UK Energy Research Centre

Call for Evidence: Critical Minerals

Business and Trade Sub-Committee on Economic Security, Arms and Export Controls

UKERC Consultation Response

Prof Gavin Bridge (Durham University)

Dr Natalie Ralph (University of Warwick)

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The following evidence is submitted by Prof. Gavin Bridge (Durham University) and Dr Natalie Ralph (Warwick University). Both are Researchers with the UK Energy Research Centre 2024-2029 (UKERC), and part of UKERC's thematic program of work on Geopolitics, Energy Security & Resilience of Net Zero which includes a work package on UK critical minerals.

Introduction to UKERC

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1. Context

1.1 Which critical minerals are the most important to the UK's national priorities today? Where are the vulnerabilities in these supply chains?

1.2 How are the mineral needs of UK industry likely to evolve over the next 10-20 years?

The UK 2024 Criticality Assessment, undertaken by the Critical Minerals Intelligence Centre (CMIC), provides analysis of the relative importance of different critical minerals to the UK economy.[1] CMIC's excellent series of demand foresight studies provide an indication of how demand for these minerals is likely to shift based on the uptake of different decarbonisation technologies.[2]

Criticality assessments like these are structured around elements using the organising framework of the periodic table, and do not differentiate priority minerals by the material form (i.e., the degree of processing and manufacture already undertaken) in which these elements are imported to the UK. Much of the UK's demand for critical minerals – and vulnerability to supply chain disruption – takes the form of critical minerals that are already embedded in imported finished or semi-finished products (like batteries, magnets and solar panels), rather than raw materials that feed UK-based processors and manufacturers of those products.

The material form in which critical minerals and mineral-based materials are imported into the UK creates different sorts of supply chain exposure. These are typically not revealed by 'elemental' measures of criticality that aggregate together different material forms and processing stages of a given critical mineral. To identify and address vulnerability, there is a need to differentiate the nature of UK demand for critical minerals by reference to the actual material forms and degrees of processing that create exposure for the UK economy. If the UK is to prioritise its vulnerabilities – and capture opportunities to leverage UK demand via partnerships with 'upstream' countries - there is a need to develop a more granular understanding of the UK's position within key mineral supply chains.

Differentiating future demand by material form is important in terms of future mineral needs. An aspiration of the Government's Industrial Strategy is to grow manufacturing across a range of sectors that use critical minerals. If this strategy is realised, it will increase demand for critical minerals overall, shift the relative importance of one critical mineral over another and introduce some new candidate 'critical' minerals – as acknowledged by the inclusion of 'growth minerals' in the 2025 Critical Minerals Strategy. In addition, however, it will also shift the UK's position within the supply chain and so change the material forms required by the

[1] Mudd, G.; Josso, P.; Shaw, R.; Luce, A.; Singh, N.; Horn, S.; Bide, T.; Currie, D.; Elliott, H.; Grant, H.; Halkes, R.; Idoine, N.; Mitchell, C. ; Watkins, I.; Price, F.; Petavratzi, E.. 2024 UK 2024 criticality assessment. Nottingham, UK, British Geological Survey, 313pp. (OR/24/059)

[2] Petavratzi, E.; Horn, S.; Shaw, R.; Josso, P.. 2024 A UK foresight study of materials in decarbonisation technologies. Nottingham, UK, British Geological Survey, 73pp. (OR/24/005)

UK economy for a given critical mineral.[3] A build out 'gigafactories' in the UK to manufacture lithium-ion cells and batteries, for example, will change the material form in which lithium enters the UK: it will increase UK demand for battery grade lithium hydroxide and engineered cathode materials containing lithium (as inputs to the cell and battery manufacturing process) and, to the extent that battery production in the UK offsets battery imports, it will decrease demand for lithium embedded in finished EV battery products.

2. Ambitions and Delivery

2.1 To what extent are the priorities set out in the Government's critical minerals strategy the right ones?

The Government's critical minerals strategy sets out objectives rather than priorities. This distinction is significant. While the strategy's twin objectives - to optimise domestic production and build resilient UK and global supply networks – are sound, there is a need to clarify priority actions and ensure necessary policies, tools, and financial resources are in place to enable implementation of the objectives. For example, the Strategy recognises there is a 'window of opportunity' to act around recycling, given a growing availability of end-of-life energy technologies over the next decade. However, if the UK is to get ahead of this significant opportunity, it needs to go further and identify priority actions now as there is competition from other countries (including the EU) in this space.

