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Canada

CIPMM FLEET MANAGEMENT WORKSHOP

ZEV Pathway to 2030 – Part 2

November 2022

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Overview

Part 2: Exploring solutions
8:45 – 9:30am, November 16

1. Discussion: Fleet greening barriers and solutions
2. ZEV 2030 Pathway initiative:
   - Overview
   - Consultant market analysis
   - Achieving the target
3. Discussion: What is needed to reach 100% ZEV by 2030?
4. Next steps and keys to success

Part 1: Setting the stage
3:00 – 3:45pm, November 15

1. Canada's Greening Government Strategy
   - Policy context, structure and emissions
2. Greening the fleet
   - Commitments and progress to date
   - Reporting website update
   - 2022-23 green purchasing requirements
3. Closing thoughts

Recap: Commitments and performance to date

Commitments: **Conventional light duty fleet is 100% zero emission vehicles (ZEVs) by 2030.**

- At least 75% of purchases are ZEVs or hybrids (HEVs)
- Targets apply if suitable options are available and operationally feasible
- Separate targets under development for national safety and security fleet (RCMP and DND tactical vehicles)

Performance: 10.7% of the conventional light-duty fleet is green – 586 ZEVs (3.4%) and 1,257 HEVs (7.3%)*

- **72%** of new purchases were green (ZEV or HEV) when suitable options were available; green vehicles comprised 45% of all new purchases*
- **59%** reduction in on-road fleet emissions from 2005-06 to 2020-21

Department leads:

- **TBS**: Lead for targets, reporting and fleet mgmt. policy and regs.
- **NRCan**: Technical support and analysis
- **PSPC**: Procurement mechanisms and supplier arragements

Conventional land fleet

(26,700 vehicles):

- ~17,200 light-duty vehicles,
- ~2,300 commercial vehicles
- ~7,100 other vehicles (off-road, industrial etc.).

National Safety and Security land fleet (23,000 vehicles)**:**

- ~12,300 light duty vehicles (mostly RCMP)
- ~8,300 standard military pattern vehicles
- ~2,300 commercial and other vehicles

** As of March 31, 2022 (FY 2021-22)*

Recap - 2022-23 Light-Duty Green Vehicle Procurement Requirements

- **Each year the TBS CGG determines which federal vehicle purchases will be publicly reported under the 75% target for that fiscal year.** :
  - This assessment is done with input from NRCan's GGO for fleets program, TBS's OCG and PSPC and considers i) current and historical HEV and ZEV bids, ii) initial capital cost and estimated total cost of ownership of the vehicles, iii) vehicle performance and reliability; and iv) the availability of vehicles in the market.
- **For FY 2022-23, light duty vehicle purchases (Cat 1, 2, 3 and 4) in 21 vehicle specification codes will be publicly reported for the target.** These 21 codes capture ~68% of the average orders placed in 2021-22
  - **Group A (17 codes):** Departments are expected to meet or exceed the 75% target for their total purchases in these codes.
  - **Group B (4 codes):** Recommended but not required (new models with very limited availability). Only green purchases count towards performance.
- **The price premiums for the HEVs and ZEVs in the GMVOG are modest over the lifetime of the vehicle:** most have TCOs that are lower than the equivalent low-bid conventional vehicle for that specification.
- **Supply is limited:** We need to purchase every green vehicle that PSPC is able to secure in order to stay on track. Priority is to be given to purchasing ZEVs.
- **For more information:** https://www.gcpedia.gc.ca/wiki/Mobility_and_Fleet

Specification codes reported for the 75% purchase target in FY 2022-23*
D00 – Int. Sedans: 2WD
D30 – Comp. Sedans: 2WD
D31 – Comp. Sedans: 4X4/AWD
H50 – Sm. Station Wagons: 2WD
1H51R – Sm. station wagon AWD (RCMP)**
G40 – Sm. Crossovers: 2WD
G41 – Sm. Crossovers: 4X4/AWD
L40 – Sm. Utility Trucks: 2WD
L41 – Sm. Utility Trucks – 4X4/AWD
L60 - Utility Trucks: 2WD
L61 - Utility Trucks: 4X4/AWD
1G41R– Crossovers: 4X4/AWD (RCMP)
1L41R– SUV: 4X4/AWD (RCMP)
1L51P– Compact utility truck: 4X4/AWD (RCMP)
1L61R– Med. utility truck: 4X4/AWD (RCMP)
M60 - Mini-vans: 2WD
M61 - Mini-vans: AWD
T80 – Cargo van: 2WD**
T81 - Cargo van: 4X4/AWD**
P41 – Crossover truck: 4X4/AWD**
Q11 - Pick-up Trucks – Crew Cab – 4X4
* Codes marked with a * are in Group B; rest are Group A

CGG Perspective on Electric Vehicle Charging Stations (EVCS)

To implement the Greening Government Strategy, departments need to ensure the availability of appropriate charging infrastructure and/or services to meet the operational needs of their fleets.

