

Global Critical Mineral Landscape: Defining a Position for the Philippine Mineral Industry

Graciano P. Yumul, Jr.^{1,2,3}, Maria Rica Xtra Arguel⁴,
Ferdinand T. Jumawan¹, Heather Kim Pomeg-as¹

¹Cordillera Exploration Company Incorporated, BGC, Taguig City, NCR

²Newminco Pacific Mining Corporation, BGC, Taguig City, NCR

³SESAM, University of the Philippines Los Baños, Laguna

⁴FCF Minerals Corporation, Quezon, Nueva Vizcaya

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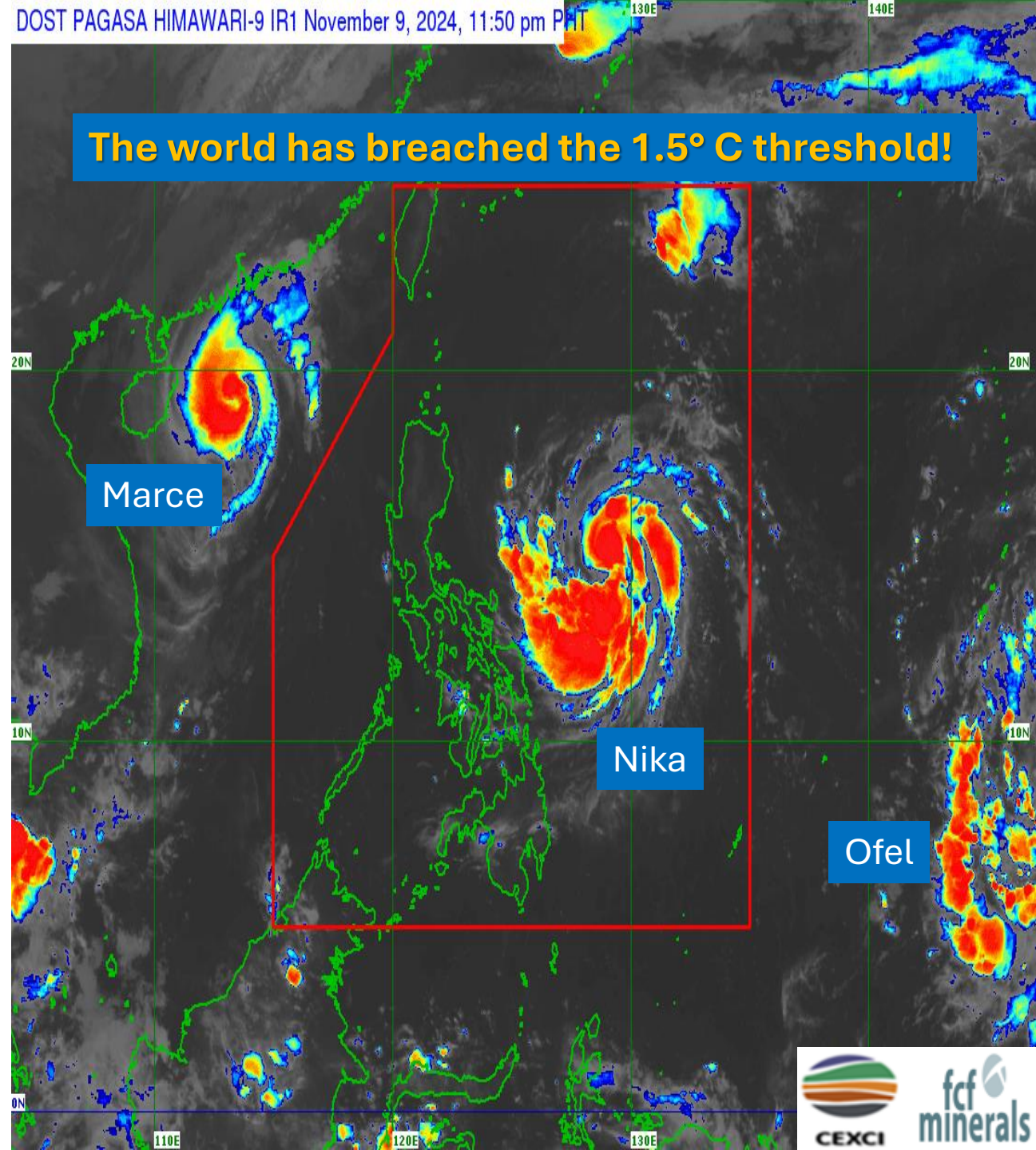
OUTLINE

- Twin Transformation
- Global Commodities Now & Tomorrow
- PH Potentials & Critical Mineral List
- Caveats

