



Pembina Institute Comments on Canada’s Proposed *Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations*

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The Pembina Institute welcomes this opportunity to provide comments on the Government of Canada’s proposed *Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations*.²

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¹ This revised version incorporates a few minor adjustments to the original version of this document, which was submitted to Environment Canada on June 16, 2010.

² Government of Canada, “Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations,” *Canada Gazette Part I* 144, no. 16 (2010). Available online at <http://www.gazette.gc.ca/rp-pr/p1/2010/2010-04-17/html/reg1-eng.html>.

1. Executive summary

The government's decision to regulate greenhouse gas (GHG) emissions from cars and light trucks is a welcome and necessary step. There is a broad consensus that such regulations are an essential ingredient of a comprehensive national plan to combat climate change. The State of California has led North American efforts to implement tailpipe GHG standards, and Québec and British Columbia both committed to replicate California's standards without waiting for federal action. We note that the Government of Canada is now proposing regulated standards similar in stringency to California's only following the Obama Administration's decision to do so. In our view, it is disappointing that the Government of Canada has not chosen to be a leader in this area. Canada could certainly meet more stringent GHG tailpipe standards than the U.S. without automakers needing to produce Canada-specific models. This is because the standards apply only to a firm's fleet average tailpipe emissions, which means that Canada could meet more stringent standards simply by having a greater proportion of lower-emission vehicles than the U.S. — as it does at present.

Tailpipe GHG standards for personal vehicles are certainly not the only policy needed to reduce GHG emissions from the transportation sector. We welcome the Minister of the Environment's recent commitment to regulate GHG emissions from freight trucks. But ***it remains essential that the federal government work with the provinces to implement a full package of policies to reduce GHG emissions from transportation.*** This should include an economy-wide price on emissions as well as policies to reduce urban sprawl, improve and expand public transit, and expand infrastructure and incentives for walking, biking and electric vehicles.

Evaluating precisely the environmental benefits of the proposed GHG tailpipe regulations is made difficult by a lack of transparency concerning both what the regulations will actually require, and what would happen in the absence of the regulations (the "business-as-usual" scenario). The regulations are highly complex, Environment Canada's modelling of their projected effects is incomplete, and its business-as-usual scenario does not appear to be plausible. ***We urge Environment Canada (i) to establish an independent, public expert committee to review and improve its modelling of the proposed regulations, and (ii) to develop a range of plausible, detailed business-as-usual scenarios for the Canadian personal vehicle sector and have those scenarios reviewed by the same independent committee.***

However, if historical trends are taken as an accurate guide to business-as-usual going forward, ***Environment Canada's estimates indicate that the proposed Canadian standards appear to require no improvement, relative to business-as-usual, in the national average fuel economy of new vehicles up to and including model year 2014 at a minimum, and, for light trucks, possibly over the regulations' entire lifespan (up to and including model year 2016).*** We also reached very similar conclusions when taking into account automakers' expected use of certain types of credits allowed by the regulations.

These conclusions are subject to uncertainty both about what would most likely happen in the absence of the regulations — the business-as-usual scenario — and about the appropriateness of the sales mix forecast used to project the national average standards. ***These conclusions should therefore be regarded as provisional. However, it is difficult to see how they can be improved upon until such time as the Minister of the Environment provides a fully transparent evaluation of the***

proposed regulations — something that we believe he must do before the regulations are finalized.

Despite this uncertainty, it is clear that business-as-usual emissions from Canada's cars and light trucks are increasing steadily and significantly in absolute terms. ***Regulations that require little or no improvement relative to business-as-usual will therefore allow continued absolute increases in emissions.***

Historically, Canada's personal vehicle fleet has been consistently more fuel efficient than the U.S. fleet, with the average Canadian vehicle emitting less GHGs than the average U.S. vehicle. But a comparison between Environment Canada's estimates and those by the U.S. federal authorities shows that ***the harmonized Canada-U.S. tailpipe standards would allow the Canadian personal vehicle fleet to lose its traditional "efficiency advantage" and GHG performance superiority over the U.S.*** Over the lifespan of the regulations (2011–16), Canada's more efficient fleet is required to show less improvement in tailpipe GHG performance than the U.S. fleet: ***Canada's new personal vehicle fleet is required to improve by 19.5%, compared to a U.S. improvement of 23.1%.*** (These numbers refer to the improvements per vehicle sold, not to the change in total emissions from personal vehicles.)

The conclusions reached above do not include the effect of early action credits (EACs). The Canadian regulations allow automakers to claim EACs if their average GHG tailpipe performance exceeded a specified reference level during 2008, 2009 and 2010. The volume of EACs available under Canada's proposed regulations is very large. For example, the volume of EACs available for model year 2009 and 2010 cars appears to be more than sufficient to allow full compliance with the car standards up to and including model year 2015 — without automakers having to make any improvements to fuel economy. Credits can also be generated by out-performing the standards in any particular year. ***The very large volume of early action credits available, plus the use of credits for out-performing the standards in earlier years, make it considerably less likely still that the standards will require any improvement over business-as-usual up to and including 2015 or even 2016. EACs are very difficult to justify; we call for the EACs mechanism to be removed from the regulations.***

Some argue that firms with surplus EACs will be unwilling to sell them to competitors. If this were true, fewer EACs could be used for compliance than we have assumed above, and automakers could need to start improving fuel economy earlier. However, we believe that given the number of players in the market for EACs, we should expect that market to be competitive, in which case all credits with a financial value will be sold. Even if one takes the view that the extent of trading of surplus EACs is uncertain, they nonetheless pose a large risk to the stringency of the regulations.

