The Green Grendel

Insatiable, impervious, regulatory monster threatens Canada.

Robert Lyman

7/29/26

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THE GREEN GRENDEL

EXECUTIVE SUMMARY

The Anglo-Saxon epic poem *Beowulf* contains references to a fearsome human-like monster who terrorizes the castle of King Hrothgar for twelve years, devouring warriors. He is insatiable, and his hide is impervious to iron weapons until the hero Beowulf mortally wounds him.

I was reminded of this story as I read the reaction of Canadian environmentalists to the recent admission by Prime Minister Mark Carney that some federal government climate policies must be adapted in the interests of national unity and global market stability. A typical response of environmental activists, often repeated in the media, was that "Carney has abandoned the climate". Alas, they are never satisfied with the policies and measures that have been taken and remain in place. Like Grendel, they seem ever-ready to kill their rivals and impervious to opposition.

They also seem unaware that Canadian governments have for almost 36 years used the complete toolkit of policy and program responses to reduce GHG emissions – regulation, taxation, tax incentives, subsidies, standards and codes, research and development, government procurement, and others. There are no authoritative estimates of the number of policies and measures that federal, provincial and municipal governments have taken.

Even if all the environmentalists' criticisms of Carney were valid, however, would it be true that he has abandoned his long-held support for radical emissions reductions? As a partial illustration of the number and intrusiveness of current policy measures, I here list and briefly describe 20 of the federal government measures in one sector of the economy – transportation.

One has to wonder why such extensive and costly measures are being taken to reduce such a small part of Canada's total emissions. The most recent federal goal is to reduce total emissions by at least 40 per cent by 2035. One could eliminate every car, SUV and pickup truck in Canada (an impossible goal) and still only make it one third of the way to that goal. Reducing emissions from passenger transportation has been a core part of the climate policy agenda since 1990, yet passenger-related transport emissions have increased from 80 MTCO2eq to 94 MTCO2eq over that time.

Perhaps Canadians will one day find a way to slay the green Grendel.

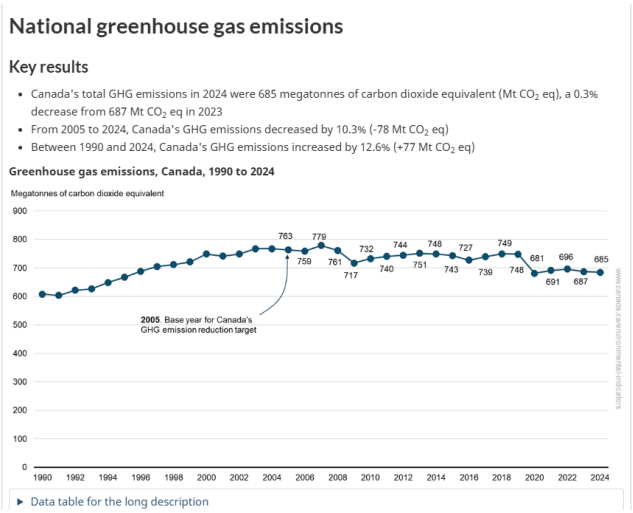
THE GREEN GRENDEL

The Anglo-Saxon epic poem *Beowulf* contains references to a fearsome human-like monster who terrorizes the castle of King Hrothgar for twelve years, devouring warriors. He is insatiable, and his hide is impervious to iron weapons until the hero Beowulf mortally wounds him.

I was reminded of this story as I read the reaction of Canadian environmentalists to the recent admission by Prime Minister Mark Carney that Canada will not hit the greenhouse gas (GHG) emission reduction targets set under Justin Trudeau and that some federal government climate policies must be adapted in the interests of national unity and global market stability. A typical response of environmental activists, often repeated in the media, was that "Carney has abandoned the climate". Alas, they are never satisfied with the policies and measures that have been taken and remain in place. Like Grendel, they seem ever-ready to kill their rivals and impervious to opposition.

For several years, I have written articles in which I have tried to describe and analyze the policies and measures adopted in Canada to respond to claims of impending climate doom.

