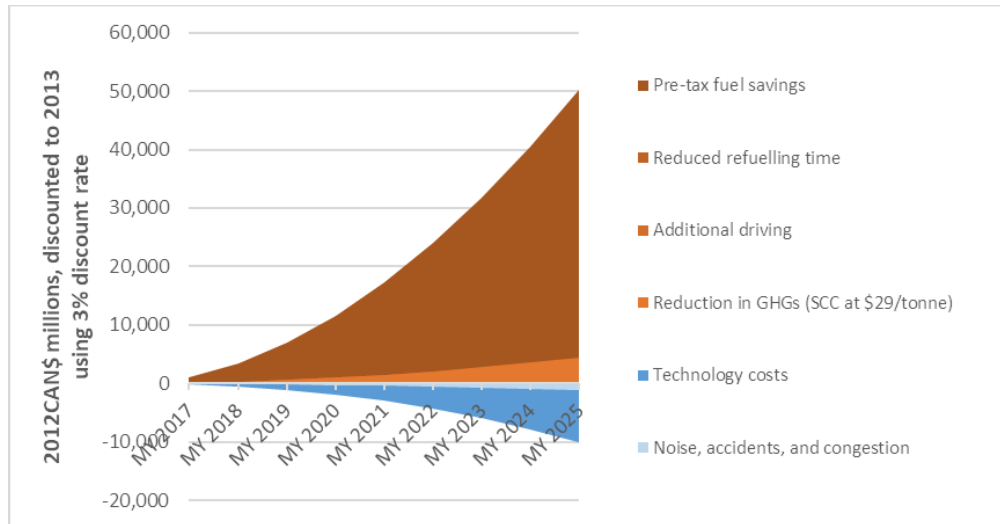
Impact of Canadian Fuel Economy and GHG Emission Regulations

Economic analysis of the current Canadian vehicle regulations for MYs 2017-2025 shows considerable economic advantages will accrue to Canadian consumers—particularly in terms of fuel savings which vastly outweigh any anticipated compliance costs. For example, Figure 6 summarizes findings from economic analysis of the Canadian vehicle regulations through 2025 conducted by Environment Canada in 2014. Similarly, ICCT research demonstrate that at fuel prices projected by the National Energy Board of Canada, the MYs 2021–2025 savings are \$34.7 billion. By 2030, maintaining the 2025 GHG standards would lead to annual fuel savings of 4.6 billion liters, or \$7.0 billion. On a fleet-wide basis, it would prevent 54.1 MtCO₂ from being emitted into the atmosphere over the lifetime of MYs 2021–2025 vehicles (Posada *et al.*, 2018a). Over its lifetime, the average 2025 vehicle would provide a return on investment within about 2 years and save the Canadian consumer nearly \$4,000 in fuel costs (Sharpe, 2018).

Also important are the emission reductions expected from Phase II of the Canadian vehicle regulations. Projecting the current vehicles regulations at 2025 levels through 2050 is expected to result in additional reductions of 25.1 MtCO₂ compared to a fleet that operates under standards frozen at 2020 levels (Figure 7). This does not take into consideration more stringent regulations for MY 2025 and beyond (which are expected) nor more ambitious ZEV adoption in the fleet. Furthermore, the economic rationale offered by the Trump administration for weakening CAFE standards does not deny these results; rather, it is contended that because of the fuel savings, Americans will drive further and suffer a larger number of traffic accidents—a logic contested by many observers.

