SNACK SERIES

TEAM DEFENCE INFORMATION
www.teamdefence.info

Session 5- 6th November 2025

CRITICAL RAW MATERIALS

SOVEREIGN RESILIENCE IN THE CRM SUPPLY CHAIN

Building the UK's Sovereign Resilience

Valerie Findlay from Pure Alchemy presented an in-depth analysis of the UK's dependence on China for critical mineral processing and refining. She emphasized that decades of outsourcing have eroded domestic capability, leaving the UK vulnerable in sectors vital to defense, clean energy, and technology. Findlay called for a coordinated national approach to rebuild midstream capacity and achieve sovereign resilience – combining legislative support, technological innovation, and joint action between government, industry, and financiers.

Understanding Current Supply Chain Vulnerabilities

The UK and much of the Western world rely heavily on China for refining and separation of rare earth elements and other critical raw materials. This concentration of control presents both strategic and economic risks. Findlay explained that China's near-monopoly on refining capacity has been built through decades of state-backed investment and strategic industrial policy. To counter this, she proposed a similar coordinated approach in the UK – integrating public-private financing mechanisms, streamlined permitting, and government-supported industrial strategy.

Technology for Material Recovery and Environmental Renewal

Pure Alchemy's vapor metallurgical technology provides a breakthrough solution to extract and refine metals from industrial waste streams – including coal fly ash, bauxite residue, and mine tailings – using zero-emission energy. The process turns environmental hazards into valuable resources, advancing both national resource security and sustainability goals. By transforming waste liabilities into domestic mineral assets, Pure Alchemy's model aligns commercial, environmental, and strategic interests.

Strategic Database of Industrial Waste Streams

Ryan Findlay presented a proposal to create a comprehensive UK database cataloguing legacy and current industrial waste streams, mapping their metal content and potential extraction value. This "inventory of hidden resources" would serve as a long-term planning tool for critical and strategic materials, enabling rapid response to evolving industrial and geopolitical needs. The initiative seeks collaboration with universities and research organizations to gather and analyze data.

Legislative and Policy Innovation

Findlay urged policymakers to adopt an industrial framework similar to that used successfully in Asia, blending government-backed financing, tax incentives, and infrastructure investment to attract private capital into mineral processing projects. She emphasized that the UK must reduce regulatory bottlenecks that delay strategic developments, noting that "policy agility" and "regulatory certainty" are as essential to resilience as technology itself.

Integrating Technology and Environmental Remediation

Pure Alchemy's vapor metallurgical technology provides a breakthrough solution to extract and refine metals from industrial waste streams – including coal fly ash, bauxite residue, and mine tailings – using zero-emission energy. The process turns environmental hazards into valuable resources, advancing both national resource security and sustainability goals. By transforming waste liabilities into domestic mineral assets,

International Collaboration and Stakeholder Engagement

A final invitation was extended to stakeholders to visit Pure Alchemy's demonstration site in Teesside, where the technology funded through current grants is being piloted. These site visits are intended to build transparency, strengthen partnerships, and encourage deeper engagement from industry and government.

Next Steps

Further market development activities will include sharing insights from the Japan trade mission to support upcoming international engagements, as well as expanding conversations with Rolls-Royce on potential collaboration opportunities

Sigh up to the next snack series here: