

EVs AND EV INFRASTRUCTURE

The electric-vehicle era is just getting rolling p. 18

The true cost of gas-powered medium- and heavy-duty vehicles p. 20

Driving down emissions with electric school buses p. 19

EV sales regulation sets Canadians up for failure p. 21

...and much more

Expanded electric capacity to handle EVs must be taken seriously, say experts

Annual increases in electricity demand from expanded use of EVs could require the equivalent of 10 new mega hydro dams or 13 large natural gas plants, according a recent Fraser Institute study.

BY JESSE CNOCKAERT

Measures by the federal government intended to electrify transportation will come with more pressure on the electric grid, leaving some experts questioning how well Canada will handle the increased energy demand.

"We certainly know that [electric vehicles], especially alongside other electrification ... they're all going to add to electricity demand," said Daniel Posen, an associate professor in the department of civil and mineral engineering at the University of Toronto. "I think one of the big challenges, of course, is that we don't know exactly yet ... what the charging behaviour is going to look like."

On Dec. 19, 2023, Environment Minister Steven Guilbeault (Laurier-Sainte-Marie, Que.) unveiled Canada's Electric Vehicle Availability Standard, intended to increase the supply of zero-emission vehicles (ZEVs) available across



UofT professor Daniel Posen says 'there are all sorts of regional demands to make sure that we don't have too much congestion on our transmission lines,' when it comes to the electrification of mobility. Photograph courtesy of Daniel Posen

the country. The standard sets a national target of 100 per cent zero-emission vehicle sales by 2035, with interim targets of at least 20 per cent of all sales by 2026, and at least 60 per cent by 2030.

Posen, who is also a Canada Research Chair in System-Scale Environmental Impacts of Energy and Transport Technologies, told *The Hill Times* that he regards the electric vehicle (EV) sales mandate as "generally positive," but added that the transition will be a big challenge because of the many different dimensions related to electric transportation.

Challenges include building enough charging stations, as well as ensuring "sufficient generation, but also sufficient capacity" to meet peak energy loads, according to Posen.

"[There is] winter versus summer demand. There are all sorts of regional demands to make sure that we don't have too much congestion on our transmission lines. There are just a lot of pieces to juggle," he said. "I think probably the bigger challenge is going to be peak capacity, rather than total energy needs."

Posen said that, for example, the increased electricity demand in Ontario for the transition to EVs could be between 50 to 100 per cent of current levels.

"I think that is manageable. It sounds like a lot, but it's probably a few per cent per year, which is not unheard of in the past. We just have to take it seriously," he said.

Posen added that EVs are better than using vehicles with internal-combustion engines when it comes to greenhouse gas emissions, but reducing overall driving, such as through public transit, is even better.

"We do have a pretty clean grid throughout most of the country. Your electric vehicle is going to do better; it's going to be better for climate change. It's going to be better for air quality, and so it's generally pushing us in the right direction," he said. "If we can do things like investing in more transit, walkable cities, and these kinds of things to reduce the amount of ... vehicle demand needed, that's always going to be better than driving more electric."

In a follow-up email on March 12, Posen said the "flip-side misconception" is to think the widespread use of EVs would be sufficient on its own to address climate change, which it will not.

"EVs are a big help, especially for greenhouse gas emissions and air quality, but we shouldn't rely on

them alone, because they are certainly not free from emissions or environmental harms; they're just better than most fossil-powered vehicles," he said in the emailed statement.

The requirement for all vehicle sales in Canada to be electric within 11 years could put a strain on the country's electricity grids, according to a study released on March 14 by the Fraser Institute, a Canadian public policy think tank.

The annual increases in electricity demand could range from 46.8 terawatt hours (or 7.5 per cent of total generation) to 95.1 terawatt hours (15.3 per cent), which would require the equivalent of 10 new mega hydro dams or 13 large natural gas plants, according to the study.

"Canadians need to know just how much additional electricity is going to be required in order to meet Ottawa's electric vehicle mandate, because its impact on the provinces—and taxpayers and ratepayers—will be significant," Cornelis van Kooten—the report's author, a Fraser Institute senior fellow, and professor of economics at the University of Victoria in British Columbia—said in a press release.

Vehicle owners are likely to get into the habit of recharging their EVs in the evening when they arrive home from work and keeping them plugged in overnight, similar to how they recharge their phones, and recharging batteries in the late afternoon or evening will lead to an increase in peak load, according to the study. Nuclear energy is cited by the study as among the most feasible and reliable clean energy options to handle the demand because "nuclear technology has constantly been improving and nuclear reactors are now safer than ever before."

"Unless society begins almost immediately to develop the required generating infrastructure, it will not be possible to meet the expected demand that EVs might pose for electricity grids in Canada," reads the Fraser Institute study. "That is, if governments continue to push for an all-electric vehicle fleet



A Tesla EV is plugged into a CAFU En-Charge mobile electric vehicle charging station on Sparks Street as part of a showcase of the Canadian Zero-Emissions Vehicle supply chain on Sept. 27, 2023. The Hill Times photograph by Andrew Meade



Environment Minister Steven Guilbeault says 'getting more electric vehicles on the road is another example of how we are taking climate action while helping make life more affordable.' The Hill Times photograph by Andrew Meade

Wind and solar power cannot serve as a baseload power source because of the intermittent availability of those sources, and stored hydroelectric capacity is determined by the capacity of the generating units and the height of the water in the reservoir behind the dam, which can fluctuate from year to year or season to season, according to the study.

