

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

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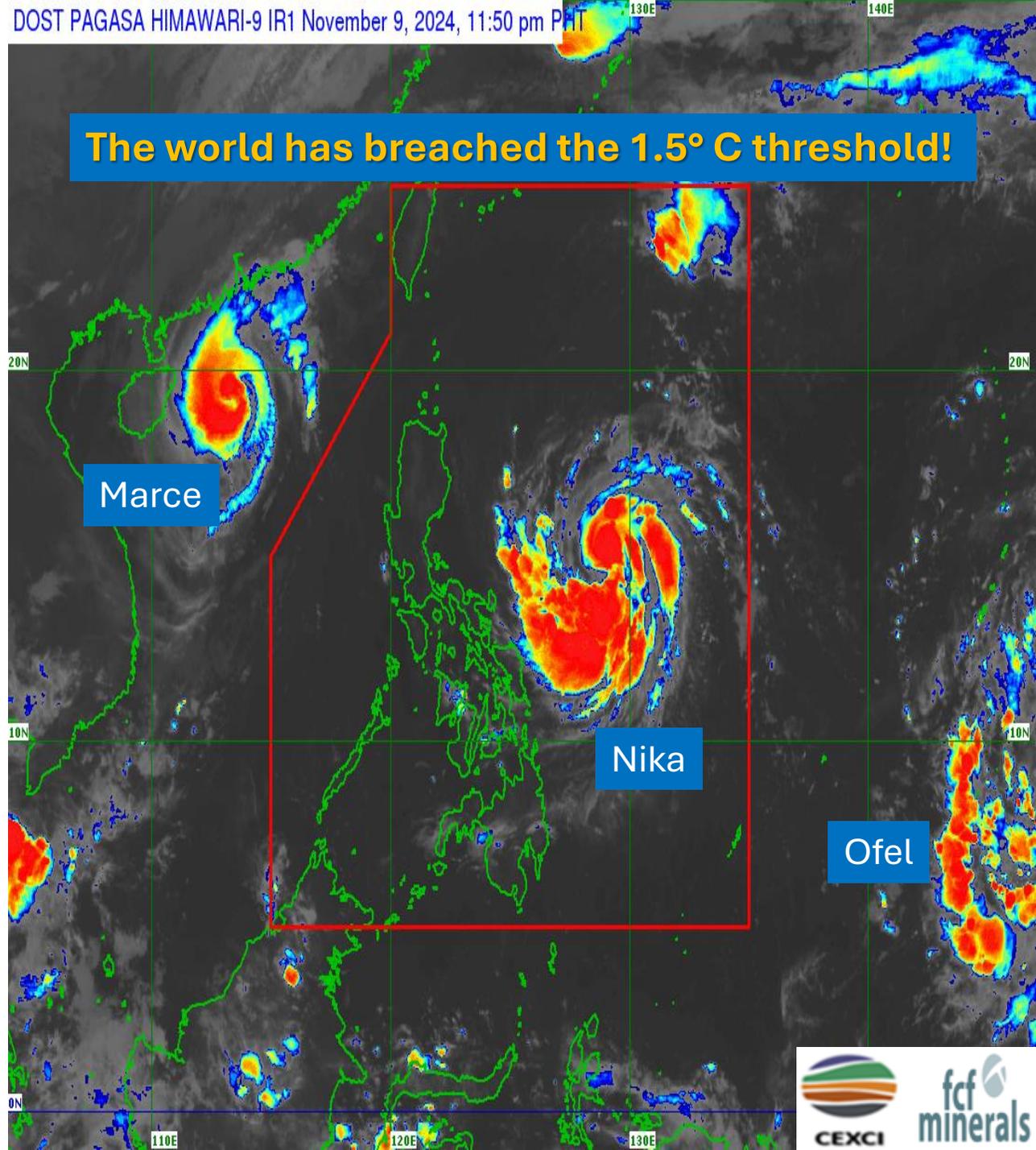
# OUTLINE