- Electric vehicle charging stations installed for the federal fleet must prioritize the charging of federal vehicles.
- Departments are also encouraged to promote greener, low-carbon commuting alternatives for employees, such as walking, biking, public transit, carpooling or ZEVs.

Departments may consider providing employee and/or public access to electric vehicle charging services to encourage greener commuting.

- There is currently no formal government-wide policy on this: it is at the discretion of each custodian department
- Considerations include the nature of the custodianship of the facility (e.g. leased or owned); the local availability of green transportation options and charging services; and resource availability.

If a Department decides to make EVCS available to employees and/or the public then it's recommended that they charge a fee for this service based on usage that is comparable to market rates in the community.

- E.g. some departments have smart charging devices that are managed by a third-party service provider who controls access to the equipment and charges users directly for the service.

TOOLS

- Electric Charging and Alternative Fuelling Stations Locator
- NRCan Electric Vehicle Supply Equipment – Procurement Preparedness Guide

Discussion: Challenges for greening conventional light-duty fleet

ZEV adoption been constrained by the availability and supply of suitable vehicles that meet operational requirements

- **Limited ZEV options currently exist for the larger vehicle types (e.g., vans, pick-up trucks) that make-up the majority of the light-duty fleet, and supplies are limited due to global supply chain issues.**
- Options are increasing: the 2022-23 GMVOG has 50 green options across 21 spec codes
- However, supply issues are ongoing, e.g. multiple manufacturers limited or removed their green options from the standing offer partway through 2022

Other challenges include:

- **Upfront cost**: Initial cost premium of up to 100% for ZEVs compared to capital budget and program needs; however, this is offset by operational and maintenance savings resulting in lower TCOs
- **Charging**: Costs and logistics for installation and/or access to charging infrastructure
- **Operational suitability:** Limited ZEV solutions for remote, field and specialized operations (e.g. towing, range, capacity, all wheel drive, etc.)
- **Education**: Employee awareness & education of green options and suitability
- **Fiscal year cycles**: Long delivery delays mean vehicles are ordered in one fiscal year but delivered in the next creating challenges for fleet planning and capital budgets (~40% of green vehicles ordered in 2021-22 arrived before March 31)
- **Pace of fleet renewal**: Replacing the remaining vehicles in the fleet with ZEVs over 7 years (2024-25 to 2030-31) would require a purchase rate of ~2,500 vehicles/year; however, the current rate is less than 1,500 vehicles/year.

Partner Discussion Question

- Partner 1 (3 min): Aside from market availability, what is your greatest challenge with purchasing ZEVs?
- Partner 2 (3 min): What internal solutions would you like to see to address that challenge?

Fleet Greening Solutions

Advancing solutions

- Enhancing procurement process to include more HEV & ZEV options
- Enhanced guidance (e.g. annual green purchase requirements; green bid list)
- Enhanced technical support (e.g. NRCan telematics and EV readiness)

ZEV Pathway to 2030 Initiative

- Developing detailed assessment of challenges, costs, benefits and measures needed to transition to 100% ZEVs by 2030
- NRCan and TBS collaboration with PSPC and fleet-owning departments
- Consultant retained (Dunsky) to prepare ZEV and charging stations market and cost analysis and projections to 2030
- **TBS will work with NRCan and PSPC to produce Pathway to 2030 report with recommendations in Q4 2022-23**.
  - Enhanced analysis of markets, technologies and total cost of ownership
  - Exploring financial solutions, e.g. earlier budget decisions, multi-year capital budgets, capital cost carry-over mechanisms, increased capital budgets
  - Exploring policy solutions, e.g. fleet optimization and right-sizing, "ZEV first" purchase policies and incentives
  - Exploring technology and procurement solutions, e.g. purchase projections

Pathway to 2030 Subcommittees

1. ZEVs

- **Fleet planning and acquisition** (e.g. demand forecasts, market availability, procurement mechanisms, estimated costs)

2. INFRASTRUCTURE

- **EV charging planning and acquisition** (e.g. charging station needs, market availability, procurement mechanisms, estimated capital costs

3. POLICY AND FINANCE

- **Departmental and GoC-wide mechanisms to enable ZEV transition** (e.g. financial planning, budgets, fleet policies, new funding requests)

2030 ZEV Pathway: Zero-Emission Vehicle Subcommittee

Objectives

- GoC-wide purchase scenario(s) based on market availability and fleet needs including costs, benefits, considerations.
- Compile the GoC-wide pathway to 2030 for ZEVs
    - Including recommendations for; budgeting & procurement solutions and needs for any temporary exemptions from target

Task Highlights

- Fleet characterization data template completed by departments
- Consultants to assess market, demand, costs, benefits, etc.
- Discuss & exchange best practices to develop a shared approach to a fleet transition plan to 2030.
    - How are departments currently doing their long-term fleet planning? How can our market analysis help?