"When the federal Electric Vehicle Availability Standard was announced, Environment Canada said in a press release that the government is "confident that the country's evolving electricity grid will be able to support the large increase in electric vehicles," adding that ZEVs are projected to account for about five per cent of total electricity demand in Canada in 2035, and 9.5 per cent in 2050.

A 2020 report commissioned by Natural Resources Canada said that the total annual load growth due to EV charging has the potential to be 20.4 terawatt hours (TWh) in Canada by 2030, 104 TWh by 2040, and 156.5 TWh in 2050. That forecasted ZEV load is equivalent to adding Ontario's 2019 annual electrical load to the national grid, according to the report.

Meena Bibra, senior policy adviser

for Clean Energy Canada, told *The Hill Times* that the 2050 deadline provides about 25 years to start planning for the increased demand.

"When we look at whose responsibility it is to really help with meeting some of these climate ambitions, EV sales targets, [and] charging infrastructure targets as well, everybody has to have hands on deck. It's not just the federal government," said Bibra. "The federal government has set these targets and is supporting them. They have spent nearly a billion-and-a-half dollars on charging infrastructure, but other public and private sector players also play a pretty important

role, and that includes car companies. Provincial governments can also offer their own financial rebates, whether it's EV rebates or public charging program rebates. This is really going to be a mixture of different actors that will make sure that we are reaching those sales targets and emissions targets that we need to get to."

Bibra argued that the EV sales mandate represents Canada "joining the pack," and referred to the United Kingdom, South Korea, and the European Union which all have similar emissions standards. The EU has set a standard that requires zero carbon dioxide emissions for

all new cars and vans from 2035 onwards.

The EV sales mandate in Canada will offer predictability, according to Bibra.

"One of the best things—and this is why the EV availability standard really is that last piece of the puzzle that will help ramp up adoption across Canada—it'll also help electric utilities and other charging infrastructure stakeholders make sure that they're prepared for EVs," she said. "When you know that 20 per cent of sales will have to be EVs in 2026, and that's going to go up to 100 per cent by 2035, that ... gives that market certainty and that investment certainty."



Meena Bibra, senior policy adviser for Clean Energy Canada, says 'when we look at whose responsibility it is to really help with meeting some of these climate ambitions, EV sales targets, [and] charging infrastructure targets as well, everybody has to have hands on deck.' Photograph courtesy of Meena Bibra

Kingston argued that using a sales mandate as a regulatory tool to get to 100 per cent EVs by 2035 is the wrong approach, and that the mandate "sets Canadians up for failure."

"We should not be dictating what vehicles Canadians can and can't buy. What we need to do is build out the ecosystem to support the transition to electric, and that's where we're falling short," he said.

To help Canadians purchase ZEVs, Ottawa has introduced programs, including an Incentives for Zero-Emission Vehicles program (iZEV) for light-duty vehicles that offers up to \$5,000 to individuals and businesses for the purchase or lease of light-duty ZEVs.

Kingston told *The Hill Times* that the iZEV program has been extremely popular, but said it is not a long-term help because it is set to expire on March 31, 2025, or end sooner if available funding is fully exhausted.

"We need to see a long-term commitment to this incentive program until the price gap between an electric vehicle and a gas-powered vehicle closes, and that's not going to happen overnight," said Kingston. "The industry's creating a North American EV battery supply chain as we speak, but that takes time, and that is costly. We need government to step up and do more at a federal level on incentives to address the affordability challenge."

Kingston also raised concerns that the needed charging infrastructure could be developed in time to accommodate the expanded number of EVs on the road.

"There are about 27,000 operational public chargers today, and according to the federal government we need 442,000 in 11 years,"

he said. "That requires building over 100 chargers every single day for the next decade. I don't see any path to that at the current pace of build out. I need to see a more clear, comprehensive plan with some urgency behind it to close that gap and make sure that we've got the charging network available to support a fully electric fleet, and as it stands today, I'm not convinced that that plan exists."

The EV availability standard is intended to include benefits such as channeling supply to Canadian markets instead of going abroad, and reducing customer wait times, according to an Environment Canada press release.

"Many Canadians are increasingly eager to make the switch to cleaner transportation, since it's a win-win-win in savings, their health, and the environment. Putting in place an Electric Vehicle Availability Standard fulfills a major climate commitment from our climate plan. Getting more electric vehicles on the road is another example of how we are taking climate action while helping make life more affordable. And our investments to position Canada as a significant player in the global electric vehicle manufacturing and battery supply chain shows how we are taking advantage of the economic opportunities provided by the emerging low-carbon economy," said Guilbeault in the press release.

Greig Mordue, a professor of engineering at McMaster University in Hamilton, Ont., and former general manager of Toyota Motor Man-

ufacturing Canada, told *The Hill Times* that Ottawa has "completely overspent for the electrification of mobility," in terms of the automotive manufacturing industry.

"We're prepared too early. That seems counterintuitive, but the reality is we are prepared and spending for an electric vehicle transition that is going to happen several years from now," he said.

The American Inflation Reduction Act (IRA) was introduced in August 2022, and included hundreds of billions of dollars in new spending and tax breaks to encourage clean energy industries in the United States.

Mordue argued that investments intended to attract EV manufacturing plants to Canada could have been significantly lower if Ottawa had waited until closer to 2032, when the IRA tax credits are set to phase out.

