

Policy Submission to Pan Canadian Framework on Clean Growth and Climate Change: Accelerating the Deployment of Electric Vehicles



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Bruce Power, Plug'n Drive and Pollution Probe are pleased to present this joint submission which outlines potential mitigation options for action under the pan-Canadian Framework on Clean Growth and Climate Change. The opportunities outlined in this document have emerged to date and in part from a collaborative study currently underway investigating the accelerated role that electric vehicles (EVs) can play within broader climate change strategies in Ontario and Canada. The study findings and recommendations will be available in late summer of this year, building on the Government of Ontario's recently announced Climate Change Action Plan and the Government of Canada's commitment to supporting the transition to low-carbon transportation options.

INTRODUCTION

EV use in Canada presents enormous opportunities for a wide range of stakeholders across a variety of sectors. The value of the technology is most often characterized by its potential to displace the demand for gasoline and diesel to power transportation, and thus reduce the associated combustion emissions that contribute to air pollution and climate change. But as the EV market continues to evolve, it has become increasingly clear that the value proposition extends well beyond emissions reductions alone. The technology also has the potential to contribute to climate change strategies, to stimulate best practices in energy conservation and efficiency, to enhance the health of communities and to play a critical role in the broadening landscape of distributed energy and storage technology. The development of a comprehensive EV policy framework will help to accelerate and support deployment, addressing a broad range of national, regional and local barriers and opportunities and in turn, unlocking the potential for increased emissions reductions.

OPPORTUNITIES FOR ELECTRIC VEHICLES TO CONTRIBUTE TO EMISSIONS REDUCTIONS STRATEGIES

Because of the potential benefits of EV technology, governments across Canada are setting ambitious goals to support EV production and use. The federal government and several provinces have set targets for reducing GHG levels over the coming years as part of broader climate change strategies. Given that transportation-related emissions account for more than 30 per cent of the country's total GHG emissions, reductions in this sector will be necessary to achieve these targets. The optimal use of vehicles partly or fully powered by electricity reduces the demand for gasoline and diesel, thus helping to meet GHG reductions targets and achieve climate change and air quality objectives. Incorporating EVs within broader climate change strategies will also contribute to positioning Canada and its provinces as first-movers in the developing EV market and enhancing the competitiveness of the clean tech sector.

Using electricity to replace the combustion of gasoline and diesel to power transportation in Canada offers emissions reductions even in those jurisdictions that have electricity grids that rely on fossil fuels. This opportunity is further realized in those provinces and territories where cleaner options make up a significant portion of the generation profile. The integration of EVs with renewable generation options (e.g., solar photovoltaic (PV) technology) can also contribute to reductions of emissions associated with electricity generation from fossil fuels. Furthermore, coupling EVs with vehicle-to-grid or vehicle-to-

home technology would allow EVs to act as battery storage, drawing power from renewable sources when they are active and discharging it when needed.

There were approximately 18,451 plug-in EVs on the road in Canada at the end of 2015. Although this represents a relatively small percentage of the overall vehicle market in Canada, significant increases in sales have been made year-over-year since EVs entered the market in 2010. For example, in 2015, EV sales increased by 32 per cent from the previous year, with sales of the Tesla Model S alone up 137 per cent year-over-year.¹ The range of EVs available also continues to grow, with most major automakers currently offering at least one hybrid or electric model to appeal to all segments of the market. There were 23 EV models on the market in Canada by the end of 2015, although availability is certain to improve over the next few years. The increased variety of vehicle makes and models available signals a commitment on the part of automakers to address a key barrier to adoption.

The successful deployment of innovative technologies that offer a broad range of social benefits often requires a strong policy framework to support the transition. Those Canadian jurisdictions that have dedicated EV policies or that identify EVs as an important component of broader climate change strategies have in turn, seen greater uptake and increased emissions reductions. For example, a number of jurisdictions, including Ontario, British Columbia and Québec, offset the upfront costs of EVs through purchase and charging infrastructure installation incentives. When sales in these provinces are compared with those that do not, it is apparent that robust EV policy frameworks play a key role in EV deployment.

BARRIERS TO ELECTRIC VEHICLE ADOPTION

Despite the broad-reaching opportunities presented by EVs, a number of barriers must be addressed for their integration into sustainable transportation and energy systems, ensuring that potential gains are realized. As governments set ambitious targets for GHG emissions reductions and number of EVs on the road, consumers and automakers may find themselves in a difficult position. Canadians currently experience long wait times for EVs based on limited availability and long production timelines. Given these limitations, meeting aggressive future targets for uptake could pose significant challenges if not proactively planned for.

Consumers may experience a number of additional challenges when visiting the automotive dealership. There are often few, if any, EVs available for purchase and sales staff may not suggest one as an option. This may be based on a lack of knowledge about the technology. As a result, the market is beginning to offer alternatives to traditional vehicle sales business models with some automakers already allowing consumers to purchase EVs direct from the manufacturer, bypassing the dealership.

The ability of the electricity distribution system to respond to the power demand for EV charging will play a critical role in the adoption of the technology, particularly in the broader market. The prevailing trend in EV technology is towards larger batteries and faster charging, as automakers respond to market demand for greater driving range, convenience and overall utility. The compounding effect of these two factors means that, in the absence of proactive measures, the ability of local utilities' to accommodate

¹ <http://www.fleetcarma.com/ev-sales-canada-2015/>

the demand for electricity could eventually be exceeded. In the coming years, it will be imperative that the demand for power to charge EVs is actively managed, so that such risks can be effectively mitigated and to avoid expensive investment in new distribution infrastructure.

