# The Global Energy Transition

## The role of mining and energy companies in enabling a nature positive energy transition

### Key Messages

- The global energy transition will significantly increase demand for key metals and minerals.
- The surge in demand will open up new frontiers of mineral extraction and has the potential to exacerbate existing environmental and social risks in operations and along supply chains for mining companies and their customers such as renewable energy companies.
- If left unchecked, these material risks may slow clean energy deployment and imperil the nature positive transition needed to halt climate change and biodiversity loss.
- Recommendations on where Proteus Partners must act to minimise biodiversity-relevant risks within their operations and supply chains and enable a nature positive energy transition include:
    1. Integration of circular design principles and closed loop efforts in the production of energy assets
    2. Accelerate the adoption of net-gain approaches to mitigate site-based impacts
    3. Contribute to closing the knowledge gap on the ecological impacts of operating in new frontiers such as deep-sea mining
    4. Disclose footprint and adopt transparent, responsible supply chains supported by verified certification schemes and due diligence procedures
    5. Underpin biodiversity commitments with meaningful indicators based on sound and scientific criteria
    6. Gain more control over the compliance of social and environmental standards along the supply chain through e.g. vertical integration and partnerships
    7. Decarbonise operations and portfolios and divest from fossil fuels

# Introduction

The threats posed by biodiversity loss and climate breakdown necessitate a global transformation to a nature positive economy. Key to this transformation will be the ongoing transition from an economy based on fossil fuels to one powered by renewable energy. The energy transition is key to achieving the goal of the 2015 Paris Agreement to limit global warming to well below 2°C[1]. The associated environmental and social challenges of the deployment of mineral-intensive clean energy technologies (box 1) must be harmonised with increased resource extraction. Ignoring the related Environmental, Social and Governance (ESG) concerns in operations and along supply chains will slow clean energy deployment and thus imperil the nature positive transition needed to halt climate change and biodiversity loss.

This Technical Briefing provides recommendations on where Proteus Partners must act to minimise socio-environmental risks within their operations and supply chains and enable a responsible energy transition.

**Box 1: Socio-environmental challenges around transition-critical minerals**

In 2019, 79% of global metal ore extraction originated from five of the six most species-rich biomes, with mining volumes doubling since 2000 in tropical forest ecosystems[5]. Currently, although few mines exist directly inside protected areas or Key Biodiversity Areas (KBAs), up to 77% of all mines in forest areas are located within 50km of a protected area and 52% within 50km of a KBA, affecting at least 13% of conservation areas worldwide[23]. At the same time, the regions where most of the transition-critical mineral deposits are located (Latin America, central and south Africa and Asia-Pacific) are of particular relevance as they contain some of the world's most intact and biodiverse ecosystems and highest levels of species endemism[2, 5].

As well as having impacts on areas important for biodiversity, mining directly depends on healthy ecosystems and the services they provide, such as ground and surface water provision or erosion control. This dependency on nature extends throughout the entire mining industry supply chain[24, 25]. However, the same ecosystems that are being targeted by mining operations are already experiencing high levels of stress, as natural capital in these regions is being depleted at high rates due to other pressures (e.g. agriculture)[26].

Furthermore, in many of the countries in these regions, minerals are being extracted through informal, artisanal and small-scale mining (ASM) operations. While it is an important industry to many, ASM is associated with poor levels of environmental compliance, poor working conditions and regulation, including child-labour, informality, and illicit financial flows[23].

# The implications of a mineral-intensive energy transition

## Socio-environmental risks of transition-critical minerals

For the mining industry, the energy transition will result in significant shifts in commodity demand and a growing scrutiny on ESG issues. While the sector itself faces pressure to improve its environmental performance, mining portfolios will now have to respond to the decarbonisation of other industries, moving operations towards the responsible extraction of transition-critical materials. Yet, while mineral demand from clean energy technologies is set to quadruple by 2040[2], there are several factors that will dramatically increase the risk profile for mining companies.

Although recycling plays an important role for the responsible energy transition, it will most likely not meet the entire mineral demand, considering the volume needed, variations in end-of-life recycling rates, and time delays in recycled minerals becoming available[3,4]. Consequently, primary extraction is set to grow for the foreseeable future. Mining activities are therefore putting increasing pressure on forests, Key Biodiversity Areas, protected areas and World Heritage sites globally, as mining advances into more remote, logistically challenging regions that have formerly been left untouched[5]. Expanding mining activities in these locations, combined with declining ore grades, requires more invasive and energy-intensive mineral extraction methods.

Moreover, many clean energy minerals are especially abundant in species-rich biomes, in already stressed ecosystems[5] or in jurisdictions with limited socio-environmental protections and poor human rights records[6].

