



Government of
Northwest Territories

Emerging Technologies and Future Commodities

Department of Industry, Tourism and Investment

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TALK OUTLINE

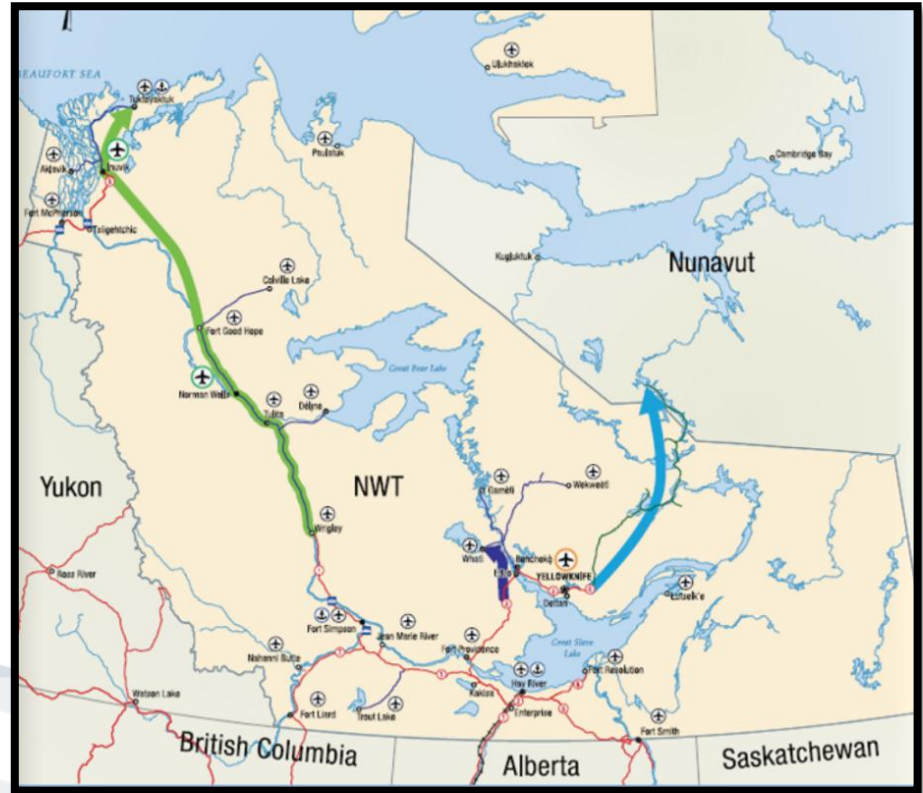
- Who We Are – NWT Mining History
- Recent NWT Resource Developments
- What Are Technology Metals and Minerals?
- NWT Technology Metals and Minerals
 - Copper, Zinc-Lead, Cobalt, Lithium and Rare Earth Metals, Tungsten, Diamond
- NWT Exploration
- Conclusions



WHO WE ARE

NWT Resources

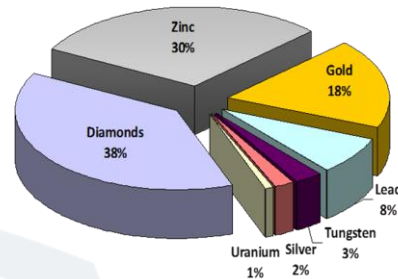
- 80 years of rich mining history
- World diamond leader
- 5th lowest risk jurisdiction in the world for mining investment
- Lowest social risk jurisdiction (Mining Journal World Risk Report)
- Leader in minimizing trade barriers; high political stability and security
- Strong partnerships with Indigenous Governments
- Transportation Corridor Initiatives



OUR MINING HISTORY

Mining Built the North; Brings us to today

- 80+ Years of production
- Gold (since 1940) = 15M oz
- Two decades as a diamond leader
- Uranium, silver, lead-zinc
- Major international investment
- Mining built infrastructure
 - Power, Rail, Highways, Ice Roads
- Economy (our main contributor)
- Employment & Procurement
 - Socio Economic Agreements
- Devolution > IGC > Resource Revenues



