



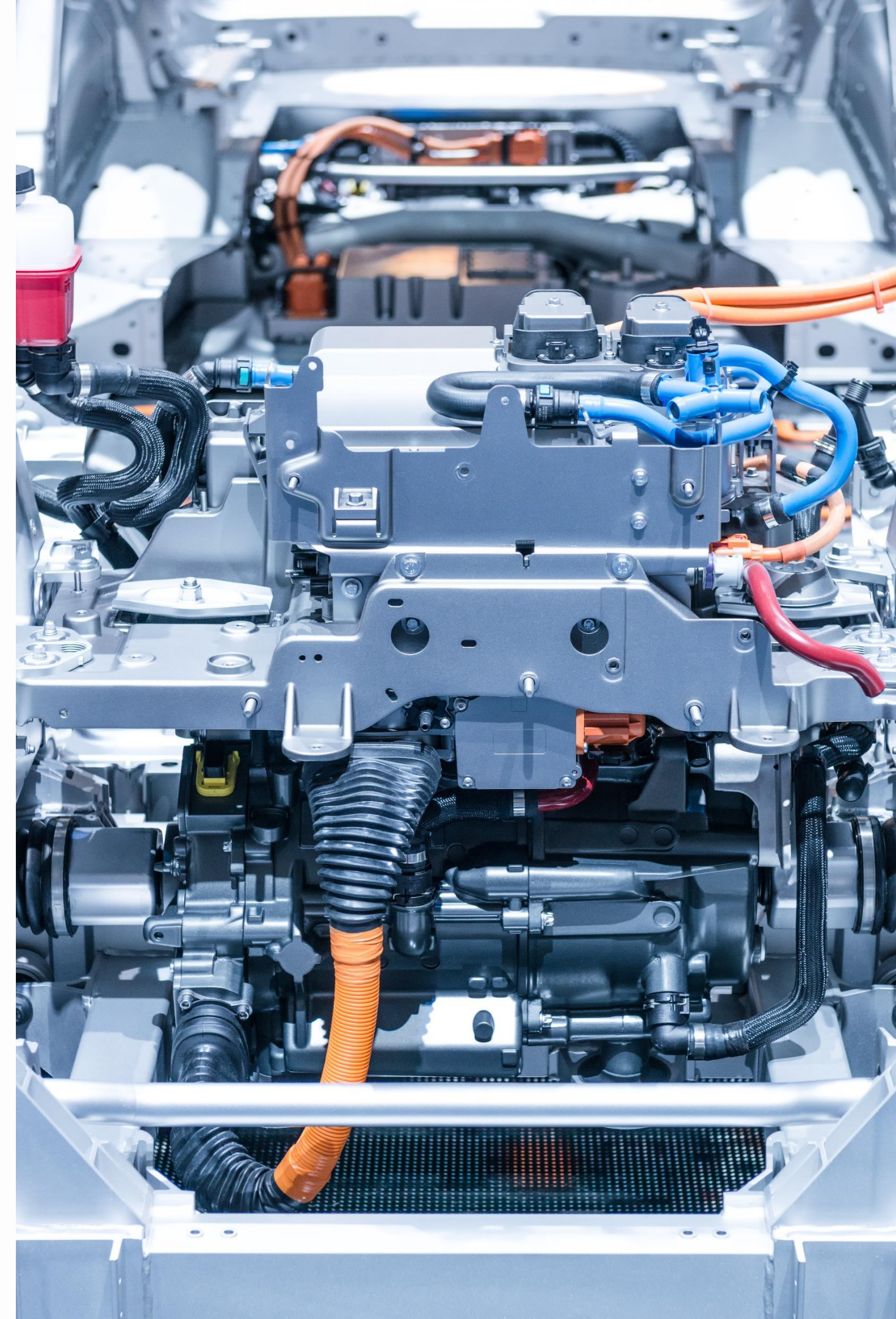
accelerate
Canada's ZEV Supply Chain Alliance



accélérer
L'Alliance canadienne de la chaîne
d'approvisionnement des VZE

Seizing Canada's ZEV Moment

Matthew Fortier, Accelerate



A Big, Wild Statement

Canada will be a Global **Zero Emission Vehicle Giant** in 2040



What does that look like?

- A major producer of processed critical and rare earth minerals?
- An global leader in battery research and manufacturing?
- A designer and producer of leading-edge ZEV parts?
- A global hub of battery recycling?
- A provider and exporter of charging infrastructure expertise?
- A significant manufacturer/assembler of ZEVs?
- A significant manufacturer of ZEVs with xx% of Canadian content?
- Some of these? All of these?



The Disruption

Charged by the global push to net-zero, the automotive industry is transitioning to zero emission vehicles.

This transition is accelerating and represents the biggest change in the industry since the invention of the internal combustion engine.

Many jurisdictions around the world, including Canada, have adopted aggressive ZEV sales targets for phasing out internal combustion vehicle sales in the next 10-15 years



A Global Shift

From 11 million passenger BEVs in 2020 to between 145 million - 230 million in 2030.

