



Priority Policies for the Advancement of Transportation Electrification in Canada

2024 Pre-budget Recommendations

By Electric Mobility Canada - Mobilité Électrique Canada

August 4th, 2023

About Electric Mobility Canada

Founded in 2006, Electric Mobility Canada is a national membership-based industry association dedicated exclusively to the advancement of electric mobility as an opportunity to fight climate change and air pollution while supporting the Canadian economy.

EMC is one of the very first organizations dedicated to electric mobility in the world.

EMC has a wide range of member organizations including, light, medium, heavy-duty, and off-road vehicle manufacturers, infrastructure providers, utilities, tech companies, mining companies, research centers, governmental departments, cities, universities, fleet managers, unions, environmental NGOs, and EV owners' groups.

EMC's mission is to enable and accelerate the transition to sustainable electric mobility in Canada through advocacy, collaboration, education, and thought leadership, with the end goal of creating a cleaner, healthier, and more prosperous future for all Canadians.

Electric Mobility Canada supports the activities of its members by:

- Communicating legislative, policy, technical and operational matters of key interest pertaining to electric mobility to our membership. This includes identifying the actions required to meet the needs of the members and proactively communicating these needs to policy makers and other stakeholders.
- Establishing partnerships to accelerate the adoption of electric mobility through research, demonstration projects, policies, programs, and strategies to increase market penetration.
- Acting as a resource center for relevant and contemporary information on electric mobility from across Canada and around the globe.

*Electric Mobility Canada is the unifying and authoritative voice for the
Transition to electric mobility across Canada.*



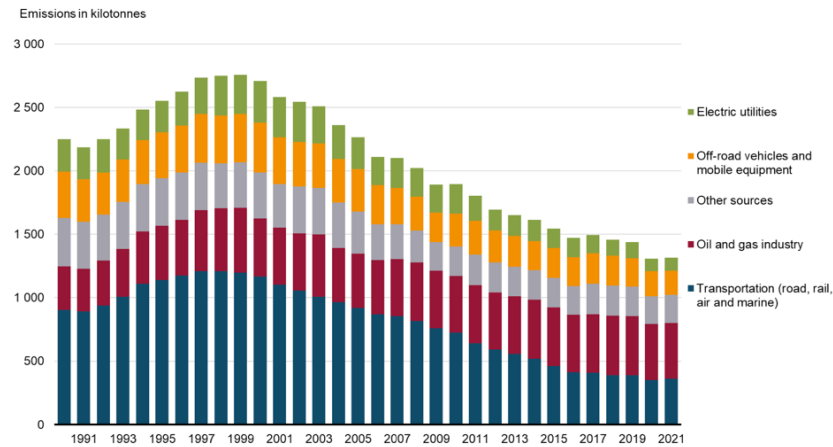
Preface

There are three main reasons to support electric mobility.

A. Air pollution & health

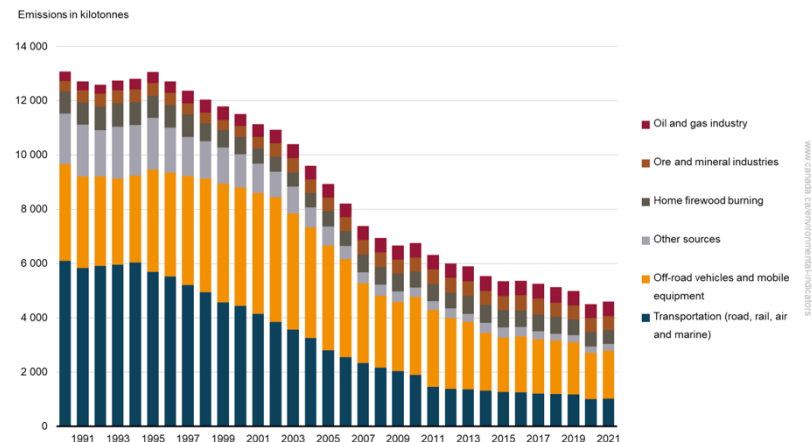
- a) According to the 2021 Health Canada report¹:
 - 15,300 deaths per year can be attributed to air pollution in Canada
 - \$120 billion a year is the total annual economic cost of health outcomes associated with air pollution
- b) According to a 2023 ECCC report on air pollutant emissions²:
 NOx: The oil and gas industry and the transportation sectors both represented 28% of Canada's 2021 NOx for a total of 56% of national NOx emissions.

Figure 7. Total nitrogen oxide emissions by source, Canada, 1990 to 2021



CO: In 2021, transportation, and off-road vehicles and mobile equipment were the two most important sources of CO. These sources combined represented 61% (2 780 kt) of national emissions.

