# Defence Industrial Strategy Statement of Intent: IOM3 response

## About IOM3

The Institute of Materials, Minerals & Mining (IOM3) is a professional engineering, environmental and scientific institution, a registered charity and governed by a Royal Charter. IOM3 supports professionals in materials, minerals, mining and associated technical disciplines to be champions of the transition to a low-carbon, resilient and resource efficient society. With around 15,000 members, IOM3 brings together expertise across the full materials cycle including in defence, safety and security.

## IOM3 response

Development of an effective Defence Industrial Strategy (DIS) is a critical step in ensuring national security, economic resilience, and technological leadership in an increasingly complex global landscape. IOM3 welcomes the Statement of Intent (SOI) and indication of Government's direction of travel. However, a more integrated and long-term approach to materials, supply chain resilience, research investment, and skills development in materials science and engineering is required to fully realise the Strategy's ambitions.

Materials and minerals, including advanced materials and critical materials underpin the UK's defence capabilities. Secure supplies and sustainable management of materials and minerals will be fundamental to national security and a high-growth economy.

To build the long-term partnerships between government and businesses set out, invigoration of the sector through greater certainty is required. Long-term spending and skills development are a good start towards this. The targeting of skills shortages will be a key pillar of an effective strategy and will benefit from close collaboration with Skills England.

The emphasis on stakeholder engagement in the SOI is positive and IOM3 welcomes the inclusion of a range of stakeholders in the Defence Suppliers Forum.

Areas that require greater focus and consideration in development of the DIS include:

1. Driving Innovation in (Advanced) Materials

The next generation of defence systems will be defined by breakthroughs in materials science. However, to achieve this, greater government support is needed for fundamental and applied research in a variety of areas including but not limited to:

- Lightweight and high-strength materials for increased fuel efficiency and performance in aerospace and armoured vehicles.
- Quantum and photonic materials to enable secure communications, sensing, and computing.
- Self-healing and adaptive materials that can extend the operational lifespan of military assets.

Fundamental materials science research will be essential to stimulating investment and activity in growth driving sectors, concentrating efforts in cities and clusters with the highest growth

potential, and bringing forward sector-specific and cross-cutting policies that support businesses to invest.

IOM3 recommends:

- Research and innovation policy should specifically target fundamental materials developments research actions for example through Innovate UK, EPSRC, DASA, DSTL, UK Space Agency. Funding mechanisms should be expanded to include more materials-focused research in order to bring promising technologies to maturity.
- The socioeconomic impact of materials development and usage (often inherently unsustainable sources and poor recyclability) should also be targeted through relevant funders like ESRC and AHRC. This will also have the positive effect of priming the skills pipeline needed in the future.

2. Developing UK supply chains

Advanced manufacturing is dependent on international supply chains for a lot of key materials, for example polymer and ceramic composite constituents like carbon or silicon carbide fibres, polymer matrix precursors for ceramic matrix composites. These composite materials make up the structural components of significant amounts of defence infrastructure like missiles, rockets, satellites and small naval vessels.

IOM3 recommends:

- Development of these supply chains in the UK where appropriate. This will require improving commercial viability and developing the expertise required.

3. Securing Critical Materials Supply Chains

One of the most pressing challenges in defence manufacturing is the secure and sustainable supply of critical materials. Advanced defence platforms—from hypersonic missiles to next-generation stealth technology—rely on minerals with global supply chains.

IOM3 recommends:

- Establishing robust global supply chains for critical materials to buffer against geopolitical supply disruptions.
- Investing in domestic extraction and recycling capacity where UK firms can leverage their technical expertise.

4. Support for SMEs

UK science and technology startups and SMEs are regularly purchased by overseas investors/companies at the point where the product or company is scaling up. Developing domestic industry and supply chains will be a key element of delivering the strategy.

IOM3 recommends:

- Putting in place mechanisms to address the causes of this and provide incentives to stay in the UK.

In addition, SMEs may benefit from additional support in understanding export control policies. Considering that a large amount of Tier 1 and 2 suppliers for materials are SMEs, a lack of understanding can hinder their ability to operate with international supply chains (often in China and India) for the purposes of R&D or they operate without understanding of the export control procedures. This endangers the UK's competitive advantage and national security.

IOM3 recommends:

- Activities and/or resources to ensure SMEs fully understand the intricacies of how and when export control policies apply.

5. Strengthening the Materials Science & Engineering Workforce

A skilled workforce is essential to implementing the DIS. The UK faces a shortage of materials scientists and engineers with expertise in metallurgy, nanotechnology, and advanced manufacturing. The number of these graduates continues to fall in the UK and reports suggest that a lack of diversity and inclusion best practices in materials related fields are a significant contributor to poor retention. This is particularly problematic with SMEs. Without addressing this skills gap, even the best-laid industrial strategies will struggle to deliver.

IOM3 recommends:

- Expanded university funding for materials science programs.
- Apprenticeship and reskilling initiatives to attract professionals into defence materials development.
- Better consideration of how to keep high skilled international graduates in the materials and manufacturing industry in the UK and addressing visa challenges.

6. Explicit alignment with net zero

Whilst a higher-level intent to align the strategy with net zero goals is apparent, this doesn't translate through the SOI. There is currently insufficient interconnectivity with respect to embedding these goals. This could be better included when considering procurement and the general practices of organisations as a means of driving the industry meaningfully towards net zero in particular. An emphasis on specific metrics would be good.

## Conclusion

The DIS will set out a vision for a more resilient and technologically advanced UK defence sector. However, to fully achieve these goals, the government must place greater emphasis on funding breakthrough materials research, securing critical material supplies, and addressing workforce shortages in materials science and engineering.