The 85 Million Tonne Obsession

Informing the Debate on Fuel Taxes, Urban Transit Cost-Benefits and Vehicle Emissions

Robert Lyman

Friends of Science Society

Contents

Executive Summary

Much of the public and media attention concerning measures to reduce greenhouse gas (GHG) emissions in Canada focuses on reducing automotive emissions. Almost every governmental announcement concerning a new climate regulation or tax celebrates this in terms of the "number of passenger vehicles per year taken off the roads". The public dialogue and policy debate that surrounds these issues, however, are not based on an informed view of the facts or of the decisions that governments have been making. This paper may help to support the public debate.

As context, in 2016 15.6 million Canadians commuted back and forth from home to work. After five decades of governmental efforts to discourage commuting by personal vehicle, the percentage of working Canadians commuting by car has fallen from 80.7 to 79.5 per cent. In other words, regardless of what government planners, transit commissions and environmentalists may prefer, the average citizen is voting for personal vehicles.

Of the many measures governments have taken, four stand out in terms of cost: vehicle fuel efficiency regulations on new light duty vehicle sales; subsidies for the purchase and refueling of hybrid and electric vehicles; transit subsidies; and taxes on motor fuels.

Canada and the United States have harmonized their light duty vehicle fuel efficiency regulations since they were first introduced in the late 1970's. In 2008 and 2012, both countries agreed to a schedule of increasingly stringent increases in fuel efficiency that would raise the standard for passenger cars from 39.1 miles per U.S. gallon in 2017 to 55.3 miles per U.S. gallon in 2025 and for light duty trucks (and SUVs) from 29.5 mpg in 2017 to 39.3 mpg in 2025. In August, 2018, the Trump Administration announced that it planned to freeze the fuel efficiency standards at 2020 levels through to 2026. California has said it will sue to oppose these changes.

In the face of these developments, the Trudeau government signed a cooperation agreement with California which, while not explicit, appears to signal that it will depart from Canada's historic policy of harmonization with the U.S. federal government. The consequences of such a move cannot be fully assessed without a detailed analysis, but it could mean that in future Canadian auto manufacturers might be required to adopt emissions and fuel efficiency technologies that are more expensive than those that are required of the U.S. auto industry in general, affecting Canadian firms' ability to compete.

In April 2019 the Trudeau government announced targets for increasing the share of zero-emissions vehicles in Canada, rising to 100 per cent of new vehicle sales in 2040. It also announced that it would provide subsidies for the purchase of hybrids and electric vehicles ranging from $2,500 to $5,000 per vehicle. When added to the subsidies offered by British Columbia and Quebec, this could raise the combined federal-provincial subsidy to a high of $10,500 to $13,000 per vehicle, which equates to $350 to $433 per tonne of emissions avoided, many times the current ($20 per tonne) value of carbon emissions permits.

U.S. studies show that as much as 70 per cent of EV sales would take place without subsidies, and that EVs are bought primarily by people with above-average incomes.

In 2016, the Trudeau government announced Canada's Long-Term Infrastructure Plan, which promises $180 billion in spending on infrastructure over the period 2016 to 2028. This includes $28.5 billion for public transit. Unfortunately, there is no source that can inform the Canadian public about how much is being spent on transit in total by federal, provincial and municipal governments, what this means for ridership or what this means for the amount and cost of emissions reductions. U.S. studies indicate that fares pay only one third of transit systems' operating costs, and that the total governmental subsidy of transit capital and operating costs is about $1.17 per passenger mile.

Canadian studies indicate that, in the unlikely case that it could be achieved, a doubling of commuters using transit would reduce GHG emissions by about 2.5 million tonnes per year.

According to the analysis of the Canadian Taxpayers Federation, the national average motor gasoline price in 2018 was $1.35 per litre, 47 cents of which was tax. This is equivalent to a carbon tax of $192 per tonne. If one adds the carbon taxes scheduled to apply by 2022, the carbon tax equivalent of all gasoline taxes will be $235 per tonne.

