Canadian Vehicle Manufacturers Association

Standing Senate Committee on Energy, the Environment and Natural Resources
Transportation and the Transition to a Low Carbon Economy

Auto Industry Economic Importance - Why it matters:

The auto manufacturing sector is a key driver for Canada’s economy contributing significantly to our nation’s manufacturing GDP, providing tens of thousands of direct and indirect high paying jobs (some 500,000 in total right across Canada). The auto manufacturing sector is highly integrated and competitive between Canada and the U.S. and in particular the U.S. Midwest and South (our competing jurisdictions). Manufacturing plants on both sides of the border are competing for capital, investment and new product mandates.

Key Facts:

1. Motor vehicles are the #1 contributor to Canada’s manufacturing GDP
2. Direct contributions of over $18 billion to GDP in 2014
3. Auto manufacturing represents 9.6% of manufacturing GDP, 7.7% of manufacturing employment (22% of manufacturing GDP in Ontario)
4. Directly employs 115,000 people, with a job multiplier effect, ranging between 7 to 9 jobs for every 1 assembly position; no other manufacturing sector has a higher job multiplier
5. Canada’s #1 manufactured export and #2 export overall
6. In 2015, exports of motor vehicles and parts totalled $87 Billion (a 16.8% increase from 2014)


Auto Industry Innovation and Technology

- The auto industry is one of the largest “Green Tech” sectors in the world, investing greater than $200 billion in fuel efficiency and “green tech” by 2025, resulting in a historically unprecedented 50% fuel efficiency improvement; some $100 billion is being invested in electric vehicle development.

- Automakers spend an average of $1,200 for R&D per vehicle*.
  - Improved fuel economy and emissions targets continue to drive automaker improvements in vehicle powertrain, light weighting, aerodynamics, electrification and other vehicle attributes. (Source: “Center for Automotive Research 2015).

- The auto industry is the largest new driver of the emerging “internet of things”
  - Moving toward connected and automated vehicles at unprecedented speed.
The Auto Industry, Climate Change and Transition to a Low Carbon Economy

The auto industry is a leader in the environmental arena and automakers are navigating the road of transition to a low carbon economy. Vehicle manufacturers are contributing to greenhouse (GHG) reductions from virtually every aspect of their business, the life cycle of the vehicles they produce, and in-use operation.

Vehicle Manufacturing:

Canadian vehicle manufacturing operations are “Smart” and Energy Efficient. They have a long history of taking action to reduce energy consumption and their carbon footprint through investment in new technologically advanced manufacturing processes, energy conservation, and waste diversion – and remain committed to reducing greenhouse gas (GHG) emissions on a continuous basis.

Energy Intensity (MJ/$2007 – GDP) in the auto manufacturing sector has been decreasing since 1990 (source: NRCAN). Put another way, the auto manufacturing sector has become increasingly more energy efficient, while having among the most productive and award winning quality plants in North America.

Efforts are being made to continue this trend.

All five auto manufacturers in Canada – FCA Canada Inc., Ford, General Motors, Honda, and Toyota – have set company-wide public targets to reduce GHG and/or energy intensity ranging from 1% to 3% per annum reaching out to the 2020 – 2025 timeframe.

Auto manufacturing contributes less than one percent of industrial GHG emissions (source: MOECC) in Ontario where it primarily resides.

Auto manufacturing is highly efficient – emitting less than half of the direct and indirect GHG emissions per vehicle built when compared to European auto manufacturing (source: ACEA; CVMA).
Emission reductions are part of the industry’s continuous improvement philosophy, engrained in automotive industry culture through its management systems because it simply makes good business and environmental sense.

**Reducing the Carbon Footprint of Light and Heavy Duty Vehicles**

The general population is more aware than ever of climate change and its impacts, both locally and globally. At all levels in our society, people are making decisions to reduce the carbon footprint of their day-to-day activities, including personal transportation.

In response, the auto industry is changing too. Vehicle technology will change more in the next five years than it has in the past 100 years.