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

Motivation: Overview & Engagement

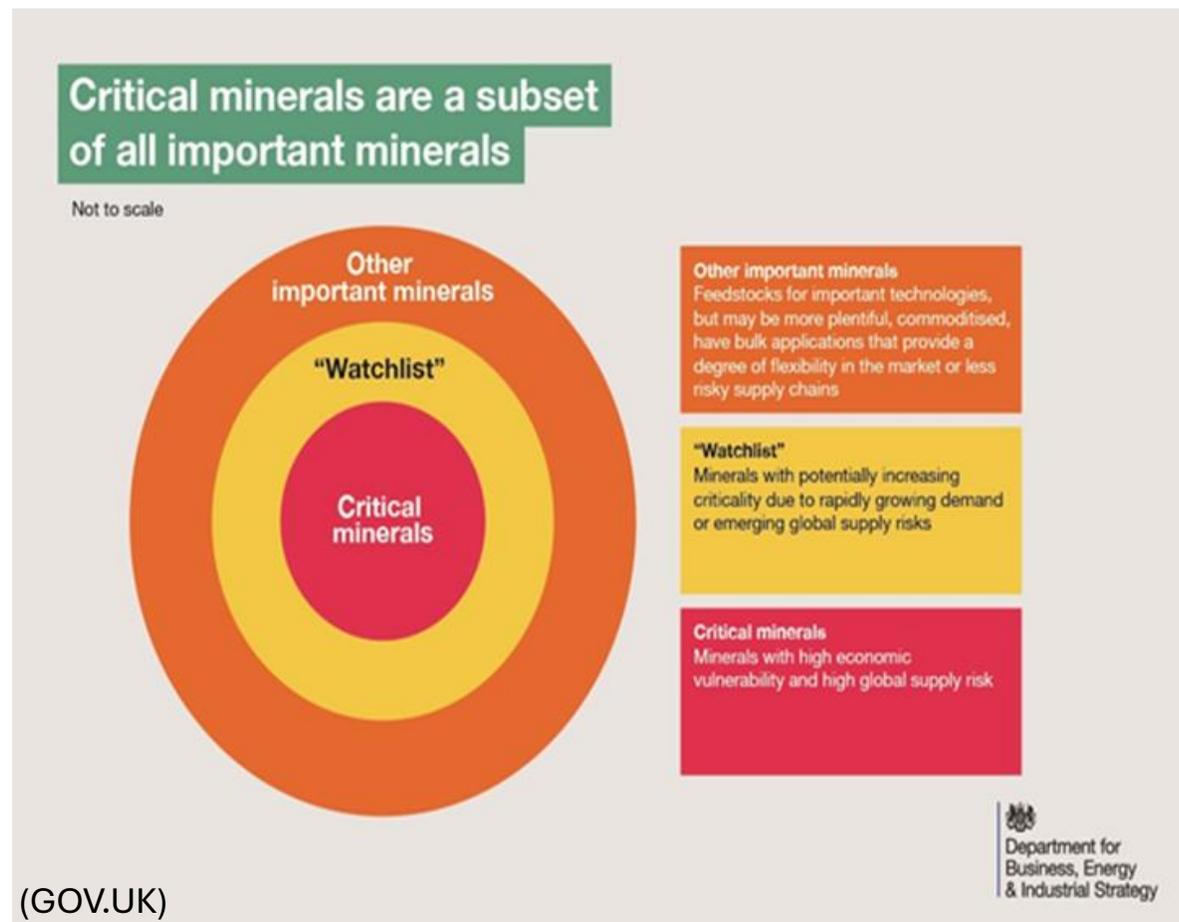


# Twin Transformation: Green Transition & Digital Acceleration



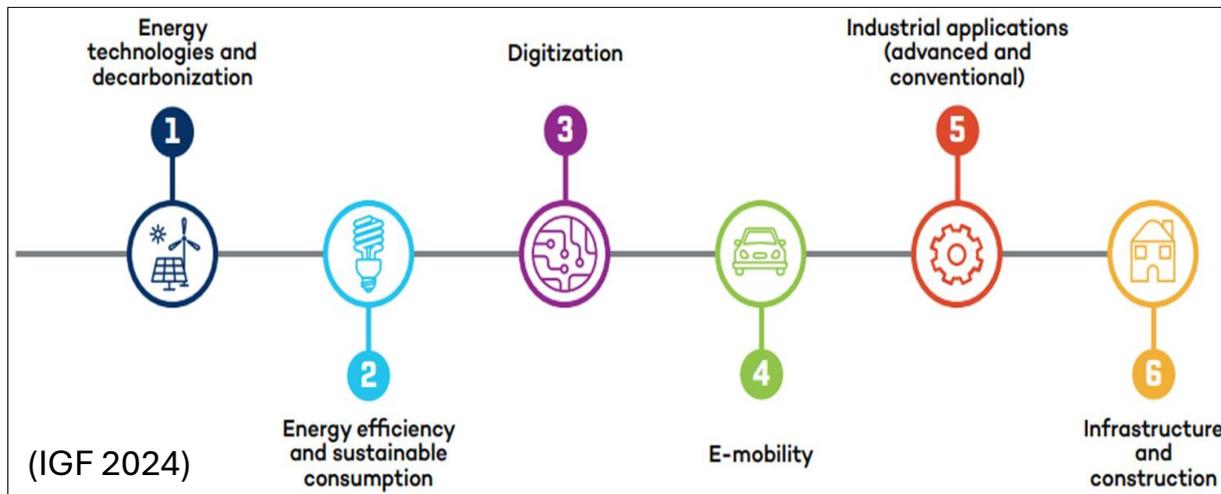
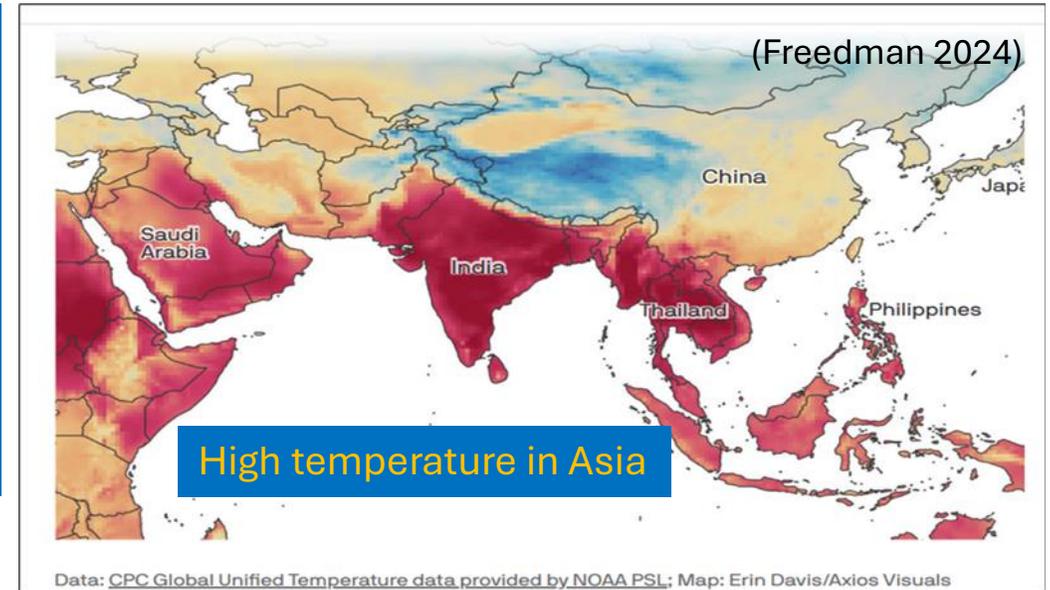
# CRITICAL MINERALS