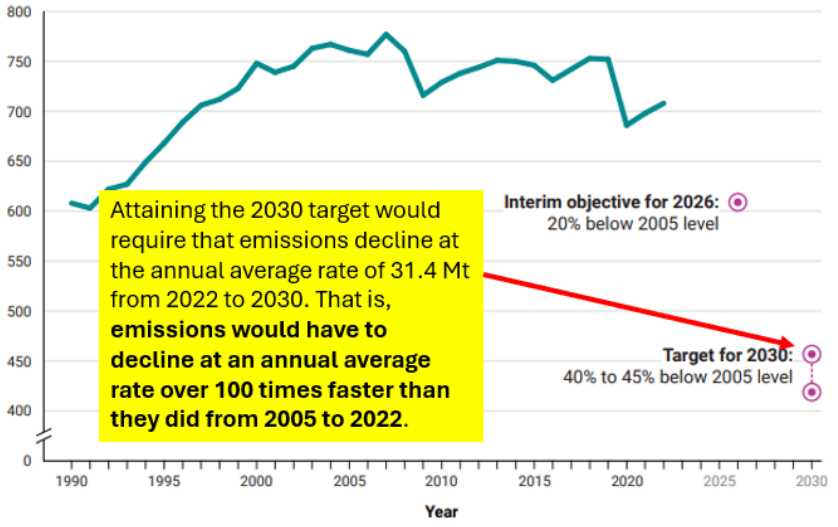
In brief, governments have used the complete toolkit of policy and program responses – regulation, taxation, tax incentives, subsidies, standards and codes, research and development, government procurement, and others. There are no authoritative estimates of the number of policies and measures that federal, provincial and municipal governments have taken. **The Canadian Climate Policy Inventory, maintained by the Canadian Climate Policy Partnership, currently lists 334 different measures taken by the federal and provincial governments**. In its most recent **biennial report to the United Nations Framework Committee on Climate Change, the federal government list of federal and provincial government measures was over 300 pages long.**



https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/greenhouse-gas-emissions.html

There is no question that Carney has approved some important changes in the policies and measures implemented by his predecessor. In some cases, like the elimination of the mandate that motor vehicle manufacturers phase out the sale of internal combustion powered light duty vehicles, he has simply substituted regulations governing vehicle fuel efficiency so as to achieve substantially the same outcome. In other cases, as with his abandonment of a hard cap on GHG emissions from the oil and gas industry, he has sought to pursue a compromise with the government of Alberta that would result in major emissions reductions in return for the province's support for the net-zero target and furthering the goal of much increased carbon dioxide capture and storage. While he has been much criticized by environmental groups for agreeing to hasten the regulatory review of a possible crude oil pipeline from Alberta to the British Columbia coast, the actual approval and financing of that pipeline remains uncertain, as it is not clear how the federal Cabinet will assess its consistency with the net-zero goals and there remain many potential political roadblocks in British Columbia.

Exhibit 7.1—Canada's greenhouse gas emissions, projections, objective, and target



