Policy Primer:

Transitioning to Low-Carbon Fleets in Ontario

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ontario chamber of commerce

Overview

As it stands, transportation is the largest source of greenhouse gas emissions in Ontario. While there is a growing consumer shift towards electric and alternative-fuel vehicles, there are unique challenges involved with transitioning medium- and heavy-duty vehicles. In fact, emissions from freight transportation in Canada increased by over 250% between 1990 and 2019,[i] undermining the tremendous progress being made with passenger vehicles.

Decarbonizing large-scale fleets will be necessary to meet Canada's net-zero target – and to attract businesses that are looking to meet their increasingly ambitious climate targets. This policy primer explores the technologies, policies, and investments required to enable the decarbonization of commercial fleets across Ontario.

The Technologies

Low-carbon vehicles come in many shapes and sizes. Battery electric vehicles (BEVs) are becoming increasingly common for passenger and last-mile delivery vehicles; however, clean fuel alternatives remain critical for medium- and heavy-duty vehicles.

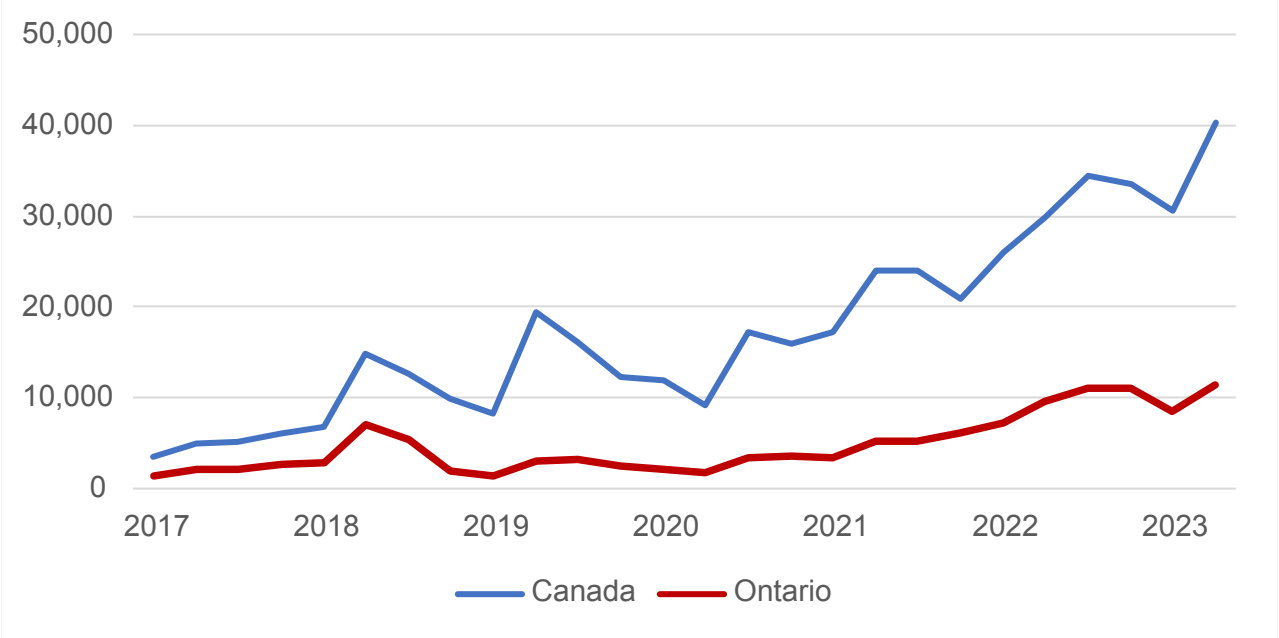
Electric vehicles (EVs), including both BEVs and plug-in hybrid electric vehicles,[1] tap into Ontario's low-carbon electricity grid and can reduce tailpipe emissions by up to 90 percent compared to traditional internal combustion engine vehicles. As of May 2023, there are more than 118,000 EVs registered in Ontario and by 2030, that number is expected to reach over one million[ii].