It is also important to note that under the Canadian regulations, as currently proposed, automakers are expected to use for compliance a greater total volume of EACs per vehicle than in the U.S. This is because the methods of calculating EACs in the proposed Canadian regulations are not aligned with the methods in the finalized U.S. regulations in two key respects. ***If the Government of Canada does not remove EACs from its proposed regulations, it should at a minimum fully align its methods of calculating EACs with the methods in the U.S. regulations.***

The proposed Canadian regulations and the finalized U.S. regulations also differ in their treatment of “advanced technology vehicles” (ATVs), which consist of electric vehicles, fuel cell electric vehicles, and plug-in hybrids. The proposed Canadian regulations allow electric and fuel cell vehicles, as well as a certain portion of plug-in hybrids, to be counted as having zero emissions. The regulations also allow automakers to apply a multiplier to their sales of ATVs, in effect counting each vehicle twice. However, in the finalized U.S. regulations, the multiplier has been removed and the volume of ATVs that can be counted as having zero emissions has been capped. It is important to recognize that the more generous the treatment of ATVs, the less the overall stringency of the regulations and the less they will reduce total emissions. ***If the Government of Canada continues to want to harmonize its regulations with the U.S. regulations, it must remove the ATV multiplier, cap the volume of ATVs that can be counted as having zero emissions at a comparable level to the U.S., and provide an equivalent treatment for ATVs beyond the cap.***

In conclusion, our analysis confirms that the proposed Canadian regulations clearly do not represent a leadership approach. Our analysis also highlights the lack of transparency concerning what the regulations will actually require — a consequence of their extreme complexity. In addition, standards that vary according to the vehicle size (as is the case with the current proposal) provide little incentive to shift the market toward smaller, lower-emitting vehicles.

As noted above, Canada could meet more stringent GHG tailpipe standards than the U.S. without automakers needing to produce Canada-specific models. ***We therefore suggest that the government address the problems that we have just summarized by changing its approach and adopting much simpler regulations that set a single corporate average GHG tailpipe standard for cars and light trucks combined. This standard should be set at a level that reflects and maintains Canada’s traditional vehicle efficiency advantage over the U.S., declines over time more quickly than business-as-usual trends, and does not allow early action credits.*** Unlike the currently proposed regulations, this would provide clear environmental benefits, allow the federal government and automakers to be clearly held to account for their performance, and demonstrate real Canadian leadership.

2. Detailed analysis and comments³

2.1 Need for regulations

The government's decision to regulate GHG emissions from cars and light trucks is a welcome and necessary step. Personal vehicles account for about 10% of Canada's GHG emissions,⁴ and there is a broad consensus that regulated standards for fuel economy or tailpipe GHG emissions from such vehicles are an essential ingredient of a comprehensive national plan to combat climate change.⁵ Voluntary, unenforceable approaches to GHG reductions, such as the memorandum of understanding (MoU) signed between the previous federal government and automakers in 2005 (see Sec. 2.3), are unlikely to be capable of generating significant changes relative to business-as-usual.

The State of California has led North American efforts to implement tailpipe GHG standards (California first enacted such standards in 2004⁶), and Québec and British Columbia both committed to replicate California's standards without waiting for federal action.⁷ We note that the Government of Canada is now proposing regulated standards similar in stringency to California's only following the Obama Administration's decision to do so. In our view, it is disappointing that the Government of Canada has not chosen to be a leader in this area.

It is often claimed that it would not be feasible for Canada to adopt more stringent GHG tailpipe standards than the U.S. federal government because of the highly integrated nature of the North American vehicle market. However, Canada could certainly meet more stringent standards than the U.S. without automakers needing to produce Canada-specific models. This is because the standards apply only to a firm's fleet average tailpipe emissions, which means that Canada could meet more stringent standards simply by having a greater proportion of lower-emission vehicles than the U.S. — as it does at present (see Sec. 2.4). If California, with an economy not much larger than Canada's, can move ahead of the rest of North America in this area, then clearly Canada could too.

2.2 Need for additional policies

It is important to note that tailpipe GHG standards for personal vehicles are certainly not the only policy needed to reduce GHG emissions from the transportation sector. Such standards should lead to improvements in vehicle technology, but they will have little or no effect on the amount of car use. In addition, when standards vary according to the vehicle size (as is the case with the current proposal), they will do little to shift the market toward smaller vehicles — another important way to reduce emissions. Tailpipe GHG standards also do not address the emissions from the production, refining and transportation of fuel before it reaches the car. And while standards for personal vehicles address the

³ In some places we have included explanations to assist a general reader not familiar with the details of the proposed regulations.

⁴ Pembina Institute, *Canada's Main Sources of Greenhouse Gas Emissions* (Drayton Valley, AB: The Pembina Institute, 2010). Available online at <http://climate.pembina.org/pub/1966>.

⁵ Matthew Bramley and Clare Demerse, *Choosing Greenhouse Gas Emission Reduction Policies in Canada* (Drayton Valley, AB: The Pembina Foundation, 2008), 19–21. Available online at <http://climate.pembina.org/pub/1720>.

⁶ California Air Resources Board, *Clean Car Standards — Pavley, Assembly Bill 1493*, California Air Resources Board, <http://www.arb.ca.gov/cc/ccms/ccms.htm> (accessed June 8, 2010).

⁷ Pembina Institute, *Highlights of Provincial Greenhouse Gas Reduction Plans* (Drayton Valley, AB: The Pembina Institute, 2009). Available online at <http://climate.pembina.org/pub/1864>.

10% of Canada's GHG emissions that come from such vehicles, they do not address the further 15% of Canada's emissions that come from other transportation sources, such as freight trucks, off-road vehicles, airplanes etc.⁸

We therefore welcome the Minister of the Environment's recent commitment to also regulate GHG emissions from freight trucks, and look forward to examining the consultation draft of the regulations expected in the fall of 2010.⁹ But it remains essential that the federal government work with the provinces to implement a full package of policies to reduce GHG emissions from transportation. This should include an economy-wide price on emissions (e.g., via a cap-and-trade system that includes emissions from transportation fuels¹⁰) as well as policies to reduce urban sprawl, improve and expand public transit, and expand infrastructure and incentives for walking, biking and electric vehicles.¹¹

2.3 Lack of transparency regarding environmental benefits

The environmental benefits of a government policy are measured by the difference between a scenario with the policy, and a scenario without it — the so-called "business-as-usual" case. The state of the physical environment is, of course, determined by absolute levels of pollution, not changes relative to business-as-usual. But the only meaningful definition of the benefits of a specific action or policy, such as the Government of Canada's proposed GHG tailpipe regulations, is the extent to which it makes a difference, i.e., relative to a scenario without the policy.¹² If there is no such difference, the policy is without effect and without benefits.¹³

Evaluating precisely the environmental benefits of the proposed GHG tailpipe regulations is made difficult by a lack of transparency concerning both what the regulations will actually require, and the business-as-usual scenario:

- The regulations are highly complex — there is no single GHG standard, but rather a continuum of standards that depend on the size of the vehicle, and automakers will be allowed to use several types of credits to comply with the standards. Environment Canada has undertaken

⁸ Pembina Institute, *Canada's Main Sources of Greenhouse Gas Emissions*.