Figure 16. Total carbon monoxide emissions by source, Canada, 1990 to 2021

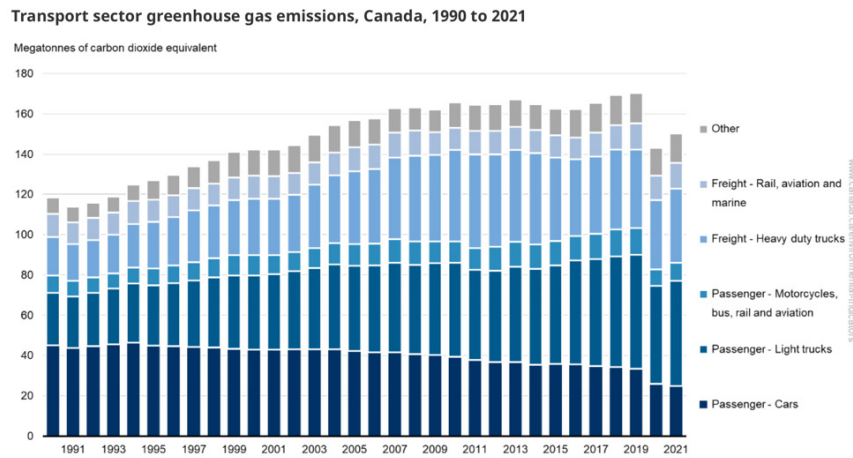


B. Climate change

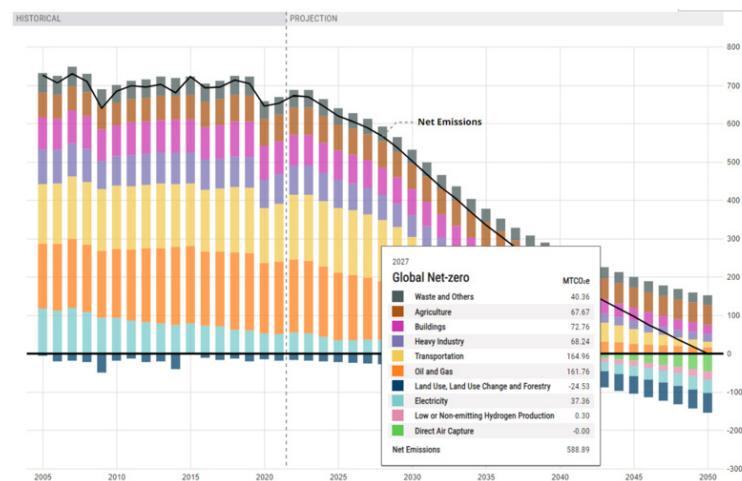
Since April 2021, Canada has a new more ambitious GHG emission reduction target for 2030: -40% to -45% compared to 2005 level. Between 1990 and 2021³, part of the GHG emissions increase was due to a higher number of vehicles on the road and to changes in vehicle type used. Although total emissions from passenger transport grew by 8%, emissions from cars declined by 45%, while emissions from light trucks (including trucks, vans, and sport utility vehicles) *doubled*. Emissions from freight travel grew by 62% between 1990 and 2021. Specifically, emissions from freight heavy-duty trucks almost doubled and emissions from other modes of freight transport increased by 13%.

Between 2005 and 2021, GHG emissions from:

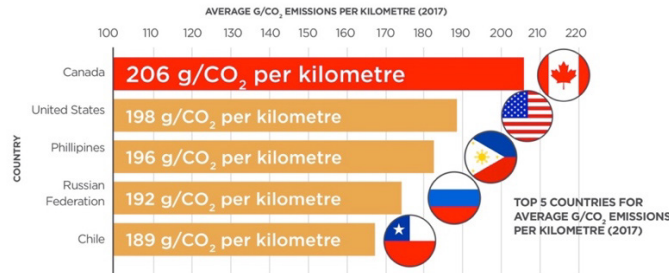
- Passenger cars (-40%) and passenger light trucks (+23%) decreased by a combined total of 9%. We expect that as people go back to a post-COVID economy and commutes, GHG emissions from the light-duty vehicle sector will increase again in the short term.
- Heavy-duty freight trucks increased by 2%.



According to the Canada Energy Regulator⁴, under a global net-zero scenario, GHG emissions from transport in Canada are on their way to become the #1 source of GHG emissions, overtaking oil & gas GHG emissions by 2027.



According to 2019 report from the International Energy Agency⁵, Canada's Light Duty passenger fleet is the #1 in the world for GHG emissions per kilometer driven. They are also the largest and second heaviest in the world.



C. The economy

Since 2019, the Canadian government has accelerated investment in the EV industry to create high paying sustainable jobs for Canadians while decarbonizing its economy. Since 2021, auto investments have tripled, making Canada the #2 player in the world for the battery supply chain⁶, according to Bloomberg New Energy Finance.

Figure 1: BNEF 2022 global lithium-ion battery supply chain ranking

Country	Raw Materials	Battery manufacturing	ESG	Industry, innovation and infrastructure	Downstream demand	Overall ranking
China	1	1	17	9	1	1
Canada	3	8	6	4	10	2
US	6	4	16	5	2	3
Finland	9	15	2	1	11	4
Norway	18	10	1	3	7	5
Germany	21	6	4	7	2	6
South Korea	17	2	10	6	5	6
Sweden	21	9	3	2	8	8
Japan	13	3	8	12	8	9
Australia	2	15	9	13	11	10
France	24	10	5	10	5	11
UK	26	15	7	8	4	12
Czechia	23	10	11	11	18	13
Poland	24	5	15	16	15	14
Hungary	26	6	13	14	20	15
Chile	7	18	14	23	19	16
Turkey	15	18	21	15	13	17
India	13	10	26	21	13	18
Vietnam	20	10	20	18	17	19
South Africa	8	18	19	17	26	20
Brazil	4	18	23	22	20	21
Indonesia	5	18	22	27	25	22
Argentina	11	18	12	19	26	23
Slovakia	26	18	18	25	24	24
Thailand	26	18	24	20	16	25
Philippines	10	18	29	28	22	26
Mexico	16	18	27	26	23	27
Morocco	19	18	25	24	28	28
DRC	11	18	30	29	30	29
Bolivia	26	18	28	30	28	30

Source: BloombergNEF. Note: "III" stands for infrastructure, innovation, and industry.

It is great news and all this work is saving the automotive sector in Canada. But more work needs to be done.

According to a March 2023 *Ernst and Young report*⁷, global leaders identified six essential pillars for EV transition success:

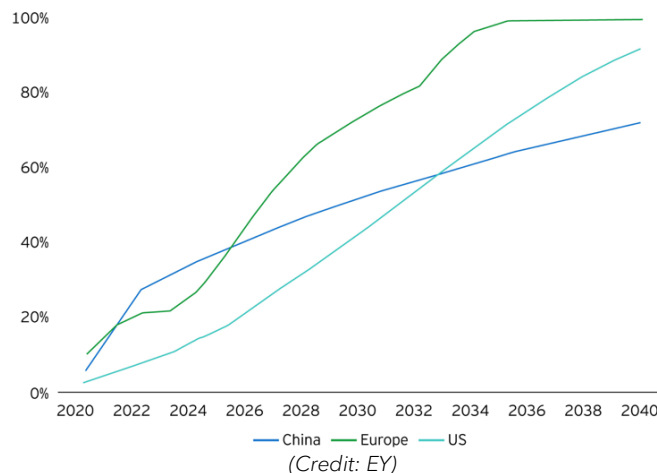
- 1- A resilient supply chain
- 2- Clean and green power
- 3- Accessible charging infrastructure
- 4- A smart grid
- 5- Digitization
- 6- Skilled labor

“Several factors feed into the uptake in electric mobility:

- Regulation is giving certainty to the direction of EV travel. It builds toward 2035 when most developed economies pledge to phase out sales of new internal combustion engine (ICE) vehicles.
- Global subsidies and incentives, which topped US\$30bn by the end of 2021, are making EVs more affordable. Subsidies continued into 2022, though some markets, such as China, are becoming self-sustaining.
- EVs fit with the societal and political urgency to decarbonize. They help to reduce dependency on fossil fuels at a time of high energy prices and security concerns.
- Global automakers are proving their commitment to an electric future by investing almost US\$1.2t into EV production and battery facilities.
- Utilities are continuing to invest in EV infrastructure, driven by consumer demand, revenue opportunities and sustainability goals.”

