



Government
of Canada

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du Canada

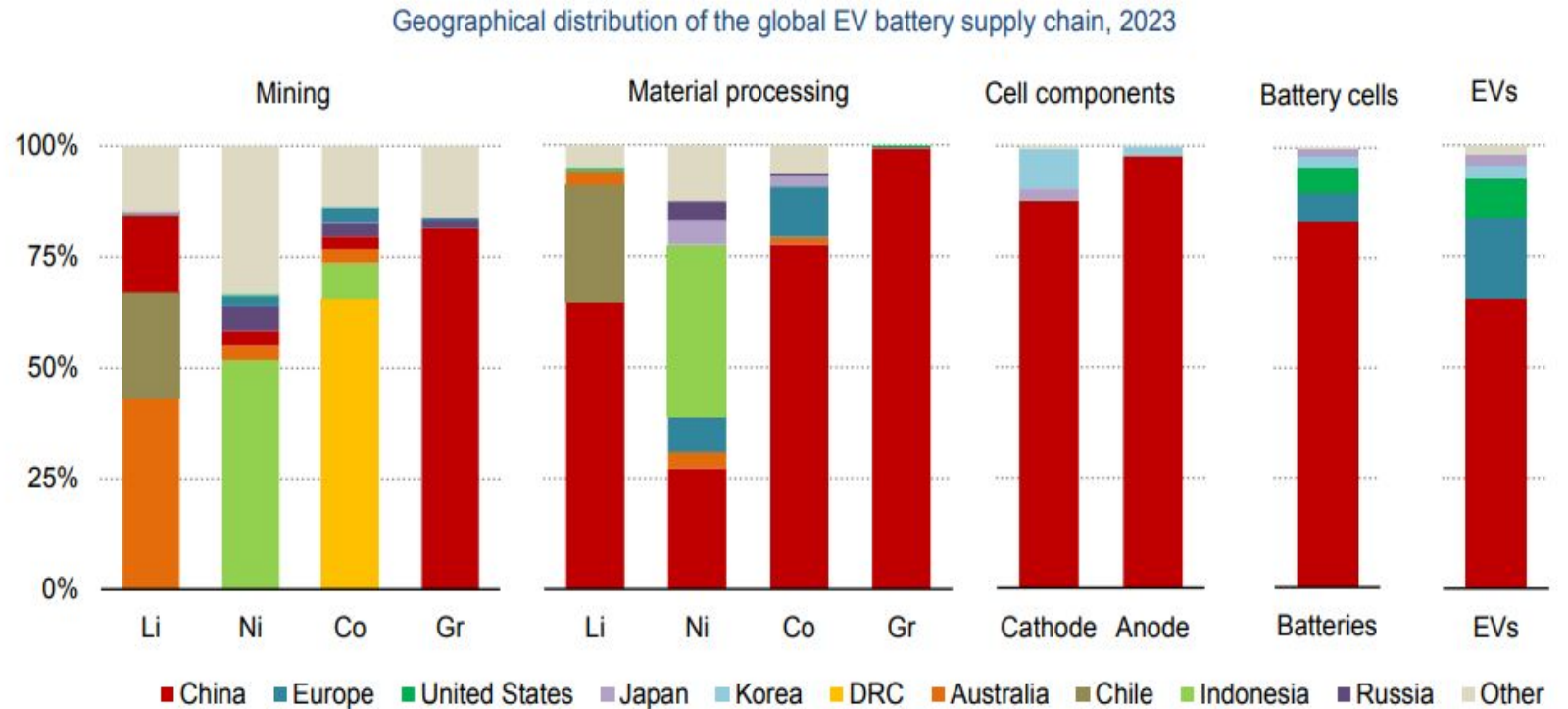
Canada

Critical Minerals in Canada

Supply Chain Vulnerability

- Between now and 2030, some 70-75% of projected supply growth for refined lithium, nickel, cobalt and rare earth elements, and almost 95% for battery-grade spherical and synthetic graphite, comes from today's top three producers
- Geopolitical events affect global mineral markets and are adding to price volatility and leading to bottlenecks in supply chains.
- Supply chain concentration and dependence has implications for Canada's **economic and national security**

China dominates the downstream and midstream global EV battery supply chain



IEA. CC BY 4.0.