In 2017, passenger vehicles, including all cars, SUVs and pickup trucks, produced 85 million tonnes of GHGs. This was 11.9 per cent of the Canadian total. If Canada somehow could eliminate these uses altogether, it would take us only 42 per cent of the way to the 2030 emissions reduction target.

As unlikely as even that is, it seems we cannot shake our public obsession with vehicle emissions, regardless of cost.

THE 85 MILLION TONNE OBSESSION

Canada's current climate change policy includes a target for greenhouse gas (GHG) emissions to decline by 30 per cent from 2005 levels by 2030. That means a reduction from 716 million tonnes (Mt) per year in 2017 to about 512 Mt per year, or 204 Mt per year in 2030. Those reductions, if achieved, might come from all parts of the economy, but much of the public and media attention focuses on reducing automotive emissions. Almost every governmental announcement concerning a new climate regulation or tax celebrates this in terms of the "number of passenger vehicles per year taken off the roads". It is almost like an obsession.

In fact, the public dialogue and policy debate that surrounds these issues are not based on an informed view of the facts or of the choices that governments have been making. The purpose of this paper is to provide better information that will support the public debate.

Some of the government measures now in place include the following:

- Car fuel efficiency/emissions intensity regulations that increase in stringency to 2025;
- Subsidies for the purchase and refueling of hybrid and all-electric vehicles;
- Subsidies for the construction of transit systems to offer an alternative for commuters;
- Carbon dioxide taxes on motor fuels added to the already high level of sales, excise and HST taxes on motor fuels.

The Context

Before examining the current state of play and issues respecting each of these measures, let us consider the central role played by personal vehicles providing mobility for people who need to get back and forth from home to work. In 2016, 15.9 million Canadians commuted. Most of them lived in or near census metropolitan areas (CMAs), cities with 100,000 or more residents.

For at least five decades, federal and provincial governments have been spending large sums of money to convince Canadians to commute via public transit or, more recently, by cycling and walking. As a consequence of this Herculean and expensive effort, the proportion of commuters driving to work has fallen all the way from 80.7 per cent in 1996 to 79.5 per cent in 2016, a fall of 1.2 per cent. Because of the growth of Canada's largest cities and the extension of public transit systems there, the proportion of people commuting to work by public transit has risen from 10.1% in 1996 to 12.4 % in 2016, while the percentage of employed people walking or cycling to work declined by 1.2 % over the same period to 5.5%.

The reasons for people's continued preference for personal vehicles are not difficult to find. The average commuting time for car commuters is 24.1 minutes, while that for public transit commuters is 44.8 minutes. Studies that suggest people would save money by switching to transit fail to take into the account the time

involved, as well as other factors such as crowding, noise and security concerns associated with transit. Regardless of what government planners, transit commissions and environmentalists may prefer, the average citizen is voting for personal vehicles.

Vehicle Efficiency/Emissions Intensity Regulations

Since the late 1970's, Canada and the United States have collaborated in the development and administration of light duty vehicle fuel efficiency regulations. These were initially justified as a way to reduce oil imports to address the risks of supply disruption from the Middle East. The regulations require each motor vehicle manufacturer's fleet of new cars sold or imported into each country each year to have an average fuel economy above a certain level, with extensive exemptions for certain types of vehicles.

The structure of the regulations has had some unintended effects. For example, as the goal is stated in terms of average fuel economy, the results of California increasing the efficiency standards for vehicles sold there has essentially been to reduce the average that the manufacturers had to attain in other U.S. markets. The standards also raised the price of large cars, such as station wagons, compared to light trucks. As a result, automakers created a new type of light truck – the sport utility vehicle, or SUV – which was covered by a lower standard and met consumers' needs. Over time, consumers' preferences switched increasingly to trucks.

In 2009 and 2012, the Obama Administration in the United States and the Mulroney Government in Canada raised the fuel economy standards and made them an explicit part of the climate policy goal of reducing GHG emissions. The 2012 regulations, covering vehicles in model years 2017 to 2025, imposed much more demanding requirements. The U.S. mile-per- gallon standard for passenger cars would rise from 39.1 in 2017 to 43.7 in 2020 and to 55.3 in 2025, while the requirements for light trucks rose from 29.5 mpg in 2017 to 31.3 mpg in 2020 and 39.3 mpg in 2025. The Canadian standards were harmonized with these.