RECENT RESOURCE DEVELOPMENTS

Active Mergers and Acquisitions in the NWT

- In 2017, 94th richest American buys Dominion Diamonds (\$1.2 Billion USD)
- Osisko Metals acquired Pine Point Mining (\$34 Million)
- GoldMining Inc. acquired two properties in NWT from Tyhee Gold
- Fortune Minerals raised \$10 Million for NICO project
- In 2018, the 5th richest Irish person backs the merger of Mountain Province Diamonds and Kennady Diamonds (\$176 Million USD)
- Resource Capital Fund LLC invests \$20 Million in Canadian Zinc Corporation (41.4 percent stake)
- Investments by major mining producers into TerraX and Nighthawk (Kinross Gold, Rob McEwan, Osisko Royalties)



Mountain Province
DIAMONDS



WHAT ARE TECHNOLOGY METALS?

Technology metals* and minerals are essential for the production of 'high tech' devices and engineered systems, essential for the clean energy economy, such as:

- Mass production of miniaturized electronics
- Alternative energy sources
- Energy storage (battery technology)
- Advanced weapons systems
- Critical Materials Strategy (USA) and Report on Critical Raw Materials for the EU
- Includes: Cobalt, Uranium, Silver, Rare Earths, Lithium, Bismuth, Tantalum and Tungsten, Platinum Group Metals etc.

Essential to the functioning of our modern society



WHY - METALS FOR LOW CARBON FUTURE

Increase in demand

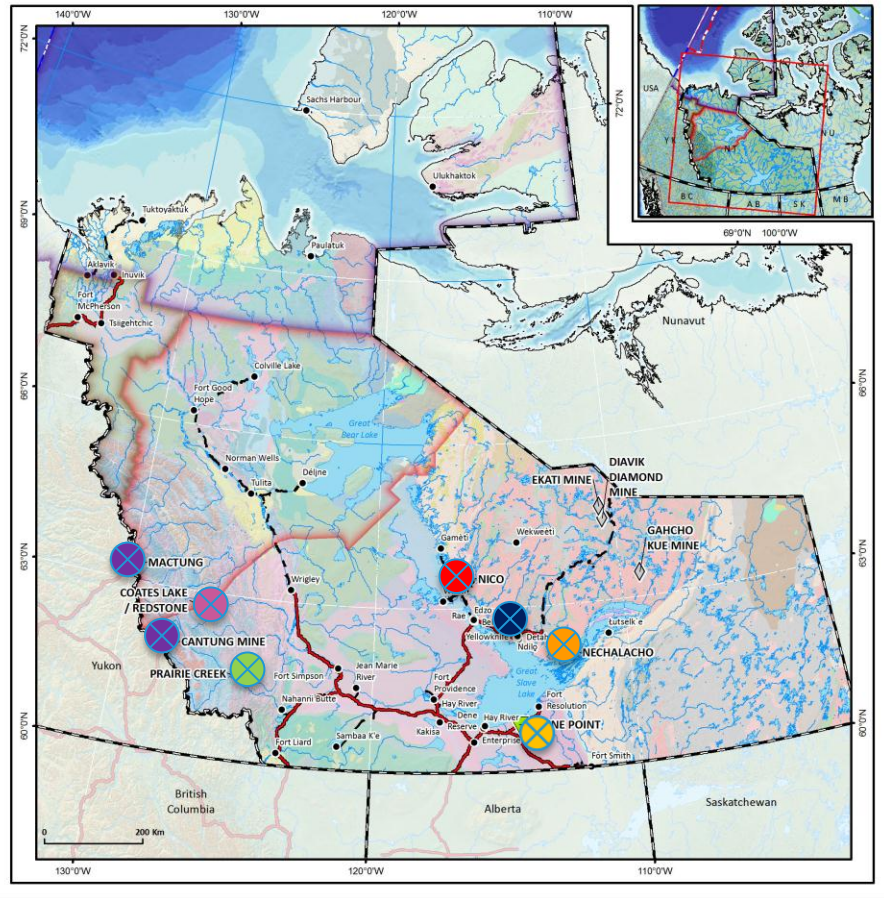
- Critical to the functioning of our modern society.
- Various countries have set timelines to ban sale of new petrol and diesel cars – France (2040), UK (2040) India (2030), and Norway (2025).
- China – 40% of global electric cars sales.
- World Bank estimates a significant impact on mineral sector due to the continuing boom of low-carbon energy technologies.
- Low carbon technologies will play a critical role in defining commodity marketplace for the next 50 years.
- Key Issues to supply: scarce , finite resources, long lead time for mine development, country risk, Chinese market dominance, capital intensive, environmental crackdowns, often a by product, long term fluctuations in price.