Motivation: Overview & Engagement

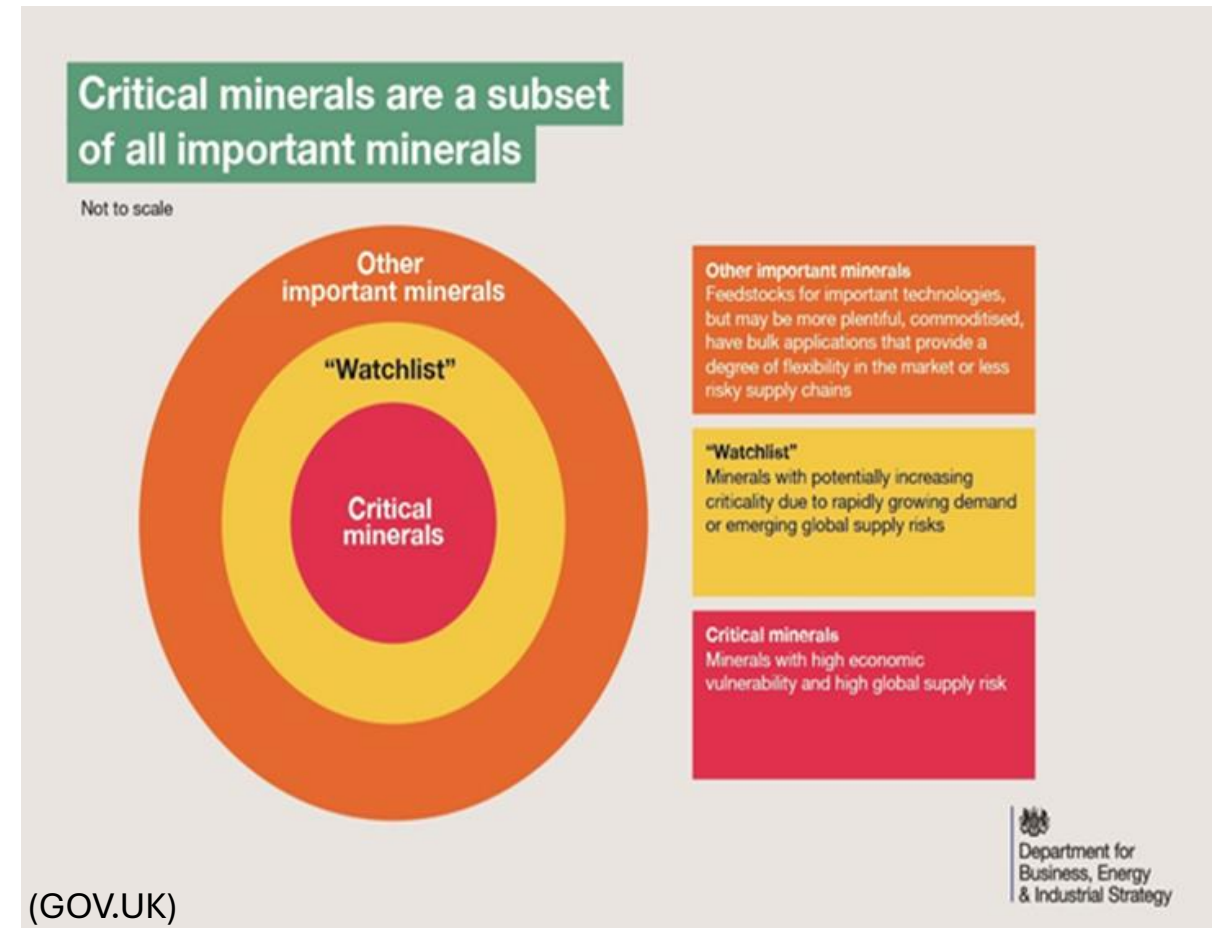


Twin Transformation: Green Transition & Digital Acceleration



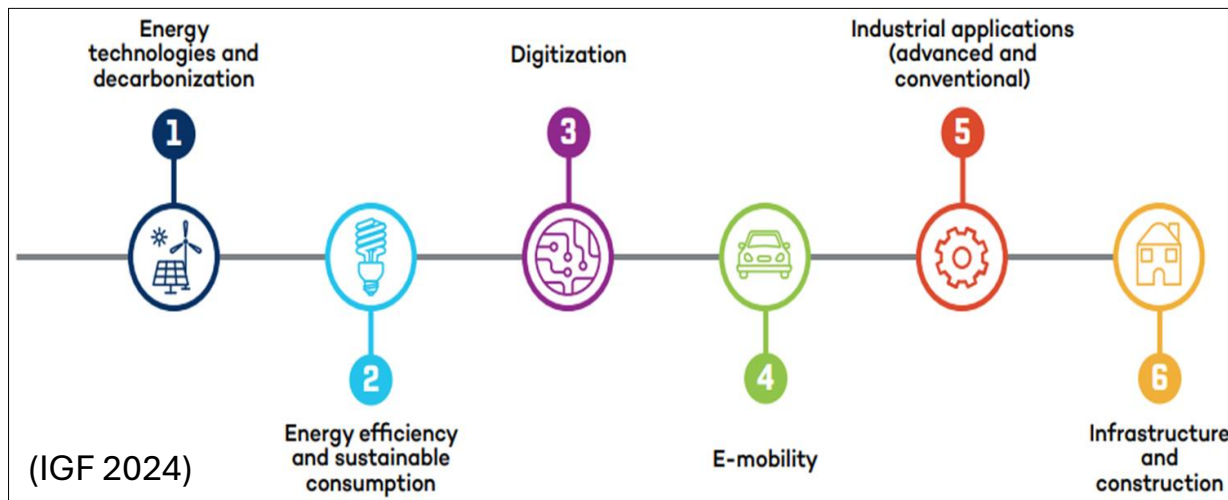
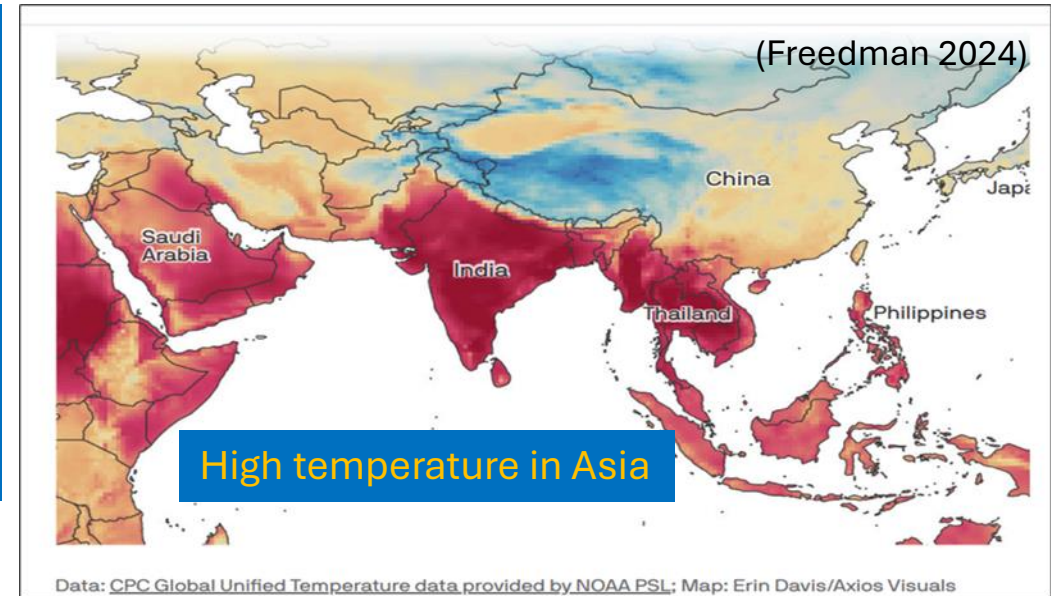
CRITICAL MINERALS

- Energy Transition Minerals or Strategic Minerals
- Economy, Security, Supply Chain
 - Material inputs in REs
- Critical Mineral lists differ