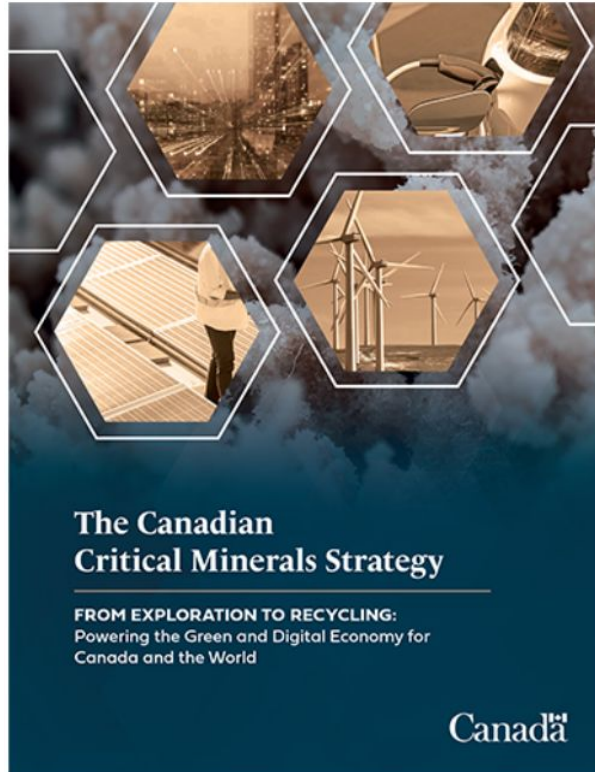
Notes: Li = lithium; Ni = nickel; Co = cobalt; Gr = graphite; DRC = Democratic Republic of the Congo. Geographical breakdown refers to the country where the production occurs. Mining is based on production data. Material processing is based on refining production data. Cell component production is based on cathode and anode material production capacity data. Battery cells are based on battery cell production capacity data. EVs is based on electric cars production data. For all minerals mining and refining shows total production not only that used in EVs. Graphite refining refers to spherical graphite production only.

Sources: IEA analysis based on EV Volumes; Benchmark Mineral Intelligence; BloombergNEF.



Canada's Critical Minerals Strategy

Investing \$3.8 billion for resilient and sustainable supply chains



Canada's [Critical Minerals Strategy](#) was released in 2022



INFRASTRUCTURE

Up to \$1.5 billion to support clean energy and transportation infrastructure through Critical Minerals Infrastructure Fund



INDIGENOUS ENGAGEMENT AND CAPACITY

\$25 million for early engagement and capacity building. Budget 2024 announced \$5 Billion Indigenous Loan Guarantee Program.



GEOSCIENCE AND EXPLORATION

\$79 million for public geoscience and exploration to better identify and assess mineral deposits



REGULATORY SUPPORT

\$40 million to support northern regulatory processes



INNOVATIVE PROJECTS

\$1.5 billion to be delivered through the Strategic Innovation Fund to support manufacturing, processing, and recycling applications



CRITICAL MINERAL EXPLORATION TAX CREDIT

30% tax credit for exploration of 15 critical minerals – such as Li, Ni, Co, Cu, Gr, rare earths, PGMs, uranium

