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PROPOSED FEDERAL TAX POLICY ADJUSTMENTS: REDUCING GHG EMISSIONS AND GENERATING REVENUE

Recommendations for budget 2017

By **Environmetal Defence** and **Équiterre**

December 2016

The recommendations related to diesel-gasoline tax deferential, the federal tax on fuel-inefficient vehicles and the tax incentives on green buildins were prepared for Équiterre by Carist Consulting.

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Carist Consulting

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RECOMMENDATIONS

This report identifies four key areas for adjustment in federal tax policy to improve alignment with Canada's greenhouse gas (GHG) emission reduction goal, which is to reduce emissions by at least 30% below 2005 levels by 2030. These fiscal measures will support policies announced in the Pan-Canadian Framework on Clean Growth and Climate Change (PCF), particularly in reducing emissions in the transportation and building sectors. Immediate changes to fiscal policies in Budget 2017 would provide early incentives to automobile manufacturers and the construction industry to be ready for future policy requirements contained in the PCF with regards to transportation and buildings. The proposed fiscal measures will also be complementary to carbon pricing, ensuring coherent fiscal policies with regards to carbon emissions, particularly in restoring the neutral of the tax system with respect to investment in oil and gas production in Canada.

1. **Address the Diesel-Gasoline Tax differential:** Raising the tax rate on diesel fuel to be equivalent to the rate on gasoline is advocated by the Organisation for Economic Co-operation and Development (OECD), and is increasingly being pursued by OECD countries. The current differential is on average roughly 4-6 cents per litre across Canada, despite the fact that diesel has worse environmental performance than gasoline. Closing the tax gap could result in an additional $350-700 million in annual revenue for the federal government, while reducing GHG emissions by between 0.3 and 2 Mt annually (see Annex 2 for caveats and details relating to these estimates). Raising both diesel and gasoline taxes over time could help bring Canada in line with other OECD countries and further encourage a shift to low-carbon transportation.

2. **Make the Federal tax on Fuel Inefficient Vehicles more Effective:** The current tax on fuel inefficient vehicles in Canada applies to too few vehicles and at too low rates to be effective in influencing vehicle purchasing decisions and contributing to climate change goals. Adjusting the tax to include more vehicles, and increase rates for more expensive vehicles, could result in an additional $200 - $600 million in additional annual revenue for the federal government, while reducing GHG emissions by between 1 and 2 Mt annually (see Annex 2 for caveats and details relating to these estimates).

3. **Extend tax incentives to increasingly energy stringent performance-based requirements (in energy use or GHG emissions intensity) for buildings:** Current federal tax incentives for renewable energy and energy efficient equipment are too narrow to effectively encourage significant investments in overall efficient building envelope and performance. New or extended tax incentives are needed that reward the cutting edge building construction needed to avoid the lock-in of future building-related GHG emissions. Expanded incentives could result in GHG reductions in the range of 0.5Mt to 3Mt per year,

depending on the degree of take-up and the level of the threshold established (see Annex 2 for caveats and details relating to these estimates).

4. Phase-out preferential tax treatment to oil and gas

5. In order to deliver on the Government of Canada's commitment to phase out fossil fuels subsidies and ensure effective implementation of the new federal carbon pricing mechanism, Budget 2017 must put in place a plan to restore the neutral tax treatment of the oil and gas sector in Canada, compared to other industrial sectors. This includes eliminating the Canadian Exploration Expense tax credit the flow-through share deductions available to oil and gas companies in Budget 2017. A timeline must also be announced to restore capital cost allowances to a deduction rate equivalent to the rest of the industry (in most cases 25%) and make necessary changes to Canadian Development Expense, the Canadian Oil and Gas Property Expense, the Foreign Resource Expense and Foreign Exploration and Development Expense to restore neutrality in the fiscal treatment of oil and gas expenses compared to other sectors.

ALIGNING CANADA'S FISCAL POLICY WITH THE PAN-CANADIAN FRAMEWORK ON CLEAN GROWTH AND CLIMATE CHANGE

PROPOSED FEDERAL TAX ADJUSTMENTS

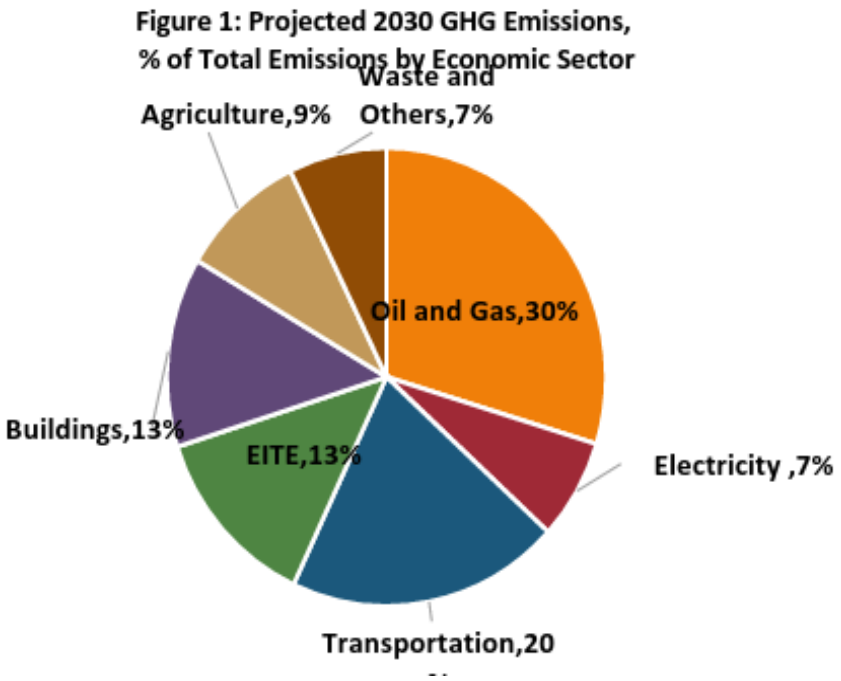
INTRODUCTION

Canada has committed to reduce GHG emissions by at least 30% below 2005 levels by 2030. According to the Pan-Canadian Framework on Clean Growth and Climate Change, GHG emissions are projected to rise to 742 Mt of CO2 equivalent in 2030. New climate policies as well as measures announced in the Pan-Canadian Framework are expected to leave a gap of 44 Mt to reach the 524 Mt 2030 target[1]. In addition, according to Canada's Mid-Century Long-Term Low Greenhouse Gas Development Strategy more ambitious policies will be required now to put us on a deep decarbonization pathway to 2050. Fiscal policy changes now are critical to shifting private investors' capital to put Canada on this long-term low carbon economy trajectory.

There are several key sectors of the economy where greenhouse gas emissions are projected to substantially grow to 2030 under current measures: oil and gas, freight transport, chemicals and fertilizers, and buildings.[2] Greenhouse gas emissions from oil and gas and chemical and fertilizer sectors should be responsive to the proposed national carbon pricing mechanism. However, relatively low carbon prices (in the range of $10 to $30/tonne), will be insufficient to induce all of the key changes that are needed to transition to a low-carbon economy and achieve GHG targets in 2030, particularly in the transportation and building sectors where individual and company choices on driving behavior, vehicle purchase and building construction are key drivers of emissions growth. Without immediate fiscal incentives, these sectors could continue to be locked into carbon intensive building stock and high emitting vehicle stock for years to come.

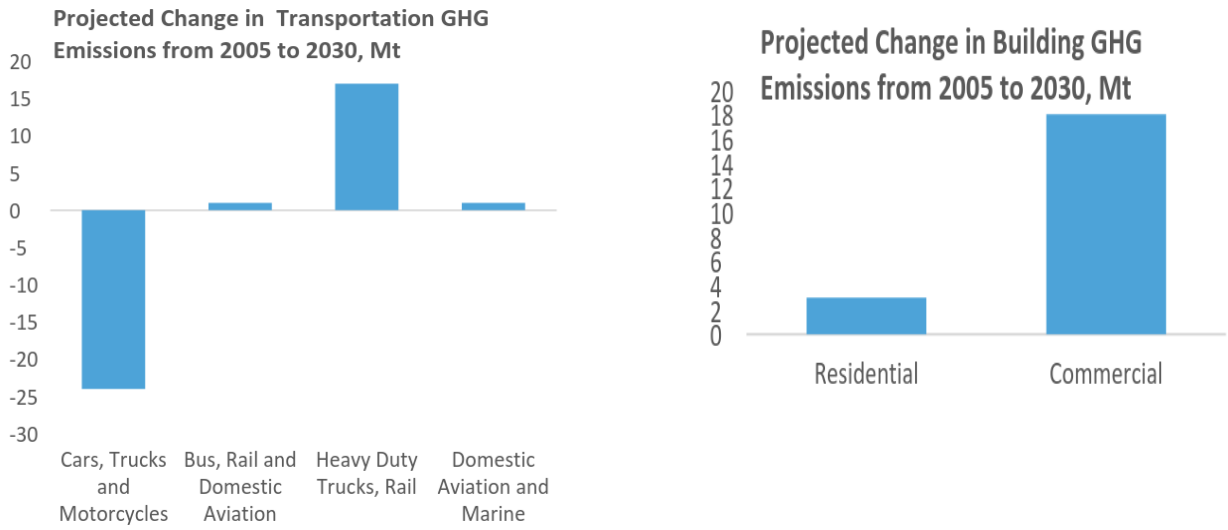
[1] Government of Canada (2016), Environment and Climate Change Canada, Canada's Second Biennial Report on Climate Change, http://ec.gc.ca/GES-GHG/default.asp?lang=En&n=02D095CB-1 (accessed September, 2016).

[2] Government of Canada (2016), Environment and Climate Change Canada, Canada's Second Biennial Report on Climate Change, http://ec.gc.ca/GES-GHG/default.asp?lang=En&n=02D095CB-1 (accessed September, 2016).



Source: Government of Canada (2016), Canada's Second Biennial Report on Climate Change

Figure 2: Freight Transport and Commercial Buildings are some of the key areas of projected emissions growth in Canada to 2030



Source: Canada's Second Biennial Report on Climate Change (2016)

Achieving Canada's 2030 emission reduction goals will require additional, complementary policies beyond carbon pricing that help to align economic and social policy frameworks towards long term GHG reduction objectives. This paper considers four key opportunities for adjustments to the federal tax system that would help reduce greenhouse gas emissions in the oil and gas, transportation and building sectors:

1. **Addressing the Diesel-Gasoline Tax differential:** Raising the tax rate on diesel fuel to be equivalent to the rate on gasoline is advocated by the OECD, and is increasingly being pursued by OECD countries. The current differential is on average roughly 4-6 cents per litre across Canada, despite the fact that diesel has worse environmental performance than gasoline. Closing the tax gap could result in an additional $350-700 million in annual revenue for the federal government, while reducing GHG emissions by between 0.3 and 2 Mt annually (see Annex 2 for caveats and details relating to these estimates). Raising both diesel and gasoline taxes over time could help bring Canada in line with other OECD countries and further encourage a shift to low-carbon transportation.

2. **Making the Federal tax on Fuel Inefficient Vehicles more Effective:** The current tax on fuel inefficient vehicles in Canada applies to too few vehicles and at too low rates to be effective in influencing vehicle purchasing decisions and contributing to climate change goals. Adjusting the tax to include more vehicles, and increase rates for more expensive vehicles, could result in an additional $200 - $600 million in additional annual revenue for the federal government, while reducing GHG emissions by between 1 and 2 Mt annually (see Annex 2 for caveats and details relating to these estimates).

3. **Extending tax incentives to increasingly energy stringent performance-based requirements (in energy use or GHG emissions intensity) for buildings :** Current federal tax incentives for renewable energy and energy efficient equipment are too narrow to effectively encourage green, energy efficient buildings. New or extended tax incentives are needed that reward the cutting edge building construction needed to avoid the lock-in of future building-related GHG emissions. Expanded incentives could result in GHG reductions in the range of 0.5Mt to 3Mt per year, depending on the degree of take-up and the level of the threshold established (see Annex 2 for caveats and details relating to these estimates).

4. **Phase-out preferential tax treatment to oil and gas:** In order to deliver on the Government of Canada's commitment to phase out fossil fuels subsidies and ensure effective implementation of the new federal carbon pricing mechanism, Budget 2017 must put in place a plan to restore the neutral tax treatment of the oil and gas sector in Canada, compared to other industrial sectors. This includes eliminating the Canadian Exploration Expense tax credit the flow-through share deductions available to oil and gas companies in Budget 2017. A timeline must also be announced to restore capital cost allowances to a deduction rate equivalent to the rest of the industry (in most cases 25%) and make necessary changes to Canadian Development Expense, the Canadian Oil and Gas Property Expense, the Foreign Resource Expense and Foreign Exploration and Development Expense to restore neutrality in the fiscal treatment of oil and gas expenses compared to other sectors.

These four measures have the potential to make an important contribution to reductions in Canada's GHG emission trajectory, and are feasible and practical for near-term implementation. Every megatonne of reductions will need to be pursued to achieve ambitious GHG reduction goals, and each seemingly minor change will – when accumulated – help generate the shift needed to move towards a low-carbon future.

The measures also leave the door open to greater ambition over time. For example, both diesel and gasoline excise taxes could be increased over time to bring them closer to levels in other OECD countries. The Federal tax on Fuel Inefficient Vehicles could also be further extended to heavy duty vehicles and increased over time as more low emission vehicle options become available. The threshold for green building incentives could be raised over time to ensure it meets the Pan-Canadian Framework commitments to require "net zero energy ready" building code by 2030 and is supporting the most ambitious projects.

1 ADDRESSING THE DIESEL-GASOLINE TAX DIFFERENTIAL

Currently, Canada's federal excise tax on diesel is set at 4 cents, while the excise tax on gasoline is set at 10 cents per litre. The OECD refers to this as the Diesel Differential, and has advocated that countries bring diesel taxes up to the same rate as gasoline taxes based on environmental grounds. Several countries have already taken steps towards this end. Overall, Canada's level of taxation on both gasoline and diesel fuels is lower than most OECD countries and should be increased over time to accelerate the shift towards low carbon transportation.

Trends in Diesel Use

Over the last 50 years in OECD countries, diesel use as a road fuel has increased overall relative to gasoline and other fuels.[3] Diesel fuel consumption is also increasing steadily in Canada.[4] Diesel accounts for approximately 25% of the fuel used on Canadian roads (slightly above the United States at 20%).[5] The heavy trucking fleet in Canada (and North America) is essentially diesel-powered.[6] In

[3] Harding, M. (2014), *The Diesel Differential: Differences in the Tax Treatment of Gasoline and Diesel for Road Use*, OECD Taxation Working Papers, No. 21, OECD Publishing. http://dx.doi.org/10.1787/5jz14cd7hk6b-en.

[4] Government of Canada, Statistics Canada, http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/trade37c-eng.htm (accessed August 2016).

[5] Harding, M. (2014).

[6] Harding, M. (2014). Diesel represents 95% of the fuel used in the heavy vehicle transport market in the OECD.

northern Canadian and remote communities, diesel is still a relatively less expensive fuel choice for heating homes and powering factories.[7]

Heavy duty trucks are expected to be one of the key sources of GHG emission growth to 2030, and sales of diesel passenger vehicles have been increasing. Drivers find value purchasing diesel vehicles despite a higher price per vehicle for the diesel option of between $1,500 and $2,500. Diesel engines are seen as more robust and considered to last longer which has factored into a resale value better than both gasoline and hybrid cars.[8] This perception may, however, have been negatively affected in the wake of revelations of the emissions testing fraud by manufacturers of the popular Volkswagen diesel vehicles.[9]

Environmental Performance of Diesel vs. Gasoline

Recent evidence shows that the environmental performance of diesel vehicles is in fact worse than gasoline powered vehicles. While diesel is often touted as an energy efficient fuel, it is a major source of GHG emissions and air pollution in OECD countries.

Table 1: Environmental Performance of Diesel vs. Gasoline

Grams per litre of fuel used	**Gasoline**	**Diesel**
Greenhouse Gas Emissions		
CO2	2259	2662
Air Pollutants		
Carbon Monoxide	71.417	2.467
Nitrogen Oxide	7.361	9.600
Particulate Matter	0.025	0.815
Volatile Organic Compounds	8.474	0.519

Note: Values for the pollutants (except CO2) are the mean estimate of emissions per litre. Diesel fuel produces 15.5% more GHG emissions per litre than gasoline (accounting for methane and nitrous oxide emissions).
Source: Harding (2014),The Diesel Differential: Differences in the Tax Treatment of Gasoline and Diesel for Road Use, OECD Publishing.

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[7] The National Energy Board of Canada (2011), *Energy Use in Canada's North: An Overview of Yukon, Northwest Territories and Nunavut – Energy Facts*, https://www.neb-one.gc.ca/nrg/ntgrtd/mrkt/archive/2011nrgsncndnrthfct/nrgsncndnrthfct-eng.html (accessed July 2016).

[8] Vorano, Neil (2014), *Are Diesel Cars a Good Choice for Canadians?*, The Globe and Mail, August 21, 2014, http://www.theglobeandmail.com/globe-drive/culture/technology/the-diesel-dilemma-popularity-in-europe-hard-to-find-here/article20139895/ (accessed July 2016).

[9] *Volkswagen settles U.S. emissions lawsuit, but Canadian owners still waiting,* The Canadian Broadcasting Corporation (online), June 27, 2016, http://www.cbc.ca/news/business/volkswagen-lawsuit-deal-1.3655371, (accessed July 2016); Also, Cain, Timothy, *Volkswagen's Canadian sales are beginning to crater*, http://www.autofocus.ca/news-events/blogs/volkswagens-canadian-sales-are-beginning-to-crater, Autofocus.ca, March 9, 2016, (accessed July 2016).