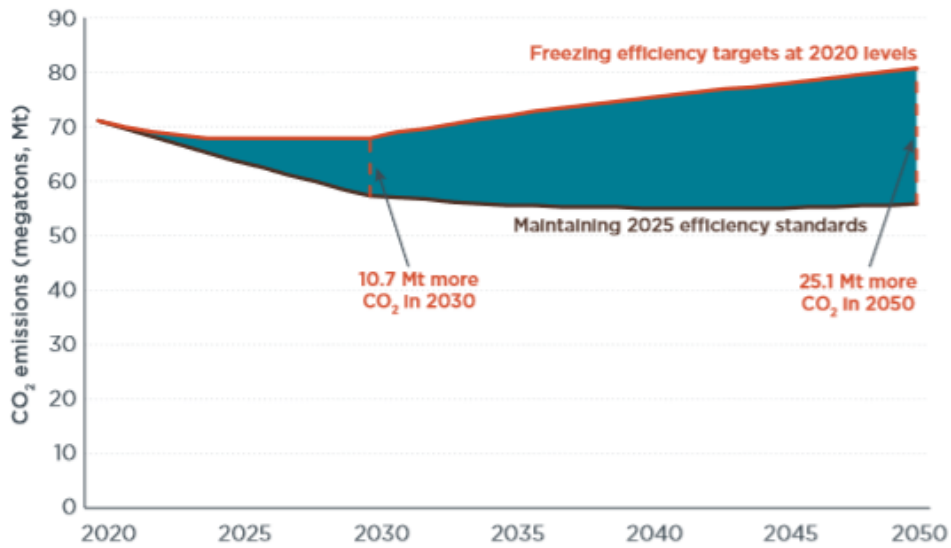
Finally, maintaining current GHG emissions regulations will stimulate innovation at Canadian firms and allow them to compete on increasingly global marketplace. While we are optimistic about California's political and legal efforts to maintain Obama-era fuel economy and GHG emission standards, with NAFTA and the threat of tariffs on Canadian automobiles also being a focus for revision under the Trump administration, it would be opportune for Canada to look to expand in other markets. More stringent standards in Canada will ensure that Canadian automakers are competitive over the long-term. As can be observed in Figure 8, increasingly stringent fuel economy standards are being adopted by countries around the world. By maintaining a stringent fuel economy standard, vehicles made in Canada will be more competitive with imports from Asia where the auto sector is already taking significant steps to address vehicle pollution.

Figure 6: Lifetime estimated net benefits from model years (MYs) 2017 to 2025 vehicles



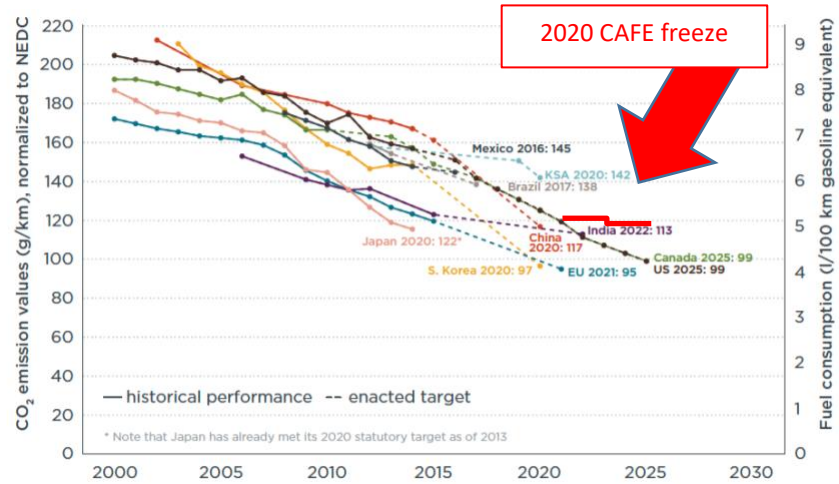
Source: (Environment Canada, 2014: Table 4)

Figure 7: CO₂ emissions from Canada’s light-duty vehicle fleet under scenarios that freeze standards to 2020 levels or maintain the 2025 standards currently in place



Source: (Posada et al., 2018: 4)

Figure 8: Historical fleet CO₂ emissions performance and current standards (gCO₂/km normalized to NEDC) for passenger cars, updated for 2020 CAFE freeze



Source: (Yang and Bandivadekar, 2017)

6. Specific Recommendations to ECCC

Transportation Can Contribute a Lot More to Climate Mitigation in Canada

While Canada's GHG emissions need to be brought down rapidly, those resulting from light-duty vehicles continue to increase. Light-duty vehicles, and personal transportation more broadly, can and should be expected to contribute significantly more to our climate mitigation efforts. There are three important trends in the composition of the Canadian fleet that need to be addressed: (i) the ever-growing share of higher-emitting vehicles, (ii) the aging fleet of vehicles on our roads and (iii) the constant overall growth in the number of gasoline vehicles. Particularly troubling are recent trends towards light-duty trucks, which tend to consume more fuel and hence produce greater emissions.