NWT Major Mining Project Locations 2018

- NWT Communities
 - - - Limit of Exclusive Economic Zone 200
 - - - Limit of Exclusive Economic Zone Pursuant to Bilateral Boundary Agreement
 - International Boundary
 - Provincial or Territorial Boundary
 - Major Road
 - Winter Road
 - Inuvialut Settlement Area
 - Gwich'in Settlement Area
 - Sahtu, Dene and Metis Settlement Area
- Mineral Deposits**
- Commodity**
- ▲ Base Metals
 - ◆ Diamond
 - Rare Earth Elements
 - Tungsten

Document: Major_Minerals_Project_Sites_Pam_AEE_Pres_v2_Jun7_2018.mxd
 Document Security: LOW
 Source: Petroleum Resources Division, Industry Tourism and Investment
 Projection: Modified Lambert Conformal Conic
 Central Meridian: 124.5°W
 Standard Parallels: 62°N 70°N
 Datum: NAD83



NWT Technology Metals Map

- ⊗ Nico Co-Bi-Cu-Au
- ⊗ Pine Point Pb-Zn-Ag
- ⊗ Prairie Creek Pb-Zn-Ag
- ⊗ Mactung- Cantung (tungsten)
- ⊗ Coates Lake (copper)
- ⊗ Hidden Lake (lithium)
- ⊗ Nechalacho (rare earth metals, lithium, beryllium, thorium etc)



COPPER

Man's First Metal

- 28 million tonnes of copper used annually
- Wind turbine holds 3.6 tonnes of copper per MW, and solar panel holds 4 tonnes per MW
- 3 times more copper in every electric car (65 Kg) compared to conventional cars
- Price of copper increased from \$2 lb to \$3.50 lb in the past 3 years



COPPER PROJECTS

Early Exploration Stage

Copper North Mining Corporation - (TSX-V: COL)

- Coates Lake/ Redstone Project – 100% owned, located 160 km west of Wrigley
- Hosts historic resource of 33.3 million tonnes grading 3.92% copper and 11.3 g/t of silver



Panarc Resources Limited

- Kennady Lake West Project – 100% owned, located 185 km east of Yellowknife
- Historic reserves have been estimated at 640,000 tonnes grading 1.12% copper



ZINC

Used in World's first battery

- \$34 billion per year market – greater than silver and platinum markets combined
- Used extensively in making alloys, batteries and construction sector
- China - largest producer and consumer
- Major zinc mines have shut down in the past 3 years – due to environmental or supply reasons
- Price of zinc increased from \$0.7/lb to \$1.6/lb in 3 years



ZINC AND LEAD PROJECTS

Advanced Exploration Stage

Canadian Zinc Corporation - (TSX: CZN)

- Prairie Creek Project – 100% owned; discovered in 1928; fully built mine
- Located in the Dehcho Region
- Hosts Measured and Indicated Resources of 8.70 million tonnes grading 9.5% zinc, 8.9% lead, and 136 gram per tonne silver
- Fully permitted for mine with all weather road in process