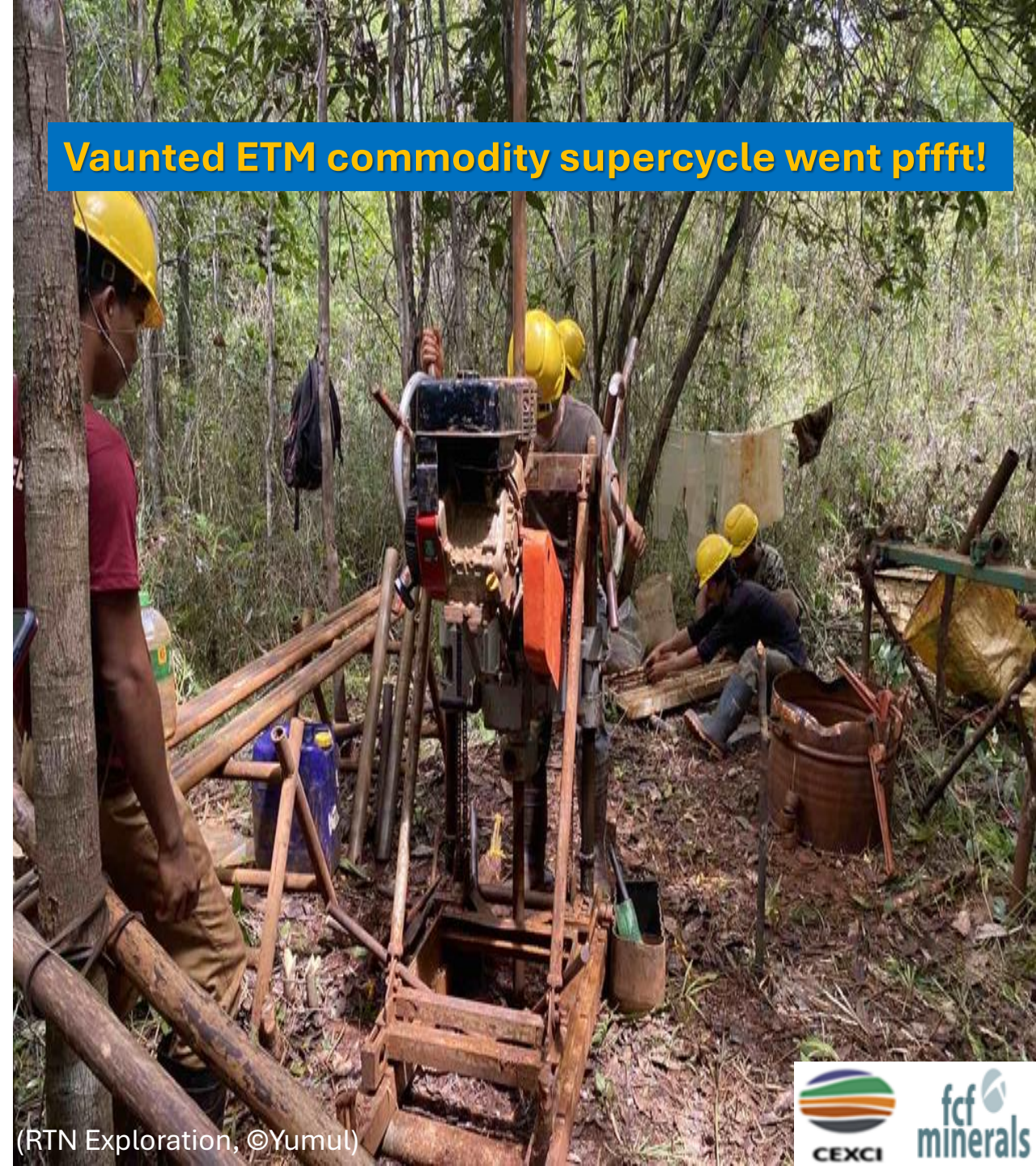
CRITICAL MINERALS: DRIVERS

- Changing Climate: **Net Zero aspiration**
- Green Transition: **Batteries & Chargers**
 - Digital Acceleration: **Data centers**
 - Business: **Electric Vehicle sales**
- Geopolitics: **Reliable & cheap energy**



Global Commodities Now & Tomorrow: Ni, Cu, Au, C

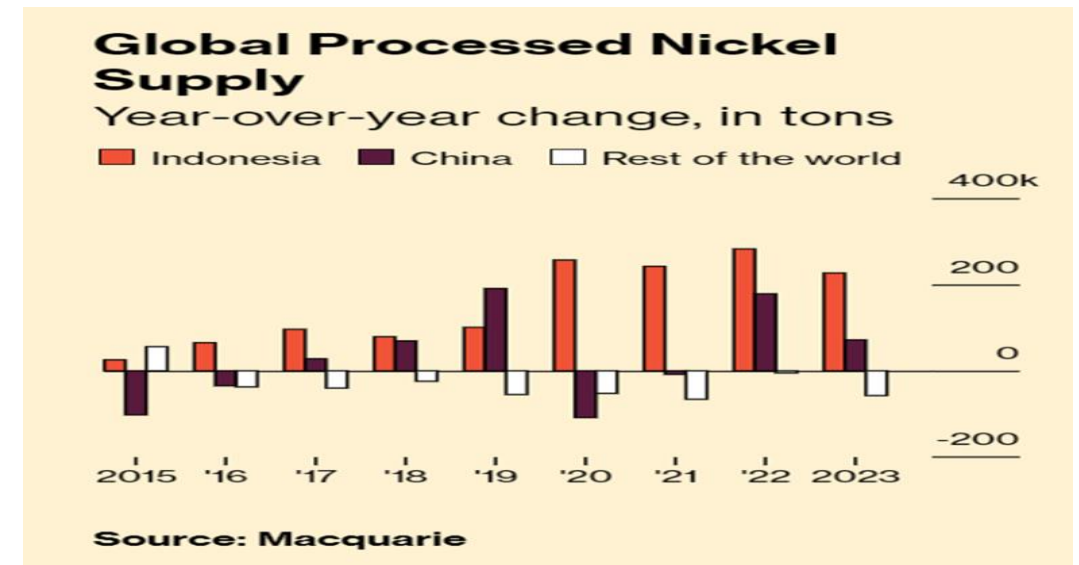
Vaunted ETM commodity supercycle went pffft!



(RTN Exploration, ©Yumul)

NICKEL NOW

- Indonesia & China: **Dominance**
- Supply glut: **Price down, Mine closed**
- Blood vs Green Ni: **Envi & human rights**
 - China factor: **Mining; Refining**
 - Pricing: **Refiners not Miners**



NICKEL DRIVERS

- US Inflation Reduction Act (IRA)
- EU Net-Zero Industry Act (NZIA)
- Mineral Security Partnership
 - Alternative minerals
- Demand uncertainties

(Ashcroft 2024)

(Trump Presidency Factor?)

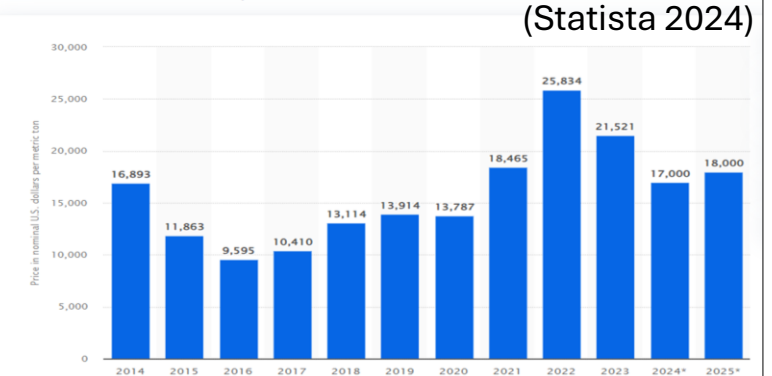


Batteries Account For Nearly 17% of Nickel Demand
Share has grown rapidly in recent years as EV output expands



Source: Citigroup Inc. forecast for 2023
Note: numbers have been rounded

Average prices for nickel worldwide from 2014 to 2025
(in nominal U.S. dollars per metric ton)