Under the GHG emission rules in the 2017-2025 standards, manufacturers may offset other efficiency improvements, such as air conditioning systems, thereby reducing the minimum effective fuel efficiency for passenger vehicles in 2025 to 49.6 mpg. Moreover, manufacturers may count the sale of each electric or plug-in hybrid vehicle as more than one effective vehicle: for plug-in hybrids, this multiple starts at 1.6 in 2017 and declines to 1.3 in 2021; for electric vehicles, the multiple is 2 in 2017, falling incrementally to 1.5 in 2021.

These regulations had a generally unpublicized impact on the price of new passenger vehicles. The U.S. Bureau of Labor Statistics measures the quality-adjusted average price of new vehicles. It found that from the mid-1990s until 2008, when fuel efficiency (or CAFÉ) standards were mostly static, the average vehicle price fell steadily. CAFÉ standards for light trucks rose from model year 2005 to model year 2010. Since 2009, however, the average vehicle price has risen steadily. By the third quarter of 2015, prices were 8.7 per cent above the pre-recession level. If the 2001-2007 trend had continued, the average prices would have been 14.8

per cent lower than they were by 2015. This happened in both the United States and Canada. International evidence fails to show any similar trend in other OECD countries.[1]

In August, 2018, the U.S. National Highway Traffic Safety Administration (NHTSA) and the Environmental Protection Agency (EPA) published a joint notice of proposed rulemaking to implement the "*Safe Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2016 Passenger Cars and Light Trucks*". This rule, if finalized, would amend currently planned CAFÉ standards and tailpipe emission standards for model years 2021 to 2026, essentially freezing them at 2020 levels. In their lengthy proposed rulemaking, the two agencies set out six reasons for the proposed change. In brief summary, these are that:

- The technologies that agencies expected to be deployed by auto manufacturers in 2012 have played out differently since then; technologies then considered likely to offer significant "bang for the buck" no longer appear likely to do so;
- As fleet-wide fuel efficiency has improved over time, additional improvements have become both more complicated and costly.
- As a result, actual fuel economy gains have become more expensive.
- Additional fuel economy benefits are subject to diminishing returns. Automakers, to reduce emissions further, must either sacrifice other performance attributes or raise the price of the vehicles.
- Oil prices are lower than anticipated in 2012 and seem likely to continue on this path, thus reducing the revenue and security of supply benefits of increased fuel economy.
- The rising prices of the new models that meet the standards are keeping consumers longer in older, dirtier and less safe vehicles (the "scrappage effect").

In their overview of the proposed rulemaking, NHTSA and EPA stated that the benefits of the proposed approach were: the estimated reduction of up to 1,000 lives lost annually in fatal vehicle crashes; a $2,340 reduction in the average ownership cost of new vehicles; and a $500 billion savings for the U.S. economy.

Some economists have noted another factor that may justify a review of the plans to continue increasing the stringency of the CAFÉ standards – the so-called rebound effect. This refers to the tendency of people, when driving costs less, to drive more, all other things being equal. They may drive rather than taking other modes of transport or they may increase the number and length of car trips. An OECD survey found that the rebound effect may reduce total fuel savings by from 25 per cent in the short term and up to 40 per cent in the long term.[2] The combination of the scrappage effect and the rebound effects thus may actually halve the emissions reductions effects of the CAFÉ standards.

At the same time as it published the proposed new CAFÉ and emissions standards, the Trump Administration announced that it was considering legislative action that would remove California's authority to set its own

---

[1] Salim Furth and David Kreutzer. *Fuel Economy Standards are a Costly Mistake*. The Heritage Foundation. March 4, 2016

[2] Julian Morris and Arthur Wardle. *CAFÉ and ZEV Standards: Environmental Effects and Alternatives*. Reason Foundation 2017

air pollution standards for vehicles, an authority that the state has had since the enactment of the Clean Air Act in 1970. California has promised to fight this and, further, has indicated that it will go to court to block the Trump Administration's proposed changes to fuel economy regulations.

