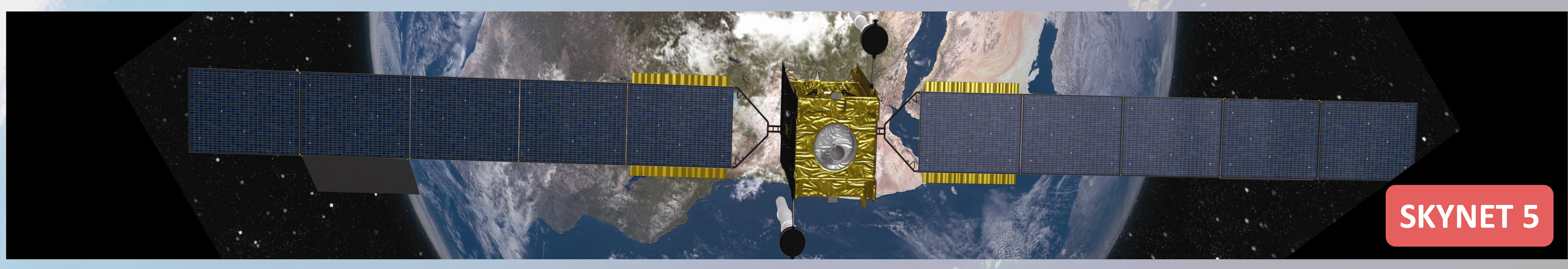
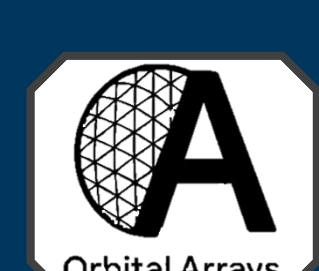


# From Zero Gravity to Zero Waste: Advancing Safe and Sustainable In-Space Manufacturing for the UK Space Economy

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## Space Underpins 18% of UK GDP — But Remains Strategically Vulnerable