IEA

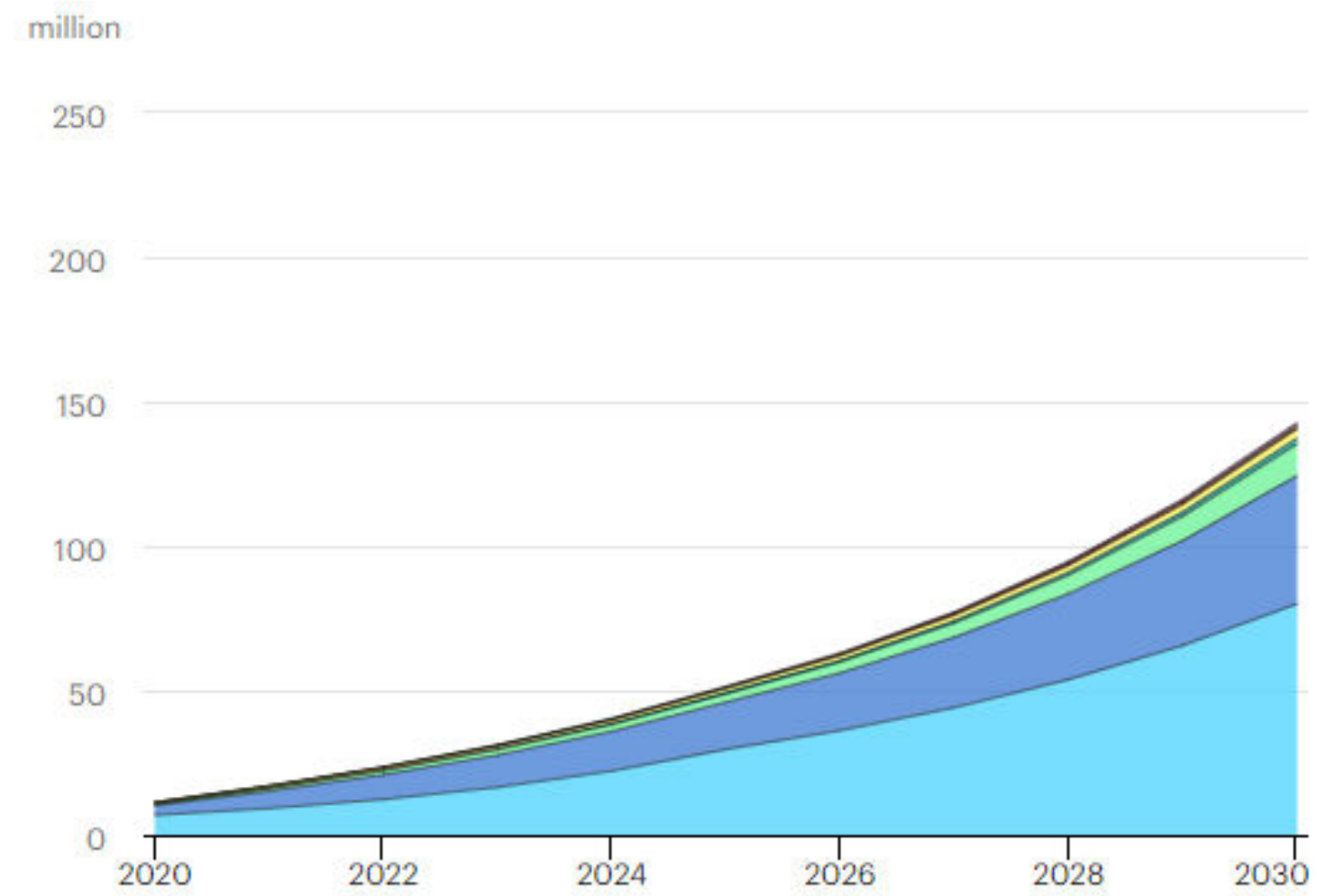
Huge surge in EV battery demand from 59 gigawatt-hours (GWh) in 2015 to 400 GWh in 2021. This will grow to 600 GWh this year.

Benchmark Minerals



Passenger cars drive the growth of electric vehicles to 2030

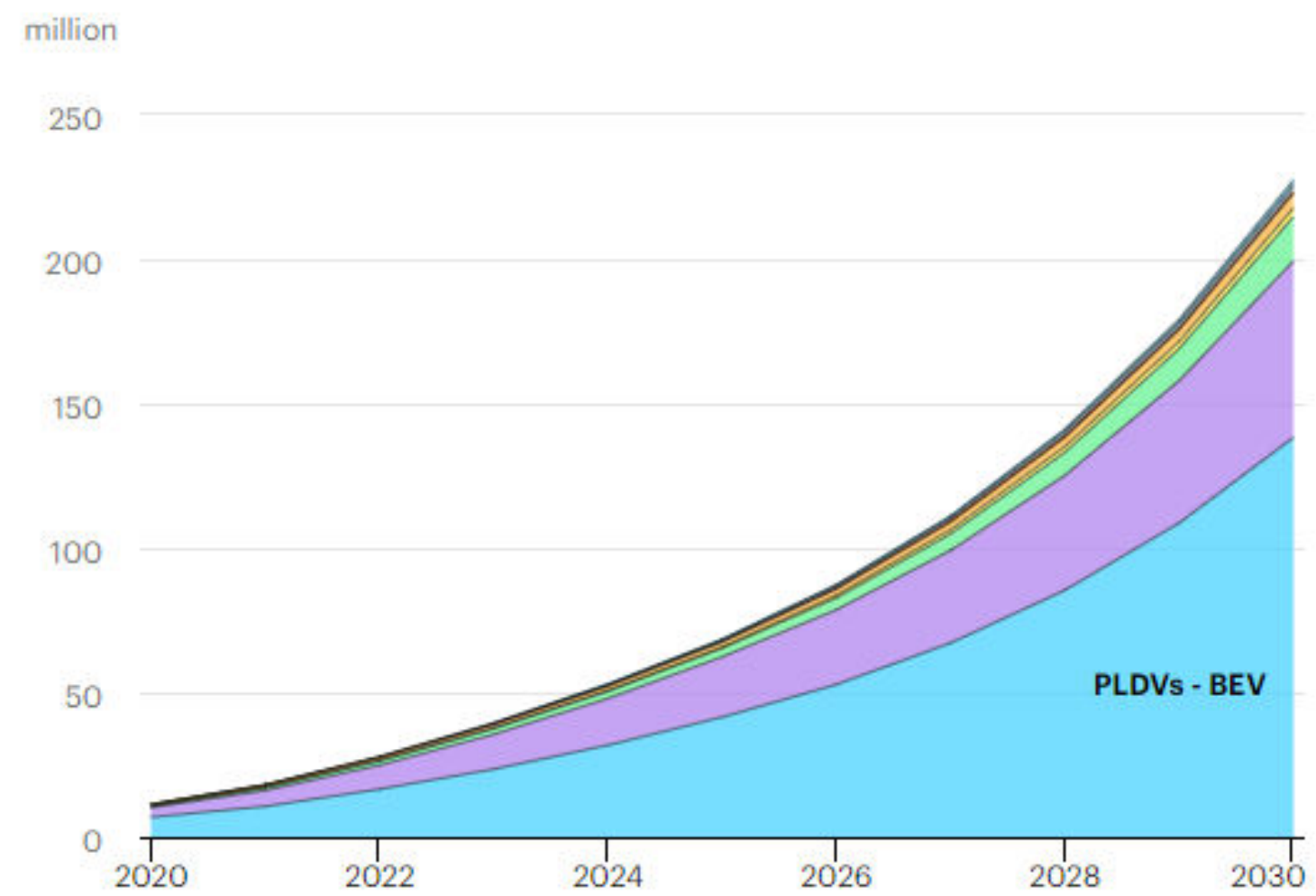
Global EV stock by mode in the Stated Policies Scenario, 2020-2030 [Open](#)



