Wilton Park

Report: Developing Renewable Energy Sources for Critical Mineral Processing

Monday 13- Wednesday 15 May 2024

In partnership with
The Foreign, Commonwealth and Development Office (FCDO), The Department for Energy Security and Net Zero (DESNZ) and the FCDO-DESNZ Energy Unit

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Introduction and background to dialogue

This Wilton Park event took place from 13 – 15 May 2024, bringing together UK Government Departments, academia, key policy-makers in a range of nickel-producing countries (Indonesia, Australia, Brazil, Canada, Philippines, China) and other partner governments, industry experts and global purchasers of nickel, to consider economically attractive alternatives to manufacture using polluting fossil fuels.

The UK Government has committed to ambitious carbon reduction targets to address climate change. However, high-energy nickel processing often involves the use of fossil fuels, contributing significantly to global emissions and undermining the 1.5-degree target for global warming. Transitioning to low-carbon or renewable energy in nickel processing aligns with the UK's commitment to climate action, sustainable development, economic growth, and aspiration for global leadership in green technologies. There is growing consumer interest in reducing the environmental impact associated with processing nickel and nickel by-products, with relevance to the processing of other critical minerals.

This event examined:

1. The reasons for the need to reduce the carbon footprint of nickel production;
2. Technical solutions and incentives to increase renewable energy sources in nickel production and disincentives for not doing so (eg eventual carbon border tax mechanisms); and
3. How solutions can be operationalised in industrial plans and strategies of key nickel-producing countries.

This report captures a series of recommendations and suggestions put forward by participants to help increase the role of renewable energy in nickel mining and processing, including potential cross-cutting, narrative, policy and regulatory, technical and financial solutions.

Cross-Cutting

- Multilateral forums could be developed to bring together investors, miners, processors, OEMs, renewable energy developers, governments and civil society to facilitate cross-industry exchange and collaboration for decarbonisation. Just Energy Transition Partnerships[1] could act as a model for collaboration and dialogue.
- Governments and the private sector should consider collaborating to develop mining hubs [2] in key nickel producing countries such as Indonesia and the Philippines. These hubs could act as multi-stakeholder platforms to pool resources for research and development and knowledge exchange, and provide a space to collaboratively develop context-specific roadmaps for decarbonisation. In addition, the hubs could group small and medium suppliers into collectives to facilitate the development of suitable renewable energy options.
- Vertical and horizontal integration provide opportunities for reducing carbon emissions by creating symbiotic relationships. Co-locating connected industries in clusters would reduce emissions from transportation and enable companies to share costs of investing in firming and storage to allow for innovative solutions for grid stability, development of transmission networks and the provision of system services; reduce risk and increase return for investors; keep more value in producing countries and increase the value of nickel products. It also has the potential to facilitate a lifecycle approach, creating local ecosystems by sharing resources between businesses. A life cycle assessment of the nickel industry in a pilot location could help understand where such clustering and integration would increase the feasibility of renewable energy.

[1] Kramer, K. (2022) *Just Energy Transition Partnerships: An opportunity to leapfrog from coal to clean energy*, IISD. Available at: https://www.iisd.org/articles/insight/just-energy-transition-partnerships
[2] Mining Hub (no date) *About Mining Hub*. Available at: https://www.mininghub.com.br/en/quem-somos

- Dialogue, cooperation and collaboration are key to enabling decarbonisation of the nickel supply chain. Governments should work closely with nickel producing and processing countries to find mutually beneficial opportunities for dialogue, knowledge exchange and innovation. The concentration of nickel production and processing in Southeast Asia means engagement could take place through the Indo-Pacific Economic Framework and the Association of Southeast Asian Nations. Thought should also be given on how to also include China, Japan and South Korea in these discussions as key players in the region. Given current geopolitical tensions, opportunities should also be sought to facilitate dialogue between the US and China. The UK could play an important role in convening relevant engagement opportunities.

Narrative

- International industry bodies should seek to promote the vital importance of critical minerals and the mining sector for meeting climate targets to ensure mining is part of relevant conversations, including at COP29. Being present in climate-related forums may enable the industry to better engage with the climate policy space and other key stakeholders such as multilateral development banks (MDBs) on the need for the critical mineral production to meet the demands of the green transition. Highlighting the industry's role in the green transition and promoting its efforts to decarbonise and address ESG concerns could also help improve public and political perceptions of mining. Developing relevant taxonomies could also help further this narrative.
- The term 'critical minerals' is inherently competitive which enhances geopolitical tensions and potentially undermines efforts to cooperate internationally. As climate change and the green transition are global issues the term should be reconsidered to facilitate collaborative working. The UN Secretary General has adopted the term '*critical energy transition minerals*'[3] and '*transition minerals*' was suggested as a more appropriate expression that emphasises their importance for the green transition.

[3] International Institute for Sustainable Development (2024) *UN Secretary-General Convenes Panel on Critical Energy Transition Minerals*. Available at: https://sdg.iisd.org/news/un-secretary-general-convenes-panel-on-critical-energy-transition-minerals/

- A wider discussion about what is meant by renewable versus green energy would help ensure all options that lower emissions whilst not necessarily being renewables-based are included in the conversation.