Fuel efficient diesel vehicles can be driven further on a litre of fuel, but contribute more CO2 emissions, nitrogen oxides and particulate matter than gasoline vehicles per litre of fuel used (**Table 1**). Diesel fuel has a carbon content around 18% higher than that of gasoline. After accounting for methane and nitrous oxide emissions, a litre of diesel fuel produces approximately 15.5% more GHG emissions than gasoline. Diesel fuel is also considered to have worse local air pollution effects than gasoline, due to the higher emissions of particulate matter and nitrogen oxides per litre and three-way catalyst technology that reduce carbon monoxide emissions from gasoline vehicles.[10]
Drivers already capture the financial benefit from more fuel efficient diesel vehicles, as a result of lower fuel costs per kilometre travelled.[11] There is therefore no need to provide a tax incentive based on fuel efficiency performance, particularly given the relatively poor performance of diesel in terms of GHG emissions and certain air pollutants.

Current Taxation of Diesel Fuel in Canada

In Canada, the current federal excise rates for fuels are set at $0.10 for gasoline and $0.04 for diesel.[12] In contrast, most Canadian Provinces tax gasoline and diesel at approximately balanced rates (Alberta[13], British Columbia, Saskatchewan, Manitoba, Ontario, Nova Scotia and Newfoundland), or at higher rates for diesel (New Brunswick and Prince Edward Island). See Figure 3, below for a graph comparing these rates across the country.[14] In June 2016 the Newfoundland Government announced a doubling of fuel tax rates for gasoline from 16.5 to 33 cents/litre which makes these by far the highest tax rates on fuels in Canada.[15]

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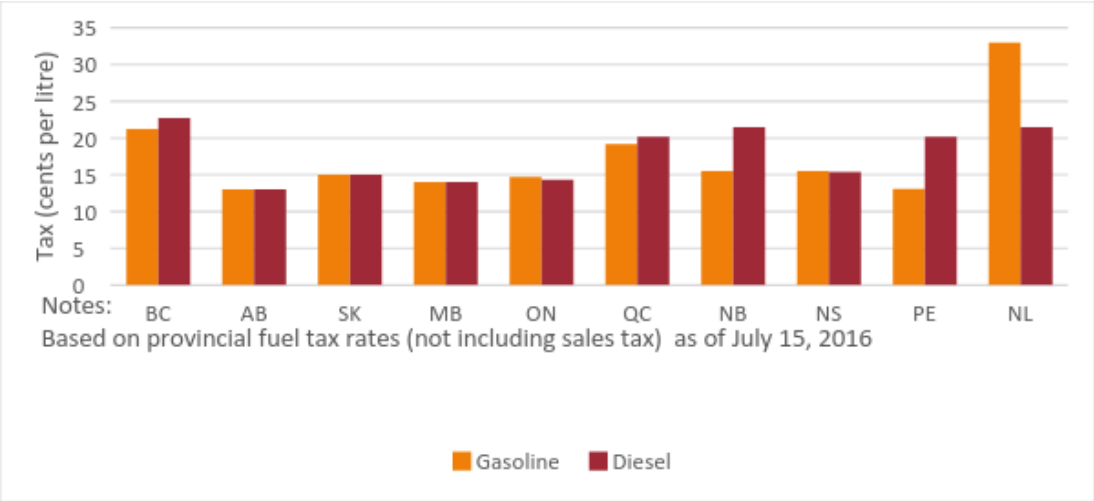
[10] Harding, M. (2014).
[11] Harding, M. (2014).
[12] Government of Canada (2013), Canada Revenue Agency, *Excise Taxes and Special Levies Memoranda; X3.1 Goods Subject to Excise Tax,* http://www.cra-arc.gc.ca/E/pub/et/x3-1/x3-1-e.html (accessed July 2016).
[13] Government of Alberta (2015), *Budget 2015:Tax Plan*, http://finance.alberta.ca/publications/budget/budget2015/fiscal-plan-tax-plan.pdf#fuel (accessed July 2016).
[14] For the March 2015 Table of Canadian Provincial rates, see Alberta's 2015 budget, http://finance.alberta.ca/publications/budget/budget2015/fiscal-plan-tax-plan.pdf#fuel (accessed July 2016).
As of July 2016, only New Brunswick and Newfoundland's rates have changed:
Newfoundland and Labrador Department of Finance, *Gasoline Tax*: http://www.fin.gov.nl.ca/fin/tax_programs_incentives/business/gasolinetax.html (accessed July 2016).
New Brunswick Department of Finance, *Gasoline Tax*: http://www2.gnb.ca/content/gnb/en/departments/finance/taxes/gasoline_motive_fueltax.html (accessed July 2016).
[15] Newfoundland and Labrador Department of Finance (2016) http://www.fin.gov.nl.ca/fin/tax_programs_incentives/business/gasolinetax.html (accessed July 2016)

Figure 3. Provincial tax rates on fuel, July 2016



Source: Alberta Government 2015 Budget table of provincial tax rates on fuel, with 2016 updates from New Brunswick Government and Newfoundland Government

In the northern territories, the Yukon government taxes diesel (7.2 cents/litre) slightly higher than gasoline (6.2 cents/litre).[16]The NWT government taxes gasoline 1 cent more than diesel. These taxes are significantly reduced "off highway", for communities further away from transport routes and supply points.[17] Nunavut publishes an annual Tax Rate Sheet, and the diesel tax is set by legislation as 0.85 times the current tax rate on gasoline.[18]

The diesel differential by province, considering combined federal and provincial excise taxes, is illustrated in Table 2 below. On average, the differential is around 6 cents across Canada. However, Newfoundland and Labrador is a significant outlier with its recent temporary increase in gasoline and diesel taxes. If Newfoundland and Labrador is removed from the calculation, the average differential across provinces is around 4 cents. In most provinces, the differential is in the range of 4 to 6 cents per litre. The three exceptions are: Newfoundland and Labrador, which has a 17.5 cent differential with the temporary tax increases; New Brunswick, which has the same overall taxes for both gasoline and diesel; and PEI, which has higher taxes for diesel than gasoline.

Table 2: The Diesel Differential by Province

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[16] Yukon Government Department of Finance (2014), *Fuel Tax Exemptions*, http://www.finance.gov.yk.ca/ft_exemptions.html (accessed July 2016).

[17] Government of The Northwest Territories, Department of Finance, *Taxation Rates on Fuel Usage*, http://www.fin.gov.nt.ca/sites/default/files/Taxation%20Policy%20and%20Rates%20on%20Fuel%20Usage.pdf (accessed July 2016)

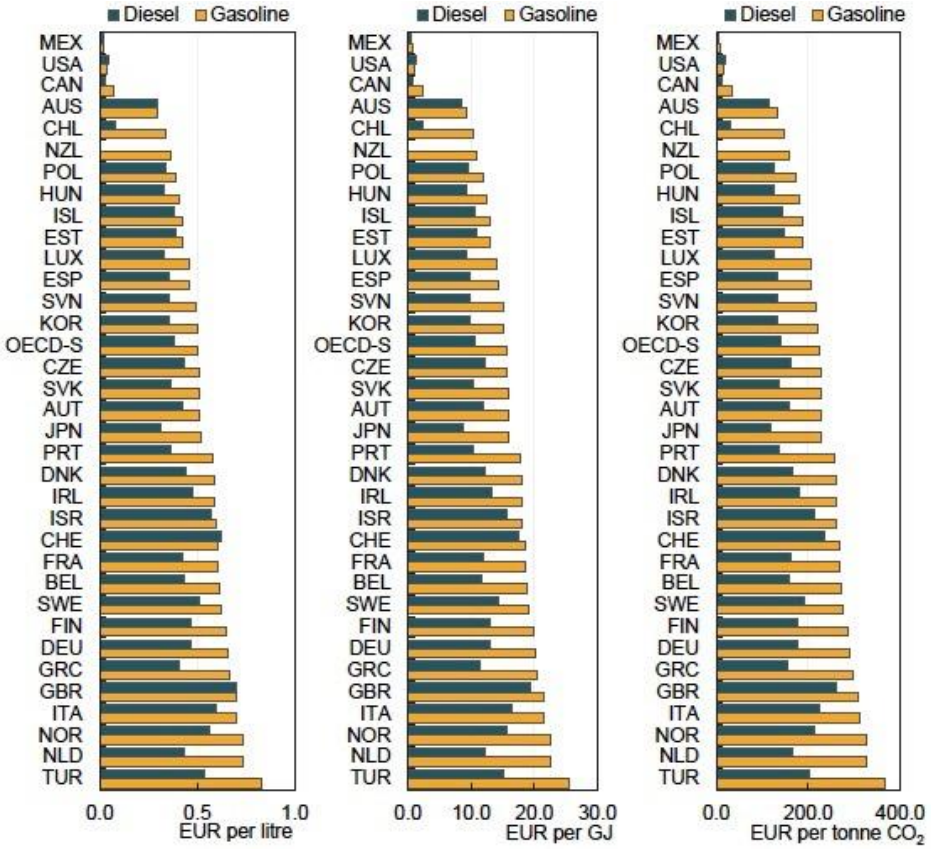
[18] Government of Nunavut, Department of Finance, Nunavut Tax Rates, 2016, http://www.gov.nu.ca/sites/default/files/files/Finance/Taxation/nunavut_tax_rate_sheet_2016_english.pdf, See also http://www.gov.nu.ca/sites/default/files/files/Finance/Taxation/rsnwt-nu-1988-c-p-5-part-1.pdf (both accessed July 2016)

Cents per litre	**Gasoline (provincial tax + 10 cent federal tax)**	**Diesel (provincial tax + 4 cent federal tax)**	**Differential**
British Columbia	31.2	26.7	4.5
Alberta	23	17	6
Saskatchewan	25	19	6
Manitoba	24	18	6
Ontario	24.7	18.3	6.4
Québec	29.2	24.2	5
New Brunswick	25.5	25.5	0
Nova Scotia	25.5	19.4	6.1
Prince Edward Island	23.1	24.2	-1.1
Newfoundland and Labrador	43	25.5	17.5
Average with Newfoundland and Labrador	**27.42**	**21.78**	**6.27**
Averaged without Newfoundland and Labrador	**25.69**	**21.37**	**4.32**

Canada has among the lowest taxes on both diesel and gasoline across OECD countries

Canada has comparatively low taxation on road fuels compared with other OECD countries. Only the U.S. and Mexico have lower rates, and Mexico has recently begun a reform to eliminate fuel subsidies.

Figure 4. Tax rates on gasoline and diesel for road transport in OECD countries

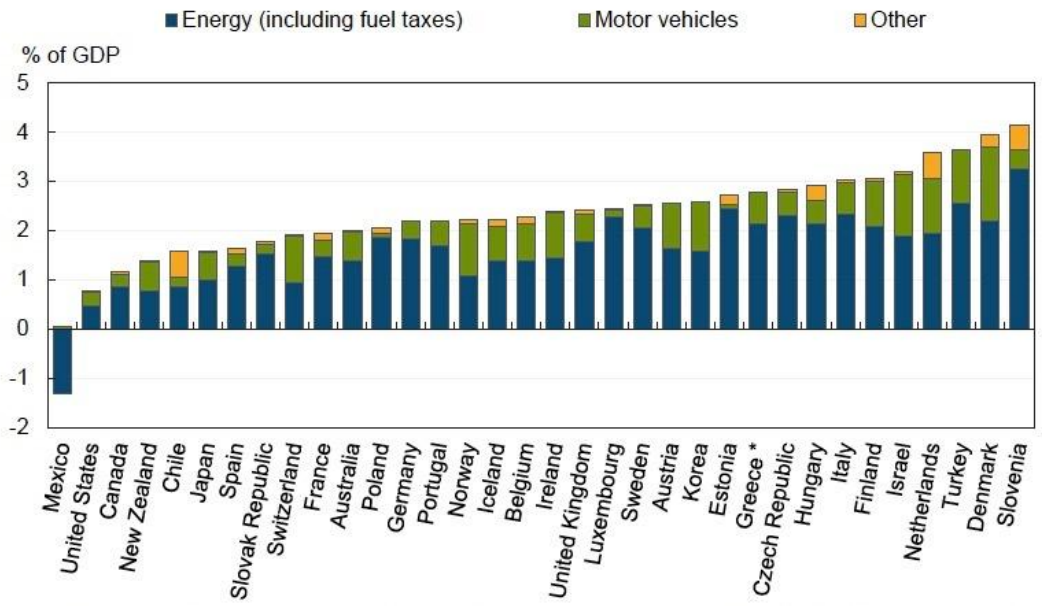


Source: OECD calculations, based on data taken from *Taxing Energy Use* (OECD, 2013). Tax rates are as of 1 April 2012 (except 1 July 2012 for Australia). OECD-S is the simple OECD average; OECD-W is the weighted OECD average.[19]
Note: Figures for Canada and the US include only federal taxes, but Canada's would still be low even with provincial taxes included (average of Cdn $0.27 roughly equivalent to EUR 0.19 per litre).

[19] Harding, M. (2014).

Canada also has comparatively low revenues from environmental taxation across OECD countries (**Figure 5**).

Figure 5. Environmentally-related tax revenues (2012) in OECD countries



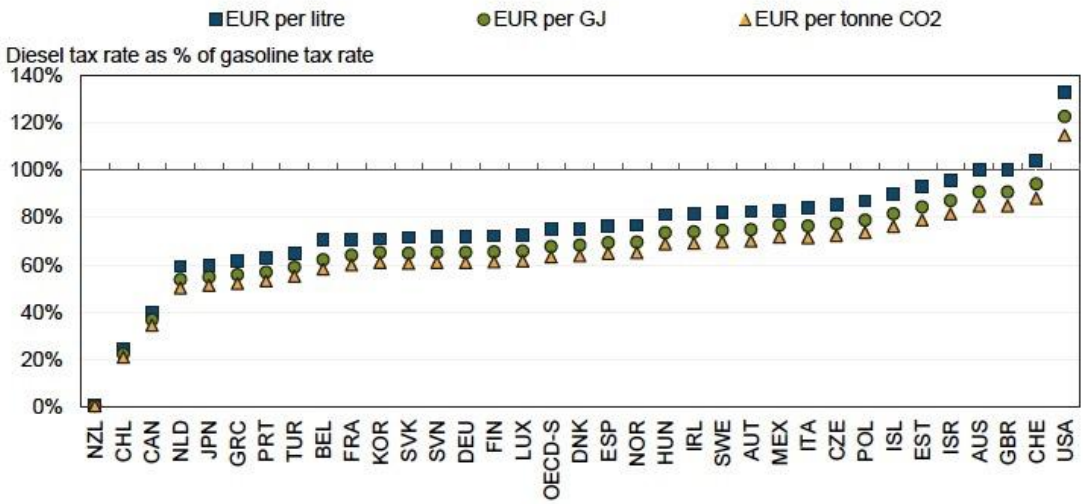
Source: OECD calculations, based on OECD Database of instruments used for environmental policy (OECD, 2013c). Energy taxes include taxes on fuels and other energy products. Motor vehicle taxes include taxes in relation to the ownership or annual registration of motor vehicles. Other includes taxes levied on all other taxes bases of environmental relevance, such as taxes on waste,hazardous material, other air pollutants and water. A * indicates that data for that country is for 2011.[20]

Diesel Differentials across OECD Countries

In the 34 OECD countries, only the United States and Switzerland tax diesel at a higher rate than gasoline per litre. The United Kingdom and Austria tax them at the same rate. However, the Netherlands government is gradually increasing the tax on diesel while maintaining the same rate of taxation on petrol.[21] The remainder, including Canada, tax diesel at lower rates per litre.
Figure 6 below illustrates the difference between diesel and gasoline rates as a proportion of the gasoline tax rates. For countries that provide a lower rate (or "tax preference") for diesel on a per-litre basis, the discrepancy is greater when the "effective tax rate" in terms of CO2 emissions is considered.[22] Canada's federal diesel tax rate is 40% of the gasoline tax rate. When provincial and federal rates are considered together (Table 2), Canada's diesel tax rate is 84% of the gasoline tax rate, which would place Canada slightly above the OECD average.

[20] Harding, M. (2014).
[21] Bragadóttir, H. et al., (2014),The Use of Economic Instruments in Nordic Environmental Policy, 2010-2013, http://norden.diva-portal.org/smash/get/diva2:738535/FULLTEXT02.pdf.
[22] Harding, M. p. 13. Graphic, Figure 7 at p. 15

Figure 6. OECD Countries: difference between diesel and gasoline tax rates



Source: OECD calculations, based on data taken from *Taxing Energy Use* (OECD, 2013). Tax rates are as of 1 April 2012 (except 1 July 2012 for Australia). Figures for Canada and the United States include only federal taxes. OECD-S is the simple OECD average; OECD-W is the weighted OECD average.

The OECD has been leading the way in challenging the lower taxation on diesel, and OECD economists now emphasize that when "setting tax rates per litre of fuel, the appropriate comparison between fuels is the environmental cost per litre of fuel use."[23]

Fuel Taxes can have an Important Impact on Driving Behaviour, Vehicle Choice and Innovation

Setting the right taxation rate on fuel is an important component of GHG policy because it influences driving behaviour, vehicle choice and transportation innovation. OECD research has found a relationship between the "tax advantage" of diesel over gasoline in OECD countries and its use as a road fuel. The lower tax rate increase the use of diesel fuel.[24] There are also several empirical studies showing that when transportation fuel prices increase, fuel use decreases.

In the car market, transportation fuel taxes can influence purchasing decisions between gasoline and diesel vehicles. Higher taxes can also encourage the purchase of more fuel-efficient vehicles, particularly when they are part of a suite of measures including taxes on vehicles (section 2) and labelling.