Electric light vehicles sales forecast, by region, 2020-40

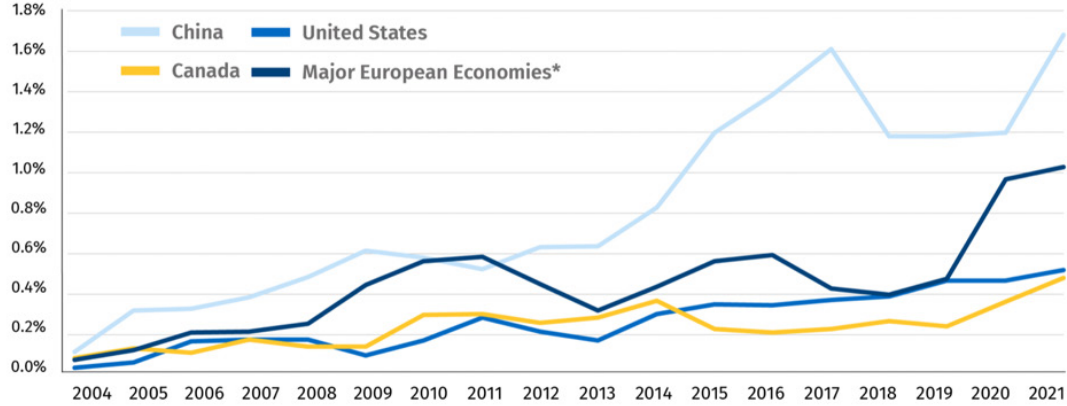
EV sales expected to outstrip all other regions by 2030



According to an *RBC report*⁸ published on September 28, 2022, “in Canada, we have lagged since 2014, when spending on clean technologies fell sharply. Though we have made up some ground in the last few years, **the pace of spending is still about half that of other major economies**. China leads the pack, spending about 1.5% of GDP on green investment each year. In some key industries, it’s the undisputed global leader, dominating solar panel and battery manufacturing, accounting for 40% of the world’s nuclear reactors under construction, and recently overtaking Europe in the share of electric vehicles sold. Historically a leader, Europe spends around 1% of GDP on green investment. The U.S., Australia and Japan are further behind. But a major shift is coming south of the border. The recently passed U.S. Inflation Reduction Act will pump US\$370 billion into clean investment and leverage additional money from the private sector.”

Canada lags in green investment

Climate-related investment, % of GDP



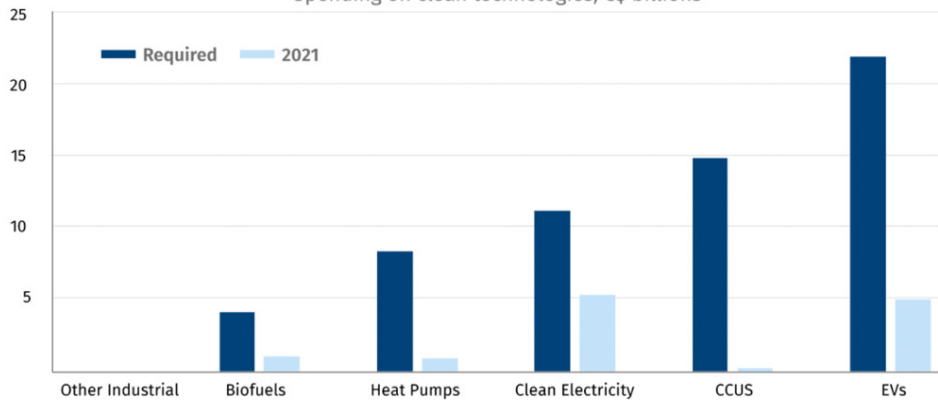
* Averages of UK, France and Germany
Source: Bloomberg NEF, IMF, RBC Economics

Canada could be left behind.

"Canada will need to adjust its policies, or risk falling even further behind major economies. After a decade of investment, we're still not spending enough on clean electricity, which needs **\$200 billion in investment** by 2035 to meet current green grid goals, and more thereafter to accommodate rapid growth in electricity demand. That said, we are much closer to spending enough on green electricity than in any other sector: investment there needs to *merely* double. **Spending on electric vehicles (EVs) will need to grow from about \$4 billion to nearly \$22 billion annually** while spending on heat pumps to decarbonize buildings will need to grow more than eight times over current levels. And Canada's heavy industries, including the oil and gas sector, need to break ground on carbon capture facilities."

Clean tech spending in Canada falls short of Net Zero needs

Spending on clean technologies, C\$ billions



Source: Bloomberg NEF, RBC Economics "\$2 Trillion Transition"



*Canada has the natural resources, the qualified workforce, the universities, the research centers... and now, the will.
That is why we at Electric Mobility Canada support accelerated investments in the EV industry
to help Canada become the global leader it can be.*

We recognize the impressive efforts that the federal government has done to make Canada a global player with many new programs and projects announced to support the acceleration of the EV industry in our country. To help Canada rise to the top with other leaders, Electric Mobility Canada proposes the following recommendations ahead of the 2024 federal budget.

Daniel Breton
President and CEO - Président et directeur général
Electric Mobility Canada - Mobilité Électrique Canada
daniel.breton@emc-mec.ca
<https://emc-mec.ca>
514 883 9274

Electric Mobility Canada

2024 Pre-budget Recommendations

1 Light-duty vehicles

Policy solutions to overcome barriers to consumer EV adoption that focus on affordability and value, education, and awareness, as well as new polluter-payer funding mechanisms to support their implementation.

1.1 ZEV REBATES

Continue purchase incentives for new passenger EVs but focus on value for electric-only range to include more long-range electric cars, SUVs, and pickup trucks.

The government should continue to provide purchase incentives to make EVs more affordable until their prices are equivalent to those of gas vehicles. This levels the playing field between the two types of vehicles. New vehicle incentives also increase the number of used EVs available which, over time, leads to lower prices for used electric cars. The federal EV rebate program should be updated to include more of the long-range cars, SUVs, and pickup trucks that Canadians want to buy.

Going forward, eligibility for incentives should be based on the price relative to electric range, rather than sticker price alone. If a given trim of a Zero-Emission car, crossover, or SUV costs less than \$145 (MSRP) per kilometer of range (EPA/NRCan) offered, it should be eligible. If a trim of a ZEV pickup truck costs less than \$180 per kilometer of range, it too should be eligible. All zero emission vehicles under \$45,000 in price should remain eligible, regardless of their price-to-range value. Plug-in hybrids (PHEVs) at this price point should also be eligible for incentives but only if they offer at least 80 km of electric range. Finally, electric vehicles above \$100,000 should be exempted from the federal luxury tax.

1.2 FEEBATE SYSTEM

Have the most polluting vehicles fund EV incentives for new vehicles

Impose a fee on the most polluting new vehicles and use the revenues generated to fund EV purchase incentives. This approach would offer consumers a choice: they can purchase a cleaner car and get an EV incentive or choose a more polluting car and help support other Canadians in going electric. Establish a feebate system where purchases of the most polluting new vehicles would be subject to polluter-pay fees that would fund ZEV purchase incentives (see 1.1 above). Average and less-than-average polluting vehicles would face no fee. This approach would offer consumers a choice: they can purchase a low-polluting vehicle and avoid the fee, or they can pick a higher polluting vehicle and help support other Canadians in going electric. Until all categories of vehicles are available in an electric version, exemptions can be proposed for large families and people who need bigger vehicles for work.

