The UK should be a partner of choice for raw materials production in Ukraine

Inquiry: Critical Minerals

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We are specialists in critical metals production and mediation for sustainable prosperity through mining. Over the years we have researched and worked professionally in ore geology, geological hazard risk and mitigation, security of supply of primary raw materials, complexity in mineral supply chains, project development, mining operations (underground and open pit), business management, critical minerals recycling, the just transition, conflict mediation and post-conflict prosperity-building.

In our submission, we refer to the terms of reference for *'trade and diversification',* and the following question:

- **What should be the focus of the international Growth Partnership announced in the Critical Mineral Strategy?**
- **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?**
- **How should the UK work with global partners to improve environmental, social and governance standards across the critical mineral sector**

Executive Summary

It has long been argued (UNEP, UN Global Compact, The World Bank) that developing a country's natural resource sector is a potential pathway to post-conflict prosperity if the industry is properly managed. However, this has a patchy record of success in countries like Afghanistan, Bosnia Herzegovina, Sierre Leone and DRC. In addition, most of the policy literature addresses the challenges countries face when emerging from intra, rather than inter-state war, such as conflict over the resources themselves.

There is an opportunity for the UK to be a leader when it comes to supporting raw materials production in a country recovering from inter-state war where the issue is less about managing conflict over resources and more about how the sector can contribute to long term, sustainable development.

The UK can be Ukraine's partner of choice for developing the natural resource sector by taking a long-term (100-year), innovative, challenge-driven, collaborative approach that goes beyond considering how mining can be better managed for post-conflict prosperity. Instead, it works with Ukraine to consider what sort of future the country wants and how developing the natural resource sector can help achieve it, in a way beneficial to both.

We recommend focusing on four areas:

- **Setting the global agenda for natural resource-related post-conflict development.**

- **Focusing on Environmental and Social Governance (ESG) as a long-term, sustainable development tool, in line with the goals of the UK/Ukraine 100-year partnership.**

- **Going beyond the large-scale, business-as-usual mining paradigm to accelerate the time-scales of development.**

- **Take whole value chain approaches tailored to new mine development and former mine rejuvenation**

The focus of the international Growth Partnership announced in the Critical Mineral Strategy should therefore be on taking the lead on reconceptualizing and operationalizing ESG and responsible mining in a post-conflict context so that it moves beyond the risk-reduction strategy currently in place and becomes a meaningful tool for contributing to long-term, sustainable prosperity. Through the approach recommended here the UK will

make a significant contribution to developing the robust shared standards and criteria for sustainable mining practice required by the multilateral initiatives it is part of.

Introduction

Developing the mining sector is a national priority for Ukraine and perceived as central to its post-war economic recovery. Both the EU and the US have critical minerals deals with Ukraine that are intended to support the development of raw materials production, but with different emphases to each other.

There is scope for the UK to offer a third way, leveraging its globally renowned academic research, its technological innovativeness and its geological/mining expertise to create a step change in the way Environmental and Social Governance (ESG) is actualized, so that the natural resource sector plays a meaningful role in creating long-term sustainable prosperity in Ukraine.

The UK/Ukraine 100-year partnership, signed in January 2025, provides a framework for this. Developing the natural resource sector in Ukraine will be an integral part of rebuilding Ukraine across most of the pillars of this partnership and should be considered a 100-year endeavour. Prosperity is not just the jobs, social uplift and infrastructure development associated with a mine, but must endure long after a particular operation has shut down.

The timing for this is right. As the UK's Critical Minerals Strategy makes clear, there is an urgent need to strengthen capabilities for mining, refining and recycling to drive economic growth in the UK and increase resilience to supply chain vulnerabilities. This is the case in the Ukraine, too, and there is scope for the two countries to do this together in a way that benefits both.

Mining in Ukraine

The conflict in Ukraine represents a tipping point between past and future mining paradigms. Developing the sector will be an opportunity for the UK and Ukraine to set the global agenda for natural resource-related post-conflict development.

A brief history

During the Soviet era the Donbas region was a major hub for coal, steel and iron production. The centrally planned industrial system collapsed with the break-up of the

Soviet Union and the sector declined. Privatization efforts during the 1990s and early 2000s involved selling vast state assets that led to a massive concentration of wealth among a few individuals, creating a powerful oligarchy. Recent reforms and wartime conditions have weakened the influence and control of sanctioned oligarchs, with state-level, asset seizures including the Mykolaiv Alumina Plant.

Mining remains a significant part of the Ukrainian economy, with a strong iron and steel sector and extensive industrial mineral extraction operations for kaolin, limestone, gypsum, clay and quartz sand. However the industry has been significantly affected by the war with production falling in the face of challenges such as rising electricity costs, higher logistics costs, financial instability, security risk and a shortage of qualified personnel due to mobilization and migration[1].