2030 ZEV Pathway: Charging Infrastructure Subcommittee

Objectives

- GoC-wide EVSE needs-assessment based on market availability and fleet needs (costs, benefits, considerations etc.)
- Identify and initiate development of new and/or enhanced procurement solutions for crown-owned and leased facilities.

Task Highlights

- Facility infrastructure characterization data template populated by departments
- Consultant to assess market, demand, costs, benefits etc.
- Discuss/exchange best practices and/or develop shared approach to EVSE needs-assessment
- Charging station procurement solutions (Fleet charge cards, access to equipment and software, design-bid-build procurement solutions, procurement / management solutions at leased facilities)

2030 ZEV Pathway: Policy and Finance Subcommittee

Objectives

- Identify the departmental and GoC-wide mechanisms needed to enable ZEV transition, particularly related to financial management (budgeting, capital cost carryover, revenue)

Task Highlights

- Review and confirm barriers, identify gaps and propose solutions
- Identify and scope out needs for updated TBS green fleet guidance and requirements (e.g. procurement, reporting, exemptions, etc.)
- Engage departmental corporate affairs (e.g. CFOs) to get perspective on options and needs for departmental vs. GoC-wide solutions
- Draw from the ZEV and EVSE Subcommittees to identify policy and finance mechanisms needed to implement the Pathway to 2030 (including roles for departmental and GoC-wide solutions)

Dunsky ZEV and charging market analysis and projections

- Contract awarded to Dunsky Energy and Climate Advisors in summer 2022.

Federal project partners include:

- Canada Border Services Agency
- Environment and Climate Change Canada
- Fisheries and Oceans Canada

Data gathered on 26,709 Government of Canada fleet vehicles and 1,461 fleet facilities. Departments include:

Conventional

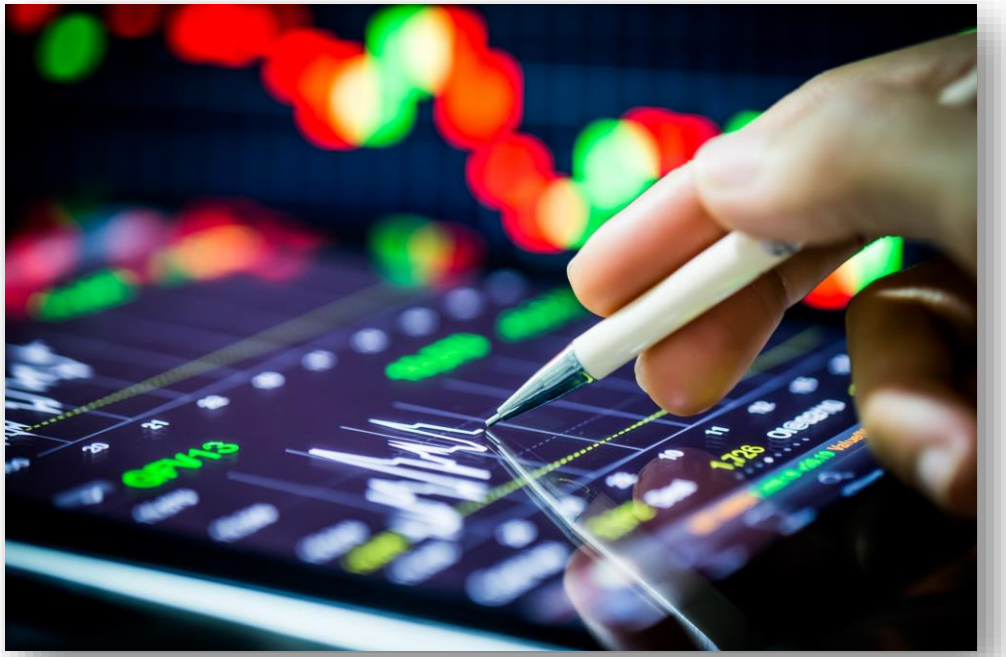
- Agriculture and Agri-Foods Canada
- Canada Border Services Agency
- Canadian Food Inspection Agency
- Department of National Defence
- Environment and Climate Change Canada
- Fisheries and Oceans Canada
- Innovation, Science and Economic Development
- Parks Canada
- Transport Canada