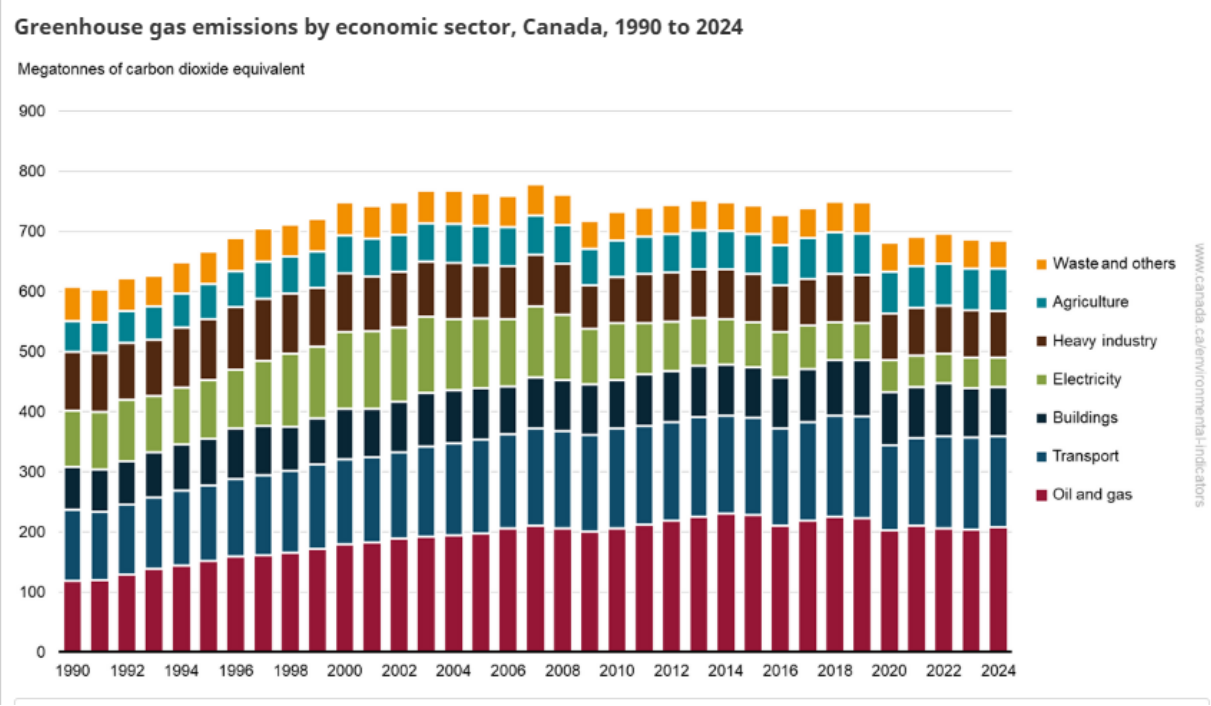
Note: The land use, land-use change, and forestry accounting contributions were not included because those values had not yet been published.

Source: Based on data from the National Inventory Report 1990–2022: Greenhouse Gas Sources and Sinks in Canada, Environment and Climate Change Canada, 2024

Even if all the environmentalists' criticisms of Carney were valid, however, would it be true that he has abandoned his long-held support for radical emissions reductions? A full answer to this question would require not just another list of the policies and measures, but a commentary on their costs and likely effectiveness. Readers would lose their patience long before the list was complete. Instead, in Annex A I list and briefly describe 20 of the federal government measures in one sector of the economy – transportation. These measures involve many billions of dollars in federal government spending as well as often highly intrusive regulations to constrain, or "guide" private citizens' choices. There is no way to know how many officials are employed in developing, administering and managing these measures; it would not be an exaggeration to say that there is a small army of bureaucrats involved.

Most of the measures on the list affect surface transportation i.e. light and heavy vehicles on roads and railways, plus so-called “active transportation” (walking and cycling). In 2023, emissions from road transportation (cars, trucks, buses, etc.) totaled 122 million tonnes of carbon dioxide equivalent (MTCO2eq), or 17.6 per cent of Canada’s total emissions that year. Passenger transportation, mainly by cars and light duty trucks, emitted 94 MTCO2eq, or 13.5 per cent of total emissions.

One has to wonder why such extensive and costly measures are being taken to reduce such a small part of Canada’s total emissions. The most recent federal goal is to reduce total emissions by at least 40 per cent by 2035. **One could eliminate every car, SUV and pickup truck in Canada (an impossible goal) and still only make it one third of the way to that goal.** Reducing emissions from passenger transportation has been a core part of the climate policy agenda since 1990, yet passenger-related transport emissions have increased from 80 MTCO2eq to 94 MTCO2eq over that time.



https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/greenhouse-gas-emissions.html

A wide range of policy tools has been used. Notably, these have included increasing taxes to make fuel use more expensive; regulating fuel efficiency; subsidizing alternative fuels, vehicles and refueling systems; massively subsidizing public transit; using federal government procurement; and so on. Provincial and municipal governments have spent billions of dollars seeking to move commuters out of cars by funding mass transit systems, limiting vehicle lanes and restricting where people can park. Municipal efforts to discourage commuting by car have generally been a bust. The latest data from Statistics Canada indicates that 81% of people in Canada commute by car, van or truck (75% as a driver, 5.8 % as a passenger). Only 12% commute by public transit and 6.2% by walking of cycling, and those figures mostly reflect trends in a handful of larger cities. Despite all these efforts and costs, the significant increase in the number of passenger vehicles on the road (driven by population increases) has more than offset the emissions reduction efforts.