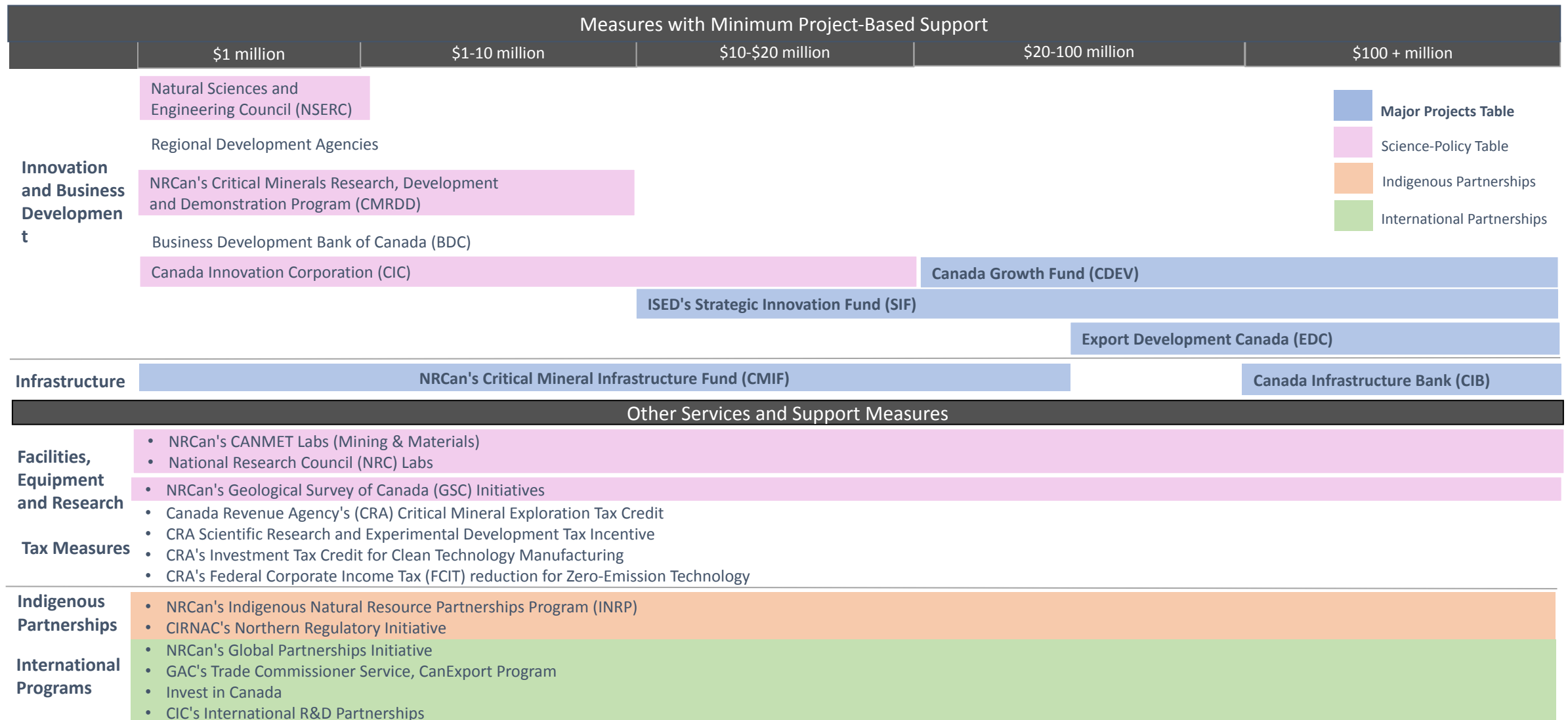


CLEAN TECHNOLOGY MANUFACTURING TAX CREDIT

30% refundable tax credit for machinery/equipment used in clean technology manufacturing and processing, and critical mineral extraction and processing.



Federal Support Measures for Critical Minerals



Strategy Achievements to Date along the Value Chain

Research, Innovation & Exploration:

- **Critical Minerals Research, Development and Demonstration (CMRDD) Program:** Implemented over 75 R&D projects and invested over \$62M to support 14 demonstration projects (battery minerals, mining value from waste and REE processing)
- **Natural Science and Engineering Research Council (NSERC) Alliance Missions Grants:** 66 grants awarded totaling \$59.9M
- **Critical Minerals Geoscience and Data Initiative Fund:** Funded 54 projects

Project Development - Strategic Innovation Fund (SIF):

- \$222M commitment to Rio Tinto Iron and Titanium to support responsible production of scandium, titanium metal and lithium
- \$37M to support Vale Canada in the development of a nickel sulphate conversion facility

