

World will soon run short of copper due to power demand, AI data centres

SUPPLY CRUNCH. Energy transition meets hard geological limits resulting in the metal becoming highly volatile

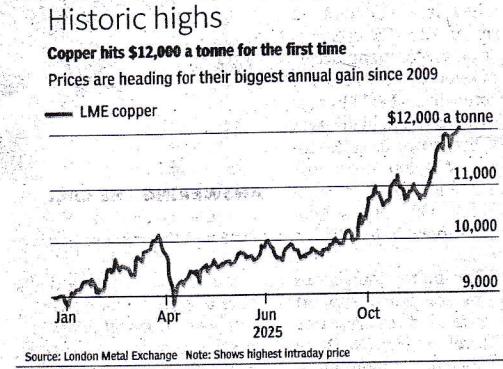
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New Delhi.

The Economic Survey has raised concerns that the world will soon run short of copper due to the massive proliferation of AI-enabled data centres and the current state of exponential growth in power demand.

Citing examples, the Survey pointed out that it would take 1,194 truckloads to provide the 2,866 tonnes of copper needed for a 1 gigawatt (GW) wind turbine — that's just for the copper — illustrating the investment and operational costs involved.

MINING INTENSITY

To produce 2,866 tonnes of copper from ore with a 0.6 per cent yield, miners must process about 167-200 tonnes of ore per tonne of copper.



Current estimates (2020s) place the average for operating mines at approximately 0.5-0.6 per cent with many large mines below 0.6 per cent and new projects even lower (around 0.4-0.5 per cent), it said.

"This already assumes only the copper-bearing ore, no waste rock, no overbur-

den, no rejected material, no processing losses.

In real mines, the total material moved is typically 2-4 times higher once waste rock stripping is factored in. If fully accounted for, total material moved per GW of wind power would likely exceed 1-2 million tonnes, not 0.48 million," it added.

The Survey also pointed out that copper is becoming highly volatile due to a series of mine outages in Indonesia, Congo, and Chile, rising concerns of a supply deficit in medium- to long-terms, given perpetually growing demand from the power sector and data centres across the world, and trade protectionist measures.

export of critical minerals by source countries," it explained.

As demand accelerates, advanced economies are responding by promoting standards-based critical mineral markets, emphasising sustainability, traceability, and governance.

BINDING CONSTRAINT

Suvendu Bose, Partner, Metals and Mining at Grant Thornton Bharat, said: "As power demand accelerates driven by renewables, electrification and AI data centres, the material intensity of clean energy is becoming the binding constraint."

"A single gigawatt generated through renewable sources requires thousands of tonnes of copper, translating into the movement of well over a million tonnes of material once real mining conditions are factored in," he added.