CONCEPT NOTE

Global Commodities Forum
9-10 December 2024
Palais des Nations, Geneva, Switzerland (CEST)

Harnessing benefits from Critical Energy Transition Minerals

(10 December, 3.00 – 5.45 p.m.)

The global shift towards low-carbon energy, often referred to as the energy transition, relies heavily on clean energy technologies such as solar photovoltaic panels, wind turbines, electric vehicle (EV) batteries and energy storage systems. Fabricating of these clean energy technologies requires significant amounts of minerals, including lithium, nickel, manganese, graphite, cobalt, and rare earth elements (REEs). However, the production and geographic distribution of these minerals are uneven. For example, over 55 per cent of cobalt reserves and 74 per cent of production are concentrated in the Democratic Republic of Congo. Similarly, 70 per cent of lithium reserves are found in Chile, Australia, and Argentina, with Australia and Chile accounting for 72 per cent of production. In the case of REEs, China holds around 70 per cent of global reserves and 40 per cent of production. The geographic concentration of these key energy transition minerals can create vulnerabilities in the supply chain due to geopolitical, economic, environmental, and logistical risks, potentially threatening the production and supply of clean energy technologies needed to meet energy transition targets. By extension, supply limitations could hinder efforts to meet greenhouse gas reduction targets outlined in the Paris Agreement, jeopardizing the goal of limiting global average surface warming to 1.5 degrees Celsius above pre-industrial temperatures.

The energy transition is gaining momentum and demand for key minerals used in clean energy technologies is expected to increase rapidly. As the world rushes to exploit these minerals, UN Secretary General Antonio Guterres cautions against repeating past mistakes, where developing countries were systematically exploited and reduced to providing raw materials, with value being created elsewhere. To promote a more equitable and sustainable approach, the Secretary General launched the Panel on Critical Energy Transition Minerals to develop a set of global, common, yet voluntary principles for a more sustainable and equitable management of the value chain for these minerals. These principles aim to contribute to ensuring that the energy transition is just, fair, and sustainable.

According to the International Energy Agency (IEA), demand for energy transition minerals could double by 2030 under a business-as-usual scenario. This increase is even higher in more ambitious energy transition scenarios, with demand almost tripling by 2030 and quadrupling by 2040 in the net zero emissions scenario.[1] Meeting this surging demand will require a major expansion in extraction of CETMs. According to IEA estimates, approximately USD 800 billion of investment in mining is required between 2023 and 2040 to meet demand for critical minerals needed for the 1.5°C scenario.[2]

[1] https://www.iea.org/reports/global-critical-minerals-outlook-2024/executive-summary
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The world needs more than 300 new mines by 2035: 121 copper, 70 lithium, 65 nickel, and 93 cobalt mines by 2035 to avoid a shortfall in meeting battery demand, according to forecasts from Benchmark Mineral Intelligence.[3] The expansion of mines in mineral-rich developing countries could boost export revenues, but also risks perpetuating and deepening their commodity dependence. The long-term prosperity of CETM-producing countries hinges on a combination of benefit sharing, value addition and economic diversification. For example, by investing in processing facilities and developing domestic skills in areas such as refining and manufacturing battery components, countries can capture a greater share of value added in the critical minerals value chain.

To succeed, value addition in critical minerals and economic diversification need to be part of a wider strategy of industrial development and structural transformation of the economy. One possibility is for CETM-producing countries leveraging their mining industry expertise to diversify into other sectors. This could involve, for example, exploring new mineral deposits to diversify the resource base, establishing manufacturing industries that process locally sourced minerals or other materials, manufacturing or assembly of parts for machine parts in other sectors, or capitalizing on project management capabilities acquired in developing CETM projects to undertake other engineering projects. Diversification initiatives can build economic resilience in CETM-producing countries and position them to compete in an expanding clean energy supply chain.