1.3 LOW- AND MODEST-INCOME HOUSEHOLDS

Make EVs more accessible for low- and modest-income households

Low- and modest-income Canadians also benefit from the fuel and maintenance savings an electric car provides but are less likely to be able to afford a new or even a used EV. Canada should establish an income-tested incentive program to make EVs more accessible for consumers inspired by the California⁹ and BC¹⁰ programs. The program should include an incentive 'top-up' for the purchase of a new EV, an incentive/rebate for the purchase of a used EV, and low-interest loans for first time EV buyers.

1.4 iZEV CAP FOR FLEETS

Make it easier for taxi, carshare, rideshare or other ride-hailing companies to go electric

To accelerate the transition to fully electric transportation by 2030, it is important to prioritize the electrification of high-use vehicles, such as those used by taxi, carshare, rideshare, and ride-hailing companies. Currently, these businesses face a cap on the number of EV incentives they can access under the [iZEV program](#) when purchasing or leasing cars. To support their transition to EVs, we recommend removing this cap for these and other transportation facilitators and providers.

1.5 EV EDUCATION AND SALESFORCE TRAINING

Support consumer EV education and industry salesforce training

Many Canadians want to go electric but have unanswered questions or do not know where to start. Work with leading and trusted organizations like Plug'n Drive, EV Society, Plug in BC, EVAAC, AVÉQ and others to establish a suite of programs to educate and support consumers in making the transition to EVs. Though interest is growing, Canadian consumers still express concerns and low levels of consumer awareness continue to be a barrier. Consumer education efforts could include creating a Canadianized version of MIT's CarbonCounter.com and supporting communication initiatives on the availability and ease of charging. We also recommend that the federal government keeps supporting industry salesforce training to facilitate EV sales.

1.6 A GREEN SCRAPPAGE PROGRAM

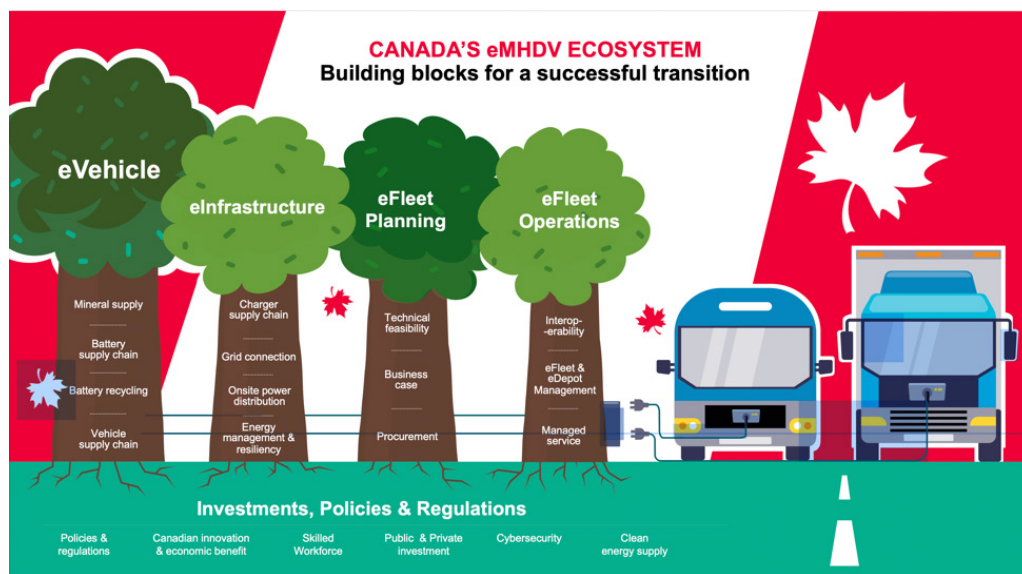
Offer a vehicle scrappage programs for all types of vehicles

Establish a program that gets fossil fuel powered vehicles off the road and replaces them with zero emission modes of transportation. Allow all polluting vehicles—from cars and trucks to buses to off-road vehicles—to be scrapped and recycled as part of the program. Government could offer clean transportation options such as dedicated EV rebates or public transit passes, vouchers for bicycles, vouchers for EV-only car/rideshare services etc., for Canadians who are not looking to purchase a new vehicle.

2 Medium- and Heavy-Duty and Off-Road Fleet Electrification

Solutions to overcome and address the barriers in the fleet and non-passenger segment, including for affordability, the transition to electric public transit, electric school bus and truck fleets, electric off-road electric vehicles, and actions the government can take regarding federally regulated facilities.

The Medium and Heavy Duty Zero Emission Vehicle segment is developing at a fast-growing pace, thanks to support from the federal government, the private sector and R&D development. Yet, we are still in the early stages of the decarbonization of this segment. In September of 2022, the Electric Medium and Heavy-Duty Vehicle (eMHDV) working group from Electric Mobility Canada published a document addressing the gaps in the eMHDV ecosystem¹¹. While some gaps can be handled swiftly with government support, some others will take more time and will need dedication in the medium to long term.



2.1 AFFORDABLE ELECTRIC TRANSIT BUSES Make the transition to electric transit buses more affordable.

Tax credits and rebates are needed to lower the upfront cost of Zero-Emission buses and related infrastructure. Continue to provide predictable and long-term funding to municipalities and transit agencies that plan to convert their entire fleet to electric vehicles.

2.2 ELECTRIC SCHOOL BUS ADOPTION Work across jurisdiction to accelerate electric school bus adoption.

Provide predictable and long-term funding to school bus operators that plan to convert their entire fleet to electric vehicles through a simpler, more efficient version of the ZETF program to make funding more readily available. Incentives should be stackable with other federal and provincial programs supporting cleaner commutes for students. Include vehicles with final assembly in Canada, sold and serviced through Canadian businesses.

2.3 ELECTRIC TRUCKS IN COMMERCIAL FLEETS

Accelerate the integration of electric trucks into commercial fleets

Accelerate business cases for ZEV medium- and heavy-duty Fleets with funds for transition planning and for the purchase of vehicles.

2.4 FEDERAL FACILITIES

Electrify vehicle fleets in ports, airports, and similar federal facilities

Phase out fossil-fuel vehicles at federally regulated properties, such as water ports, intermodal railyards, parks, and airports, through a combination of tolls on polluting vehicles, obligations for subcontracting operators, restrictions on access for polluting trucks.