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



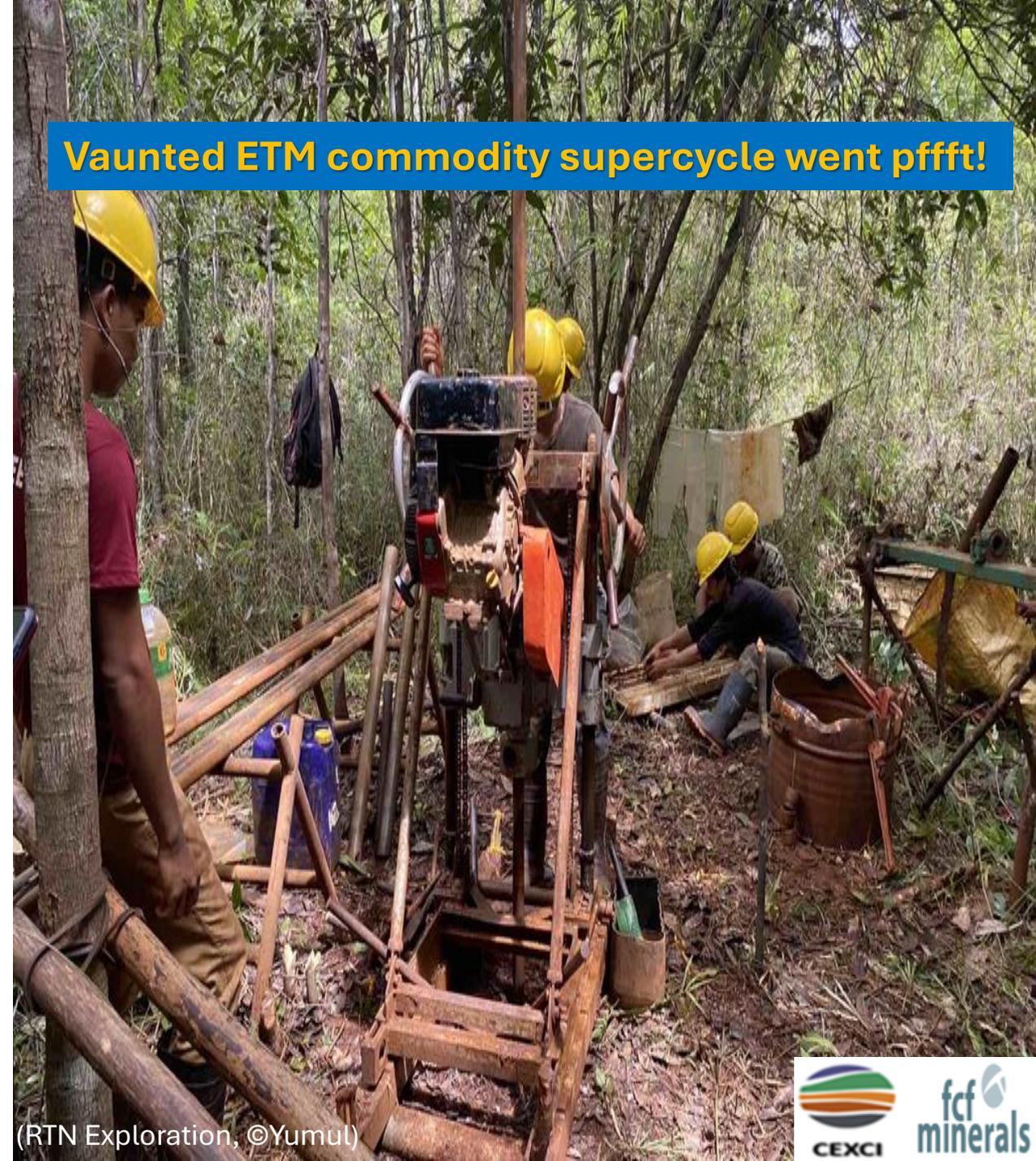
# CRITICAL MINERALS: DRIVERS

- 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!

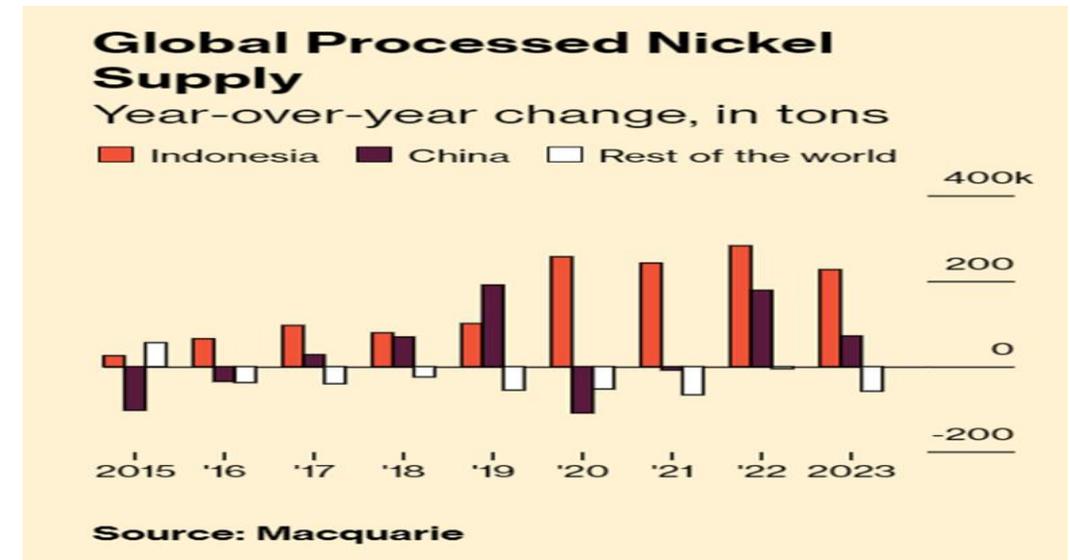


(RTN Exploration, ©Yumul)



# 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

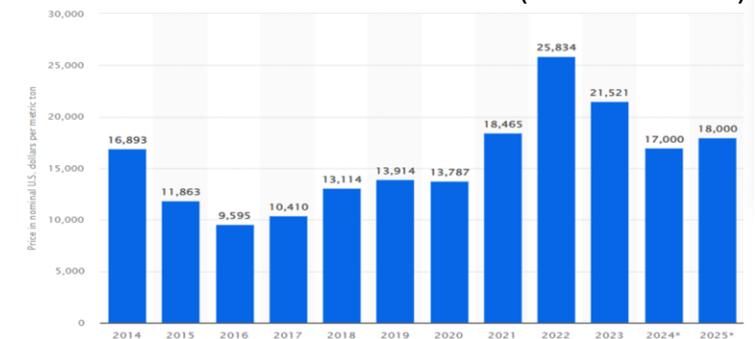


Source: Citigroup Inc. forecast for 2023  
Note: numbers have been rounded

## Average prices for nickel worldwide from 2014 to 2025

(in nominal U.S. dollars per metric ton)

