

BGS response to the Foreign Affairs Committee inquiry into critical minerals

Which critical minerals are the most important to the UK's national priorities (including national security and the green transition)? Where are the vulnerabilities in these supply chains? What are the consequences of disruption to these supply chains?

The [UK criticality assessment](#), undertaken by the British Geological Survey, produced a list of 18 minerals that have a 'high' potential criticality rating based on their global supply risk and the UK economic vulnerability to such a disruption. The minerals on this list are vital for high-value manufacturing, for example in the aerospace and defence sectors, and for clean energy technologies, including electrification of transport, wind turbines, solar photovoltaics, and the hydrogen economy. However, the complexity of the global mineral supply chains means that this assessment provides only a 'snapshot' of a dynamic system. Therefore, the UK Critical Minerals Intelligence Centre will also monitor a wider group of minerals or 'watchlist' that could be affected by evolving market developments. It is also necessary to understand the criticality of different traded forms of a mineral (e.g., ores and concentrates, refined metals, specific compounds), and recognise UK reliance on critical minerals embedded in imported components and finished goods.

The UK is dependent on imports and the international market for most of its critical mineral needs, and supply chains are often complex. The principal risk in the supply chain relates to the strong concentration of upstream (mining and extraction) and midstream (separation, processing, and refining) activities in a small number of countries. China is the dominant global player in the midstream for critical minerals and is well-established in the downstream manufacturing stages. Although China does not dominate upstream production to the same extent, it is leading miner of rare earth elements and graphite. Furthermore, for several years Chinese companies have been securing minerals globally, for example they are the dominant source of foreign investment in the Indonesian nickel sector and in cobalt mining operations in the Democratic Republic of Congo. Additional supply chain vulnerabilities relate to the geopolitics in producing countries, the growing importance of demonstrating environmental, social and governance best practice, vertical integration in the mining value chain, stockpiling and speculative trading, and the challenges associated with attracting private-sector investment in new critical minerals projects.

What opportunities are there for diversification of the UK's critical minerals supply chains? How is the FCDO supporting the Government's efforts to diversify supply of critical minerals?

The UK has several options to diversify its' critical mineral supply chains: i) understand and pursue domestic opportunities for mining and extraction of critical minerals, but with notable uncertainty over the timescales to commercial-scale production, which critical minerals can be produced and the proportion of domestic demand they can meet; ii) establish midstream operations in the UK, which would be dependent on imported mineral feedstocks with associated supply risks, except where domestic supply can contribute; iii) maintain trade relationships with existing partners and develop new

bilateral trade agreements with like-minded resource-rich countries.

Many countries that have strong links to the UK, for example as members of the Commonwealth, also have resources of critical minerals and may be eager to attract foreign direct investment. During the last decade, a notable feature of critical minerals supply chains in many of these countries is Chinese engagement, which continues to grow at a rapid pace. If the FCDO is to support supply chain diversification, and counter Chinese engagement, actions will need to be taken immediately. Previously the FCDO (and formerly DFID) has supported diversification efforts through funded capacity building and other development projects in strategic countries. The British Geological Survey has used development funding to support development of in-country geological knowledge and skills, including work to improve the sustainability and transparency of natural resource management. Developing knowledge on natural resource information and data management systems can in turn support the development of sustainable and transparent mineral-related industries, mitigating the risk of 'resource colonialism'. This work also increases UK influence in mineral supply chains, which often begin in low- and middle-income countries and end with UK manufacturers.

The FCDO facilitates introductions and dialogue with new stakeholders in UK partner countries, typically through the work of Embassies and High Commissions. UK diplomats are keen for UK organisations and companies to engage at many points along the supply chain. However, the reduction in the ODA budget and the associated closure of many ODA programmes, such as Partnerships for Development, means that there are currently very few funding mechanisms to support work relating to critical mineral supply chains in these countries by UK public sector organisations. The FCDO has announced new initiatives, such as the Centres of Expertise, and it will be important for these programmes to prioritise work relating to critical minerals supply chains.

What can the UK learn from steps taken by other countries to reduce the vulnerability of their critical mineral supply chains?

To establish secure critical minerals supply chains, it is necessary to take a long-term view that is directly linked to delivery of the country's industrial strategy and promotes investment across the value chain. This is illustrated by the whole-of-government strategy and decades of state support that China has made, which means that it has now achieved near-monopoly control over the supply chain for certain critical minerals and is increasingly moving up the value chain.

The complex and dynamic characteristics of international supply chains and mineral markets necessitate ongoing monitoring and collection of accurate and high-resolution data and intelligence to assess vulnerabilities. Several countries have well-established, government-funded minerals intelligence capabilities, to guide decision-making by government and industry, and make recommendations for targeted interventions.

In common with the UK, Canada, the U.S., and Australia are placing greater regulatory scrutiny on foreign investment in their strategic supply chains, including ordering the divestiture of Chinese investment in critical minerals companies and projects.

In response to China's approach, other countries are pursuing state-supported strategies. In some instances, these investments equate to hundreds of billions of dollars in funding and tax credits. They include offering subsidies and tax credits to domestic manufacturers, government-backed loan facilities and funding to grow the critical minerals sector and support research and development activities, investment by state-backed companies in overseas critical minerals producers and projects, and proactively partnering with like-minded, 'trusted' allies to help address supply chain risks.