With heavy duty vehicles, there has historically been less responsiveness to fuel price increases, given the relatively few alternatives to diesel engines.[25] However, technology is changing rapidly in the heavy duty vehicle market and options are growing by the year. The U.S. Office of Energy Efficiency

[23] Harding. M. (2014).
[24] Harding, M. (2014).
[25] Harding, M. (2014).

and Renewable Energy SuperTruck Initiative, for example, has resulted in 26 additional technologies that have the potential to succeed in the market in the next two to four years. Industry partners such as Daimler and Volvo have far exceeded the 50% efficiency improvement goal set by the organization with advancements in combustion engines, lightweight materials and aerodynamic improvements. The improvements on Class 8 trucks are estimated to create an opportunity to save 300 million barrels of oil annually, while saving truck operators as much as US $20,000 per year on fuel.[26]

Canada's federal regulations for heavy-duty vehicles (aligned with the U.S.)[27] are expected to improve the average fuel efficiency of trucks, reducing fuel consumption by 7.2 billion litres over the lifetime of the model year 2014–2018 fleet.[28]

Mercedes also recently unveiled the first fully electric heavy-duty transport truck, with a 200 kilometre range and the ability to haul 26 tons. Mercedes expects it to be commercially available in the early 2020s. Tesla CEO Elon Musk has announced plans to develop electric transport trucks and heavy-duty buses.[29]

Higher fuel taxes will encourage even greater vehicle innovation by increasing demand for fuel-efficiency and electric vehicles. Further investments in electric vehicle charging infrastructure would also help the transition. It is preferable to invest in electric infrastructure rather than natural gas vehicle fueling infrastructure. Given Canada's GHG targets, there is not sufficient time to support a transition fuel such as natural gas.

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[26] United States Government (2016), Department of Energy, *Supertruck Leading the Way for Efficiency in Heavy-Duty, Long-Haul Vehicles*, June 27, 2016, http://energy.gov/eere/articles/supertruck-leading-way-efficiency-heavy-duty-long-haul-vehicles (accessed August 2016).

[27] Government of Canada (2013), Canada Gazette, *Heavy-Duty Vehicle and Engine Greenhouse Gas Emission Regulations*, http://gazette.gc.ca/rp-pr/p1/2012/2012-04-14/html/reg1-eng.html (accessed July 2016); United States Government (2016), Environmental Protection Agency, *EPA Regulations and Standards: Heavy Duty* https://www3.epa.gov/otaq/climate/regs-heavy-duty.htm (accessed July 2016).

[28] Government of Canada (2013), Environment and Climate Change Canada, *Canada Gazette Part II Vol. 147, no.6, Current Regulations: Heavy-duty Vehicle and Engine Greenhouse Gas Emission Regulations*, http://www.ec.gc.ca/lcpe-cepa/eng/regulations/detailReg.cfm?intReg=214, (accessed August 2016).

[29] Canadian Manufacturing (2016), *Mercedes Unveils First Fully-Electric Heavy-Duty Transport Truck*, http://www.canadianmanufacturing.com/technology/mercedes-unveils-first-fully-electric-26-ton-transport-truck-172950/?custnum=23557353938&title=Director&utm_source=CTECH&utm_medium=email&utm_campaign=160803B (accessed August 2016).

Box 1. Diesel Fuel in Canada's North

The National Energy Board estimates almost three-quarters of northern Canadian fuel consumption is a by-product of refined oil, and almost all this fuel is imported from the south. To offset the cost of diesel in northern communities, there has been a Federal excise tax exemption for diesel used as heating fuel, or for generating electricity. While the Federal Government made a recent revision to the Tax Act, removing the tax exemption for using diesel fuel in industrial processes, an exemption remains "exclusively" for heating homes. The 2016 Budget pledged $10.7 million over 2016-18 to Indigenous and Northern Affairs Canada to help "off-grid" Indigenous and northern communities move from diesel toward renewable energy and clean technology. A gradual phase out of the excise tax exemption on heating fuel could support this shift to greener infrastructure in northern communities. A separate program could be established to ensure that low income Northern communities are not financially disadvantaged by the cost increases (while preserving the incentive to reduce fuel use and seek diesel alternatives).

European and Nordic Countries are moving to Balance Tax Rates on Diesel and Gasoline

Some OECD countries are already moving towards balancing tax rates on diesel and gasoline. The UK has equalized the tax on non-commercial diesel and petrol, removing the subsidy for non-commercial purposes. The Netherlands Government is gradually increasing the excise duty on diesel while keeping the tax on petrol unchanged.[30] The European Commission has stated its intention to gradually phase out diesel subsidies to non-commercial vehicles, "to remove the bias against petrol."[31]

A recent case study for the Nordic Council examined whether lower taxation rates on diesel fuel should be phased out as an environmentally harmful subsidy (EHS) in Norway, Finland, Sweden, and Denmark.[32] Iceland was excluded from the study as it already taxes diesel at a higher rate than petrol.[33] Norway has the highest tax rates for diesel and petrol, while recent tax reform in Sweden to equalize fuel taxes per energy content, has brought diesel and petrol rates closer. [34] After evaluating and comparing the environmental costs of diesel fuel and gasoline, the study confirmed that diesel has a much greater negative impact. The study concluded that lower taxation rates could be considered an EHS.

It was also noted that while Nordic countries have a higher vehicle road tax on diesel vehicles, the tax was not sufficient to offset the adverse effects of the lower tax on diesel fuel.[35] The study concluded

[30] Bragadóttir, H. et. al, (2014).

[31] Bragadóttir, H. et. al, (2014).

[32] Bragadóttir, H. et. al, (2014).

[33] Taxes on fuels in these countries generally include a CO2 charge and an energy charge.

[34] Bragadóttir, H. et. al, (2014).

[35] Bragadóttir, H. et. al, (2014).

that the diesel EHS primarily benefits fuel producers, owners of private diesel-fueled vehicles and manufacturers of diesel technology and should be removed.[36]

The Nordic study considered a scenario where the diesel and petrol (gasoline) rates were balanced or harmonized in Norway, Finland, Sweden and Denmark. Based on the authors' calculations, if the tax rates on diesel (based on energy and CO2 content) were brought up to the same level as that of petrol, the price of diesel in these four Nordic countries would increase between 8 and 16%. [37] Overall, the authors concluded that foregone revenue from the lower tax on diesel represented 5% of total tax expenditure in these countries[38].

The Nordic study considered the impacts on diesel consumption and revenue from an increase in diesel tax rates. A higher tax rate per litre of diesel will increase revenue, but the amount of revenue will decrease as consumers alter fuel use and vehicle choice. After calculating the net effect of these "counteracting factors", the study estimated that the countries could add over EUR 1 billion to annual revenues (**Table 3**).[39]

Table 3. Nordic Study: Fiscal Impact due to tax harmonisation

	Change in diesel consumption	Yearly fiscal impact, EUR million
Denmark	-4 to -9%	342 to 451
Finland	-5 to -13%	257 to 368
Norway	-4 to -9%	294 to 411
Sweden	-3 to -6%	173 to 238
Total		*1,067 to 1,468*

Source: Copenhagen Economics based on data from the World Bank, national statistics agencies, Sterner (2006), CE Delft (2008).

Source: Bragadóttir, H. et al., The Use of Economic Instruments in Nordic Environmental Policy, 2010-2013,

In theory, the maximum fiscal potential of removing the diesel EHS was EUR 3 billion based solely on current tax expenditure and no consumer response. Taking into account behavioural changes resulted in an estimated revenue potential of approximately half of that amount. [40]

To determine the environmental impact of the diesel EHS, the Nordic study followed guidelines developed for determining the environmental costs of transport in Europe[41] as well as in Finland.[42]

[36] Bragadóttir, H. et. al, (2014).
[37] Bragadóttir, H. et. al, (2014).
[38] Bragadóttir, H. et. al, (2014).
[39] Bragadóttir, H. et. al, (2014).
[40] Bragadóttir, H. et. al, (2014).

The CE Delft (2008) handbook on the external costs of transport in Europe calculates the environmental costs of European passenger vehicles as set out in Table 2. The CE Delft values show environmental costs for diesel vehicles are higher per km than gasoline passenger vehicles.

Table 4. Nordic Study: Environmental cost of different passenger cars

Vehicle	Costs eurocent/vkm
Petrol passenger car, urban	1.81
Diesel passenger car, urban	2.66
Petrol passenger car, interurban	1.18
Diesel passenger car, interurban	1.72

Source: CE Delft (2008).

Source: Bragadóttir, H. et al., The Use of Economic Instruments in Nordic Environmental Policy, 2010-2013

Based on these guidelines, it was calculated that the diesel EHS removal would create an environmental impact five times smaller (in monetary terms) than the overall fiscal impact, at between EUR 89 and 222 million (**Table 5, below**).[43]

Table 5. Nordic Study: Environmental impact of a tax harmonization between diesel and petrol

	Change in diesel price	Change in driven distance per year (bn km)	Yearly environmental impact (EUR million)
Denmark	11%	-0.9 to 2.3	24.7 to 61.8
Finland	16%	-1.2 to -2.9	31.2 to 77.9
Norway	11%	-0,8 to -2.0	21.2 to 53.1
Sweden	8%	-0.5 to -1.1	12.0 to 29.9
Total	-	*-3.3 to -8.4*	*89.1 to 222.7*

Note: Lower bound is calculated based on estimated long-run price elasticity for diesel of -0.32, and upper bound on -0.8.
Source: Copenhagen Economics based on data from the World Bank, national statistics agencies, Sterner (2006), CE Delft (2008), Konjunkturinstitutet (2012).

Source: Bragadóttir, H. et al., The Use of Economic Instruments in Nordic Environmental Policy, 2010-2013
The authors of the Nordic Study conclude if the subsidy is phased out, the increased price of diesel would make it possible to transition to "greater fuel efficiencies, other types of fuels and other modes of transport".[44]

[41] CE Delft, (2008), *The External Costs of Transport in Europe*, http://www.cedelft.eu/publicatie/external_costs_of_transport_in_europe/1258. (accessed July, August 2016)
[42] Bragadóttir, H. et. al, (2014).
[43] Bragadóttir, H. et. al, (2014).
[44] Bragadóttir, H. et. al, (2014).

Canada's Diesel Tax Rates Should be brought into line with Gasoline Tax Rates

In 2009, Canada pledged with other G20 countries to begin to phase out fossil fuel subsidies and has since taken steps to end the Atlantic Investment Tax Credit (AITC, as of 2016) and the Accelerated Capital Cost Allowance (ACCA) for Alberta oil sands projects (as of 2015). As shown in the Nordic case study, above, setting diesel taxes at a lower rate than gasoline can be viewed as an environmentally harmful subsidy. Increasing diesel tax rates will help Canada meet GHG reduction targets, promote an accelerated shift to cleaner technologies and generate revenue.

Improved labelling of the environmental impacts of fuel choice would be a complementary measure and help explain the rationale for a tax increase. [45] The OECD paper on diesel differentials suggests that social and other economic policy concerns associated with the tax increase should be dealt with separately, through "targeted forms of assistance for those in particular need, without providing adverse environmental signals".[46]

Recommandations

1. **Increase the federal excise tax on diesel fuel by 4 cents per litre to close the diesel differential in Canada.** The tax increase should be gradually phased-in to allow for adjustment, with a 1 cent increase each year for the following four years (commencing FY 2017, leading to an 8 cent per litre federal excise tax on diesel fuel by FY 2021).

2. **Implement environmental labelling at the fuel pump and on new vehicles.** Fuel pumps should detail the GHG emissions associated with fuel choices (e.g. mean estimate of emissions per litre in CO2 equivalent). Canada also recently introduced new vehicle labelling standards, which create an opportunity to clearly explain each vehicle's average weighted fuel consumption (L/100km) and CO2 emissions at the point of sale.[47] Labelling diesel and other fuels at purchase points to explain related fuel consumption and CO2 emissions is also consistent with the proposed Low Carbon Fuel Standard. It will help better inform consumers about the environmental costs of their fuel use and vehicle purchasing decisions[48]. This information can help influence both driving behaviour and vehicle purchasing decisions towards greater efficiency and cleaner technology.

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[45] Tencer, Daniel (2015), *Gas Retailers Line Up Against Climate Change Warning Labels on* Pumps, May 26, 2015, Huffington Post, http://www.huffingtonpost.ca/2015/05/26/climate-change-warnings-gas-pumps_n_7441534.html (accessed in July 2016). Article notes some Canadian municipalities have initiated labelling at the pump on environmental issues.

[46] Harding, M. (2014).

[47] Government of Canada (2016), Natural Resources Canada, *EnerGuide Label for Vehicles*, https://www.nrcan.gc.ca/energy/efficiency/transportation/cars-light-trucks/buying/7483 (accessed in July 2016).

[48] Harding, M. (2014).

Estimated Impacts

The estimates provided should be considered rough, ballpark estimates only. Please see Annex 2 for details on the assumptions, calculations and caveats behind these estimates.

Revenue Impact: A 4 cent increase in the federal excise tax on diesel fuel would be estimated to raise between roughly $350 and $700 million per year by the time it is fully implemented

GHG Reduction Impact: A 4 cent increase in the federal excise tax on diesel fuel would be estimated to reduce GHGs by between 0.3 and 2Mt annually once it is fully implemented, depending on consumer responsiveness to diesel price changes.

Competitiveness Impacts: Historically, there has been concern about the competitiveness impacts of diesel tax increases given the limited technological options available to reduce diesel consumption and the high level of fuel costs as a proportion of operating costs in some sectors (particularly in the trucking industry). However, by 2020 a number of new technological options are expected to be available that will make the tax increase more affordable. Increasing diesel tax rates could also be an important area of harmonization discussions with the U.S. and Mexico as part of joint efforts to address climate change. Diesel prices currently vary by more than 4 cents across Canadian provinces (Table 1), however, so an argument for harmonization with the U.S. would also support harmonization across Canada.

Other Considerations

Use of Revenue: While directly tying new programs to anticipated revenue from the diesel tax could be problematic given the uncertainty of the revenue stream over time, the additional fiscal room could be used to justify new temporary programs that help support the transition of key sectors, such as trucking, and vulnerable communities in rural or northern regions. It could also be used to support transportation innovations and technology commercialization that accelerates the development of alternatives for diesel-using sectors.

Adjustments: Given provincial variation in diesel differentials, and existing provincial measures that also affect fuel prices such as B.C.'s carbon tax, there may be calls for adjustments to the proposed 4 cent diesel excise tax rate increase. While adjustments may be justified, the ultimate objective should be to ensure equivalent taxation on diesel and gasoline fuels per litre across Canada, whether through adjustments in fuel excise taxes, carbon taxes or some combination of the two.

Long-term Ambition: Over the long-term, Canada should consider raising taxes on both gasoline and diesel fuel to ensure that they fully reflect the environmental and social costs of their use. As

technological alternatives increasingly become available, this will help accelerate the transition to low carbon vehicles and fuels and support markets for cleaner technologies.

2 MAKING THE FEDERAL TAX ON FUEL INEFFICIENT VEHICLES MORE EFFECTIVE

The Government of Canada currently places an excise tax on the purchase of a few classes of the most inefficient vehicles on Canadian roads, known as the "green levy".[49] Thus far, the tax appears to have little influence on purchasing decisions, as too few vehicles are covered, the tax is based on fuel efficiency instead of CO2 emissions, and there is limited awareness of the tax and its role in achieving climate change goals.

Trends in Vehicle Purchasing

In 2015, Canadians purchased new vehicles in record numbers, with light trucks (pickup trucks, SUVs and vans) once again among the most popular choices.[50] According to the last Canadian Vehicle Survey conducted (2009) between 2000 and 2009, the number of vehicles in the "light truck" category increased relative to cars. The number of SUVs almost doubled, and this category of the light vehicle fleet increased from 6.9 percent to 12.8 percent. Meanwhile, the share of cars *decreased* from 60.5 percent to 55.4 percent, while the share of station wagons increased by 1 percentage point to reach 3.5 percent in 2009. At the time of the 2009 survey, there were 1.47 vehicles per Canadian household on average (an increase from 1.43 in 2000).[51]

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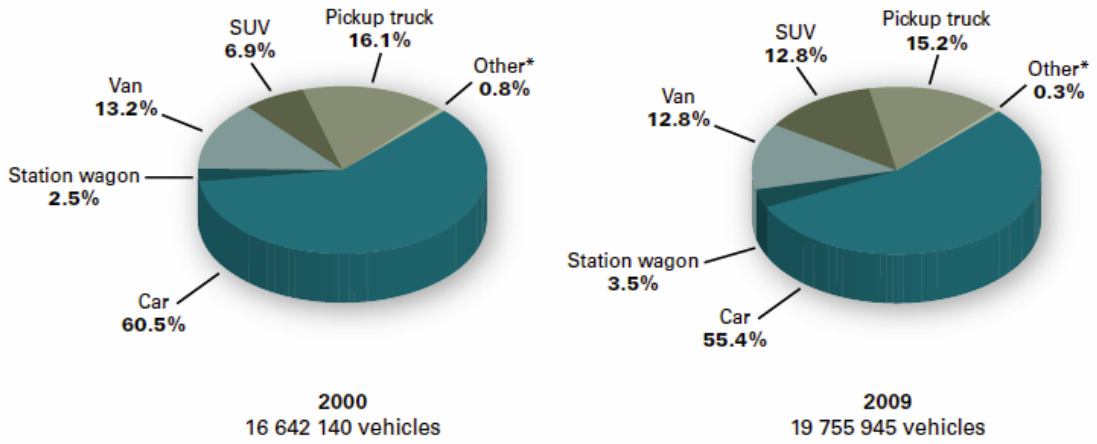
[49] Most of the tax is on luxury brand automobiles, so a small portion of the passenger vehicle fleet. For a complete list of vehicles taxed under the green levy, see Annex 1.

[50] 2015 Top 5 selling vehicles in Canada: Ford 150 (118,837), RAM 1500 (91,195), Honda Civic (64,950), GMC Sierra (53,727), Ford Escape 47,726) Sources: Autotrader.ca website: http://www.autotrader.ca/newsfeatures/20160106/canadas-25-best-selling-cars-in-2015/#jByYtGscwY5y958w.97, See also http://www.autofocus.ca/news-events/news/canadas-30-best-selling-vehicles-in-2015 (accessed in July 2016)

[51] Government of Canada (2011), Natural Resources Canada, *Canadian Vehicle Survey 2009*, http://oee.nrcan.gc.ca/publications/statistics/cvs09/pdf/cvs09.pdf (accessed in August 2016).