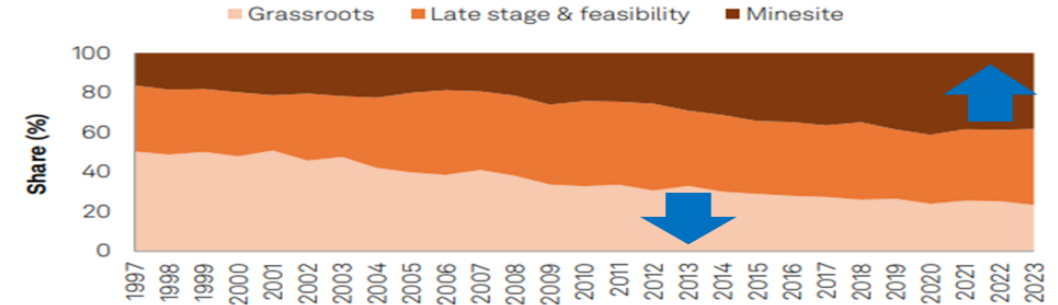


COPPER NOW

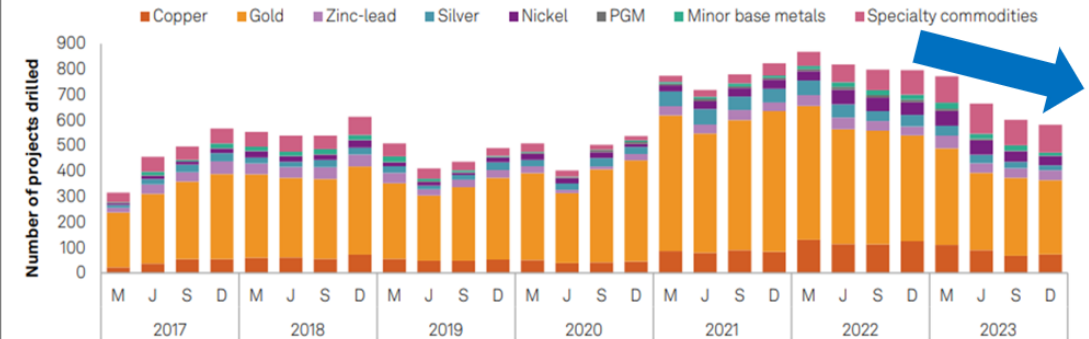
- Exploration down
- Near mine than greenfield
- New mines unopened
- RE, EV & AI data centers' massive needs

Global Cu demand up by 50% by 2050!

Grassroots exploration continues downward trend



Global drilling activity, 2017–2023



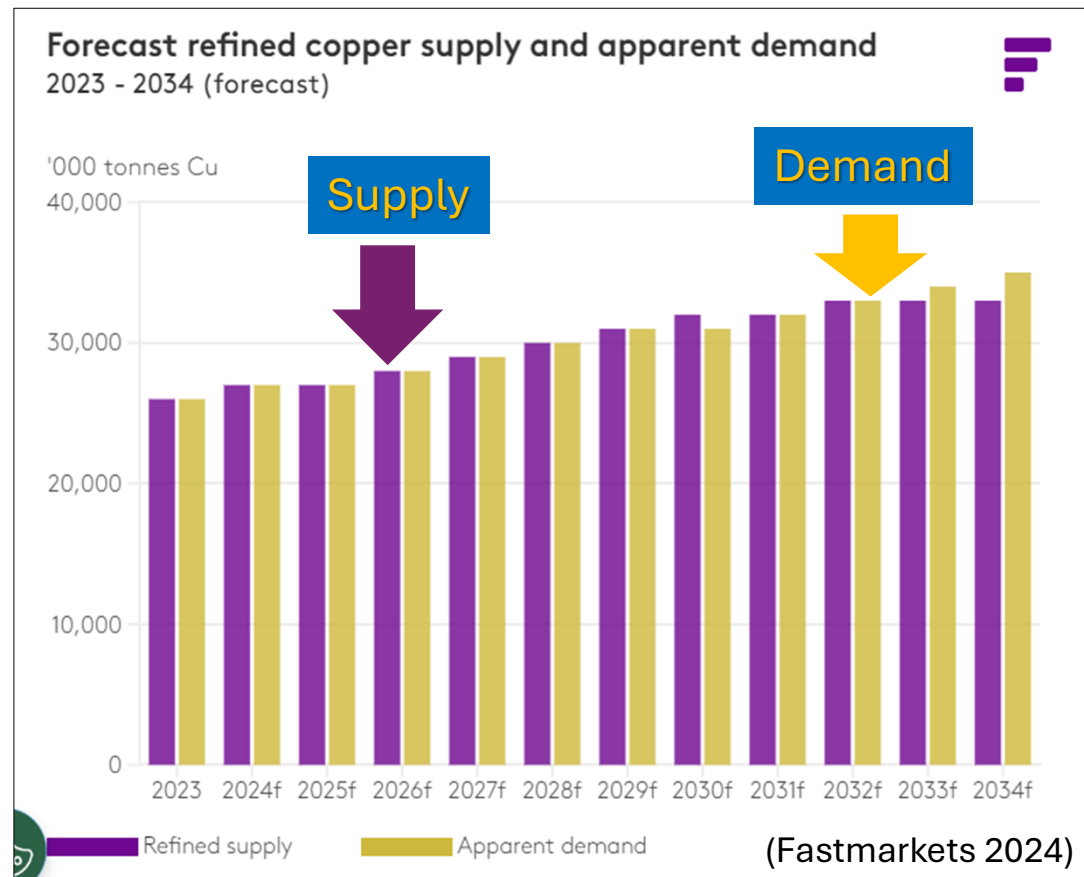
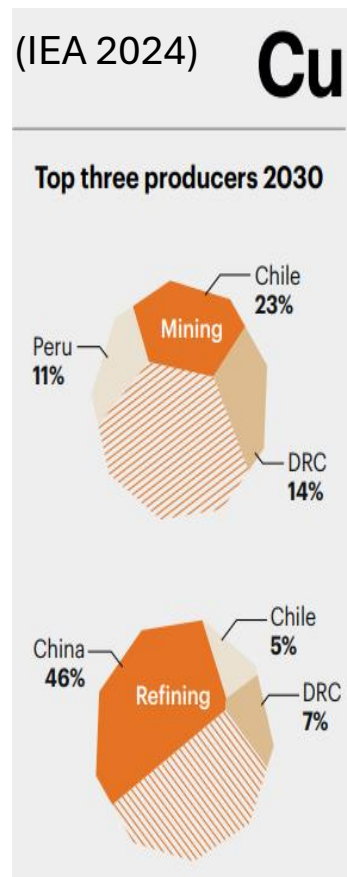
Cobre Panama Mine, Luis Acosta/AFP/Getty Images



FACTORS IMPACTING COPPER SUPPLY & DEMAND

- China & Russia factor
 - Energy transition
 - Mine production
 - Inventory levels
- Smelter challenges
- Secondary copper
 - Construction

(Fastmarkets, 2024; Pierssens 2024; Pistilli 2024; Tunncliffe 2024)