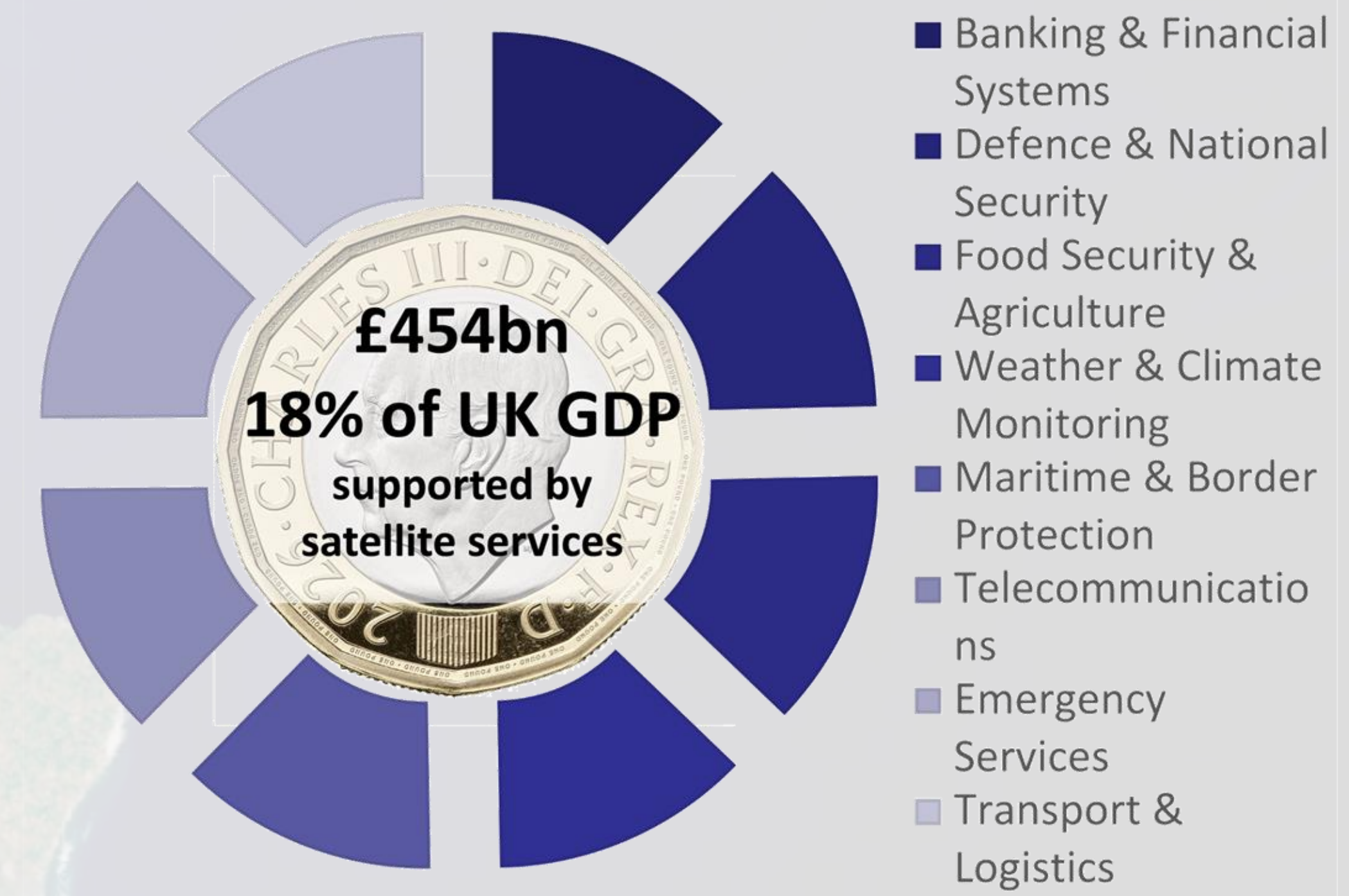
Space is no longer exploration alone. It underpins daily life and national resilience. The UK space sector generates £18.6bn annually and supports 55,500+ jobs and **18% of UK GDP (£450+ billion)** relies on satellite services