"Remember, about 10 per cent of the North American market is electric vehicles right now, which means 90 per cent of the market is internal-combustion-engine vehicles," he said. "We don't want to have 90 per cent of our plants scrambling around for 10 per cent of the market. We should have waited, and if we would have waited, we would have got closer to the end of the Inflation Reduction Act and the plants that we paid \$50-billion for ... we probably could have got for a fraction of that, and we would have been more aligned with what's happening in the market."

jcnockaert@hilltimes.com
The Hill Times

ufacturing Canada, told *The Hill Times* that Ottawa has "completely overspent for the electrification of mobility," in terms of the automotive manufacturing industry.

"We're prepared too early. That seems counterintuitive, but the reality is we are prepared and spending for an electric vehicle transition that is going to happen several years from now," he said.

The American Inflation Reduction Act (IRA) was introduced in August 2022, and included hundreds of billions of dollars in new spending and tax breaks to encourage clean energy industries in the United States.

Mordue argued that investments intended to attract EV manufacturing plants to Canada could have been significantly lower if Ottawa had waited until closer to 2032, when the IRA tax credits are set to phase out.

"Remember, about 10 per cent of the North American market is electric vehicles right now, which means 90 per cent of the market is internal-combustion-engine vehicles," he said. "We don't want to have 90 per cent of our plants scrambling around for 10 per cent of the market. We should have waited, and if we would have waited, we would have got closer to the end of the Inflation Reduction Act and the plants that we paid \$50-billion for ... we probably could have got for a fraction of that, and we would have been more aligned with what's happening in the market."

jcnockaert@hilltimes.com
The Hill Times

Electric vehicle (EV) statistics

- In 2022, global EV sales represented 14 per cent of all vehicles sold, marking a substantial increase from the nine per cent market share in 2021.
- This rise, led by China and Europe, contributed to a total of more than 26 million EVs on roads, with battery electric vehicles (BEVs) driving about 70 per cent of this growth.
- Quebec, Ontario, British Columbia, and the territories have led in ZEV representation in recent years, accounting for 92.2 per cent of new ZEV registrations in Canada from 2018-2022.
- In 2017, zero-emission vehicles represented one per cent of new Canadian vehicle registrations, growing by more than tenfold to 10.3 per cent through the first three quarters of 2023.
- While some provinces are plateauing in residential energy demand, B.C. experienced consistent growth from 69,962 terajoules in 2018, to 78,082 terajoules in 2022. In 2018, ZEVs represented 0.5 per cent (14,773 vehicles) of registered light-duty vehicles on B.C. roads, growing to 2.8 per cent (91,528 vehicles) in 2022.
- However, Alberta—which demonstrated the second-largest percentage increase from 2018-2022 in residential energy demand—appeared in the lower end provincially, with ZEVs representing 0.3 per cent of total light-duty vehicle registrations, growing by more

—Source: Watt's up? Electric Vehicles and future electricity generation needs, released by Statistics Canada on Jan. 30, 2024

EVs and EV Infrastructure Policy Briefing



In Canada, one-in-nine new car sales registered in 2023 were either battery electric or a plug-in hybrid, and the number of ZEVs sold increased by almost 50 per cent compared to 2022, writes Liberal MP Adam van Koeverden. *The Hill Times* photograph by Andrew Meade

The electric-vehicle era is just getting rolling

Canada is going electric by producing critical minerals and cutting-edge batteries, re-tooling passenger vehicle plants, manufacturing electric vehicles, and much more.

Liberal MP Adam van Koeverden



Opinion

More well-paying jobs for Canadians. Lower fuel and maintenance costs. More options and availability, increasing charging stations, falling sticker prices, better air quality. A major win in the fight against climate change.

The shift to electric vehicles (EVs) will benefit all of Canada: our economy, environment, health, and well-being.

My EV has more than 50,000 km on it, and there is definitely

no turning back for me. It's a better car, an enhanced driving experience, cleaner, greener, and more efficient. It's also way more convenient—I spend less time fuelling up since I charge overnight at home, and it doesn't require oil changes as the only liquid it uses is windshield washer fluid.

My commutes to Ottawa include a civilized 40-minute breakfast and email stop around a Kingston, Ont., fast charger. Overall, zero-emission vehicles are a big upgrade to the way we get around.

By producing critical minerals and cutting-edge batteries here in Canada; re-tooling passenger vehicle plants; manufacturing electric buses, vans, and trucks; developing hydrogen technology; and rapidly expanding our national network of electric charging stations, this country is going electric.

Canadian household finances, our workers, and the health of our downtown communities and heavy traffic corridors all stand to benefit.

More and more Canadians, including my neighbours in Milton, Ont., are discovering the many benefits of zero-emission vehicle (ZEV) ownership. Down in Oakville, Ont., the Ford Motor Company is preparing and retool-

ing to become a "high-volume" EV manufacturing hub.

More than 50 models of ZEVs were available in Canada last year, with many more expected in 2024. Perhaps the best news is that prices have started to fall, there are more used EVs available, battery costs are decreasing, and automakers are bringing more compact vehicles to market. Chargers are popping up everywhere due to government programs, private sector efforts, and consumer demand.

