Decarbonizing Canada's Medium- and Heavy-Duty Vehicle Sector

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Leading Canada’s transition to clean energy

The Pembina Institute is a charity and think-tank that advocates for strong, effective policies to support Canada's clean energy transition.

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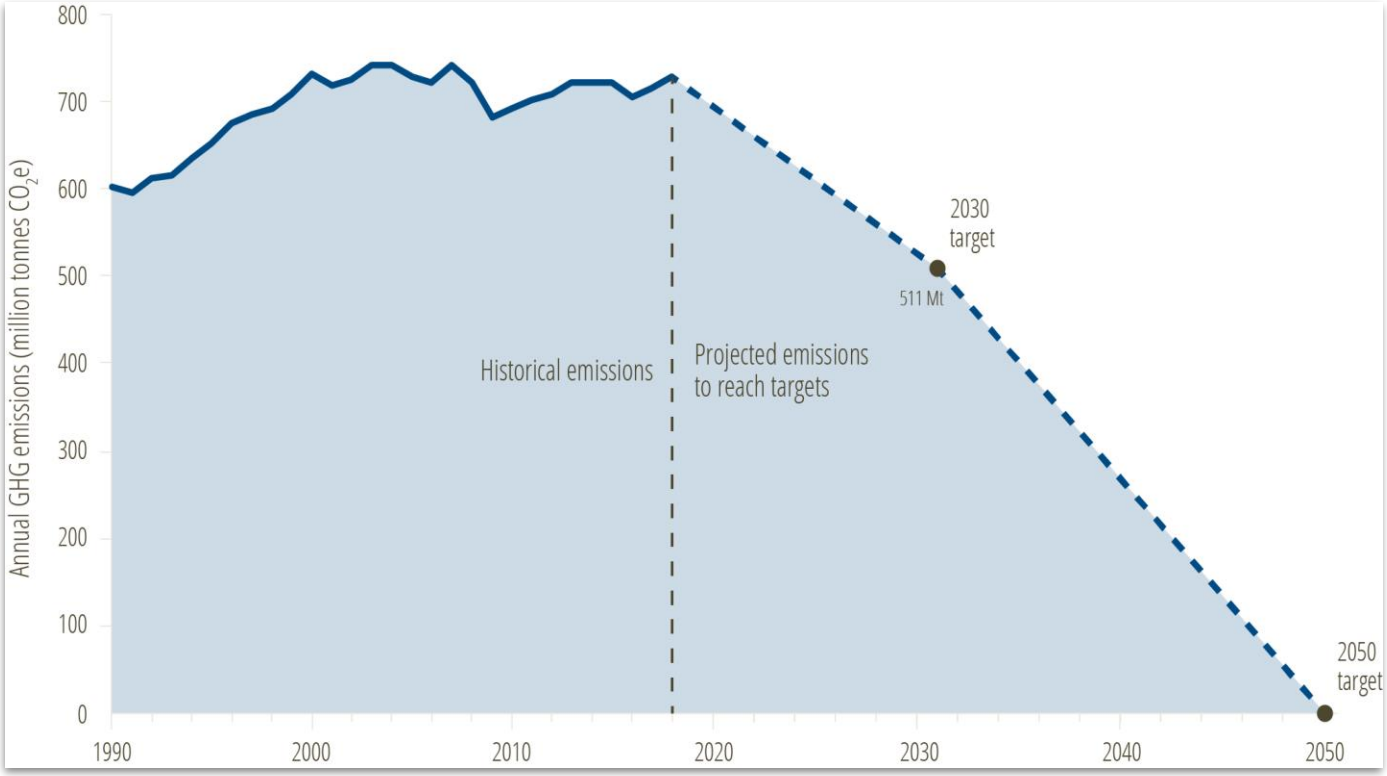
Flattening Canada's carbon curve

Canada committed to reduce GHG emissions by 40 to 45% below 2005 levels by 2030 and net-zero by 2050