At the same time, freight-related transport emissions have steadily increased, going from 30 MTCO2eq in 1990 to 48 MTCO2eq in 2023, a 60 per cent increase. These were largely driven by increased economic activity. In a country with Canada's size and geography, it is difficult to reduce the need to transport both people and goods. Without a changed population (i.e. immigration) policy and prolonged recession, passenger-related and freight-related GHG emissions seem destined to continually increase.

The green Grundel will doubtless continue to resent and oppose every effort to compromise in the pursuit of net-zero emissions, and to pretend that there does not exists a lengthy list of other climate policy measures that have

not been amended in the interests of the Canadian economy. Can Canadians, like Beowulf, find a way to slay the beast?

ANNEX A

FEDERAL GOVERNMENT CLIMATE MEASURES IN THE TRANSPORT SECTOR

SURFACE

CLEAN FUEL REGULATIONS

The Clean Fuel Regulations take a performance-based approach to reducing greenhouse gas emissions in Canada. The Regulations are designed to increase the cost to consumers of gasoline and diesel fuel and thereby "incentivize" adoption of non-hydrocarbon technologies and expand the use of low carbon intensity fuels throughout the economy.

The Regulations give fuel suppliers the option to meet the requirements in a potentially lower cost way. They establish a credit market, where each credit represents a lifecycle emission reduction of one tonne of CO_2e. For each compliance period (typically a calendar year), a primary supplier will demonstrate compliance with their reduction requirement by creating credits or acquiring credits from other creators, and then using the required amount of credits for compliance.

Compliance credits can be created in three ways:

- Compliance Category 1: Undertaking projects that reduce the lifecycle carbon intensity of liquid fossil fuels (e.g., carbon capture and storage, on-site renewable electricity, co-processing);
- Compliance Category 2: Supplying low carbon intensity fuels (e.g., ethanol, biodiesel); and
- Compliance Category 3: Supplying fuel or energy to advanced vehicle technology (e.g., electricity or hydrogen in vehicles)

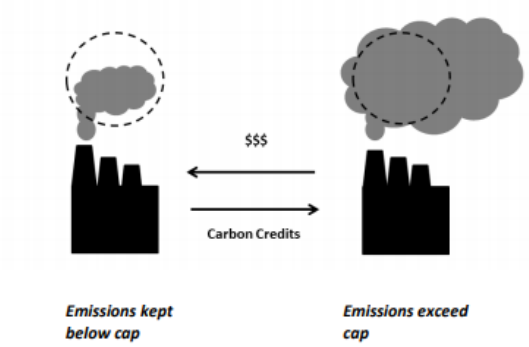
OUTPUT-BASED PRICING SYSTEM

The federal Output-Based Pricing System (OBPS) is a regulatory system for large industry, including oil and gas producers and refineries. It raises their cost of using hydrocarbons to pressure them to reduce their greenhouse gas (GHG) emissions, while allegedly protecting against the risks of "carbon leakage" (industries moving to other regions to avoid a price on carbon pollution).

Participants of the OBPS are required to compensate for GHG emissions that exceed an annual facility emissions limit. If a facility's emissions are below its annual limit, it will earn surplus credits. These surplus credits can be sold to facilities that need credits for compliance or banked for future use. This creates an ongoing financial incentive for facilities to reduce their emission intensity in order to reduce the amount owed for compensation or to emit below their limit and earn surplus credits. The current rate of the OBPS is $95 per tonne of GHG emissions; it is scheduled to rise to $135 per tonne by 2035 and to higher levels after that.

2 OVERVIEW OF CARBON TRADING

The carbon market is also commonly referred to as a "cap-and-trade" regime. A limit (or "cap) is set for countries or companies on the total amount of greenhouse gas emissions they can emit. If they exceed the limit they are required to buy carbon credits from others. Those with spare carbon credits may sell surplus credits to emitters that require more (the "trade").