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- PLDVs - BEV
- PLDVs - PHEV
- LCVs - BEV
- LCVs - PHEV
- Buses - BEV
- Buses - PHEV
- Trucks - BEV
- Trucks - PHEV

Global EV stock by mode in the Sustainable Development Scenario, 2020-2030 [Open](#)

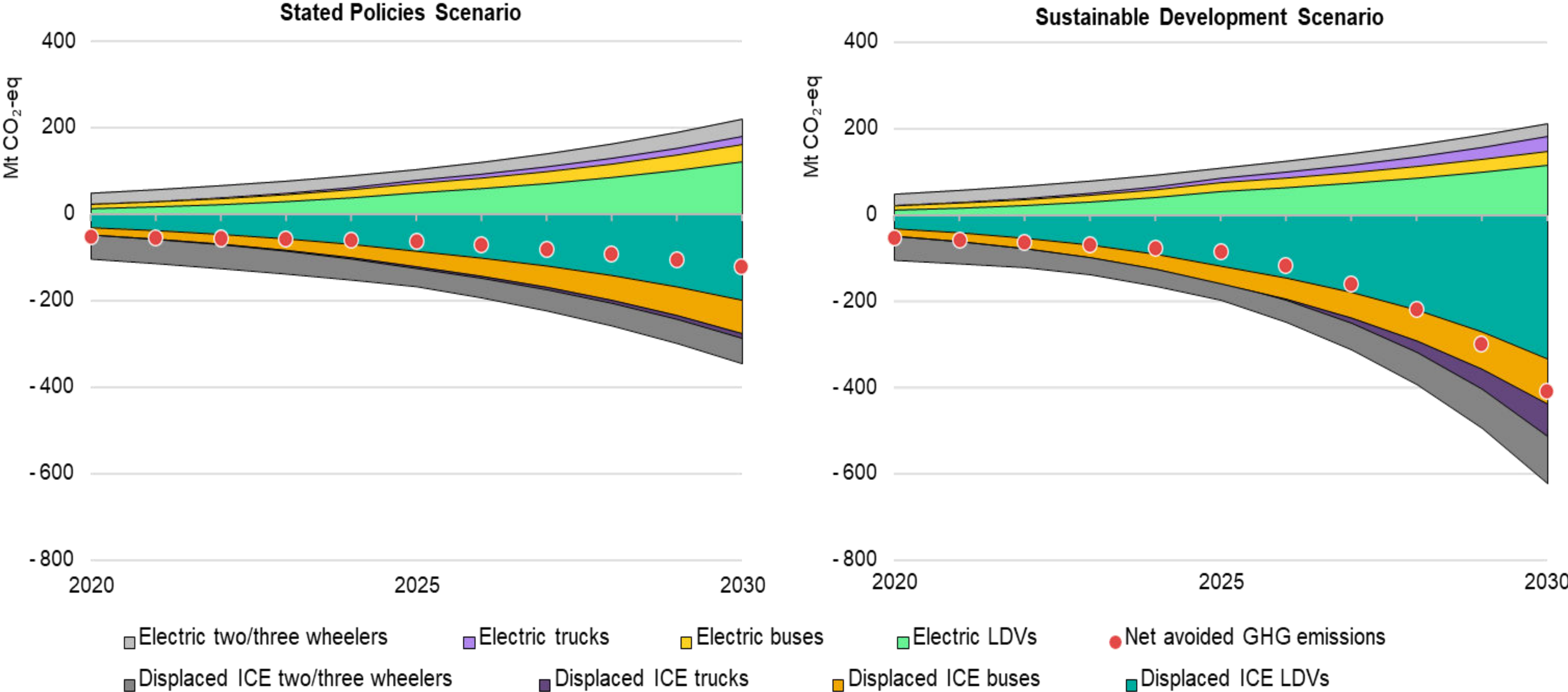


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Net reduction of GHG emissions from EVs increases over time

Net and avoided well-to-wheel GHG emissions from the global EV fleet by scenario, 2020-2030



The Importance of Canada's Auto Sector

- ▶ **Canada has 5 global OEMs** that assemble over 1.4 million vehicles each year.
- ▶ **The Canadian automotive sector is one of the largest manufacturing sectors** in Canada supporting 500,000+ direct and indirect jobs
- ▶ In 2020, vehicles were the **2nd most exported product** in Canada. **Canada is the 5th largest exporter of vehicles** in the world.