(Statista 2024)

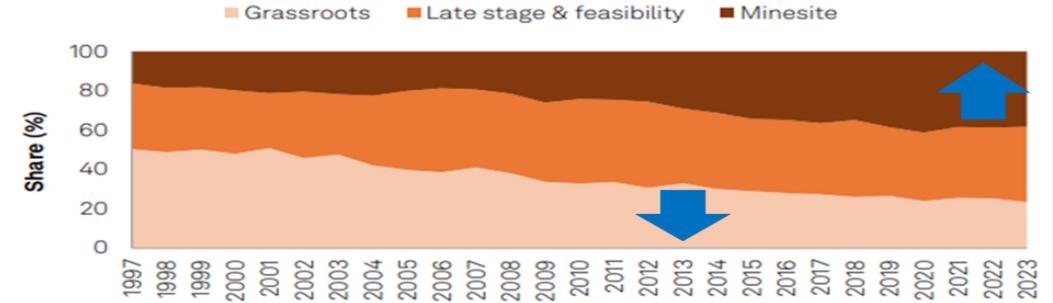


# COPPER NOW

- 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



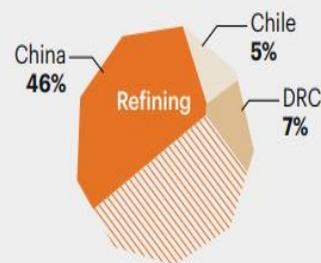
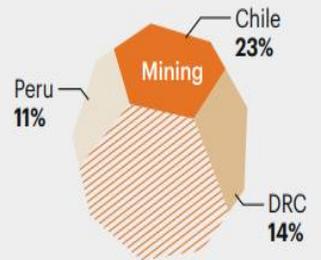
# FACTORS IMPACTING COPPER SUPPLY & DEMAND

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

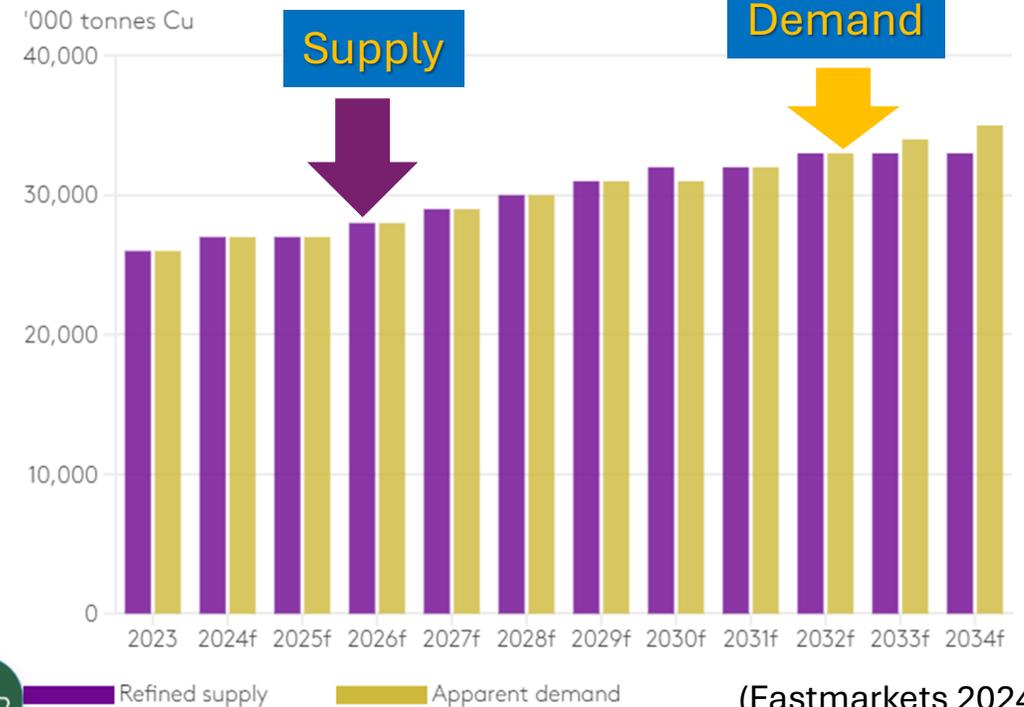
(Fastmarkets, 2024; Pierssens 2024; Pistilli 2024; Tunncliffe 2024)

(IEA 2024) **Cu**

Top three producers 2030



Forecast refined copper supply and apparent demand  
2023 - 2034 (forecast)