Improving vehicle energy efficiency and reducing vehicle GHG emissions is a common interest worldwide. Vehicle manufacturers are competing to introduce new and advanced vehicle technologies to market with energy efficiency, reduced fuel consumption and alternative fuels being important competitive factors driving technology development and innovation.

The automotive industry is taking a leadership role in reducing greenhouse gas emissions (GHG) from new vehicles. The GHGs for the on-road fleet of light duty vehicles is a relatively small portion of the total inventory in Canada at 11% (84 Mt.) and this percentage is forecast to steadily drop as new vehicles replace the older vehicles in operation.

**Light Duty Cars & Trucks are 11 % of Total Canadian GHGs**

The Government of Canada has revised a number of extremely stringent regulations to address motor vehicle emissions on a national basis harmonized with the U.S. regulations, including:

- 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
- 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).

**Light Duty Vehicles**

The very stringent Passenger Car and Light Duty Truck GHG Emission Regulations – 2017–2025 model years have 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.

The unprecedented stringency of the new 2017-2025 MY GHG standards will require manufacturers to spend an estimated $200 billion USD in advance vehicle technology development, focused on vehicle GHG emission reductions, including $100 Billion in electric vehicle development. These regulations require manufacturers to adopt a multi-technology and fuels 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 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 (or 266 million tonnes) of carbon dioxide equivalent (CO2) GHG emissions from the LDV fleet on a national basis. To put this into perspective the annual year over year improvement prior to this regulation averaged from 1.1% to 1.3% per year.

![Cdn & US Federal New Vehicle GHG Standards](image)
Even greater reductions are expected as new vehicles and technologies are adopted by consumers and older higher emitting vehicles are retired.

Vehicle Electrification

The new light duty vehicle GHG regulations will also increase the use of alternative energy sources in vehicles, such as electric vehicles, fuel cell electric and, plug-in hybrid electric vehicles (PHEVs), compressed natural gas (CNG) and hydrogen (H₂) vehicles. The industry introduction of these new vehicle technologies is well underway and expected to increase over the duration of the regulations. Since 2011, 25 new plug-in electric vehicles have been introduced in Canada across a growing number of vehicle segments (increasing to 29 for the 2017 model year), some of which will be built in Canada; these vehicle offerings have been made available in the absence of a legislative mandate.

Increasing vehicle electrification, including plug-in hybrid and battery electric vehicles, is an option that can provide reductions in GHG emissions reductions. Plug-in electric vehicle technology (PEV) continues to come with a significant cost premium and consumers must be able to make a value judgement based upon their needs to select the most cost effective vehicle choices.

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.
Beyond cost, electric vehicle technology also has significant technical challenges with range and vehicle size that needs further development before mass consumer acceptance and adoption of these technologies is possible; it will require a transition period which is a function of consumer demand for these products. Consumer financial incentives that support new technology are helpful while policies which increase new vehicle prices will slow new vehicle sales and GHG reductions. In many jurisdictions, policies supporting plug-in electric vehicle consumer incentives and measures that make electric vehicle use more convenient and less costly have been found to be more helpful than regulation at increasing consumer adoption rates. Sales of plug-in electric vehicles across Canada have been steadily rising year-over-year and this growth is expected to continue based on the number of new plug-in vehicle models being brought to market; there are now 21 models available to consumers and growing.

Policies that educate consumers, increase consumer demand and support consumer use of these new vehicle technologies will be critical to increasing the consumer adoption of these alternative energy vehicle choices.

Greater success in electric vehicle adoption can be achieved by proactively instituting policies that help increase the consumer demand for electric vehicles, enhance the recharging infrastructure in the most effective locations and through public education.