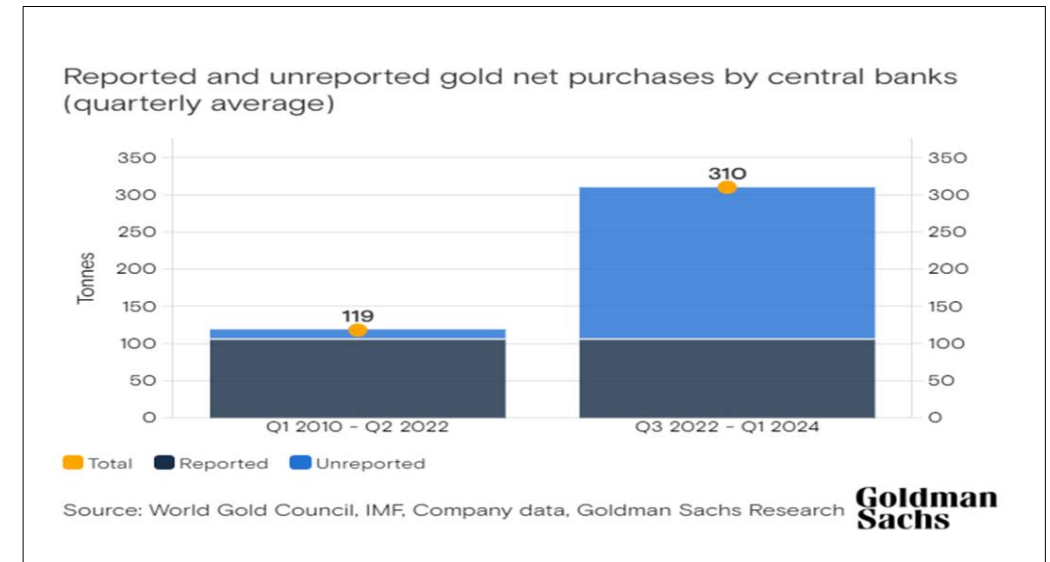
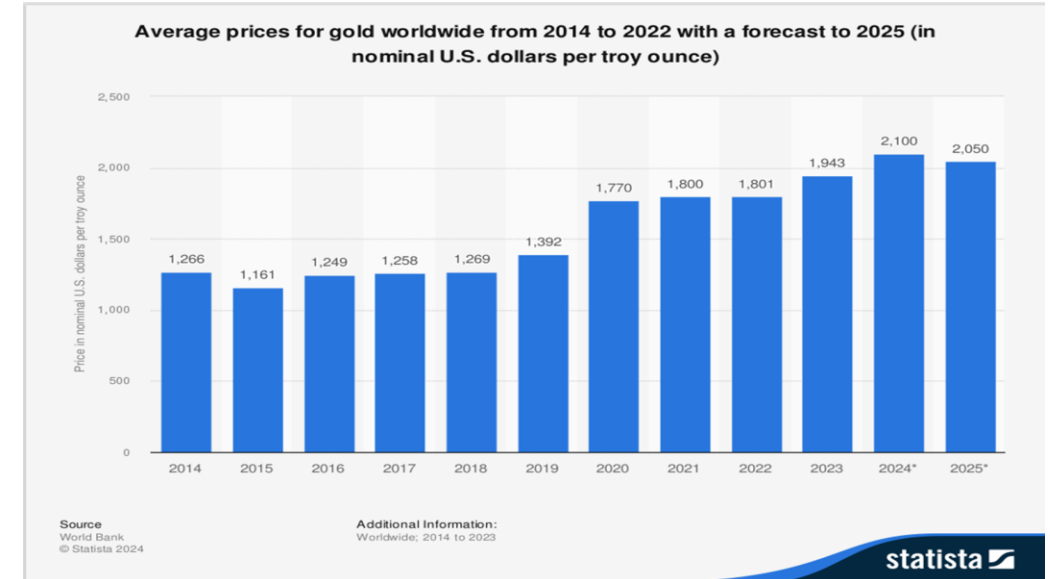
GOLD: PREFERRED HEDGING COMMODITY

Price Increase Factors

- Central bank purchases
- Federal Reserve interest rate cuts
- Geopolitical reasons: Sovereign debt burden, wars, financial sanctions, etc.

(Baffes et al 2024; Goldman Sachs 2024; Mills 2024; InvestingHaven 2024; Wulkandari 2024)

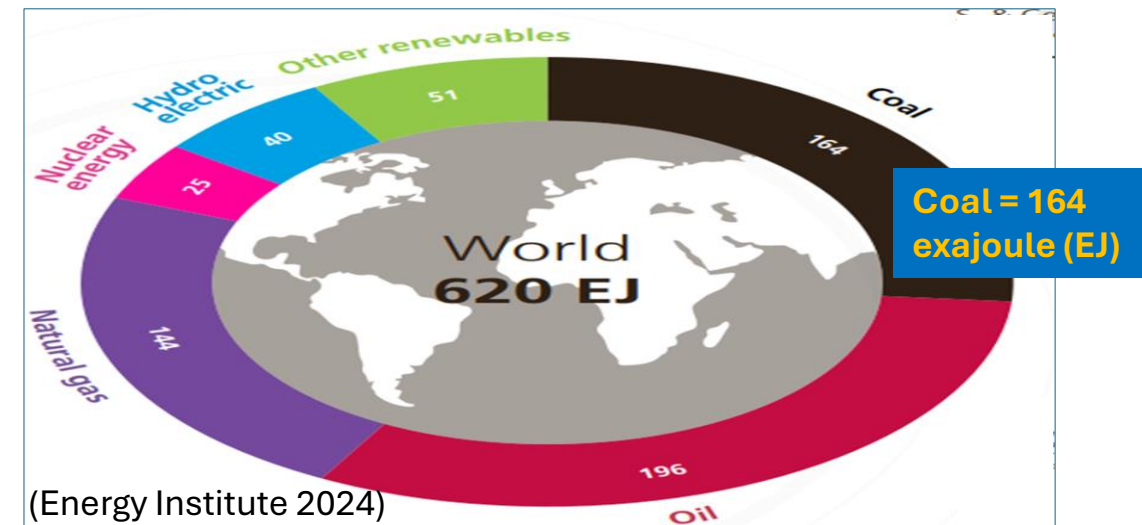
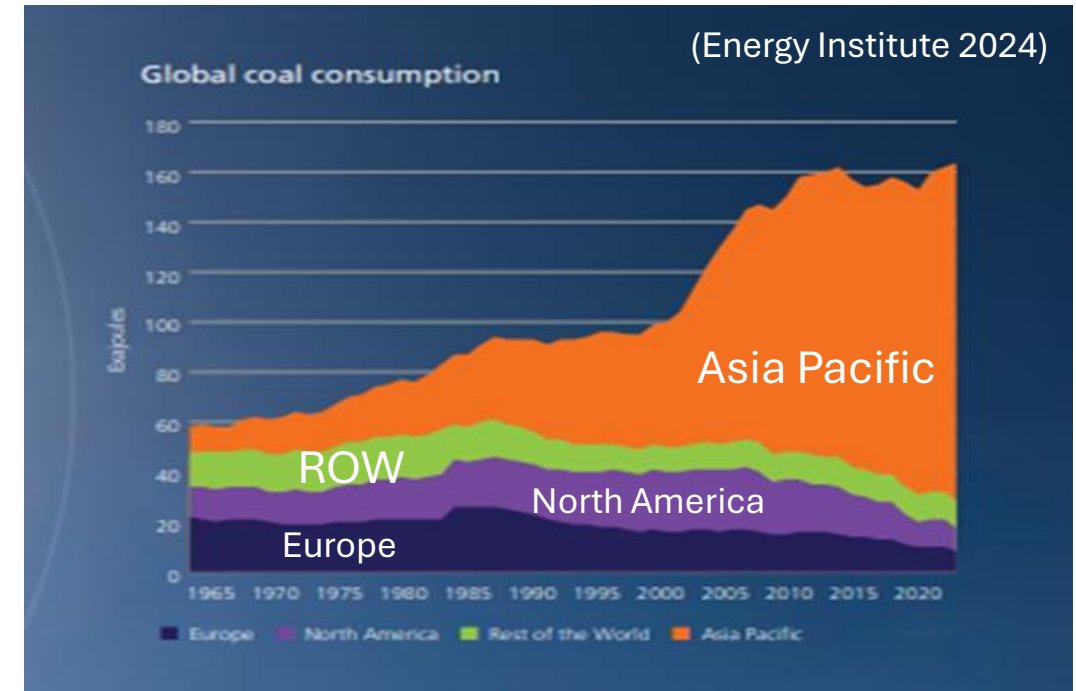
2025-2030 Price Projection: US\$1.6k-3k/oz!