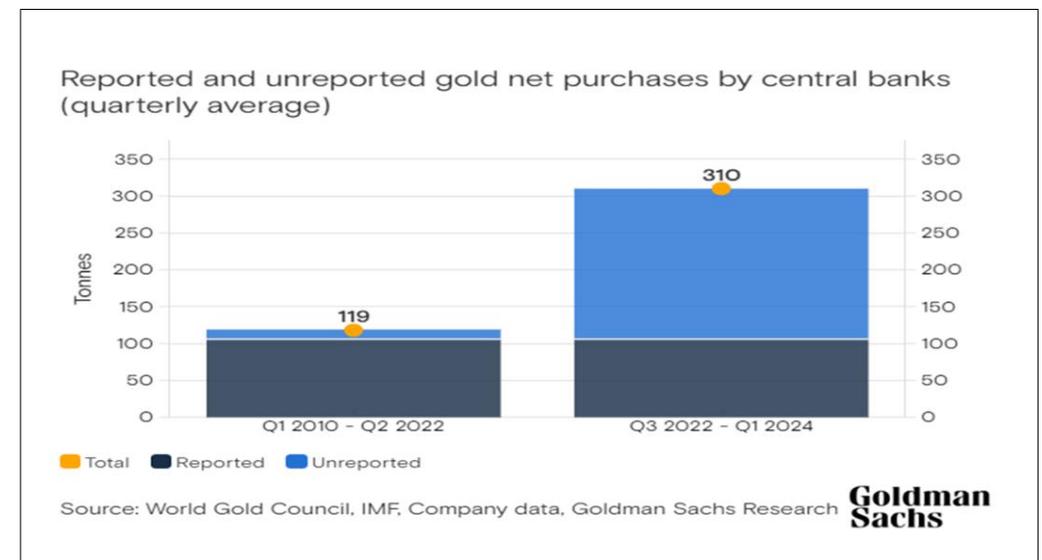
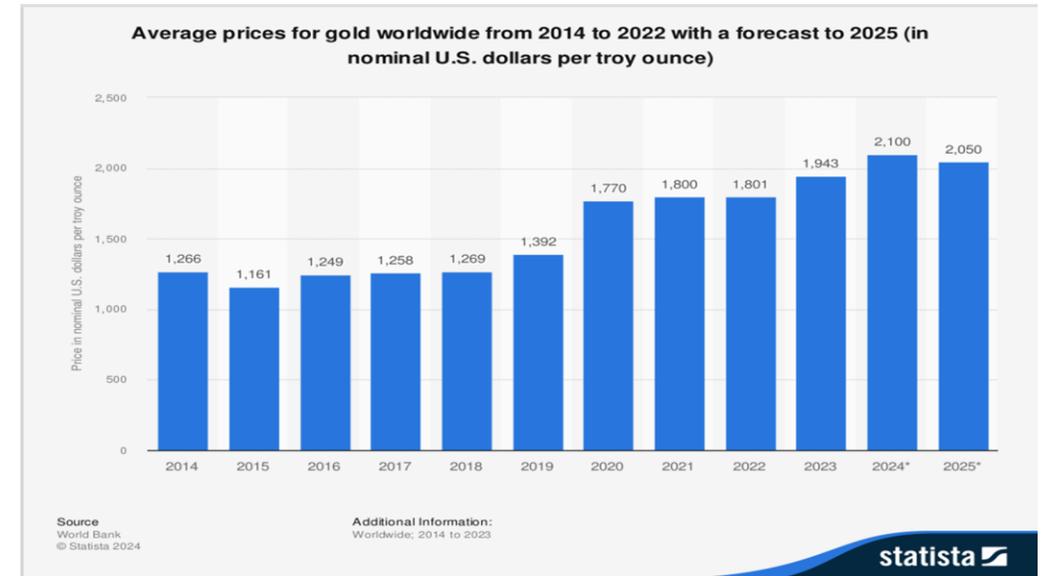
# GOLD: PREFERRED HEDGING COMMODITY

## 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)

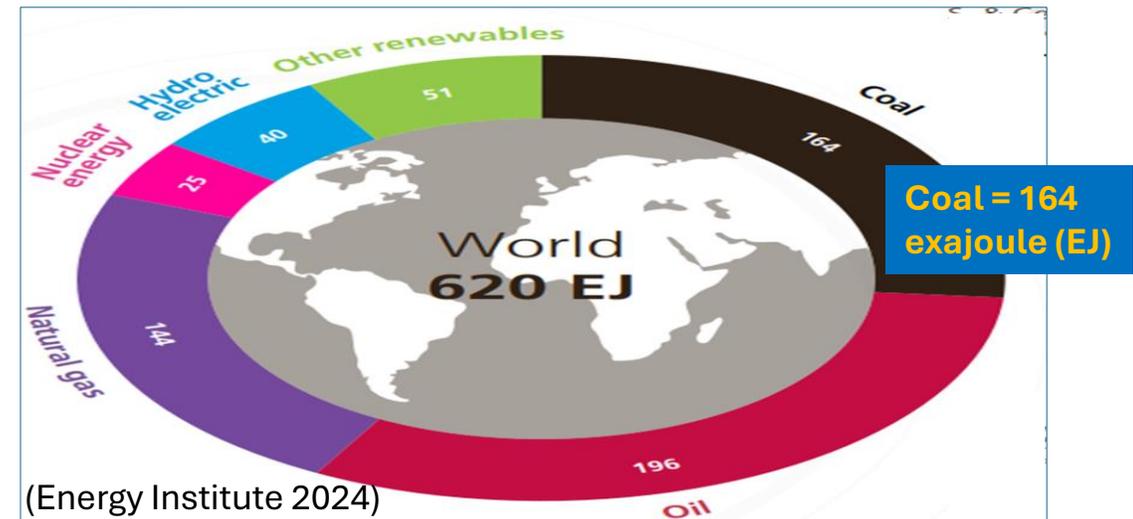
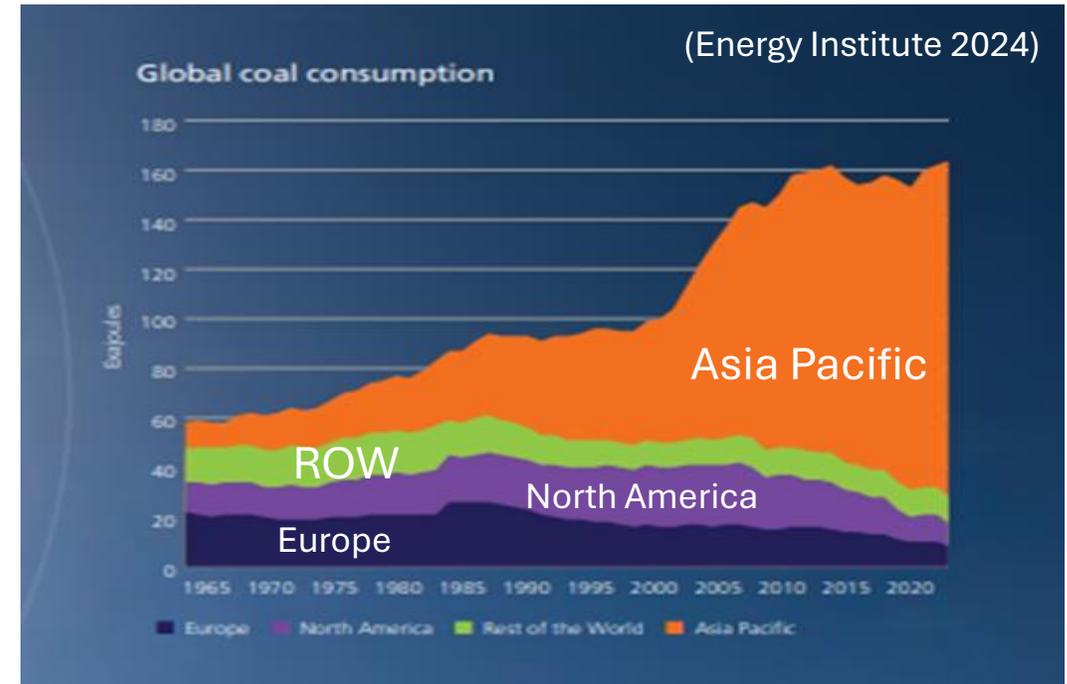
**2025-2030 Price Projection: US\$1.6k-3k/oz!**