In the midst of this uncertainty, Catherine McKenna, Minister of the Environment and Climate Change announced on June 26, 2019 that she had signed a new cooperation agreement with the California Air Resources Board to "advance clean transportation". While the agreement is not explicit on this point, it appears to send a signal by the Trudeau Government that, if the Trump Administration departs from the previous schedule of fuel efficiency standard changes, Canada will align its regime with that of California.

It seems likely there will be the political consequences in terms of Canada-U.S. relations if the Trump Administration sees the Canadian government as taking sides in its dispute with the state of California. Apart from that, it is very difficult to assess the consequences for Canada of departing from its historic policy of harmonization with the U.S. federal government on motor vehicle standards.

It seems likely there will be the political consequences in terms of Canada-U.S. relations if the Trump Administration sees the Canadian government as taking sides in its dispute with the state of California. Apart from that, it is very difficult to assess the consequences for Canada of departing from its historic policy of harmonization with the U.S. federal government on motor vehicle standards. In principle, it could mean that the auto industry on both sides of the border will in future face restrictions on the models that can be sold in the other jurisdiction. If Canadian firms are required to adopt emissions and fuel economy technologies that are more expensive than those required of the U.S. industry in general, this could not only affect the ability of firms to compete, but might also affect future decisions about where to locate auto manufacturing plants. Canadian firms will probably be disadvantaged compared to off-shore producers.

It would be impossible to assess the precise consequences without a detailed analysis of the likely effects on future demand by models and the costs of the technologies involved. They are unlikely to be good for Canada. Given the recent controversy over the closing of the General Motors assembly plant in Oshawa, this seems to be another case in which the Trudeau government is placing environmental symbolism ahead of Canada's economic interests.

Subsidies for the Purchase and Refueling of Hybrid and Electric Vehicles

Governments in Canada provide a range of subsidies for the purchase of hybrid and all-electric vehicles on the grounds that this will reduce GHG emissions and help (eventually) to lower the unit cost of production of these vehicles so that they will reduce emissions even more in future. They also provide subsidies for the installation of electric vehicle refueling stations, for public promotion of EVs and for research and development for future EV technology.

In April 2019, the Canadian government announced targets for increasing the share of zero-emission light duty vehicles sold each year in Canada. It will aim for 10 per cent of new light duty vehicle sales by 2025, 30 per cent of light duty vehicle sales by 2030, and 100 per cent of new light duty vehicle sales by 2040 to be zero-emission cars. (Electric and hybrid vehicles now account for only two per cent of new vehicle sales.) At the same time, the government published the details of the incentives it will provide. These will be range from $2,500 to $5,000 per vehicle depending on its range, drawn initially from a fund of $300 million over three years. To be eligible for incentives, the vehicle must have a base-model manufacturer's suggested retail price ((MRSP) of less than $45,000 for passenger vehicles with six or fewer seats and less than $55,000 for vehicles with seven or more seats. The list of eligible vehicles includes 27 models and trims. Nine electric cars and 12 plug-in hybrids are eligible.

If all the vehicles subsidized received $2.500 each, the program would apply to 120,000 vehicles. So, at most, the program will subsidize 40,000 vehicles per year over three years.

The program works in addition to any provincial zero-emission vehicle incentive, which are currently only available in British Columbia and Quebec. The British Columbia program provides up to $5,000 for the purchase or lease of a new battery electric or plug-in hybrid vehicle and up to $6,000 for a hydrogen fuel-cell vehicle. B.C. also subsidizes the purchase and installation of a level 2 home recharging station, at a 75 per cent rate up to a maximum of $750. Quebec offers up to $8,000 for the purchase of an electric , plug-in hybrid, hybrid or hydrogen fuel cell car. Quebec also offers $350 for the purchase of a home charger and $250 for the installation of the charger for a combined incentive of $600. Further, it offers a subsidy of up to $5,000 for the purchase and installation of a workplace recharging station. Through Hydro Quebec, the province builds and maintains the Electric Circuit, Canada's largest network of public charging stations.