2.5 ELECTRIC OFF-ROAD VEHICLES

Make electric off-road vehicles more affordable

A growing number of companies offer a diversity of off-road vehicles ranging from electric snowmobiles to electric watercrafts and electric ATVs that are either used for work or pleasure, and that can help significantly reduce GHG emissions, air, and water pollution. For example,

- a modern gas snowmobile emits as much air pollutants as forty modern cars.
- noise pollution is also a nuisance to wildlife.
- In remote regions of the country, snowmobiles can often be one of the first means of transportation.
- Because of our winters, snowmobiles are relied upon by law enforcement units (for search and rescue work and emergency missions), they are used by surveyors, ranchers, public utility employees, environmental and wildlife scientists, ski centres, recreational park agencies, and countless other organizations. The same is true for other off-road vehicles.

Today, a growing number of cities, states, countries, and automakers are moving towards 100% ZEV sales by 2035 of both road and off-road vehicle and Canada could do the same. The jurisdictions that are including targets for the electrification of off-road vehicles include New Jersey (Bill S 432), California (Sept. 23, 2020, Executive Order) and New York (Bill S 2758). If the government is serious about achieving zero emissions in the transport industry, it must also extend these policies to the off-road sector. In addition, some of the leaders in the electric off road and marine industry are based here in Canada, which means that supporting the transition to zero emission will help create high paying sustainable jobs in the country.

That is why we recommend:

- A federal rebate for the purchase of electric snowmobile, personal watercraft, or RV in line with the Yukon rebate of \$2500.¹²
- A ZEV mandate for small off-road vehicles in line with the most ambitious jurisdictions in North America, whether at the federal or state level.
- A luxury tax exemption for zero emission vessels as they are more expensive to purchase and need to be encouraged.¹³



2.6 FERRIES

Support the electrification of Canada's ferry services

According to the Canadian Ferry Association¹⁴ "Canada is home to over 180 different ferry routes with a route presently operating in each province and most of the territories. These ferries represent a mix of private and publicly operated routes as well as a mix of passenger, freight, and mixed-use ferries. Transportation through waterways has always been a crucial part of Canada's history. With ferry routes in every region across Canada, the ferry sector continues to play an integral role in Canada's economic and social development.

In June 2022, a large EMC delegation went to Norway for the EVS35 International conference. That is when we discovered that 47% of Norway's ferries were already electric. The largest ferry in Norway, the Bastø Electric¹⁵ is 139.2-metre-long and 21-metre-wide has room for 600 passengers and 200 cars or 24 trucks. The battery and fast-charging systems for all three ferries are supplied by [Siemens Energy from the battery factory in Trondheim](#). Bastø Electric uses batteries with a capacity of 4.3 MWh. The fast-charging system has a capacity of 9 MW, according to the shipping company. When docking, the ferry is always "charged at lightning speed".

BC Ferries has already acquired six new electric ferries. The Ontario Ministry of Transportation recently commissioned the construction of two of them. The Quebec government announced that it would adopt a zero-emission ferry for its Saint-Ignace-Sorel and L'Isle-aux-Coudres ferry services starting in 2030¹⁶.

We recommend that the federal government works with regional or provincial ferry agencies, as well as Crown corporations like BC Ferries, to launch a program to support the electrification of ferry services across Canada to lower GHG emissions, air and water pollution, underwater noise AND create a Canadian zero emission marine industry to become a North American leader.



(Electric Ferry in Oslo, June 2022)

3 EV Charging infrastructure

Transitioning to electric mobility requires a new way of thinking about the fueling infrastructure of the future: electric vehicle charging. We propose solutions to overcome EV charging challenges in multi-unit buildings, remote areas, highway corridors and on public lands.

3.1 EV CHARGING INFRASTRUCTURE TARGETS

Set targets for EV charging installations, for all types of vehicles

Set clear and ambitious targets, aligned with NRCan's latest reports¹⁷ on *public and residential* infrastructure deployment needs, for putting EV charging connectors in key areas such as apartment buildings, workplaces, downtown cores, along highways and remote travel corridors, and at fleet depots. Expand current funding programs and provide them with the necessary resources to support a strong and timely roll out of charging infrastructure across the country, to achieve those targets. Ensure charging access for all Canadians by setting targets specific to northern, rural, and Indigenous communities.

3.2 EV-READY PARKING

Make one-million condominium and apartments EV-ready over four years

Nearly 30% of Canadians live in apartments or condominiums (Statistics Canada, 2016). A lack of EV charging access in these buildings creates a major barrier to EV uptake. Government should take immediate steps to make one-million parking spaces in these buildings, EV ready. Complete this goal by allocating \$1 billion over four years to make one-million existing condominium and apartment parking stalls EV-ready. Allocate \$250M/year for five years specifically for the purpose of funding 50% of electrical power upgrade and make-ready infrastructure costs in existing multi-unit residential buildings.

3.3 NATIONAL BUILDING CODES

Add EV charging requirements to national building codes

Establish provisions in the upcoming review of the National Model Building and Electrical Codes to have all new residential parking spots be "EV-ready" and 20%-40% of new non-residential parking spots to include the basic electrical infrastructure needed for EV charging. Cities should also be encouraged to play a leadership role by developing their own EV-ready requirements.

3.4 UNDERUTILIZED GOVERNEMENT LAND

Put underutilized government-owned lands to work: establish public charging "hubs"

To support access to charging in urban areas for those without reliable home charging access, establish charging hubs on underused government-owned lands, particularly in high-density urban areas. Charging hubs should be large, open to all charging operators without exclusivity, and accessible to the public. User fees should be limited to charging services, which may include «idling» fees.

3.5 CONNECTION REBATE TO COVER UTILITY COSTS

Provide a connection rebate to cover costs levied by utilities when building large-scale charging stations

Moving freight and large volumes of passenger vehicles with electricity will require electrical service upgrades to accommodate the power needs of large-scale charging infrastructure. These installations are costly today. Federal and provincial governments, electric utilities, provincial regulators and charging operators must work together to better allocate these costs while recognizing the economic opportunities. In the near-term, Canada can support charging investments by providing time-limited rebates for large-scale charging investments.