COAL REALITY

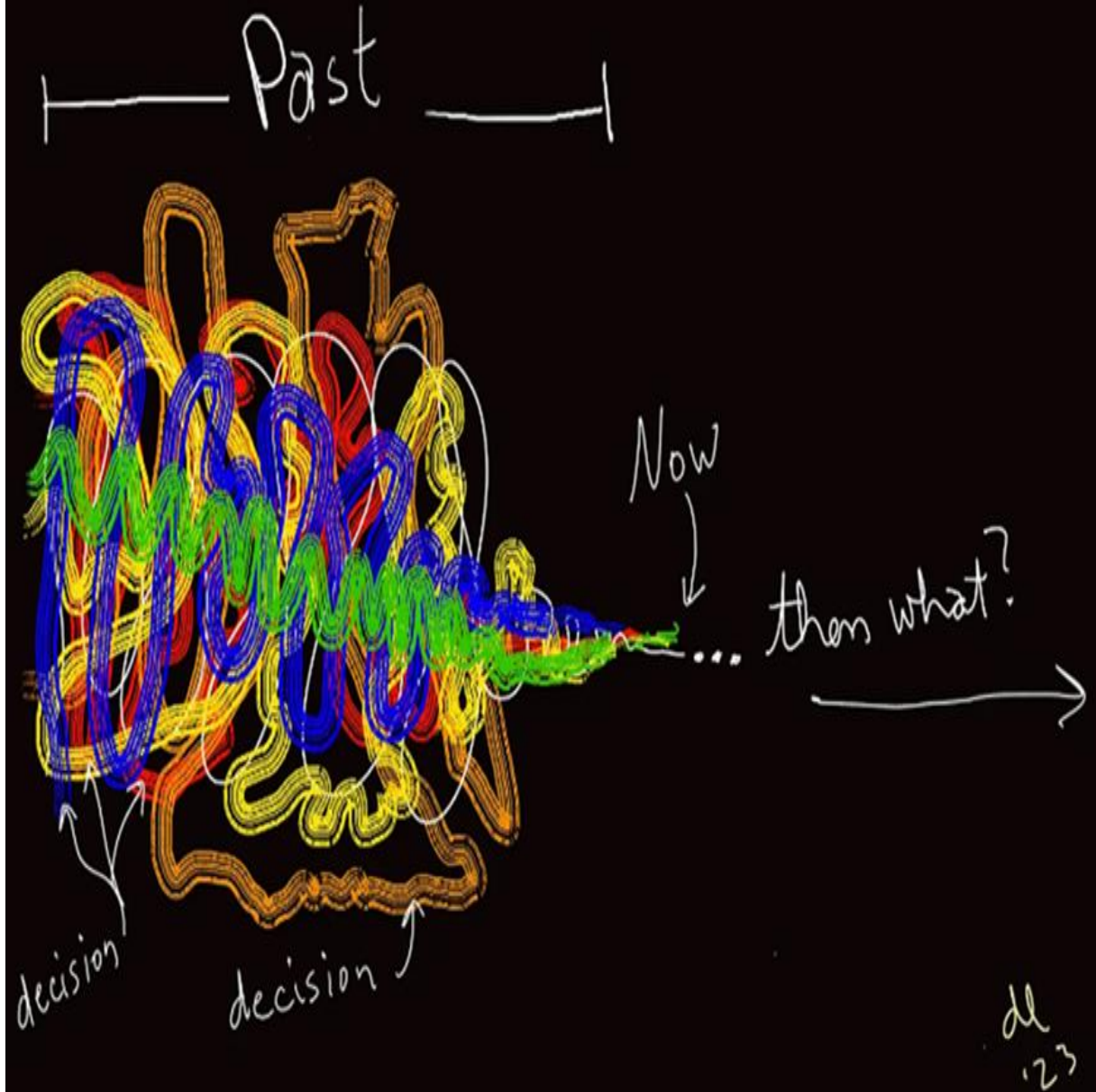
- Metallurgical & Thermal Coal
- Reliable & cheap power supply
- 2023 highest global coal production
- 80% of global output from Asia-Pacific (97% from Aus, Chi, Ind, Indo)
- *Biggest users: India, SE Asia*

PH Green Transition Driver: Fossil Fuel!



PH Potentials & Critical Mineral List

What is critical to you may not be to me!

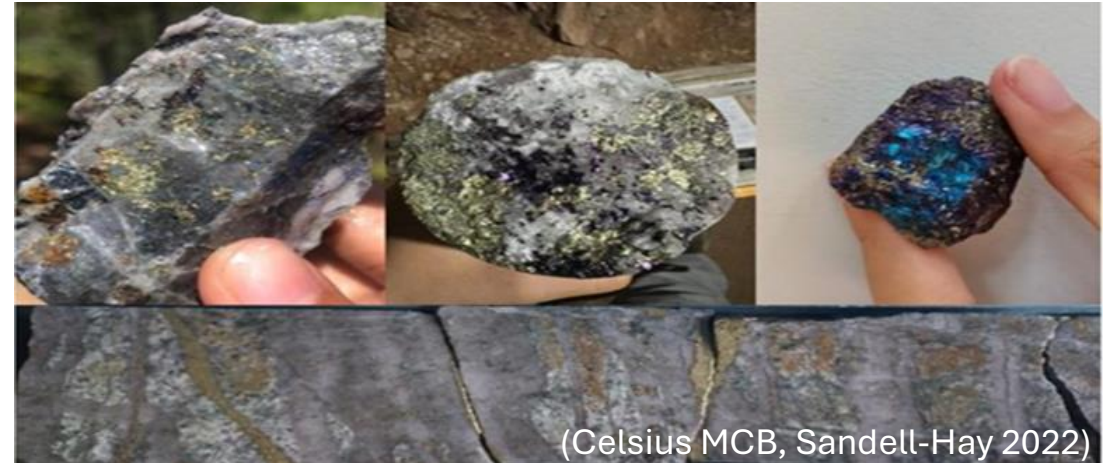


(Loewen, 2023)

