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Institute for Global Prosperity

Mineral Security is Energy, Economic and Societal Security

Inquiry: Economic Security

Written evidence submitted by:

Dr Kathryn Moore, Senior Lecturer in Critical and Green Technology Metals; Camborne School of Mines, University of Exeter
Dr Bridget Storrie, Teaching Fellow, Institute for Global Prosperity, University College London

We are specialists in critical metals production and mediation for sustainable prosperity through mining. Over the years, we have investigated and worked professionally in ore geology, geological hazard risk and mitigation, security of supply of primary raw materials, complexity in mineral supply chains, the just transition, conflict mediation and post-conflict prosperity-building.

In our submission, we refer to the terms of reference and in PART A will cover:

1. What is 'criticality' in the wider landscape of raw materials needs for the UK?
2. What are the supply chain threats and opportunities?
3. What are the threats and opportunities in the UK?

In PART B, we will address how the UK raw materials knowledge economy can be reconfigured to foster resilient supply chains and position the UK as a global leader.

Executive summary:

There are significant threats to UK economic security related to critical mineral supply and significant opportunities, too. The UK has limited access to indigenous geological raw materials and is vulnerable to turbulence in their supply. There is an urgent need to work with national and international partners to address this. The UK also has a long history of mining innovation, and significant academic and diplomatic capacity when it comes to understanding and mediating supply chains. We recommend reconfiguring the UK raw materials knowledge economy to mitigate risk, foster resilience from mine to consumer, and position the UK as a global leader in promoting responsible mining. The particular focus of our submission is on the importance of initiating and supporting efforts to improve the environmental and social impact of mining in countries rich in high-value natural resources and to play a role in peacebuilding efforts where appropriate. Conflict in these countries is directly linked to the economic security of the UK.

PART A

1. What is 'criticality' in the wider landscape of raw material needs for the UK?

The UK is a nation with a small landmass that limits access to the multiple geological raw materials required by strategic industries including defence, digital and technological, advanced manufacturing, and clean energy. As a result, every facet of UK industry depends on complex,

global supply chains to import primary feedstocks and advanced materials, and turbulence in these supply chains is a risk to the UK's economic security and growth.

The threat of supply turbulence is influenced by geo-political, environmental and/or socio-political shocks in the regions in which materials are mined, and where refining and intermediate manufacturing occurs. Their supply is also vulnerable to increasing competition from other nations.

The UK Critical Minerals Intelligence Centre ranks the probability of supply chain disruption based on numerous metrics. The raw materials of greatest importance to the UK's strategic sectors with highest risk supply chain turbulence are termed the critical minerals[i].

The criteria for criticality are not fixed, but subject to change as technologies evolve and the UK becomes reliant on new resources as a result[ii]. They are influenced by what products are being manufactured and the sustainability of domestic supply.

The number of minerals assessed as critical is increasing and resources not currently considered critical, such as copper, are anticipated to become critical in the future. Therefore, it is essential to consider risks and opportunities relevant to the demand and supply for all primary raw materials, using improved criticality assessments to prioritise interventions.

2. What are the Supply Chain Threats and Opportunities?

There are threats and opportunities associated with mineral supply chains which are likely to become more salient as mining activity increases to meet demand.

THREATS:

Immobility of mines: The extractive industry is particularly vulnerable to crises. A mine cannot be moved out of the way of conflict, nor can alternative geological resources be brought into production at the pace with which crises develop. It usually takes decades from the discovery of a resource, through proof of its economic viability, to the development of the site and production.

Mining and conflict: Mining operations can drive conflict, with perhaps 40% of all conflicts over the last 60 years linked to natural resources[iii]. Conflict over natural resources can result from uneven wealth creation, the monopolization of control, the disenfranchisement of certain people, and environmental and social harm. Through its supply chains the UK is connected to conflicts in countries including Ukraine, Afghanistan, Angola, the Democratic Republic of Congo (DRC) and Sierra Leone[iv].

"The challenges associated with preventing, managing, and resolving natural resource-induced conflicts may well come to define global peace and security in the 21st century"[v].

Changing geopolitical climate: Conflicts over natural resources can play out at the local, national and international level and all have the potential to disrupt supply. At the geopolitical level, increasing nationalism, protectionism and competition over resources can be seen as threats, as

countries race to secure supply chains in ways that may undermine collaboration and cooperation. The recent minerals deal between the US and Ukraine exemplifies this.

Local level vulnerability: At the local level, the global demands of the net zero transition are increasing fears that the environmental and social load of mining will increase, creating 'green sacrifice zones' where the negative impacts of mining are understood as an inevitable part of greening global economies [vi].

Supply chain bottlenecks: The global demand for some critical minerals is met by a very small number of mines, creating significant bottlenecks in supply. In addition, the raw materials from certain mines are funnelled into a very small number of processing, refining and intermediate manufacturing locations, globally. These bottlenecks are vulnerable to disruptions of all sorts, including extreme weather phenomena related to climate change such as flooding and fires[vii].