A Critical Future Need for Canada

If it's going to have a future, Canada's vehicle sector will have to be zero emission-based. Otherwise, we risk losing tens of thousands of manufacturing jobs and missing out on emerging opportunities to create wealth for future generations of Canadians

Failure to transition our automotive sector will result in more imports to meet Canada's net-zero targets.

Make it more difficult to rally public support for net-zero policies.



A Comprehensive Supply Chain

Canada is active within every part of the ZEV supply chain.

- Critical metals and minerals
- Battery development and recycling
- Drivetrain components
- Power electronics
- Assembly of light, medium and heavy-duty vehicles
- Charging infrastructure

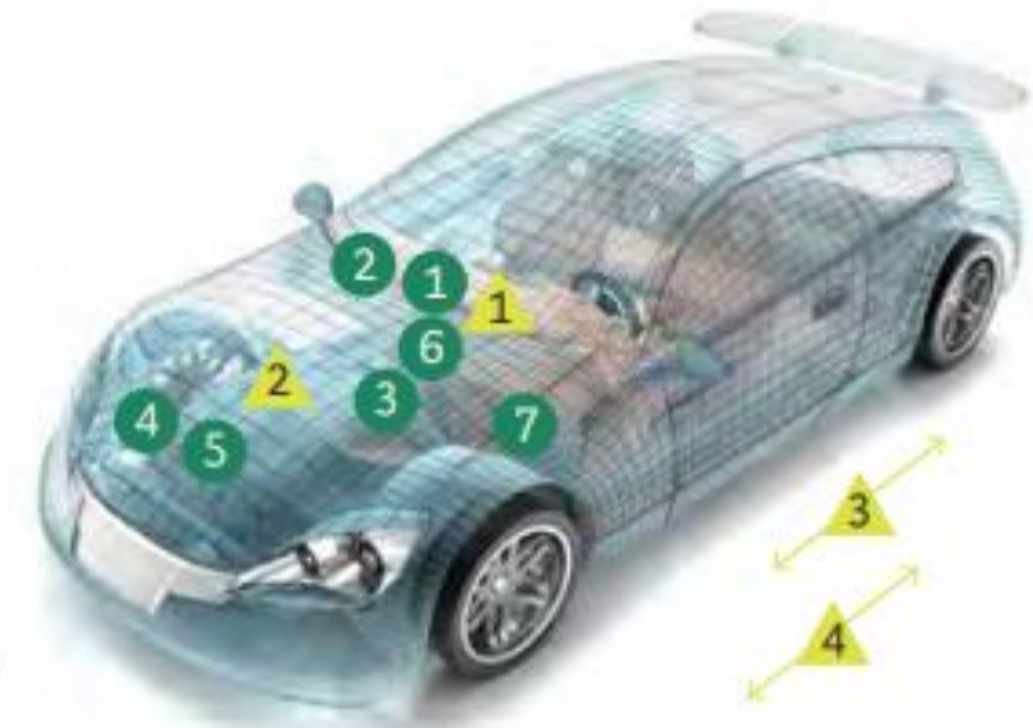
Powertrain

- 1 Internal combustion engine
- 2 Alternator and starter
- 3 Fuel and exhaust system
- 1 Battery pack
- 2 Battery thermal management
- 3 Electric motor
- 1 Cooling system
- 2 Gearbox

Power electronics

- 4 Converters and inverters
- 5 Power electronics controller
- 6 Power electronics thermal management
- 7 High-voltage wiring