PH MINERAL DEPOSITS NOW & TOMORROW

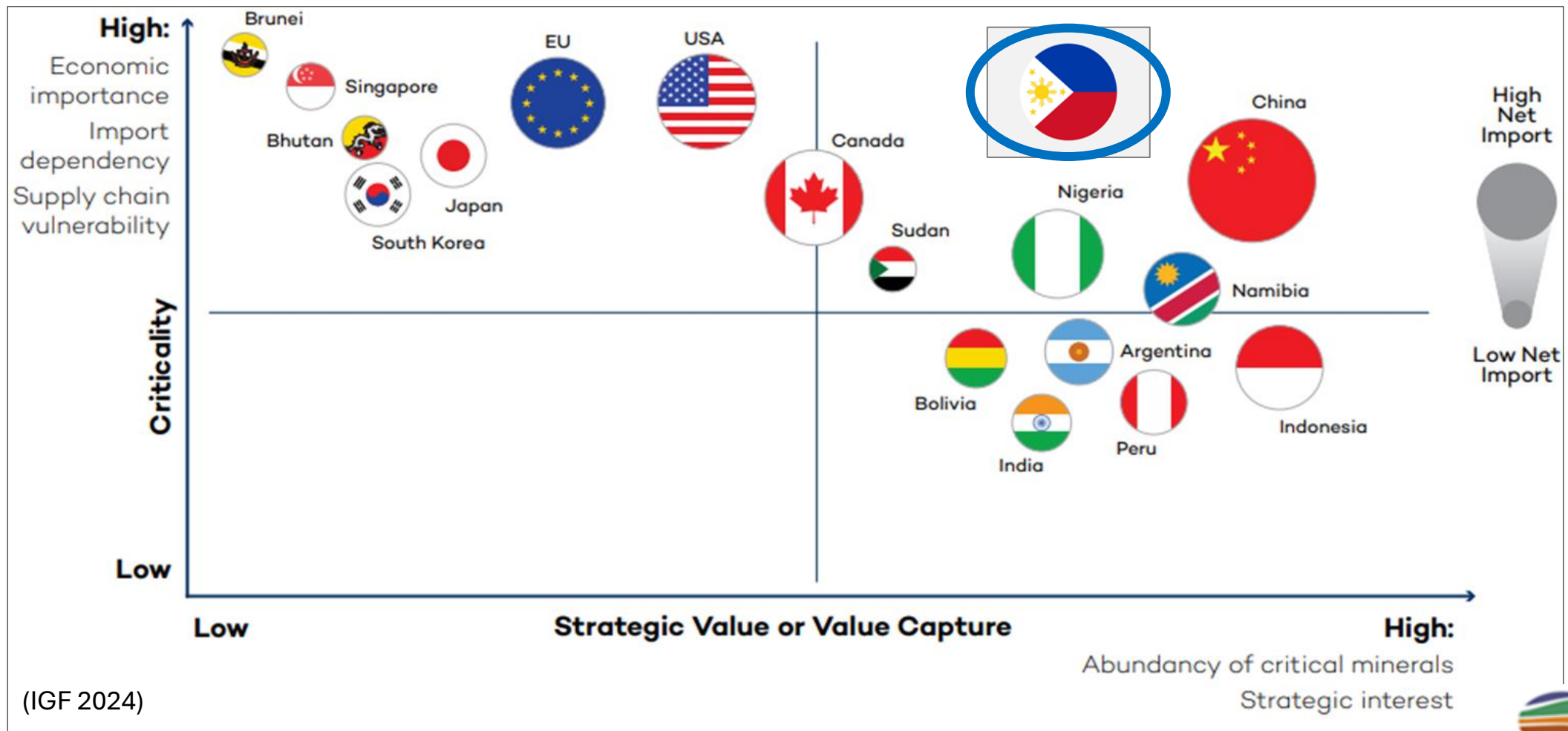
- Massive sulfides with PCDs, Magnetite Skarn, IOCG
- Alkalic rock-hosted deposits
 - Deep & Deeper deposits
- New, old exploration plays

***A lot of exploration plays but ...
not that many play 😞***



PH CRITICAL MINERAL DETERMINATION

Criticality: 1. Security & Control of Supply; 2. Value Capture

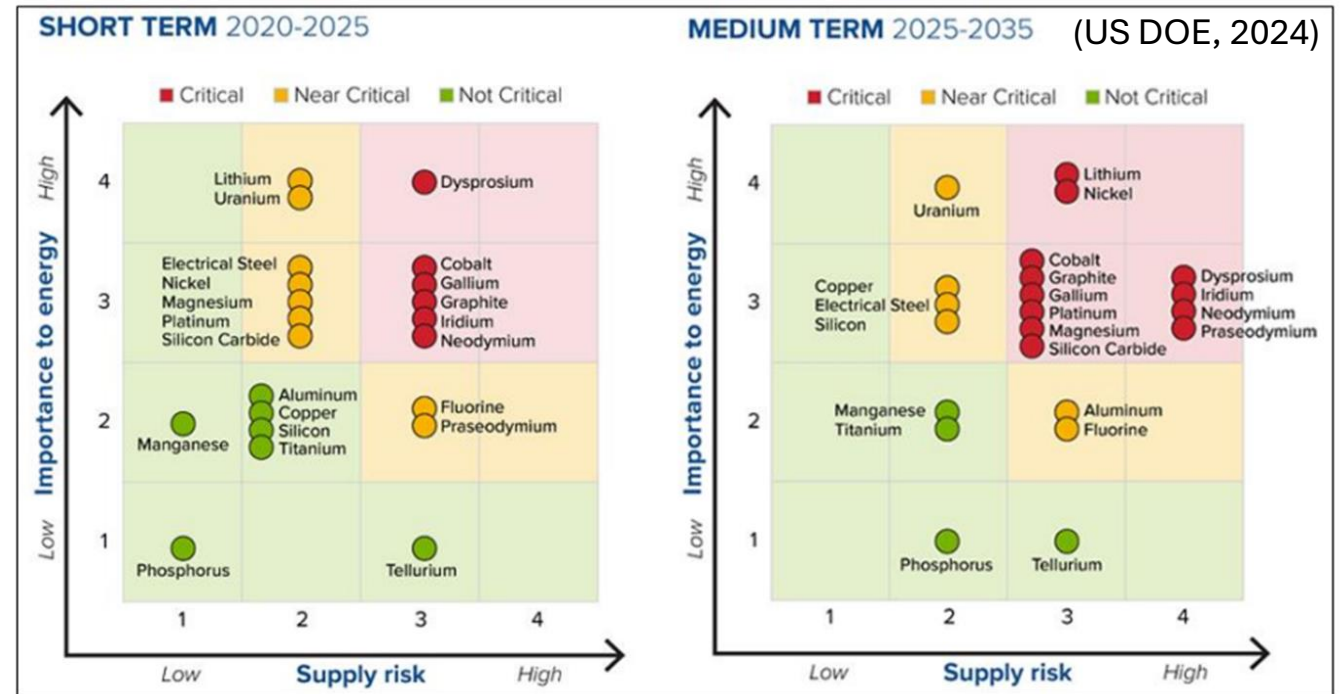


FORWARD MOVE

What do we want to achieve so we can strategize & operationalize?