Pine Point Mining Limited - (TSX - V: ZINC)

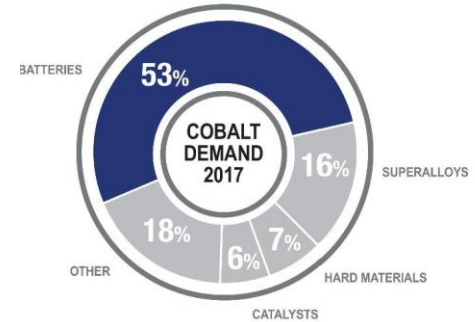
- Pine Point Project (past producer 1964-1988) - 100% owned by Osisko Metals
- Close to Town of Hay River- road accessible
- Hosts 46 known deposits remaining with an estimated 63 million tonnes of mineral resource (including 5.8 billion lb zinc and 2.2 billion lb lead in all resource categories)



COBALT

Battery Metal

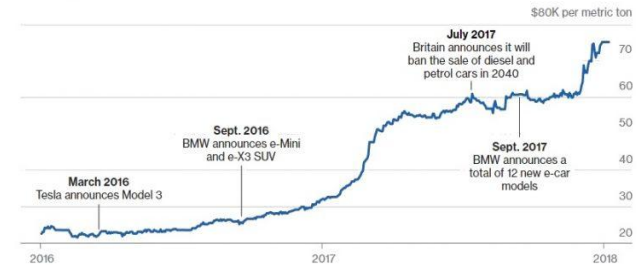
- 50 percent of battery weight in lithium ion battery for EV
- EV battery will requires 30-80 kg of high grade cobalt
- 60 percent of cobalt mined in Democratic Republic of Congo
- Price of cobalt increased from \$10/lb to \$40 / lb in the past 3 years
- USA is the worlds largest consumer of cobalt and considers cobalt a strategic metal
- Used in superalloys



Source: Darton Commodities

Rapid Rise

Cobalt prices stage one of the biggest jumps among commodities



Source: London Metal Exchange

Courtesy of @StockTwits

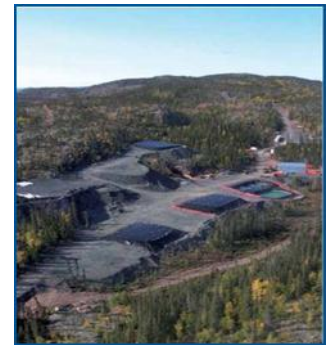


NICO COBALT PROJECT

Advanced Project

Fortune Minerals Limited - TSX (Canada): FT and OTC QX (USA): FTMDF

- NICO Project - 100% owned shovel-ready Canadian cobalt project
- Cobalt-Bismuth-Copper-Gold
- 21-year mine life
- \$116 million invested to date
- 33 million tonne (Mt) reserve test mined, pilot plant tested, FEED Engineering, positive feasibility study & peer review
- Environmental Assessment (EA) approvals & major mine permits in place
- Focused on securing project financing for construction



LITHIUM AND RARE EARTH ELEMENTS

Fuel for Green Revolution

- Lithium

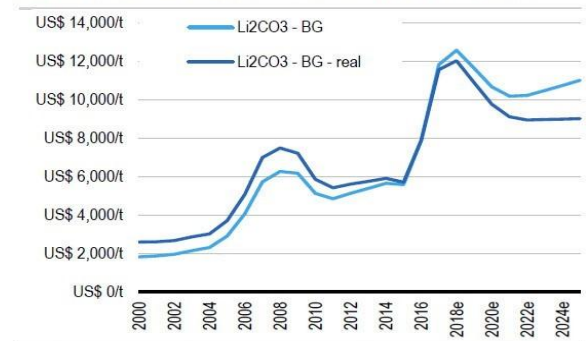
- By 2025, the lithium usage in batteries will be 2x bigger than entire lithium market today
- Increase in electric cars from 1 million (2018) to 20 million (2030)
- 63 Kg of Lithium in each EV (70Kwh)
- Every 1% increase in EV market share = 70,000 tonnes of Li_2Co_3 .
- 100% increase in lithium price in past 2 years
- Potential for lithium in brines as by-product of oil and gas activity