Source: Interpol's "A Guide to Carbon Trading Crime"

PASSENGER AUTOMOBILE AND LIGHT TRUCK GREENHOUSE GAS EMISSION REGULATIONS

The Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations establish greenhouse gas (GHG) emission standards for new 2011 and later model year light-duty on-road vehicles offered for sale in Canada. These regulations require importers and manufacturers of new vehicles to meet fleet average emission standards for greenhouse gases. The Regulations also establish annual compliance reporting requirements. The CO2e emission standards are company-unique and are based on the footprint and the quantity of vehicles offered for sale in a given model year.

Up until recently, these footprint-based target values have been aligned with those of the United States Environmental Protection Agency (EPA) and have increased in stringency from the 2012 through 2026 model years. Since the introduction of the regulations, the fleet average standards for passenger automobiles and for light trucks have become more stringent by 43.0% and 36.2% respectively. A company's performance relative to its standard is determined through its sales weighted fleet average emissions performance for the given model year for its new passenger automobile and light truck offerings, expressed in grams per mile of CO2e based on standardized emissions tests simulating city and highway driving cycles. The emissions measured during these test procedures include CO2 and other carbon related combustion products, namely carbon monoxide (CO) and hydrocarbons (HC). This ensures that all carbon containing exhaust emissions are also recognized. These

regulations also set limits for the release of other greenhouse gases such as methane (CH4) and nitrous oxide (N2O).

A number of mechanisms are incorporated into the regulations which provide companies with a series of options to achieve the applicable greenhouse gas standards while penalizing them if they do not increase deployment of new greenhouse gas reducing technologies. Flexibility mechanisms include recognition of the emission benefits of dual-fuel capability, electrification and other technologies that contribute to improved greenhouse gas performance. The regulations also include an emission credit system that allows companies to generate emission credits if their fleet average performance is superior to the standard. Emission credits can be accumulated for future use to offset emission deficits (a deficit is incurred if a company's fleet performance is above their applicable standard). This allows companies to maintain regulatory compliance as their product mix and demands change year to year and through product cycles which may result in fleet average performance above the standard. Companies that generate emission credits may transfer those credits to other companies. Emission credits generated for performance superior to the standard have a lifespan which is determined based on the model year in which they were generated, whereas deficits generated for performance worse than the standard must be offset within 3 years from the model year in which the deficit was incurred. Compliance to the regulations and the corresponding tracking of credits is monitored, in part, through the annual reports and companies are required to maintain all relevant records relating to their vehicle greenhouse gas emissions performance.

Vehicle manufacturers have estimated that compliance with the regulations raises the up-front cost of a vehicle by $3,000 to $9,000 depending in the vehicle; supporters of the regulations claim that these upfront costs are more than made up by the costs of the benefits of the fuel savings.

HEAVY DUTY VEHICLE GHG REGULATIONS

Canada's Heavy-duty Vehicle and Engine Greenhouse Gas Emission Regulations establish stringent performance standards for on-road vehicles with a Gross Vehicle Weight Rating (GVWR) over 3,856 kg (8,500 lbs). Harmonized

with the U.S. EPA, the rules mandate progressive CO_2 reductions per ton-mile through Phase 1 and Phase 2 requirements, aggressively pushing toward low and zero-emission fleets.

- The standards cover Class 2b to 8 vehicles, including heavy-duty pickup trucks, vocational vehicles, dump trucks, urban buses, and highway tractors.

- The current Phase 2 rules scale stringency based on vehicle service classes and engine types, tightening reduction goals through successive model years. For example, CO_2 emission standards for spark-ignition vocational vehicles decrease significantly from 461 g per short ton-mile (MY 2021-2023) to 413 g per short ton-mile (MY 2027 and later).

- Manufacturers and importers must meet fleet-average GHG targets and can utilize averaging, banking, and trading (ABT) credit systems to encourage early and innovative reductions.

INCENTIVES FOR ZERO EMISSION AND HEAVY-DUTY VEHICLES PROGRAM

INCENTIVES FOR ZERO-EMISSIONS VEHICLES PROGRAM (EV AFFORDABILITY PROGRAM)

The Electric Vehicle Affordability Program (EVAP) offers federal point-of-sale rebates of up to $5,000 for eligible fully electric or fuel-cell vehicles, and up to $2,500 for plug-in hybrids. This program replaced the previous iZEV program and features specific purchase caps and origin requirements. The cost to taxpayers is estimated to be $2.3 billion over five years.

