Snack Series Session 3 Summary- 30th September 2025

UK Magnet Supply Chain Collaboration Strengthens Circular Economy

Leaders from Ionic Technologies, Less Common Metals (LCM), and HyProMag came together this week to present a comprehensive overview of the UK's rare earth magnet supply chain, highlighting efforts to build a resilient, circular system that supports both industry and defence.

The three companies demonstrated how their activities span the full supply chain: **Ionic Technologies** focuses on hydrometallurgical recycling to produce rare earth oxides, **LCM** converts oxides into specialist alloys, and **HyProMag** manufactures magnets from both virgin alloys and recycled feedstock. Working collaboratively, the group aims to reduce reliance on imports and strengthen domestic capacity.

Discussions explored the technical processes underpinning magnet recycling, including Ionic's long loop hydrometallurgical recovery, LCM's electrolysis-based alloy production, and HyProMag's patented hydrogen processing method. These innovations are central to scaling up UK production and enabling the reuse of critical materials in high-value applications such as electric vehicles, wind turbines, and defence platforms.

Speakers emphasized the strategic importance of securing rare earths amid global competition and China's market dominance. Challenges include sourcing sufficient feedstock, preventing the export of valuable end-of-life magnets, and ensuring UK policy supports domestic recycling. Future opportunities were also identified, such as designing new equipment with disassembly and reclamation in mind.

Collaborative initiatives are already underway, including an £11 million Advanced Propulsion Centre-funded project involving major automotive and defence partners, aimed at validating the UK's supply chain and scaling up capacity.

Engagement with the UK Ministry of Defence, DBT, and other policymakers is ongoing, with industry leaders calling for stronger regulatory support and investment to secure a sustainable, sovereign magnet supply chain for the UK.

Key Discussion Points

1. Supply Chain Structure

- Confirmed that the UK rare earth magnet supply chain is effectively covered by three core companies: recycling and oxide production, alloy production, and magnet manufacturing.
- Agreed that collaboration between these stages is essential to ensure resilience and domestic value creation.

2. Recycling Processes

- Noted differences between short loop (fast, less control) and long loop (slower, higher purity) recycling methods.
- Agreed the need to pursue both approaches to balance speed of return with quality requirements for high-specification applications.

3. Production Capabilities & Expansion

- Confirmed ongoing expansion of alloy and magnet production capacity, with targets of supporting 1,000 tonnes of NdFeB magnets annually.
- Endorsed continued investment in UK-based facilities alongside international partnerships.

4. Strategic Importance & Policy Context

- Recognised rare earths as critical to national resilience, with risks from export controls and global competition.
- Agreed to align activities with UK and NATO critical mineral strategies and to maintain active engagement with government.

5. Feedstock Sourcing

- Acknowledged that significant volumes of end-of-life magnets will be required to meet recycling targets, with imports necessary in the short term.
- Agreed to explore measures to reduce the export of valuable feedstock outside the UK.

6. Defence & Policy Engagement

- Confirmed the importance of ongoing dialogue with defence stakeholders to align with national priorities.
- Noted that stronger policy and regulatory support would aid the growth of domestic recycling businesses.

7. Design for Recycling

- Agreed that future industrial and defence platforms should incorporate design-for-disassembly principles to facilitate magnet recovery.
- Recognised that procurement processes could include recyclability and reclamation assessments.

8. Risks & Competition with China

- Identified risks related to reliance on Chinese equipment and scale of production.
- Agreed to explore alternative ownership and procurement models to ensure material retention in the UK.

9. Collaborative Initiatives

- Highlighted the £11 million Advanced Propulsion Centre-funded project to validate and scale up the UK rare earth magnet supply chain and the potential opportunity for the Defence sector to lean in.

10. Recycling Timelines & Yields

- Agreed that short loop processes can provide magnets within weeks, while long loop methods are necessary for high-purity outputs.
- Recognised the need for further data on recoverable materials from decommissioned assets.

Defence Sector Strategic Actions

1. Strengthen Engagement and Alignment

- Maintain active dialogue between magnet supply chain companies and defence stakeholders (MOD, DBT, NATO) to ensure recycling and production efforts support national defence strategies.
- Align industry initiatives with the forthcoming UK critical minerals strategy and NATO guidance.

2. Promote Policy and Regulatory Support

- Advocate for stronger UK policies to prevent export of critical end-of-life magnets and retain material for domestic recycling.
- Encourage introduction of recycling content targets and stockpiling measures relevant to defence applications.

3. Showcase Recycled Materials

- Demonstrate performance and reliability of recycled rare earth magnets to defence procurement teams to build confidence in adoption.
- Highlight sustainability and resilience benefits of recycled materials in presentations and defence engagement forums.

4. Design for Recyclability

- Integrate design-for-disassembly principles into defence equipment specifications (e.g., coatings, assembly methods, ease of magnet removal).
- Incorporate end-of-life reclamation assessments into defence procurement and lifecycle planning processes.

5. Support Domestic Supply Chain Scale-Up

- Explore opportunities for defence procurement to de-risk or co-fund capacity expansion of UK-based recycling and manufacturing facilities.
- Encourage partnerships with domestic suppliers as part of supply chain resilience strategies.

6. Address Global Risks and Competition

- Mitigate risks from reliance on Chinese equipment and supply chain dominance by supporting development of UK and allied alternatives.
- Consider ownership and procurement models (e.g., OEMs retaining end-of-life material ownership) to ensure valuable materials are recycled domestically.

In short: The defence sector is expected to engage, influence policy, adopt design-for-recycling practices, showcase and validate recycled magnets, and support domestic capacity expansion to secure sovereign supply of critical materials.