There are a host of issues concerning electric vehicles that are beyond the scope of a single paper like this. These include whether the GHG emissions that are actually caused by the production of the vehicles (especially the batteries) are so large that they may exceed the emissions savings over the life of the vehicle; whether the emissions caused by the production of the electricity to fuel the vehicle may exceed those produced by comparable internal combustion engines, especially in jurisdictions where coal is the primary source of electricity generation; whether the various costs of owning and operating an electric vehicle are so far above the costs of owning and operating a comparable vehicle with an internal combustion engine as to permanently disadvantage EVs in the marketplace; and whether the availability and cost of scarce minerals required for battery construction may severely limit the growth of vehicle production in future. Here, however, I will focus on a single issue – the cost per tonne of GHG emissions avoided by government subsidies in Canada.

Using Canadian electricity generation sources, an electric vehicle emits about 30 tonnes of GHGs less than a conventional internal combustion engine during its life cycle. In British Columbia, the combined federal-provincial subsidy per EV will range from $7,500 to $10,000, which equates to $250 to $333 per tonne of emissions avoided. In Quebec, the combined federal-provincial subsidy per EV will range from $10,500 to $13,000, which equates to $350 to $433 per tonne of emissions avoided. These figures exclude the cost of the taxpayer subsidies for recharging stations. By comparison, the price of an emissions trading permit on the market is about $20 per tonne, as is the current minimum federal government carbon dioxide tax. **In other words, the subsidies equal up to 17 times the market price of carbon dioxide in British Columbia and up to 22 times the market price of carbon in Quebec.**

Studies in the United States have found that most electric vehicle purchases would have been made without the subsidy. In 2012 the Congressional Budget Office estimated that the U.S. federal tax credit for EVs was responsible for "incentivizing" only about 30 per cent of new EV sales, while 70 per cent would have occurred without the subsidy.[3]

It is also clear from U.S. studies that the subsidies are highly regressive.

"Direct subsidies for new vehicles are generally claimed by those with higher incomes for a number of reasons. First, because wealthy people are more likely to purchase new vehicles, subsidies for new car purchases (EV or not) will tend to benefit the wealthy. Additionally, electric vehicles tend to have lower ranges than gasoline vehicles, making them less attractive as a household's first vehicle. Households that purchase electric vehicles are therefore more likely to be able to afford several vehicles, rather than just one. Finally, because many electric vehicles are expensive compared to gasoline vehicles, they tend to be purchased by wealthier individuals. These factors have the combined effect of making policies that subsidize the purchase of electric vehicles particularly regressive, even when compared with other clean energy policies in the United States."[4]

Transit Subsidies

Municipal governments in Canada have long advocated increased federal and provincial government subsidies to urban transit systems as a way to reduce congestion and GHG emissions. Governments have responded generously, judging by the size of the investments now being made in light rail transit systems in all the major Canadian cities with populations over one million. It is extraordinary, however, that so little information is available to the Canadian public about the answers to the following questions:

- How much has the federal government provided in capital subsidies for the construction of transit systems and the addition of transit vehicles since 2000?
- How much have provincial and municipal governments provided in capital and operating subsidies to urban transit systems since 2000?
- What are the trends in transit ridership since 2000?
- What percentage of transit costs is paid by taxpayers in the form of capital and operating subsidies?
- By how much have transit subsidies reduced GHG emissions and by how much will currently planned subsidies reduce emissions in future?

In the absence of information from government or academic sources, we have to grasp at a few sample indicators and comparative information from studies in the United States.

---

[3] Congressional Budget Office. September, 2012. *Effects of Federal Tax Credits for the Purchase of Electric Vehicles.*

[4] Ryan Bosworth and Grant Patty. Utah State University. *The Current State of Electric Vehicle Subsidies: Economic, Environmental, and Distributional Impacts*, 2017

In 2016, the Trudeau government published *Investing in Canada: Canada's Long-Term Infrastructure Plan*. This document spelled out the federal government's priorities for infrastructure investment over the 12-year period 2016 to 2028. Over that period, the federal government will spend $180 billion subsiding infrastructure. Of that amount, $28.7 billion will be directed to public transit. This, however, is only a small portion of the funds that governments will spend. The Ford government in Ontario, for example, recently announced $28.5 billion is subsidies to build transit in the Toronto Area alone. Several billion more will be spent on transit capital investments in other Ontario cities. The Quebec government has committed to spend about half of the money that it receives from the sale of carbon dioxide emissions permits to build more public transit in Quebec. Billions more are being spent on transit in Vancouver and other Canadians cities.

