



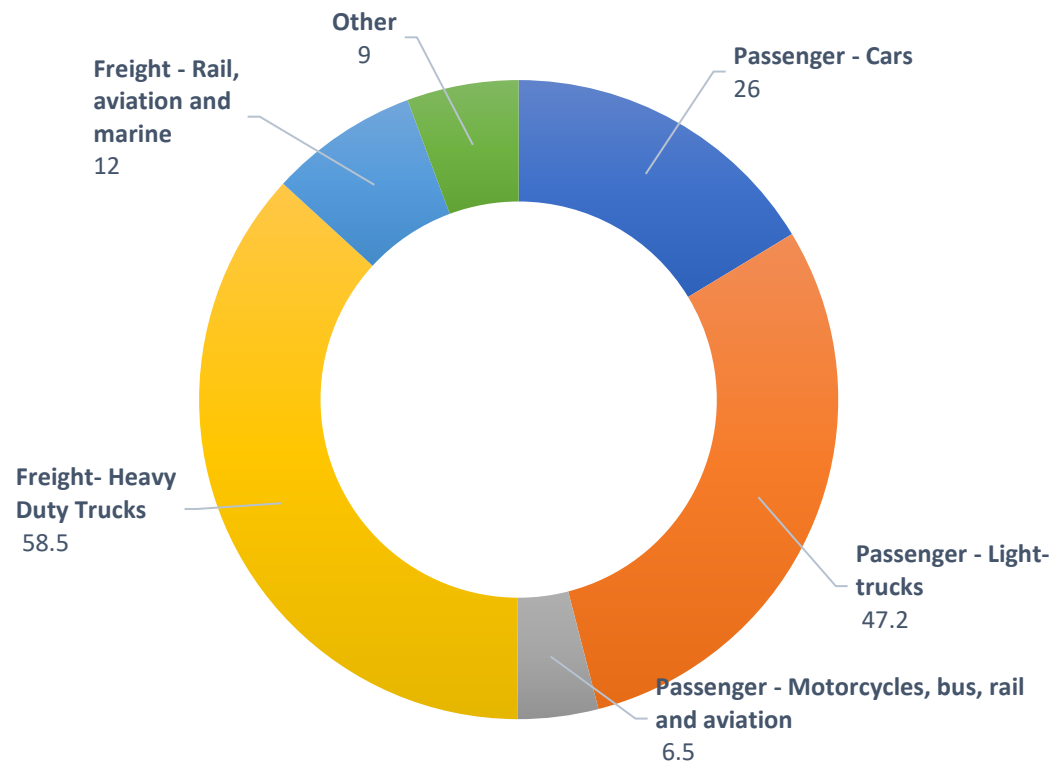
Decarbonization of Long-Haul Trucking in Canada

April 2023

Jordan Wolfe, Deputy Director
Zero-Emission Trucking Program
Transport Canada

Heavy-duty transport is a key economic driver but also a major emitter

GHG emissions from the transport sector, 2020
(Mt CO₂ eq.)



- U.S. goods and services trade with Canada totaled an estimated **\$718.4 billion in 2019**, with 90% of all goods and 95% of mineral shipments being moved by truck.
- **Transportation is Canada's 2nd largest GHG emitter**, after the Oil and Gas industry, representing **24% of total GHG emissions**.
- Transportation of freight by **Heavy-Duty Trucks emits** an equivalent of **58.5 Mt CO₂** annually, representing almost **37% of emissions from the transportation sector**.

Emission Reduction Plan - ZEV Sales Mandates

- The Government of Canada has committed to achieving net-zero emissions by 2050.
- Through the 2022 Emissions Reduction Plan, the Government of Canada signaled ZEV sales mandates for both the LDV and MHDV sectors:

Year	LDV	MHDV
2026	20%	---
2030	60%	*
2035	100%	---
2040	---	100%**

* *Interim soft target to reach 35% of overall MHDV sales being ZEV*

** *for a subset of vehicle types based on feasibility, with interim 2030 regulated sales requirements that would vary for different vehicle categories based on feasibility, and explore interim targets for the mid-2020s.*

Challenges & Opportunities for Decarbonizing the Medium- and Heavy-Duty Transportation Sector

- Medium and Heavy-Duty Zero Emission Vehicles face unique challenges compared to the LDV sector:
 - High purchase price of MHZEVs
 - MHZEV availability
 - MHZEV infrastructure readiness
 - MHZEV application in the Canadian context (range, climate, weights & dimensions)
 - Intensive Duty Cycles
 - Grid readiness
- Despite these challenges, we're seeing enthusiasm and movement in the sector from OEMs, fleets, researchers, and governments.

Despite remaining challenges, industry is keen to adopt zero emission trucking solutions

- Companies such as Volvo, Peterbilt, Freightliner, Hyundai, Tesla, Nicola, Lion and many others have models on offer or soon to come online. Currently, over 200 separate models and trims are eligible for federal purchase / lease incentives.
- Similarly, early **Canadian deployments** are being considered in several regions, for example: AZETEC in Alberta, Hyzon and Nikola's rotating commercial vehicle trials, and potential pilots out of the Port of Vancouver.
- And there is similar interest among **Canadian fleets**, with a cursory scan indicating that fleet operators have already placed orders for over 780 zero-emission heavy-duty trucks over the past few years.
- To facilitate the safe introduction of Medium / Heavy Duty Zero-Emissions Vehicles (MHZEV), governments are working to establish an **enabling framework** of guidelines, codes, standards and regulations.

