

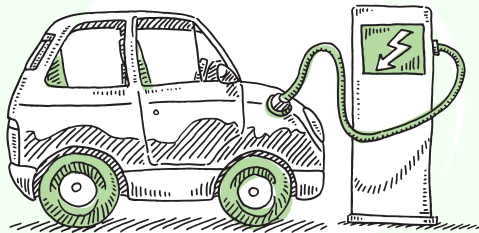


Invest in zero-emission vehicles to create healthy, green and just communities

Over the coming years, Canadian governments will be investing in programs and policies to kick start our economy and get people back to work. The electrification of Canada’s transportation sector (that is responsible for one quarter of Canada’s greenhouse gas (GHG) emissions) needs to be a pivotal part of that plan.

By investing in zero-emission vehicles (ZEV)* and implementing supportive policies,¹ Canadian governments can dramatically

reduce GHG emissions and air pollution, while creating hundreds of thousands of jobs² and significant fuel savings for consumers.



CLIMATE CHANGE IS ALREADY HARMING PEOPLE IN CANADA

On a global scale, climate change is already having a catastrophic impact on human health. In 2018, nearly 300,000 people around the world died prematurely because of hotter temperatures resulting from climate change.³ And yet, increasing temperatures is only one of the

many risk factors presented by climate change.

In different parts of Canada, climate change has contributed to an increase in the frequency and intensity of floods, wildfires, hurricanes, ice storms, and heat waves, over the last several decades.⁴ These events have exposed millions to extremely

high levels of toxic air pollution,⁵ forced hundreds of thousands of Canadians to evacuate their homes, and left hundreds of thousands without power for extended periods. Climate change is also melting permafrost in the far north, increasing sea levels on three coast lines, and extending the range of vector-borne diseases such as Lyme disease.⁶

* A ZEV is defined by the federal government as a vehicle that has the potential to produce no tailpipe emissions. It can have an internal combustion engine, but it must be able to operate without using it. From a legal perspective, plug-in hybrid-electric vehicles or vehicles that run on electric batteries or hydrogen fuel cells are considered to be ZEVs.

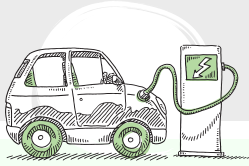
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While climate change can harm the health of everyone, it has a greater impact on some. Young children, older people, and people with pre-existing health conditions are more sensitive to heat waves and wildfire smoke. Indigenous Peoples in Northern communities can experience increased food insecurity as melting permafrost and shifting plant and animal populations disrupt their access to traditional foods. In addition, people who live on lower incomes may not have the resources to protect themselves or recover from extreme weather events.⁷

The costs of weather-related disasters fuelled by global warming are considerable. The number of catastrophic events has more than tripled since the 1980s. Over the last nine years, these events have resulted in \$14 billion in insurance costs in Canada, an increase of 1,250% since the 1970s.⁸

ZEVS REDUCE GREENHOUSE GAS EMISSIONS THAT CAUSE CLIMATE CHANGE

In order to avoid catastrophic levels of global warming, the Intergovernmental Panel on Climate Change (IPCC) has concluded that all countries must reduce climate emissions by 45% by 2030 and to net zero by 2050.⁹

The transportation sector is the second leading source of the GHG emissions that cause climate change and is responsible for 26% of all of Canada's GHG emissions.¹⁰ Over the last 20 years, GHG emissions from the transportation sector have increased by nearly 30% as SUVs and trucks, with their higher emissions, have become more popular.¹¹

Switching from a gas-fuelled car to a ZEV can cut GHGs by 34-98% depending on the source of the electricity. The cleaner the electricity grid, the greater the reductions.¹² A national modelling study found that if all new cars and SUVs sold by 2030 were 100% electric, GHG emissions could be reduced by 33 million tonnes (Mt) per year, and if 75-80% of all new trucks were electrified by 2030, GHG emissions could be reduced by 30 Mt per year.¹³ Combined, these reductions (63 Mt) represent 34% of the GHG emissions from Canada's transportation sector (185 Mt in 2018) and 8.6% of the GHGs from all human activity in Canada (729 Mt in 2018).¹⁴