Policy and Regulation

- There is a compelling case for regulations and standards to be streamlined and standardised to reduce confusion, minimise the administrative burden on producers and make it easier for financial institutions to identify sustainable businesses to fund. A reduced number of standards might also make it harder for companies to hide behind weak standards.
- It should be considered whether lowering reporting requirements to only Scope 1 emissions may be more effective as it should be attainable for companies of all sizes, thereby levelling the playing field in the short-term, allowing standards to be gradually raised in the long-term.
- In the long-term the development of globally accepted standards could incentivise producers to decarbonise their operations.
- Producer and processing countries should be supported, where required, to undertake strategic planning and industrial policy work. This should enable better prioritisation of government resources in areas like land use regulation and infrastructure to maximise impact in facilitating renewable energy expansion.
- The removal of fossil fuel subsidies will likely be key for incentivising increased uptake of renewables.

Technology and Innovation

- Decarbonising the next generation of nickel mines is significantly cheaper than retrofitting existing mines and provides opportunities to build renewable energy into supply chains from the start. To facilitate this, governments should look to connect renewable energy developers with companies developing new nickel assets.
- Governments, donors and financial institutions should work with processing countries such as the Philippines to identify where support might be prioritised to develop the infrastructure and technology needed to build renewable energy into their nickel industry.

- Ensuring there is a framework for renewable energy development introduced at the beginning of new projects along with feasibility studies would help identify opportunities before development begins. Renewable energy should be considered alongside technology like battery storage, small modular reactors[4] and microgrids, as well as lower carbon fossil fuel options like gas to ensure solutions are context-specific. High quality carbon offsetting and carbon sequestration may also be needed to facilitate decarbonisation.
- Technological advancements are being made that will support the decarbonisation of the nickel industry[5] but there needs to be more public sector and financial support for integrating these into existing markets and ensuring their financial viability.
- The mining industry should look to invest more heavily in research and development to find innovative, tailored solutions to decarbonisation. Technical collaboration through mining hubs would encourage open innovation and the sharing of relevant technological advancements. Instilling innovation as an industry-norm could help overcome longer-term challenges such as declining ore quality and the consequent need for additional processing.
- Bringing OEMs together with nickel associations to discuss how to reduce changing specifications and clarify their needs may help align upstream and downstream priorities.
- While secondary supply from recycled minerals will not be sufficient to meet global demand, advancement in this area could reduce industry emissions and meet up to 7% of requirements by 2050.[6] Improved waste and tailings management also presents an opportunity to process and re-use waste to extract more valuable materials and facilitate a circular economy approach.

Finance

- The financial sector's aversion to risk limits funding for novel renewable energy projects. Public finance should seek to bridge this gap to incentivise financial institutions to accept a higher degree of risk to facilitate innovation and the development of new technologies. Concessional capital and regulatory reform

[4] Government of Canada, *Small Modular Reactors (SMRs) for Mining*, May 2021. Available at: https://natural-resources.canada.ca/our-natural-resources/energy-sources-distribution/nuclear-energy-uranium/canadas-small-nuclear-reactor-action-plan/small-modular-reactors-smrs-for-mining/22698

[5] E.g. Transport & Environment, *Paving the way to cleaner nickel*, October 2023. Available at: https://www.transportenvironment.org/articles/paving-the-way-to-cleaner-nickel; Canada Nickel Company, *Canada Nickel Demonstrates Carbon Sequestration Potential of Tailings from the Crawford Nickel Sulphide Project*, PR Newswire, November 2021. Available at: https://www.prnewswire.com/news-releases/canada-nickel-demonstrates-carbon-sequestration-potential-of-tailings-from-the-crawford-nickel-sulphide-project-301420832.html

[6] International Energy Agency, *Reliable supply of minerals*, March 2022. Available at: https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions/reliable-supply-of-minerals

could also be used to bridge the gap between strategic and commercial interests as has been done successfully in India.[7]

- Increased investment may be facilitated by bringing together both export credit agencies to co-create renewable energy criteria for investment decisions, and the donor community to discuss how they can support renewable energy development for mining.
- Conversations around the role of mining in the green transition need to be happening at the level of G7 and G20 to encourage buy-in from the financial industry.
- Financial institutions should consider bringing in China as a co-funder for renewable energy projects.
- A wide range of tools should be used by public finance and MDBs to provide incentives for renewable energy and de-risk innovation in mining so the private sector can support decarbonisation efforts. This could include reformed export credit arrangements, longer repayment terms, critical mineral specific bonds, loan guarantees, renewable energy subsidies and tax incentives for reducing emissions across the supply chain and developing energy transition infrastructure.
- Encouraging OEMs to agree off-take agreements may help stabilise prices to allow for increased renewable energy development. Similarly, mining companies could use offtake agreements to secure long-term financing for large scale renewable energy projects.
- Small and medium companies often struggle to access financing. They could be brought together with investors and the donor community to ensure mining companies of all sizes can access the support and capital they need to help reduce emissions.
- Indonesia and the Philippines are heavily reliant on Chinese investment. It should be considered how to make these markets more appealing for Western investors, ensuring that public and private finance and cross-sector stakeholders work together to allocate capital and appropriate support to these countries to meet increasing standards such as those required by the US's Inflation Reduction Act and the EU's upcoming Carbon Border Adjustment Mechanism. In Indonesia in particular, decarbonisation will remain challenging without this funding given the country's reliance on coal.

[7] Sarangi, G.K. (2018) *Green Energy Finance in India: Challenges and Solutions*, Asian Development Bank Institute Working Paper 863, Tokyo: Asian Development Bank Institute. Available at: https://www.adb.org/publications/green-energy-finance-india-challenges-and-solutions

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