Mining for these minerals has therefore the potential to further exacerbate existing socio-environmental challenges around biodiversity, water, land use and human rights and create new ones where it opens up new global frontiers of extraction such as deep-sea mining[7] (see Box 2).

### Box 2: Deep-sea mining

While assumptions over whether a mineral-intensive energy transition will require deep sea mining differ, the economics may now be attractive enough to spur significant development in this field[7]. However, deep sea mining comes with significant challenges around unforeseeable ecological impacts and an unclear regulatory environment.

The International Seabed Authority (ISA), established by the UN Convention of the Law of the Sea (UNCLOS) is mandated to organise, regulate, and control all mineral-related activities in the international seabed area[27]. At the 2021 World Conservation Congress, IUCN member states and organisations voted for a global moratorium on deep seabed mining until sufficient scientific information is available to better understand its socio-ecological impacts[28].

As of today, the ISA has already approved 30 licenses for the exploration of seabed minerals in areas beyond national jurisdiction (ABNJ)[27].

## Business risks span across supply-chains

While mining companies will need to have safeguards in place to minimise the impacts of their growing operations, energy companies that transition towards renewables will have to increasingly focus on the footprint of their procurement. Although significant on-site impacts can still emanate from development and construction (e.g. of wind and solar farms), a large proportion of the footprint is embedded within the mineral-intensive renewable energy technologies[8,9]. Energy companies transitioning towards renewables will be under increased scrutiny to track environmental impacts along their supply chains and ensure responsible sourcing of minerals used in renewable energy technologies.

For the coming decades it is predicted that the energy sector and battery industry will be the leading consumers of non-base metals, driven by the rapid expansion of low carbon technologies[4]. Current data suggests that within 20 years the share of these technologies in total mineral demand may reach over 80% for Lithium, 60% for Cobalt and Nickel and at least 40% for Copper and rare earth elements[3]. As electric vehicle and battery production significantly ramp up, some of these key minerals are already facing supply chain constraints[10].

Business risks span across entire supply chains, as mineral miners, producers, and consumers (e.g. renewable energy companies) alike need to disclose on their ESG performance in the light of changing societal norms, investor expectations and regulatory requirements.

While the inherent social and environmental risks of resource extraction are not new to the mining and energy sectors, the scale at which these would intensify if left unchecked takes on a new dimension. This is reflected in ESG risks being at the top of the agenda for mining and energy companies today[11,12]. The urgency with which economies are transitioning is further represented by global ESG-screened assets being on track to exceed $53 trillion by 2025, which represents more than a third of the $140.5 trillion in projected total assets under management globally[13].

# What companies can do to enable a nature positive energy transition

To successfully shift to a nature positive economy, a holistic approach that considers the socio-environmental footprint and supply chain impacts of renewables and other low-carbon technologies is needed. Both mining, and energy companies must address nature-related impacts and risks by implementing responsible resource extraction practices, developing sustainable materials supply chains, and decarbonising their portfolios. Only then will businesses and society secure long-term benefits from the immense opportunities that the energy transition holds[1].

There are several key areas where Proteus Partners must act to enable a nature positive energy transition.

## Advancing recycling and circular economy approaches

Energy companies need to engage with their suppliers and create structures that move them towards and support them in accelerating the integration of circular design principles in the production of energy assets such as wind turbines or PV panels[30]. This helps to mitigate the increase in mineral demand and reduces the pressure on miners to produce minerals at levels incompatible with a nature positive economy[14].

## Avoiding and mitigating impacts

Where new development projects are planned, both mining and energy companies need to ramp up the integration of approaches to mitigate site-based impacts such as the mitigation hierarchy and biodiversity net gain. Energy companies can apply knowledge and expertise on impact mitigation from conventional fossil fuel operations to new renewable energy development projects. At the same time, new tools to enable responsible renewable energy infrastructure planning are being developed, such as Birdlife International's Avian Sensitivity Tool for Energy Planning (first regions launching 2022). The adoption of these tools can assist companies in applying the early stages of the mitigation hierarchy to new renewable energy projects. This will require an increase in company capacity to minimise and manage novel impacts associated with renewable energy projects (e.g. bird collisions with wind turbines).

For mining companies, it may also include exploring better regulated mining areas rather than relying on sources with poor human rights and environmental standards. Where miners still operate in frontier jurisdictions they need to push for best practice and go beyond national legislation. In the context of seabed mining, fundamental knowledge gaps on ecological impacts and rate of recovery need to be addressed before commercial mining commences. It is expected that data from private sector exploration activities will assist in overcoming the current lack of information[15].