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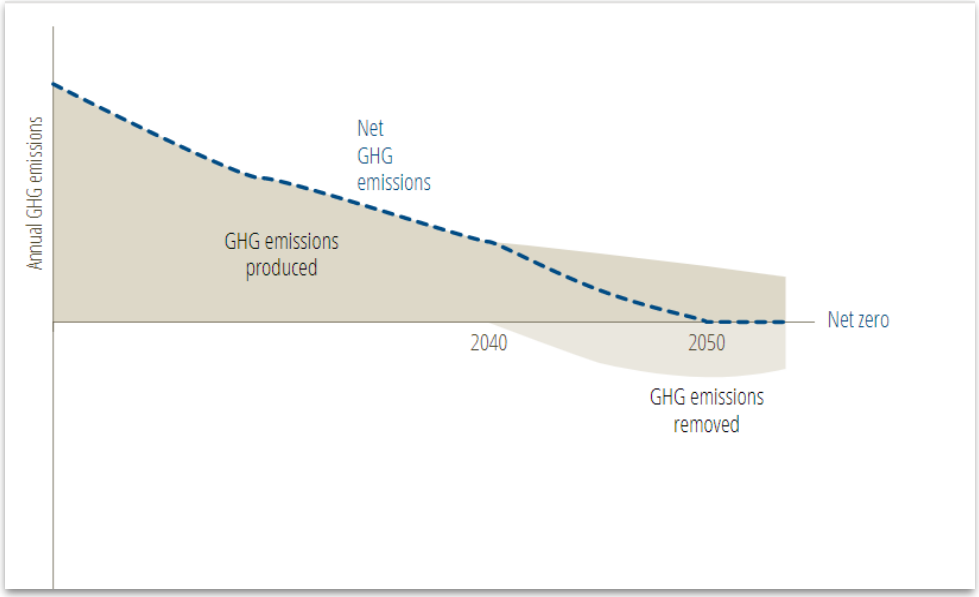
The pathway to net-zero

- Not every pathway to net-zero is equal
- A robust blueprint is needed with accountability checkpoints
- Canada's Emission Reduction Plan aims to reduce emissions to meet 2030 and 2050 targets.



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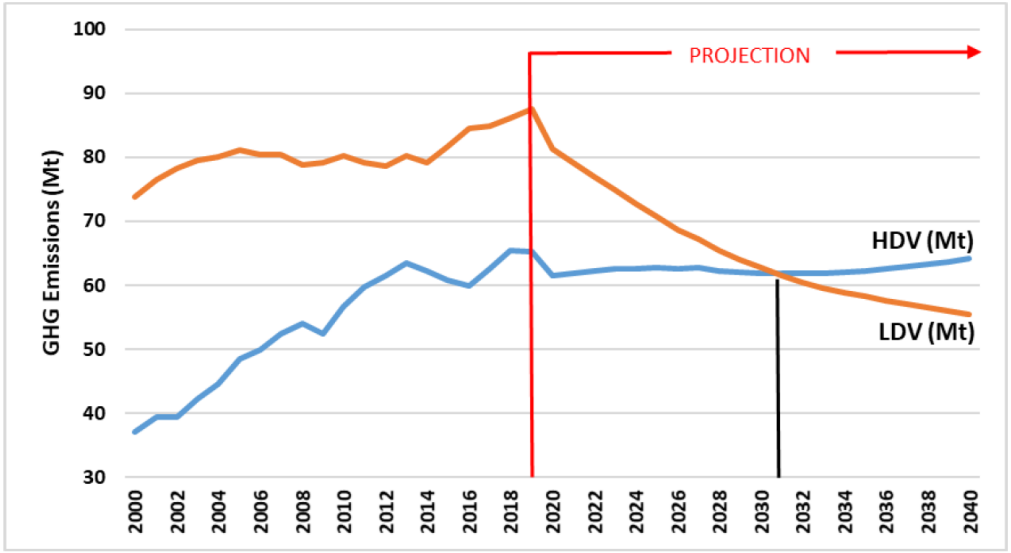
Heavy-duty vehicle emissions

- Globally, gas and diesel trucks and buses represent 4% of on-road fleet but contribute 36% of on-road fuel consumption and GHG emissions
- Emit over 70% of on-road NOx emissions and 60% of PM2.5 emissions.
- HDV sector is projected to become the largest source of GHG emissions from transportation by 2030.



Source: Government of Canada 2030 Emission Reduction Plan (2022)

