



## Critical Materials for Development: A New Trajectory for Norwegian Foreign Aid Policy

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### Key take-aways

- The war in Ukraine has accelerated the global shift to renewable energy. As a result, global mineral and metal supply chains have also started changing in response to rising demand for materials for clean energy technologies. The scale of coming changes in critical material markets is unprecedented. By 2040, the energy transition will raise demand by more than 1,000% for lithium, cobalt, copper and nickel needed for the production of solar panels, wind turbines and batteries. Demand for germanium will rise by as much as 8,600%.
- Many of these minerals are located in poor and politically unstable developing countries in Africa and Asia, many of which are Norad partner countries. Most of these countries require targeted international aid to improve their extractive industries for the mining, production and supply of critical materials.
- Similar to the Norwegian Government's Oil for Development (OfD) programme launched in 2005, Norad could devise a new programme, 'Critical Materials for Development', where the assistance provided to partner countries could be tailor-made to promote sustainable mining and improve local economic development in the short and long run.
- Moreover, Norwegian development agencies including Norad could consider joining existing global initiatives on critical materials and sustainable mining and provide financial and technical support in the form of co-finance and capacity-building schemes.

## Introduction

After over a year of war in Ukraine, the world experienced dramatic and negative ripple effects related to food, energy security and commodity markets. Global food and energy shortages are now leading to social instability, protests and conflict and putting increasing pressure on public finances. For instance, prices of basics such as oil and wheat are rising and resulting in severe food shortages in Egypt, Lebanon and Somalia. Low-income countries are likely to be hit hardest by increasing food and energy prices in the long run. As the war continues, various second- and third-order negative effects are likely to intensify. Therefore, Norwegian and international development assistance devised before the war needs to be recalibrated to address the rapidly changing situation and better adapt to it. This policy brief presents several trajectories for adjusting future Norwegian development aid delivery to developing countries in the area of energy transition.

The war in Ukraine has already triggered a massive global shift to renewables. As of 2022, more than 100 countries had announced carbon neutrality plans and adopted ambitious energy transition targets for 2050 or 2060. As the world transitions from fossil fuels to renewable energy, the global minerals and metals landscape is also being transformed. Key inputs to renewable energy technologies are critical minerals such as lithium, cobalt, copper, germanium, chromium and many others. These minerals are located in poor and politically unstable developing countries in Africa and Asia, and many are Norad partner countries. Ensuring secure and stable supply of critical materials for the needs of energy transition will be critical for cutting dependence on fossil fuels. However, these countries require targeted international assistance to improve their extractive industries for the mining, production and supply of critical minerals.

## Energy transition and critical materials

Solar panels, wind turbines and batteries require significant inputs of lithium, cobalt, copper, graphite and other minerals. According to the International Energy Agency (2021), reaching the 2°C goal of the Paris Agreement will require ‘a quadrupling of mineral requirements for clean energy technologies by 2040’. Various international organizations predict a 1000% increase in total demand for many critical materials (see Table 1). Demand for germanium is expected to grow by 8,600% in 2050. However, the shift to a clean energy system may outpace mineral supply and cause geopolitical rivalry (Bazilian, 2018; Pavel et al., 2017).

In 2020–2021, as the supply of minerals failed to satisfy growing demand, a new wave of state capture in mining and metals industries swept the world: 34 countries introduced stricter fiscal regimes and raised both royalties and state ownership in critical minerals industries (Blanco and Machado, 2021). It is increasingly uncer-

tain whether the world will be able to satisfy the rising demand for minerals, given that there was already a substantial deficit in 2021. A failure to ensure the supply of critical materials may jeopardize the energy transition.

Table 1. Demand growth for critical materials used for clean energy technologies

	Solar power	Electric vehicles/storage	Wind power	Projected demand growth	Target year
Germanium	x			8600%	2050
Bauxite & aluminium	x	x	x	1200%	2030
Copper	x	x	x	1000%	2025
Iron	x	x	x	1000%	2030
Lead	x	x	x	1000%	2030
Manganese		x	x	1000%	2030
Nickel	x	x		1000%	2030
Cobalt			x	1000%	2030
Lithium		x		1000%	2030

Source: Vakulchuk and Overland (2021).

The critical materials sector has highly complex geography and market structures for the extraction, processing and application of critical materials, and their geopolitical implications can affect the energy transition. The war in Ukraine and the resulting volatility in global energy markets have presented many new bottlenecks in critical materials supply chains that could threaten supply security. There are also changing power dynamics between producing countries, many of which are located in Africa, and consumers.

