



**UKAEA**

**Fusion Futures - Industry Capability  
Programme**

**14th Suppliers' Event**

**24<sup>th</sup> April 2025**





**UKAEA**

# Introduction to the Programme

## Fusion Futures - Industry Capability

**Stephen Wheeler**

Executive Director for Fusion Technology, Tritium Fuel Cycle & Industrial Engagement



## Fusion industry body predicts £31 trillion opportunity

News

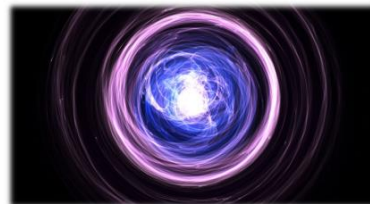
A new policy report from the Fusion Industry Association (FIA) predicts a long-term global opportunity of £31 trillion, with £5 billion up for grabs in the next five years.



The members of the Fusion Industry Association (FIA) will spend billions of pounds in the next five years, with many companies forecasting spends of well over £100M by 2029, and some far higher. FIA believes that £1 Bn+ of this could credibly be drawn to the UK

### Towards Fusion Energy 2023

The next stage of the UK's fusion energy strategy



October 2023

*There are a wide range of estimates as to what share of the global energy market fusion will capture and the resulting levels of investment as a consequence of this. An average of these estimates implies a global fusion market of \$6.9 trillion in the future. One nation would only be able to capture a proportion of this but as a global leader in fusion, the opportunity for the UK is enormous*

# Priming capability & capacity

Stimulate industry **capacity growth** through access to large value work packages, ensuring companies are of sufficient size to support future fusion powerplant development

Prompt industry **capability growth** in areas which have been identified as significant for future fusion powerplant development, through work packages including workforce upskilling.

# “ Capability ”

**Ability to efficiently and effectively produce goods and services**



## Competence

- Knowledge
- Technical Expertise
- Skills
- Tools

## Facilities

- Production
- Test
- Development

## Relationships

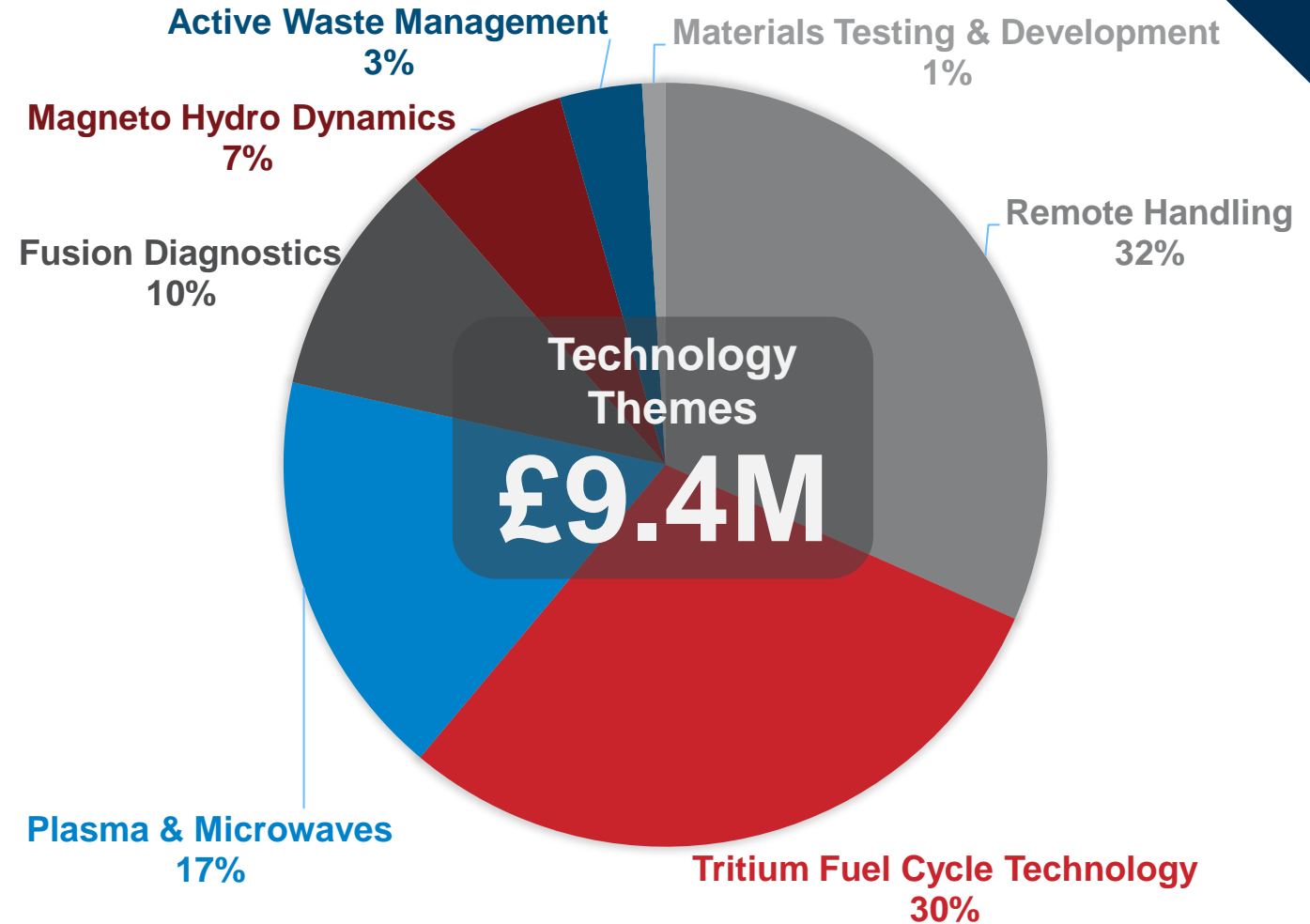
- Supply Chain Networks
- Partnership and collaboration networks