In 2023, global sales of electric cars reached around 14 million, meaning almost one-in-five cars sold was electric. In Canada, one-in-nine new car sales registered in 2023 were either battery electric or a plug-in hybrid, and the number of ZEVs sold increased by almost 50 per cent compared to 2022. Meanwhile in Norway, which is a few years ahead of us, more than 82 per cent of new car sales in 2023 were ZEVs.

Recently a United States study found that the switch to zero-emission vehicles will have a dramatic reduction in the amount of childhood asthma in neighbourhoods near heavy traffic corridors.

But I still hear concerns about long wait times to get a new zero-emission vehicle, and the need for more charging stations.

As an Olympic kayaker, I know the importance of everyone paddling in the same direction. That's why our government is building more charging stations, supporting made-in-Canada manufacturing of vehicles and batteries, and ensuring Canadians have market access to the new vehicles they want and need. But every level of government needs to get on board; British Columbia and Quebec outpace the rest of the country in terms of sales and infrastructure thanks to provincial government support. Towns and cities with more charging infrastructure have better uptake as well.

Our government's Electric Vehicle Availability Standard is driving Canada towards our goal of all new light-duty vehicle sales in Canada being electric or plug-in hybrids by 2035. The first interim goal of 20 per cent by 2026 is essential to grow the sector, satisfy consumer demand, and meet our emissions reduction targets.

Canada's total GHG emissions have already declined by seven per cent since 2015, but meeting our 2030 targets depends on ramping up the sale and use of zero-emission vehicles. The Electric Vehicle Availability Standard will help drive that momentum.

All of these ambitions include plug-in hybrids that allow drivers to make short trips running on electricity and only use fossil fuels when towing or on a longer road trip in the winter. These are perfect for Canadians still hesitant about making the switch to an all-electric model, and the technology is perfect for trucks and delivery vehicles. Having an electric-only driving option for shorter trips is like diversifying your fuel-option portfolio.

Combined with federal investments in public transit systems, clean fuel regulations, and federal support for cycling and walking paths, Canada is lowering emissions from its transportation sector.

That's a big win for Canada. We've always been global leaders, punching well above our weight with respect to our innovation, economy, and environmental stewardship. That will continue as we electrify our transportation sector—gold medals for our planet, people, and pocketbooks.

Adam van Koeverden is the Liberal Member of Parliament for Milton, Ont., and is the parliamentary secretary to the minister of sport, and the parliamentary secretary to the minister of the environment and climate change. He is known for his dedication to public service and sports excellence. Van Koeverden is a celebrated Olympic kayaker who has represented Canada at four Olympics winning one gold medal, two silver, and a bronze. He is a first-generation Canadian, and grew up at Chautauqua Co-op in North Oakville, Ont.

The Hill Times

Driving down emissions with electric school buses

Transitioning to cleaner alternatives such as electric school buses would mean cutting out more than four million tons of carbon dioxide from our emissions every year.

NDP MP
Laurel Collins

Opinion



Every day, more than two million children in Canada take the bus to go to school—that's 51,000 school buses. These buses emit unnecessary, yet dangerous, amounts of carbon into the atmosphere, affecting our children's health and well-being, as well as our environment.

Solutions exist, but we need a government that's willing to take bold steps to drive down emissions. An electric school bus program would go a long way in achieving this. The switch from diesel-run school buses to electric would not only reduce carbon emissions, but it would also keep our kids and our environment healthy.

Toxic emissions from diesel and gas-powered vehicles greatly affect the air quality that we're breathing in our cities. Health experts warn us that exhaust from school-bus engines can lead to negative health impacts. In fact, children are much more likely than adults to be affected by breathing in polluted air, and are at higher risk of developing asthma and other lung complications if they are often exposed to traffic exhaust.

Every day, diesel-powered school buses are releasing significant amounts of particulate matter into the air, and our government isn't doing enough to address the issue.

The reality is that transportation currently makes up nearly a quarter of all greenhouse gas emissions in Canada. When it comes to decreasing those emissions, we need to tackle the problem from multiple angles. Transitioning to cleaner alternatives such as electric school buses would mean cutting out more than four million tons of carbon dioxide from our emissions every year. If the Liberal government wants an easy solution to tackle carbon emissions, then an electric school bus program is a major first step to take.

Canada's 2030 Emissions Reduction Plan has set a goal to reduce greenhouse gas emissions by 40 to 45 per cent below 2005 levels by

2030. To achieve this, it aims for 35 per cent of medium- and heavy-duty vehicle sales to be zero-emission vehicles by 2030. This should include school buses, but the Liberals have shown no signs of including them in any of their emission-reduction strategies.

The upfront cost of transitioning to an electric school bus fleet across the country is worthwhile when considering the long-term impacts. While we would undeniably be reducing our emissions, which is already worth the cost, electric vehicles have a lower maintenance and operating cost than traditional diesel engines. Furthermore, school districts would be able to save money on the gas to run the buses. And, most importantly, replacing one diesel school bus with an electric school bus can save \$11,800 in health costs related to diesel pollution. When you think about the 51,000 buses being used every day, that number is substantial.

Our world is changing so quickly. But that's a good thing. To fulfill our international commitments, Canada must rapidly reduce our emissions, but under the Liberals, Canada isn't on track to meet emission targets and we have the worst climate track record in the G7. And with the Conservatives, there's no talk of solutions because they're still debating if climate change is real or not.

Our children deserve a healthier and cleaner future, and that starts with electrifying school buses—an achievable policy if the federal government stepped up and committed funding. Solutions like electrifying school buses mean that our cities can be cleaner, our environment healthier, and our quality of life better.