The federal government alone has had a bewildering series of infrastructure subsidy programs over the past decade, including the Community Improvement Fund, the Building Canada Fund, the New Building Canada Fund, the P3 Canada Fund, the Green Infrastructure Fund and other Infrastructure Canada programs. Over the period 2016-17 to 2027-28, these programs will provide over $58 billion in subsidies. How much specifically for transit? We do not know.

From U.S. studies, we do know about trends there. Since 2014, transit ridership has declined. Transit plays a significant role in urban passenger transportation in New York, Boston, Chicago, Philadelphia, San Francisco, Seattle, and Washington. However, transit carries fewer than 3 per cent of commuters to work in half of the U.S.'s largest 50 urban areas. Transit agencies spent U.S. $46.9 billion on operations in 2016 and paid for about a third of those operating costs, U.S. $15.8 billion, out of fare revenues. In 2016, transit agencies carried 56.5 billion passenger miles, for an average of 83 cents per passenger mile in operating costs, and spent another U.S. $19.4 billion, or 34 cents per passenger mile, on capital improvements and maintenance. The total subsidy of capital and operating costs is thus about $1.17 per passenger mile. At that level, transit costs more than four times as much as driving a personal vehicle, and transit subsidies are more than 70 times as large as highway subsidies (if one takes into account the revenues governments receive from gas taxes, tolls, and vehicle registration fees).[5]

During the Climate Change Table Process, the two-year federal-provincial collaboration to research ways economically to reduce GHG emissions in 1999 and 2000, the Transportation Table examined the potential effects of shifting passenger traffic from cars to urban transit. A 50% shift from cars to transit is generally considered to be a "stretch" goal.[6] John Lawson, the lead Transport Canada economist, subsequently examined the implications of doubling the percentage of passengers using transit. He estimated that it would reduce annual emissions by 2.5 million tonnes per year.

Studies commissioned by the Canadian Urban Transit Association recently found that transit ridership trends indicated a steady but gradual increase in usage from 1996 to 2011, and a leveling off to 2016. From 2000 to 2016, transit ridership increased about 25 per cent. [7]

---

[5] Randal O'Toole. *Charting Public Transit's Decline*. Cato Institute. November, 2018

[6] John Lawson. *The contribution of the Transport Sector to an Efficient Greenhouse Gas Strategy.* Ottawa

[7] Eric Miller et. al. *Canadian Transit Ridership Trends Study*. University of Toronto, October 2018

Nowhere can one find estimates of the cost per tonne of government subsidies to reduce emissions. Given the magnitude of the spending involved, and the claims being made concerning large emissions reduction from passenger transport in future, Canadians deserve more transparency in this area.

Taxes on Motor Fuels

On May 17, 2018, the Canadian Taxpayers Federation (CTF) published its 20th Annual Gas Tax Honesty Report, the federation's analysis of the taxes on motor gasoline and diesel fuel. I previously provided a summary of the main findings.

"How Much is Enough? The Tax Attack on Canadian Drivers"

The taxes imposed by federal, provincial and municipal governments historically have been justified by energy "security of supply" concerns, by a desire to reduce vehicle traffic in urban areas, or more often simply as a way to raise revenues. Recently, governments have added the justification of reducing GHG emissions.

Table 1 shows the 2018 composition of prices on a national average basis.

TABLE 1

Gasoline Tax Breakdown ($/litre)

Provincial excise tax	**$0.149**
Carbon tax	$0.044
Transit Tax	$0.014
Provincial sales tax	$0.07
Federal excise tax	$0.10
Federal sales tax	$0.06
HST tax-on-tax	$0.03
Total tax	$0.47

Source; Canadian Taxpayers Federation

As the national average gasoline price in 2018 was $1.35 per litre, taxes constituted about 40 per cent of the total.

