



Environment
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Electric Vehicles in Canada

**Presentations of National Frameworks
(Agenda item 7)**

**Document EVE-02-13
13 September 2012
EVE IWG Meeting #2
Baltimore, Maryland, USA**

Outline

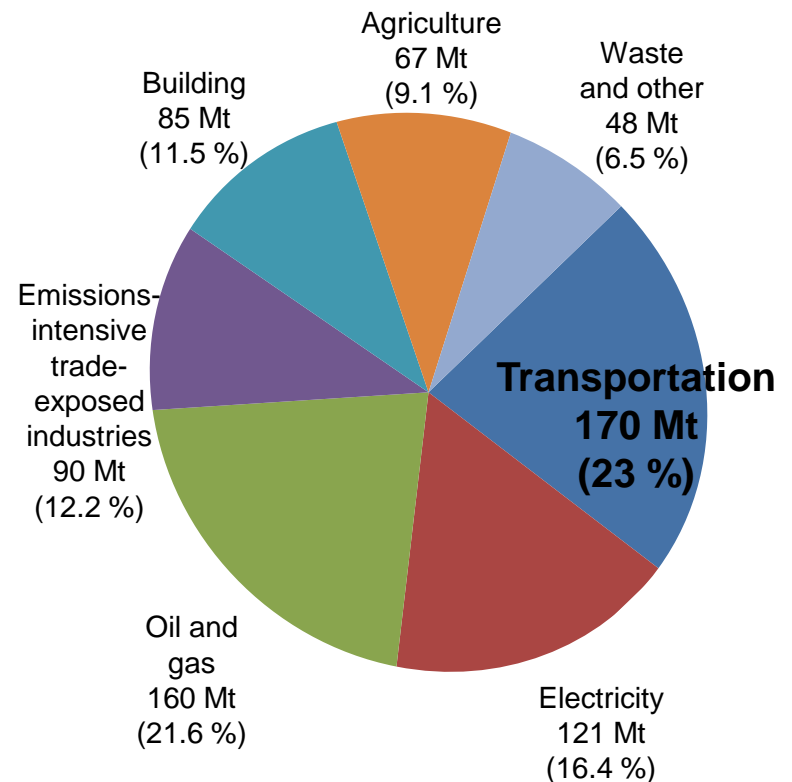
- Background
- Federal actions
- Provincial actions
- Canadian EV considerations



Transportation Emissions and Canada's GHG Target

- Government of Canada is committed to reducing Canada's total GHG emissions by 17% from 2005 levels by 2020.
- Transportation sector is the largest single source of GHG emissions in Canada, accounting for 23% of Canada's total GHG emissions, with light duty vehicles alone accounting for 12% (2005).
- Given that clean energy contributes approx. 75% of Canada's total electricity mix, **electrifying the transportation system** provides an opportunity to reduce Canada's GHG emissions