ENHANCED CAPITAL COST ALLOWANCE FOR ZERO-EMISSION VEHICLES

Capital cost allowances are features of the income tax system that allow a taxpayer to deduct from the capital taxes payable amounts that exceed what would normally be allowed based on the expected depreciation of the capital asset. The Canadian Capital Cost Allowance for Zero-Emission Vehicles provides a first-year accelerated tax write-off of 55% for ZEVs made available for use in 2026, capped at $61,000 for passenger vehicles.

The government does not publish the estimated income tax revenues forgone as a result of this allowance. As is the case with all EVs and other Zero-Emission vehicles, however, these typically are sold to higher-income consumers, so the allowance represents a transfer of income for average income people to higher-income ones.

Your neighbour is thinking about buying a new battery powered electric vehicle (EV). It might be a good deal for him, but as a taxpayer, are you going to be happy paying your share of the $59,000 in subsidies for his new car?

https://friendsofscience.org/pdf-render.html?page=2948

GREEN FREIGHT PROGRAM

The Green Freight Program, administered by Natural Resources Canada, provides subsidies to help commercial truck fleets reduce fuel consumption and greenhouse gas emissions. It previously provided grants covering up to 50% of eligible third-party assessments, equipment retrofits, and fleet modernization. Both program streams are currently closed to new applications due to high demand.

The initiative was divided into two main streams:

- Stream 1 – Assess and Retrofit: Covered up to 50% of fleet energy assessment costs (up to $15,000 to $40,000 depending on assessment type) and 50% of eligible equipment retrofits like aerodynamic devices and anti-idling technologies, with a maximum of $250,000 per applicant.

- Stream 2 – Fleet Modernization: Provided non-repayable contributions toward engine repowers, purchases of low-carbon alternative fuel vehicles, and logistical improvements.

While the Green Freight Program grants are currently closed, there is no end to government-funded measures to subsidize “green energy”. Fleets can still utilize other Natural Resources Canada tools like the SmartWay Transport Partnership and the SmartDriver Training Curriculum to improve efficiency and reduce operational costs.

GREEN INFRASTRUCTURE: ELECTRIC VEHICLE INFRASTRUCTURE DEMONSTRATION PROGRAM

The EVID program funded projects across Canada that aimed to accelerate the market penetration of electric vehicles through “technology demonstration”. It is not clear why a technology that has been well established in the marketplace for at least a decade still needs subsidies for technology demonstration.

Electric vehicle infrastructure demonstrations involve pilot projects for next-generation charging, smart-grid integration, and hydrogen refueling. Key initiatives include next-generation fast-charging networks**,** utility-integrated residential payment models**, and** corridor-wide rural installations**.**

- The program committed $76 million to advance innovative charging and hydrogen storage technologies from early development stages to commercial readiness.
- Grants typically cover up to 50% of project costs (reaching up to $3 million per approved undertaking) to de-risk private and municipal deployment.

CLEAN TECHNOLOGY INVESTMENT TAX CREDIT

The Clean Technology ITC is a refundable tax credit for capital invested in the adoption and operation of new clean technology property in Canada from March 28, 2023, to December 31, 2034.

The Clean Technology ITC rate may be up to 30% of the capital cost of clean technology property that is acquired and that becomes available for use from March 28, 2023, to December 31, 2033.

The Clean Technology ITC rate may be up to 15% for property that is acquired and that becomes available for use in 2034. The Clean Technology ITC will be unavailable after 2034.

LOW-CARBON FUEL PROCUREMENT PROGRAM

Under the Greening Government Strategy (GGS), the Government of Canada spends more to reduce greenhouse gas (GHG) emissions from its operations and pursue the (unattainable) goal of net-zero emissions by 2050. The GGS defines net-zero emissions as reducing GHG emissions from operations to as close to zero as possible and then balancing out any remaining emissions with an equivalent amount of carbon dioxide removal (CDR).