- Rare Metals

- Neodymium and praseodymium increased demand since 2013
- Used in high strength magnets vital in EVs, wind turbines, fiber-optic cables, energy efficient light bulbs, and in the nuclear industry



Figure 84: Lithium carbonate – battery grade – prices



Source: Roskill, Benchmark Mineral Intelligence, UBS estimates



NWT LITHIUM AND RARE EARTH ELEMENT PROJECTS

Advanced Exploration Stage

Avalon Advanced Materials Inc. - (TSX: AVL)

- Nechalacho Project – 100% owned, located in the Akaitcho region
- Estimated capital cost of mine \$1.57 billion, mine output of 2,000 tpd and mine life of 19 years

FAR Resources Corporation - (TSX - V: NTY)

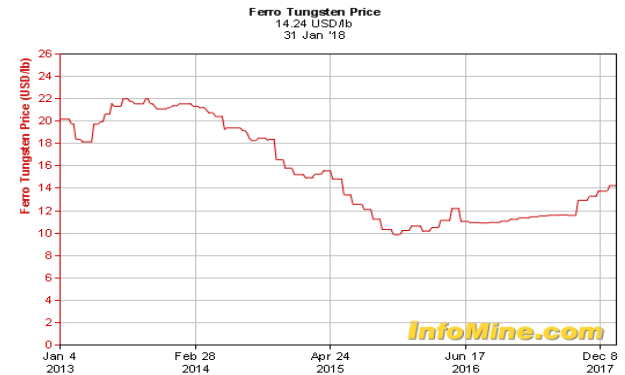
- Hidden Lake Project – located in Yellowknife Pegmatite Belt
- Close to road and other infrastructure
- 90% owned by FAR Resources Limited (CNSX: FAT)
- Metallurgical test work has produced high grade mineral concentrate of 6.16% lithium oxide



TUNGSTEN

Strongest Metal

- Hard, dense, heat resistant and environmentally benign
- Used in tungsten carbide and alloys
- Used in Ammunition - Advanced tungsten bullets can penetrate armored plates
- Extensively used in high speed railway industry (estimated \$8 trillion industry by 2025)
- Price of tungsten increase from \$10/lb to \$15/lb in the past 3 years



NWT TUNGSTEN PROJECTS

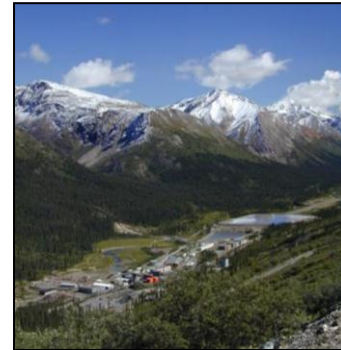
Future Marketing

Mactung Mine (Ready for JV or Acquisition)

- Owned by Government of Northwest Territories
- Active regulatory permits being maintained; straddles NWT-Yukon border; Yukon Project Certificate
- Indicated resource 33 million tonnes grading 0.88% WO₃
- 2009 feasibility study defined 11 year mine life