3.6 HOME ENERGY RETROFITS

Include EV charger installation in home energy retrofit programs

While most Canadians live in single detached houses in Canada in 2016¹⁸, hundreds of thousands of older Canadian homes have outdated electrical panels, making it difficult and sometimes impossible to install an EV charger. EVs being three-times more energy efficient than gas cars and contributing to reducing GHG emissions, existing home energy retrofit programs should support the installation of newer, more efficient electrical panels and EV charging infrastructure, including panel size and smart panel upgrades, *It is worth noting that the 2 provinces with the lowest amount of single detached houses (Québec and BC) are the ones with the highest percentage of EV sales.*

Table 1
Occupied private dwellings and types of dwelling, by region, 2016

	Occupied private dwellings	Single-detached houses	Apartments in a building that has five or more storeys	Apartments in a building that has fewer than five storeys	Apartments or flats in a duplex	Other dwellings ¹
	number		percent			
Canada	14,072,080	53.6	9.9	18.0	5.6	12.9
Newfoundland and Labrador	218,670	73.3	0.3	5.3	11.5	9.5
Prince Edward Island	59,470	69.2	0.1	15.2	1.7	13.7
Nova Scotia	401,990	65.5	5.3	14.5	3.1	11.5
New Brunswick	319,775	69.3	1.2	13.8	4.2	11.4
Quebec	3,531,660	45.4	5.3	32.7	7.5	9.1
Ontario	5,169,175	54.3	17.2	10.1	3.4	15.0
Manitoba	489,050	67.8	8.0	13.7	1.4	9.1
Saskatchewan	432,625	72.7	2.4	13.2	2.2	9.5
Alberta	1,527,680	61.9	4.1	14.6	2.8	16.5
British Columbia	1,881,970	44.1	9.4	20.5	12.2	13.7
Yukon	15,215	62.0	0.3	11.6	4.0	22.1
Northwest Territories	14,980	57.6	3.0	15.9	2.6	20.9
Nunavut	9,815	44.3	1.1	13.3	1.8	39.5
Census metropolitan areas (CMAs)	9,835,655	45.4	13.8	20.7	6.5	13.7
Outside CMAs	4,236,425	72.7	0.9	11.8	3.5	11.0

(Source: StatsCan 2016 survey)

3.7 FUNDING PROGRAMS FOR MHDV CHARGING INFRASTRUCTURE

Establish a dedicated grant-based incentive program to support the deployment of large-scale EV charging installations and electrical service upgrades, to facilitate the medium and heavy-duty segments, particularly in the truck sub-sector that is not considered under the current CIB program for electric buses and school buses. The new program should support charging infrastructure design and deployment for MHD commercial and public fleet depots, including funding for urban hubs, highway-side locations, and rest-stops. As-a-service offerings that shift charging solutions to Opex rather than Capex should be considered eligible for funding

3.8 TECHNOLOGY BASED SOLUTIONS

Leverage technology-based solutions to add value and reduce costs for EV drivers and the grid.

Funding programs should offer flexibility for innovative charging solutions such as software-based charging management solutions that can help optimize charging load by shifting and shaping demand, by sharing power intelligently between vehicles and other load sources, and mobile charging solutions to complement static charging infrastructure especially for underserved and urban areas where there are grid limitations. This can help EV drivers, property owners, fleet managers, and utilities save money by reducing the need for costly upgrades on both sides of a customer meter while ensuring reliable charging infrastructure access.

3.9 RIGHT TO CHARGE

Support right to charge rules for residents of multifamily properties.

Residents of multifamily properties such as apartment and condominium buildings are sometimes prevented by property managers or resident associations from installing or accessing charging stations. This contributes to an inequitable disparity in charging access between residents of single-family homes and multi-family properties. Provincial "Right to Charge" rules provide support to residents of multifamily properties by allowing them to pursue adding EV charging infrastructure for their use in most circumstances.

3.10 SUPPORTING RURAL, REMOTE, AND OFF-ROAD ACCESS TO CHARGING.

Rural, remote, and off-road regions do not always have access to sufficient electricity supply that can accommodate charging infrastructure for light-, medium-, heavy-Duty and off-road electric vehicles. These regions must be supported in making level 2 and fast charging infrastructure accessible, especially if they are off-grid, with green-innovative charging solutions.

4 Federal Regulation

Achieving EV adoption will require coordination and strategy - including a focus on overcoming the challenges of vehicle availability and supply. We also need to ensure no Canadians are left behind, whether they live in rural, remote, or Indigenous communities.

4.1 NATIONAL ZEV SALES REGULATION

Adopt national ZEV sales regulations for passenger vehicles, requiring 100% ZEV sales by 2030.

National ZEV sales regulations will push automakers to introduce more EV makes and models, increasing consumer choice, reducing long wait times for EVs, and improving battery technology to help meet the ever-growing demand for EVs in Canada. It will also help supply EVs across Canada, where currently most EVs available for sale are distributed to the two provinces that already have ZEV mandates in place: British Columbia and Quebec. Apply national ZEV sales regulations only where provincial standards are weak or do not exist.

National ZEV sales regulations will increase consumer choice, reduce wait times for vehicles, reduce vehicle costs, deliver better value for infrastructure programs, attract industrial production, and drive innovation (through longer-range battery technology) to supply ever-growing domestic ZEV demand and achieve ZEV goals. It will also help to level the playing field across Canada. Today, most EV supply goes to the two provinces that already have ZEV mandates in place: British Columbia and Quebec. So, Canada should treat a federal ZEV standard as a means of filling in the gaps in ZEV policy across Canada and to ensure that EV supply is available in provinces which have not yet established their own ZEV mandates of equal or greater stringency, relative to the federal program. For more details, see our 2022 report titled **"How Canada can design a truly effective zero-emission vehicle mandate"**¹⁹.

4.2 STRONG TAILPIPE EMISSION STANDARDS

Implement strong tailpipe emission standards for all types of vehicles

Canada must align its auto tailpipe emission standards with the toughest emission standards in North America, in addition to establishing a national ZEV regulation. Cleaner cars not only cut carbon emissions, but they also improve air quality in our communities and save consumers money at the pump. The existing standards have too many "compliance flexibilities" (loopholes) which should be eliminated going forward. Canada must also strengthen emission standards for larger vehicles like buses and trucks, as these are big contributors to tailpipe pollution. Standards should not be footprint based, like the US EPA standards, since that approach entices car manufacturers to sell larger models and abandon their smaller, more efficient models.

4.3 NATIONAL ZEV SALES REGULATION FOR MHDVS

Adopt a national ZEV sales regulation for medium and heavy-duty trucks and buses requiring 100% ZEV sales by 2040 at the latest.

