IRENA
International Renewable Energy Agency

Roundtable: Trade in Minerals Critical for Climate Transitions and the Green Economy: Developing Country Perspectives and Pathways for International Cooperation

UN environment programme

UN trade & development UNCTAD

12 July 2024

TESS Forum on Trade, Environment, & the SDGs

Critical Materials for the Energy Transition

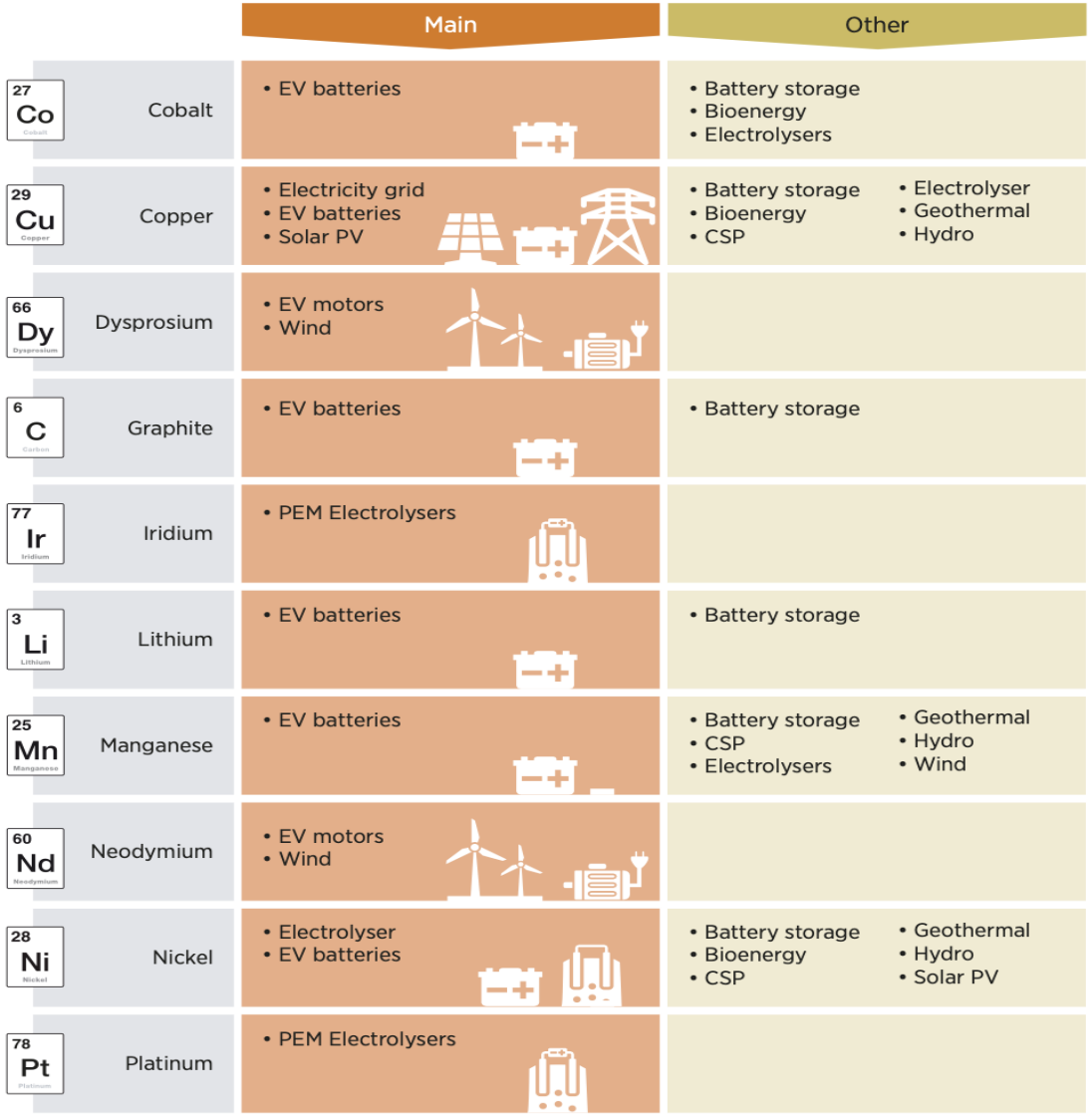
The complete decarbonization of our energy systems will require substantial quantities of critical materials.

Why Critical?

- Complexity of extraction and refining process,
- Scarcity and proximity of supply,
- Lack of viable substitutes,
- Concentration of supply.

Criticality is dynamic and location-specific

- Unique economic structures,
- Industrial needs,
- Geopolitical risks,
- Resource endowments.



Source: (RENA, 2023)

Critical Materials for the Energy Transition

In the long-term, the availability of resources is not a constraint for the energy transition.

Comparison of the estimated 2030 demand for selected critical materials with the estimated identified resources

Material	Estimated annual demand in 2030 (Mt/year)	Estimated Resources (Mt)	Resource-to-Annual Demand Ratio
Lithium	1.7 – 2.3	560	240 - 330
Cobalt	0.24 – 0.39	25	65 – 105
Graphite	6.5 – 7.4	800	1110 – 1200
Nickel	3.9 – 4.7	350	75 – 90
Copper	31.3 – 38.1	2,100	55 - 70
Phosphorous	28.2 – 29.2	30,000	1,030 – 1,060
Manganese	22.5 – 26.0	17,000	660 - 760

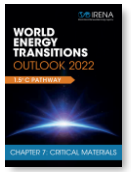
Source: Estimated resources based on (HAlM`an, 2023; USGS, 2024).

However, **efforts are needed** to mitigate **supply risks,** and to timely and effectively **scale up production** to meet growing demand in the **short-to-medium term.**

Timeline of the Collaborative Framework on Critical Materials

21 March 2022

Launch and 1st meeting of the Collaborative Framework



WETO 2022

1st meeting of **WG I** – Observatory (6 July 2022)

1st meeting of **WG II** – De-risking the supply (9 June 2022)

1st meeting of **WG III** – ESG and mining (12 Sep 2022)

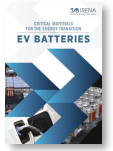
Geopolitics of the Energy Transition: Critical Materials

Webinars on lithium, rare earths, and deep-sea mining.

Ministerial Roundtable on Critical Materials at IRENA's 13th Assembly (Jan 2023)

12 October 2023

2nd meeting of the Collaborative Framework



EV Batteries: Critical Materials

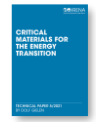
IRENA Innovation Week: Session on Future Materials for EV Batteries (Sep 2023)

4 April 2024

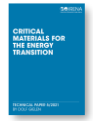
3rd meeting of the Collaborative Framework

Q3/Q4 2024

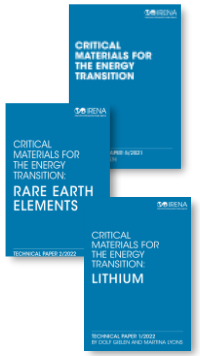
4th meeting of the Collaborative Framework



Constructing a Ranking of Critical Materials for the Global Energy Transition



Critical Materials for Renewable Energy: Improving Data Governance



Critical Materials For The Energy Transition

Critical Materials For The Energy Transition: Lithium

Critical Materials For The Energy Transition: Rare Earths

Thank you for your attention!

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