TRAFFIC-RELATED AIR POLLUTION IS A SIGNIFICANT HEALTH CONCERN

Air pollution continues to be a significant health risk in Canada. It is responsible for approximately

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14,600 premature deaths each year from heart disease, strokes, lung cancer and chronic obstructive pulmonary disease.¹⁵

High-volume traffic corridors are a major source of air pollution in Canada and a principal source of variation in levels of air pollution within urban centres. Many studies have demonstrated that those living within 50-1,500 metres of major roads and highways are exposed to significantly higher levels of air pollution.¹⁶

Traffic-related air pollution (TRAP) is strongly associated with increases in asthma exacerbations and the incidence of asthma in children, reduced lung function,¹⁷ and morbidity and deaths from cardiovascular disease and lung cancer.¹⁸ TRAP is a serious concern in Canada because about 10 million people live in close proximity to high

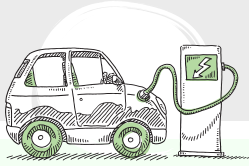
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volume traffic corridors that have elevated levels of air pollution (i.e., within 500 metres of a highway or 100 metres of a major urban road).¹⁹ In the Greater Toronto and Hamilton Area (GTHA) alone, it has been estimated that TRAP is responsible for approximately 700 premature deaths and 2,800 hospitalizations each year due to heart and lung conditions. The health-related impacts of TRAP are valued at \$4.6 billion per year.²⁰

The COVID-19 pandemic has further highlighted the impact of air pollution on health. New studies suggest that long-term exposure to air pollution results in increased death rates from COVID-19, with one study estimating that air pollution contributed to 15% of deaths from COVID-19 around the world.²¹ One U.S. study estimated that death rates from COVID-19 increase by 8% with every 1 µg/m³ increase in the level of fine particulate matter (PM_{2.5}) in the air. PM_{2.5} is one of the components of TRAP and the air pollutant most clearly associated with increased rates of chronic cardiovascular and respiratory diseases.²²

ZEVS CAN REDUCE AIR POLLUTION

Increasing the proportion of ZEVs on Canadian roadways is expected to produce significant air quality

health benefits as well as climate benefits. The health benefits will vary depending upon the emissions associated with the electricity grid in each province.

A modelling study conducted by researchers at the University of Toronto found that a substantial number of air pollution-related premature deaths could be avoided each year in the GTHA if gasoline- and diesel-fuelled vehicles were replaced with electric-powered vehicles. Using vehicle statistics from 2016 and electricity emissions based on Ontario's electricity grid in 2019, the study estimated that each year:

- 313 premature deaths could be avoided, producing \$2.4 billion in social benefits if 100% of the cars and SUVs were replaced with electric-powered vehicles
- 157 premature deaths could be avoided, producing \$1.2 billion in social benefits if 50% of the cars and SUVs were replaced with electric-powered vehicles
- 68 premature deaths from TRAP could be avoided, producing \$500 million in social benefits if 20% of the cars and SUVs in the GTHA were replaced with electric-powered vehicles; and
- 143 premature deaths could be avoided, producing \$1.1 billion in social benefits if 100% of the public transit buses in the GTHA

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were replaced with electric-powered vehicles.²³

The social benefits associated with these scenarios represent the financial value placed on a premature death. They do not capture health care or lost-time costs associated with the many adverse health outcomes beyond premature death that can be associated with air pollution.²⁴ Yet, with social benefits estimated at \$9,850 for each electric vehicle that replaces a gas-powered car, and with the accompanying health savings, these benefits far outweigh the \$5,000 rebate currently being offered by the federal government to encourage the transition.²⁵

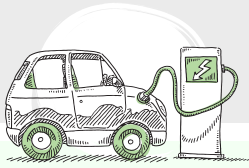
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ZEVs CAN REDUCE HEALTH INEQUITIES

While air pollution is unhealthy for everyone, it presents a greater risk for some. For example, young children, older people, and those with pre-existing health conditions are more sensitive to the adverse effects of air pollution.²⁶

In addition, a number of groups within Canada – such as lower-income populations, newcomers, racial minorities, Indigenous Peoples, and people with other health challenges – are more vulnerable to air pollution because they already experience higher rates of illness, chronic diseases, and premature death because of social disadvantages.²⁷ These groups are also more likely to live near highways and major roadways that expose them to higher levels of air pollution.