Despite the promising opportunities presented by surging CETM demand, resource rich countries must contend with significant challenges in meeting this growing demand. For example, increased demand could exacerbate existing environmental challenges associated with critical mineral extraction. Mining operations in the past – both large and small scale – have sometimes resulted in polluting water sources, disrupting ecosystems, and contributing to deforestation. The pressure to meet growing demand in a short time could lead to less responsible and less sustainable mining practices, jeopardizing the clean energy future these minerals should enable. Additionally, increased mining operations can have negative social impacts on local communities, such as forced displacement of people, labour exploitation, violations of the rights of Indigenous Peoples, as well as tensions and conflicts within communities, with the benefits accruing to only a few whiles most of the population experiences limited economic gains and potential health risks. Faced with responding to growing demand for CETMs, the challenge for producing countries is therefore to adopt a policy framework that allows for expanding production, while establishing robust safeguards to mitigate environmental and social risks. Ensuring fair compensation, minimizing displacement, and investing in local development projects are crucial for safeguarding the well-being of local communities and Indigenous Peoples.

Other challenges facing CETM-producing developing countries include the significant infrastructure upgrades needed in transportation networks and power generation, as well as acquiring the technology needed to efficiently exploit their mineral wealth, and the huge costs involved. Bringing new mines and processing facilities on stream and building infrastructure such as transport networks and energy can take a long time and requires huge investment. On average, it takes approximately 16 years for a mine to go from discovery of a deposit to production. Open-pit mines often have longer lead times than underground mines, primarily due to lengthier exploration and permitting phases.[4] This long lead time may cause supply shortages, resulting in higher prices of CETMs and potential disruptions in industries which rely on that mineral as well as price volatility, making it difficult for companies and governments to plan and invest.

[3] Benchmark Intelligence forecast presented at CETM Panel Co-Chairs' Dialogue on Investment and Finance, 29 July 2024.
[4] https://www.spglobal.com/marketintelligence/en/news-insights/research/average-lead-time-almost-18-years-for-mines-started-in-2020-23

As sales of clean energy technologies grow, so do the quantities of industrial residues and end-of-life products. For example, waste in the form of spent batteries is expected to increase significantly. This could create new business opportunities, jobs, and economic growth through recycling, innovation and resource efficiency. Recovering CETMs and other valuable elements from end-of-life products can boost the resilience of the value chain by increasing the total supply of CETMs, while reducing the reliance on primary extraction and slowing the rate of resource depletion. The circular economy approach could contribute to achieving sustainability by decoupling economic growth from resource consumption. It can significantly reduce the environmental footprint of CETMs production and ensure a more sustainable supply of these essential materials. However, the industry will have to address challenges such as developing efficient and scalable recycling technologies, investing in these new supply chains and devising policies and levies that incentivize recycling and create viable business opportunities.

In summary, policymakers should carefully navigate the complex landscape of CETMs, taking advantage of opportunities while tackling challenges to create an enabling environment for responsible development. For example, the potential for economic growth through job creation and local enterprise involvement in the industry should be maximized without compromising the environmental and social goals during the development of the CETM sector. Increased tax revenue and export earnings from CETM sector can be used to fund infrastructure projects, supporting economic diversification and attracting new industries. Moreover, recycling of CETMs used in clean energy technologies will be crucial for meeting future demand given the surging demand for CETMs.

This session will underscore the growing importance of critical minerals to the global economy, driven by the accelerating energy transition. It will highlight the opportunities and challenges faced by various stakeholders, including CETM-producing countries, industry players throughout the value chain, and policymakers. The session will focus on value addition, recycling, and job creation, aiming to foster discussions on strategies to maximize the benefits of these minerals while mitigating associated risks. In this context, panelists and participants at the GCF will examine how developing countries can harness their CETMs for a sustainable development path. The key questions to be addressed include:

- How can CETM-producing countries seize the opportunities (value addition, diversification, local content etc) presented by the surge in demand for CETMs to propel their sustainable development?
- What safeguards are necessary to mitigate the environmental and social risks associated with CETM extraction and processing and downstream industries, including recycling?
- How can the massive investments needed to expand the supply of CETMs mining and value chains be financed?
- How can international cooperation be enhanced to ensure that developing countries harness the benefits from this increase in demand for CETMs?

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