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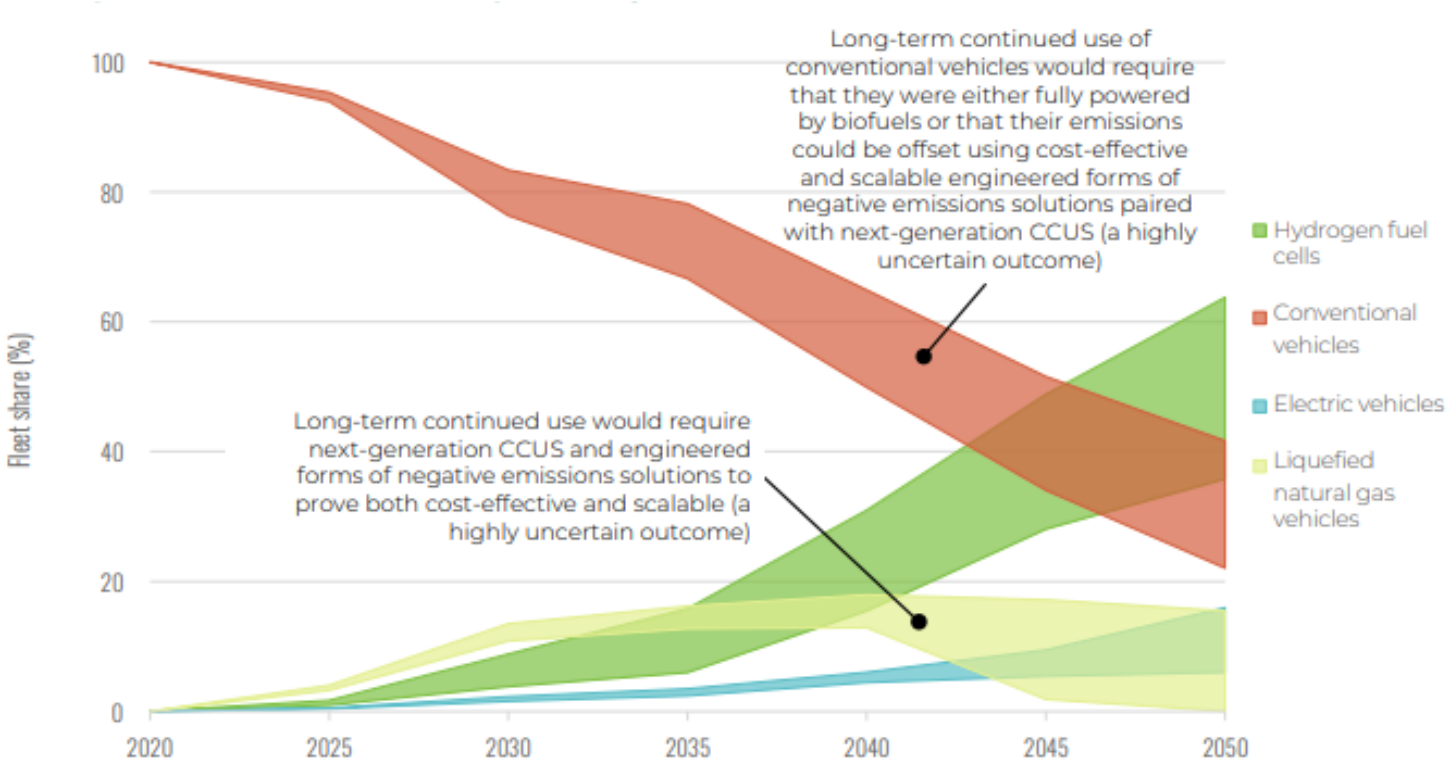
Net-zero pathways for freight

Total market share of different vehicle types in Canada's freight transportation fleet across pathways to net zero



Source: Canadian Institute for Climate Choices. Canada's net-zero future (2021)

