

Intelligence MEMOS



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To: Canadians concerned about carbon

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Re: **UNPACKING OTTAWA'S AMBITIOUS CARBON PLAN FOR CARS AND TRUCKS**

The federal government's "strengthened climate plan," [projects](#) a reduction of 213 megatonnes of greenhouse gas (GHG) emissions – or 30 percent of 2018 nationwide GHGs – by 2030.

It seeks a 35-megatonne fall in GHGs from transportation from 186 megatonnes in 2018 to 151 megatonnes by 2030. Understanding the practical implications of transportation emissions goals will support policymakers in considering the trade-offs involved in achieving those goals.

Our new C.D. Howe Institute [Commentary](#) focuses primarily on passenger and freight transportation, from cars to SUVs and trucks, which are the main sources of the sector's emissions.

Transportation was the second-largest Canadian GHG emitting sector in 2018, after oil and gas. Ottawa's 2020 strengthened climate plan projects the majority of GHG reductions in the transportation sector to come from passenger transportation, whether cars, passenger light trucks, motorcycles, passenger air, buses, or passenger rail.

Our paper focuses on the changes required for passenger vehicles and freight trucks to meet emission targets – specifically the changes required for the vehicle stock, including the extent of zero-emission vehicle penetration and required improvements in vehicle efficiency

It explores the practical implications of achieving this projected reduction, finding that it would have to translate to a 41-percent reduction in average GHGs per passenger vehicle over the next decade.

An example scenario would require several concurrent events: an increase in the blending of biofuels, a 2.5-percent annual improvement in the efficiency of internal combustion engine vehicles, and having zero-emission vehicles account for a roughly 30 percent share of the total vehicle stock.

This will require the annual share of electric – and conceivably hydrogen – vehicle sales to reach 70-75 percent by 2030, which corresponds with the federal government's recently updated mandatory zero-emission vehicle sales target of 100 percent of all passenger vehicles in 2035.

Significant GHG reductions from transportation require either decreases in driving or the replacement of older vehicles with more efficient, lower emission technology.

The rate of turnover (i.e., retirement) of the current vehicle fleet is a significant determinant of what reductions are feasible by 2030.

If recent trends in vehicle sales (i.e., a shift from cars to larger passenger light trucks) persist, greater efficiency improvements or higher ZEV penetration would be required to achieve the projected reduction in transportation sector GHGs by 2030. In recent years, the vehicle stock has increasingly shifted from cars towards light trucks, which use relatively more energy and emit greater GHGs per driven distance than smaller vehicles. The stock of passenger light trucks has increased from 2.8 million vehicles in 1990 up to 10.3 million in 2018, representing an increase of 268 percent. Cars have only increased from 11.1 million to 12.5 million during the same time.

The federal plan's projected reductions would require a roughly 18-percent reduction in the average emission intensity of freight trucks by 2030. Such a reduction will require either improvements in vehicle efficiency, electrification or adaptation of hydrogen fuel cell technology for freight transport, as well as biofuel blending.

Overall, the average emission intensity of the passenger vehicle fleet must fall 41 percent per vehicle to meet Ottawa new targets. Based on our assumptions – including a 13-megatonne reduction from using more biofuels and a 2.5-percent annual rise in overall engine efficiency – approximately 7.7 million zero-emission passenger vehicles would need to be on the road in 2030 to achieve the projected reduction under the federal climate plan.

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