⁹ Environment Canada, "Canada Announces Continental Approach to Reduce GHG Emissions from Heavy-Duty Vehicles," news release, May 21, 2010. Available online at <http://www.ec.gc.ca/default.asp?lang=En&n=714D9AAE-1&news=2D7A8979-B4F4-4A06-87E0-C76237F5E803>.

¹⁰ Matthew Bramley, *Key Questions for a Canadian Cap-and-Trade System* (Drayton Valley, AB: The Pembina Institute, 2009), 5. Available online at <http://climate.pembina.org/pub/2015>.

¹¹ Cherise Burda, Alison Bailie and Graham Haines, *Driving Down Carbon* (Drayton Valley, AB: The Pembina Institute, 2009), Chapter 6. Available online at <http://climate.pembina.org/pub/1993>.

¹² Environmentalists often criticize the use of a business-as-usual reference point for creating a misleading impression about absolute outcomes. Emission reductions stated only relative to business-as-usual can create an impression of absolute reductions when there are none; economic costs stated only relative to business-as-usual can create an impression of recession when there is only reduced growth. In addition, stating outcomes relative to business-as-usual can be vague if business-as-usual is not clearly defined. But it remains the case that the only meaningful way to measure the benefits of a specific policy is relative to business-as-usual.

¹³ We acknowledge that even if a policy has no present benefits in the way defined here, it may nonetheless be useful in establishing a regulatory framework that can be strengthened later — leading to future benefits more quickly than if no such framework were established now.

modelling¹⁴ to estimate the actual levels of the standards, and the effects of certain types of credits (see Sec. 2.4), although not early action credits, which are expected to be very significant (see Sec. 2.5). The Environmental Protection Agency (EPA) and the National Highway Traffic Safety Administration (NHTSA) have made these estimates for the finalized U.S. tailpipe GHG standards,¹⁵ which are the template on which the proposed Canadian standards are based, and Environment Canada has adapted these calculations to the Canadian fleet using the EPA's model. Environment Canada's estimates would be very difficult to reproduce, and they have not been subject to an independent, public review.

- All business-as-usual projections are inherently uncertain, but this is perhaps particularly so in the transportation sector, where the market is rapidly evolving and vehicle efficiencies, the mix of new vehicles and the vehicle kilometres travelled are all important factors. Environment Canada has made available partial details of a business-as-usual scenario for new Canadian personal vehicle sales, but it assumes that the fuel consumption rates of individual models would remain at 2008 levels¹⁶ — in contradiction to the historical trend towards better fuel economy (see Sec 2.4). The government has not provided a more plausible detailed business-as-usual scenario.

Unfortunately, lack of transparency about the Canadian personal vehicle sector is not a new problem. Notably, government and industry have failed to comply with the transparency requirements of their 2005 *Memorandum of Understanding [MoU] between the Government of Canada and the Canadian Automotive Industry Respecting Automobile Greenhouse Gas Emissions*. Under this MoU, interim reports on GHG reductions, relative to a business-as-usual scenario, were to have been published by May 31 2008, 2009 and 2010.¹⁷ However, to date none of these reports has been released.¹⁸

It is noteworthy that the U.S. federal government has published a much more abundant set of data, modelling details and other information in support of its finalized tailpipe GHG standards,¹⁹ which are the template on which the proposed Canadian standards are based. We urge Environment Canada (i) to establish an independent, public expert committee to review and improve its modelling of the proposed regulations, and (ii) to develop a range of plausible, detailed business-as-usual scenarios for the

¹⁴ John Lawson, *Technical Report on Analysis of Proposed Regulation of Passenger Automobile and Light Truck Greenhouse Gas Emissions* (report prepared for Environment Canada, 2010). Available on request from Environment Canada.

¹⁵ Environmental Protection Agency and National Highway Traffic Safety Administration, "Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule," *Federal Register* 75, no. 88 (2010): 25324. Available online at http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cape/CAFE-GHG_MY_2012-2016_Final_Rule_FR.pdf.

¹⁶ Lawson, 20, 26.

¹⁷ Natural Resources Canada, *Memorandum of Understanding between the Government of Canada and the Canadian Automotive Industry Respecting Automobile Greenhouse Gas Emissions* (Ottawa, ON: Government of Canada, 2005). Available online at <http://oee.nrcan.gc.ca/transportation/ghg-memorandum/memorandum-of-understanding.cfm?attr=8>.

¹⁸ Natural Resources Canada, *Automakers Agreement to Reduce GHG Emissions*, Natural Resources Canada, <http://oee.nrcan.gc.ca/transportation/ghg-memorandum/> (accessed July 26, 2010).

¹⁹ Environmental Protection Agency and National Highway Traffic Safety Administration.

Canadian personal vehicle sector and have those scenarios reviewed by the same independent committee.

2.4 Apparent major delays to environmental benefits

We have nonetheless attempted to assess the environmental benefits of the Government of Canada's proposed regulations by looking at the difference between the following two quantities:

- Environment Canada's estimates (see Sec. 2.3) of (i) the average fuel economy levels that correspond to the GHG tailpipe standards set out in the regulations,²⁰ and (ii) the actual average fuel economy levels expected to be achieved by the standards when taking into account automakers' expected use of certain types of credits allowed by the regulations. These estimates are uncertain because, as noted in Sec. 2.3, there is no single GHG standard, but rather a continuum of standards that depend on each vehicle's "footprint" (the axle-wheelbase area). Under the regulations, these standards are averaged over an automaker's entire fleet to calculate the standards applying to that firm's fleet average tailpipe emissions for new cars and light trucks respectively. Projections of the firm-level and national average standards are uncertain because the future mix of new vehicles is uncertain.
- A continuation of historical trends in the fuel economy of Canadian personal vehicles (based on historical trends). These would appear to be the best available estimate of business-as-usual (what would happen in the absence of the regulations) given the lack of plausible detailed business-as-usual scenarios for the Canadian personal vehicle sector. Canada has seen an accelerating improvement in vehicle fuel economy over the past two decades. Therefore, to be conservative, we have used the gentler trends averaged over the last 20 years and ten years in addition to the more steeply declining trend averaged over the last five years (2005–10).