In an era in which technological advancements are rapid and constantly changing, the transition to electric school buses shouldn't be a difficult switch. The integration of cutting-edge battery technology and improvements in charging infrastructure is making electric buses more efficient and accessible. By investing in this transition, Canada would not only address the immediate environmental concerns, but also position itself at the forefront of innovation in sustainable transportation.

The urgency to fulfill our environmental commitments is increasing every day. The rapid pace of change demands bold solutions, not more Liberal broken promises and delays, or Conservative denialism of the problem.

Electrifying school buses stands out as a tangible and impactful step. It's an investment not just in transportation, but also in the well-being of our communities and the future of our children. By embracing this shift, we pave the way for a cleaner, greener, and more sustainable Canada.

NDP MP Laurel Collins, who represents Victoria, B.C., is her party's environment and climate change critic, as well as the deputy critic for families, children and social development.

The Hill Times

Canada has all the resources and tools we need to benefit from a clean and green economy



To be competitive, we need to be able to use our grid like a battery, and all Canadians should be encouraged to install renewable energy systems, writes Elizabeth May. Pexels photograph by Gustavo Fring

We only lack the political will to remove jurisdictional obstacles that hold us back from ensuring that Canada's electricity grid is smart and integrated.

Green Party Leader
Elizabeth May

Opinion



In seeking transformational climate solutions, Saul Griffith's 2022 book title says it all: *Electrify: An Optimist's Playbook for Our Clean Energy Future*.

We have known this for decades. Back in October 2002, when I was executive director of the Sierra Club of Canada, we teamed up with the David Suzuki Foundation and Climate Action Network for a groundbreaking report, *Kyoto and Beyond*. Our legally binding target was to reduce greenhouse gas emissions six per cent below 1990 levels, and to have achieved it between 2008 and 2012. Then-prime minister Stephen Harper cancelled that commitment without regard to our international reputation for honouring a legally binding treaty. As soon as permitted under Kyoto, he legally withdrew us from the protocol—the only nation to have done so.

Kyoto and Beyond showed in detail how we could deliver on those emissions cuts. The research by energy analysts Torrie Smith Associates demonstrated that over the previous two decades, without really trying, Canada had delivered enormous

gains in energy productivity. In other words, our economy benefited from doing more with less. Looking to deliver on Kyoto, it was all within reach. The bottom line was that without building a single new mega dam or nuclear power plant, our existing electrical system could be more efficient and deliver on climate commitments while boosting the economy. The only needed investments were in modernizing and ensuring the connectivity of our national grid.

Here we are two decades later, and not yet near our 2012 target. But the world is moving toward those 2002 recommendations. The COP28 global stocktake calls on all governments to double domestic energy efficiency and to triple renewable energy installations—and do both by 2030.

Where in these goals does the Liberal target for electric vehicles (EVs) fit? They are totally consistent, but insufficient, primarily from an equity standpoint. All Canadians deserve to have access to affordable, sustainable, and secure ground transit systems. It is a key call for justice from the Inquiry into Missing and Murdered Indigenous Women and Girls and 2S+ peoples. Canadians, no matter where we live—whether in urban centres or in rural and remote areas—should be within walking distance of safe public transit. Ideally, we need a multi-modal and interconnected system of buses and trains. Those systems should be electric. But they should not be modelled on the car culture of the privately owned car.

It is increasingly clear that the overarching status of the personal automobile in urban planning for roads and parking lots is a prime occupier of valuable surface area that could support emergency housing. We need not replicate car culture as we move to EVs and self-driving vehicles.

As for needed infrastructure for EVs, we need not overbuild. For most homeowners

Continued on page 20

EVs and EV Infrastructure Policy Briefing

The true cost of gas-powered medium- and heavy-duty vehicles

Diesel-powered MHDVs are a disproportionately large contributor to traffic-related air pollution, which contributes to 1,200 premature deaths annually.

Adam Thorn
& Sarah
Butson

Opinion



According to a 2023 poll conducted by Abacus Data for the Canadian Lung Association, 79 per cent of respondents are concerned about the effect of traffic emissions on air quality, write Adam Thorn and Sarah Butson. *Pexels photograph by Towfiq Barbhuiya*

Operators of medium- and heavy-duty vehicle (MHDV) fleets frequently cite cost as one of the single biggest impediments to purchasing battery-electric trucks to replace gas- or diesel-powered ones. But the sticker price of a fossil-fuelled vehicle doesn't reflect its true cost. We urge the Government of Canada to consider the embedded costs to our health-care system, our environment, and the well-being of Canadians, and to implement policies that will accelerate the transition to low-carbon road freight.

Diesel-powered MHDVs are a disproportionately large contributor to traffic-related air pollution (TRAP). According to Health Canada, TRAP contributes to 1,200 premature deaths, 210,000 asthma symptom days, and 2.7 million acute respiratory symptom days every year. The four-in-10 Canadians who live within 250 metres of a high-traffic roadway are especially vulnerable. And children whose lungs and brains are still developing are at even greater risk. Forty-eight per cent of schools are located within 200 metres of areas that experience

high traffic volumes, and approximately 2.2 million children in Canada travel on school buses every day, 70 per cent of which are diesel-fuelled. A known carcinogen, diesel exhaust contains a mixture of toxic particles that are small enough to be inhaled deep into the lungs. Health risks range from throat and lung irritation, wheezing, and coughing, to impaired cardiac function, and lung, breast, and bladder cancer. Exposure to diesel exhaust has been linked to the development and worsening of asthma symptoms, behavioural and neurologi-

cal problems, and even childhood leukemia.