The UK's approach centres on mobilising private capital rather than government intervention. This may not be sufficient, and the value of dedicated financial support for critical minerals (£50 million, announced in the Strategy) is low relative to allies and competitors. Critical minerals projects are eligible for general UK public finance (e.g. National Wealth Fund (NWF) and UK Export Finance(UKEF)), but in ways that are more restricted than equivalents in other countries. There is some evidence of innovation, such as UK Export Finance enabling support to overseas projects with offtake for the UK, but, given the modest value of dedicated financing, further innovation and adaptation around existing sources of UK public finance will be required.

Recent efforts to enhance the visibility of the UK 'offer' around critical minerals need to be accelerated. The primary critical minerals challenge for the UK is not the concentration of production in China, but the rapid and substantial actions being undertaken by allies and competitors (like the US and EU) to secure critical minerals. In that context, UK statecraft around critical minerals needs to be more agile so it can respond to a dynamic geopolitical landscape. Ambition and agility are required just to stand still: this year a flagship rare earth refinery (Pensana in East Yorkshire)[4] shifted its UK investment to the US, and a UK manufacturer of rare earth metals (Less Common Metals in Cheshire) was sold to US investors.[5]

[3] Bridge, G. and Faigen, E., 2023. Lithium, Brexit and Global Britain: Onshoring battery production networks in the UK. *The Extractive Industries and Society*, 16: 1-21.
[4] UK RE hopes dashed as Saltend refinery scrapped. Argus Media, 17 October 2025. https://www.argusmedia.com/en/news-and-insights/latest-market-news/2743508-uk-re-hopes-dashed-as-saltend-refinery-scrapped
[5] USA Rare Earth buys UK metal maker LCM. MetalTech News, 29 September 2025. https://www.metaltechnews.com/story/2025/10/01/tech-metals/usa-rare-earth-buys-uk-metal-maker-lcm/2493.html

Greater alignment with international partners is necessary, including the EU. The UK lacks a continental scale geography from which to source the range of materials it needs (unlike the US and EU) and also lacks the financial capacity to go it alone. Partnerships can leverage existing UK strengths, as outlined in the strategy, but enhancing and deepening existing bilateral agreements is essential.[6] To enable partnership with upstream critical mineral producers, greater clarity on the 'demand function' of the UK is required - i.e., the extent to which UK firms can offer a reliable market for critical minerals, and a potential alternative outlet for critical mineral producers who want to decouple their activities from midstream or downstream use in China. The 'demand aggregation platform' proposed in the Strategy has potential, but priority actions around its scope and form need to be identified. More broadly, demand forecasts for the UK should be periodically updated to ensure that they remain relevant and in line with current technological trends and trajectories.[7]

The Strategy's reference to priority partners and growth partnerships is a solid first step. This now requires a strategy for each country that lays out the UK's offer and engagement actions with country stakeholders. Because the UK does not have the same scale of public finance for critical minerals as the US and EU, it must coordinate an 'all tools' approach to statecraft – i.e., coordinated strategic actions across government with regard to priority partners. This would have two elements: a designated central 'senior lead' on critical minerals, to overcome the currently distributed leadership of critical minerals across trade, defence, development, industry and environment; and upgraded UK capacity on critical minerals within countries designated as 'international growth partnerships,' to identify and facilitate opportunities and ensure the UK has a competitive offer. The latter could involve an extended strategic network that brings government, industry, civil society and academic institutions together to support international approaches, both for particular countries and to maintain a regional/global perspective.

Demand-side approaches to critical minerals security (beyond recycling) deserve more attention, given that a lower demand energy system will require relatively less demand for imported critical minerals and low carbon goods with embedded critical minerals.[8] These can be supported by identifying appropriate minerals for demand reduction, and enhanced funding for research on substitution, materials efficiency and product design, as well as circular economy measures.

[6] Bridge, G. and N. Ralph 2026 Securing Materials for Clean Power: Strategy, Geopolitics and Implementation, in UKERC, Review of Energy Policy 2025, January, https://ukerc.ac.uk/publications/review-of-energy-policy-2025/.

[7] Rhodes, A., P. Heptonstall, and J. Speirs. Materials for Energy. 2022. UKERC and Imperial Energy Futures Lab https://www.dx.doi.org/10.25561/100872;

[8] On energy demand-side security, Kuzemko, C et al. 2025 UK Energy Security: Making the Most of Demand-Side Measures, UKERC Policy Brief, https://d2e1qxpsswcpgz.cloudfront.net/uploads/2025/09/170659-UKERC-2025-08-UK-Energy-Security-Final.pdf. On resource efficiency strategies and the contribution to addressing climate change, see Norman, J., Barrett, J., Betts-Davies, S., Carr-Whitworth, R., Garvey, A., Giesekam, J., James, K., Styles, R. and Scott, K. 2021. Resource efficiency scenarios for the UK: A technical report. Centre for Research into Energy Demand Solutions. Oxford, UK. ISBN: 978-1-913299-06-4.