## Biodiversity reporting and certification

Where site-based impacts remain, they need to be disclosed to enable transparent supply chains and adoption of best practices by downstream companies. Once companies understand and measure their impacts, they can go on to identify and implement the most appropriate ways to manage those impacts and track their own performance. As supply chains become more complex, especially when

factoring in the reintegration of recycled materials, companies need to start mapping their biodiversity footprint early in the production or procurement process and establish baselines. The Aligning accounting approaches for nature (Align) project is currently working on developing standard recommendations for companies to measure and value their impacts and dependencies on biodiversity. Ideally, these recommendations will be embedded within international reporting and disclosure frameworks to harmonise measurement across the supply chain and help companies identify contributions to societal goals such as the post-2020 biodiversity framework and the Sustainable Development Goals.

Engaging in verified certification and stewardship schemes, reporting mechanisms and due diligence of supply chains will be crucial. Over the past few years, measurement approaches and reporting frameworks have become increasingly important and matured in their sophistication[16]. Some leading frameworks include the Global Reporting Initiative (GRI), the Sustainability Accounting Standards Board (SASB), CDP, the Climate Disclosure Standards Board (CDSB) as well as the Task Forces on Climate- and Nature-related Financial Disclosures (TCFD and TNFD).

## Driving responsible sourcing through target setting and supply chain monitoring

Downstream businesses such as energy companies must drive the integration of comprehensive biodiversity monitoring and reporting mechanisms by making public commitments to responsible sourcing in order to accelerate responsible resource extraction practice. Today, many of the world's leading companies have already set biodiversity targets and commitments[17,18]. It is critical, however, to underpin these by the adoption of meaningful KPIs based on sound and scientific criteria. Much of this work on biodiversity-related targets and metrics is being advanced by the Science Based Targets Network (SBTN). Other efforts towards developing a set of globally accepted and standardised KPIs to harmonise monitoring and reporting of environmental and social commitments and targets across industries and impact areas include the Positive Impact Indicators Directory developed in consultation with investment funds, banks, donors and non-governmental organisations. Still, companies will need to build capacity to integrate and measure such KPIs as part of their supply chain monitoring and to enable the adoption of transparency tools. Here energy companies can learn from and engage with sectors who already have extensive experience in tracking products, raw materials and associated socio-environmental impacts along supply chains and production steps, such as agriculture or forestry, using tools like trase. In this context, Proteus Partners should look to engage with cross-sectoral initiatives seeking peer-to-peer learning opportunities as a means to advance thinking and implementation of good practice from other sectors.

## Engaging with upstream suppliers

To further increase transparency, reduce complexity and gain more control over the compliance of social and environmental standards along the supply chain, companies may also seek increased collaboration and/or vertical integration in global supply chains. Although direct partnerships between miners and manufacturing industries have not been very common in the past, renewable technology producers are starting to build relationships with mining companies to secure access to transition-critical minerals and ensure responsible sourcing[19,20]. While it is currently mostly battery and electric vehicle

producers who seek this cooperation, renewable energy companies could benefit from a similar strategy to gain more control over the environmental footprint of their supply chains.

## Decarbonising the portfolio

Climate change as a cause of biodiversity loss has the potential to undermine businesses' efforts towards a nature positive energy transition if not addressed adequately[29]. In addition to engaging on site-based biodiversity and human rights impacts, the wider decarbonisation of operations and portfolios therefore remains key. For Proteus Partners, this not only constitutes transitioning to renewable energy production and consumption but also engaging with scope 3 emissions along their supply chains and identifying emission reduction opportunities in their products.

Mining companies especially need to tackle their scope 1 and 2 emissions by adopting energy-efficient processing approaches, integrating renewables at the mine site (e.g. through hybrid renewable energy microgrids) and reducing emission from maritime transportation[21,22]. This can closely link to mine site reclamation and related biodiversity net gain commitments where brownfield sites may be used for renewable energy projects post closure.

# Conclusion

Mining and energy companies have a critical role to play in enabling the global transition to renewable energy, driven by society's need to decarbonise. However, mining companies cannot rely exclusively on their role in the energy transition for social license to operate.

Similarly, renewable energy developments can still have negative socio-environmental impacts including on biodiversity, water and local communities. To enable a nature positive energy transition, mining and energy companies must adopt a holistic approach to biodiversity impacts and risks, including mitigation of site-based impacts and collaboration throughout metal and mineral supply chains. This will ensure the technology underpinning renewable energy development is creating societal value from the local to global levels, and enable it to realise its full potential as a solution to the global climate and biodiversity crises.

**Citation:** UNEP-WCMC (2021) The Global Energy Transition: The role of mining and energy companies in enabling a clean energy transition

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**Acknowledgements:** The author would like to thank their reviewers, including Alex Ross, Stacey Baggaley, and Matt Jones.

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The UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) is a global Centre of excellence on biodiversity. The Centre operates as a collaboration between the UN Environment Programme and the UK-registered charity WCMC. Together we are confronting the global crisis facing nature.



http://www.unep-wcmc.org/

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