According to the current schedule of federal carbon dioxide pricing increases, rates will rise from $20 per tonne in 2019 to $50 per tonne in 2022. That will add at least another 9 cents per litre to the national average prices shown for 2018.

If one were to convert the existing taxes into a carbon tax equivalent, they would be $192 per tonne, according to the CTF. Including the anticipated carbon tax increases to 2022 will raise the effective carbon dioxide tax equivalent to $235 per tonne.

If one were to convert the existing taxes into a carbon tax equivalent, they would be $192 per tonne, according to CTF. Including the anticipated carbon tax increased to 2022 will raise the effective carbon dioxide tax equivalent to $235 per tonne.

The Other Programs

The preceding description does not include all of the policy and program measures intended to reduce GHG emissions from passenger transportation. Governments directly and indirectly subsidize the production and sale of ethanol as a gasoline and diesel fuel additive, and mandate its use. They spend millions of dollars on the construction of bicycle lanes. They have multiple programs to support the use of "active transportation', meaning walking and cycling. They impose policies intended to "densify" cities, thereby creating congestion, but theoretically reducing vehicle use. They have several programs to promote and finance research, development and commercial demonstration of new vehicle technologies.

Conclusion

All of this effort and cost is targeted at one specific sector of the Canadian transportation sector - light duty passenger vehicles.

To what extent are passenger vehicles (i.e. cars, sport utility vehicles, and pick-up trucks) the source of GHG emissions? According to Environment and Climate Change Canada, in 2017 these three sources produced 85 million tonnes (Mt), or 11.9 per cent of the Canadian total. So, we could eliminate all three means of personal passenger transportation, and we would not attain the 2030 emission reduction target – in fact, we would

only get about 42 per cent of the way there. It is extremely unlikely that we will come anywhere close to that goal.

We just cannot seem to shake the 85 million tonne obsession, regardless of cost.

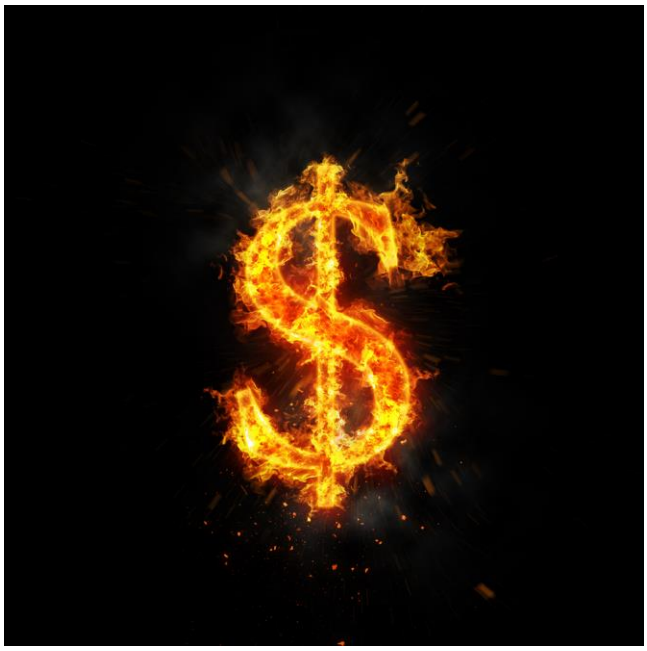

Image licensed from Shutterstock.

About the Author

Robert Lyman is an Ottawa energy policy consultant and former public servant of 27 years, a diplomat for 10 years prior to that. His complete biography can be read here.

About

Friends of Science Society is an independent group of earth, atmospheric and solar scientists, engineers, and citizens who are celebrating its 16th year of offering climate science insights. After a thorough review of a broad spectrum of literature on climate change, Friends of Science Society has concluded that the sun is the main driver of climate change, not carbon dioxide (CO2).

Friends of Science Society
P.O. Box 23167, Mission P.O.
Calgary, Alberta
Canada T2S 3B1
Toll-free Telephone: 1-888-789-9597
Web: friendsofscience.org
E-mail: contact(at)friendsofscience(dot)org
Web: climatechange101.ca