The results are shown in Figures 1 (cars) and 2 (light trucks). They indicate that the projected national average regulated standards for both Canada's new car and new light truck fleets (depicted as solid lines in the figures) correspond to average fuel economy levels that would be reached **without the regulations** (the dotted lines in the figures) up to and including model year 2015 for new cars, and 2016 for new light trucks, if the fuel economy trends observed over the 2005–10 period continued in a business-as-usual scenario.

If, instead, future business-as-usual fuel economy trends were those achieved over the 2000–2010 period, the projected national average regulated standards correspond to the average fuel economy levels that would be reached without the regulations up to and including model year 2015 for both new cars and new light trucks.

And if the future business-as-usual fuel economy trends were only those achieved over the 1990–2010 period, the projected national average regulated standards correspond to the average fuel economy levels that would be reached without the regulations up to and including model year 2014 for both new and new light trucks.

²⁰ It is straightforward to convert GHG tailpipe standards into corresponding fuel economy levels because GHG emissions are proportional to fuel consumed.

To summarize: the proposed standards appear to require no improvement, relative to business-as-usual, in the national average fuel economy of new vehicles up to and including model year 2014 at a minimum, and, for light trucks, possibly over the regulations' entire lifespan (up to and including model year 2016) — if historical trends are an accurate guide to business-as-usual going forward.

In addition to looking at the projected standards on their own (depicted as solid lines in Figures 1 and 2), we also looked at the actual fuel economy levels expected to be achieved by the regulations when taking into account automakers' expected use of certain types of credits (dashed lines in the figures). The conclusions reached are very similar. (For cars, there is only one change to the conclusions above: if the future business-as-usual fuel economy trend was that observed over the 1990–2010 period, the regulations would require an improvement over business-as-usual for model year 2014 onwards. For light trucks, the regulations would overtake business-as-usual only if the future business-as-usual fuel economy trend was that achieved over the 1990–2010 period, and that would happen only for model year 2016.)

As noted above, the projected national average standards are uncertain because the future mix of new vehicles is uncertain. Environment Canada's estimates of the average fuel economy levels corresponding to the standards rely on a detailed forecast of vehicle sales by Desrosiers Automotive Consultants Inc. that used the 2008 sales mix as a starting point. If that forecast had instead used the current (2010) sales mix as its starting point, Environment Canada's estimates (the solid and dashed red lines in Figures 1 and 2) would have been different — but it is difficult to say by how much and in which direction, given the lack of (i) publicly available information on vehicle sales and (ii) an understanding of how sensitive Desrosiers' forecasting methodology is to its starting point. (Desrosiers' methodology is proprietary.)

The conclusions above are therefore subject to uncertainty both about what would most likely happen in the absence of the regulations — the business-as-usual scenario — and about the appropriateness of the sales mix forecast used to project the national average standards. The conclusions should therefore be regarded as provisional. However, it is difficult to see how they can be improved upon until such time as the Minister of the Environment provides a fully transparent evaluation of the proposed regulations — something that we believe he must do before the regulations are finalized.

Despite this uncertainty, it is clear that business-as-usual emissions from Canada's cars and light trucks are increasing steadily and significantly in absolute terms. The National Energy Board's most recent economy-wide business-as-usual scenario shows Canadian gasoline consumption increasing every year between 2010 and 2020, with a 12% increase over the decade.²¹ Total GHG emissions from Canada's cars and light trucks would therefore increase by a similar percentage. Regulations that require little or no improvement relative to business-as-usual will therefore allow continued absolute increases in emissions.

²¹ National Energy Board, *2009 Reference Case Scenario: Canadian Energy Demand and Supply to 2020 — Appendices* (Calgary, AB: National Energy Board, 2009), Table A2.1. Available online at <http://www.neb-one.gc.ca/clf-nsi/rnrgynfntn/nrgyrprt/nrgyftr/2009/rfrnccsscnr2009ppndc-eng.pdf>.

Figure 1: Average fuel economy of Canada's new car fleet (L/100km)