Indigenous Reconciliation:

- **Indigenous Natural Resource Partnerships (INRP) Program:** \$12.8M allocated for 9 critical mineral-related projects

Infrastructure Development - Critical Minerals Infrastructure Fund (CMIF):

- Joint investment of ≤\$195M with British Columbia to upgrade key highway infrastructure
- **CMIF Indigenous Grants Stream:** Provided ≤ \$3.5M for eligible projects with first national call for proposals

Global Leadership and Security - Global Partnerships Initiative:

- Allocated \$11M to co-fund **Canadian critical mineral projects with international partners** to strengthen supply chains
- **Critical Minerals Traceability Project Grants:** Funded 5 Canadian projects
- Support to the International Energy Agency, Extractive Industries Transparency Initiative and other international organizations



Capital Challenges

- Global cumulative investment needs for cobalt, copper, graphite, lithium and nickel for energy transition estimated to be in range of **US\$1.1-1.7 trillion** until 2050.
 - **US\$480–750 billion projected in the mining stage** of the supply chain to build roughly 330 new mines
 - **US\$70 billion per year needed within the next decade** to meet the increased demand scenarios.
 - Current investment gap is estimated at **US\$25 billion per year**.
- Canadian critical mineral projects, domestically and international, **facing capital shortages**.
 - Capital shortages **disproportionately impact upstream and early-midstream activities** in critical mineral value chains (mining, extraction, refining, processing, smelting).
 - **Price volatility amplifying investment risk** and dissuades financiers from providing long-term investment in critical minerals projects.
 - Price volatility creating **uncertainty** around the long-term viability of specific projects and **pausing development or operations**.
 - Issue faced by critical mineral projects globally.

CM Investment Trends

	Impact	Causes
Difficulty passing project development stage	<ul style="list-style-type: none"> • Disincentivized investors • Shortage of private capital for junior mining companies 	<ul style="list-style-type: none"> • Development timelines • Difficulties obtaining capital for development
Shortage of private capital during development	<ul style="list-style-type: none"> • Risk of good projects being stranded 	<ul style="list-style-type: none"> • Investor behaviour • Seniors more selective in investment and spending decisions • Retail investors moved on to other industries • ‘Exploration’ still too risky for institutional investors • Many offtakers not yet prepared to invest in upstream

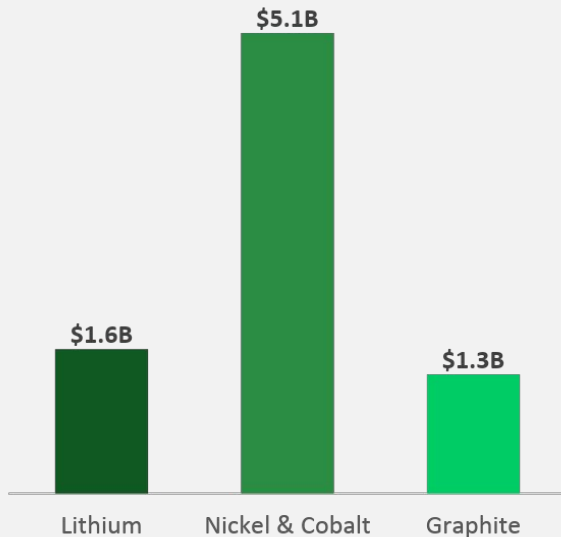


Canadian Battery Value Chain

- **Approximately \$24B** in total capital expenditures is required across battery minerals alone to reach enough production to satisfy 100% of demand from 4 battery factories and make Canada self sufficient. Without this production, Canadian downstream **battery factories will rely significantly on imports.**
- **Capital expenditures reflect estimated total costs to advance mining and processing projects.**