# COAL REALITY

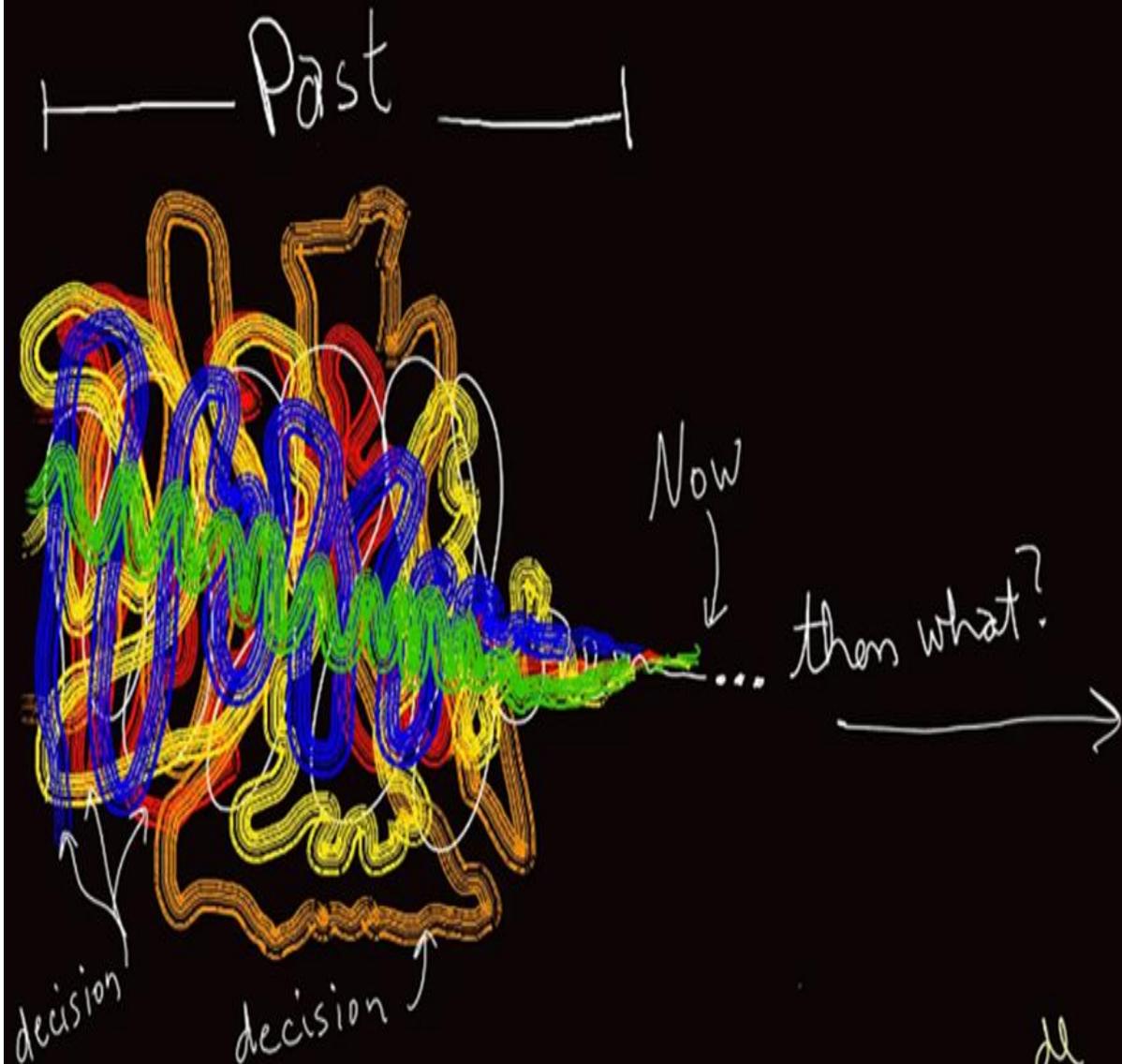
- Metallurgical & Thermal Coal
- Reliable & cheap power supply
- 2023 highest global coal production
- 80% of global output from Asia-Pacific (97% from Aus, Chi, Ind, Indo)
- *Biggest users: India, SE Asia*

**PH Green Transition Driver: Fossil Fuel!**



# PH Potentials & Critical Mineral List

What is critical to you may not be to me!