Electrification of the Canadian Fleet is Necessary Meet our Climate Commitments

The share of electric vehicles (battery and plug-in hybrid) in Canada needs to be ramped up significantly. Currently, ECCC refers to the 2014 Regulatory Impact Analysis Statement (RIAS) to assert that the Canadian vehicle regulations would yield only a 2-4% market penetration by electric vehicles. While this level of electrification appears feasible, it is insufficient, and out of date, given rapid technological development and drop in cost of producing these vehicles. Ambitious adoption targets for ZEV in the Canadian fleet are essential to meet Canada's commitments under the Paris Agreement and especially, for long-term decarbonization of transportation. Indeed, last year the Canadian government joined with countries and business in committing to reaching a 30% for new sales to electric vehicles by 2030 as part of EV30@30 campaign of the Clean Energy Ministerial (CEM, 2018). We urge the federal government to undertake a new RIAS to integrate this target into its regulatory development for the Canadian vehicles regulations.

Zero Emission Vehicle Policies Needed

Current policy to support the deployment of the electric vehicles needs to be strengthened, including both the Canadian vehicle regulations but also its coordination with other efforts by federal and provincial governments to increase the penetration of Zero Emission Vehicles (ZEV).

Regarding the current Canadian vehicle regulations, there are concerns about the zero-emission vehicle (ZEV) multiplier credit as a compliance mechanism for meeting fleet average emission standards. As the penetration of electric vehicles becomes more significant, there is a risk that the ZEV multiplier credit will allow for emissions from the traditional gasoline-fueled vehicles to offset if not surpass any emission reductions gained. We strongly urge the federal government to consider unsetting of the ZEV multiplier credit under the Canadian vehicle regulations. It was only necessary to promote the adoption of electric vehicles in the absence of other supporting policies—such as the promised Zero Emission Vehicle Strategy.

Despite commitments in the PCF to develop a ZEV Strategy, current levels of support by the federal government for the deployment of electric vehicles are still insufficient. While acknowledging an initial investment in alternative fuels and electric charging stations in the federal budget 2017, more will be necessary. Furthermore, there has been insufficient information and details about the proposed ZEV Strategy to gauge its impact of ZEV adoption in Canada. It is essential that the Strategy be released immediately, with detailed GHG emission modelling to 2030, to inform the mid-term evaluation of the Canadian vehicle regulations. This is particularly critical in light of our concerns above about the ZEV multiplier credit.

In our view, the proposed ZEV strategy to increase adoption of ZEV should focus on increase supply and facilitating the use of electric vehicles by introducing a national ZEV mandate. That is, the federal government would require that a certain share of new vehicles sold in Canada be zero emission vehicles. A ZEV mandate would solve a major impediment to meeting electrification of personal transportation targets, which remains the lack of supply for electric vehicles on the Canadian market. As research demonstrates, a national ZEV mandate would be the most cost-effective policy tool to increase the supply of ZEV in the Canadian market (Axsen *et al.* 2017). The recently launched ZEV mandate in Quebec should be a lesson learned for national policy (Gouvernement du Québec, 2016; Government of Quebec, 2018).

Other Policy Reforms

As important as electric vehicles may be, there is still an opportunity to improve and correct, other trends in Canada's vehicle fleet with respect to GHG emissions. Reforming the current federal excise tax on fuel inefficient vehicles is necessary to reverse the trends towards a greater share of new sales being high-emitting vehicles in Canada. The current federal excise tax on fuel inefficient vehicles (the Green Levy) applies to too few vehicles and at too low a rate to be effective in influencing vehicle purchasing decisions and contributing to climate change goals (Équiterre, 2016). A reform of the federal excise tax on fuel inefficient vehicles is therefore an essential complementary policy to the Canadian vehicle regulations.

