



## Surge in Demand of Copper

**For Prelims:** Properties and Applications of Copper, Mining Methods of Copper, Copper Deposits in India, Hindustan Copper Limited, Chalcopyrite, Bornite, Chalcocite

**For Mains:** India's Copper Appetite, Copper as an Economic Barometer.

[Source: IE](#)

### Why in News?

As demand for [copper](#) grew by 16% yearly-on-year in **FY23**, policymakers and corporations have increasingly turned their attention to the **critical role of copper in spurring [economic growth](#)**.

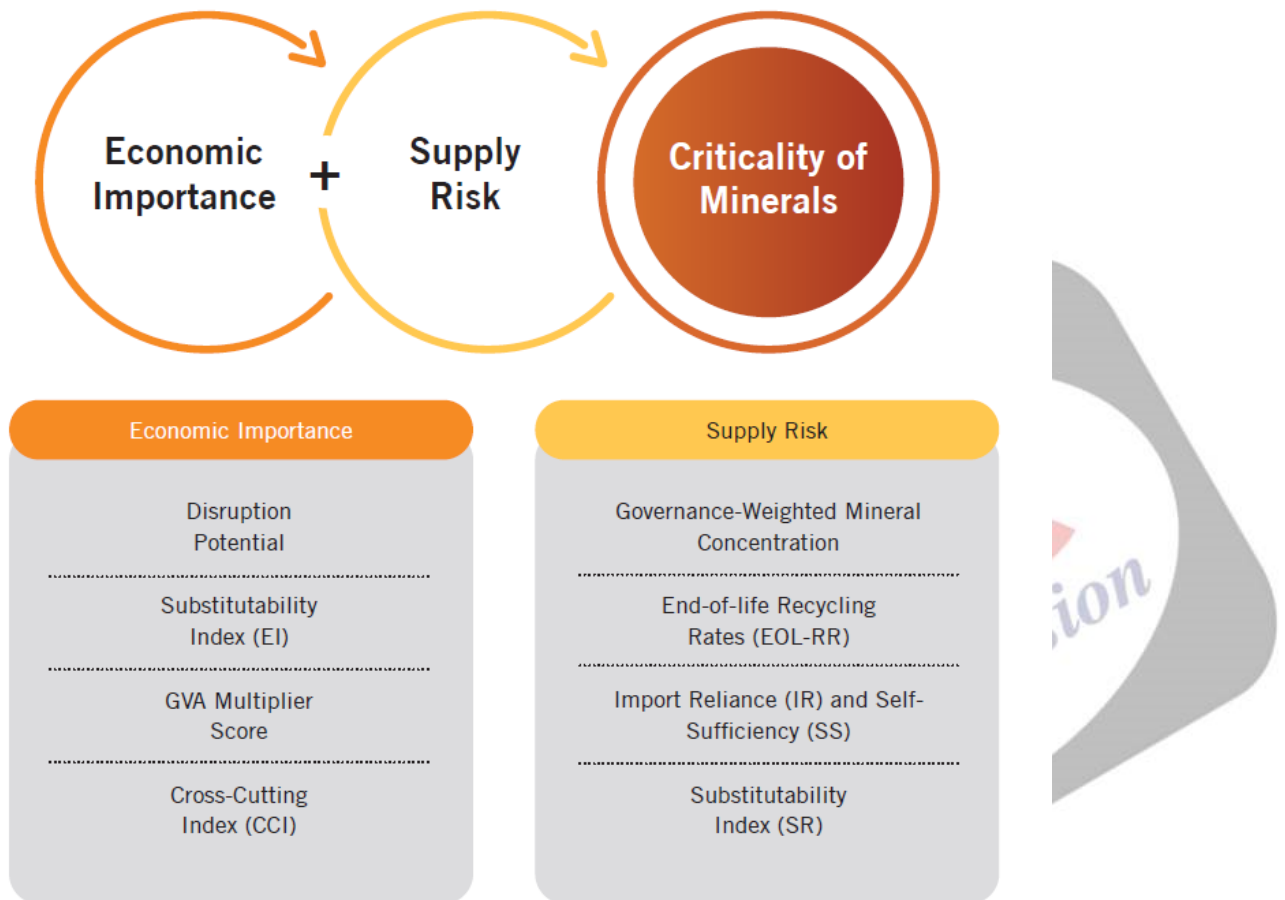
### What are the Key Points Related to Copper?