Figure 7: Light Vehicles by Body Type, 2000 and 2009



2000 data are derived from Statistics Canada's *Canadian Vehicle Survey: Annual* (Cat. No. 53-223). The share by body type, found in the publication, was applied to the total number of light vehicles in 2000 (16 642 140 vehicles).

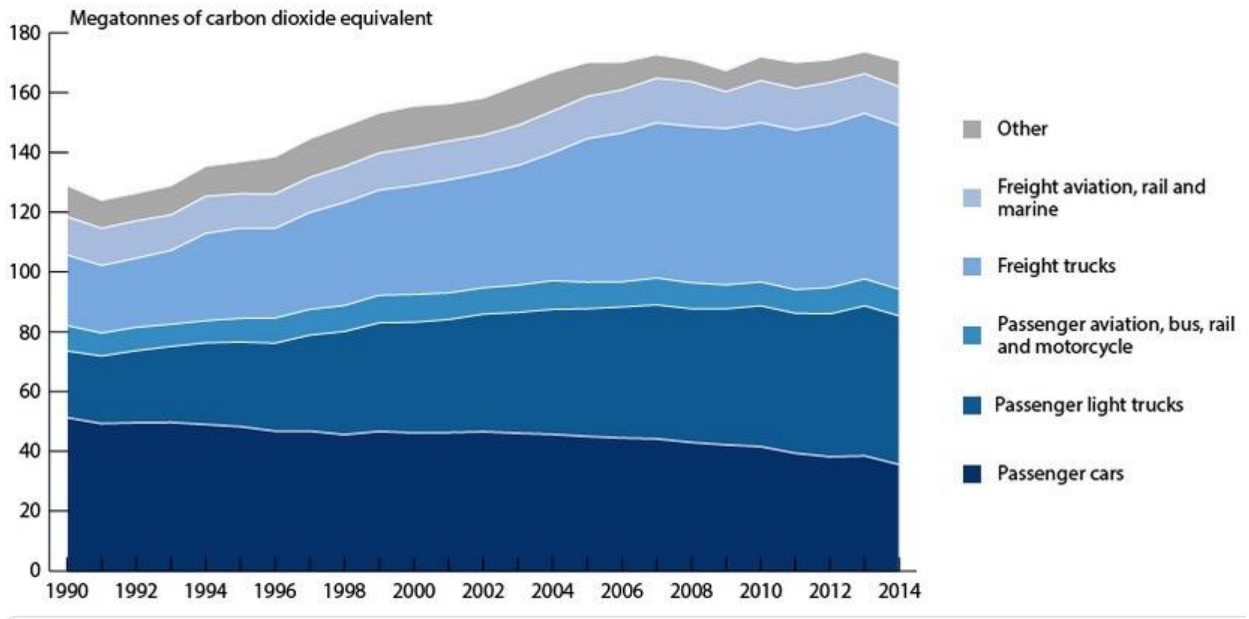
* Straight trucks, tractor-trailers and buses as defined by Statistics Canada.

Source: Natural Resources Canada, 2009 [52]

[52] Government of Canada (2011), Natural Resources Canada, *Canadian Vehicle Survey 2009*, http://oee.nrcan.gc.ca/publications/statistics/cvs09/pdf/cvs09.pdf (accessed in August 2016).

Figure 8 below illustrates that in the 2014 passenger fleet, passenger "light trucks" were a greater source of GHG emissions than all other passenger vehicles. Although both passenger cars and light trucks have become relatively more fuel efficient, this does not offset the increases in emissions due to the shift in the vehicle fleet towards light trucks since 1990.[53]

Figure 8. Transportation sector greenhouse gas emissions, Canada 1990 - 2014



Source: Environment Canada[54]

Environmental Performance of Efficient vs. Inefficient Vehicles

There is significant variation in CO2 emissions per kilometer across vehicles (**Table 6**). In most vehicle classes, there is a range of choice, with a number of vehicles receiving some of the top CO2 performance rankings and hybrid or electric options available. Luxury sports cars are the worst performers across car categories, but there are also a number of non-luxury vehicles that receive poor CO2 ratings. There are fewer choices and less variation in performance in vans and pick-up trucks, but some vehicles still outperform their counterparts.

In the mid-size car category, for example, the worst performing vehicle emits 3.5 times more CO2 per kilometer than the best performing vehicle. In the standard SUV category, the worst performing vehicle emits 2.5 times more than the best performing vehicle. In the van and standard pick-up truck categories, the worst performers emit 1.2 and 1.5 times more CO2 than the best performers

[53] Government of Canada (2011), Natural Resources Canada, *Canadian Vehicle Survey 2009*, http://oee.nrcan.gc.ca/publications/statistics/cvs09/pdf/cvs09.pdf (accessed in August 2016).
[54] Government of Canada (2016), Environment and Climate Change Canada, *Greenhouse Gas Emissions by Economic Sector*, https://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=F60DB708-1 (accessed in August 2016).

respectively. Increased private and publicly funded innovation across all categories - driven by more stringent standards for new vehicles - holds the potential to expand the range of options available with strong environmental performance.

Table 6: Comparison of Environmental Performance of Vehicles by Class

	Make/Model	Fuel Efficiency (Combined City-Highway L/100 km)	CO2 Emissions (g/km)	CO2 Rating (1=worst, 10=best)
Cars				
Minicompact (I)				
Best	Fiat 500 Hatchback	6.8	160	8
Worst	Aston Martin DB9 GT	15.6	365	2
Two-Seater (T)				
Best	Mazda MX-5	7.8	183	7
Worst	Lamborghini Aventador Roadster	19.3	452	1
Battery-Electric Option	SMART FORTWO Electric drive	2.2	0	10
Subcompact (S)				
Best	Ford Fiesta SFE	6.6	153	8
Worst	Bentley Continental GT Convertible	16	375	2
Plug-in Hybrid Option	BMW i3 REX	6.0	22	10
Battery-Electric Options	BMW i3	1.9	0	10
	Chevrolet Spark EV	2.0	0	10
	Mitsubishi i-MiEV	2.1	0	10
Compact (C)				
Best	Prius c	4.7	111	10
Worst	Rolls-Royce Phantom Drophead Coupe	17.2	404	2
Plug-in Hybrid Option	Chevrolet Volt	5.6	32	10
Battery-Electric option	Ford Focus Electric	2.2	0	10
Mid-Size (M)				
Best	Toyota Prius	4.5	104	10
Worst	Bentley Flying Spur (12 cylinder)	16	375	2
Plug-in Hybrid	Hyundai Sonata	5.9	63	10

Option	Plug-in			
Battery-Electric Option	Nissan LEAF	2.1	0	10
Full-Size (L)				
Best	Ford C-Max Hybrid	6.0	140	9
Worst	Rolls-Royce Phantom EWB	17.2	404	2
Plug-in Hybrid Option	Mercedes-Benz S 550e	9.0	141	9
Battery-Electric Option	Tesla Model S	2.3 – 2.6	0	10
	Make/Model	**Fuel Efficiency** **(Combined City-Highway L/100 km)**	**CO2 Emissions** **(g/km)**	**CO2 Rating** **(1=worst, 10=best)**
Vans				
Minivans (V)				
Best	Mazda 5	9.7	226	5
Worst	Chrysler Town and Country FFV	12	282	4
Passenger Vans (VP)				
Best	Ford T-150 Wagon	14.6	342	3
Worst	Chevrolet Express 3500 Passenger	19.8	465	1
	GMC Savana 3500 Passenger	19.8	465	1
Pickup Trucks				
Small (PS)				
Best	Chevrolet Colorado (2.5 L, A6)	10.5	247	5
	GMC Canyon	10.5	247	5
Worst	Nissan Frontier 4WD (M6 transmission)	13.7	322	3
Standard (PL)				
Best	Ford F-150	10.9	256	5
Worst	Toyota Tundra 4WD (5.7 L)	16.3	380	2
Sport Utility Vehicles (SUVs)				
Small (US)				
Best	Toyota RAV4 Hybrid AWD	7.2	169	8
Worst	Jeep Wrangler Unlimited 4x4 (A5)	13.4	314	4
Standard (UL)				

Best	Toyota Highlander Hybrid AWD LE	8.4	195	7
Worst	Mercedes-Benz AMG G 65	21.4	476	1
Plug-in Hybrid Option	BMW X5 xDrive40e	9.9	153	8
Battery-Electric Option	Tesla Model X	2.5 – 2.6	0	10

Source: NRCan 2016 Fuel Consumption Guide

Current Federal Taxation of Fuel Inefficient Vehicles

The federal excise tax on fuel inefficient vehicles or green levy was enacted by the federal government in March 2007, to replace the existing heavy vehicle weight tax. The green levy still applies to *"automobiles (including station wagons, vans, sport utility vehicles) designed primarily for use as passenger vehicles, but not including pick-up trucks, vans equipped to accommodate 10 or more passengers, ambulances, and hearses, in accordance with the vehicle's fuel-efficiency rating."*[55]

The list of vehicles actually targeted under the green levy illustrates the very narrow target for this tax (see Annex 2 for a complete list)[56]. It is similar in design to the U.S. "Gas Guzzler Tax", in capturing only the most polluting vehicles on the market, and is a tax based solely on the vehicle's average weighted fuel consumption.[57] The calculation of the green levy is determined by Natural Resources Canada and combines 55% of a vehicle's city fuel consumption rating with 45% of the highway fuel consumption rating. [58]
Automobiles that have a weighted average fuel consumption rating of 13 or more litres per 100 kilometres will be subject to the excise tax at the following rates:

- at least 13 but less than 14 litres per 100 kilometres, $1,000;
- at least 14 but less than 15 litres per 100 kilometres, $2,000;
- at least 15 but less than 16 litres per 100 kilometres, $3,000; and

[55] Government of Canada (2007), Canada Revenue Agency, *Imposition of Excise Tax on Fuel-Inefficient Vehicles*, http://www.cra-arc.gc.ca/E/pub/et/etsl64/etsl64-e.html (accessed in July 2016)
[56] Government of Canada (2007), Canada Revenue Agency, *Notice to All Licensed Manufacturers and Wholesalers, and Importers of Automobiles*, http://www.cra-arc.gc.ca/E/pub/et/etsl64/etsl64-e.html (accessed in July 2016)
[57] United States Government (2016), Environmental Protection Agency, *Gas Guzzler Tax*, https://www3.epa.gov/fueleconomy/guzzler/index.htm (accessed in July 2016).
[58] Government of Canada (2007), Canada Revenue Agency, *Notice to All Licensed Manufacturers and Wholesalers, and Importers of Automobiles*, http://www.cra-arc.gc.ca/E/pub/et/etsl64/etsl64-e.html , and Government of Canada (2007), Canada Revenue Agency, *Imposition of Excise Tax on Fuel-Inefficient Vehicles*, http://www.cra-arc.gc.ca/E/pub/et/etsl64/etsl64-e.html (accessed in July 2016).

- 16 or more litres per 100 kilometres, $4,000.[59]

Box 2. Canada's Gas Guzzler Tax… The Excise Tax on Fuel-Inefficient Vehicles ("Green Levy") targets only the worst polluters in the Canadian passenger fleet. Many are from luxury brands such as Bentley and Rolls Royce, or expensive racing cars like Aston Martin or Lamborghini. Levies ranging from $1,000 to $4,000 are unlikely to discourage a luxury car buyer, nor do they fully account for external environmental costs. The tax does capture some mid-price range, 8 cylinder engine, "muscle car" models like the Chevrolet Camaro Z/28, or the Dodge Challenger, where tax may have more of an effect on buyers. Only three SUVs pay excise tax. The Toyota Sequoia, and Nissan Armada are the most polluting SUVs with a weighted fuel consumption of over 14.6 L/100 km, and are taxed at $2,000. The Jeep Grand Cherokee 4x4, is taxed at $1000. With a 6.4 L, 8 cylinder engine, it averages 16.6 L/100 km in the city and 10L/100 km on highways. Many Canadian vehicles which are below the 13 L/100 km threshold greatly exceed this level for city driving, but currently pay no tax.

Source: http://www.cra-arc.gc.ca/E/pub/et/etsl64/list/lst_vh-2015-eng.html, For a list of vehicles taxed in Canada, see Annex 1.

The tax applies mainly to luxury vehicles, performance/racing cars, and large, expensive SUVs. However, it is not set at a high enough level to create a shift in consumer purchasing decisions towards more efficient vehicles. Consider the worst performer in the two-seater car category, the Lamborghini Aventador Roadster. Under the current approach, purchasers of the vehicle – which costs more than $400,000 – would be required to pay only $4000. This is less than 1% of the vehicle purchase price, for a car that emits 2.5 times the best performer in its class. The Aston Martin DB9, which rates worst in its class of minicompact vehicles, and retails for more than $200,000, would be required to pay only $1000.

Box 3. "Pickup" trucks are not taxed

The federal excise tax on fuel-inefficient vehicles does not apply to pickup trucks. The small and compact car market share in Canada is increasing, but trucks such as Ford's F-150 (#1) and Ram 1500 (#2) are repeatedly the top-selling passenger vehicles in Canada. NRCan's 2016 CO2 ratings (see Table 6) rank vehicles from 1 (*worst*) to 10 (*best*). Ford's F-150 scores highest in the standard pickup truck category at 5. Worst is the Toyota Tundra 4WD (5.7 L engine) with a score of 2.

Sources: http://www.autotrader.ca/newsfeatures/20160106/canadas-25-best-selling-cars-in-2015/#jByYtGscwY5y958w.97; and http://www.autofocus.ca/news-events/news/canadas-30-best-selling-vehicles-in-2015

[59] Government of Canada (2007), Canada Revenue Agency, *Imposition of Excise Tax on Fuel-Inefficient Vehicles*, http://www.cra-arc.gc.ca/E/pub/et/etsl64/etsl64-e.html. Or see http://www.cra-arc.gc.ca/E/pub/et/etsl64/etsl64-e.pdf (accessed in July 2016).

The fuel consumption threshold for application of the tax is also too high, with many of the worst performing vehicles in each category not captured and the van, pick-up truck and heavy-duty vehicle categories exempt.

Many OECD Countries have Vehicle Purchase or Registration Taxes

Many OECD countries have some kind of registration tax for vehicles, with the majority of these based on CO2 emissions standards, as well as relative fuel or energy efficiency. In Finland, diesel cars pay an additional tax (currently set at EUR 0.055 per day per 100 kilograms of weight) that is not applicable to gasoline cars.[60] New Zealand has road user charges based on the type of vehicle per kilometre driven by diesel vehicles. [61]

Norway, a leader in electric vehicle market penetration (**see Box 6, below**), has a registration tax on vehicles, and an annual excise duty for light and heavy vehicles. In 2011, the registration tax created EUR 2.6 billion in fees and is the largest source of environmentally related revenues for the Norwegian government out of a total of EUR 8.2 billion.[62]

In the *bonus-malus* scheme used in France since 2008, the purchase of a car is either taxed or subsidized depending on the efficiency of the vehicle. Vehicle taxes also depend on other factors, such as emissions, power and fuel type. [63] The most polluting cars under this scheme are subject to a tax of $2,600 Euros (approximately Cdn $3760). Less polluting cars can receive a price reduction up to $1,000 Euros (approximately Cdn $1450). While the *bonus-malus* has been very effective in creating a shift to more efficient and cleaner vehicles, it was costly and the net environmental effect was negative, at least in the short term, due to increased upstream and downstream effects, as well as vehicle mileage (**see Box 5**). [64]

Box 4. France's Bonus-Malus Feebate: a lesson in revenue neutral design

In an evaluation of the *bonus-malus* feebate, its effect on the French vehicle market was described as "*spectacular*". While the regime promoted a shift from larger to smaller, more efficient cars, new car sales rose by 13% and overall GHG emissions increased. The French government expected the *bonus-malus* to be a revenue neutral measure, but it ended up costing the government 285 million Euros in 2008. Evaluation of the program concluded that the main policy design problem was with the "pivot point": dividing less polluting vehicles which receive a rebate (*bonus*) from those more polluting which will pay the tax (*malus).* The pivot point was too low and the rebates too generous. "As the first-order terms in the policy effects are manufacturing or traveling scale effects, the most important point to ensure CO2 reductions is to calibrate it in order to decrease or keep constant total sales". The study concluded however that feebates can still be very efficient tools if carefully designed.

Source: D'Haultfœuille, X. et al., "The Environmental Effect of Green Taxation:The Case of the French "Bonus/Malus"(2012), pp.2, 35, http://www.crest.fr/images/doctravail/doctravail2012/2012-13.pdf

Box 5. A GST exemption for Zero Emission Vehicles? Norway's waiver on VAT...