In addition, the federal government has not yet begun to implement incentives to support the modal shift away from the dominant model of single car ownership for personal mobility in Canada. While we applaud the large federal investments in public transit, which include lower thresholds for provincial and municipal contributions, modal shift towards public transit will be necessary to reap the benefits of those investments. Massive modal shift towards public transit, active transportation, shared mobility services and electric vehicles are essential to achieve deep GHG emission reductions in the transportation sector (Fulton *et al.*, 2017).

Finally, other policy reforms, though small, promise to combine into a significantly larger effort. Examples include financial incentives like scrappage programs in favor of EV (BC Scrap-It, 2018) and tax credits in combination with other non-financial incentives like driving restrictions policies for older cars and preferential access to EV (HOV lanes, urban access). These are some policies that should be considered in order to accelerate the fleet turnover while increasing the EV market share (Barahona *et al.*, 2016).

Stringent Light-Duty Vehicle Regulations are in Canada's Economic Interests

Maintaining stringent Canadian vehicle regulations would not only deliver climate benefits for Canadians, but also deliver economic benefits. There is a strong body of academic literature and policy evidence that shows that 'smart' environmental regulations, such as the Canadian vehicles regulations, drive innovation (Porter and van der Linde, 1995). It is in Canada's interests to

maintain the Canadian vehicle regulations in order to bolster the competitiveness of the Canadian auto industry. This will allow Canadian automakers to better serve emerging market for zero and low emissions vehicles in the US, Canada as well as potential other emerging market. Existing research also indicates that these innovations are within the grasp of industry. Research from ICCT has demonstrated that compliance costs for the adopted 2025 standards will be 34% to 40% lower than projected in the latest U.S. midterm evaluation regulatory analysis (Lutsey *et al.*, 2017). It also shows that the current standards can be achieved cost-effectively. Such standards would result in modest, gradual vehicle price increases through 2030, though with consumer fuel savings being two to three times greater than costs (Posada *et al.*, 2018b).

But maintaining the Canadian vehicle regulations also stakes out a significant and growing market. Under a potentially bifurcated light-duty vehicle market in North America, where Canada would maintain its regulations through to 2025 along with California and the Section 177 states, ICCT research finds that approximately 40% of the combined Canadian-U.S. market would be subject to 2025 targets by MY 2025, and the remaining 60% would be covered under 2020 targets until MY 2025 (Posada *et al.*, 2018b: 7). Similarly, these authors have demonstrated that under a split market scenario, the cost of the majority of technologies only increase slightly, by 3% to 5%, due to a deceleration in learning rates and economics of scales for newer technologies. These are all important factors in maintaining an innovative and competitive automobile industry which the Canadian vehicle regulations contribute to.

Overall, the technologies to transform the Canadian auto industry into a constructive partner in the transition to a low-carbon economy are in sight. The Canadian government needs the courage and resolve to seize this opportunity by providing regulatory predictability over the long term. A long-term commitment by the Canadian government to greater fuel economy standards for the Canadian light-duty vehicle fleet is essential to ensure that the Canadian auto industry continues to be competitive in the global low-carbon economy.

7. Conclusion

Current Canadian vehicle regulations for 2022 to 2025 model years remain appropriate for Canada. There are, in addition, several complementary policies available to the Government of Canada to continue reducing greenhouse gases from the transportation sector. The projected GHG emission reduction contribution of the light-duty vehicle sector towards meeting our national GHG reduction target is not reasonable - it should be much greater. Necessary complementary policies include a national ZEV mandate to increase ZEV adoption in Canada, Clean Fuel standards, policies to increase vehicles turn over, policies to reduce the share of high-emitting vehicles in the Canadian fleet and policies to incentivize modal shift towards public transit, shared and active mobility.

As the world moves to address climate change, Canada should not be left behind in the emerging global markets for clean transportation technologies. Canada is especially at risk of falling behind and missing on global clean transportation innovation, especially the booming Zero Emission Vehicles markets, due to its continued support for the internal combustion engine sector in Canada.

We therefore submit that stringency of the *2014 Regulations Amending the Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations* for model years 2017-2025 is appropriate, and must be maintained, and recommend that the Minister of the Environment and Climate Change Canada immediately begin the regulatory process to remove the reference to the US EPA regulations in the Canadian vehicle regulations.

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