## Creation of IP

- Development of UK proprietary IP

# Year 1 Portfolio – Technology Themes

Technology Theme	FY 24/25 Spend
Remote Handling	£2,690,000
Tritium Fuel Cycle Technology	£2,930,000
Plasma & Microwaves	£1,833,000
Fusion Diagnostics	£1,004,000
Magneto Hydro Dynamics	£575,000
Active Waste Management	£287,000
Materials Testing & Development	£81,000



# Year 1 Industry Capability Key Figures

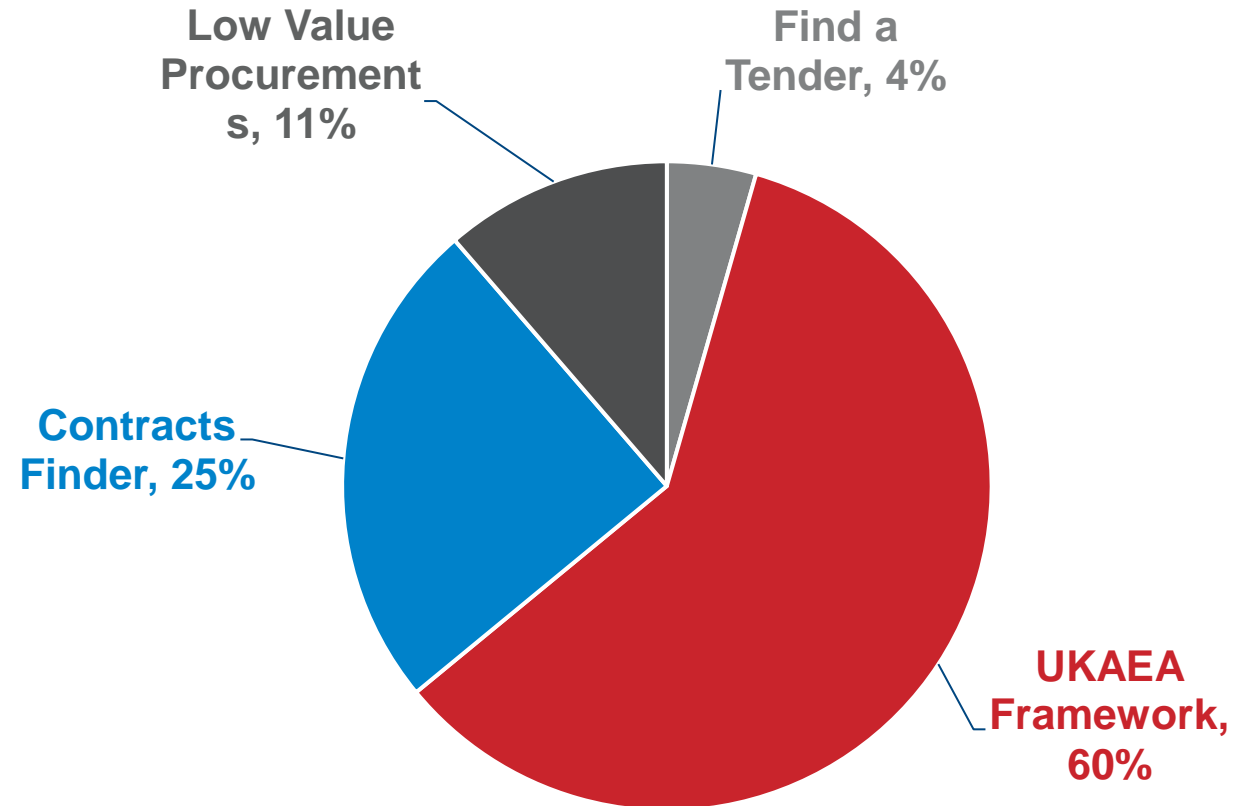
**36** projects

**>285** individual contracts

**~£9.4M** awarded

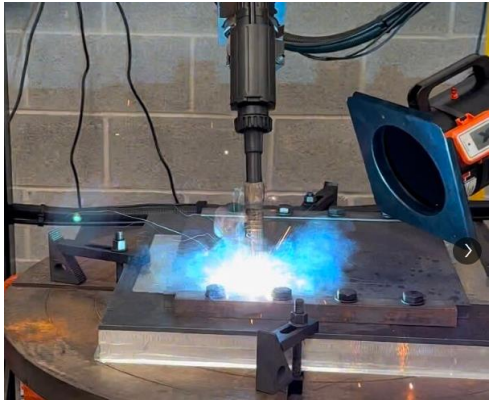
**>80** companies involved

Overall Year 1 Industry Capability Portfolio











# The FF programme offers a unique opportunity for direct exposure to fusion related work



*"Participating in the Fusion Future Programme has been an incredibly successful experience for M5tec during its first year.*

*We have had the opportunity to work on **8 projects** in total.*

*These projects have given at least **12 of our employees** direct exposure to fusion-related work, including some who are experiencing it for the first time."*

# Partnering with UKAEA drives global interest and investment



*“Fusion future funding helps provide confidence in the sector and our continued growth plans in fusion overall.”*

*“Our UK fusion portfolio has become a **hub for fusion knowledge and expertise**, with **foreign clients increasingly interested in investing in our capabilities...**”*



# Technology Themes

## FUEL CYCLE

The majority of fusion powerplants will use tritium but radiological challenges of handling tritium present barriers for industry. The proposed focus is on development of industry access to radiologically active test facilities and experts, alongside development of key components, to enable development of design and build services by UK industry

## MAGNET TECHNOLOGIES

High temperature superconducting magnets are core technology across all magnetic confinement fusion devices. This theme is at the early stages of scoping, with the aim of supporting development of a full UK supply chain for fusion magnets, and associated subsystems, maturing in time for fusion plant roadmaps.

## UNDERPINNING TECHNOLOGIES

There is a wide range of underpinning technologies that need development in industry to enable access to larger thematic opportunities. This theme will focus on developing technologies and capabilities within UK industry, ahead of fusion plant roadmaps.