Hydrogen fuel cell vehicles use hydrogen to power an electric motor. These technologies could eventually be used for long-haul vehicles as hydrogen offers quicker refuelling and longer vehicle range as compared to electric trucks.

Other clean fuels, such as renewable natural gas (RNG) and renewable diesel, can reduce emissions cost-effectively for vehicles already in use without changing current fleets or infrastructure. These fuels use bio-based feedstocks and/or cleaner energy production processes. Vehicles fuelled with RNG and renewable diesel can have the same range and refuelling time as traditional diesel engines, and RNG vehicles can also be carbon-negative, depending on the method of fuel production and the blending ratio.[iii]

1 Battery EVs are powered by electricity stored in high-capacity batteries, and plug-in hybrid EVs combine an electric motor with an internal combustion engine and a battery. Plug-in hybrid EVs can operate in battery-only mode for shorter trips, and use their engines for longer trips, making them suitable for fleets requiring greater range flexibility.

New Quarterly Electric Vehicle Registrations, Ontario & Canada[iv]



Policy Recommendations

1 Clean energy supply:

Low-carbon vehicles are only as clean as the energy that powers them.

Ontario will need to continue procuring significant amounts of baseload power to support electrification of transportation and other sectors, particularly as it faces significant electricity supply shortfalls over the next decade. Nuclear and hydroelectric power currently make up 75 percent of electricity output[v] and will continue to be an important source of clean power for Ontario, in addition to renewables like wind and solar.

Hydrogen, renewable diesel, and RNG supply are also limited, in part because they are newer and currently challenging to produce at scale. Policies should look to accelerate the development of a diverse mix of clean energy resources to underpin the fleet transition.

Recommendations (Ontario & Canada):

1. Prioritize procurement and financing of clean baseload electricity infrastructure projects.
2. Work towards a more flexible and streamlined regulatory framework for clean energy projects. For example, environmental and safety assessments approved by one level of government should be able to form the basis for approval by another government and for the expansion or continued operation of those sites.
3. Set supply targets and incentivize production of hydrogen, RNG, and renewable diesel, borrowing best practices from British Columbia's Low-Carbon Fuel Standard.

2 Charging and refuelling:

The availability of charging and refuelling station infrastructure is another obstacle, albeit one that is gradually being addressed through investments from the public and private sectors, such as Ontario's Ivy Charging Network, the ChargeON program, and the Canada Infrastructure Bank's Charging and Hydrogen Refuelling Infrastructure (CHRI) initiative.[2] Meanwhile, Canada's Zero-Emission Vehicle Infrastructure Program (ZEVIP) is targeting the deployment of 33,500 EV chargers and 10 hydrogen refuelling stations across the country by 2026.

To date, most efforts to expand charging and refuelling stations have focused on passenger vehicles.[vi] Infrastructure needs to be designed to allow physical access for larger vehicles and to ensure that sites can support the high-powered, Level 3 charging required for medium- and heavy-duty vehicles along major roads and highways.

On a positive note, Ontario and Quebec combined have 20 public/cardlock stations along their highways that are capable of quickly refuelling medium- and heavy-duty trucks that operate on compressed and renewable natural gas. Most of these sites accommodate tractor trailers, including long combination vehicles, and some have been designed to accommodate future facilities for hydrogen and EV charging.

Another challenge relates to electricity rate structures. Commercial fleet operators currently pay electricity delivery rates primarily based on their peak demand (i.e., the maximum amount of power they consume over a billing cycle). However, under an alternative rate design, businesses could be incentivized to charge their EV fleets during off-peak hours using surplus baseload power, which would reduce costs and support broader electricity system benefits.[vii]

Recommendations (Ontario & Canada):

1. Expand and incentivize investments in charging and refuelling station infrastructure for low-carbon commercial fleets across major supply chain and commercial transportation routes.
2. Expand electricity distribution infrastructure across the province to support the added charging infrastructure.
3. Implement an alternative electricity rate structure for commercial EV fleet operators to incentivize time-of-use behaviours and reduce cost barriers.
4. Work with industry and post-secondary institutions to ensure Ontario's workforce has the skills needed to build and operate low-carbon transportation infrastructure.