The Basics

- Deep level-mining systems
 - Domestic processing
 - Enhanced exploration
- Negotiated preferred status
 - Critical mineral list



The Key Concepts of Heraclitus' Philosophy

Everything Is Fire?

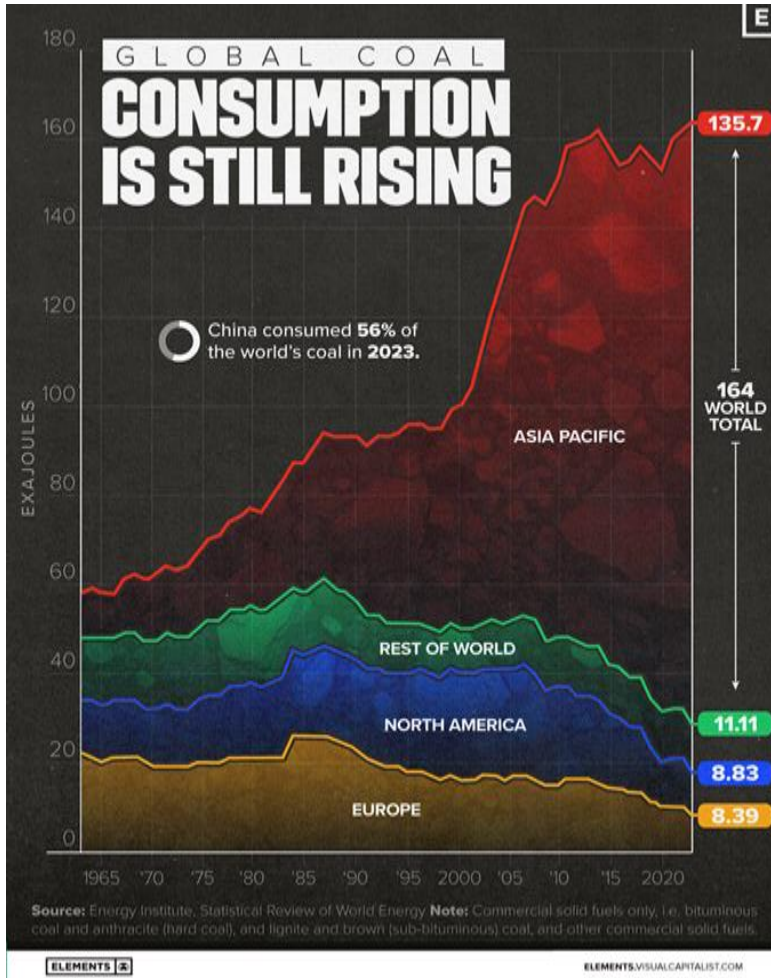
Caveats

No point knowing changes,
if we do not adapt!

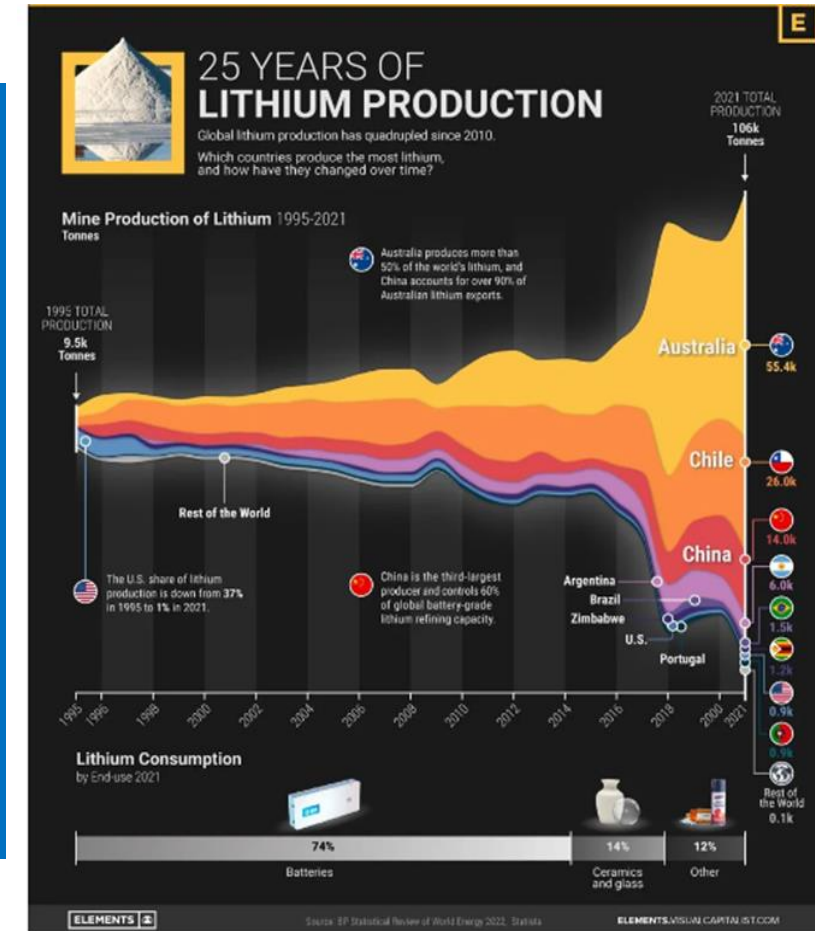


Heraclitus the Crying Philosopher, Peter Paul Rubens, 1636-8, Prado (left); Fire from Barry Island Fire Festival, Photo by Andy Watkins (right).

CHANGES & CAVEATS



- Vigilance needed:**
- Sustainability
 - Technological breakthrough
 - Mineral substitution
 - Geopolitical upheaval



LITHIUM PRODUCTION, BY COUNTRY

THE FUTURE

Responsible & sustainable mining is for real.

From Shareholder Capitalism to Stakeholder Capitalism!

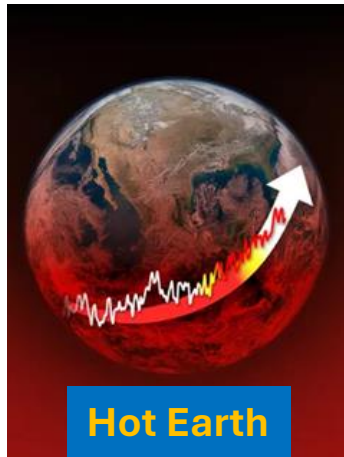
Continuous Growth



**Exploration,
Development,
Extraction &
Rehabilitation.**



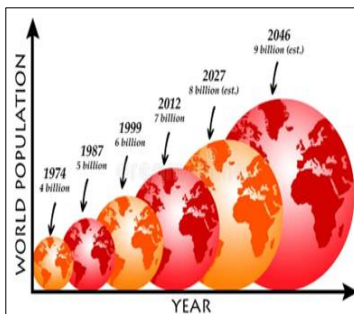
**For and about the greater good
of the Minerals Industry!**



Hot Earth



Digital World



Population↑

Thank You



Leading Exploration, Mining Possibilities...
Beyond Limits!

Cordillera Exploration Co., Inc.
The NAC Au-Cu Subsidiary