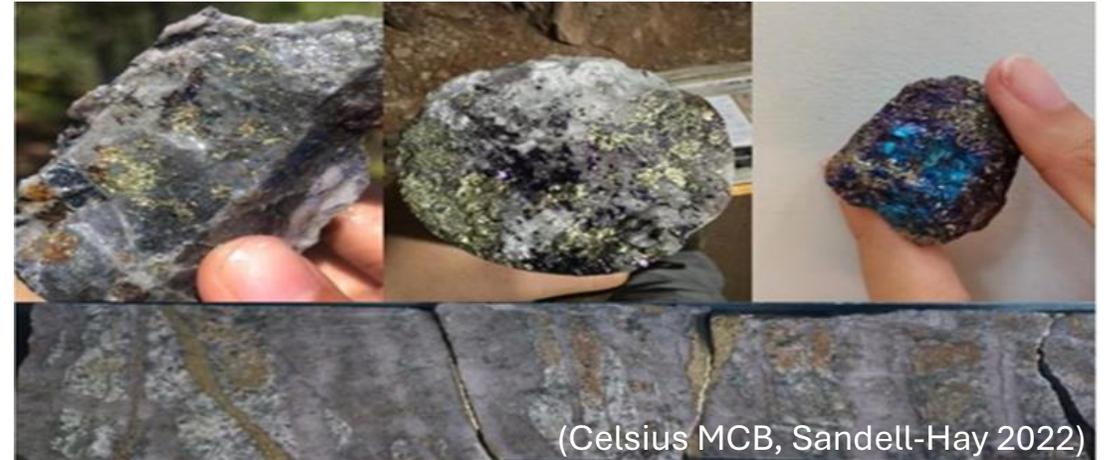
(Loewen, 2023)

dl  
'23

# PH MINERAL DEPOSITS NOW & TOMORROW

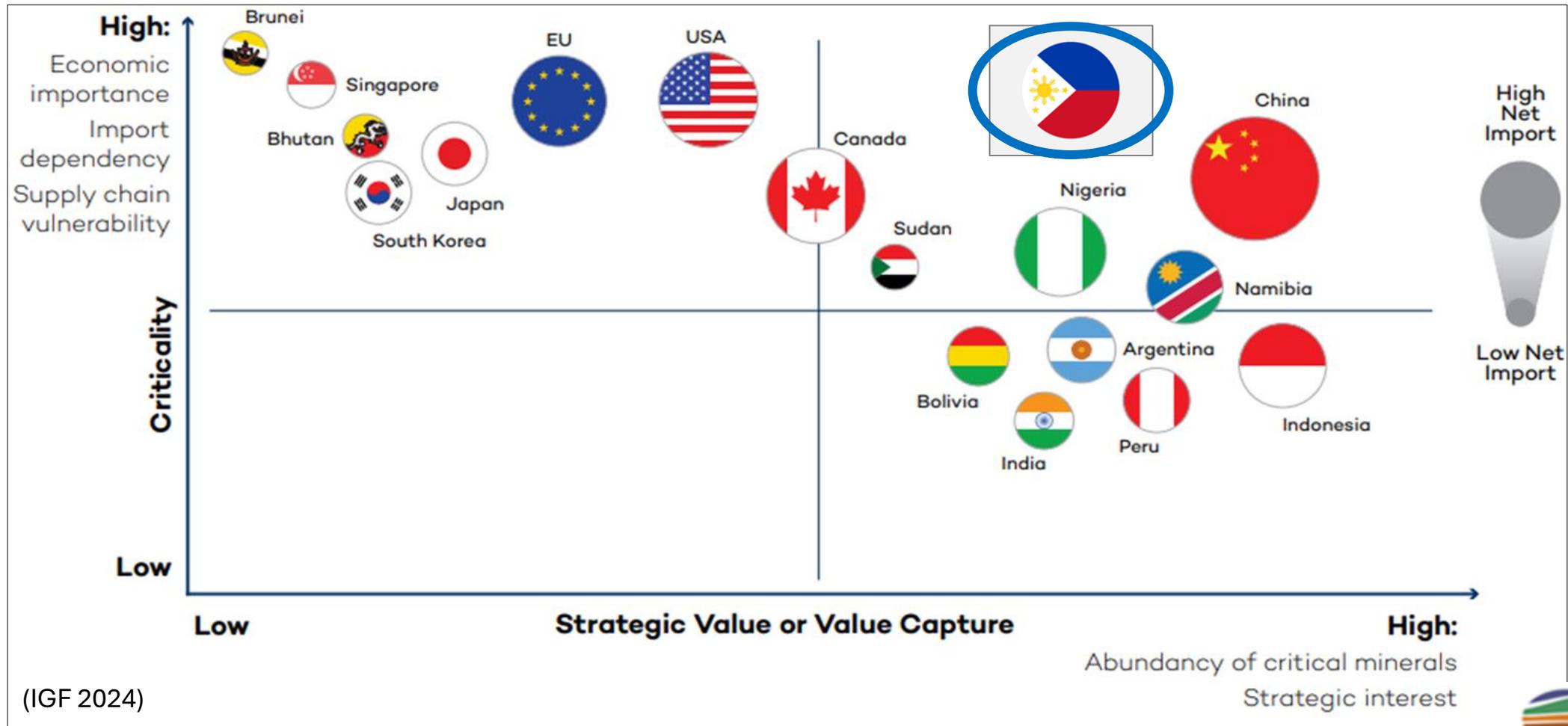
- Massive sulfides with PCDs, Magnetite Skarn, IOCG
- Alkalic rock-hosted deposits
  - Deep & Deeper deposits
- New, old exploration plays

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



# PH CRITICAL MINERAL DETERMINATION

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



(IGF 2024)