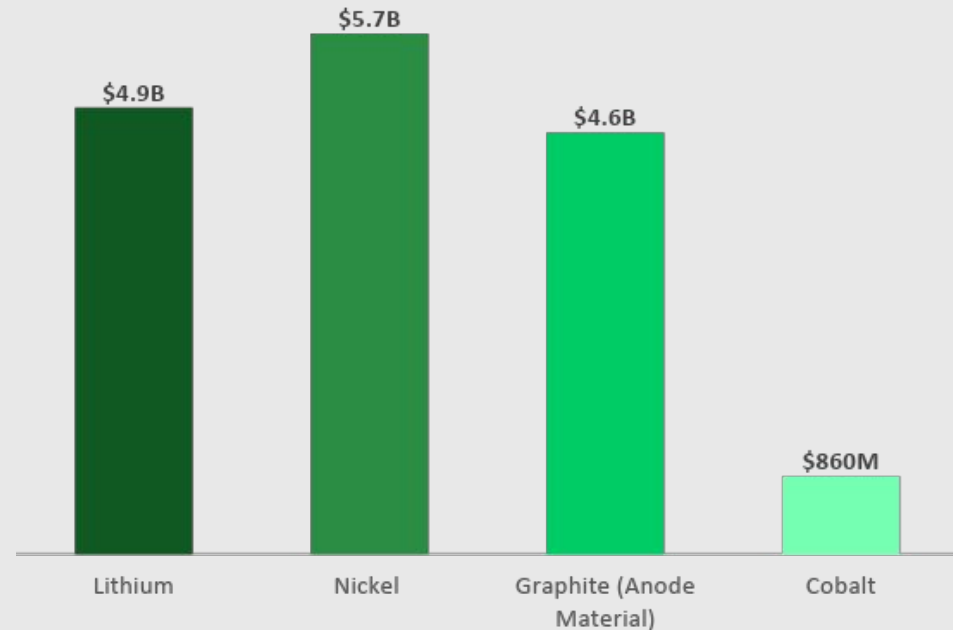
MINING

\$8.1B in Capital Expenditures



MIDSTREAM

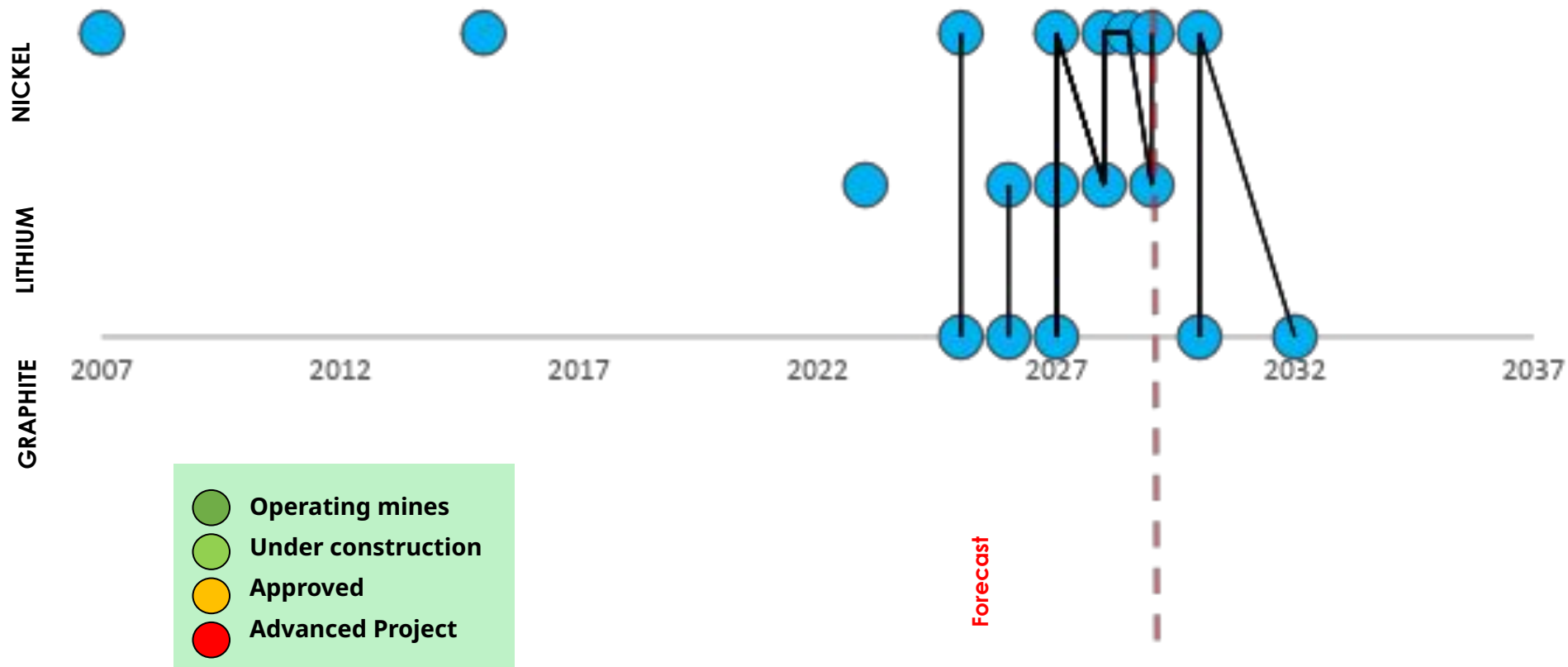
\$16.1B in Capital Expenditures



By 2035, these combined investments could create up to 40,000 in total new jobs (direct, indirect, and induced) and contribute an estimated \$16 billion to GDP annually.

Past and Future: Battery Mineral Mine Openings

15 more mines need to open over the next decade to supply enough minerals for 4 EV battery factories. The pace of new battery metal mine openings needs to increase fivefold through 2035 to fully support domestic battery production.



Case Study: Arafura Rare Earths – Nolan's Project

- **Arafura Rare Earths:** Nolan's Bore rare earths-phosphate-uranium-thorium (REE-P-U-Th) deposit, located in Australia's Northern Territory. Project is among the world's largest undeveloped neodymium and praeodymium (NdPr) resources and was added to the first list of **Minerals Security Partnership (MSP)** projects under consideration in the MSP Project List in September 2022.
- In total, **\$775 million USD** (approx. \$1.05 billion CAD) in total senior debt (plus **\$80 million USD** in debt cost overrun funding) is required for the project.
- The project recently obtained conditional financing from ECAs in **Australia, South Korea, Germany, and Canada:**
 - **Australia (\$533 million USD):** Northern Australia Infrastructure Facility's (NAIF), Export Finance Australia (EFA)
 - \$200 million USD subordinated standby liquidity facility to fund cost overruns during project ramp-up period.
 - **Canada (\$300 million USD):** Export Development Canada (EDC)