## Designed for Launch, Not for Orbit

Spacecraft are optimised for the first 10 minutes of launch — yet must operate for up to 20 years in orbit.

- Rockets impose strict mass and volume limits.
- Structures must survive extreme vibration and acceleration.
- Antennas, radiators and arrays are folded to fit inside fairings.

In addition, UK sovereign missions require foreign heavy-lift capability (mainly Space X) to reach orbit. **Launch constraints limit in-orbit performance, scalability and sovereign flexibility.**



[https://www.gov.uk/government/publications/factsheet-the-uk-space-sector/factsheet-the-uk-space-sector?utm\\_source=chatgpt.com#fn:1](https://www.gov.uk/government/publications/factsheet-the-uk-space-sector/factsheet-the-uk-space-sector?utm_source=chatgpt.com#fn:1)

## Launch the payload with any rocket -> Build the infrastructure in orbit.

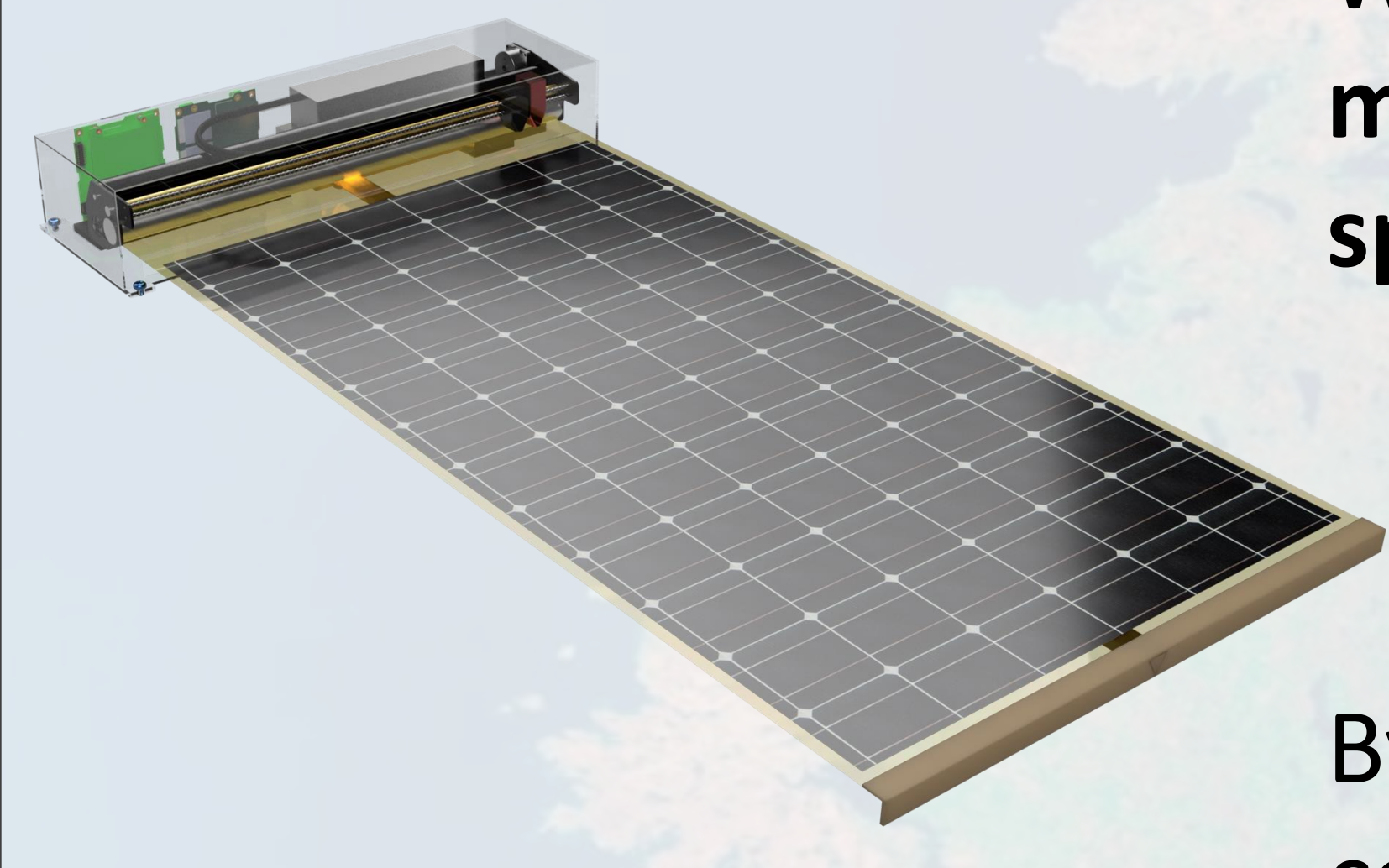
Launch with any rocket

Optimize for Space

Save 30% Cost/Price

Upgrade directly in orbit

## A Sovereign and Competitive Edge for the UK



We are developing an **autonomous orbital manufacturing module** that prints **full-scale spacecraft structures directly in space**. After launch, the system fabricates beyond fairing limits:

- Large antenna arrays
- Large solar panels
- High-efficiency thermal radiators

By building structures in microgravity, spacecraft are no longer constrained by rocket size.

Zero-G flight demonstration



Importance of ISAM and safety



World 1<sup>st</sup> safety qualification facility



## Leadership and Impact

This work is building UK capability in safe and sovereign in-space manufacturing.

- **£445,000** secured to date from the UK Space Agency and national innovation programmes
- Development of the UK Space Agency-funded **Multi-Purpose Environmental Chamber (MPEC)** for space-condition qualification
- Microgravity validation via parabolic flight testing
- National media coverage highlighting the strategic relevance of orbital manufacturing

The next phase aims to scale this capability with first commercial product in orbit through a **£3 million seed round**.

Space 3d printer being tested in our unique MPEC facility duplicating space conditions and tested in Zero-Gravity.