2.2 The new Critical Minerals Strategy sets targets for domestic production, domestic lithium production, recycling, and supply chain diversification. Do these targets reflect the right level of ambition?

2.3 Are the measures set out in the strategy enough to deliver these targets? What further measures, if any, would strengthen its impact?

2.4 Are the funding arrangements adequate? What further measures, if any, would strengthen delivery?

The inclusion of a product recycling target is welcome. Clean power technologies and battery energy storage present particular opportunities for materials circularity.[9] However, it is unclear from the Strategy whether the national percentage targets (for domestic production and recycling) are to be calculated by value or weight. This matters because the list of critical and growth minerals includes bulk materials measured in hundreds of thousands of tonnes (like iron and copper) alongside other minerals used in fractions of these amounts (like niobium and gallium). If measured by weight, potentially both the 10% and 20% targets could be met by action on just one or two minerals (e.g., scrap steel recycling).

Dedicated funding is modest compared with competitors and allies, given the capital intensity of many critical minerals projects. There is some ambiguity over whether the £50million announced in the strategy is an annual commitment or (a far less compelling) total over the Strategy's 10-year horizon.[10] Although critical minerals projects are eligible for other sources of public finance, like NWF and UKEF, these can be difficult to navigate. There has been some outreach and innovation in UK public finance around critical minerals – such as UK Export Finance's Critical Minerals Supply Finance (2024) and Critical Goods Export Development Guarantee (2025) offerings – and further innovation and/or adaptation of available financial tools will be needed. Other governments are securing critical minerals supply using a wider range of financial tools (including offtake agreements, stockpiling and overseas equity participation) and demonstrate a greater appetite for risk.[11]

[9] ORE Catapult. End of Life Materials Mapping for Offshore Wind in Scotland. 2022. https:// cms.ore.catapult.org.uk/wp-content/uploads/2022/07/FINAL-Catapult_ELMWind_ Report-online-version.pdf
[10] Bridge and Ralph 2026, https://ukerc.ac.uk/publications/review-of-energy-policy-2025/
[11] Bridge and Ralph 2026, https://ukerc.ac.uk/publications/review-of-energy-policy-2025/

3. Pictures, graphs and charts Trade and Diversification

3.1 What should be the focus of the international Growth Partnerships announced in the Critical Mineral Strategy?

3.2 How should the UK coordinate its efforts with, and contribute to, multilateral initiatives: (a) the US led Pax Silica, (b) the EU's RESourceEU Action Plan, (c) the G7 Critical Minerals Action Plan, and (d) the Canada led Critical Minerals Production Alliance?

3.3 How should the UK work with global partners to improve environmental, social and governance standards across the critical mineral sector?

Current 'priority partners' named in the Strategy include the US, EU, Canada, Australia, Saudi Arabia, India and Japan, and there are also MOUs or Joint Statements in place with South Africa, Kazakhstan, Zambia, South Korea, Mongolia, and Indonesia. MOUs are purposeful statements of intent, but much of the 'action' they anticipate lies in the private sector beyond Government's direct control. This means that resourcing and catalysing the aspirations of the existing MOUs is key to achieving the Strategy's core objective regarding international partnerships, and to the capacity of these partnerships to deliver the supply chain diversification target.

Resourcing here also includes preparatory 'in-country' work with a diverse range of partners, including civil society organisations able to monitor the creation of standards-based markets and promote engagement with workers, Indigenous Peoples and local communities.[12] Critical mineral supply chains are more than conveyor belts for securing materials or the technologies in which they are embedded.[13] Critical mineral supply chains distribute revenues and risks, and present opportunities to reduce (or exacerbate) social inequalities. In this context, the UK can leverage and share its experience and strengths in international development and conflict sensitivity research around mining, and develop interest-based agreements for mutual benefit. Addressing the socio-economic and environmental

[12] Ralph, N and G Bridge 2025 Critical Minerals 2.0: What Should we Anticipate from the UK's new Critical Minerals Strategy?, UKERC, 18 July, https://ukerc.ac.uk/news/critical-minerals-2-0-what-should-we-anticipate-from-the-uks-new-critical-minerals-strategy/

[13] Bridge, G. and E. Faigen. Towards the lithium-ion battery production network: Thinking beyond mineral supply chains. 2022. Energy Research & Social Science, 89: 1-19.

aspirations of workers and communities along the value chain - within and beyond the UK – will be increasingly central to the sustainability of UK critical mineral supply chains