OPPORTUNITIES:

Mining and Peace. High value natural resources can contribute to peacebuilding if they are sufficiently well managed[viii]. Peace might come through fairer revenue sharing, increased transparency, economic development and the generation of employment, and responsible environmental and social stewardship.

Environmental Mediation. What happens in the places where mining takes place will affect economic security in the UK through supply chains, and we therefore have a responsibility to consider how our patterns of consumption will affect others. High value natural resources are increasingly seen as sites for mediation, for example by the UNEP Environmental Peacebuilding organisation. Environmental peacebuilding is an emerging field of research and practice and there is an opportunity for the UK to be a thought leader here. See recommendations.

Timing. We are at a pivotal juncture in terms of the threats posed to supply chains and important decisions need to be taken. Many other countries are grasping the scale, urgency and complexity of the problem and there is a significant window of opportunity for global cooperation and collaboration as a result.

3. **What are the threats and opportunities in the UK?**

This is a pivotal moment in terms of understanding how vulnerable the UK economy is to supply chain turbulence. On one hand, numerous bilateral agreements are being reached between the UK and producer countries to cooperate on raw material supply issues. On the other, increasing trade tensions, the withholding of raw materials from the open market and increasingly bellicose rhetoric regarding natural resources and critical minerals acquisition is creating uncertainty.

THREATS:

Lack of self-sufficiency. The UK is not self-sufficient in any geological resources. Europe (including the UK) consumes approximately 30% of the world critical minerals production, but only 2 – 3%

comes from Europe[ix]. Nearly everything therefore needs to be imported which makes UK industry particularly vulnerable to supply turbulence. Imports of critical minerals must increase as part of any UK growth strategy focussed either on industrial resilience or net zero carbon goals. The link between mineral security and energy security is particularly challenging[x] because it underpins all other industries.

Lack of viable alternatives. Recycling is not sufficiently scaled up to offset demand for primary raw materials and has poor economic viability due to technical challenges in the process routes, excessive energy consumption and/or the difficulty in obtaining sufficient materials to be recycled. Replacing one raw material for another is also problematic when substitute materials do not meet safety and performance specifications, or are also critical[xi].

Insufficiency of current criticality assessments. The most recent UK criticality assessment[i] is world-leading in its sophistication and uses reliable, consistently curated data. However, the timeframe over which data is collected and analysed is greater than the timeframe over which sudden geopolitical shocks occur. There is also inadequate analysis of international conflict and peace dynamics relative to UK supply chains.

OPPORTUNITIES:

Technical, research and financial capacity in the UK: The UK has a long history of global mining leadership, through our industrial innovators, consultancies, academic institutions and professional organisations such as IMMM (Institute of Materials, Minerals and Mining). The London Metal Exchange is the world centre for industrial metals and the City of London is preeminent in mining finance and green investment[xii]. Multinational mining companies including Rio Tinto, and Anglo American have headquarters in London and are working to improve mining practice.

The Critical Minerals Intelligence Centre (CMIC) provides the UK with supporting data while the Critical Minerals Alliance works to enable industry. The Department of Business and Trade has a team dedicated to strengthening UK businesses along critical mineral supply chains and, along with FCDO, fostering international collaboration.

Timing. Reports that the UK has been late to develop a comprehensive critical minerals strategy, relative to other countries[x] are somewhat misleading. Prior to developing independent criticality assessments and a coherent strategy following Brexit, the UK was influential in developing the European approach. There has been a significant critical minerals knowledge economy in the UK for as long as there has been in the EU, and it is sufficiently mature to be influential if it develops greater visibility.

Lack of self-sufficiency. This is an opportunity as well as a threat. No country is self-sufficient in geological raw materials. The problem of securing supplies is a shared one – therefore the need to cooperate and collaborate is shared, too. The alternative is to compete. This would make the world

more dangerous than it currently is. There is a window of opportunity for the UK to lead the way in articulating how and why countries can collaborate.

PART B

Recommendations

The current development of UK-based primary and secondary raw materials supply chains should continue. This includes exploration, the construction of new mines where economically viable, scaling up secondary raw materials use and promoting circular economies.

However, the UK cannot be self-sufficient in these materials and a heavy emphasis should be on fostering cooperation and collaboration with other countries to secure supply. Our recommendations for this are as follows:

Encourage thought leadership. There is an opportunity for the UK to take a leadership role in articulating how and why countries can collaborate over securing critical minerals supply using a long-term vision for resource use, founded on 'do no harm' and 'net positive impacts' principles. The UK can adhere to and promote the idea that what happens where natural resources are mined affects economic security in the places where they are consumed, so the risks and responsibilities of extraction are shared. We recommend reconceptualizing the problem of natural resource supply as a collaborative futures problem, as we are creating the future together with the metals and minerals that come out of the ground. The questions that arise are: W*hat sort of future do we want? And how can we resource it?* The point is to create an issue that can be negotiated over collaboratively within the UK and with other countries too[xiii].