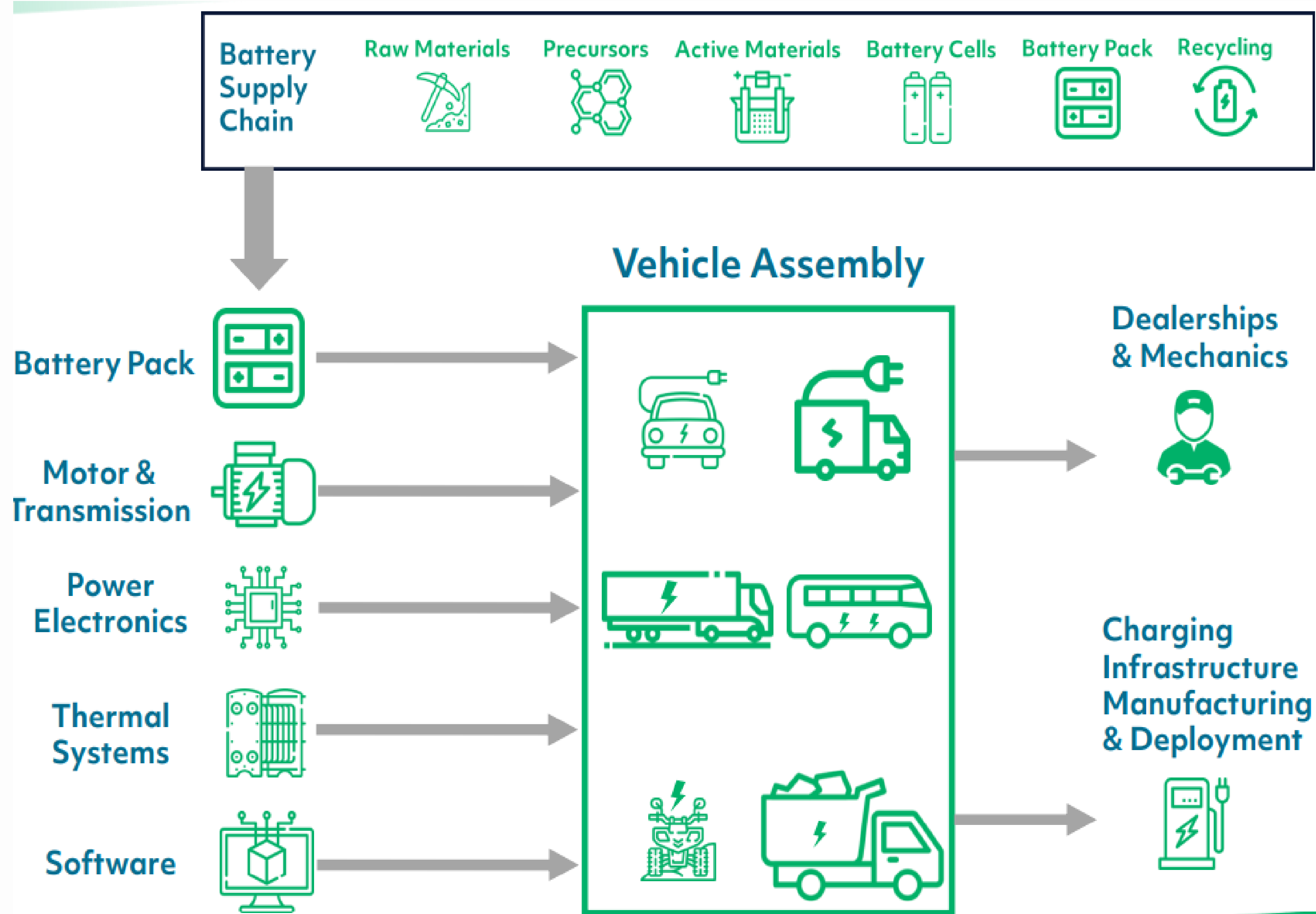
Battery electric vehicle (BEV)



The Emerging Opportunity

Canada has existing **world-leading firms along the supply chain**

To maximize the opportunity for Canada, we need to **target critical and high value-added segments of the supply chain**

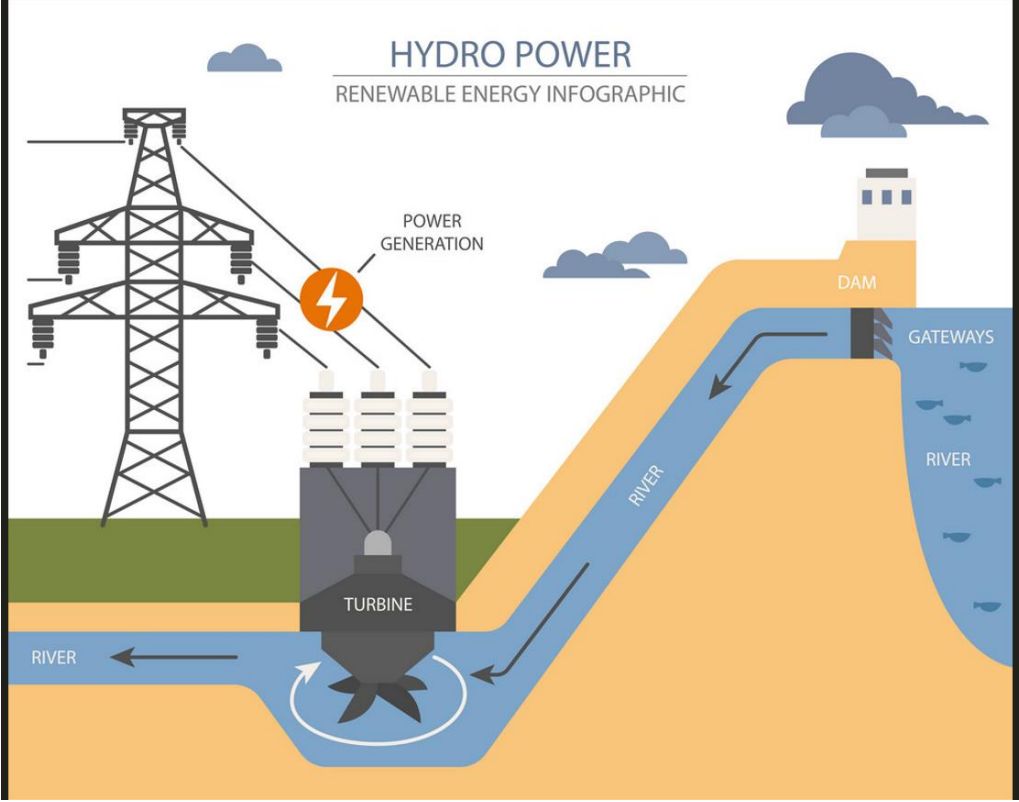


Canada's Advantages

- Established vehicle sector
- **World class vehicle parts manufacturers**
- 80% clean, renewable electricity grid
- **CUSMA, CETA, CPTPP**
- Peace, Order and Good Government