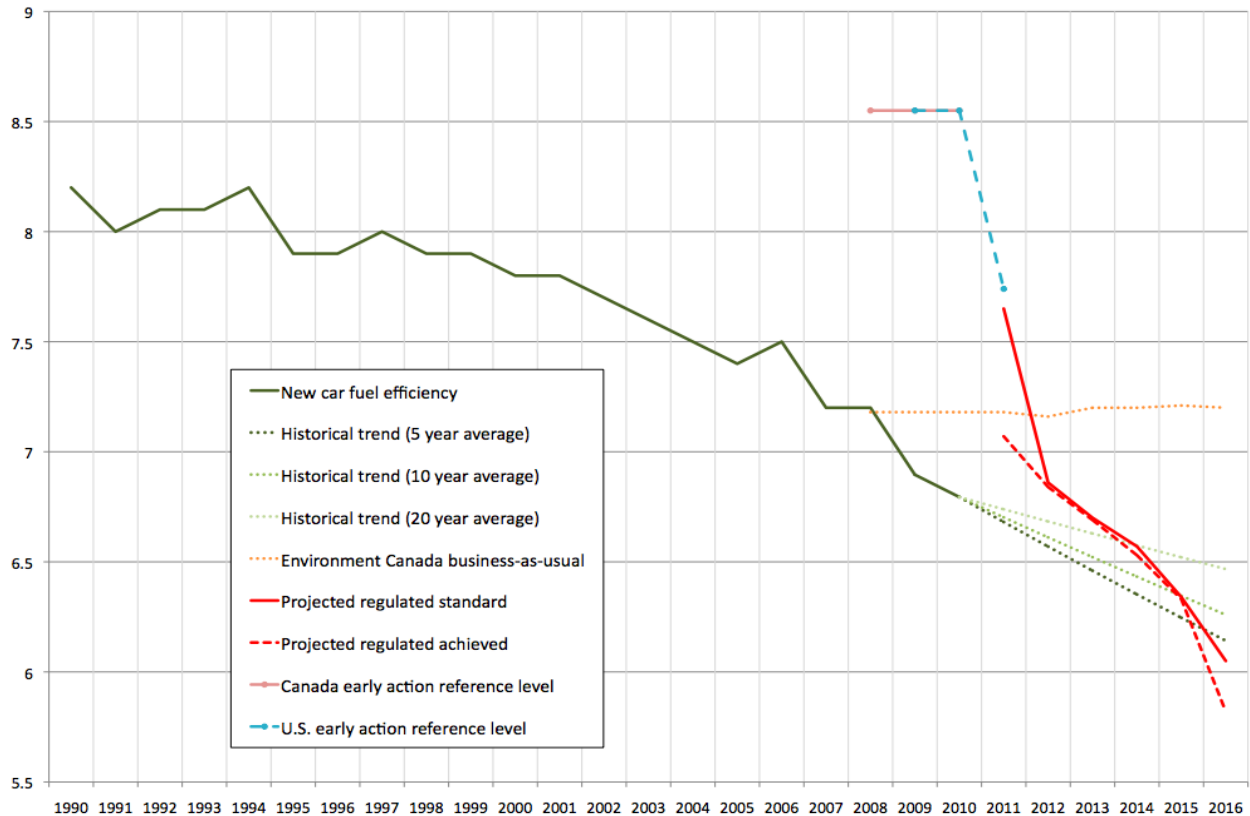


Illustration of the average fuel economy of the Canadian new car fleet by model year.²² We have adjusted the historical data for 2008–10 to show actual fuel economy by removing credits for flex-fuel vehicles, using estimates from Toyota.²³ Dotted green lines project historical trends (averaged over the past five, ten, and 20 years) into the future. Fuel economy levels corresponding to the projected national average regulated standards for model years 2011–16²⁴ take into account expected credits for air conditioner improvements. “Projected regulated achieved” levels depict Environment Canada’s estimates²⁵ of the actual fuel economy levels achieved by the standards when flexibilities such as flex fuel credits, temporary fleets, and credit trading between car and light truck fleets are incorporated. These estimates do not, however, take into account early action credits and trading between firms/model years. The dotted orange line is Environment Canada’s business-as-usual scenario.²⁶ The early action reference levels are explained in Sec. 2.5.

²² Transport Canada, *CAFC Targets and Canadian Fleet Averages* (2010), Transport Canada, <http://www.tc.gc.ca/eng/programs/environment-fcp-cafc-targets-385.htm> (accessed July 26, 2010). The 2009 and 2010 levels are “estimated values.”

²³ Toyota, *2009 North America Environmental Report* (New York, NY: Toyota Motor North America, Inc., 2009), 14. Available online at <http://www.toyota.com/about/environmentreport2009/>. We used the Toyota report to estimate the percentage difference in 2008 between actual fleet average fuel economy and Transport Canada’s values that include flex-fuel credits, and then applied this percentage difference to 2009 and 2010.

²⁴ Lawson, 40, 80.

²⁵ Lawson, 87.

²⁶ Lawson, 26–27. The Lawson report notes that the sales figures used for Environment Canada’s business-as-usual scenario differ from the sales figures used for Transport Canada’s historical data. This explains why the historical and business-as-usual levels for 2008 differ slightly in the figure.

Figure 2: Average fuel economy of Canada's new light truck fleet (L/100km)

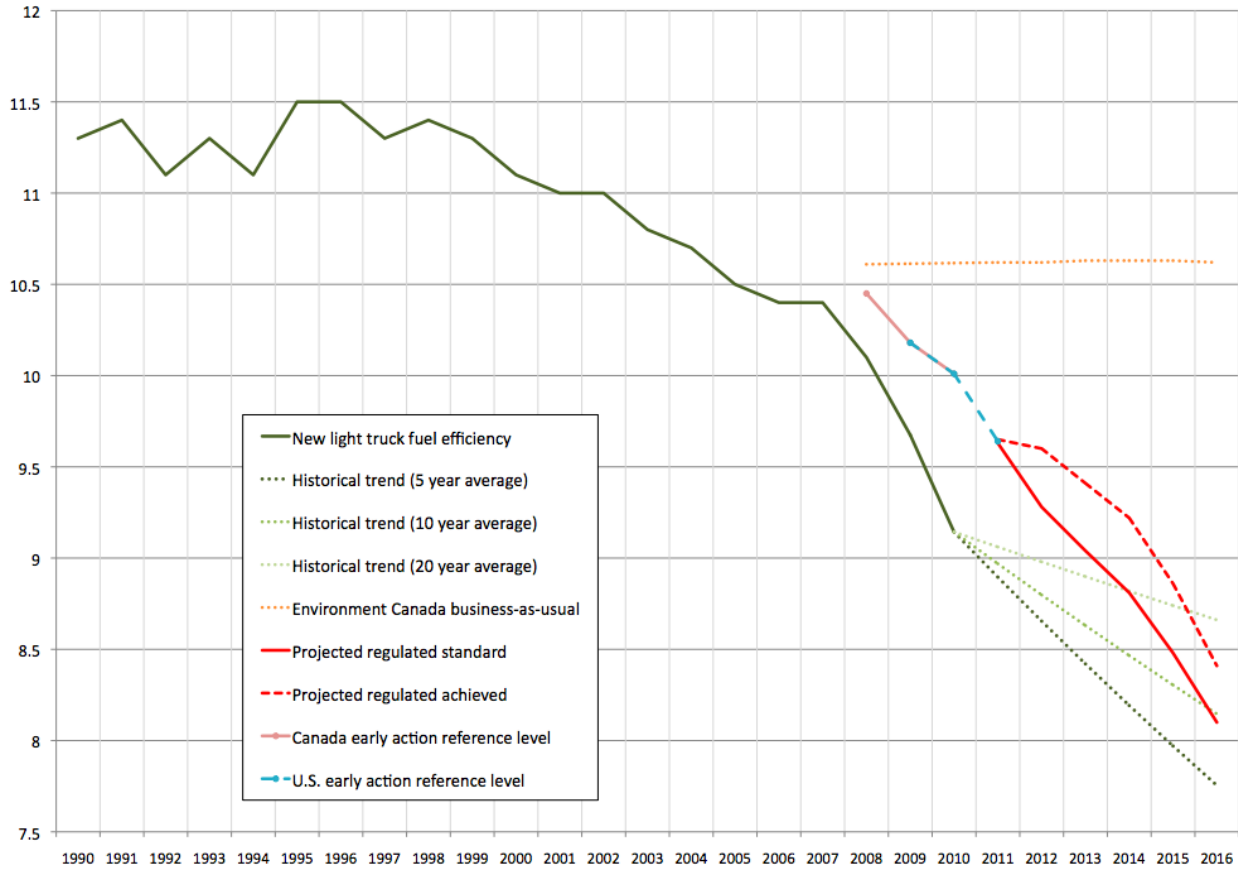


Illustration of the average fuel economy of the Canadian new light truck fleet by model year.²⁷ We have adjusted the historical data for 2007–10 to show actual fuel economy by removing credits for flex-fuel vehicles, using estimates from Toyota.²⁸ Dotted green lines project historical trends (averaged over the past five, ten, and 20 years) into the future. Fuel economy levels corresponding to projected national average regulated standards for model years 2011–16²⁹ take into account expected credits for air conditioner improvements. “Projected regulated achieved” levels depict Environment Canada’s estimates³⁰ of the actual fuel economy levels achieved by the standards when flexibilities such as flex fuel credits, temporary fleets, and credit trading between car and light truck fleets are incorporated. These estimates do not, however, take into account early action credits and trading between firms/model years. The dotted orange line is Environment Canada’s business-as-usual scenario.³¹ The early action reference levels are explained in Sec. 2.5.