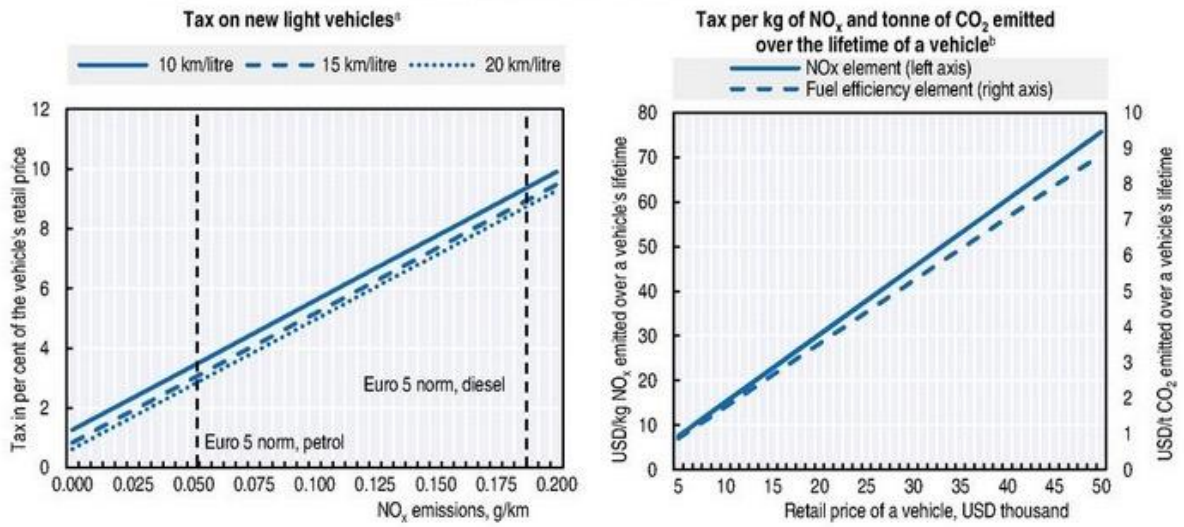
Norway is considered a successful model of electric vehicle (EV) adoption, currently with the highest market penetration of EVs in the world (26.5% March 2015). A key factor noted for success has been Norway's VAT exemption for EV purchases. Unlike many feebate programs which must budget for a limited rebate program, the Norway VAT exemption allows for an ongoing "rebate". Norway has a registration tax on new vehicles and EVs are exempt from this as well. The combination of these and several other fee exemptions makes the purchase of EVs more attractive to Norwegian consumers and helps level the playing field with gasoline and diesel vehicles.

Source: Pacific Institute for Climate Solutions, "Norway's Electric Vehicle Revolution: lessons for British Columbia", https://pics.uvic.ca/sites/default/files/uploads/publications/Norway%20EV%20Briefing%20Note%20October%202015.pdf

Chile is another OECD country using a vehicle registration tax. The Chilean tax varies according to both a vehicle's test-cycle urban fuel efficiency and NOx emissions, as well as the vehicle retail price. The NOx element of the tax is being phased in gradually. In 2016, the NOx element will be 75% of the full value to be applied from 2017. It is not yet possible to assess the overall impact of the tax but indicators suggest that consumption is increasing market share for low-emission vehicles. [65] In Figure 8 below Chilean vehicle registration taxes vary depending on the NOx emissions for different levels of fuel efficiency. The tax rate per unit of both NOx and CO2 lifetime emissions increases with the price of the vehicle. More expensive vehicles (USD 20,000 and up) are taxed over USD 30 per kg of NOx. The CO2 tax on lifetime vehicle emissions is lower, but captures all vehicles below the USD 30,000 threshold, and is based on the new Chilean tax for stationary sources of carbon emissions (USD 5/tonne CO2E). The Chilean registration tax does not apply to commercial vehicles or SUVs.

[65] OECD/ECLAC (2016), *OECD Environmental Performance Reviews: Chile 2016*, OECD Publishing, Paris.DOI: http://dx.doi.org/10.1787/9789264252615-en The tax referred to is being phased in since being enacted by the Chilean Government in January 2015.

Figure 8: Chile's vehicle tax is lower for cleaner and cheaper vehicles



a) The tax level depends on the price of the vehicles. In this chart, data refer to vehicles with an assumed retail price of CLP 6 000 000 (approximately USD 9 000). The tax rates shown are for 2017.
b) The calculation assumes that each vehicle is driven 200 000 km over its lifetime. The tax rates shown are for 2017.
Source: OECD calculations.

Source: OECD Environmental Performance Reviews: Chile 2016

Vehicle Taxes can Influence Purchasing Decisions

Nicholas Rivers and Brandon Schaufele conducted a review of the Ontario feebate program which ran from 2000-2011, and is no longer in place.[66] Ontario's feebate program (the *Tax and Credit for Fuel Conservation* program) began as a taxation scheme similar in design to the current federal excise vehicle tax. Table 4 lists the fee in 1989 at $600 for cars with a city/highway fuel consumption of over 9.5-12L/100km, and a maximum of $3500 for cars over 18 L/100 km.

In 1990, the government of Ontario tried to double and extend this initial schedule but political pressure resulted in a compromise. More vehicles, including SUVs, were added in 1990, but passenger vans and light trucks remained exempt. As shown in Table 7, a separate fees list for SUVs was created with much lower fees than for cars. The government also began the rebate for more efficient vehicles (fuel consumption rates below 6 L/100 km). Vehicle efficiency did improve over the subsequent feebate period, allowing more cars to become eligible for rebates. Offsetting this was a dramatic increase in the number of SUVs in the fleet, shown in Figure 9 below.

[66] Rivers, N. and Schaufele, B., (2014) *"New Vehicle Feebates: Theory and Evidence"*, retrieved at: http://www.ivey.uwo.ca/cmsmedia/1361413/new-vehicle-feebates.pdf

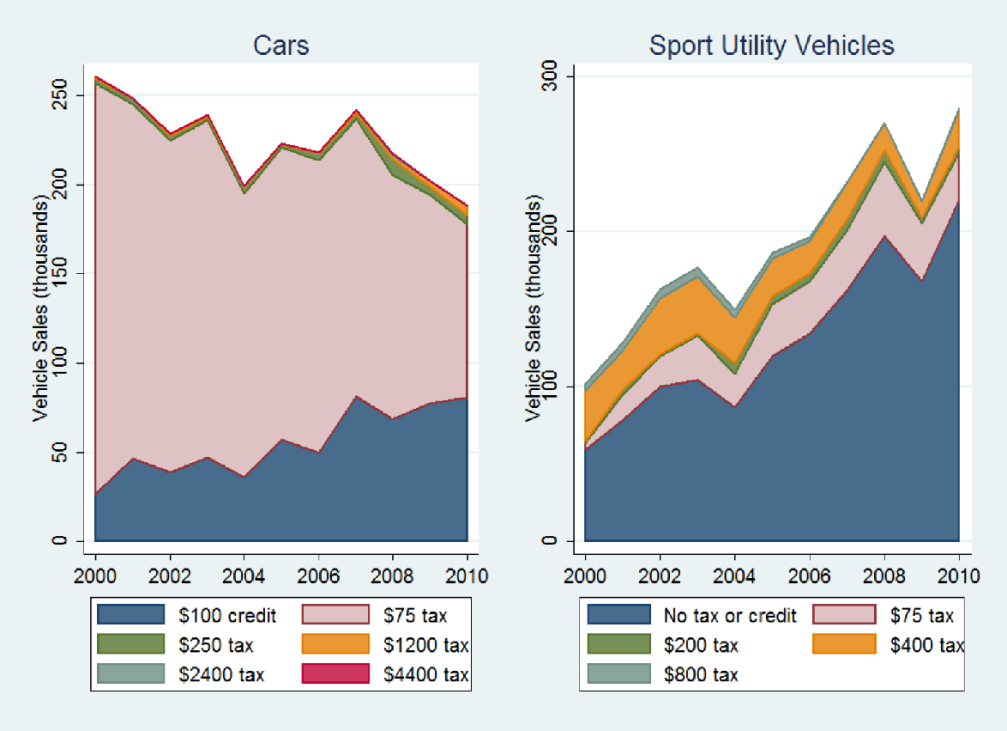
Table 7 Schedule of new vehicle fees and rebates for the Ontario Feebate Program 1989 to 2010

Highway fuel efficiency rating (L/100km)	1989 Cars	1990 Cars	1991-2010 Cars	1991-2010 SUVs
less than 6.0	-	-	-100	-
6.0-7.9	-	-	75	-
8.0-8.9	-	200	75	75
9.0-9.4	-	700	250	200
9.5-12.0	600	1200	1200	400
12.1-15.0	1200	2400	2400	800
15.1-18.0	2200	4400	4400	1600
over 18.0	3500	7000	7000	3200

All fees and subsidies are in nominal Canadian dollars. Sources: Government of Ontario (1989), Government of Ontario (1991) and Government of Ontario (2010).

Source: Rivers, N. and Schaufele, B., 2014, *New Vehicle Feebates: Theory and Evidence*

Figure 9. Sales of passenger cars and SUVs in Ontario by vehicle feebate class



Source: Rivers, N. and Schaufele, B., 2014 New Vehicle Feebates: Theory and Evidence,
http://www.ivey.uwo.ca/cmsmedia/1361413/new-vehicle-feebates.pdf
http://www.ivey.uwo.ca/cmsmedia/1361413/new-vehicle-feebates.pdf
http://www.ivey.uwo.ca/cmsmedia/1361413/new-vehicle-feebates.pdf

A central conclusion of the Rivers study is that modest fees and rebates can create meaningful changes in vehicle purchasing decisions. The results of a small tax increase on sales of the Ford Mustang illustrates the effect of a relatively modest feebate on consumer decision making. In 2004 the Mustang was redesigned with increased engine size and more horsepower and as a result moved from 8.9L/100km to a greater than 9.0 L/100km fuel consumption rating. Its fee rate suddenly rose from $75 to $250. The analysis of the data in Ontario indicates this small change of $175 per vehicle resulted in consumers purchasing other vehicles. That Mustang sales also fell in Ontario relative to vehicle markets in other Canadian provinces at the time is further confirmation. The authors caution it is not clear these results would hold true for other models, however. [67]

In order to draw broader conclusions about the efficiency of feebates, the study analyzed the data available from Ontario and other provinces to find the "true underlying behavioural response" to the feebate, and to conclude whether it was "welfare improving". Rivers and Schaufele were able to confirm that Ontario's feebate had a significant effect on the mix of vehicles in the passenger fleet, and that a $1000 dollar fee reduces the per vehicle market share by approximately 30%.[68] These results apply across vehicle specifications and other studies have yielded similar results. In other OECD countries the results of similar studies have been in the same approximate range of $1000.[69]

The Federal Excise Tax on Fuel-Inefficient Vehicles should be redesigned to increase its effectiveness

The primary goal of the excise tax on fuel-inefficient vehicles should be to influence consumer purchasing decisions, shifting demand towards lower emitting vehicles. Shifting the vehicle fleet will reduce GHG emissions from transportation, while also helping to grow the market for new vehicle innovations that improve environmental performance.

The current coverage of the tax is too narrow and the tax is too low to effectively influence consumer choice. A broader range of vehicles should be included, and tax rates should be tied to both CO2 emissions and the retail price of vehicles. Other OECD countries are basing their vehicle taxes on CO2, and the measure should be more directly linked to Canada's climate change objectives. It also addresses the issue of diesel vehicles, which may be more fuel efficient but emit greater CO2 emissions per litre.

There is now comprehensive environmental and consumer information for vehicle buyers which can also assist in the re-design of the federal excise tax on fuel inefficient vehicles. In addition to the combined fuel consumption rating, NRCan now provides information on individual vehicle CO2 emissions, as well as a CO2 rating. All light passenger vehicles (including large vans, SUVs and light

[67] Rivers, N. and Schaufele,B. (2014).
[68] Rivers, N. and Schaufele, B. (2014).
[69] Rivers, N. and Schaufele, B., (2014).

trucks) are given a CO2 rating ranked from 1 (worst) to 10 (best).[70] A list of the most efficient vehicles, including conventional and "advanced technology" vehicles is also available.[71] In January 2016, the federal government announced new, improved environmental labelling standards for all vehicles that will help improve consumer awareness.[72]

Recommandations

1. **Apply the federal excise tax on fuel inefficient vehicles to all cars and SUVs that receive a CO2 rating below 6 (based on NRCan's annual Fuel Consumption Guide).** This preserves a range of vehicle choices at a variety of price points that would not be subject to the tax, while extending the coverage of the tax to a greater number of vehicles.

2. **Apply the excise tax to all minivans and pick-up trucks that receive a CO2 rating below 5.** The lower threshold reflects the lower level of market choice for consumers in these categories. As technology improves and lower emission choices become available, the threshold could be increased.

3. **Base the rate of the tax on the CO2 rating and retail vehicle purchase price, with those with the worst rating (1) and highest retail prices facing the highest taxes.**

   For example:

Vehicle CO2 Rating	Tax as a % of Vehicle Purchase Price
1	10%
2	9%
3	8%
4	7%
5	5%

Such a tax structure would mean that the Lamborghini Aventador Roadster, ranked at a 1 and retailing for around $400,000, would face a tax of $40,000. On the other hand, a vehicle ranked at a 5 and costing $30,000 would face a tax of only $1,500.

[70] Government of Canada (2016), Natural Resources Canada, *2016 Fuel Consumption Guide*, http://www.nrcan.gc.ca/energy/efficiency/transportation/cars-light-trucks/buying/7487 (accessed in August 2016).
[71] Government of Canada (2016), Natural Resources Canada, *Most Fuel Efficient Vehicles*, http://www.nrcan.gc.ca/energy/efficiency/transportation/cars-light-trucks/buying/7479 (accessed in July 2016).
[72] Government of Canada (2016), Natural Resources Canada, *EnerGuide Label for Vehicles*, http://www.nrcan.gc.ca/energy/efficiency/transportation/cars-light-trucks/buying/7483 (accessed in July 2016).

4 **Develop a CO2 rating for heavy-duty vehicles that will allow for the implementation of a similar tax as lower-emitting heavy-duty vehicle options are developed.**

5 **Rename the tax to link it directly to climate change objectives.** For example, it could be called the tax on High-Emission Vehicles.

Estimated Impacts

The estimates provided should be considered rough, ballpark estimates only. Please see Annex 2 for details on the assumptions, calculations and caveats behind these estimates.

Revenue impact: The proposed tax change could be expected to result in additional revenue of up to $600 million per year, depending on the tax rate applied, but would likely decrease over time as more low emission vehicles become available.

GHG reduction impact: The changes could result in approximately 1-2Mt of GHG emission reductions per year by 2030, depending on consumer responsiveness to the tax.

Competitiveness and Household Impacts: The competitiveness and household impacts of the tax changes should be minimal. For the most part, consumers will have a choice of vehicle in the same class that would not be subject to the tax. With the tax tied to vehicle purchase price, those paying less for a vehicle will also pay less tax. While those purchasing vans and pick-up trucks, either for work or personal requirements, have fewer low emission choices than car buyers, technology is improving rapidly. Several vehicles in the van and pick-up truck categories currently receive a CO2 rating of 5 and would therefore not be subject to the tax. The number of options with better CO2 ratings is expected to increase over the next 5 years, with Nissan and Chrysler developing electric and plug-in hybrid minivans and Nissan, Ford and others developing electric pick-up trucks. Federal and provincial investments in improved electric vehicle charging infrastructure will also help improve the viability of these options.

Other Considerations

Use of Revenue: Some countries and provinces have chosen to use revenue from a tax on high-emitting vehicles to provide a financial incentive for low-emitting vehicles. Referred to as a feebate, the approach is intended to further accelerate the shift towards lower emitting vehicles. However, the case of the Bonus-Malus regime in France shows that it is difficult to match revenues with expenditures in such a program, making it an implementation challenge. Several provinces also already offer financial incentives for the purchase of electric vehicles. Increased revenues could also be used

to justify the enhancement of innovation programs that will help accelerate the development of low-emission vehicle options, particularly in the van, pick-up truck and heavy-duty vehicle categories.

Unintended consequences: It is possible that an increase in tax on certain vehicles may cause drivers to keep their cars, or buy used ones, rather than purchase more efficient new models. This issue could be addressed by, for example, waiving the new vehicle tax on those that trade in their older, inefficient vehicle for a more efficient vehicle.

3 EXPANDING FEDERAL TAX INCENTIVES FOR GREEN BUILDINGS

Buildings accounted for 12 % of GHG emissions in Canada in 2013 and are expected to be one of the greatest sources of emissions growth to 2030.[73] If we account for the electricity and fossil fuels delivered to buildings, buildings are responsible for nearly 25% of Canada's GHG emissions. [74]Building decisions being made today will influence emissions for decades to come. However, current incentives for green buildings are piece-meal, targeted at specific technologies rather than environmental performance of the whole building. Green leaders in the Canadian construction industry believe government policy could play a greater role in raising environmental standards across the sector.[75]

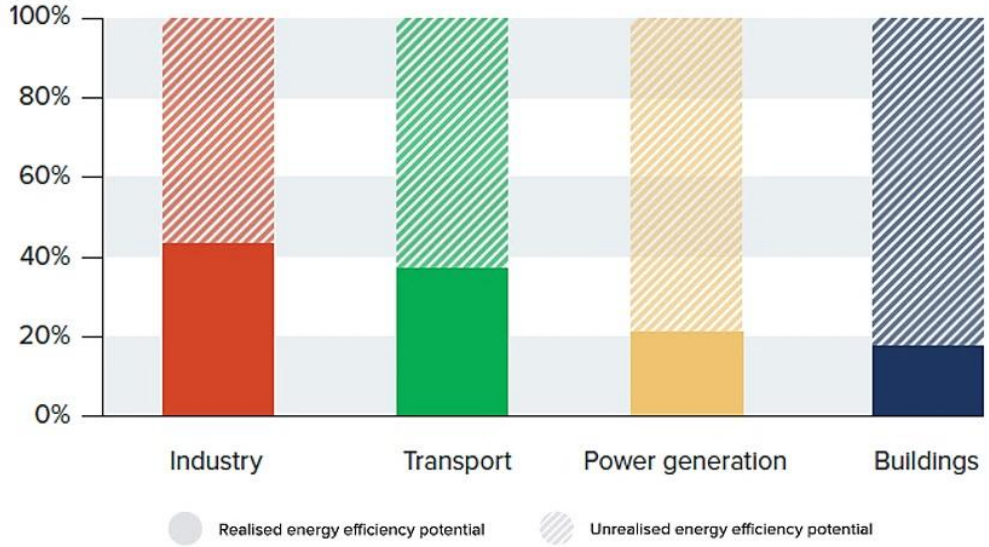
Trends in Buildings

The number of residential households is expected to grow from 14 million in 2013 to 17 million by 2030. Commercial floor space is expected to increase from 747 m^2 to 972 m^2 over the same period.[76] This growth is projected to result in an increase in greenhouse gas emissions from the sector of 23 Mt between 2013 and 2030.
[77]

[73] Government of Canada (2016), Environment and Climate Change Canada, *Canada's Second Biennial Report on Climate Change*, http://ec.gc.ca/GES-GHG/default.asp?lang=En&n=02D095CB-1 (accessed September, 2016).
[74] Canadian Council of Academies, 2015. *Technology and Policy Options for a Low-Emission Energy System in Canada*. p. 81.
[75] The Canada Green Building Council (2014), *Green Building Trends: Benefits Driving the New and Retrofit Market* (2014),http://www.cagbc.org/CAGBC/Advocacy/GreenBuildMarketRes2014/CAGBC/Resources/Green_Building_Marke.aspx?hkey=36b22df4-d4f7-4bc2-80da-fd8767ff42d6 (accessed in July, August 2016).
[76] Government of Canada (2016), Environment and Climate Change Canada, *Canada's Second Biennial Report on Climate Change*, http://ec.gc.ca/GES-GHG/default.asp?lang=En&n=02D095CB-1 (accessed September, 2016).
[77] Government of Canada (2016), Environment and Climate Change Canada, *Canada's Second Biennial Report on Climate Change*, http://ec.gc.ca/GES-GHG/default.asp?lang=En&n=02D095CB-1 (accessed September, 2016).