The location of public EV charging stations plays a critical role in the personal mobility patterns of EV owners, such as the routes they travel and where they choose to shop. Even though most EV drivers charge at home at night, the lack of public infrastructure is a deterrent to significant uptake of EVs. Issues surrounding an appropriate cost-recovery strategy for private charging stations has had the unintended consequence of discouraging investment in private installation.

Addressing common misconceptions about EV technology will also be important for ensuring the technology appeals to a broad cross-section of the population. For example, range anxiety is a perceived barrier, however, it is not a typical experience for EV owners, many of which use their EVs as their primary vehicle. Other misconceptions include those related to the length of time required to charge the vehicle and the necessary range to accommodate typical driving patterns. Many consumers are looking for better information about how electrified transportation technologies work, what makes and models are available and the associated price points, so that they can determine if an EV would be a good fit for them.

OPTIONS FOR ACTION UNDER THE PAN-CANADIAN FRAMEWORK ON CLEAN GROWTH AND CLIMATE CHANGE

The following are examples of potential options for addressing the barriers and capitalizing on the opportunities related to EV use as a means of achieving emissions reductions under the pan-Canadian Framework on Clean Growth and Climate Change.

Governments

- Look for opportunities to further support EVs within existing regulatory frameworks and government programs. This could include consideration of incorporating more informative EV data into existing fuel consumption and environmental information within Natural Resource Canada's EnerGuide Label for Vehicles. Another option would be to investigate enhanced incentives for EVs under the Government of Canada's light-duty vehicle regulations.
- Continue data and information-sharing across jurisdictions (e.g., nationally, internationally etc.) and support additional EV research and initiatives. This could include investigating the potential for vehicle-to-grid or vehicle-to-home options or supporting local distribution companies to better understand the effects of EVs on the grid system. Develop an appropriate business model for public and private charging station installation and cost recovery for capital expenditures in order to contribute to a proliferation of charging infrastructure.
- Invest in additional public charging networks in collaboration with provinces and territories. The location of public charging stations plays a critical role in the personal mobility patterns of EV owners and can reduce drivers' "range anxiety".

- Support home, workplace and public charging infrastructure and use in collaboration with provinces, territories and municipalities. This could involve changes to building codes for homes and multi-unit dwellings (e.g., City of Vancouver mandated 20 per cent of parking stalls to have access to with 220V plug).
- Provide tax exemptions or credit for the purchase of EVs to offset initial upfront vehicle costs as modelled by other jurisdictions (e.g., Norway, Belgium, Germany etc.) and has been included in Ontario's Climate Change Action Plan.
- Consider financial incentives similar to those currently found in Ontario, British Columbia and Québec, to support the purchase of both the EV and the installation of home charging stations.
- Support non-financial incentives in collaboration with provinces and municipalities including use of HOV lanes and free public parking.
- Support effective awareness and education campaigns to reinforce and expand the information currently available about EVs. The provision of relevant, reliable and easily accessible information is crucial to successful uptake of EVs and the corresponding emissions reduction potential.

Industry

- Explore options for increasing EV supply and consumer demand for EVs in collaboration with government and other stakeholders.
- Provide increased support for dealerships to support EV sales. This could include increasing the knowledge of sales staff through dealer training, similar to that currently being conducted by Plug'n Drive in Ontario.
- Consider options for sharing data and information related to EV technology with other key stakeholders including government in an effort to establish a strong EV market within Canada, supported by an effective policy framework.
- Work together with utilities and electric vehicle supply equipment companies to develop standardized EV technologies to ensure better vehicle-to-grid integration and successful vehicle usage. This could include partnering to demonstrate how the inclusion of EV technology within a suite of home energy storage applications can increase household electricity savings.

Utilities

- Monitor the progression of the EV market and build knowledge and capacity around advances in technologies, operating standards, regulations and general market adoption. Collaborate on research initiatives that support monitoring and evaluation of the evolving impacts of EV charging on the local distribution system.
- Investigate options for implementing programs that allow utility customers to voluntarily share information about their intention to purchase an EV and the technology they choose to purchase (e.g., vehicle model and charging services). With this information, utilities can conduct predictive assessments of the infrastructure that will be affected and ensure that quality of service is maintained.
- Collaborate with key stakeholders to identify optimal locations for public charging stations.
- Promote and facilitate EV charging habits that reduce daily peaks in demand for power and that optimize use of the distribution system's existing assets. Managing optimal EV charging will mean

that prevailing design standards for neighborhood-level infrastructure can be maintained while accommodating increased demand for EV charging.

- Engage the system regulator and governments in dialogue about super off-peak electricity service rates for EV owners, as is proposed in Ontario's Climate Change Action Plan. This will constitute a financial reward for customers who charge their EVs in a time frame that helps to optimize system utilization.
- Investigate opportunities for responsive, automated EV charging. Establishing a program in which EV owners can volunteer to share control of charging times and levels with utilities would be a productive first step.
- Identify opportunities for integrating EV charging with renewable energy sources such as residential solar PV. The use of renewables could help to ease the impacts of EV charging on the electricity distribution system during periods of peak power demand.

For further discussion or clarification on any of the opportunities outlined within this submission, please do not hesitate to contact us.

Thank you for your time and consideration.

Cara Clairman
President and Chief Executive Officer
Plug'n Drive
cara@plugndrive.ca

James Scongack
Vice President, Corporate Affairs
Bruce Power
James.Scongack@brucepower.com

Steven McCauley
A/Chief Executive Officer
Pollution Probe
smccauley@pollutionprobe.org