

Time to secure renewable energy supply chains

This requires global cooperation in mining, manufacturing and tech, as also involving think tanks for providing reliable data

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With rising oil prices and countries struggling to meet their net-zero targets in a multipolar world (at war), there are two phrases making their place into every international summit — critical minerals and renewable energy supply chains.

A recent study by the Council on Energy, Environment, and Water (CEEW) for the G20 Energy Transition Working Group revealed a concerning concentration of over 80 per cent of solar module, wind turbine gensets, and lithium-ion battery manufacturing in just three countries. This skewed distribution has led to significant import dependence on a handful of suppliers, which particularly affects middle-income nations.

The rising demand for clean technologies has spurred global mining of critical minerals, with current production levels for minerals like cobalt, copper, and nickel already surpassing two per cent of current global reserves. This indicates that these resources may be depleted in less than 50 years if new reserves or substitutes aren't discovered.

Additionally, these supply chains are



CRITICAL MINERALS. Intensive mining

intricate and susceptible to disruptions from *force majeure* events or the geopolitical tumult that is currently playing out. This requires international cooperation that trumps protectionist measures.

POLICY COHERENCE

First, global policy coherence is required to address the limitations in the supply chains. Establishing a mature and robust mining and manufacturing supply chain is a time-intensive process, spanning over a decade. Each stage — from mineral exploration to manufacturing of products — demands significant effort and sustained financial support to achieve competitive scales. The Mineral Security Partnership, the EU Critical Minerals Club, the Indo-Pacific

Economic Framework for Prosperity and the Quad agreement of Clean Energy Supply Chain Principles are some initiatives that a group of governments are undertaking to solve supply chain challenges.

In parallel, there are domestic initiatives like the US' Inflation Reduction Act (IRA), and the EU Critical Raw Minerals Act and India's Production-Linked Incentive scheme, which may slow down the global effort to diversify production.

It's impractical to attempt to localise the entire value chain within one country or region. Instead, countries should collaborate based on their strengths and tackle vulnerabilities and solve for choke-points in the supply chain.

Second, foster institutional collaborations and increase funding for technology co-development and deployment. Government-backed technology development funds, managed with academia and industry, can drive innovation in improving material use efficiency.

Currently, renewable energy technology patents and consequently processing and manufacturing capabilities are limited to a few countries like the US, Japan, Korea, China and those in the European Union. Their prevalent business models, policy

landscape and climatic conditions may not align with those of emerging economies. In such a scenario, there is a need for, jointly funding the co-development of next-generation technologies for exploration, mining, processing, manufacturing and mineral recovery.

Finally, non-state actors like multilateral institutions, think tanks and academic institutions will have to play a strategic and proactive role by identifying contentious issues, creating new avenues in track 2-type dialogues and providing timely inputs to policymakers in national and international forums. They can help facilitate the sharing of reliable manufacturing and trade data for clean energy technologies in a transparent manner. More importantly, they can play a critical role in establishing draft standards and a rules-based architecture to govern the use and deployment of emerging technologies and energy sources.

The onus is on the world's major economies to collectively steer the course towards a secure, resilient and a reliable supply chain of critical minerals and clean technologies.

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