A few studies have found that lower-income neighbourhoods are more likely to be located in closer proximity to areas of high traffic density than are higher-income neighbourhoods.²⁸ For example, a study found that the lowest-income neighbourhoods in Toronto and Montreal were 3.5 and 2.8 times (respectively) more likely to be within 200 metres of

a highway than were the highest-income neighbourhoods.²⁹ Given their increased vulnerability, lower-income populations and those who live near highways will likely benefit more from the replacement of gas- and diesel-fuelled vehicles with ZEVs.

INVEST AND SUPPORT ZEVs FOR A HEALTHY, GREEN AND JUST RECOVERY

While ZEVs are currently more expensive than many gasoline- and diesel-fuelled vehicles, analysts in the field expect that they will become the most economic choice within five years as battery prices decrease. Over the past 10 years, battery costs decreased from \$30,000 to \$4,100 for a small car in response to scaled-up production and reductions in material costs. Rebates and progressive taxes would help support this transition.³⁰

Investments in ZEVs have the potential to create many jobs for people in Canada. Over that last twenty years, vehicle manufacturing in Canada has decreased by 37% and jobs in the auto sector have fallen from 172,000 to 133,000. In California, where there are supportive regulations and rebates, there are now 275,600 jobs in the ZEV sector.

Investments in ZEVs have the potential to create many jobs for people in Canada

Energy analysts have estimated that Canada could create 474,000 jobs and produce about \$11.7 billion in fuel savings each year for drivers by requiring by 2030 that all new cars and SUVs and 75-80% of all new trucks sold in Canada be electric. The analysts suggest that the Canadian government could foster this transition by investing \$12 billion over 5 years to:

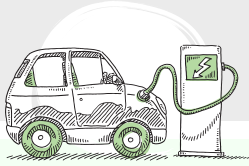
- accelerate the installation of ZEV charging stations along highways and in urban centres;
- provide \$5,000 rebates to encourage the purchase of electric cars and SUVs; and
- provide the funds needed by municipalities and school boards to purchase 7,500 electric transit and school buses over the next five years.³¹

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To date, the federal government has taken several steps in the right direction. It has:

- invested over \$200 million, and promised another \$150 million, to support the installation of recharging and refuelling stations for ZEVs;
- offered Canadians up to \$5,000 towards the purchase of light-duty ZEVs with a 3-year budget of \$300 million since May 2019,³² and promised an additional \$287 million over two years starting in 2020-21;³³
- announced \$1.5 billion to accelerate the uptake of zero-emission buses by transit authorities, school boards and municipalities;³⁴ and
- recently announced voluntary ZEV sales targets for light-duty vehicles sales of 15% by 2025, 30% by 2030, and 100% by 2040, and promised to align Canada's Light-Duty Vehicle regulations with the most stringent performance standards in North America post-2025.³⁵

In order to produce the health benefits, GHG reductions, jobs

and fuel savings identified by energy analysts, more significant investments will be needed, along with a comprehensive set of supportive regulations and policies, including:

- financial incentives for new and used ZEVs that target lower- and middle-income Canadians;
- building codes that include provisions for ZEV charging stations;
- ZEV sales targets for medium- and heavy-duty vehicles as well light-duty vehicles;
- mandatory Vehicle Emission Standards that require improvements in fuel efficiency and reductions in vehicle emissions for each model year;
- mandatory fuel standards that require suppliers to reduce the carbon intensity of the fuels they sell and provide credits for alternative fuels such as electricity and hydrogen; and
- funding and tax breaks to encourage ZEV and battery manufacturing plants to locate in Canada and for existing plants to re-tool.^{36,37}

More investments will be needed, along with a comprehensive set of supportive regulations and policies

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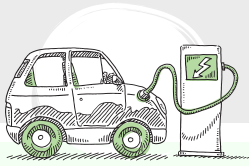
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Part of a series on improving public health, decreasing health inequities and addressing climate change.