The Government of Canada has already begun a push towards the electrification of MHDVs. Since July 2022, the federal government has offered purchase incentives to encourage uptake. In December of 2022, Transport Canada unveiled Canada's Action Plan for Clean On-Road Transportation to boost the number of zero-emission MHDVs available for sale. Last August, the government invested \$3-million in the Zero-Emission Trucking Program to encourage sector-wide read-

iness for transitioning to clean transportation.

But it's time for more action, and the Canadian public agrees.

According to a 2023 poll conducted by Abacus Data for the Canadian Lung Association, 79 per cent of respondents are concerned about the effect of traffic emissions on air quality, and 83 per cent support the electrification of school buses. Eighty-two per cent support regulations that require auto makers and importers to sell zero-emission MHDVs as an increasing percentage of their total sales until all new trucks and buses sold are emission-free models by 2040.

It's time that we reframe concerns about the upfront expense of purchasing an MHDV. Instead of posing the issue as a matter of *price*, it should be framed as a matter of *cost*. We must consider the costs of conventional road freight over its lifespan, as well as the costs of TRAP-related diseases and health issues. And this cost is not insignificant. The Atmospheric Fund has calculated that Canada's proposed federal zero-emission vehicles regulation will result in more than \$90-billion in health savings over the next 25 years, including up to 11,000 avoided premature deaths.

This reframing will not happen organically. The federal government must advance the electrification of MHDVs through implementing policies and regulations (including a progressive sales standard) that accelerate the replacement of internal-combustion MHDVs with low-carbon ones. Given the host of benefits that accompany a switch to zero-carbon road transport, and the urgency of the climate crisis, there is little time to lose. Stronger regulations to speed up the transition to emission-free vehicles is vital to reducing the negative health impacts of fossil-fueled MHDVs and ensuring a climate-safe future for all Canadians.

Adam Thorn is the director of the Pembina Institute's transportation program. Sarah Butson is the incoming CEO of the Canadian Lung Association.

The Hill Times

Canada has all the resources and tools we need to benefit from a clean and green economy

Continued from page 19

ers, it is convenient and affordable to install a home energy charger. For plug-in hybrids, it is easy to use an extension cord to any three-prong utility plug.

The claims I hear repeated in the House from rural MPs that EVs will not work because the charging stations have not yet been installed in their area are laughable. Anyone living in a

rural area with an electric vehicle already knows how much money they save just plugging in their car to standard outdoor plugs. None of this is complicated.

Where it does get complicated is in ensuring that Canada's electricity grid is smart and integrated between and among provincial jurisdictions.

We are less connected with each other than the separate sovereign nations of the Europe-

an Union are. We need a full-court press for co-operation to enhance the grid. If the EU can be described as having a "smart grid," we have a really stupid one. Yet, to be competitive we need to be able to use our grid like a battery. Wherever you are in Canada, everyone should be encouraged to install renewable energy systems, generate electricity when the sun is shining and the wind is blowing, and feed electricity

production in excess of domestic requirements into the grid.

When the wind is not blowing and the sun is not shining, every Canadian should be able to pull electricity from that grid. Across the pond, separate nation states have it figured out. Denmark sells its excess wind-generated electricity by underwater cable to Norway. Norway's elegant electricity "battery" is in "pumped storage." The Danish

wind-generated power pumps water from lower elevations into reservoirs at higher levels. When Norway needs more electricity, it opens the floodgates in those reservoirs to generate hydro power. The released water awaits wind-generated electricity to pump it back to higher elevations and future recycled hydro power in Norway.

The technology is elegant, simple, and clean. And it meets another COP28 goal: the move toward a circular economy.

Canada has all the resources and tools we need to benefit from a clean and green economy. We only lack the political will to remove jurisdictional obstacles that hold us back. We owe it to Canadians to think—and act—like a country.

Elizabeth May is the Green Party Leader and MP for Saanich-Gulf Islands, B.C.

The Hill Times

Policy Briefing **EVs and EV Infrastructure**

Charging, range anxiety, and price still barriers to mass EV adoption—but there are potential solutions

The things holding back a lot of people from taking the EV plunge are a mix of real problems and lingering myths.

Kristine D'Arbelles

Opinion



Electric vehicle sales in Canada have grown tremendously in the last couple of years to the point where they have burst through 10 per cent of new vehicle purchases. But there's lingering doubt whether this rate of growth will continue or if we could be coming to the end of the first great boom in EV sales.

The things holding back a lot of people from taking the EV plunge are a mix of real problems and lingering myths. It's a fact that four-in-10 Canadians buy used vehicles, and that market is in its infancy for EVs. It's a fact that most Canadians buy pickups and SUVs, two categories in which EVs are just



Although the satisfaction rates among EV drivers are extremely high, if we want to get to mass adoption, we need to take a real hard look at our public charging infrastructure, writes Kristine D'Arbelles. *Unsplash photograph by Zaptec*

starting to make their mark. And it's a fact that the average new EV is at a higher price point than an equivalent internal-combustion vehicle—a gap in pricing that may not lessen in the short term, as government incentives appear to be melting away, with Quebec being the latest to announce plans to phase them out.