In Norway, many local actors are planning large-scale clean energy projects in the form of large-scale battery factories or offshore wind power. These will require the supply of critical materials from abroad. Whereas China, the EU, and the US have been thinking about and positioning themselves actively to access or control supply chains (Kalantzakos et al., 2023), there has been little reflection and strategic thinking on this in Norway.

## Bottlenecks in the development of critical materials

A major bottleneck is that the extraction of minerals essential for solar panels, wind turbines and batteries is concentrated in a few countries (Månberger and Johansson, 2019; Vakulchuk and Overland, 2021). This results in dependencies among importers and could potentially have similar consequences for supply security, as the Strait of Hormuz and Russian natural gas pipelines had in the past for fossil fuels. Some of these states are fragile, and mining may contribute to conflict hindering local development and threatening supply security (Church and Crawford, 2018). A much-cited example of related risks is the Democratic Republic of Congo (DRC), which has the world’s largest reserves of cobalt. China is its main buyer (Sovacool, 2019) and, since the 1990s, China has taken a near-monopoly position in global critical materials supply

chains that includes control over production, processing, recycling and supply infrastructure (Vakulchuk and Overland, 2021).

In the past, periods of laissez-faire market management of the sector have been followed by increased direct state involvement, e.g., expropriation of mining concessions, with importing states responding with bilateral trade agreements and upstream investments. The current trend indicates rising resource nationalism in critical materials. In 2017, Brazil, Burkina Faso, Burundi, Chile, Kyrgyzstan, Madagascar, Mali, Mauritania, Mongolia, Peru, the Philippines, Russia, South Africa, Uganda, Zimbabwe and several US states informed investors that they had toughened mining legislation, redefining their mining and metals industries as ‘strategic’ industries to be owned and/or tightly regulated by the state (Nyer et al., 2021). For instance, in 2021, Uganda adopted a new mining law creating a separate tax regime for strategic minerals and requiring a state ownership stake of 15% in private mining operations. Countries rich in critical materials engage in ongoing discussion domestically about how they can best benefit from exporting minerals or use their resource wealth to achieve strategic foreign policy objectives (Barandiarán, 2019). These options have direct implications for the ability of import-dependent countries to access critical materials and adopt green technologies (Lee et al., 2020). Increased state involvement also affects the business climate and may thus lead to reduced upstream investment from private actors, further constraining the supply of critical materials.

It is highly likely that new mining projects launched to meet the demand for critical materials will be located in developing countries, including in Africa. Developed countries are unlikely to initiate new mining projects due to high social opposition and environmental concerns. In contrast, developing countries suffer from poor governance, low mining standards and the absence of mining bans. Unsustainable mining can eventually pose major risks to local environments and communities and hinder local economic development.

### **New trajectories of Norwegian development assistance in the area of critical materials**

There are several policy options that Norway could consider in its foreign aid policy in the aftermath of the war in Ukraine. First, similar to the Norwegian Government’s Oil for Development (OfD) programme launched in 2005, Norad could devise a new programme, ‘Critical Materials for Development’, either under the auspices of OfD or as a separate initiative. The assistance to partner countries endowed with mineral reserves, primarily in Africa, could be tailor-made to improve local economic development in the short and long run and meet the demands of energy transition through establishing sustainable mining practices.

Second, in response to the need to ensure sustainable mining in developing countries and to secure the supply of critical materials, various international organizations have established various governance initiatives. Norwegian development agencies, including Norad, could consider joining some of these initiatives and providing financial and technical support in the form of co-finance and capacity-building schemes. The following relevant governance initiatives that include some of Norad’s partner countries could be considered:

- The World Bank Climate-Smart Mining Initiative helps resource-rich developing countries benefit from increasing demand for minerals and metals while ensuring the mining sector is managed in a way that minimizes its environmental and climate footprint (World Bank, 2019).
- OECD Due Diligence for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas encourages companies to respect human rights and avoid contributing to conflict through their purchasing decisions and practices (OECD, 2016).
- The International Council of Mining and Metals has established mining principles seeking to maximize the industry’s benefits to host communities while minimizing negative impacts in order to manage issues of concern to society (ICMM, 2020).
- In 2022, the International Renewable Energy Agency launched a new Collaborative Framework on Critical Materials for energy transition to coordinate actions to ensure a rapid but sustainable expansion of mining for the purpose of energy transition (IRENA, 2022).

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