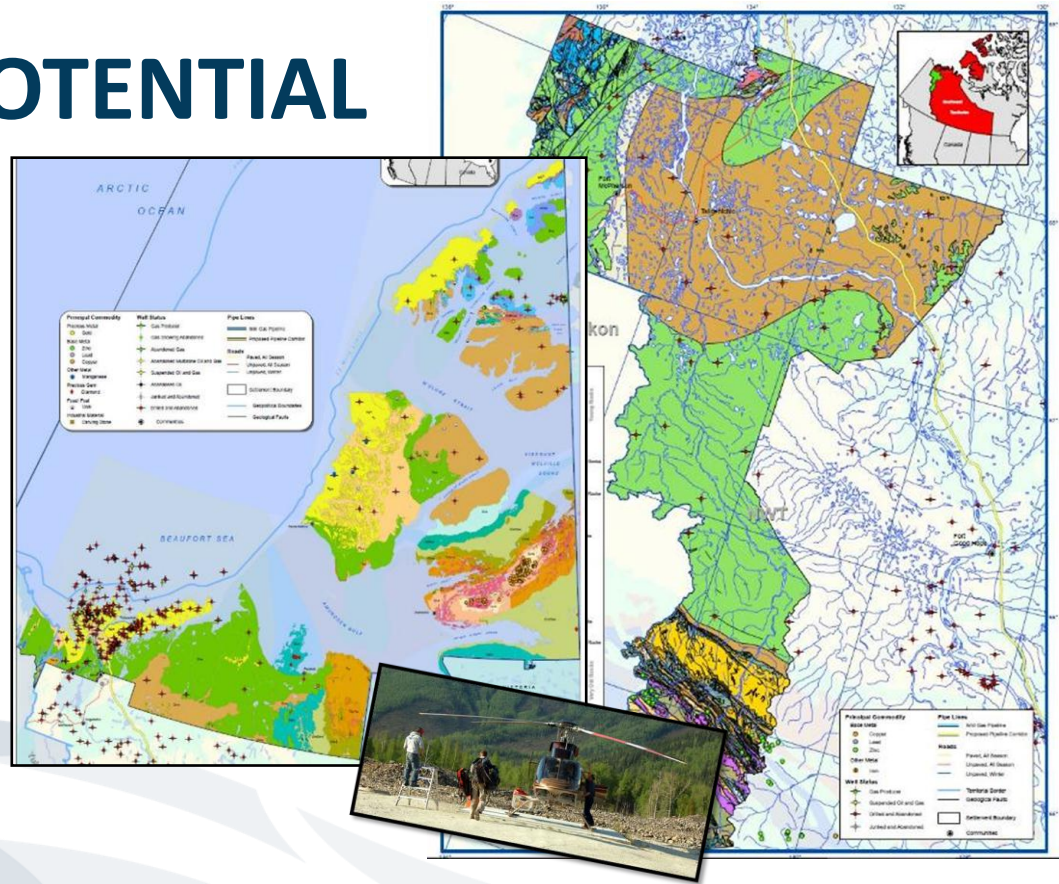
Cantung Mine (Care & Maintenance)

- Owned by Government of Canada
- Past producing tungsten mine since 1962
- Hosts roughly 6 million tonnes of indicated and inferred resources at 0.3% cutoff (WO₃), and 0.24% copper



NWT MINERAL POTENTIAL

- Excellent potential for new mineral discoveries
- Large land area and favorable geology
- Relatively unexplored
- Mineral Potential Mapping:
 - Gwich'in: lead, zinc, copper, gold
 - Inuvuluit: nickel-copper, lead-zinc, diamond
- Current Exploration increasing:
\$71 Million in 2017



GNWT SUPPORT

- Investment in Infrastructure
- Incentive programs (MIP, SEED)
 - Have proven successful discoveries
- Public Geoscience
- Legislation and Regulations
- Socio-Economic Agreements:
 - Employment, Procurement, Training
- Education & Awareness
- Pathfinding and Client Services
- Competitive royalty structure
- GNWT Strategies
 - Mineral Development Strategy, Energy Plan



The NWT's Future in Technology Metals

1. Rich and diverse geology, relatively underexplored for technology minerals and metals
2. NWT is host to significant known deposits of technology minerals and metals
3. New exploration in the NWT including for technology minerals and metals
4. Ongoing awareness and securely sourced minerals and metals
5. Initiatives underway to promote education and awareness
6. Ongoing need for transportation and energy infrastructure development



Thank you



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