Ukraine can be described as a post-socialist, conflict-affected resource economy, not a resource frontier. There is potential to develop greenfield projects (Appendix; Table 1) in areas with no history of mining, and the US-Ukraine critical minerals deal prioritizes new projects to build up future supply chains. However, there are brownfield sites (Table 1) to consider too. These are active or former mine sites that can be redeveloped and remediated.

Developing the natural resource sector is a priority for Ukraine but Ukraine does not want to be a raw materials larder for the rest of the world. Instead, it aims to position itself as a centre for critical minerals mining, processing, downstream manufacturing, and recycling in a way that is integrated within European and global supply chains.

Mineral resources in Ukraine

Ukraine possesses the largest known deposits in Europe of titanium, graphite, manganese, and uranium, and the third largest lithium resource (Appendix; Table 2), in addition to iron ore and coal. Titanium, graphite, manganese, lithium, and iron ore are all assessed as critical by the UK[2].

Most of the geological exploration in Ukraine was carried out during the Soviet period and, while it established the size of certain mineral deposits (the resources), it did not explore the economic viability of extracting them (the reserves). Key reforms are needed to the exploration process including digitalizing the national resource database[3], adopting internationally recognized classification systems, modernizing the regulatory

[1] https://gmk.center/en/posts/what-is-happening-in-the-mining-industry-in-the-fourth-year-of-the-war/

[2] https://www.ukcmic.org/downloads/reports/ukcmic-2024-criticality-assessment.pdf

[3] A Ukraine-Canada collaboration is underway: https://canada.mfa.gov.ua/en/news/ukraine-and-canada-officially-launch-cooperation-geology-and-mineral-resource-management

framework to reflect global best practice, and streamlining the permitting process for new projects, including initiatives to reprocesses mining waste[4].

Being a Partner of Choice for Raw Materials Production In Ukraine. Offering a 'Third Way'

Ukraine has signed critical minerals deals with the United States (the US/Ukraine Development Fund) and the EU (Ukraine – EU Strategic Partnership on Raw Materials). There is an opportunity for the UK to offer a third approach that is different and complementary to both.

The US/Ukraine Reconstruction Investment Fund (URIF)

The URIF is a jointly managed equity fund created to invest in strategic sectors such as technology, energy, and minerals in order to support Ukraine's reconstruction and make Ukraine's mineral resources available to the US. Under the terms of the deal Ukraine will put 50% of future mining revenues from royalties, fees and licenses into the fund and give US companies preferential access to Ukraine's rare earth elements, titanium, graphite, lithium and energy reserves.

The URIF recognizes Ukraine's obligations related to EU accession, its sovereignty over its resources, and its right to determine the areas within its territory to be made available for mining.

The first of three investments has recently been announced, into Sine Engineering, a Ukrainian dual-use military technology company, and a US led consortium has recently been awarded the rights to the Dobra lithium deposit.

Under the terms of the URIF mining-related post-conflict reconstruction is understood solely in terms of investment and the privileging of US companies, rather than through the mutual development of best practice. The likely outcomes will be (1) a focus on large-scale mining and the extraction of hydrocarbons, rather than context-sensitive innovation in the resource sector (2) value chains that may prioritize US interests and (3) the institutionalization of US priority access and investment[5].

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[4] https://mepr.gov.ua/wp-content/uploads/2025/07/20250711_CRM-whitepaper_final_SCREEN.pdf
[5] https://www.globsec.org/what-we-do/commentaries/strategic-autonomy-starts-ukraine-eu-must-move-faster-critical-raw

The URIF aligns with the dominant global mining paradigm within which it can take between ten to twenty years to bring a mine on-stream and millions, if not billions of dollars. The system is reinforced by a financing model that favours a long mine life, large reserves, and experienced operators to reduce risk.

The Ukraine/EU Strategic Partnership on Raw Materials

This partnership was launched in July 2021 and establishes a framework for collaborating on critical raw materials. It has a focus on regulatory alignment, transparency and Ukraine's integration into EU value chains, with Ukraine sustainability and environmental standards brought in line with EU standards. There is also an emphasis on innovation in this partnership particularly with regard to refining and recovery technologies and recycling.

The role of raw materials production in post-conflict reconstruction is understood in terms of Ukraine's accession to the EU in a way that will reduce the EU's reliance on third-country suppliers for the critical raw materials Ukraine possesses.

The UK/Ukraine 'Third Way'

The UK can offer an alternative to the transactional approach taken by the US and the integrational approach offered by the EU. There is scope for the UK to take a leadership role when it comes to reconceptualising how developing a country's natural resource sector can contribute to long term, equitable, post-conflict development. This will not just be through investment, or integration but through re-thinking the sector itself, beyond the large scale 'business-as-usual' model already available to us. The UK has a proven track record of research into the alternative scales of mining (e.g. Johnson et al., 2024; Moore et al., 2021), which can be used to accelerate development ahead of the large-scale mining paradigm.