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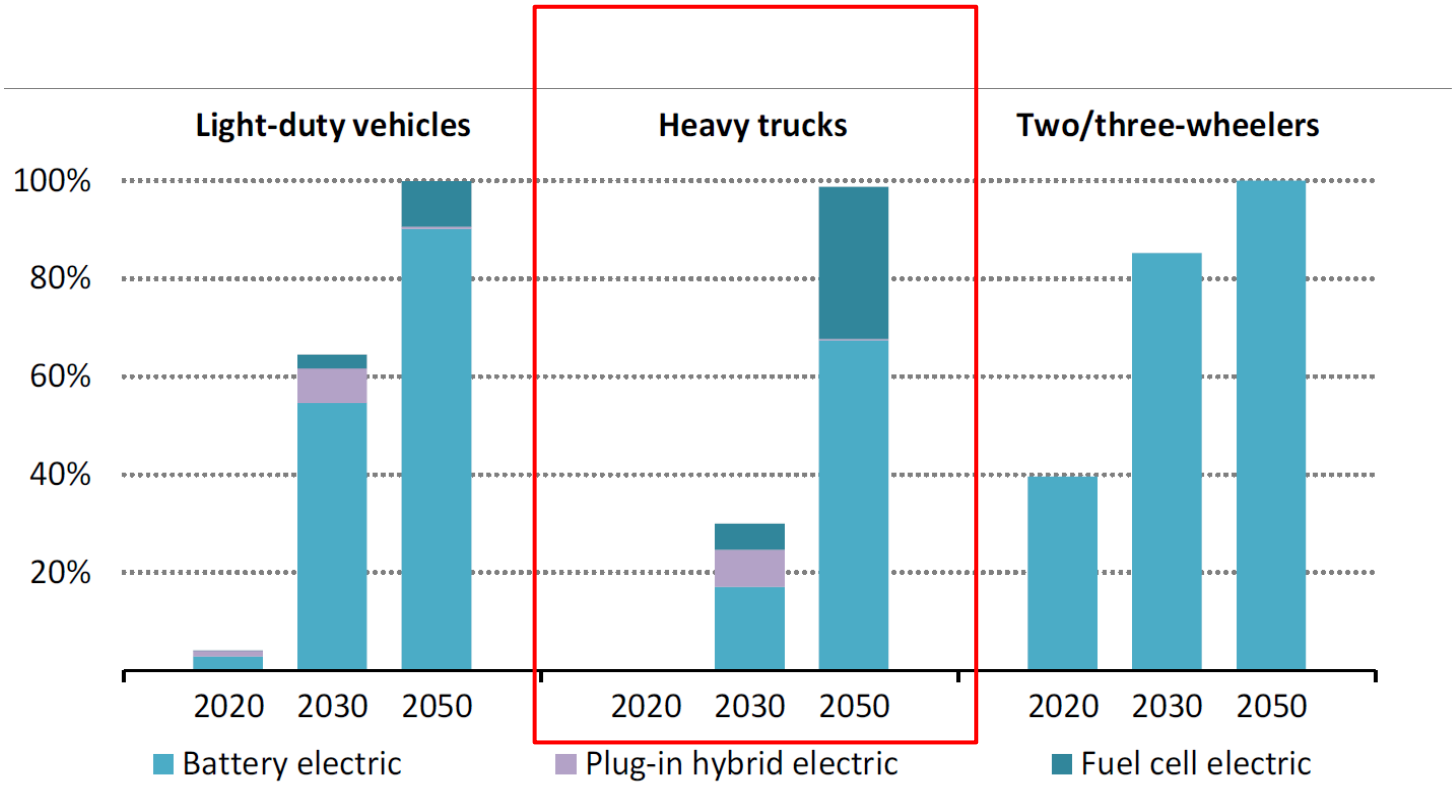
Canada's Emission Reduction Plan

- An integrated MHDV decarbonization strategy
- 35% of total MHDV sales to be ZEVs by 2030
- Regulation to require 100% ZE MHDV sales by 2040 with 2030 regulated sales requirements for certain vehicles, where feasible
- Stringent HDV standards post-2025
- Increase adoption of fuel-efficient technologies
- Increase production and use of low-carbon fuels (Clean Fuel Regulation)
- Net-zero electricity by 2035 through a Clean Electricity Standard
- Driving down carbon pollution from the oil and gas sector

Share of ZEVs globally



Sales of battery electric, plug-in hybrid and fuel cell electric vehicles soar globally

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Current Status in Canada

- As of 2021, ZE MHDVs account for less than 1% of total new truck sales, with particularly low sales among pick-up trucks and vans (Government of Canada, 2022)
- Under current Canadian policy conditions, ZE MHDV sales expected to be around 11% and 13%, respectively, by 2040 (ICCT, 2020)

A Stronger ZEV Policy Framework

- **Economic development:** Canada's ZEV economy could grow from representing ~$1.1 billion of GDP (2015$) and employment of 10,000 workers to ~$152 billion of GDP and 1.1 million workers in 2040 (ICCT, 2020)
- **Improved public health:** Replacing 240 to 1,000 diesel trucks per day along the Highway 401 corridor with low- and zero-emission trucks could save 1,310 years of life lost annually (or $428 million in annual social cost) (Minet et al., 2020)
- **Cost savings:** Total cost of ownership (net of purchase costs and running costs) of ZE MHDVs is about half of that of diesel trucks (ICF, 2019)

Barriers to ZEV adoption

- Lack of charging infrastructure
- Higher purchase costs for ZE HDVs
- Insufficient awareness and capacity
- Retiring and replacing existing fleets
- Reduced payload capacity

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Key pillars to accelerating ZE MHDVs

1. Strategic planning and regulations
2. Incentives for deployment
3. Investments in charging/refuelling infrastructure and related systems
4. Building fleet capacity; labour market programs and skills training

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A ZE MHDV Strategy

Pembina is undertaking a new initiative to develop a national industry-endorsed ZE MHDV strategy for Canada.

Policy objectives for a strategy:

1. Emissions reduction
2. Accelerate deployment of ZEVs
3. Provide market certainty
4. Protect and preserve public health and well-being
5. Spur economic activity and innovation

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Study scope

- Spotlighting best use cases for electrification
- Literature review of ZE MHDV policies and programs
- Recommendations on impactful supply and demand side policies and actions to meet Canada's ZE MHDV targets
- Recommendations on policy design, where appropriate

Stakeholder workshops planned in summer and fall 2022 to inform strategy development process.

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