²⁷ Transport Canada. The 2009 and 2010 levels are “estimated values.”

²⁸ Toyota, 14. We used the Toyota report to estimate the percentage difference in 2008 between actual fleet average fuel economy and Transport Canada’s values that include flex-fuel credits, and then applied this percentage difference to 2009 and 2010.

²⁹ Lawson, 40, 80.

³⁰ Lawson, 87.

³¹ Lawson, 26–27. The Lawson report notes that the sales figures used for Environment Canada’s business-as-usual scenario differ from the sales figures used for Transport Canada’s historical data. This explains why the historical and business-as-usual levels for 2008 differ somewhat in the figure.

Figure 3 provides a comparison between Canadian and U.S. estimates of the national average regulated standards (including both cars and light trucks), and of the national average tailpipe emissions expected to be achieved by the standards when taking into account automakers' expected use of certain types of credits. The Canadian estimates are again from Environment Canada, and the U.S. estimates are from the EPA/NHTSA.

Historically, Canada's new personal vehicle fleet has been consistently more fuel efficient than the U.S. fleet.³² This is because although the vehicle models sold in the two countries are mostly the same, Canadians have tended to buy a greater proportion of more fuel-efficient models. Assuming equal distances driven, this "efficiency advantage" means that the average Canadian consumer purchases less gasoline to power his or her vehicle, which emits less GHGs than that of his or her U.S. counterpart.

This is reflected for model year 2011 in Figure 3, which shows Canada's new vehicle fleet maintaining a 6% better GHG tailpipe performance than that of the U.S. in that year. But the figure also shows that the harmonized Canada-U.S. tailpipe standards subsequently allow the Canadian and U.S. average tailpipe GHG performance to virtually converge by 2016, with Canada's fleet then outperforming the U.S. fleet only by 1.6%. In other words, over the lifespan of the regulations (2011–16), Canada's more efficient fleet is required to show less improvement in tailpipe GHG performance than the U.S. fleet: Canada's new personal vehicle fleet is required to improve by 19.5%, compared to a U.S. improvement of 23.1%.³³ (These numbers refer to the improvements per vehicle sold, not to the change in total emissions from personal vehicles.)

What must be happening over these years is Canada's new vehicle mix becoming very close to that of the U.S. There are two possible explanations for this: either (i) because the footprint-based standards provide little incentive to prefer smaller vehicles, they are doing nothing to prevent Canada from drifting towards U.S. preferences in regard to vehicle size; or (ii) within each footprint size, the single Canada-U.S. standard is forcing a stronger shift to lower-emitting vehicles in the U.S. than in Canada, because Canadians are already buying more lower-emitting vehicles at the outset.

Whatever the explanation, the Environment Canada and EPA/NHTSA estimates show that harmonizing to the U.S. standards allows the Canadian personal vehicle fleet to lose its traditional "efficiency advantage" and GHG performance superiority over the U.S.

However, this assumes that Canada's vehicles achieve only the required improvements. Based on our analysis above, if historical trends continue, the actual GHG performance of the Canadian fleet could out-perform the improvement required by the regulations for much or all of the 2011–16 regulatory period.

³² Transport Canada; National Highway Traffic Safety Administration, *Summary of Fuel Economy Performance* (Washington, DC: U.S. Department of Transportation, 2009). Available online at http://nhtsa.gov/DOT/NHTSA/Rulemaking/Articles/Associated%20Files/Dec_2009_Report.pdf.

³³ The percentage figures in this paragraph are based on the emissions levels expected to be achieved by the standards — the dashed lines in Figure 3.

Figure 3: Projected fleet average tailpipe GHG standards and performance — Canada and U.S. (gCO₂e/mile)