But there are some more positive facts as well: both the range of models available and the used market will continue to grow. So, to a certain extent, the market will take care of some of the reasons people hold back.

Meanwhile, according to the Canadian Automobile Association's (CAA) recent survey of 16,000 EV drivers in Canada, satisfaction rates among EV drivers are extremely high. An overwhelming majority (97 per cent) say they

will purchase another EV when it comes time to replace their existing one. To buy one is to love them, despite some of the obstacles.

Nevertheless, there are a couple of key barriers outside the auto market itself that need to be addressed, as CAA research has shown.

Range anxiety is still a top barrier, only behind price. The reality is that the average Canadian drives about 40 kilometres a day, making it highly unlikely they will run out of charge on the side of the road. But this myth persists, and our research shows that more than half of Canadians say they won't purchase an EV because they worry about the vehicle's range.

This ongoing range anxiety goes beyond just the everyday drive. Two-thirds of Canadians say they won't purchase an EV

because driving range is limited on road trips. This is a more valid worry, as the charging network gets sparse once you are out of the big cities and major highway corridors. Even EV owners don't trust the out-of-town network: more than two-thirds in our survey still own an internal-combustion engine vehicle, and more than a third of them say they prefer taking their gas vehicle on long road trips.

If we want to get to mass adoption, we need to take a real hard look at our public charging infrastructure. More than one-in-four EV owners in Canada rated their satisfaction with charger reliability, location convenience, and speed of charger negatively. Our country is good at installing chargers, but not so good at maintaining them. It is important that governments require organizations who install chargers to provide a maintenance plan if they want to qualify for funding. There are too many stories of broken chargers.

We believe clear and fair labelling of EV range is also crucial in building up confidence. We live in a winter country, and while studies on cold-weather performance of EVs vary, they all agree that an EV battery loses range in the cold. And yet, auto manufacturers only publish an average driving range

for their vehicles, despite the fact EVs can lose up to 40 per cent of their range in the cold.

These labels also need to be prominent. More than half of Canadians are not even aware that new EVs must display even the average driving range on their window sticker. And those averages come from American work from the Environmental Protection Agency. CAA believes this work should be done in Canada, under Canadian conditions, by a neutral third party such as the government.

Honest, apples-to-apples figures will lead to greater consumer confidence, and fewer myths.

EVs are an important part of the future. With an increased focus on getting public charging right and clear labelling of EV range, we can help increase the confidence drivers have in making the switch.

Kristine D'Arbelles is the senior director, public affairs for Canadian Automobile Association (CAA) National. She strategically manages and executes communications initiatives and programs on CAA's five pillars: road safety, environment, mobility, infrastructure, and consumer protection. D'Arbelles has been one of the lead spokespersons on CAA National's research on EVs in Canada.

The Hill Times

EV sales regulation sets Canadians up for failure

Instead of regulating what vehicles Canadians buy, time and resources would be better spent regulating the availability and reliability of Canada's charging network.

Brian Kingston

Opinion



The ink is barely dry on the federal government's electric vehicle (EV) sales mandate and there are already signs that the regulated sales targets are out of reach. Without stronger efforts to address the barriers facing

Canadians who want to switch to electric—namely affordability and charging infrastructure—the regulations are designed to fail.

The sales mandate dictates what vehicles Canadians can and can't buy, with a requirement for 100 per cent EV sales by 2035. With only 11 years to increase EV sales from 11 per cent of light-duty vehicle sales in 2023 to 100 per cent, a serious plan is required to not only address the well-known barriers to widespread EV adoption in Canada, but also to ensure a successful transition for the automakers that have invested in Canada.

According to the federal government's own analysis of the regulation, the sales mandate will have a disproportionate and negative impact on low-income, rural, and northern Canadians. This is due primarily to the higher costs of EVs and a lack of charging infrastructure options at home and in public places.

The average transaction price for an EV today is approximately \$14,000 higher than the average price of a vehicle powered by an

internal-combustion engine. While that price gap is expected to close over the next decade, stronger consumer purchase supports are required if sales are going to reach the mandated target levels.

The federal government's consumer incentives for Zero-Emission Vehicles program offers Canadians up to \$5,000 when they purchase an EV. The program has been hugely successful, rebates totalled \$712.6-million last year. At the current pace, the program will be out of funds well before the first mandated sales target of 20 per cent EV sales in 2026. Budget 2024 should recapitalize the program and increase the size of the incentive if the sales targets are to be realized.

But solving the affordability challenge is relatively straightforward compared to the bigger barrier: a lack of convenient charging infrastructure. A recent survey of EV drivers by Pollution Probe found that most drivers are not satisfied with the existing public charging network. Even in Quebec, the province with the

best charging network in Canada, just 40 per cent of EV drivers reported satisfaction with charger availability.

The federal environment and sustainable development commissioner underlined Canada's charging infrastructure challenges, noting in a 2023 report that "if the number of charging ports does not keep pace with the zero-emission vehicle sales targets, there is a risk that these targets will be unachievable."

With only 27,000 operational public chargers of a required minimum of 442,000 chargers, there is no path to 100 per cent ZEV sales. Closing the charging gap requires more than 100 public chargers to be built every single day for the next 11 years.

Even more concerning is the survey findings on charger reliability. Nearly 20 per cent of EV drivers in Quebec and up to 44 per cent in other provinces reported experiencing outages. Imagine half of the population reporting gas station outages.