Recommendations

1. **Set the Agenda:**

- Take a long-term approach to natural resource related prosperity in line with the UK/Ukraine 100-year partnership. It is not just about the short-term jobs, social uplift, and infrastructure development that can come from mining, when it starts, but how the natural resource sector can contribute to achieving long-term, sustainable and equitable prosperity.
- Expand the just transition concept beyond its current focus on coal, oil and gas. All mining operations – including those extracting critical minerals - have a limited

lifespan as ore becomes inaccessible or uneconomical to extract. Expanding the just transition concept means making sure there are no stranded communities left behind when mines close down.

- Take a broad-based approach to natural resource related post-conflict development in line with the UK/Ukraine 100-year partnership. While the UK and Ukraine have agreed to collaborate on building a greener transport network, and green infrastructure, they can also collaborate on developing a greener natural resource sector in both countries. Make it explicit that developing the natural resource sector is part of the UK's commitment to support Ukraine's ambitious social reform agenda in a way that benefits both Ukraine and the UK.
- Use the UK's presidency of the G7 and the UK-hosted G20 conference as opportunities to guide the global agenda on raw materials production and prosperity in a post-conflict environment, noting that the partners in Ukraine alliances are also partners in UK alliances. Use these platforms to promote Ukrainian ownership and operation of mines sites.

2. Focus on Environmental and Social Governance:

- Position ESG as part of post-conflict reconstruction infrastructure. Create a step change in the way ESG is conceptualised and actualized, from a mining risk management tool to a mechanism for achieving real-terms societal reconstruction for mining affected communities emerging from conflict.
- Recognise that ESG changes character in greenfield and brownfield development and will require different approaches. Research is needed to create greenfield and brownfield decision-making frameworks aligned with, and going beyond, the United Nations Resources Management System[6] toolkit.

3. Go beyond the dominant large scale mining paradigm:

- Establish a route by which Ukrainian and UK students and scholars can mobilize to collaboratively innovate, with particular reference to how mining can support a just transition in a post-conflict scenario. A whole system approach should be fostered, where sabbatical and exchange programmes encompass the policy and regulation research needed for cultural preservation and societal reconstruction, as well as the technological aspects of exploration, extraction and remediation. The transdisciplinary, public/private, multinational challenge-led research should lead innovation within the industry.
- Explore the role of SMEs for smaller footprint extraction, the rapid start-up of operations and for staging towards larger projects. Knowledge and expertise in this area already exists within the UK. Work with the EU and Ukraine to streamline regulations for SMEs and address permitting delays
- Support Ukraine's drive to improve resource efficiency and circularity by focussing on evaluating and extracting mineral content from mining waste at current and

[6] https://unece.org/sites/default/files/2021-05/2017886_E_ECE_ENERGY_134_WEB.pdf

closed operations, with the simultaneous ambitions of reconditioning former sites and generating revenue to aid in the redevelopment of sites.

4. **Take a whole of value chain approach.**

- The UK can position itself as a long-term, strategic partner across the entire value chain – working with Ukraine to develop its primary (mining) and secondary (recycling) raw materials sectors in alignment with the UK Critical Minerals Strategy. The UK and Ukraine both urgently need to develop their raw materials sectors, for growth and as part of post-conflict reconstruction. How can they do this together in a way that benefits both?
- Leverage the world-leading knowledge and experience that already exists in the UK. For example, the British Geological Survey (with their partnerships for development P4D programme) , Camborne School of Mines at Exeter University (working across the mining value chain), the Royal School of Mines (Imperial College), Queen's University Belfast (a leader in sustainable metals and minerals recycling), the Institute for Global Prosperity at UCL (working on post-conflict development in Ukraine), the Natural History Museum, London (specialized mining consultancy and geometallurgy services), Manchester University (advancing critical mineral processing), SRK (mining services from exploration to mine closure), ERM (environmental and social consultancy), multiple consultancies of the Cornwall Mining and Geo-Resources Alliance with expertise from drilling and blasting to remediation, Levin Sources (consultancy focussing on small mining businesses), IOM3 (Institute of Materials, Minerals & Mining), the London Metal Exchange (LME) among others.
- Create a database of UK providers that covers each phase of the value chain and build bridges for development work. For example, Rokbak (builds articulated haulers in Scotland), Rados International Services Ltd (ore sorting technologies), SW Metallurgical Services (build gravity separation spirals), Holman Wilfley Global Gravity Solutions (build shaking tables). Enable

Summary

In this submission, we referred to the terms of reference for *'trade and diversification'*, particularly the questions relating to International Growth Partnerships, coordination efforts and working with partners to improve environmental, social and governance standards across the critical mineral sector.