National Safety and Security

- Department of National Defence
- Royal Canadian Mounted Police

Dunsky study objectives

- Model light-duty vehicle (LDV) fleet electrification pathways to inform the Canadian federal government's approach to achieving 100% ZEVs by the end of fiscal year (FY) 2030-31.
- Model the anticipated ZEV vehicle market landscape (**availabilities, total costs, and volumes**) as well as the **charging infrastructure** landscape over the time period.
- Identify different purchasing and ZEV adoption scenarios while considering existing operational requirements, including **driving range, performance, and carrying capacity** to achieve the 2030 objectives.



Market and Technology Trends

Increasing ZEV availability

- Expect **more than 100 new HEV and ZEV options** to enter the market over the next 3-4 years, including pick-up trucks, vans and buses.
- EV **ranges of >400km** becoming common

Increasing ZEV affordability

- **Initial cost parity of ZEVs with conventional vehicles projected when battery costs <$100 kWh.**
    - Larger vehicles with larger battery packs and higher price points are likely to achieve cost parity sooner than smaller vehicles
    - Electric vehicle initial cost parity with conventional vehicles is likely between 2024–2025 for shorter-range and 2026–2028 for longer-range vehicles.
- **Lifecycle / total cost of ownership parity exists for some vehicles already**; anticipated for remaining vehicles between 2022-2026

Increasing EV charging accessibility

- ~7,000 Level 2 and ~1,400 Level 3 charging stations (NRCan tracker)
- Major investments announced by manufacturers (E.g. Ford, Tesla)
- Enhanced technologies and portable / non-permanent installations


Ford F-150 Hybrid and Lightning


EV Tractor


Kia Niro EV


Ford Police Interceptor


Chrysler Pacifica Plug-in

Dunsky Study Deliverables

DELIVERABLE 1 – State of play report:

A. State of Play Report will develop parameters for characterizing and modelling the current composition (e.g. vehicle model, fuel type, age and condition, replacement schedule etc.) and utilization (e.g. average daily distance driven, idling, fuel consumption, etc.) of the federal fleet.

B. Fleet segmented by common vehicle types and historical purchases.

C. Conventional and National Safety and Security fleets characterized and segmented separately.

DELIVERABLE 2 – 2030 ZEV pathway report:

A. Dunsky to leverage proprietary fleet electrification model, E-FLEET, to identify the optimal time to replace each vehicle in the fleet with a ZEV alternative.

B. Report to inform scenarios for transitioning to 100% ZEVs as well as anticipated infrastructure requirements under a 100% ZEV scenario as well as year-over-year charging infrastructure deployment model forecasting up to 2030.

C. Optimized Fleet Electrification Roadmap to be developed for the following scenarios:

   i. Low market availability

   ii. High market availability

   iii. Two additional scenarios exploring various paces of ZEV adoption (TBD)

   iv. Business-as-Usual

Achieving 100% ZEV by 2030 is feasible with an accelerated response

Currently, ZEV adoption is constrained by the availability and supply of suitable vehicles that meet operational requirements

- Suitable ZEV options exist for <50% of the most common GoC vehicles
- Supply is very limited (global shortages, competition, COVID-19)

- ZEV purchase price is 40-100% more but total cost of ownership is 0-20% less than conventional vehicle (over seven years)
- Concerns with vehicle range and accessibility of charging stations (<400 federally-operated stations)

- Delivery delays and uncertainty create challenges for fleet planning and annual capital budgets

To achieve 100% by 2030 will require increased investments and alignment of fleet planning, budgeting and procurement processes

By 2025-26, projections are that suitable ZEV options will exist for most fleet needs but competition will remain high

- Supply-chain and cost issues may persist as ZEV production grows to meet increased demand

Preliminary estimate of additional investments needed between now and 2027-28, offset by operational savings:

- Installing >5,000 charging stations
- Acquiring >7,000 new ZEVs

Enhanced departmental and GoC-wide processes, e.g.

- Long-term fleet purchase plans and budgets
- "ZEV first" procurement requirements
- Accelerated charging station installation and fleet renewal
- Targeted bulk vehicle procurement

Discussion: What is needed to reach 100% ZEV by 2030?