- **About:** Copper is a **malleable, ductile metal** known for its excellent heat and electricity conductivity. It possesses corrosion resistance and antimicrobial properties.
  - **Malleability** refers to the ability of a material to be pressed, or **rolled into thin sheets without breaking or cracking**.
  - **Ductility** is the property of a material that allows it to be stretched or **drawn out into a thin wire without losing** its strength or breaking.
- **Applications:** It is widely utilised in **construction, consumer durables, transportation, and industrial manufacturing**.
  - It is also Integral to clean energy technologies such as [solar panels](#), [electric vehicles \(EVs\)](#), and energy-efficient motors.
  - It is a 100% recyclable metal (allows for a [circular economy](#)).
- **Occurrence and Composition:** It is naturally found in various forms in the Earth's crust.
  - It can be found in sulphide deposits (as **chalcopyrite, bornite, chalcocite, covellite**), in carbonate deposits (as **azurite and malachite**), in silicate deposits (as **chrysocolla and diopside**) and as pure native copper.
  - Most commercial copper ore deposits contain an average grade of 0.8% copper, while copper ore in India has an average copper content of **around 1%**.
- **Mining Methods:** There are two primary methods of copper mining: **open-pit and underground mining**.
  - Open-pit mining dominates, constituting **80% of global copper mining operations**.
- **Copper Deposits in India:** Mainly located in **Singhbhum (Jharkhand), Balaghat (Madhya Pradesh), and Jhunjhunu and Alwar (Rajasthan) districts**.
  - Minor deposits are found in Agnigundala (Andhra Pradesh), Chitradurg and Hasan (Karnataka), and South Arcot (Tamil Nadu) districts.
- **India's Copper Appetite:** India's demand for copper is soaring due to rising infrastructure projects, renewable energy initiatives, and urbanisation.
  - Despite this, the country heavily relies on copper imports due to limited domestic reserves.
  - To address this, the government is promoting investments in smelters and refineries while **Indian companies are acquiring copper mines abroad** to secure a stable supply

and reduce dependence on international markets.

- Recently, the **Ministry of Mines** has proposed sending an Indian industry delegation to **copper-rich Zambia** to discuss potential copper exploration and mining projects in the southern African country
- Recognizing copper's criticality, the government has included it in its list of **critical minerals**, highlighting the need to reduce import dependence.

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- **Hindustan Copper Limited (HCL):** Established in 1967 under the Companies Act, It is a **Miniratna Category-I enterprise** operating under the **Ministry of Mines, Government of India**.
  - It was formed to consolidate all copper exploration and exploitation projects from the **National Mineral Development Corporation Ltd.**
  - HCL is India's **only vertically integrated copper producing company**.
- **Copper's Key Importance:**
  - **Copper as an Economic Barometer:** Copper prices reflect **demand/supply dynamics**, monetary markets, and speculation, making it a global economic indicator.
    - Unlike sector-specific commodities, copper is integral across all economic sectors.
  - **Copper for Energy Efficiency:** Copper plays a vital role in promoting energy efficiency in buildings.
    - Its excellent thermal and electrical conductivity make it ideal for **wiring, heat exchangers, and roofing**, leading to reduced energy consumption for heating, cooling, and lighting.
    - By minimising energy losses throughout a building's lifespan, copper contributes to a more sustainable future.

## Note

- **Chile is the top copper producer** in the world, with 27% of global copper production. In

addition, the country is home to the two largest mines in the world, **Escondido and Collahuasi**.