Government of Canada Support for On-Road Decarbonization & Enabling Policies



In March 2022, the Government of Canada (GoC) announced a suite of measures to reduce emissions from the On-Road Transportation Sector:

- \$1.7 B to extend the LDV Purchase / Lease Incentives (TC)
- \$ 547.5 M for MHZEV Purchase / Lease Incentives (TC)
- \$75.8M for the Zero Emission Trucking Program (TC)
- \$200 M for Truck Retrofits (NRCan)
- \$900 M for ZEV Infrastructure (NRCan and CIB)
- \$2.2 M for Greening Government Fleets (TBS)



In March 2023, through Budget 2023 the GoC announced several policies to increase the production of clean energy, which will support the decarbonization of the on-road transportation sector:

- Funding for Clean Electricity projects
- Tax credits for Clean Electricity production
- Tax credits for Clean Hydrogen production & CCUS Technology
- Tax credits for Clean Technology manufacturing

Zero Emission Trucking Program (ZETP) – Core Program Objectives



As per the funding decision in Budget 2022, the ZETP will focus on **advancing its mandate by pursuing 5 key activities:**

- **PT Calls for Proposals:** Provide capacity funding to PTs via contribution agreements to develop, modernize, and align training, guidance, codes, standards and regulations for zero emission trucking. [1st CFP closed on March 29th, 2023.](#)
- [Zero Emission Trucking Testbeds:](#) Support 2 HDZEV deployments to bring industry, FPT and research stakeholders together to evaluate technologies in Canadian conditions, share best practices, and accelerate HDZEV readiness in Canada.
- **Directed Studies and Research:** Address data and knowledge gaps to remove barriers to the introduction of zero emission trucks in the Canadian marketplace. (E.g., reports on Battery Technologies for Electric Long-Haul Trucks (Available upon request) and the Canadian Trucking Dataset Meta Analysis)
- **MHZEV Safety Research Program:** Validate MHZEV safety performance and inform the development of new safety requirements, as needed.
- **Motor Vehicle Test Centre Capital Investments:** Construct a Commercial Vehicle Lab and accompanying H2 refueling and HDV charging infrastructure to support HDV testing and research on site.

Government of Canada On-Road Decarbonization Programs

Natural Resources Canada (NRCan)

- ZEV Infrastructure Program
- ZEV Awareness Initiative
- Greening Freight programs (Retrofits, etc.)

Environment and Climate Change Canada (ECCC)

- Upcoming Regulatory work
- Sales mandates for LDVs
- Sales targets for MHZEVs

Transport Canada (TC)

- iMHZEV: Purchase incentive program for Medium and Heavy Duty ZEVs
- iZEV: Purchase Incentive program for Light Duty Vehicles (iZEV)
- Zero Emission Trucking Program (ZETP)



Treasury Board of Canada Secretariat

- Greening Government Strategy



Infrastructure Canada

- Zero Emission Transit Fund

Innovation, Science, and Economic Development Canada (ISED)

- Measurement Canada (accurate and reliable measurement of charging and refueling infrastructure)
- Industrial policy & Investments for the Canadian Automotive Manufacturing sector
- Strategic Innovation Fund (SIF)/ Net Zero Accelerator (NZA)

Canadian Infrastructure Bank (CIB)

- EV Charging and Hydrogen Refueling Infrastructure Initiative (Large-scale)



Intergovernmental Collaboration: Industry Workshops

- Transportation in Canada is a shared responsibility among the federal, provincial, and municipal levels of government. While the federal government is responsible for overseeing international and inter-provincial transportation, Provinces and Territories have authority over intra-provincial transportation, including registration, enforcement, and insurance.
- Given the shared mandate and interlinkages of newly announced programming, we hosted a series of 3 Zero Emission Trucking Workshops to ensure that our vision is well aligned with the needs of other jurisdictions. The following action items were identified as priorities for future work:
 - **Awareness & Information Sharing:** Creation of an information portal on the Canadian zero emission trucking ecosystem and federal government initiatives. Support for programs that increase awareness, knowledge and public confidence in MHZEVs.
 - **Development of Guidance, Codes, Standards & Regulations:** Continue collaborating with PTs and internationally to modernize and align MHZEV codes, standards and regulations and develop guidance materials to accelerate permitting for related infrastructure installations.
 - **MHZEV Infrastructure Investments:** Continue supporting infrastructure installations, through programs such as ZEVIP, to address the barrier of recharging / refueling station availability and invest in Canadian manufacturing capacity.
 - **MHZEV Training & Skills:** Identify and address knowledge and skills gaps in the MHZEV sector by developing curricula and supporting its wide diffusion across Canada (e.g., roadside inspections, 1st responders).
 - **Address Data & Knowledge Gaps Through Deployments:** Fund targeted research on MHZEVs (e.g., vehicle light-weighting) and gather data, while generating confidence in the technologies, through in-service on-road MHZEV deployments in Canadian conditions.

Intergovernmental Collaboration: CAN-US ZEV Summit

- The 2021 joint statement by Minister Alhabra & Secretary of Transportation Pete Buttigieg set the tone for *"bilateral cooperation to fight climate change and limit the environmental impacts from our transportation networks"*, including the acceleration of MHZEVS and supporting infrastructure.
- In February 2023, TC hosted the first meeting of the Canada-U.S. Zero Emission Vehicle (ZEV) Task Force in Ottawa, with a vision to accelerate the decarbonization of the on-road sector.
- Joint Actions coming out of the Summit include:
 - Undertaking work to establish Bi-National Alternative Fuel Corridors.
 - Support the harmonization of ZEV charging standards.
 - Collaborate on R&D and Demonstrations to share findings, support safety standards, and regulatory harmonization.
 - Collaboration to build consumer / user confidence in ZEVs.
 - Indigenous engagement planning.



Zero Emission Trucking Program

If you have questions or comments, please feel
free to contact us at:

ZETProgram-ProgrammeCZE@tc.gc.ca