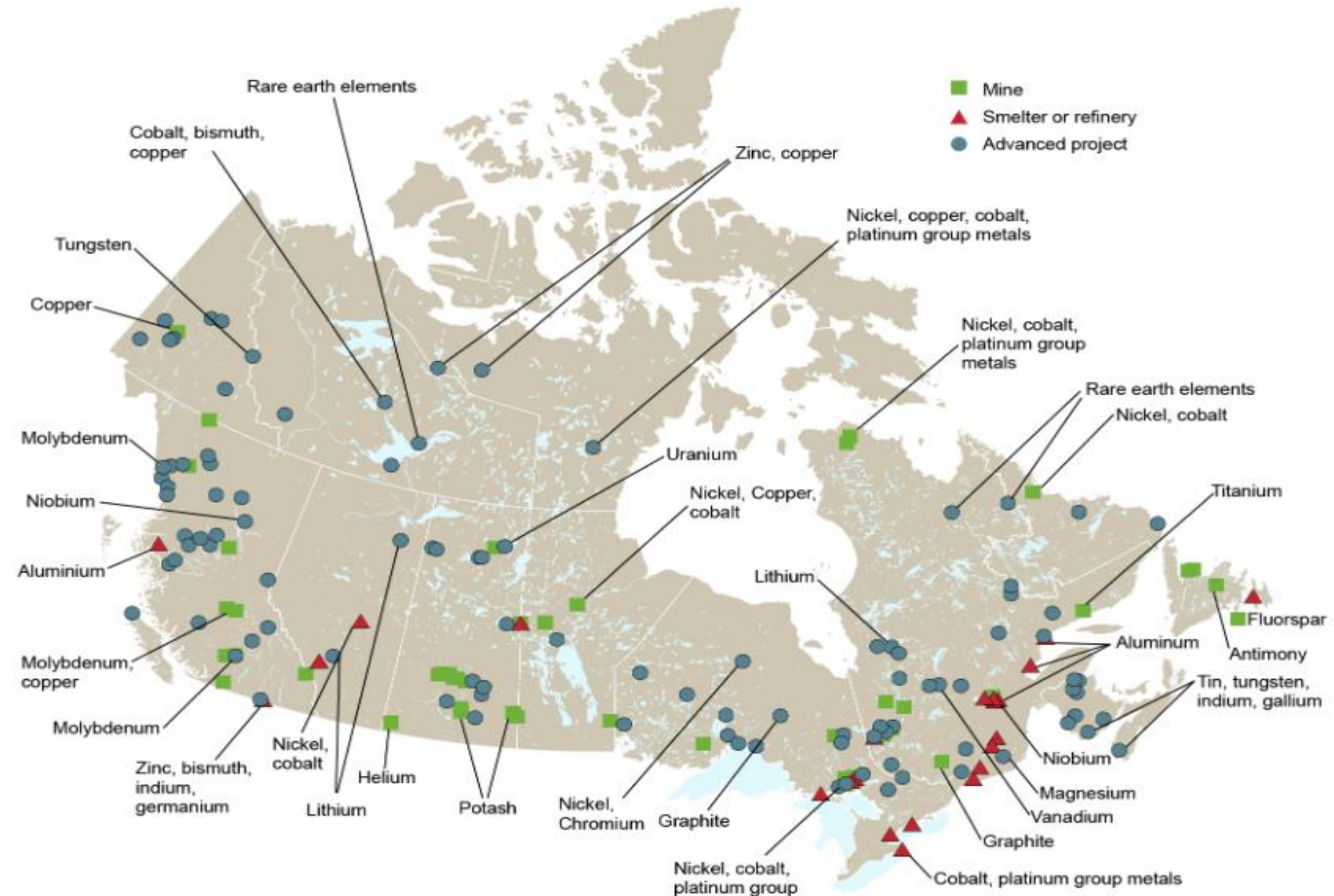


OEM	ZEV Sales Targets
	100% by 2035
	40% by 2030
	40% by 2030 100% by 2040
	40-50% by 2030
	40% by 2030



Canada's Advantages

Critical mineral development across Canada



Recent Developments



Vale confirms supply deal with Tesla for low-carbon nickel

Honda to spend \$1.1 billion on EV upgrade in Ontario plant



Glencore investing \$200 mln in battery recycler Li-Cycle

GM Canada's \$2 Billion Transformational Investments Are Creating 2,600 New Jobs Now and Canada's First Electric Vehicle Production by the End of 2022



Recent Developments



Government expanding electric vehicle rebate program to include trucks, vans, SUVs

Policy

Budget 2022 puts over \$9 billion into EV battery supply chain, ZEV purchase rebates, suitability assessments and clean electricity

FINANCIAL POST

[Mining](#) / [FP Energy](#) / [Electric Vehicles](#) / [Commodities](#)

Ottawa to invest at least \$2 billion on mineral strategy for EV battery supply chain



Challenges Ahead

**Harvard
Business
Review**

How the War in Ukraine Is Further Disrupting Global Supply Chains

by David Simchi-Levi and Pierre Haren

Morgan Stanley Flags EV Demand Destruction as Lithium Soars

- China battery makers will need to raise prices almost 25%
- Bank overweight Tesla as best-placed to weather challenges

Poll: Canadians want EVs, but charging concerns loom

'The mustang has left the barn': Moving the needle on electric-vehicle adoption will hinge on addressing consumer concerns

THE WHITE HOUSE



BRIEFING ROOM

FACT SHEET: Securing a Made in America Supply Chain for Critical Minerals

Motor Mouth: The inconvenient truth about EVs in cold weather

Tesla's Model 3 passengers need a "blankie" to complete its record-breaking cross-country Cannonball Run



Ontario makes big promises with critical minerals plans but First Nations advocates remain concerned



Challenges Ahead

Not enough raw materials in the pipeline to take the majority of EV makers beyond 2030.