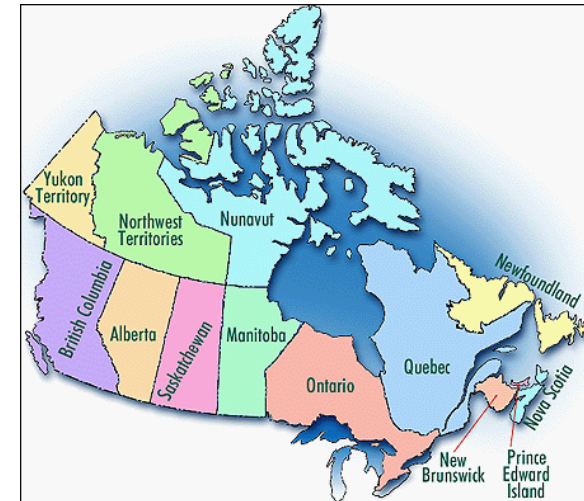
Canada's GHG Emissions – 2005



Total : 740 Mt in 2005

Canadian Context

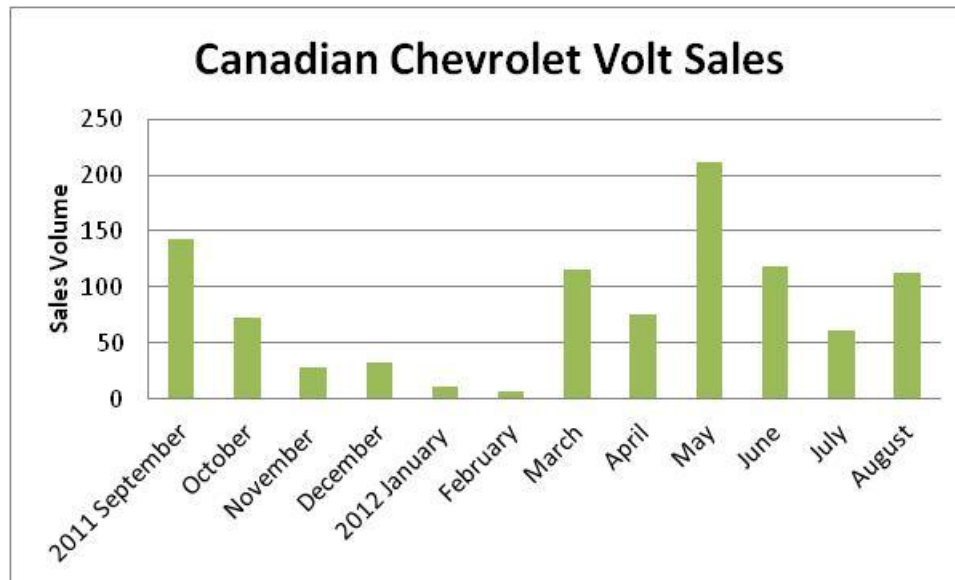
- The **Government of Canada** has historically regulated the manufacture and import of new vehicles and engines sold in Canada
 - Environment Canada regulates emissions
 - Transport Canada regulates safety
- **Provinces** have traditionally regulated the use and operation of vehicles and engines
- Through initiatives such as the Regulatory Cooperation Council and the Canada-U.S.A. Air Quality Agreement, Canada has a policy of alignment with the U.S. EPA for emissions standards in the transportation sector



Current Status of Electric Vehicles in Canada

- Manufacturers currently offer:
 - HEV: Toyota Prius, Ford Escape Hybrid, Honda Insight, etc.
 - PHEV: Chevrolet Volt, Toyota Prius
 - BEV: Nissan Leaf, Mitsubishi i-MiEV, Tesla, Fisker Karma

Example:



- In 2011, 275 Chevrolet Volt vehicles were sold in Canada, from January to July 2012, over 700 Volts have been sold.
- In 2011, 1.5 million vehicles were sold in Canada

Source: Automotive data reports, Automakers

Current Status of Electric Vehicles in Canada (cont'd)

- Toyota has announced plans to build the electric RAV in Ontario
- Canadian company, Azure Dynamics, did the electric conversion work for Ford on the Connect BEV
- In 2011, over 1,000 electric vehicles were imported into Canada
- Small scale / experimental manufacturing taking place – Motive Industries, etc.
- High adoption rate of hybrid-electric buses in Canada
- Hybrid electric buses testing performed by Environment Canada shows significant reductions in fuel consumption

Purolator is a Canadian courier who operates over 3,500 vehicles, including 600 hybrid vehicles



Current Status of Electric Vehicles in Canada (Cont'd)

- A 2012 report revealed 54 Canadian organizations active in electric passenger vehicle technologies
- Canadian organizations that are active in electric propulsion systems research include:
 - Auto 21 Inc.
 - Automotive Partnership Canada
 - BC Ministry of Transportation
 - Canadian Vehicle Manufacturer Association
 - National Centre for Advanced Transportation
 - Opal – RT Technologies
 - Université Laval
 - University of Ontario Institute of Technology
 - University of Waterloo

Federal Engagement in Electric Vehicles

- Regulates emissions and safety for vehicles and engines under the *Canadian Environmental Protection Act, 1999* and the *Canada Motor Vehicle Safety Act* respectively;
- Monitors and encourages market competitiveness;
- Carries out research & development and technology demonstrations;
- Develops codes and standards;
- Develops, with the collaboration of stakeholders, guidance, consumer outreach and policy for the deployment of Evs; and
- Participates in a Federal/Provincial Working Group on Mobile Sources to improve collaboration and information sharing on emission reduction initiatives within the transportation sector, including exploring the use and adoption of electric vehicles within Canada.