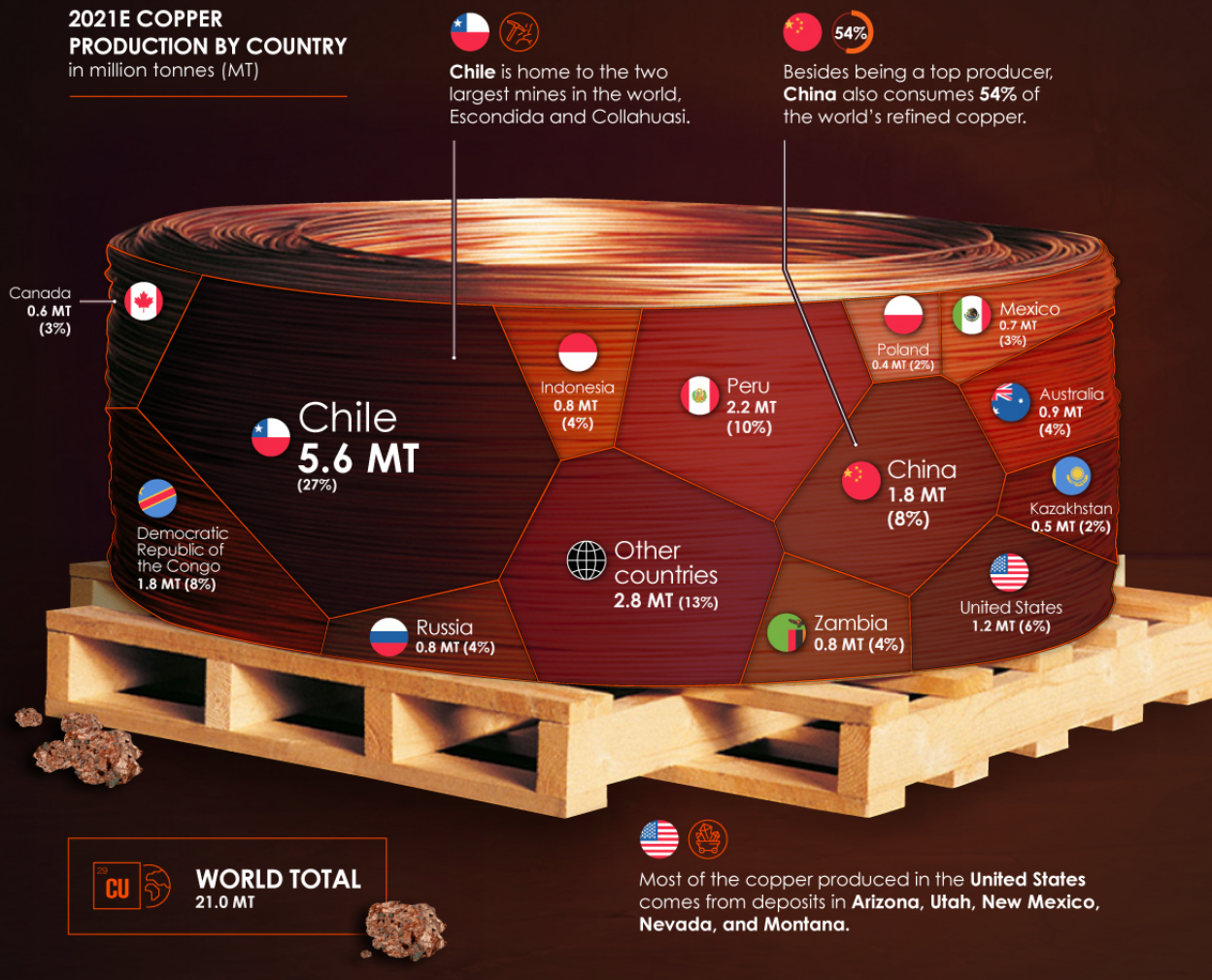


## VISUALIZING THE WORLD'S LARGEST COPPER PRODUCERS

Man has relied on copper since prehistoric times. Because of its high ductility, malleability, and electrical conductivity, it is a major industrial metal.

As green technologies like electric vehicles, solar panels, and wind turbines require copper, the demand for the red metal has increased in recent years.

### 2021E COPPER PRODUCTION BY COUNTRY in million tonnes (MT)



### UPSC Civil Services Examination Previous Year Question (PYQ)

#### Prelims

**Q. With reference to the mineral resources of India, consider the following pairs: (2010)**

**Mineral : 90% Natural sources in**

1. Copper : Jharkhand
2. Nickel : Orissa

3. Tungsten : Kerala

**Which of the pairs given above is/are correctly matched?**

- (a) 1 and 2 only
- (b) 2 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**Ans: (b)**

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**Mains**

**Q.** Despite India being one of the countries of Gondwanaland, its mining industry contributes much less to its Gross Domestic Product (GDP) in percentage. Discuss. **(2021)**

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