More than US\$500bn for 285 gigafactories around the world but investment in critical mineral mines and processing plants not keeping up



Challenges Ahead



OPINION

So much for the electric vehicle revolution. You cannot make the machines without the metals that power them



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What does that look like?

- How are we going to do it?
- What investments need to be made?
- What incentives will catalyse activity?
- What legislation and regulation need to be addressed?

This is the ZEV challenge facing Canada



What Canada Needs to Compete

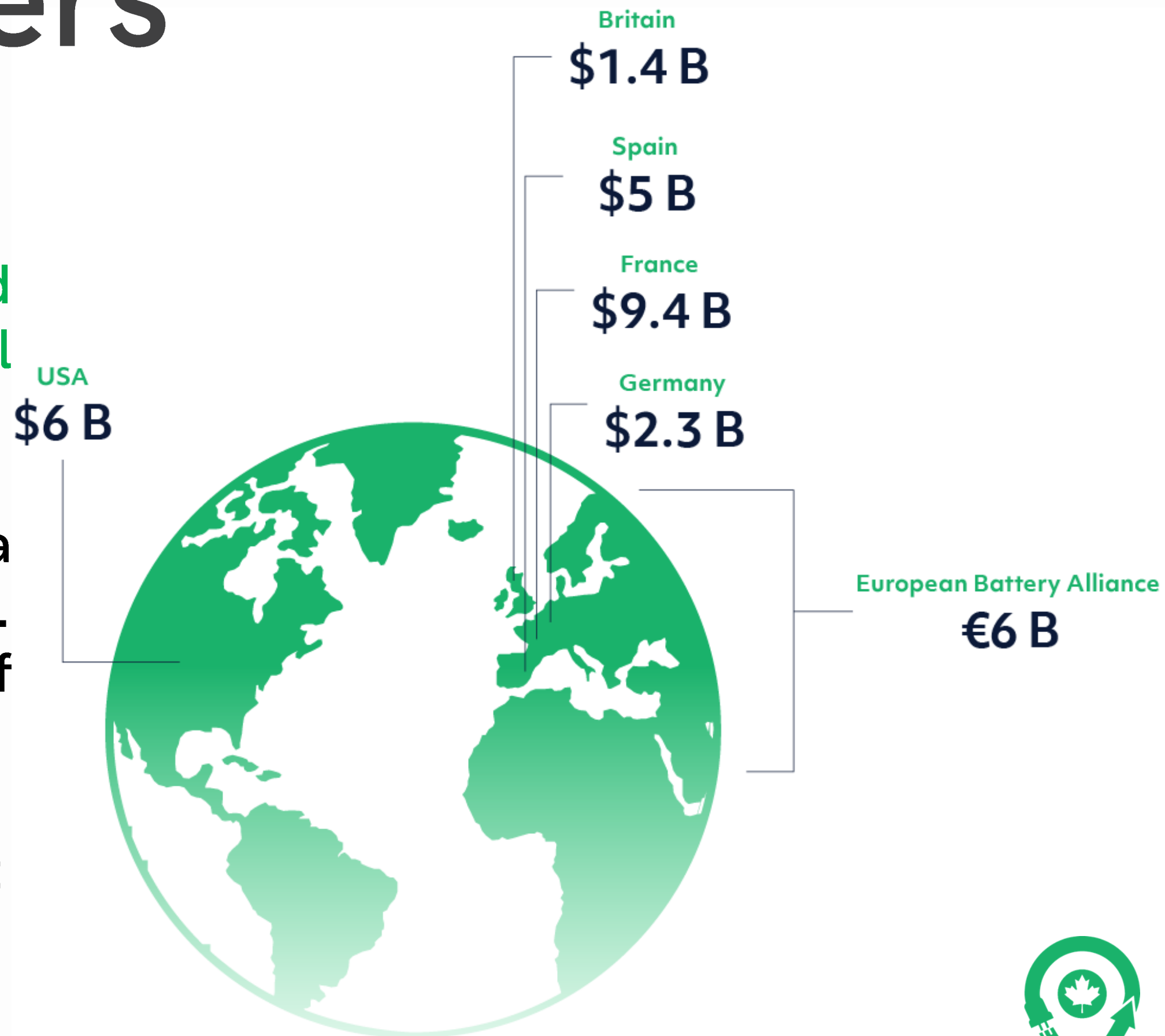
- Coordination and alignment between industry, government and civil society
- A comprehensive ZEV industrial strategy that encompasses:
 - Sustainable development of critical and rare earth minerals
 - First Nations partnerships
 - Battery R&D, manufacturing & recycling
 - ZEV manufacturing
 - Roles for public and private investment

What have others done?