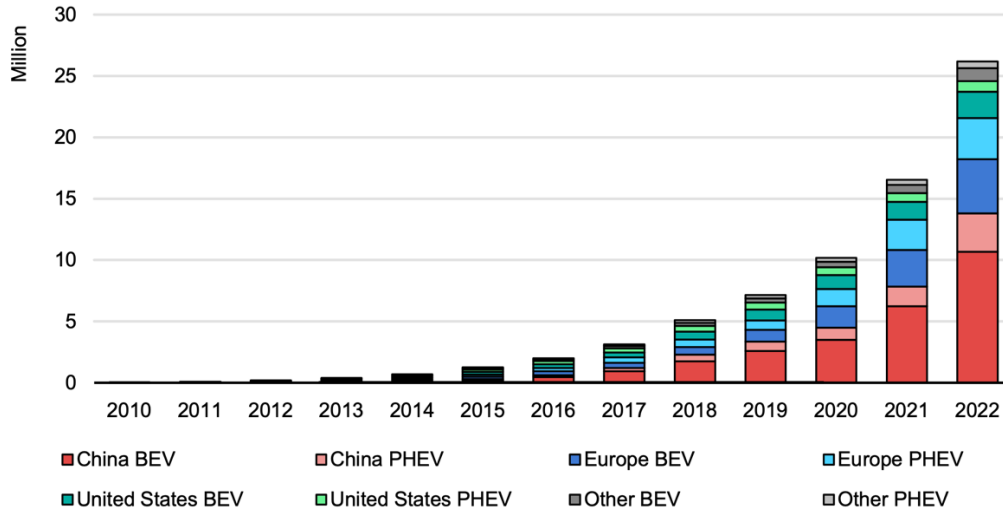
Adopt a ZEV sales regulation to achieve 100% Zero-Emission bus and truck sales by 2040, at the latest, with interim milestones along the way. Increase ambition as technology and product offerings improve. Align Canada's requirements with the most ambitious targets in North America.

5 A Canadian EV Action Plan

Achieving EV adoption will require coordination and strategy - including a focus on overcoming the challenges of vehicle availability and supply. We also need to ensure no Canadians are left behind, whether they live in rural, remote, or Indigenous communities. A Canadian EV Economic Development and Investment Attraction Strategy, focused R&D efforts, and action to protect Canadian industry and workers from foreign buy-domestic rules will help ensure a prosperous transition to an electric mobility economy in Canada.

One of the most important reasons why Canada needs to accelerate electric mobility policies is jobs. When we say that we must reduce our GHG emissions and air pollution, we all agree that we must be doing that while supporting the transition to sustainable jobs in the clean energy and transportation sectors. According to IEA's Global EV outlook 2023, electric car markets are seeing exponential growth as sales exceeded 10 million in 2022. A total of 14% of all new cars sold were electric in 2022, up from around 9% in 2021 and less than 5% in 2020.²⁰

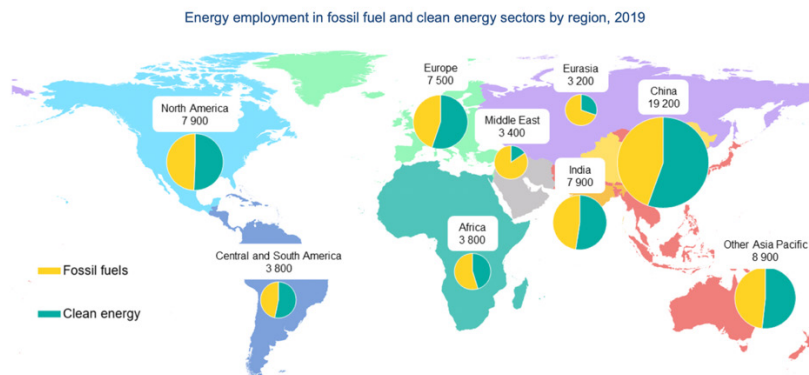
Figure 1.1 Global electric car stock in selected regions, 2010-2022



IEA. CC BY 4.0.

(Credit: IEA)

According to a 2022 World Energy Employment report for the International Energy Agency²¹, "Energy employment is set to shift rapidly as countries and companies accelerate efforts to decarbonize and meet net zero emissions pledges... Clean energy employs over 50% of total energy workers, owing to the substantial growth of new projects coming online. »



The Canadian Battery industry: a once in a generation opportunity

According to the 2022 Clean Energy & Trillium Report titled “Canada’s Economic Engine”²² in which EMC participated,

- By 2030, Canada’s EV battery supply chain could support nearly 250,000 direct and indirect jobs and add \$48.2 billion to its economy. When induced jobs are considered (for example, employees at a restaurant popular with supply chain workers), a total of nearly 323,000 jobs could be created across Canada and \$59 billion added to the Canadian economy.
- Between 2020 and when the analysis underlying this report was finalized in June 2022, Canada attracted at least \$1 billion related to EV battery mineral extraction and materials manufacturing, \$5.2 billion related to EV battery cell and module manufacturing, \$6.6 billion related to EV assembly, and \$1 billion related to EV battery components and recycling.
- The global market for batteries will be worth at least **US\$360 billion** by 2030. By 2040, the International Energy Agency projects demand for critical minerals to grow by **at least 30 times** to meet rising demand for batteries used in EVs and storage.

Here are the six key recommendations from this report:

- **Develop a strategy:** Canada needs a public-facing, national battery strategy that pulls existing efforts together, connects dots across the battery supply chain, and guides industrial development.
- **Build the workforce:** Canada is home to one of the world’s top talent pools but is faced with worker shortages and challenges ensuring the right talent is in the right place. Canada must develop new strategies to engage and mobilize big populations of skilled workers.
- **Accelerate project development:** Canada faces significant competition in securing additional battery supply chain investments. Canada should focus on lining up project land and infrastructure needs while creating predictable and efficient review processes for projects across the supply chain.
- **Grow the North American market:** Canada must support and expand policies to increase domestic EV demand and uptake.
- **Promote Canada’s clean battery brand:** Canada should continue promoting its many clean battery advantages—including low-carbon critical minerals, proximity to the U.S., a cutting-edge battery research and recycling leadership, and abundant clean electricity—to attract investment into its battery supply chain and increase export opportunities.
- **Scale up homegrown clean battery leaders:** Canada is home to a host of innovative battery technology companies. The next step is to leverage existing investments from multinational battery cell manufacturing companies to also support domestic companies.

5.1 CANADIAN EV STRATEGY

Immediately Launch a Canadian EV Strategy

Enact legislation requiring the federal government to establish a Canadian EV strategy and a regularly updated EV action plan through 2035. Legislation should require the government to implement actions sufficient to achieve 100% passenger vehicle sales by 2030 and by 100% Zero-Emission bus and truck sales by 2040 at the latest.

Launch a pan-Canadian EV Strategy that includes an EV Action Plan to accelerate EV adoption. Enact legislation requiring the federal government to (1) establish an EV strategy, and (2) maintain and regularly update an EV action plan through 2035. Legislation should require the government to implement actions sufficient to achieve 100% passenger vehicle sales by 2030, and by 2040 at the latest for MHDVs. Accountability measures, such as audit, should be established. The initial strategy and plan should adopt the actions contained in this Platform document.

5.2 RURAL, NORTHERN, FIRST NATIONS AND INUIT COMMUNITIES

Develop a plan to help rural, northern, First Nations and Inuit communities go electric

Many rural, northern, and Indigenous communities in Canada have not yet had equal opportunity to participate in the benefits of the EV transition due to a lack of charging options and vehicle availability, among other things. It is critical that these barriers be addressed to allow all Canadians a meaningful opportunity to drive electric.