The UK can offer an alternative to the transactional approach taken by the US and the integrational approach offered by the EU to be a partner of choice for Ukraine as it develops its raw materials sector. There is scope for the UK to take a leadership role when it comes to reconceptualising how developing a country's natural resource sector can

contribute to long term, equitable, post-conflict development. This will not just be through investment, or integration but through re-thinking the sector itself.

The aim of creating long-term sustainable businesses in a way that aligns with the UK/Ukraine 100-year partnership will be supported by going beyond the large-scale mining 'business-as-usual' model already available and working along the full value chain from exploration, to mining, processing, manufacturing and re-cycling with. Specific recommendations are designed around: (1) how mining contributes to post-conflict whole systems development, (2) how approaches are tailored to development of greenfield and brownfield mining sites, (3) how the scales of mining operation can be used for staging and continuity of post-conflict development of industrial foundations. The UK's presidency of the G7 and hosting of the G20 summit in 2027 are opportunities to set the global agenda on raw materials production and prosperity in a post-conflict context.

Further resources

Johnson C, Moore, KR, Johnson D, 2024. Maturing the concept of small-scale mining (SSM) in the Global North using concept evaluation criteria on the placer mining industry in Yukon, Canada. Resources Policy 91: 104978x

Moore KR, Moradi S, Doyle K et al., 2021. Sustainability of switch on-switch off (SOSO) mining: Human resources development tailored to technological solutions. Resources Policy 73:102167

Moore KR, 2026. Is the emerging systemic reliance on brownfield expansion a mining 'bubble'? One Earth 9(2): 10610

Moore KR and Storrie B, 2025. Mineral Security is Energy, Economic and Societal Security. Written submission from Dr Kathryn Moore and Dr Bridget Storrie (ECO0034) https://committees.parliament.uk/writtenevidence/141792/pdf

Appendix: Information Tables

Table 1. A comparison of some characteristics of greenfield development and brownfield expansion (Moore 2026)**.**

	Greenfield development	Brownfield expansion
Discovery and resource definition	New discovery rate by exploration is decreasing overall, but remains important for technology metals that were not historically extracted in large quantities.	Resource definition extended at world-class deposits as increasing commodity prices & innovation enable a decrease in the economic cut-off grade of ore.
Competition in global market	New discoveries may have strategic support but the resource valuation may yet fail to excite multinational mining companies with large overheads, instead relying on bespoke entrepreneurial and smaller scale mining operations.	The efficiencies of scale reduce the unit cost of production in the largest active 'world-class' ore bodies. Former mining districts were rarely exhausted and have infrastructure and workforce availability, making them attractive propositions.
Development to production	High CAPEX investment is required to establish necessary infrastructures, and a return on investment may be significantly delayed pending technical, regulatory or societal challenges.	Existing infrastructure may be fit for purpose and offset CAPEX investment, or investment may see a return within a short time-frame if production can be rapidly established.
Societal acceptance	Reconciliation is needed to address oppositions & mitigate the marginalisation of local cultures & traditional livelihoods; fears about past industrial misadventures & present-day poor practices; frustrated expectations for local employment by automated mining.	Appropriately trained workforces & community relations may be well-established for some mines. Mining may already form part of local culture embedding general (though never universal) support. Conversely, communities may be fatigued by the cumulative loads of long-term exposure to mining.

Table 2. Selected Mineral Resources of Ukraine

Commodity	Ukraine deposits	Production status
Gallium	By-product of bauxite refining at Nikolaev alumina plant in southern Ukraine	1.3% in 2019; 0.9 % global production, 2021*
Germanium	By-product of coal and zinc (Donbas and Lviv-Volynsky basins) residues, primarily from the Zaporizhzhia Titanium Magnesium Plant.	0.6 % global refined production*
Graphite	20 million tonnes of proven reserves and potential resources (up to 230-500 million tons of ore) with key deposits in the Ukrainian Shield.	Zavakivsky mine operating. Proven viability in Odea & Kirovohrad regions.
Lithium	Contract awarded to a US-registered company to develop the Dobra lithium project	Planned
Manganese	Extraction from the Nikopol deposit by the Pokrov Mining and Processing plant (GOK) and Marganets GOK	3.1% global primary production*. Significant reduction due to war.
Rare earth elements	Ore deposits located in Donetsk, Zaporizhzhia and Zhytomyr regions.	Prospective. No commercial operational rare earth mines.
Titanium	Approximately 5% of global reserves, mining concentrated in the Zhytomyr, Dnipropetrovosk and Kirovohrad regions: ilmenite concentrate, metallic titanium powder & byproducts	6.5% global primary production in 2021*, reduced by > 93% in early 2025.

* 2021 data from the Resource Management Information System (RMIS) of the EU quantifies.