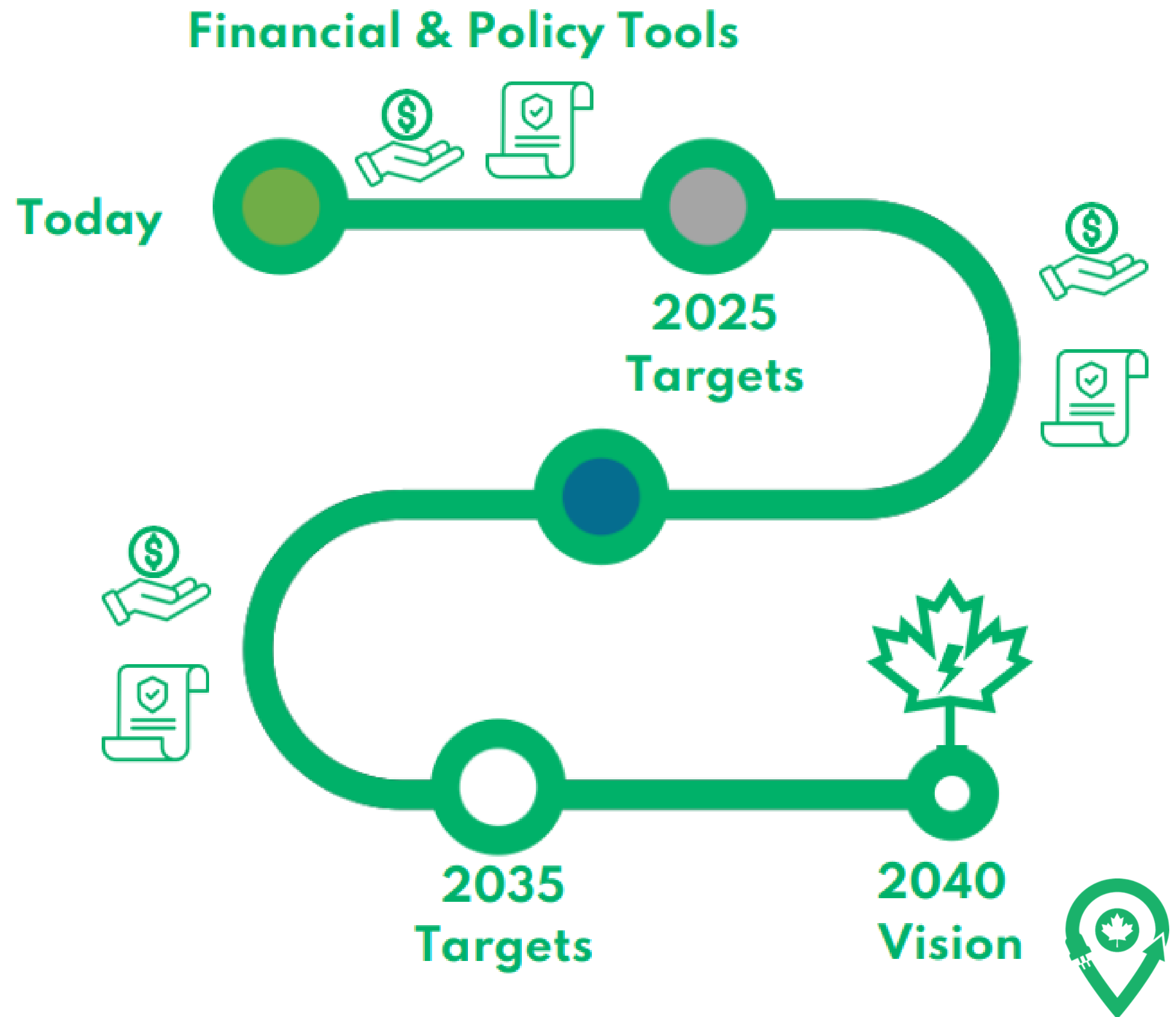
Other jurisdictions have developed ZEV supply chain policies proportional to the size of the opportunity.

Canada has all the components of a globally competitive ZEV supply chain. We can compete but the window of opportunity is narrow.

Canada needs to strategize to ensure it is not left behind.



Canada can develop a world-leading public facing ZEV Supply Chain Strategy



What is Accelerate?

- **The Accelerate Alliance is a national initiative** bringing together key players from across Canada, from mining to mobility, R&D to commercialization, and from vehicle assembly to infrastructure
- The Alliance's mission is to **support the accelerated development of a Zero Emission Vehicle Supply Chain in Canada**



NRC-CMRC



Lithion
Lithium-ion battery recycling



AddENERGIE
Solutions de recharge | Smart Charging Solutions



M MANGROVE LITHIUM
Unlocking a battery-powered future



ACEL
GO ELECTRIC



STELCO
The Steel Company of Canada



BV



LOMIKO METALS



PRO
UNE DIVISION DE / A DIVISION OF
Electrical Components International

NOVABUS



MMG
NOUVEAU MONDE GRAPHITE

Teck



CANADA
CLEANTECH



LION



chargepoint

Litens



C2M2A
CANADIAN CRITICAL MINERALS & MATERIALS ALLIANCE



ELECTRIC MOBILITY CANADA
ACCELERATING ELECTRIC TRANSPORTATION



CHFCA
Clean. Efficient. Energy.



UNIFOR
the Union | le syndicat



BYD



Canadian Colleges for a Resilient Recovery



CLEAN ENERGY CANADA



BMAC
Battery Metals Association of Canada



adventec



dunsky



MOLICEL



propulsion
Québec



accélérer
accelerate



sudbury
canada's resourceful city

Action Areas

1. Develop an industrial roadmap for building out Canada's zero emission vehicle and infrastructure supply chains



2. Advocate for policy instruments from federal and provincial governments to support the ZEV supply chain



3. Enable collaboration and partnerships across the supply chain



4. Facilitate and attract investments into the Canadian ZEV industry



5. Promote the economic benefits of a Canadian ZEV supply chain to the public



6. Create a talent pipeline aligned with the needs of the emerging ZEV supply chain





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