We also know that the potential for buildings to improve energy efficiency, and reduce greenhouse gas emissions is enormous (Figure 10). In fact, globally it exceeds the untapped potential of industry, transport, and power generation.

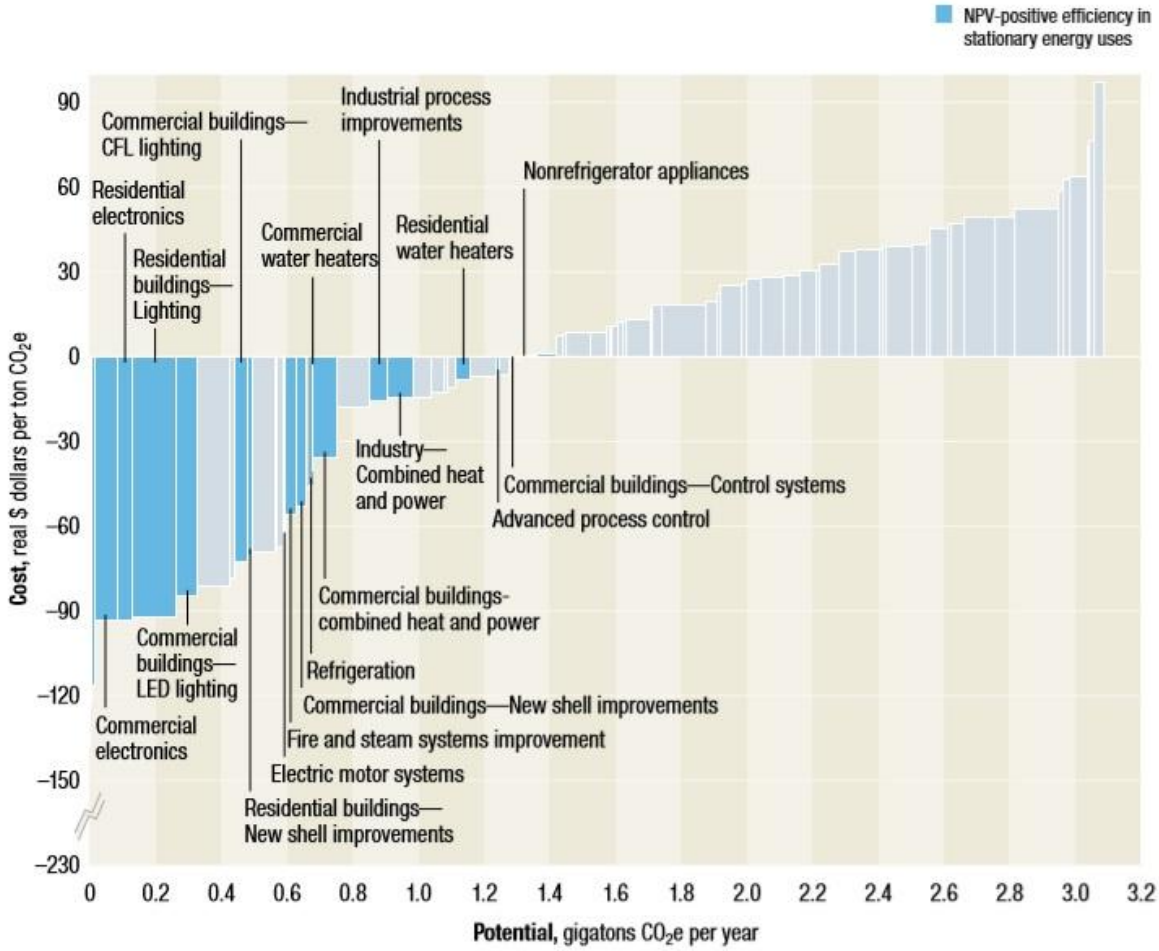
Figure 10. Global Energy Efficiency Potential



Source: New Climate Economy (2015), drawn from IEA (2014), Capturing the Multiple Benefits of Energy Efficiency.
Note: Energy efficiency potentials are based on the International Energy Agency (IEA) New Policies Scenario outlined in the World Energy Outlook 2012, based on long-term energy efficiency potential to 2035.

Investments in building energy efficiency improvements also represent some of the least cost options to reduce GHG emissions. The U.S. GHG Abatement cost curve developed by McKinsey and Company illustrates the low and negative cost opportunities in residential and commercial buildings (**Figure 11**).

Figure 11: U.S. GHG Abatement Cost Curve in 2030



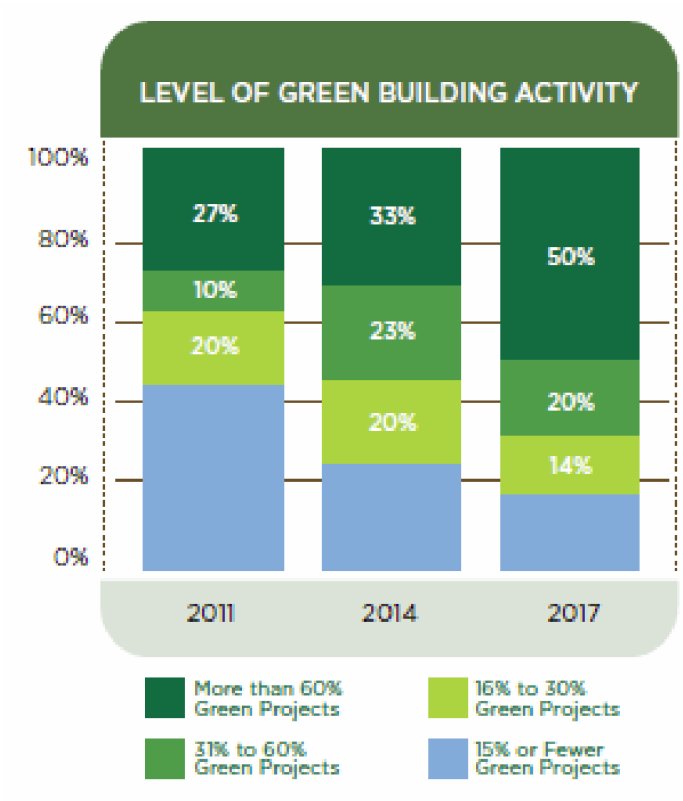
Source: McKinsey Sustainability and Resource Productivity (2010), Energy Efficiency: A Compelling Global Resource

Green Buildings

"While there are many different definitions of green building out there, it is generally accepted as the planning, design, construction, and operations of buildings with several central, foremost considerations: energy use, water use, indoor environmental quality, material section and the building's effects on its site." U.S. Green Building Council

The number of green buildings in Canada is growing, but not at a fast enough pace to significantly slow the GHG trajectory of the sector. The Canadian Green Building Council (CGBC) commissioned a survey in 2014 on green building in Canada and found that by 2017, 50% of respondents expected more than 60% of their projects to be green (Figure 12).

Figure 12: Green Building Activity, 2011-2017



This is a significant increase from only 27% who said this in 2011.[78] The survey drew on the responses of engineers, architects and building owners, ranging from $250 million firms to small businesses.

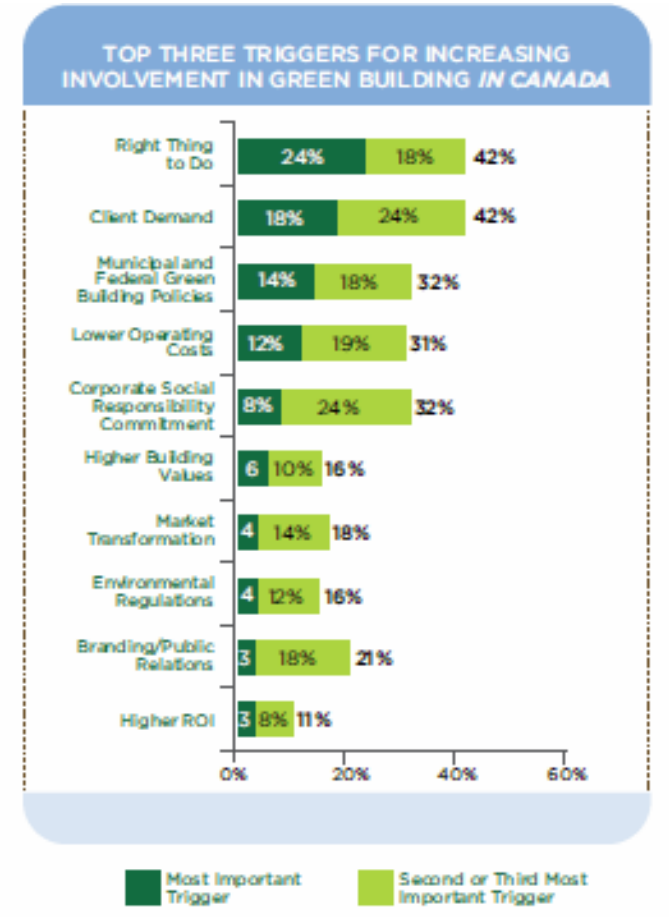
The survey found that the importance of "doing the right thing" (24%) and client demand (18%) were the top ranking reasons for deciding to create green building projects. Canada stood out from other countries in terms of the "right thing to do" being the top trigger, and scored only slightly higher than the rest in terms of client demand (Figure 13). [79]

Respondents in the CGBC survey viewed municipal and federal green building policies as the third top trigger for increasing involvement in green building in Canada. The CGBC report quotes experts and green leaders who see government green building policies (municipal and federal), as having the potential to help encourage those who are not already in the business of green building. This is particularly the case with "lower-value buildings", where it is important to stimulate more green building construction projects."[78]

Figure 13: Why Invest in Green Building?

[78] The Canada Green Building Council (2014), *"Green Building Trends: Benefits Driving the New and Retrofit Market"*, http://www.cagbc.org/CAGBC/Advocacy/GreenBuildMarketRes2014/CAGBC/Resources/Green_Building_Marke.aspx?hkey=36b22df4-d4f7-4bc2-80da-fd8767ff42d6 (accessed in July, August 2016).

[79] The Canada Green Building Council (2014), *"Green Building Trends: Benefits Driving the New and Retrofit Market"*, http://www.cagbc.org/CAGBC/Advocacy/GreenBuildMarketRes2014/CAGBC/Resources/Green_Building_Marke.aspx?hkey=36b22df4-d4f7-4bc2-80da-fd8767ff42d6 (accessed in July, August 2016).



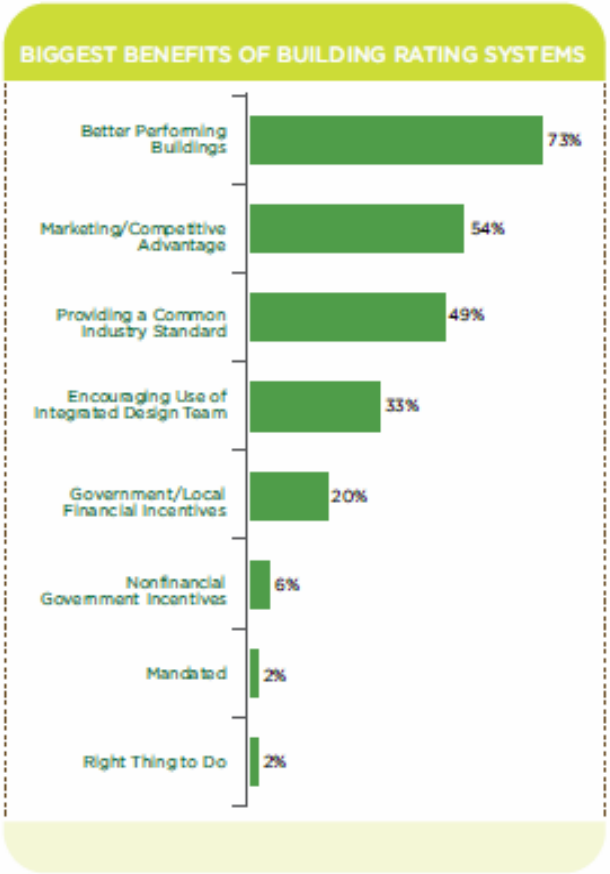
The idea of mandatory energy use disclosure was found to be just as influential to decision making as government policies and incentives. NRCan already has EnerGuide ratings for new homes.[80] Vancouver became the first Canadian city to require that all city buildings meet a passive house or equivalent energy performance standard.[81] The Pan-Canadian Framework on Clean Growth and Climate Change commits "federal,
provincial and territorial governments to work together to with the aim of requiring labelling of building energy use by as early as 2019."

Figure 14: Benefits of Green Buildings

[80] Government of Canada (2016), Natural Resources Canada, *EnerGuide Rated New Homes*, http://www.nrcan.gc.ca/energy/efficiency/housing/new-homes/5035 (accessed in July 2016).

[81] http://vancouver.ca/news-calendar/vancouver-takes-next-step-to-advance-renewable-city-strategy.aspx

Benefits to Businesses of Using Green Rating Systems



Better performing buildings were the most important factor for businesses in choosing to use a rating system, according to 73% of respondents (Figure 14). The marketing aspect was also important at 54%. The response of only 20% to government and local financial incentives suggests that factors like energy efficiency and associated cost-savings as well as other environmental benefits were the drivers.

The conclusion is that private industry is more influential than government in terms of the value associated with green building standards.[82] It is interesting to note that while overall the top motivation for green building was "the right thing to do", it is the lowest ranked benefit of seeking green building certification.

Barriers to green building projects in Canada

Capturing the value of GHG reductions - Energy cost savings are a key aspect of a green building's value to owners and tenants. However, one of the challenges noted in this CGBC survey is that they currently receive no financial benefit from the GHG emissions reductions associated with green buildings.

Misunderstanding of Start-Up Costs- survey respondents believe that concern about a slight increase in up-front costs for a greener project is misplaced. One example given in the CGBC report was a recent LEED Platinum office building completed with only 2% additional budgeting.[83] However, the

[82]The Canada Green Building Council (2014), *"Green Building Trends: Benefits Driving the New and Retrofit Market"*, http://www.cagbc.org/CAGBC/Advocacy/GreenBuildMarketRes2014/CAGBC/Resources/Green_Building_Marke.aspx?hkey=36b22df4-d4f7-4bc2-80da-fd8767ff42d6 (accessed in July, August 2016).

[83]The Canada Green Building Council (2014), *"Green Building Trends: Benefits Driving the New and Retrofit Market"*, http://www.cagbc.org/CAGBC/Advocacy/GreenBuildMarketRes2014/CAGBC/Resources/Green_Building_Marke.aspx?hkey=36b22df4-d4f7-4bc2-80da-fd8767ff42d6 (accessed in July, August 2016).

perception of higher up-front capital costs is still a factor holding many building owners back from investing in green buildings.

Low energy costs in Canada – across sectors and geographical regions of Canada, low energy prices were cited in the CGBC report as a factor that undermined green building investment. Carbon pricing, along with other initiatives that factor in the external environmental costs of energy use more appropriately, may help stimulate more interest in green buildings over time. However, accelerating this transition will likely require additional efforts.

Difficulty obtaining certification in small cities and rural areas – the CGBC respondents pointed out that choosing to certify a building as green is more difficult in Canada because we have fewer large population centres, making it hard for those outside big cities to achieve LEED accreditation without additional costs.

Current Federal Tax Incentives

Accelerated Capital Cost Allowance (ACCA): Investment in clean and efficient energy equipment

The federal government utilizes Classes 43.1 and 43.2 in Schedule II of the *Income Tax Regulations* to attract investment in the Canadian renewable energy sector and to benefit businesses using clean or efficient energy generation equipment. Certain capital costs of systems that produce energy by using renewable energy sources or fuels from waste, or conserve energy by using fuel more efficiently are eligible for accelerated capital cost allowance. Under Class 43.1, eligible equipment may be written-off at 30 percent per year on a declining balance basis. In general, equipment that is eligible for Class 43.1 may be written-off at 50 percent per year on a declining balance basis under Class 43.2. Without these accelerated write-offs, many of these assets would be depreciated for income tax purposes at annual rates between 4 and 30 percent.[84]

This ACCA provision encourages businesses to invest in specified clean energy generation and energy efficiency equipment, including some technologies included in green building projects. The Technical Guide specifies that the "property" that is eligible does not include buildings unless they are specifically related to the energy system or equipment. For example, the guide states that for co-generation systems, buildings or other structures are not eligible "property" except as "working platforms that primarily serve generation or heat production systems". [85]

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[84] For an overview of the ACCA, and CRCE 2016 see Government of Canada (2016), Finance Canada, https://www.fin.gc.ca/taxexp-depfisc/2016/taxexp1604-eng.asp; and Natural Resources Canada, http://www.nrcan.gc.ca/energy/efficiency/industry/financial-assistance/5147

[85] Government of Canada (2013), Natural Resources Canada, *Technical Guide to Class 43.1 AND 43.2, 2013 Edition*, accessed at http://www.nrcan.gc.ca/energy/efficiency/industry/financial-assistance/5147 (accessed in July, August 2016).