The Treasury Board of Canada Secretariat's Centre for Greening Government operates a Low-carbon Fuel Procurement Program (LCFPP) within the Greening Government Fund. The LCFPP has $134.9 million in funding over eight years (fiscal years 2023–24 to 2030–31) to support the purchase of low-carbon-intensity liquid fuels for federal air and marine fleet operations and in 2024, the program was expanded to include the procurement of CDR services.

CANADA PUBLIC TRANSIT FUND

The Canada Public Transit Fund (CPTF) is a permanent infrastructure program launching in the 2026–2027 fiscal year that provides approximately $30 billion over 10 years to expand and improve public transit and active transportation networks across the country. It delivers stable capital funding through three primary streams.

- Baseline Funding Stream: Delivers roughly $500 million annually to support routine capital needs, rehabilitation, and smaller system expansions for established transit networks.
- Metro-Region Agreements: Allocates approximately $2 billion per year to support long-term development and major construction projects in large metropolitan areas.
- Targeted Funding Stream: Targets specific evolving priorities including rural transit solutions, active transportation, and zero-emission transit.

To access this federal funding, municipalities with populations over 150,000 must implement specific housing-supply policies. These requirements include eliminating mandatory minimum parking within 800 metres of high-frequency transit lines, allowing high-density housing near major transit nodes and post-secondary institutions, and completing local Housing Needs Assessments.

The Canadian Public Transit Fund is thus a means for the federal government not only to subsidize otherwise no-economic municipal transportation networks but also to intrude into the jurisdiction of the provincial and municipal governments to influence zoning decisions.

ZERO EMISSION TRANSIT FUND

The Zero Emission Transit Fund (ZETF) is a $2.75 billion Canadian federal program launched in August 2021 to electrify public transit and school bus fleets, aiming to purchase 5,000 zero-emission buses. Managed by Housing, Infrastructure and Communities Canada, it works alongside the Canada Infrastructure Bank to cut pollution and upgrade national transit systems.

Grants cover up to 80% of eligible costs for studies, technical modeling, and feasibility analysis and up to 50% of eligible costs to purchase zero-emission buses and build charging or fueling infrastructure.

The main goals of this program are to transition municipal and school bus fleets to battery-electric or hydrogen fuel cell power and lower greenhouse gases and urban air pollution to hit national climate targets.

ZERO-EMISSIONS VEHICLES INFORMATION PORTAL

The Zero-Emissions Infrastructure Portal is a website maintained by Transport Canada that contains information on all the different programs and activities of the federal government that support the increased purchase of zero-emission vehicles. No wonder.

ZERO EMISSION VEHICLE INFRASTRUCTURE PROGRAM

The Zero Emission Vehicle Infrastructure Program (ZEVIP) is one operated by Natural Resources Canada. It provides funding to subsidize deployment of electric vehicle (EV) chargers and hydrogen refueling stations. It covers public places, multi-unit buildings, workplaces, and fleets, running with up to 50% cost support (75% for Indigenous projects) until March 31, 2027.

- Direct funding up to $2 million per project for public, workplace, or residential installations.
- It provides up to $2 million per project with federal support covering up to 75% of total costs.

Projects exceeding $20 million are redirected to the Canada Infrastructure Bank.

CANADA INFRASTRUCTURE BANK: PUBLIC TRANSIT

The Canada Infrastructure Bank (CIB) invests in public transit with a core target of $5 billion, focusing heavily on zero-emission buses (ZEBs), fleet electrification, and local transit infrastructure to support sustainable growth and cut greenhouse gas emissions.

Its main funding goes to the Zero-Emission Bus Program; it dedicated more than $1.5 billion to subsidizing transit agencies and school bus operators replace diesel fleets with electric alternatives. It also co-finances major municipal transformations, such as a $380 million agreement with Ottawa (OC Transpo) for up to 350 electric buses and $136 million for York Region Transit.

- The bank uses debt financing and co-investments where upfront capital costs are hopefully offset by long-term savings on diesel and maintenance expenses.

These reports are available on Friends of Science blog. Search by title.