Some countries and organisations are signing agreements with resource-rich low and middle-income countries to develop value chains (e.g. the EU-Namibia partnership on sustainable raw materials and the MoU between the U.S. and the Democratic Republic of Congo and Zambia that aims to strengthen battery value chains). The UK has strong relationships with many key countries that have potential to supply critical minerals, and there is an opportunity to formalise these relationships but it is essential to move quickly owing to international competition for these minerals.

How can the FCDO support the responsible sourcing of the UK's critical minerals? How can the UK work with global partners to improve environmental, social and governance performance (ESG) across the sector? What are the potential complications/implications of insisting on traceability in supply chains?

A growing number of standards and guidance on responsible sourcing are being developed, including the OECD Due Diligence Guidance, the Responsible Minerals Initiative (RMI), the Global Battery Alliance Passport, the International Finance Corporation ESG standards, the Initiative for Responsible Mining Assurance (IRMA), the UN Resource Management System (UN RMS) and many more. However, there is a requirement for an agreed international definition of responsible sourcing, including a globally accepted framework, associated metrics and consistent and comprehensive datasets. Furthermore, these initiatives attempt to address this topic from different perspectives. These range from providing guidance to industry to monitoring the sourcing of minerals from conflict and other high-risk areas, to sustainable resource management and performance tools to assess the environmental, social and governance (ESG) risks of existing operations or provision of ESG ratings for investment purposes. The FCDO should play a major role in the development of a globally accepted definition and framework for responsible sourcing, which should align with the ESG and sustainable development principles. There are multiple tools available to undertake an assessment, but we need to ensure that the scope, scale and weighing of the three dimensions of ESG are equal in the chosen assessment process. It is important that the UK promotes sustainable resource management, and assists with relevant capacity building in countries that are key mineral producers and suppliers to the UK.

What are the opportunities and challenges of deep seabed mining for critical minerals? What should the UK's role be in regulatory development around this?

This topic is addressed in the British Geological Survey-led, independent deep-sea mining evidence review report that was commissioned by the UK Government to inform its policy in relation to deep-sea mining. Preliminary estimates suggest that the deep seabed hosts large quantities of economically important minerals, including certain critical metals. If the resources are proven to be economically viable to extract, exploiting certain critical minerals in deep-sea mineral deposits could contribute to meeting global demand and diversify the sources of their supply, with potential benefits for security of

supply. The major challenge is that mining in the deep sea will cause adverse impacts to the environment and biological communities, and therefore, securing social acceptance of deep-sea mining projects is likely to be problematic. The UK should work with other countries to ensure that decisions on the rules, regulations and procedures issued by the International Seabed Authority to regulate prospecting, exploration and exploitation of marine minerals in the international seabed are informed by an independent and impartial evidence base. This needs to recognise the significant uncertainty that exists, and that the development of deep-sea mining will be influenced by numerous factors that are diverse, dynamic and often interrelated (spanning economics, geopolitics, technology, environment, regulation and societal acceptance).

Where should the UK's focus be in developing bilateral relationships for improving our supply chain accessibility and traceability? How can the UK Government help mitigate any adverse impact of "debt-trap diplomacy" and increasing divides between the global South and global North?

Critical mineral supply chains are generally monopolised by a small number of countries, which limits opportunities for new entrants, such as the UK. However, projected increases in demand and rising prices for many critical minerals have stimulated global exploration activity, which may support long-term diversification of supply. It is important for the UK to:

- Invest in resource diplomacy with major mineral producing countries that are responding to increasing demand, share UK values and ambitions for sustainable development of resources and diverse and transparent supply chains, and have capabilities, skills and expertise that are now limited in the UK (e.g., mineral processing and metallurgy - Australia, Canada).
- Seek bilateral partnerships in other countries that are developing capacity, but are lacking the investment, skills, innovation, and fundamental research to increase their pace of development. The focus here should be on countries where the UK already has strong relationships and where Chinese influence is not yet dominant; this is likely to include countries in the Commonwealth.
- Strengthen bilateral discussions with neighboring countries (e.g. EU) as they represent our key trading partners.
- Actively participate in projects that have a strong low-carbon agenda (e.g. mining, refining) as they are likely to have better chances of surviving economic and environmental risks.

What are the risks to international security of having mid-stream processing concentrated in a handful of countries? How can the UK guard against hostile states leveraging access to critical minerals for political gain?

Having mid-stream production highly concentrated in a small number of countries makes global supply vulnerable to political instability, geopolitical risks, and trade instruments such as export restrictions and tariffs. As demand for critical minerals increases and market deficits emerge, it is anticipated that Chinese miners and processors, which are frequently state backed, will satisfy domestic demand as a priority. This could lead to the rest of the world scrambling for non-Chinese controlled supplies, driving up critical mineral prices. A risk from inadequate critical mineral supply could be a more expensive, delayed or less efficient clean energy transition, with implications for meeting net zero targets.

Development of mid-stream processing capability in the UK would clearly be beneficial but will also be dependent upon a reliable supply of raw material. It may be possible to supply some raw materials from future mining within the UK, but at the time of writing the UK has no critical mineral mines. Therefore there is a need to strengthen relationships, and support UK companies and public sector organisations to engage key resource-rich countries, in order to diversify the raw material supply base, and to ensure responsible sourcing of critical minerals.