# 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?

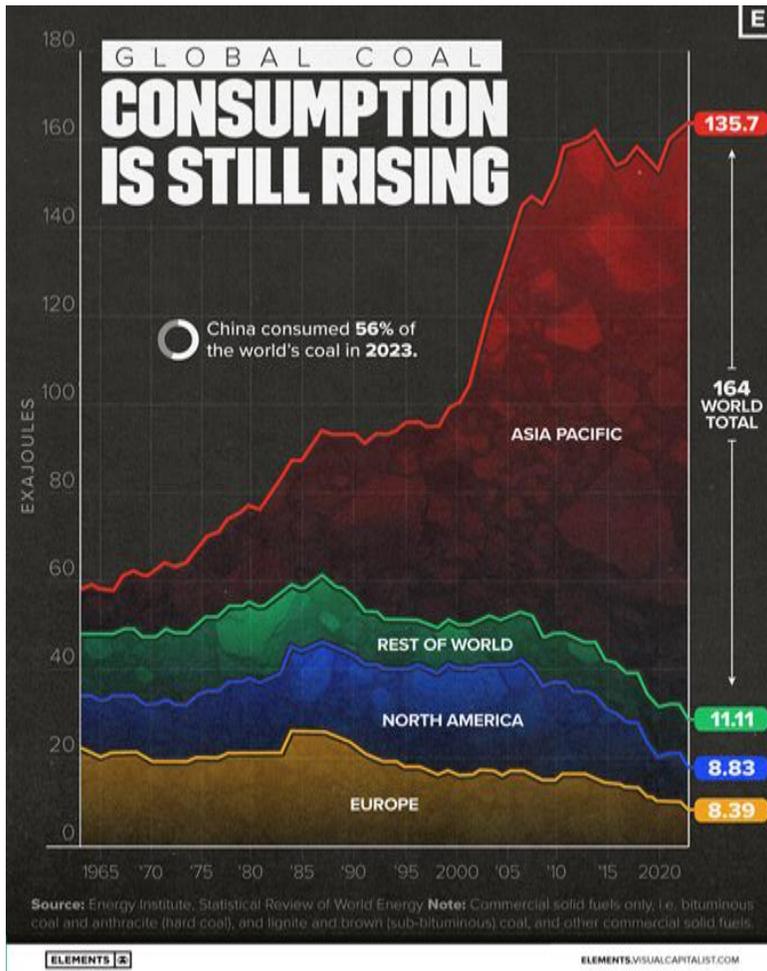
Caveats

No point knowing changes,  
if we do not adapt!

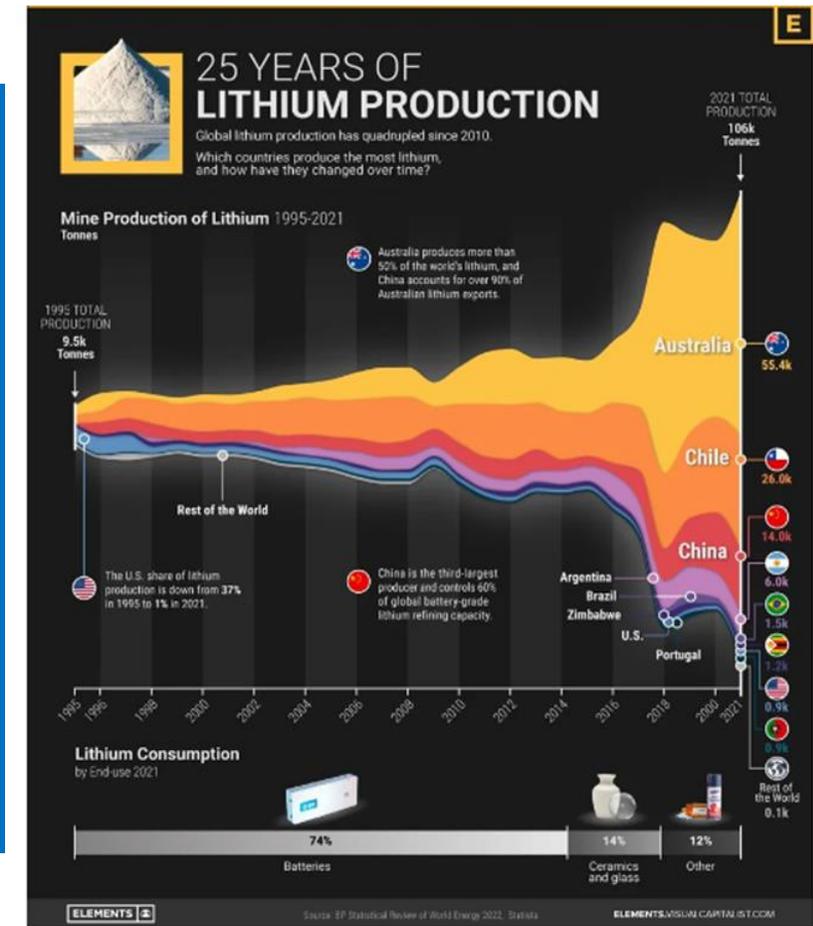


[Heraclitus the Crying Philosopher, Peter Paul Rubens, 1636-8, Prado \(left\); Fire from Barry Island Fire Festival, Photo by Andy Watkins \(right\).](#)

# CHANGES & CAVEATS



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



LITHIUM PRODUCTION, BY COUNTRY

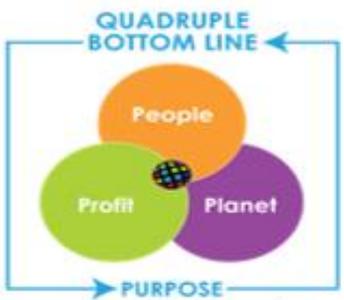
# THE FUTURE

**Responsible & sustainable mining is for real.**

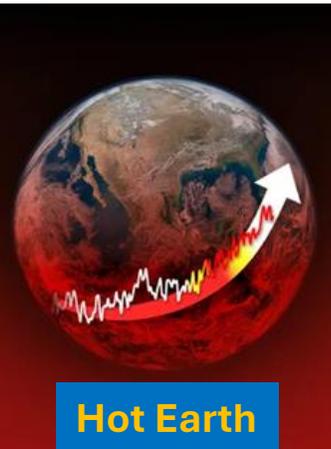
**From Shareholder Capitalism to Stakeholder Capitalism!**



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



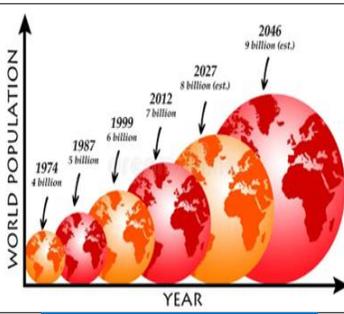
**For and about the greater good of the Minerals Industry!**



**Hot Earth**



**Digital World**



**Population ↑**

(References: Various internet sources)

# Thank You



**Leading Exploration, Mining Possibilities...**

**Beyond Limits!**

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