The 2013 Technical Guide to Class 43.1 and 43.2 specifies how these incentives may be applied to green building construction projects. Eligible systems and equipment are listed in Table 8 below. Some systems may be appropriate for green building projects, such as photovoltaic or geothermal systems. Many do not likely have a practical application in the majority of building construction projects. Classes 43.1 and 43.2 are continuously reviewed to add new renewable and energy efficient technologies, though some have argued that the response time is slow. For example, energy storage technologies are not currently included.[86]

Table 8. List of Systems and Equipment Eligible under Class 43.1 and 43.2

Cogeneration and Specified-Waste Fueled Electrical Generation Systems
Thermal Waste Electrical Generation Equipment
Active Solar Heating Equipment and Ground-Source Heat Pump Systems
Small-Scale Hydro-Electric Installations
Heat Recovery Equipment
Wind Energy Conversion Systems
Photovoltaic Electrical Generation Equipment
Geothermal Electrical Generation Equipment
Landfill Gas and Digester Gas Collection Equipment
Specified-Waste Fueled Heat Production Equipment
Expansion Engine Systems
Systems to Convert Biomass into Bio-Oil
Fixed Location Fuel Cell Equipment
Systems to Produce Biogas by Anaerobic Digestion
Wave or Tidal Energy Equipment

Source: Natural Resources Canada, TECHNICAL GUIDE TO CLASS 43.1 AND 43.2, 2013 EDITION, accessed at: https://www.nrcan.gc.ca/sites/www.nrcan.../Class_431-432_Technical_Guide_en.pdf
https://www.nrcan.gc.ca/sites/www.nrcan.../Class_431-432_Technical_Guide_en.pdf

Canadian Renewable and Conservation Expenses (CRCE)

Another measure enacted by the Federal Government to support energy efficiency and renewable energy was to allow similar treatment of initial business expenses to encourage investment. The Income Tax Act (subsection 66.1(6) and *Income Tax Regulations*, section 1219) allows certain expenses incurred during the development and start-up of renewable energy and energy conservation projects to be fully deducted in the year they are incurred, carried forward indefinitely and deducted in future years, or transferred to investors through a flow-through share agreement.

These expenses include intangible start-up costs of renewable energy and energy efficiency projects

[86] The Mowatt Centre (2015), *The Mowatt Report -Step Change: Federal Policy Ideas Toward a Low Carbon Canada*, https://mowatcentre.ca/wp-content/uploads/publications/112_step_change.pdf (accessed July 2016).

"for which at least 50% of the cost of depreciable assets can reasonably be expected to be property that is eligible for accelerated capital cost allowance (CCA) under CCA Class 43.1 or Class 43.2." CRCE also includes expenses such as the cost of engineering and feasibility studies, which may be considered analogous to exploration expenses incurred by firms in the non-renewable resource sector. [87]

Green Building Incentives in the United States

Federal level

The U.S. Department of Energy has a program similar to Canada's Classes 43.1 and 43.2 where businesses receive an investment tax credit (ITC) to deduct expenses for investments in certain types of energy efficiency and renewable energy systems.[88] There is also a specific solar investment tax credit.[89]
The U.S., however, also has a specific measure to encourage energy efficient commercial buildings that has been in place since 2005. [90]. Owners of new or existing buildings receive a tax deduction of USD 1.80 per square foot for installing specified systems including: interior lighting; building envelope, or heating, cooling, ventilation, or hot water systems that reduce the building's total energy and power cost by 50% or more in comparison to a building meeting minimum requirements set by ASHRAE Standard 90.1-2007.[91] Energy savings must be calculated using qualified computer software approved by the U.S. Internal Revenue Service.

As well, building owners can deduct USD 0.60 per square foot on the condition that a building's individual lighting, building envelope, or heating and cooling systems meet target levels "that would reasonably contribute to an overall building savings of 50% if additional systems were installed."[92] Deductions are taken in the year when construction is completed.

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[87] Government of Canada (2016), Finance Canada, *Report on Federal Tax Expenditures - Concepts, Estimates and Evaluations 2016*, https://www.fin.gc.ca/taxexp-depfisc/2016/taxexp1604-eng.asp (accessed in August 2016).
[88] United States Government (2015), Department of Energy, *Business Energy Investment Tax Credit (ITC)* http://energy.gov/savings/business-energy-investment-tax-credit-itc (accessed in August 2016).
[89] Solar Industries Association (U.S.) (2006), *Solar Investment Tax Credit*, http://www.seia.org/policy/finance-tax/solar-investment-tax-credit (accessed in August 2016)
[90] United States Government (2015), Department of Energy, *Business Energy Investment Tax Credit (ITC)* http://energy.gov/savings/energy-efficient-commercial-buildings-tax-deduction. *See also* http://www.efficientbuildings.org (accessed in August 2016).
[91] American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), https://www.ashrae.org/news/2015/updates-on-ashrae-standards-publications-featured-in-2016-winter-conference-tech-program (accessed in August 2016).
[92] United States Government (2015), Department of Energy, *Business Energy Investment Tax Credit (ITC)* http://energy.gov/savings/energy-efficient-commercial-buildings-tax-deduction (accessed in August 2016).

Many green building incentive programs in the U.S. are administered at the state and county level. The trend in the U.S. is toward a more holistic approach to green buildings, through energy efficiency and renewable energy programs and stricter building codes. California is again at the forefront of innovation, requiring that new homes and buildings be net zero ready by 2020 and 2030 respectively.[93]

Canada Needs Whole Building Incentives

While current tax incentives for specific technologies are an important component of supporting renewable energy and energy efficiency investment in Canada, an additional "whole building" incentive approach would help encourage more ambitious efforts to improve the energy efficiency of new buildings in Canada and slow the lock-in of anticipated building-related growth in GHG emissions. If implemented immediately, this tax credit could ease the way into the expected mandatory requirements for all new buildings to be "net zero energy ready" by 2030, as per the Pan-Canadian Framework on Climate Change. In a National Research Council review of sustainable building initiatives one expert from NRCan expressed his view that in addition to making National Energy Code and Building Code more stringent there should be " incentives to cover the design process."[94]

The tax credit would spur innovation and investments in cutting edge technologies, including design, to improve the energy performance of the whole building envelope for new buildings, starting immediately.

For example, building projects meeting a minimum performance-based energy requirement (i.e. energy use intensity or GHG emissions intensity) could be eligible to receive ACCA and/or CRCE type tax incentives on lighting, building envelope or heating and cooling system costs linked to achievement of the standard. Alternatively, an approach similar to the U.S. could be pursued that allowed building owners to deduct $2-3 per square metre on costs that contribute to overall building energy savings of 50% or more. This tax credit could be designed to increase in the stringency of the energy performance, in line with the Pan-Canadian Framework commitment for all new buildings to be net-zero ready by 2030.

Recommandations

1 **Extend current tax incentives for renewable and energy efficiency equipment to support the construction of "net-zero ready" buildings in Canada.** This could be done by extending ACCA and CRCE incentives under Class 43.1 and 43.2 of the Income Tax Regulations to cover

[93] https://www.nrdc.org/experts/meg-waltner/new-california-building-efficiency-standards-set-stage-zero-net-energy-homes
[94] National Research Council Canada (2011), *Dimensions: Experts weigh in on sustainable buildings in Canada*, http://www.nrc-cnrc.gc.ca/eng/dimensions/issue6/experts_weigh_in.html (accessed in August 2016).

lighting, building envelope and heating and cooling system expenses that help achieve a prescribed energy performance requirement. The energy performance threshold to benefit from the tax credit could be tightened over time, in line with the PCF commitment to require all new buildings to be "net zero energy ready" by 2030. This would provide an early incentive for building owners, investors and developers to build the low-carbon building infrastructure needed to meet Canada's GHG reduction goals.

2 **Task NRCan or another expert organization with developing an appropriate threshold for the incentive, and with an audit function to ensure building owners achieve promised environmental performance.**

Estimated Impacts

The estimates provided should be considered rough, ballpark estimates only. Please see Annex 2 for details on the assumptions, calculations and caveats behind these estimates.

Revenue impact: It is not possible to estimate the cost of this incentive. Finance Canada does not, in fact, estimate the costs of the existing ACCA provisions as they state that adequate data is not available to calculate the tax expenditure with a reasonable degree of accuracy and that simplifying assumptions would be required to model the pattern of deductions that would be claimed in the absence of the incentives.[95]

GHG reduction impact: Increased incentives for green and energy efficient buildings could result in GHG reductions between 0.5Mt and 3Mt per year by 2030, depending on the degree of take-up of the incentive and the level of the threshold established.

Competitiveness and Household Impacts: As most energy efficiency investments result in energy cost savings that more than pay off up-front capital costs over time, the incentive would be expected to have a positive impact on both businesses and households that are able to capture these benefits. Energy efficient buildings will also be more resilient to the effects of rising energy and carbon prices.

4 PHASE-OUT PREFERENTIAL TAX TREATMENT TO OIL AND GAS

[95] Government of Canada (2016), Finance Canada, *Report on Federal Tax Expenditures - Concepts, Estimates and Evaluations 2016*, https://www.fin.gc.ca/taxexp-depfisc/2016/taxexp1601-eng.asp#Toc442180625 (accessed August 2016)

Current preferential tax treatment to oil and gas in Canada

A 2015 report by Oil Change International, the Overseas Development Institute and the International Institute for Sustainable Development (IISD) estimates that Canadian federal production subsidies to the fossil fuel industry amounted to a minimum of $CAN 1.8 billion annually. Provincial subsidies to fossil fuel producers in Canada could amount to a minimum of $CAN 1.1 billion annually.

Federal subsidies for the production of fossil fuels include the accelerated capital cost allowance available for Liquefied Natural Gas facilities that was originally introduced in Budget 2015. Other measures include a duty exemption for imports of mobile offshore drilling units, the Canadian Development Expense and the Canadian Exploration Expense Tax deductions. The latter provides a tax deduction of 100% for the costs incurred for geological, geophysical, and geothermal surveys and exploratory drilling against their corporate income tax. This significantly reduces the financial risks of exploratory drilling for additional oil and gas development. A list of current preferential tax treatment to oil and gas can be found in Annex 1.

Conversely, the Government of Canada has introduced accelerated capital cost deductions for a variety of equipment that generates energy by using renewable energy sources or fuels from waste, or conserves energy by using fuel more efficiently. Budget 2016 extended these measure to include energy storage and electric vehicles charging stations.

The federal government has also committed significant funding to promote clean technologies through Mission Innovation, where Canada seeks to double clean energy investment to $775 million by 2020. Additional funding will be delivered through the $2 billion Low Carbon Economy Fund, the Canada Infrastructure Bank and an additional $1 billion commitment over four years, to support clean technology in many sectors, including energy. However, policy and fiscal coherence is necessary to make the Canadian clean energy sector attractive to domestic and foreign investors, and to maximize the return on federal support for the clean energy sector. As such, remaining federal subsidies to the production of oil and gas must be eliminated.

Otherwise, GHG emissions reduction achieved through those increased federal investments in clean energy risks being dwarfed by continued oil and gas exploration and development. There are oil and gas and liquefied natural gas projects in the application stage in Canada, with some start-up dates for these projects extend out to 2030 and beyond. The current trend of growth in GHG emissions in the oil and gas industry will continue if facilitated by governments' support for continued exploration and development.

Coherent fiscal policy: Carbon pricing and preferential tax treatment to oil and gas

On October 3, 2016 the Government of Canada announced a pan-Canadian approach to pricing carbon pollution, as a central component of the Pan-Canadian Framework on Clean Growth and Climate Change. Essentially, the federal government will unilaterally impose a carbon price starting in 2018, in those provinces without such a system in place. Pricing will be based on GHG emissions and applied to a common and broad set of sources to ensure effectiveness and minimize interprovincial competitiveness impacts. The carbon mechanism will include legislated increases in stringency, based on modelling, to contribute to our national target and provide market certainty. For jurisdictions with an explicit price-based system, the carbon price should start at a minimum of $10 per tonne in 2018, and rise by $10 per year to $50 per tonne in 2022. The federal government will introduce an explicit price-based carbon pricing system that will apply in jurisdictions that do not meet the benchmark. The federal system will be consistent with the principles and will return revenues to the jurisdiction of origin.

Canada's proposed carbon price and existing provincial carbon pricing regimes, are an economic signal meant to *reduce* carbon emissions from producing and consuming fossil fuels. This conflicts with fossil fuel subsidies that create an incentive to produce and consume *more* fossil fuels, and which *increase* carbon pollution.

As indicated in Table 9 below**,** Canada's subsidies to fossil fuel producers send a strong signal to pollute and undermine the intent of carbon pricing – a signal to reduce carbon emissions. Canada is creating a double standard when it comes to carbon emissions from the consumption and production of fossil fuels. In 2020, depending on the province, Canadian consumers can expect to pay between $18 and $30 per tonne of carbon dioxide emitted. Contrast this with subsidies to oil and gas producers today, which incentivize fossil fuel production (oil and gas companies) to the tune of $19 per tonne of carbon dioxide emitted.

The figure of $19 per tonne of carbon dioxide emitted in the table below was calculated by simply dividing Canadian subsidies to oil and gas production by the oil and gas sector's reported emissions in each jurisdiction. Although subsidy figures through 2015 are available, the latest official data available for Canada's oil and gas sector emissions is from 2014. Therefore, to ensure a same-year comparison, this analysis uses the 2014 figure for Canadian subsidies to oil and gas production ($3.6 billion), divided by the 2014 data for Canada's oil and gas sector greenhouse gas emissions (192 megatonnes of carbon dioxide equivalent).

Table 9: Canada's proposed carbon prices vs. current fossil fuel subsidies: conflicting price signals[96]

(All figures in $ CAD / tonne CO2)

Subsidy for carbon emissions from oil and gas production in Canada	Federal carbon price floor, 2020	Quebec, 2020	Ontario, 2020	British Columbia, 2020	Alberta, 2020
-$19	$30	$18	$18	$21	$23

These subsidies drastically undercut the goal of the Pan-Canadian carbon pricing benchmark to be introduced in 2018. Unless these subsidies are eliminated, between now and 2020 more money will flow *from* government to oil and gas companies in Canada than money collected *by* government from a carbon price.

Recent and long-standing commitments to fossil fuels subsidy reform

The Government of Canada has a long-standing commitment to phasing out production subsidies to the fossil fuel industry, starting with the commitment in the G20 Leaders' Statement at the 2009 G20 Summit in Pittsburgh. This commitment was reiterated again at the recent G7 meeting in Japan, which urges all countries to phase out fossil fuel subsidies by 2025 – suggesting that leading economies, like Canada, will have to act earlier if they expect all countries to follow suit within a decade. At the North American Leaders' Summit in June 2016, Canada, along with Mexico and the United States, reiterated this commitment to eliminate fossil fuel subsidies by 2025. These international commitments must now be met through immediate reform of federal fiscal measures on fossil fuel production.

[96] This analysis is likely conservative in a number of ways: first, it only considers subsidies to fossil fuel producers, and leaves out hundreds of millions of dollars in subsidies that encourage fossil fuel consumption, such as tax exemptions for aviation fuel or reduced tax rates for certain kinds of diesel fuel. Second, since many Canadian jurisdictions do not yet have carbon price signals in place but are planning to introduce some form of carbon pricing in the near future, we compare proposed carbon price levels with today's subsidies to fossil fuel producers , which already provide an incentive to pollute. Carbon prices in Canada today are considerably lower than they are expected to be in 2020; thus, this comparison is more conservative than comparing today's carbon prices with today's subsidy levels 3. According to Environment and Climate Change Canada, available at https://www.ec.gc.ca/indicateursindicators/default.asp?lang=en&n=F60DB708-1 4. Effective coverage-weighted carbon price figures for provinces from Beguin, D. et al. (2016) "Comparing Stringency of Carbon Pricing Policies." Canada's Ecofiscal Commission. Available at https://ecofiscal.ca/ reports/comparing-stringency-carbon-pricing/

The Minister of Finance and the Minister of Environment and Climate Change were both mandated to work together to fulfill a commitment to the G20 to phasing-out fossil fuel subsidies to over the medium-term as outlined in their Mandate Letters.

In Paris, at the COP21 meeting leading to the Paris agreement, the Government of Canada, along with 39 other countries and major corporations, endorsed the Fossil Fuel Subsidy Reform Communiqué. Supporters of this Communiqué have recognized that the elimination of fossil-fuel subsidies would contribute significantly to reducing global greenhouse gas emissions and that accelerating the reform of fossil-fuel subsidies is therefore an urgent priority. In its campaign Platform, the Liberal Party of Canada committed to phasing out fossil fuel subsidies, starting with changes to the Canadian Exploration Expenses tax deduction.

In addition, with these tax preferences still in place, the Government of Canada risks foregoing billions of dollars in additional tax revenues from accelerated deduction rates for pre-production costs for new projects over decades to come. Phasing-out of fossil fuel subsidies will allow governments to reap significant fiscal benefits over the medium and long-term by recouping foregone tax revenues.

Delivering on this long-standing commitment requires a transparent and predictable phase-out schedule released by the federal finance minister, thus providing certainty to investors, and certainty to Canadians, that the federal government intends to eliminate tax preferences to the oil and gas sector, in line with the federal carbon pricing mechanism.

Recommendations

- Budget 2017 should eliminate the Canadian Exploration Expense tax credit, which currently provides a 100% deduction for costs incurred for geological, geophysical, and geothermal (G3) surveys and exploratory drilling;

- Budget 2017 should eliminate the flow-through share deductions available to oil and gas companies;

- The federal government should announce, in Budget 2017, a schedule for phasing out remaining federal production subsidies by 2020. This should include restoring capital cost allowances to a deduction rate equivalent to the rest of the industry (in most cases 25%). The phase-out schedule must include eliminating the duty exemption for imports of mobile offshore drilling units in the Atlantic and the Arctic and changes or phase-out of the Canadian Development Expense, the Canadian Oil and Gas Property Expense, the Foreign Resource Expense and Foreign Exploration and Development Expense to restore neutrality in the fiscal treatment of oil and gas expenses compared to other sectors.