5.3 ATTRACT INVESTMENTS

Support and attract EV-related business and investment in Canada

Focus on attracting more investment to accelerate EV manufacturing and related industries in Canada, including assembly, parts, machinery, charging equipment, and battery making, critical battery materials extraction/processing with a “Canadian EV Economic Development and Investment Attraction Strategy.” Building these industries will create good sustainable jobs and raise the profile of EVs to further support their adoption in Canada.

5.4 FOCUS R&D INVESTMENTS ON STRATEGIC EV TECHNOLOGIES

Canada should focus its efforts on accelerating technologies, research, development, and manufacturing associated with reducing the costs of vehicle batteries and thus vehicle costs per unit of range. Achieving economies of scale in vehicle, battery and charging infrastructure production will also help to reduce costs for consumers and fleets. Finally, to keep Canada competitive, create new financial instruments to support domestic EV-related R&D and manufacturing, including MHDV, off-road, marine and rail vehicles and ecosystems.

5.5 FAST-TRACK EV-ONLY SERVICE TRAINING

Work with provinces to fast-track EV-only service technician training

EVs are far less complicated machines than gas vehicles. Work with provinces to revamp the vehicle mechanic curriculum to prioritize EVs by fast-tracking training for EV mechanics and provide them with more apprenticeship opportunities. As more EV batteries will need repair, help create a dedicated program to make EV battery repair as affordable as possible to lower insurance fees on EVs.

5.6 EV MANUFACTURING IN NORTH AMERICA

Take a North American approach to EV manufacturing and supply chains

Work with the US Administration to ensure that any “Buy America” policies reflect the North American auto market and do not negatively impact Canadian EV-related businesses or suppliers. Collaborate with the U.S. to build a North American EV industry and supply chain *beyond the Inflation Reduction Act*. Ensure policies are designed in a way that maximizes and accelerates ZEV and ZEV infrastructure deployment.

5.7 RETRAINING PROGRAMS FOR WORKERS

Support retraining programs and help workers make the transition to zero carbon industry.

Building a labor force with the right skills– from engineering and research, electrical and mechanical, charging infrastructure installation, maintenance, and fleet management–will be critical to the success of Canada’s transition to a zero-carbon economy. Explore opportunities for the government to support employers, whether traditional industry or all-EV, to train new employees who have not previously worked in the EV industry. Maintain existing funding commitments for training and re-training.

5.8 ELECTRIFY THE MINING SECTOR
Support electrification in the mining sector

Support electrification at mining locations across Canada and promote sustainable mining development and operations, particularly in relation to minerals and metals needed for the ZEV supply chain in Canada and other jurisdictions.

5.9 EV BATTERY CIRCULAR ECONOMY
Support EV battery circular economy

By 2030, there will be over 6 million end-of-life battery packs retiring from electric cars, buses, vans, and trucks according to IDTechEx. In addition to this, according to a DOE study, there will be over 1 TWh of battery capacity in North America by 2030 (see map below). This means that the need to add recycling capacity in North America is urgent as most of the addressable battery recycling market from now until 2030 will come from off-spec products. We need to ensure that the critical minerals in EOL battery packs, off-spec and recalled products are not lost as they are too valuable for economic and environmental reasons. That is why we recommend that the government modernizes the legislative and regulatory framework to facilitate the transportation of used and end-of-life batteries and to encourage battery recovery, repurposing, remanufacturing, and recycling in North America.



6 Federal leadership

Government can lead by example and make use of its own facilities, convening ability and internal process to help accelerate the transition to electric mobility.

6.1 PRIVY COUNCIL OFFICE FOR ELECTRIC TRANSPORT

Create a dedicated Privy Council Office to coordinate EV responsibilities across departments and advise the Prime Minister on progress being made towards achieving the government's electrification goals. Centralized coordination and Prime Ministerial oversight will elevate the importance of this issue and ensure it receives the attention it deserves.

6.2 EV SOLUTIONS FOR OUR GRID

Convene electricity stakeholders to develop EV solutions for our grid

Establish cross-Canadian guidance for electricity regulators to speed up deployment of charging infrastructure through an intergovernmental table to examine electrical system regulatory matters to expedite EV charging infrastructure installation and to support utilities Work through the Council of Canadian Energy Ministers to establish pan-Canadian guidance for electricity regulators to expedite deployment of charging infrastructure. Guidance could address electrical service size challenges for EV charging; demand charges and opt-in electricity rates for public charging; the need for EV charging station connection prioritization to keep infrastructure expanding in step with EV demand; and pre-building distribution and transmission capacity in locations where future charging installations are anticipated. Charging infrastructure for medium- and heavy-duty vehicles as well as for light-duty vehicles should be included in the scope of work.

6.3 GOVERNMENT & PARLIAMENTARIAN EV AWARENESS

Make government & parliamentarian EV awareness and education a priority

Unless both consumers and policy makers understand all the benefits, needs and savings associated with electric vehicles, the transition to an electric future will take longer than necessary. The government should make education a priority, working with leading organizations like Plug'n Drive, EV Society, AVEQ, EVAAC, Plug in British Columbia and others to establish experiential learning opportunities for elected officials and civil servants.

6.4 FEDERAL FLEETS AND BUILDINGS

Ensure federal fleets and buildings are 100% electric and EV-ready

Government can lead by example and further increase domestic EV demand and investment by using its own purchasing power. Starting now, every vehicle purchased by the government should be electric, unless an electric option does not yet exist to meet a specific need. Canada should also start electrifying its owned and leased parking lots immediately to offer charging options to its fleets, employees, and visitors. Set a hard target of at least 10% of all owned and occupied parking spaces being electrified by no later than 2025.

6.5 ZERO EMISSION ZONE IN THE CITY OF OTTAWA

The Government of Canada should work with the National Capital Commission and the City of Ottawa to establish a Zero Emission Zone (ZEZ) in downtown Ottawa. ZEZs are areas in which polluting vehicles are required to pay a fee to enter, acting as a disincentive for gas-vehicle use within the zone, and encouraging forms of zero emission travel such as EVs, bicycles or electric public transit. Other cities and national capitals (e.g., London, UK) are implementing Zero-Emission zones too.

6.6 CLEAN PROCUREMENT POLICIES Adopt “Clean procurement” policies across Canada

Lowest bidder public policies have hampered the transition to cleaner, sometimes more expensive technologies that can, in the end, be less expensive when total cost of ownership is considered. New “clean procurement” policies could help Federal departments, agencies and crown corporations, provincial governments, municipal governments, transit agencies, ferry agencies, school boards and other institutions to purchase zero emission vehicles of all types without conflicting with free trade agreements.

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