 - **South Korea (\$150 million USD):** Export-Import Bank of Korea (KEXIM)
 - **Germany (\$115 million USD):** Euler Hermes Aktiengesellschaft (Euler Hemes), German inter-ministerial committee



Case Study: Arafura Rare Earths – Nolan’s Project

- One of the **riskiest mining project financing transactions** that ECAs have historically agreed to.
 - Project being in a **regulated market**, supported by **experienced mining lenders** (including non-Canadian ECAs) who share similar requirements on **environmental, social and governmental (ESG) criteria** mitigates some risk.
- Project financing arrangement unique as it represents the first for rare earth elements (REEs) of this magnitude for a like-minded partner:
 - Project financing transactions typically comprised of equal portions of debt and equity.
 - **Commercial banks unwilling to provide uncovered debt for REE projects**, as current prices below model forecasts.
 - **Debt tenors of 10-15 years** required due to long construction/ramp-up period, which commercial banks wouldn’t provide.
 - Typically 3-5 years, but adjusted to align with **offtake agreements, project needs**, and to create **certainty** for investors.
 - ECA provision of conditional Letters of Interest (LOIs) created investment interest in the project.
- **Offtake agreements** executed with Siemens Gamesa RE (wind turbines) and Hyundai/Kia (EVs).
 - Other potential offtakes in discussion with Mercedes-Benz (EVs), Bosch USA , Stellantis (EVs), POSCO, and GE (wind turbines).



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Visit our webpage for more information on the Canadian Critical Minerals Strategy and related programs