3 Clean technologies for medium- and heavy-duty vehicle classes:

The BEV market is developing rapidly, supported by investments from the Governments of Ontario and Canada to build supply chains from critical minerals to manufacturing.

However, alternative technologies are being developed which may be better suited for medium- and heavy-duty vehicle classes – such as range-extended EVs, hydrogen fuel cell vehicles, and RNG-powered vehicles.

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[2] The Ivy Charging Network (owned by Hydro One and Ontario Power Generation) is building a fast-charging network across the province, with 160 chargers across 60+ locations. The ChargeON program (launched in November 2023) provides funding for the installation of public EV chargers in Ontario communities outside of major cities. The CHRI provides loans towards the buildout of EV charging infrastructure; as the second investment in this space, the Canada Infrastructure Bank is enabling the roll out of nearly 4,000 fast EV charging ports nationwide in collaboration with private sector partners.

These technologies will continue to evolve, spurred in part by demand, Ontario's Low-Carbon Hydrogen Strategy, and a federal target of 100 percent zero-emission medium- and heavy-duty vehicles by 2040 (where feasible). The federal government has also implemented policies to help address this challenge, including Canada's Zero-Emission Trucking Program, which was allocated $75.8 million over five years to support development, testing, and deployment of zero-emission trucks across the country.[viii]

Many of the innovative solutions that will be needed to decarbonize fleets are originating at Ontario's world-class post-secondary institutions with industry support. Continued investment in research and development will be critical to spur additional progress.

Further, policies and programs designed to support low-carbon vehicles should consider the full lifecycle emissions of fuels, vehicles, and their components from raw materials to end-of-life waste management. Vehicle manufacturers should be incentivized to demonstrate improvements in the carbon intensities of the liquid fuel pool as well as the vehicle technologies over time to contribute to emission reductions during the transition.

Recommendations (Ontario and Canada):

1. Invest in low-carbon vehicle research and development programs at Ontario's post-secondary institutions to support the advancement and commercialization of new technologies for medium- and heavy-duty vehicle classes.
2. Recognize RNG as a zero-emission technology solution.
3. Recognize the contribution of low-carbon intensity liquid fuels as part of the transition while low-carbon vehicle technologies advance.

4 Purchase incentives:

While supply-side considerations are important, the market ultimately evolves where there is demand. The cost of low-carbon vehicles is currently a major barrier for businesses looking to transition their fleets in Ontario. Purchase incentive programs should be designed to achieve a high return on investment for taxpayers by attracting more capital into Ontario from businesses looking to meet their climate targets.

The United States offers businesses a tax credit for the purchase of any commercial EV or fuel cell EV.[ix] In Canada, the federal government's Incentives for Medium- and Heavy-Duty Zero-Emission Vehicles (iMHZEV) Program provides incentives of up to $200,000 per vehicle (based on the vehicle class) for up to ten vehicles annually, for Canadian businesses looking to transition their fleets.[x] Several provinces and territories have adopted their own incentive programs to complement the federal offer.

Canada also offers the Green Freight Program, which helps fleets reduce their fuel consumption and emissions through energy assessments, retrofits, and the purchase of low-carbon vehicles.[xi]

Recommendation (Ontario): Consider adopting a low-carbon vehicle incentive program for commercial fleets to complement the federal iMHZEV program and Green Freight Program, and match the incentives found in British Columbia and Quebec.

Endnotes

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[v] Government of Ontario. 2023.

[vi] Government of Canada. "Canada's Action Plan for Clean On-road Transportation." https://tc.canada.ca/sites/default/files/2023-03/ROAD-04-ON_ROAD_ACTION_PLAN_REPORT_EN_V09.pdf.

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Author: Claudia Dessanti, Senior Manager, Policy, Ontario Chamber of Commerce
Design: Wan-Chiao Hsu, Graphic Designer, Ontario Chamber of Commerce