The unreliability of Canada's charging infrastructure is simply unacceptable. Instead of regulating what vehicles Canadians buy, time and resources would be better spent regulating the availability and reliability of Canada's charging network. The European Union and United States understand this and have developed charging coverage and reliability standards. Canada must follow suit.

Failing to address these barriers to EV adoption, while simultaneously mandating sales, will leave Canadians at the curb. Transitions to new technology require industry and government to work together on solutions. An honest conversation about barriers to success and how to manage this transition considering those is long overdue. Without it, we risk not just losing ground on the transition, but losing jobs in the process.

Brian Kingston is president and chief executive officer of the Canadian Vehicle Manufacturers' Association.

The Hill Times

EVs and EV Infrastructure Policy Briefing



The good news is that national registrations of zero-emission vehicles reached 11.7 per cent of new vehicle registrations in 2023, up from 8.9 per cent in 2022, writes David Adams. *The Hill Times* photograph by Andrew Meade

Will we beat the clock to achieve our zero-emission vehicle adoption goals?

All of us are in uncharted territory, but the known obstacles represent some real challenges to hitting the zero-emission vehicle targets.

David Adams

Opinion



From the point of view of the automotive industry, the more relevant question is: will we beat the clock in achieving our sectoral greenhouse gas emission reduction goals? However, that ship has sailed with the federal government passing its national zero-emission vehicle (ZEV) mandate regulation late last year,

packaged in a more voter friendly wrapper as the Electric Vehicle Availability Standard (EVSA).

Government and industry are now collectively focused on technology adoption as opposed to GHG emissions reduction, and—let's be clear—one is not a proxy for the other. The other reality is that those two parties—the regulator and the regulated—are largely dependent on a third party: Canadian consumers, who through their choice of vehicle that meets their personal utility, lifestyle, and affordability needs, will determine if we hit the ZEV targets under the EVSA of 20 per cent in 2026, 60 per cent in 2030, and 100 per cent in 2035. So, the obvious questions are: where do we sit right now with respect to ZEV adoption, and what's it going to take to give us any hope of being able to achieve those targets?

On the first question, the good news is that according to S&P Global, national registrations of zero-emission vehicles reached 11.7 per cent of new vehicle registrations in 2023, up from 8.9 per cent in 2022, with pure battery electric vehicles making up 8.8 per cent of those registrations

(versus seven per cent in 2022), while plug-in hybrid electric vehicles comprised 2.8 per cent of total registrations (versus 1.9 per cent in 2022). However, 11.7 per cent—while fantastic—is a long way from the almost double 20 per cent that will be required in 2026, and before we start thinking that that's still almost two years away, remember that automakers will be introducing some 2026 models in January 2025, or nine months from now.

According to S&P Global, back in April of last year, the forecast was for 2023 to end up with ZEVs reaching 12.8 per cent of new registrations, which we didn't quite achieve and the number they forecast almost a year ago for 2024 was 17.3 per cent. If that forecast persists, then getting to 20 per cent by 2026 looks achievable.

With respect to the second question of what it's going to take to give us any hope of being able to hit those targets, I'd highlight that there are some key obstacles in the way of hitting the S&P target for this year and next, and the 20 per cent for 2026 when the mandate kicks in, as well as the

remaining mandate targets. These obstacles, in no particular order, are: how adoption is actually occurring, the old chestnuts of vehicle price and lack of sufficient charging infrastructure, mortgage renewals in Canada, and continued reliance on public incentives.

Touching briefly on each of these obstacles, with respect to adoption we need to understand that we are likely through or almost through the early adopters, so new ZEV consumers are going to require more education and convincing to make the shift, and this adoption curve moving forward will be lumpy, not smooth.

Regarding price, the federal government noted in its own regulatory impact statement issued along with the Electric Vehicle Availability Standard last year that it did not expect price parity with internal-combustion-engine vehicles until beyond 2035 in most segments. This represents a real challenge, and Quebec recently added insult to injury by announcing in its 2024 budget the phasing out of its ZEV incentive, which will likely significantly impact sales in the price-sensitive province.

With respect to charging infrastructure, our deficit there has been well documented and will continue to give consumers cause to reconsider whether the ecosystem can support their driving habits, regardless of how much they may wish to move to an EV. We are woefully behind where we need to be, but the real issue is ensuring that consumers can charge their vehicle where they live, and we have a herculean challenge to retrofit multi-unit residential buildings.

A less-obvious obstacle is the fact that last fall, the Canada Mortgage and Housing Corporation forecast that 2.2 million Canadians will be renewing their mortgage over the next two years and can expect a 30-40 per cent increase in their mortgage payments. Homeowners are also those well-enough heeled to afford relatively expensive ZEVs, so their budgets are going to be squeezed in a big way. This sleeper obstacle may become one of the more significant issues we need to overcome to attempt to hit our targets.

All of us are learning and are in uncharted territory, but the known obstacles represent some real challenges to hitting the ZEV targets, never mind the black swans that invariably appear and upset the apple cart. In the end, it will still all come down to the consumer.

David Adams is president and CEO of Global Automakers of Canada. Global Automakers of Canada members include 15 of the world's most prestigious auto manufacturers representing over 25 brands in the Canadian marketplace, as well as Canada's two largest vehicle producers, Toyota and Honda.

The Hill Times