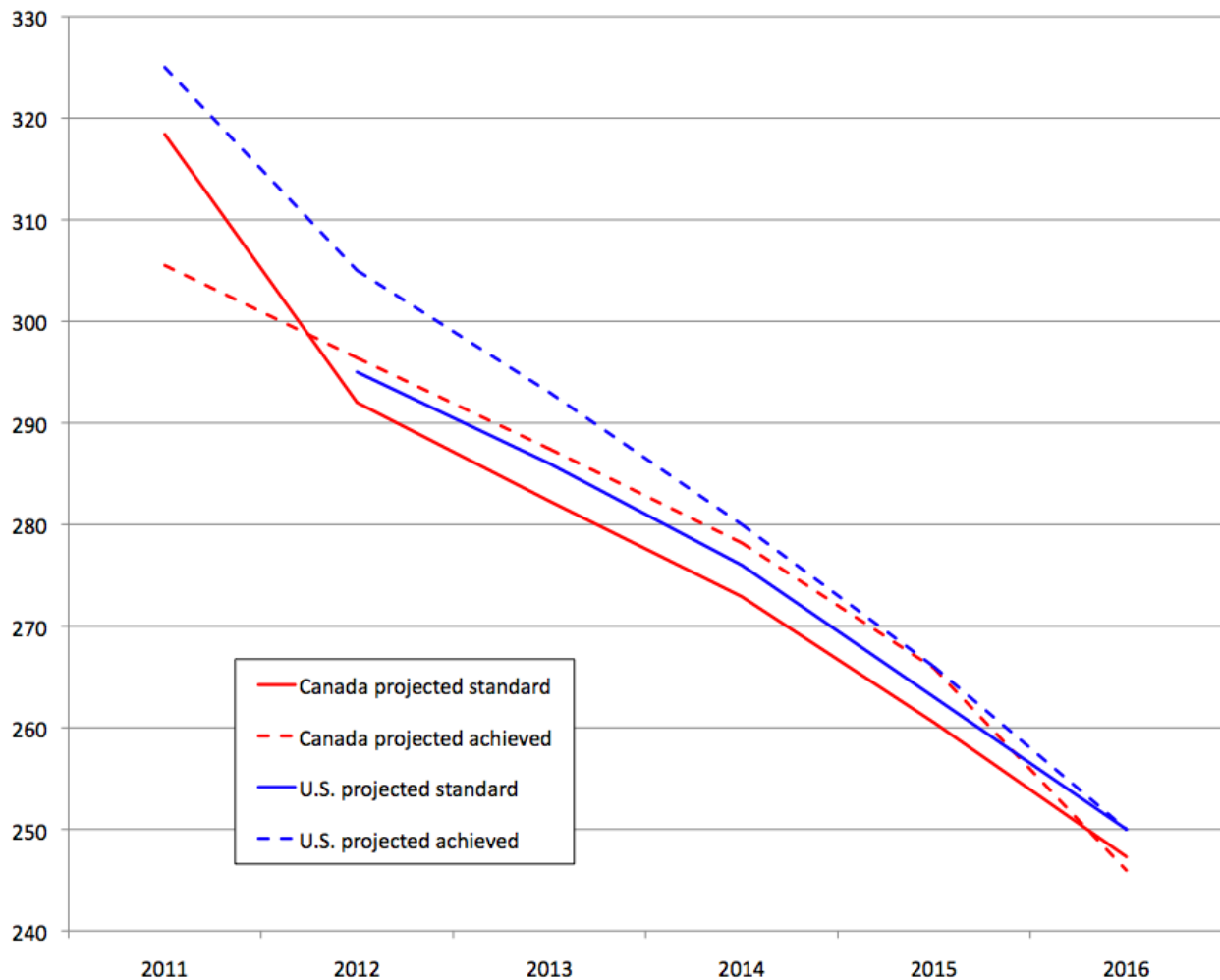


Illustration of the projected national average regulated standards by model year for Canada³⁴ and the U.S.³⁵ “Projected achieved” levels include Environment Canada³⁶ and EPA³⁷ estimates of flexibilities such as flex fuel credits, temporary fleets, and credit trading between car and light truck fleets. Early action credits and trading between firms/model years are not included.

2.5 An additional major loophole: early action credits

The Environment Canada and EPA/NHTSA estimates that were the basis for the analysis in Sec. 2.4 did not take into account automakers’ use of all the types of credits allowed in the regulations. Most importantly, they did not include the effect of early action credits (EACs). The Canadian regulations allow automakers to claim EACs if their average GHG tailpipe performance exceeded a specified reference level during 2008, 2009 and 2010. EACs will be tradeable and bankable, which means that a firm will be able to save them up and use them for compliance with future years’ standards — or sell

³⁴ Lawson, 80.

³⁵ Environmental Protection Agency and National Highway Traffic Safety Administration, 25331.

³⁶ Lawson, 88.

³⁷ Environmental Protection Agency and National Highway Traffic Safety Administration, 25332, 25396.

them to allow another firm to use them for compliance. EACs issued for 2008 can only be used to comply in 2011, but EACs issued for 2009 and 2010 can be used up to five years later.

Figures 1 and 2 depict the reference levels relative to which EACs will be awarded in the Canadian system (light red solid line marked “Canada early action reference level”) and the U.S. system (light blue dashed line marked “U.S. early action reference level”). The total volume of EACs awarded corresponds to the gap between fleet average performance and the reference level. This means that if, for example, automakers claim all the EACs to which they are entitled in Canada for model year 2008 cars, the volume of EACs will correspond to the gap between the light red line and the dark green line in Figure 1 for that year.

It is clear from Figures 1 and 2 that the volume of EACs available under Canada’s proposed regulations is very large. Looking at Figure 1, for example, suppose that there were no improvements in car fuel economy from 2008 to 2015 — Environment Canada’s business-as-usual scenario (dotted orange line). This is a very conservative assumption for the generation of EACs, because Transport Canada estimates that fuel economy improved in 2009 and 2010, and historical trends suggest that even without the regulations, business-as-usual fuel economy would continue to improve in subsequent years. Nonetheless, even with this assumption, the volume of EACs available for model year 2009 and 2010 cars (gap between light red line and dotted orange line) would be more than sufficient to allow full compliance with the projected car standards up to and including model year 2015 — without automakers having to make any improvements to fuel economy.

The volume of EACs available for light trucks is smaller than for cars, although it should be noted that if more EACs are generated for cars than are needed for compliance of cars, they can be used for compliance of light trucks.

It should be noted that credits can also be generated by out-performing the standards in any particular year, and these credits can be used for compliance up to five years later. For example, credits created by out-performing the standards in 2011, something that appears to be virtually certain based on Figures 1 and 2, can be used to allow Canada’s new personal vehicle fleets to emit more GHGs than the standards in 2016.

In Sec. 2.4 we provisionally concluded that the proposed Canadian standards appear to require no improvement, relative to business-as-usual, in the national average fuel economy of new vehicles up to and including model year 2014 at a minimum, and, for light trucks, possibly over the regulations’ entire lifespan, up to and including model year 2016 — if historical trends are an accurate guide to business-as-usual going forward. The very large volume of EACs available, plus the use of credits for out-performing the standards in earlier years, make it considerably less likely still that the standards will require any improvement over business-as-usual up to and including 2015 or even 2016.

EACs are very difficult to justify. During 2008–10, before there was any certainty about the new regulations, it is unlikely that any automakers made a financial sacrifice in order to achieve better average fuel economy in those model years. Automakers who produced more efficient vehicles in those years will already be rewarded by virtue of being better positioned to meet the new standards in 2011 than their competitors. It is not acceptable to further reward the better-performing firms by generating

a large volume of “windfall” credits that may completely eliminate the environmental benefits of the regulations. We therefore call for the EACs mechanism to be removed from the regulations.

Some argue that firms with surplus EACs will be unwilling to sell them to competitors. If this were true, fewer EACs could be used for compliance than we have assumed above, and automakers could need to start improving fuel economy earlier. However, we believe that given the number of players in the market for EACs, we should expect that market to be competitive, in which case all credits with a financial value will be sold. (Similarly, in cap-and-trade systems, firms are expected to sell all their surplus allowances.) Even if one takes the view that the extent of trading of surplus EACs is uncertain, they nonetheless pose a large risk to the stringency of the regulations.