Raise geological awareness across sectors. The inquiry committee should advocate for factoring the security of supply of all primary and secondary raw materials into any risk assessment relating to the manufacturing, energy and defence industries. When the government endorses technological developments, the following questions should be asked: *How can a sufficient supply of raw materials be guaranteed and what implications will this have for the places where mining and processing takes place?* Particular attention should be paid to the local environmental and social costs and benefits of mining and how these can be mitigated and augmented. Attention should also be paid to conflict and peace dynamics, and the role new or increased resource extraction is likely to play. This is challenging for individual SMEs to navigate due to the complexity of supply chains and plurality of oversight organisations[xii], so it will likely need centralised assistance.

Develop mediation capacity: Collaborate with UK based, and international mining companies, academics, mediators, environmental peacebuilders, activists and affected people to understand local, social and environmental issues in countries where extraction occurs and be part of mediating better outcomes. Work with mediation organisations to develop environmental mediation capacity in the UK so that domestic mining related conflicts can be resolved faster and more effectively.

Engage with the field of Environmental Peacebuilding. More research is needed to understand the relationship between mining, peace and the green transition.

Alternative Criticality Assessments. The supply- and demand-based data is flowing, but the detail of geopolitical and micropolitical context is often hidden behind the data. Moreover, objective criticality assessments are based upon the recent past, while foresight studies focus on quantitative demand and supply data. There is an opportunity to build alternative criticality assessments based on scenario modelling of threats that might emerge.

Share information and plan: There is an additional need for a library of open-access information that describes the dynamic and evolving place-based contexts of mining and processing operations around the world, both actual and potential, with a focus on the within-nation dimensions. This would support more refined analysis and zoning of which supply chains present the greatest (e.g. geopolitical) hazards to economic security in the UK, including the commodities that are considered to be most critical and other strategic raw materials. An effective reporting mechanism needs to be established, to integrate the sociocultural analysis with technoscientific data reporting, and bring it to the attention of decision-makers and industrial users. The analysis needs to feed into nuanced risk mitigation plans that can be enacted appropriately when supply chain 'hazards' arise.

Diversification, on-shoring and friend-shoring. The risks associated with supply chains can be reduced by diversifying and broadening them, where possible. This includes developing and scaling up recycling initiatives, developing new mines in the UK and restarting ones that have shut down, and identifying and collaborating with new suppliers. Scaling up and supporting recycling initiatives presents an increasing opportunity for the UK as the amount of recyclable material increases, such as end-of-life electric vehicle and storage batteries.

Promote the idea that lack of self-sufficiency is an opportunity to collaborate. The global insecurity caused by Trump's changes to the US tariff regime demonstrates how complex and interconnected our supply chains have become. No country is entirely self-sufficient in geological raw materials and every country has unique strengths and vulnerabilities in terms of what they need that intersect with the strengths and vulnerabilities of others. Collaborating and cooperating over supply chains is therefore in the interests of all nations. **It is the route to a more prosperous future for everyone.**

We would be pleased to provide further information to inform this inquiry. Please do not hesitate to contact Kathryn Moore [k.moore@exeter.ac.uk] and Bridget Storrie [bridgetstorrie@me.com].

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[i] https://www.bgs.ac.uk/news/uk-2024-criticality-assessment/
[ii] https://www.gov.uk/government/publications/uk-critical-mineral-strategy/resilience-for-the-future-the-uks-critical-minerals-strategy
[iii] https://www.iisd.org/publications/conflict-peacebuilding-role-natural-resources-and-environment
[iv] https://theconversation.com/ukraine-minerals-deal-the-idea-that-natural-resource-extraction-can-build-peace-has-been-around-for-decades-252090
[v] https://www.un.org/pga/76/2022/03/18/natural-resources-peaceful-societies-and-sustainable-development-lessons-from-the-kimberley-process/
[vi] https://www.sciencedirect.com/science/article/pii/S259033222030542X
[vii] https://www.unepfi.org/wordpress/wp-content/uploads/2024/05/Climate-Risks-in-the-Metals-and-Mining-Sector-1.pdf
[viii] https://www.routledge.com/High-Value-Natural-Resources-and-Post-Conflict-Peacebuilding/Lujala-Rustad/p/book/9781849712309
[ix] https://discoveryalert.com.au/news/uk-critical-minerals-strategy-2025/
[x] https://www.lyellcollection.org/doi/full/10.1144/geoenergy2024-016
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[xii] https://discoveryalert.com.au/news/uk-critical-minerals-strategy-2025/
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