Federal Regulations Facilitating EV Deployment



- Emission regulations encourage low emission technology, including electric vehicles
- *On-Road Vehicle and Engine Emission Regulations*
 - Affects 2004 and later model year on-road vehicles and engines, including passenger vehicles, sport utility vehicles, heavy trucks, buses, motorcycles and scooters.
 - Aligned with U.S. EPA Tier 2 program
- *Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations*
 - Phases in more stringent standards over the 2011-2016 model years (MYs), aligned with the U.S.
 - Phase II standards targeting 2017 – 2025 MYs are currently being developed
 - Advanced Technology Vehicles are multiplied in fleet calculations
- Proposed *Heavy-duty Vehicle and Engine Greenhouse Gas Emission Regulations* published in April 2012

Treatment of Advanced Technology Vehicles (LDV GHG Regulations)



- LDV GHG Regulations include provisions that effectively serve as an incentive for the introduction of advanced technology vehicles
 - electric, plug-in hybrid, or fuel-cell vehicles
- When calculating its fleet average GHG emissions for the 2011–2016 model years, a company can:
 - use a value of zero g/mile for fully electric vehicles; the electric portion of plug-in hybrids and fuel cell vehicles.
 - multiply the volume of vehicles “sold” by a factor of 1.2 
- Use of the value of zero g/mile is limited to a maximum number of vehicles
 - generally the first 30,000 ATVs during the 2011–2016 model years
 - if cap is exceeded, use a general value of 120 grams of CO₂e per mile.



Other Federal Activities

Electric Vehicle Technology Roadmap (evTRM), 2010

Industry-led, Canadian federal government coordinated document, focused on the development and adoption of EVs in Canada, fostering a robust industry.

Goal: 500,000 plug-in electric vehicles in Canada by 2018

- Three key recommendations from the roadmap
 1. Substantial investments in energy storage devices and the manufacture of EVs
 2. Development of government mechanisms to promote public acceptance and charging infrastructure
 3. Committees should be used to ensure that the strategic initiatives identified in the Roadmap are addressed
- Committees have been established and are currently working towards initiatives

Provincial EV Programs: Selected Examples

British Columbia

- Clean Energy Vehicle (CEV) Program started November 2011, as part of B.C.'s LiveSmart initiative, includes a \$5,000 incentive program

Ontario

- Incentive for eligible PHEVs and BEVs acquired after July 1, 2010 is based on the vehicle's battery capacity
- Target: 1 in 20 vehicles driven in Ontario to be electrically powered by 2020 (announced 2010)

Québec

- Starting January 1, 2012, up to \$8,000 in rebates for the first 10,000 plug-in electric vehicles
- Target: 25% of sales will be EVs or PHEVs by 2020, announced in the Action Plan for Electric Vehicles (2011)

Non-Government Organizations: Select Research on Electric Vehicles

Pollution Probe is a national ENGO actively involved in research projects related to EVs including:

- developing business cases on the electric vehicle market within Canada;
- identifying current needs assessments (e.g. infrastructure); and
- identifying potential policy measures in Canada.

Pollution Probe: Select EV Projects

- 1. Electric Mobility Adoption and Prediction Project (EMAP):** will map the locations of early EV-adopter communities in Toronto and assess the EV-readiness of the local power service in those areas. The final report, expected in Summer 2012, will include recommendations for infrastructure investment to support the anticipated adoption of EVs.
- 2. Electric Vehicle Analysis (EVAN):** will provide a business case for fleet managers to make informed decisions on electric vehicle procurement, based on a case study performed in the Toronto area.



Canadian EV Considerations

- Given that clean energy contributes approx. 75% of Canada's total electricity mix, electrifying the transportation system provides a significant opportunity to reduce Canada's GHG emissions
- Charging infrastructure availability and locations will need to consider relative large distances between Canadian urban centers and urban sprawl
- Although cold climate can impact EV range, advances in technologies are being made to mitigate this challenge
- Challenges on the demands of the electrical grid will need to be considered as EVs are deployed

Canada wants to support global solutions to technological challenges as electric vehicle deployment increases.