Vehicle manufacturers have and will continue to work collaboratively with the government to support their objectives in the area of the Climate Action and vehicle GHG emissions reductions. A partnership approach between the government and industry is the best and most effective way to reduce GHGs, preserve consumer choice and demand, and achieve the government’s goal of reducing vehicle fleet GHG emissions. This will result in increased consumer demand and reduced GHG emissions from the light duty fleet without risking the strength of the Canadian economy or constraining consumer choice.
We offer the following recommendations for industry and government collaborative action that would form this partnership approach:

1) Joint dealer and consumer education  
2) Targeted support for the electrification of city fleets for example taxis, delivery fleets, car sharing, commercial and government fleets  
3) Expanded HOV/ EV fast lane access and free charging & parking  
4) Enhance city and workplace EV charging infrastructure and fast charging installations along highways  
5) Monitor consumer PEV adoption – use Ontario-level incentives to accelerate adoption  
6) Explore Green Tech Opportunity - R&D and testing for batteries, EV components, EV infrastructure (plug-in & hydrogen) and autonomous vehicles  
7) Retirement Program of higher GHG emitting 12 years and older vehicles

Heavy Duty Vehicles

Similarly, for the heavy duty vehicle fleet, the federal government has published regulations pertaining to the heavy duty vehicle and engine greenhouse gas emissions for the 2014 to 2018 model years. This regulation was effective February 2013 and through its implementation period, it is expected to reduce the average GHG emissions of 2018 heavy-duty vehicles by up to 23%\(^1\). In September 2014, the federal government also announced its intent to further tightening the heavy-duty vehicle and engine GHG emission requirements for the 2019 model year and beyond, following suit with recent U.S. regulatory developments.

Vehicle Smog Causing Emissions and Clean Air

New vehicles must also reduce smog-related emissions simultaneously while reducing GHG emissions; today's new gasoline vehicles are virtually zero emissions vehicles.

Since the mid-1980’s vehicle manufacturers have met increasingly more stringent smog related emission requirements each year. 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%. Commencing in 2017, even more stringent smog related standards, Tier 3, will be introduced reducing these small remaining emissions by yet another 80%. These standards are fuel neutral, which means each vehicle must comply with the same smog related standards regardless of the fuel type used. 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 and account for less than 10% of Canada’s total NOX and VOC inventory, despite increases in vehicle population. These virtually zero smog-related emission vehicles will be supported in the market place with ultra-low sulphur gasoline (10 ppm sulphur), both of which contribute significantly to achieving these dramatic vehicle emission reductions and improved air quality.

\(^1\) Reference: Environment Canada Heavy Duty Vehicle and Engine GHG Regulations, February 2013
What is needed – Canada’s National Framework to Address Climate Change:

Auto manufacturing is also highly trade exposed (source: StatCan data) and very sensitive to any cost increases imposed provincially and federally. That is why the design of the Pan Canada Framework for Climate Change is very important to the competitiveness of Canada’s auto manufacturing and ultimately the achievement of Canada’s economic and environmental objectives.

What is needed is a national climate action framework that ensures the sustainability and long term competitiveness of the automotive industry, a cornerstone of Canada’s economy. It is critical in order to maintain the Canada’s current manufacturing footprint and to avoid the migration of many thousands of jobs “carbon leakage” to other jurisdictions (which have no similar climate policy commitments).

All Canadian jurisdictions (federal government, provinces and territories), must continue to support the national implementation of advanced emission and GHG reducing technologies as the most cost effective approach to emission reductions for governments and consumers. Overlaying sub-national policies on these national regulations, which are not aligned across North America, will sub-optimize the industry’s ability to effectively deploy these technologies and will do so at an increased cost to consumers.

Vehicle related emissions reduction successes have been achieved by aligning regulatory approaches between Canada and the United States. A continued harmonized regulatory approach allows for the leveraging of North American economies of scale which provide Canadians with the greatest access to advanced vehicle technologies and their commensurate environmental benefits (reduction in vehicle GHG emissions as well as criteria emissions). These actions are consistent with the activities and objectives of the Regulatory Cooperation Council and the June 29, 2016 Leaders’ Statement and Action Plan on the North American Climate, Clean Energy, and Environment Partnership.