It is also important to note that under the Canadian regulations, as currently proposed, automakers are expected to use for compliance a greater total volume of EACs per vehicle than under the finalized U.S. regulations. Under the proposed Canadian regulations, EACs are awarded based on automakers outperforming their choice of either the U.S. CAFE standards³⁸ for 2008–10 (standards that have not changed for cars since 1985) or the California standards³⁹ for 2009–10 (with the 2009 standard also counting as the 2008 standard). We will refer to these options as Pathways 1 and 2 respectively. In contrast, in the finalized U.S. regulations, EACs are awarded for models years 2009–11, because the regulations only start in 2012 (the U.S. has enacted a separate regulation for 2011). Figures 1 and 2 illustrate that the reference levels relative to which EACs will be awarded in the Canadian and U.S. systems (the figures depict the Pathway 1 reference levels) are the same in 2009 and 2010, and the basis for awarding U.S. EACs in 2011 is very similar to the basis for awarding Canadian credits for outperforming the standards in 2011.

However, there are two reasons why automakers are expected to use for compliance a greater total volume of EACs per vehicle under the Canadian regulations, as currently proposed, than in the U.S.:

1. The reference levels for all Canadian EACs, and for U.S. EACs in 2009 and 2010, are corporate-average GHG levels for cars and light trucks respectively. The higher average fuel economy of the Canadian fleet will therefore result in greater total crediting per vehicle than when the same reference levels are applied to the U.S. fleet. To align with the U.S. regulations, the Canadian reference levels would need to be tightened to reflect the higher fuel economy of our fleet.
2. U.S. efforts to limit excessive EACs have not been incorporated into the proposed Canadian regulations. Specifically, the two pathways for calculating EACs in the Canadian regulations do not fully align with those in the U.S. regulations:
 - The U.S. equivalent to Pathway 1 requires automakers to exclude vehicles sold in California and the so-called CAA 177 states (the 13 states that intended to apply California’s vehicle standards) if they are calculating their EACs relative to the CAFE reference level nationally.⁴⁰ To align with

³⁸ The CAFE standards are the U.S. regulated fuel economy standards that are currently in force.

³⁹ The State of California has implemented tailpipe GHG standards for its personal vehicle fleet, beginning with model year 2009. The standards have been amended to allow compliance with the federal 2012–16 standards to satisfy compliance with the California program. See California Air Resources Board.

⁴⁰ Environmental Protection Agency and National Highway Traffic Safety Administration, 25440–25443.

this provision, Canada would need to exclude sales in CAA 177-equivalent provinces (notably Québec and British Columbia) for Pathway 1.

- For the U.S. equivalents to Pathway 2, EPA has recognized that EACs generated by reference to the California standards for model year 2009 risk diluting the overall effect of the standards because the California standards in that year are less stringent than the CAFE standards, particularly for light trucks. EPA has therefore prohibited trading of model year 2009 EACs generated using California standards as a reference level.⁴¹ To align with the U.S. regulations, this same prohibition would need to be applied to EACs generated under Canada's Pathway 2 — for both 2008 and 2009.

If the Government of Canada does not remove EACs from its proposed regulations, it should at a minimum fully align its methods of calculating EACs with the methods in the U.S. regulations, in accordance with our analysis above.

2.6 Different treatment of electric vehicles than the U.S.

The proposed Canadian regulations and the finalized U.S. regulations also differ in their treatment of “advanced technology vehicles” (ATVs), which consist of electric vehicles, fuel cell electric vehicles, and plug-in hybrids. The proposed Canadian regulations allow electric and fuel cell vehicles, as well as a certain portion of plug-in hybrids, to be counted as having zero emissions. The regulations also allow automakers to apply a multiplier to their sales of ATVs, in effect counting each vehicle twice. However, “EPA has concluded that the combination of the zero grams/mile and multiplier credits would be excessive.”⁴² As a result, in the finalized U.S. regulations, the multiplier has been removed and the volume of ATVs that can be counted as having zero emissions has been capped.

We agree that the regulations should recognize ATVs' low lifecycle emissions. But it is important to recognize that the more generous the treatment of ATVs, the less the overall stringency of the regulations and the less they will reduce total emissions.

If the Government of Canada continues to want to harmonize its regulations with the U.S. regulations, it must remove the ATV multiplier and cap the volume of ATVs that can be counted as having zero emissions. Based on the 10:1 scaling ratio used to adapt the U.S. Temporary Lead-time Allowance Alternative Standards program to the Canadian Temporary Optional Fleets program, 20,000 vehicles per firm over model years 2012–16 would be an appropriate cap. The U.S. cap also includes an incentive for automakers selling large volumes of ATVs in the early years of the program, allowing them to count larger numbers of these vehicles as zero emissions. Applying the same 10:1 scaling factor, automakers who sell at least 2500 ATVs in Canada in model year 2012 could be eligible for an expanded cap of 30,000 zero emission vehicles. For ATVs beyond a firm's cap, the EPA will calculate GHG emissions for compliance purposes “according to a methodology that accounts in full for the net increase in upstream GHG emissions.”⁴³ Canada should do likewise.

⁴¹ Ibid.

⁴² Environmental Protection Agency and National Highway Traffic Safety Administration, 25436.

⁴³ Environmental Protection Agency and National Highway Traffic Safety Administration, 25456.

2.7 A Canadian leadership approach

Our analysis in the preceding sections confirms that the proposed Canadian regulations clearly do not represent a leadership approach. Our analysis also highlights the lack of transparency concerning what the regulations will actually require — a consequence of their great complexity. We have also noted that footprint-based standards provide little incentive to shift the market toward smaller, lower-emitting vehicles.

As noted in Sec. 2.1, Canada could meet more stringent GHG tailpipe standards than the U.S. without automakers needing to produce Canada-specific models. We therefore suggest that the government address the problems that we have just summarized by changing its approach and adopting much simpler regulations that set a single corporate average GHG tailpipe standard for cars and light trucks combined. This standard should be set at a level that reflects and maintains Canada's traditional vehicle efficiency advantage over the U.S., declines over time more quickly than business-as-usual trends, and does not allow early action credits. Unlike the currently proposed regulations, this would provide clear environmental benefits, allow the federal government and automakers to be clearly held to account for their performance, and demonstrate real Canadian leadership.