ANNEXS

Annex 1: Canada's fossil fuel subsidies

Canada's fossil fuel subsidies	Targeted energy source	Estimated annual amount, million USD	2013 estimate	2014 estimate
Tax expenditures – federal-level				
Canadian Development Expense: 30% deductible on a declining-balance basis	Oil	785	785	Not available
Canadian Development Expense: 30% deductible on a declining-balance basis	Gas	196	196	Not available
Atlantic Investment Tax Credit (AITC): 10% (2013) and 5% (2014) tax credit on energy investments	Oil & Gas	136	200	72
Canadian Exploration Expense: 100% deduction for costs incurred for geological, geophysical, and geothermal (G3) surveys and exploratory drilling (in the coal sector this includes the intangible costs of mine development)	Oil, gas, coal	127	127	Not available
Accelerated capital cost allowance (ACCA) for tar-sands projects and accelerated write-offs for some intangible tar-sands costs	Oil	122	167	77
Flow-through share deductions	Oil, Gas & Coal	119	126	111
Canadian Exploration Expense	Gas	32	32	Not available
Canadian Oil and Gas Property Expense (COGPE): 10% deduction for the cost of acquiring an oil or gas well; an interest or right to explore, drill, or extract oil or natural gas; or a qualifying interest or right in oil or gas production (excl. Crown royalties)	Oil	28	28	Not available
Canadian Oil and Gas Property Expense (COGPE): 10% deduction for the cost of acquiring an oil or gas well; an interest or right to explore, drill, or extract oil or natural gas; or a qualifying interest or right in oil or gas production (excl. Crown royalties)	Oil & Gas	7	7	Not available
Duty exemption for offshore exploration equipment	Oil & Gas	Not available	Not available	Not available

imports				
Foreign resource expense (FRE) and foreign exploration and development expense (FEDE): 30% deduction for exploration costs overseas	Oil, Gas & Coal	Not available	Not available	Not available
Exploration limited partnerships: proceeds taxed as capital gains at just 50% the rate of regular income	Oil, Gas & Coal	Not available	Not available	Not available
Introduction of ACCA for Liquified natural gas (LNG) assets	Gas	n.a.	n.a.	n.a.
Addition to CEE of the following expenses: environmental studies and community consultations that are required in order to obtain an exploration permit or licence	Oil	n.a.	n.a.	n.a.
Total (National)		1552	1669	260

Annex 2: Current Application of Federal Excise Tax on the Most Fuel Inefficient Vehicles

X= Regular Gasoline Z= Premium Gasoline

Model	Engine Size (L)	#Cylinders	Trans	Fuel Type	City F.C. L/100 km	Hwy F.C. L/100 km	Weighted F.C. L/100 km	Fuel inefficient vehicle tax ($CDN)
Aston Martin								
DB9	5.9	12	A6	Z	16.2	10.7	13.725	1,000
Vanquish	6	12	A8	Z	15.8	9.6	13.01	1,000
V8 Vantage	4.7	8	M6	Z	16.3	10.4	13.645	1,000
Vantage GT	4.7	8	M6	Z	16.3	10.4	13.645	1,000
V8 VantageS	4.7	8	M6	Z	16.3	10.4	13.645	1,000
V12 VantageS	6	12	AM7	Z	17.7	10.9	14.64	2,000
Audi								
R8	4.2	8	M6	Z	19.1	11.3	15.59	3,000
R8	5.2	10	AM7	Z	17	9.6	13.67	1,000
R8	5.2	10	M6	Z	19.1	11.7	15.77	3,000
R8 Spyder	4.2	8	M6	Z	19.1	11.3	15.59	3,000
R8 Spyder	5.2	10	AM7	Z	17	9.6	13.67	1,000
R8 Spyder	5.2	10	M6	Z	19.1	11.7	15.77	3,000
Bentley								
Continental GT	6	12	AS8	Z	17	9.8	13.76	1,000
Continental GT Conv	6	12	AS8	Z	18.1	10.4	14.635	2,000
Flying Spur	6	12	AS8	Z	18.2	10.4	14.69	2,000
Mulsanne	6.8	8	As8	Z	20.3	12.7	16.88	4,000
BMW								
760Lix DriveSedan	6	12	AS8	Z	16.9	9.8	13.705	1,000
Chevrolet								
Camaro Z/28	7	8	M6	Z	16.3	10.4	13.645	1,000
Camaro ZL1	6.2	8	AS6	Z	18	11.1	14.895	2,000
Dodge								

Challenger SRT Hellcat	6.2	8	A8	Z	16.2	9.6	13.23	1,000
Challenger SRT Hellcat	6.2	8	M6	Z	16.3	10	13.465	1,000
Charger SRT Hellcat	6.2	8	A8	Z	16.2	9.6	13.23	1,000
Viper SRT Coupe	8.4	10	M6	Z	17.6	10.4	14.36	2,000
Jeep								
Grand Cherokee FFV 4x4	6.4	8	A8	Z	16.6	10.7	13.945	1,000
Lamborghini								
Aventador coupe	6.5	12	AM7	Z	20.7	11	16.335	4,000
Aventador Roadster	6.5	12	AM7	Z	22.7	13.1	18.38	4,000
Huracan	5.2	10	AM7	Z	15.6	10.9	13.485	1,000
Veneno Roadster	6.5	12	AM7	Z	20.9	12.2	16.985	4,000
Land Rover								
Range Rover Supercharged	5	8	AS8	Z	15.5	10.6	13.295	1,000
RR (LWB) Supercharged	5	8	AS8	Z	15.5	10.6	13.295	1,000
Lexus								
LX 570	5.7	8	AS6	Z	17.1	11.6	14.625	2,000
Maserati								
Granturismo	4.7	8	AS6	Z	16.4	9.7	13.385	1,000
Granturismo Convertible	4.7	8	AS6	Z	16.4	9.9	13.475	1,000
Mercedes-Benz								
C 63 AMG Coupe	6.2	8	AS7	Z	16.1	10.4	13.535	1,000
G550	5.5	8	AS7	Z	18.1	13.6	16.075	4,000
G63 AMG	5.5	8	AS7	Z	17.5	13.4	15.655	3,000
GL 550 4 Matic	4.7	8	AS7	Z	15.8	11.2	13.73	1,000
GL 63 AMG	5.5	8	AS7	Z	15.9	11.4	13.875	1,000
ML 63 AMG 4matic	5.5	8	AS7	Z	15.5	11.5	13.7	1,000

S600	6	12	AS7	Z	15.9	9.7	13.11	1,000
S65 AMG	6	12	AS7	Z	16.7	10	13.685	1,000
S65 AMG Coupe	6	12	AS7	Z	16.2	9.6	13.23	1,000
SLS AMG GT COUPE	6.2	8	AM7	Z	16.4	10.7	13.835	1,000
SLS AMG GT Roadster	6.2	8	AM7	Z	16.4	10.7	13.835	1,000
Nissan								
Armada 4WD	5.6	8	A5	X	17.3	11.4	14.645	2,000
Rolls Royce								
Ghost	6.6	12	AS8	Z	17.3	10.5	14.24	2,000
Ghost EWB	6.6	12	AS8	Z	17.3	10.5	14.24	2,000
Phantom	6.7	12	AS8	Z	18.9	10.9	15.3	3,000
Phantom EWB	6.7	12	AS8	Z	18.8	11	15.29	3,000
Phantom COUPE	6.7	12	AS8	Z	18.9	10.9	15.3	3,000
Phantom Drophead CP	6.7	12	AS8	Z	18.8	11	15.29	3,000
Wraith	6.6	12	AS8	Z	16.9	10	13.795	1,000
Toyota								
Sequoia 4WD	5.7	8	AS6	X	17	11.9	14.705	2,000

Source: Canada Customs and Revenue http://www.cra-arc.gc.ca/E/pub/et/etsl64/list/lst_vh-2015-eng.html

Annex 3: Details on Calculations of Revenue and GHG Impacts

Recommendation 1: Increase the Federal Excise Tax Rate on Diesel by 4 cents by 2021

Revenue estimate: $350 - $700 million per year

Caveat: Ideally, revenue estimates would be calculated using a sophisticated econometric model that incorporates projected economic growth and dynamic effects across the economy. The estimate below should be considered a rough, ballpark figure for illustrative purposes only.

Net sales of diesel oil across Canada in 2014 were 17,655,729,000 litres, and were relatively stable between 2011 and 2014.[97]

Assuming sales will be similar in 2021 to 2014 (which is a cautious assumption given anticipated economic growth), an additional 4 cents per litre would result in an estimated $706 million in additional revenue per year.

However, consumers are likely to respond to the tax increase through altered driving behavior and vehicle choice that reduces overall diesel fuel sales. There may be a lag in responsiveness, but over time revenue would be expected to decrease. The Nordic study estimated that the actual fiscal impact would be approximately half of the theoretical potential revenue once dynamic effects were considered. For Canada, this would imply a lower bound estimate of $353 million per year.

GHG Reduction estimate: 0.3 to 2 Mt annually by 2030

Caveat: Ideally, GHG reduction estimates would be calculated using an integrated energy, emissions and economy model that incorporated the latest projected emissions and dynamic consumer response effects. Given the differences in pricing, taxation and economic structure across provinces, responsiveness may also vary regionally. The estimate provided should be considered a rough, ballpark figure for illustrative purposes only.

Diesel consumption is generally considered less sensitive to price increases than gasoline, though that may change as technological innovation produces greater alternatives in vehicle choice. A literature review by Jean-Thomas Bernard, Grant Guenther and Maral Kichian found that median price elasticities were -0.16 for diesel fuel, and that long-run price elasticities could be around 50% larger.[98]

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[97] Government of Canada (2015), Statistics Canada, *Sales of Fuel Used for Road Motor Vehicles, by province and territory*, http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/trade37c-eng.htm (accessed July 2016)

[98] Bernard, Jean-Thomas, Grant Guenther and Maral Kichian (2014), *Price and Carbon Tax Effects on Gasoline and Diesel Demand*, October 3, 2014 https://www.ecn.ulaval.ca/sites/ecn.ulaval.ca/files/Seminaires_Matu/Papiers_Matu_2014/bgk-3oct2014.pdf

Using elasticity estimates of -0.16 for the short-term (1 year) and -0.24 for the long-term (5 years), and an estimated approximate 3-4% increase in diesel fuel prices, a simple linear calculation would lead to an estimated reduction in fuel consumption of 0.5 - 0.6% in the short term (-0.16 x 0.03 or 0.04) and 0.7 -1% in the long-term (-0.24 x 0.03 or 0.04).[99]

While Canada's GHG projections do not differentiate between diesel and gasoline passenger vehicles, it is possible to assume that the majority of emissions from the heavy duty truck and rail sector (which together are projected to account for 66 Mt of GHG emissions in 2030) are from diesel consumption.[100] In these sectors, if the reduction in consumption resulted in a similar 0.5-1% reduction in GHG emissions, GHG reductions from the tax increase could be between 0.3 and 0.6Mt annually.

If there continue to be limited alternatives to diesel or slow improvements in fuel efficiency for freight transport, the result will likely be on the lower end. On the other hand, with the development of electric heavy duty trucks and significant improvements in fuel efficiency, results could be significantly higher. Complementary programs that promote technological innovation and accelerate transition could help increase near-term GHG benefits. Including reductions in diesel use in passenger transport, or more ambitious assumptions on responsiveness, would increase estimated GHG reductions from the measure.

For example, if the responsiveness to diesel price increases was similar to that of gasoline, we could see elasticities as high as -0.34 in the short-term and – 0.51 in the long-term. This degree of responsiveness could result in greater reductions in diesel consumption, in the range of 1% to 2%. Using the same assumptions as above, this could imply emission reductions of between 0.7Mt and 1.3Mt annually by 2030.

The Nordic Study estimated that an increase in diesel prices by 8-16% would reduce diesel consumption by between 3 and 13%. However, these countries likely have greater diesel passenger vehicle use than Canada which may be more sensitive to price changes. If the responsiveness in Canada was similar to what is shown in the Nordic study - in the range of a 3% reduction in consumption for example - emission reductions could be as high as 2Mt annually.

Recommendation 2: Extend the coverage and increase the rate of the Federal Excise Tax on Fuel Inefficient Vehicles

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[99] Litman, Todd (2013), *Understanding Transport Demand and Elasticities*, March 12, 2013, Victoria Transport Policy Institute, http://www.wsdot.wa.gov/NR/rdonlyres/D9746FB3-664A-4924-B702-65459365C876/0/FuelPrice

[100] Government of Canada (2016), Environment and Climate Change Canada, *Canada's Second Biennial Report on Climate Change*, http://ec.gc.ca/GES-GHG/default.asp?lang=En&n=02D095CB-1 (accessed September, 2016).

Revenue Estimate: $200 - 600 million annually

Caveat: Ideally, revenue estimates would be calculated using a sophisticated econometric model that incorporates projected economic growth, detailed vehicle sales and emissions performance data, and dynamic effects across the economy. The estimate provided should be considered a rough, ballpark figure for illustrative purposes only.

In 2015, there were around 1,939,000 new motor vehicle sales in Canada (including heavy trucks and buses).[101] If we assume similar sales in the future, that roughly 20 - 30% of new vehicle sales would be subject to the tax, and that on average the tax would be $500 - 1000 per vehicle, revenue could be in the range of $200 to 600 million annually. Revenue would also likely decrease over time as manufacturers produce fewer vehicles with poor emissions performance and consumers shift to lower emitting choices.

GHG Estimate: 1-2 Mt annually by 2030

Caveat: Ideally, GHG reduction estimates would be calculated using an integrated energy, emissions and economy model that incorporated the latest projected emissions and dynamic consumer response effects. The estimate provided should be considered a rough, ballpark figure for illustrative purposes only.

Emissions from cars, trucks and motorcycles are projected to be 64Mt in 2030. There is already a trend toward lower emitting vehicles embedded into these projections, as a result of federal regulations requiring improved CO2 performance and fuel efficiency of vehicles as well as other measures.

It is difficult to predict with accuracy what the additional response would be to an increase and extension of the excise tax on fuel inefficient vehicles. However, we can develop a rough, ballpark estimate of the potential.

First, we could assume that 80% of emissions related to this category of vehicles on the roads in 2030 relate to vehicles that have been purchased after the changes to the tax would be implemented (e.g. 2018). In reality, this % may be higher as owners hold onto vehicles for an average of just over 6 years. However, given the higher emissions associated with older vehicles, 80% is not unreasonable. If 80% of the anticipated emissions in 2030 are associated with vehicle purchases that could be influenced before 2030, that would leave 51.2 Mt to work with.

[101] Government of Canada (2016), Statistics Canada, *New Motor Vehicle Sales*, http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/trade12-eng.htm (accessed August 2016).

In the Rivers, Schaufele study referenced in section 2 above, they conclude that a $1000 fee reduces market share of the vehicle by 30%.[102] The taxes we propose would be higher than $1000 for certain vehicles, but lower for others. If we assume that one third of new passenger vehicles will be captured by the tax, and that 30% of those will be encouraged to shift to vehicles with emissions on average around 20-40% lower, overall GHG reductions could be in the range of 1-2Mt annually by 2030. Greater consumer responsiveness, extending the tax to heavy-duty vehicles and improvements in low-emitting vehicle options, would result in higher GHG reduction estimates.

Recommendation 3: Extending Tax Incentives to Green Buildings
Revenue estimate: N/A

It is not possible to estimate the cost of this incentive with any accuracy. Finance Canada does not, in fact, estimate the costs of the existing ACCA provisions as they state that adequate data is not available to calculate the tax expenditure with a reasonable degree of accuracy and that simplifying assumptions would be required to model the pattern of deductions that would be claimed in the absence of the incentives.[103]

GHG estimate: 0.5Mt to 3Mt per year by 2030

Caveat: Ideally, GHG reduction estimates would be calculated using an integrated energy, emissions and economy model that incorporated the latest projected emissions and dynamic consumer response effects. The estimate provided should be considered a rough, ballpark figure for illustrative purposes only.

Annual building emissions are expected to grow by 13Mt between 2020 and 2030, which is linked to new residential and commercial building construction. If the new incentives resulted in 20-30% of

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[102] Rivers, N. and Schaufele, B. (2014).
[103] Government of Canada (2016), Finance Canada (2016), *Report on Federal Tax Expenditures - Concepts, Estimates and Evaluations 2016*, https://www.fin.gc.ca/taxexp-depfisc/2016/taxexp1601-eng.asp#Toc442180625

Sources Box 1. Diesel Fuel in Canada's North

The National Energy Board of Canada (2011) Energy Use in Canada's North: An Overview of Yukon, Northwest Territories and Nunavut – Energy Facts, https://www.neb-one.gc.ca/nrg/ntgrtd/mrkt/archive/2011nrgsncndnrthfct/nrgsncndnrthfct-eng.html

Government of Canada (2016), Excise Taxes and Special Levies Notice: Budget 2016 "*Restricting the Relief of Excise Tax on Diesel Fuel and Aviation Fuel*", June 2016. As of June 30, 2016, the exemption applies only to "heating oil would be defined as fuel oil that is consumed exclusively for providing heat to a home, building or similar structure."
2016 Budget statement on INAC funding: https://www.aadnc-aandc.gc.ca/eng/1458682313288/1458682419457

new buildings (or the buildings responsible for 20-30% of emissions) reducing annual emissions by 20-30%, GHG reductions could be in the range of 0.5Mt to 1Mt per year. If half of new buildings reduced annual emissions by 50%, GHG reductions could be as high as 3Mt per year.

As building emission projections exclude indirect emissions associated with electricity use, GHG reductions from the initiative would be even larger when reduced electricity use is accounted for (particularly in provinces with remaining coal-fired electricity generation).
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