**** Potential ideas identified to date through consultation ****

Charging and ZEV Readiness	• EV and ZEV market analysis and projections (e.g. Dunsky study) • Fleet EV charging needs assessment • Fleet ZEV suitability and needs analysis (e.g. telematics)

ZEV Acquisition	• Aligning departmental purchase policies and processes to prioritize ZEVs
	  • Developing purchase forecasts to signal demand and help secure supply
	  • Reducing costs through optimizing fleet and vehicle size (e.g. right-sizing)
	  • Decision-making based on total cost of ownership
	• Placing orders early in the year to secure access and ensure FYE delivery
	  • Bulk purchase orders with other departments for common vehicles

EV Charging acquisition	• Investing in robust charging infrastructure and systems • Non-permanent or mobile solutions for leased facilities • Innovative financing / partnerships with third parties • Financial authorities for fees and revenue recovery
Fleet team engagement	• Engaging and educating employees on costs, benefits and considerations for ZEVs • Training on ZEV and energy efficient operation

Budgets & Financial Management	• Earlier budget decisions and/or multi-year capital budgets
	• Financial solutions for purchases that span multiple fiscal years
	  • Enhanced capital cost carry-over mechanisms?
	  • Alternate procurement (e.g. leasing, advance payments)?
	• Increasing capital budgets through re-allocation or new funding
	  • Borrow from future operational savings?
	  • Departmental fleet capital budget carve-outs?
	  • Internal funding / incentives for ZEVs?

Group Discussion

At your table:

- What are the most important internal solutions or changes needed to accelerate ZEV purchases over the next year?
- What information do you need from the Pathway to 2030 initiative and/or TBS to enable these solutions?

Next Steps and Questions?

Next steps

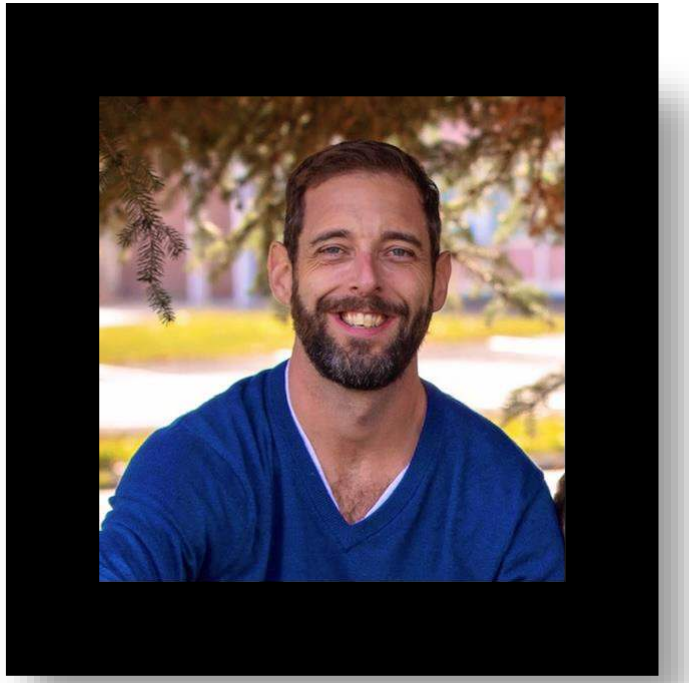
- Completing *ZEV Pathway to 2030 Initiative* to develop detailed analysis of challenges, opportunities, costs and benefits (TBS, NRCan, PSPC)
  - Ongoing engagement with departments' fleet, greening and capital planning teams
  - Consultant study on market availability and costs by Dec. 2022
  - Report and recommendations completed by Mar. 2023
- Reviewing requirements, guidance and tools
  - TBS green purchase and reporting requirements
  - TBS mandatory procedures for light duty and exec. fleet
  - NRCan ZEV and EV charging tools and services
  - PSPC ongoing industry engagement and innovation in ZEV and EV charging service procurement
  - PSPC developing ZEV infrastructure strategy
- Supporting operational fleet decarbonization planning for national safety and security fleets (TBS, NRCan)
- Launching consultations to update the Greening Government Strategy (Q4 2022-23)

To get involved in the 2030 ZEV Pathway initiative contact Craig Miller at Craig.Miller@NRCan-RNCan.gc.ca and Yves Madore at Yves.Madore@TBS-SCT.gc.ca.

Thank You!

Helpful Links

- Federal Greening Government site and Greening Government Strategy
- NRCan Electric Charging and Alternative Fuelling Stations Locator
- Awareness and information guides
  - NRCan
  - Plug'n Drive
  - CAA
- Fuel use and GHG emissions data
  - NRCan
- Driver training
  - Stantec/ NRCan ecoDriving online



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