CANADA'S NATIONAL ACTIVE TRANSPORTATION STRATEGY

The Active Transportation Strategy includes federal government spending of $400 million to subsidize projects in communities across Canada. In addition to spending on bike lanes and walking lanes, it funds "public awareness" programs, the establishment and maintenance of a website to spread information about best practices, and coordination with programs that promote increased use of public transit.

CLEAN RAIL ACADEMIC GRANT PROGRAM

This program, operated by Transport Canada, provides taxpayer funds to subsidize academic research programs currently developing technologies and practices that aim to reduce air emissions from the rail sector. The recent funding rounds have involved dispersal of $250,000 each. Examples of R&D areas funded include locomotive systems, data management, use of new materials in rail, reducing friction losses of railcars, use of alternative fuels, and optimizing railway operations.

AVIATION

CANADA'S AVIATION CLIMATE ACTION PLAN

For several years now (since 2005), Transport Canada has had in place a voluntary agreement with the Air Transport Association of Canada (ATAC) to reduce GHG emissions. It also has worked with the Canadian Airports Council (CAC) to develop a quantification methodology for GHG emissions at Canadian airports.

The Aviation Action Plan goes further by funding or regulating in a number of areas . These include the development and adoption of "green" aerospace technologies, including electric, hybrid and hydrogen propulsion in the aviation sector; through the Strategic Innovation Fund and Low Emission Aviation Program, subsidizing a range of "sustainable" aerospace technologies; reducing emissions through better air traffic management; promoting the purchase of electric/low emission ground fleet and support equipment; and promoting the widespread availability and use of "sustainable aviation fuels", with an aspirational goal of 10 percent SAF use by 2030. The federal government will subsidize the use of SAF in the federal fleet of aircraft.

MARINE TRANSPORTATION

GREEN SHIPPING CORRIDOR PROGRAM

The Green Shipping Corridor Program subsidizes Canadian ports, shippers, vessel owners, operators and other marine organizations through projects to "decarbonize" operations and reduce the impact of marine shipping on communities and ecosystems.

The program includes the Clean Ports Stream, which will provide up to $127.2 million to fund the adoption of commercially available “clean” technology at ports and terminals and to subsidize ports’ measures to attract “clean vessels”.

It also includes the Clean Vessel Demonstration Stream, which provides up to $22.5 million to fund Canadian-led projects that aim to “study, test and encourage the adoption of zero-emission, and near zero-emission technologies for the largest emitting vessels operating in Canadian waters”.

Under the Clydebank Declaration, signed at COP 26 in 2021, Canada committed to support the establishment of at least six green shipping corridors globally by the mid-2020s. Green shipping corridors are maritime routes between two or more ports where zero-emission fuels and vessel technologies are used.

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Are Canadians getting their money’s worth? Canada is responsible for only 1.5% of global GHG emissions, the federal objective to reduce emissions by 40% would reduce global emissions by 0.6%, some or all of which will be offset by increased emissions elsewhere. **If Canada achieved the intended emissions reduction and maintained that reduction in future, the global average temperature would be reduced by 0.007 degrees C.** (seven thousandths of a degree Celsius) as of 2100 compared to a case in which Canada does nothing. (Again, this assumes that these emissions cuts would not be offset elsewhere). https://blog.friendsofscience.org/2024/08/24/at-last-the-costs-and-benefits-of-canadas-climate-plan/

ABOUT THE AUTHOR

Robert Lyman is an economist with 27 years of experience as an analyst, policy advisor and manager in the Canadian federal government, primarily in the areas of energy, transportation, and environmental policy. He was also a diplomat for 10 years. Subsequently he has worked as a private consultant conducting policy research and analysis on energy and transportation issues as a principal for Entrans Policy Research Group. He is a frequent contributor of articles and reports for Friends of Science, a Calgary-based independent organization concerned about climate change-related issues. He resides in Ottawa, Canada. Full bio.

ABOUT FRIENDS OF SCIENCE SOCIETY

Friends of Science Society is an independent group of earth, atmospheric and solar scientists, engineers, and citizens that is celebrating its 23rd year of offering climate science insights. After a thorough review of a broad spectrum of literature on climate change, Friends of Science Society has concluded that the sun is the main driver of climate change, not carbon dioxide (CO2).

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