## BLANKET ENGINEERING

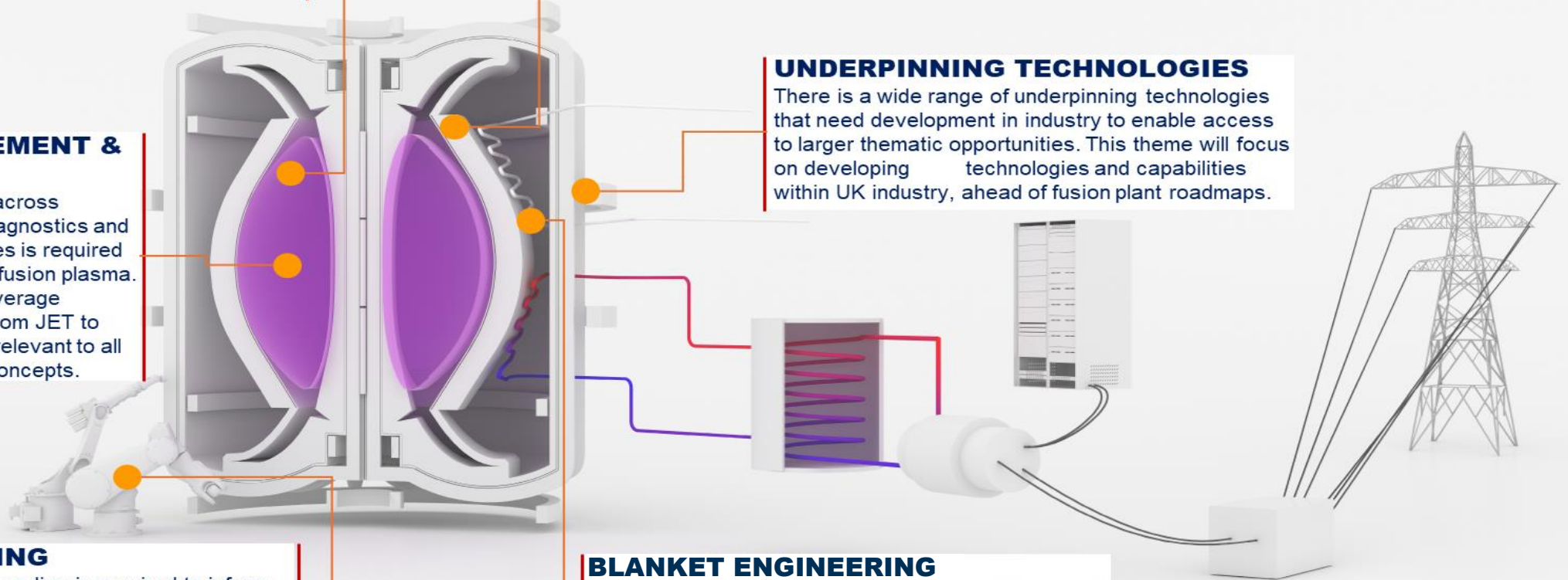
These will move heat and tritium fuel from the core of the reactor to extraction systems. The proposed focus is on development of computational design tools, along with a prototype lithium lead liquid metal loop, to enable industry simulation tool development & validation, alongside prototype component testing.

## PLASMA MEASUREMENT & CONTROL

Integration of technologies across advanced measurement, diagnostics and real time control technologies is required to confine and optimise the fusion plasma. The proposed focus is to leverage UKAEA's vast experience from JET to develop industry capability relevant to all plasma fusion powerplant concepts.

## REMOTE HANDLING

Development of remote handling is required to inform "design for maintenance" of fusion powerplants. The proposed focus is on industry development towards a full radiation hardened robotic system, remote cutting and welding systems, and remote repair inspection systems, to demonstrator level."



# Afternoon Session Agenda

12:40 - 13:30

Exhibition  
Booth



**Fusion Futures - Industry Capability**  
Programme and Commercial Teams

13:30 - 15:00

Workshop



**FFIC programme: Recap and Year 2 direction,**  
Chris Neeson, Head of Programme



**Commercial Overview**  
James Woods, Commercial Lead



**Industry Engagement Strategy**  
Stuart Harrison, Industry Engagement Consultant

Location:

Hornbill  
building





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# **Programme Direction Y2**

## **Fusion Futures - Industry Capability**

Chris Neeson, Head of Programme



# Fusion Futures Industry Capability Team

## Programme Team



**Stephen Wheeler**  
Executive Director



**Chris Neeson**  
Head of Programme



**Fanny Fouin**  
Programme Manager



**David Clapton**  
DIS Programme Manager



**Rebecca Pursey**  
DIS Senior Project Manager



**Stuart Harrison**  
Industry Engagement Consultant



**Lucie Le Faou**  
Industry Engagement Project Lead

# Fusion Futures Industry Capability Team

## Commercial Team



**James Woods**  
Commercial Lead



**Sandie Brown**  
Commercial Manager



**Charlotte Byrne**  
Assistant Procurement Manager



**Tony Morris**  
Commercial Manager



**Ben Sawyer**  
Commercial Manager

# Priming capability & capacity

Stimulate industry **capacity growth** through access to large value work packages, ensuring companies are of sufficient size to support future fusion powerplant development

Prompt industry **capability growth** in areas which have been identified as significant for future fusion powerplant development, through work packages including workforce upskilling.



# FFIC Ecosystem

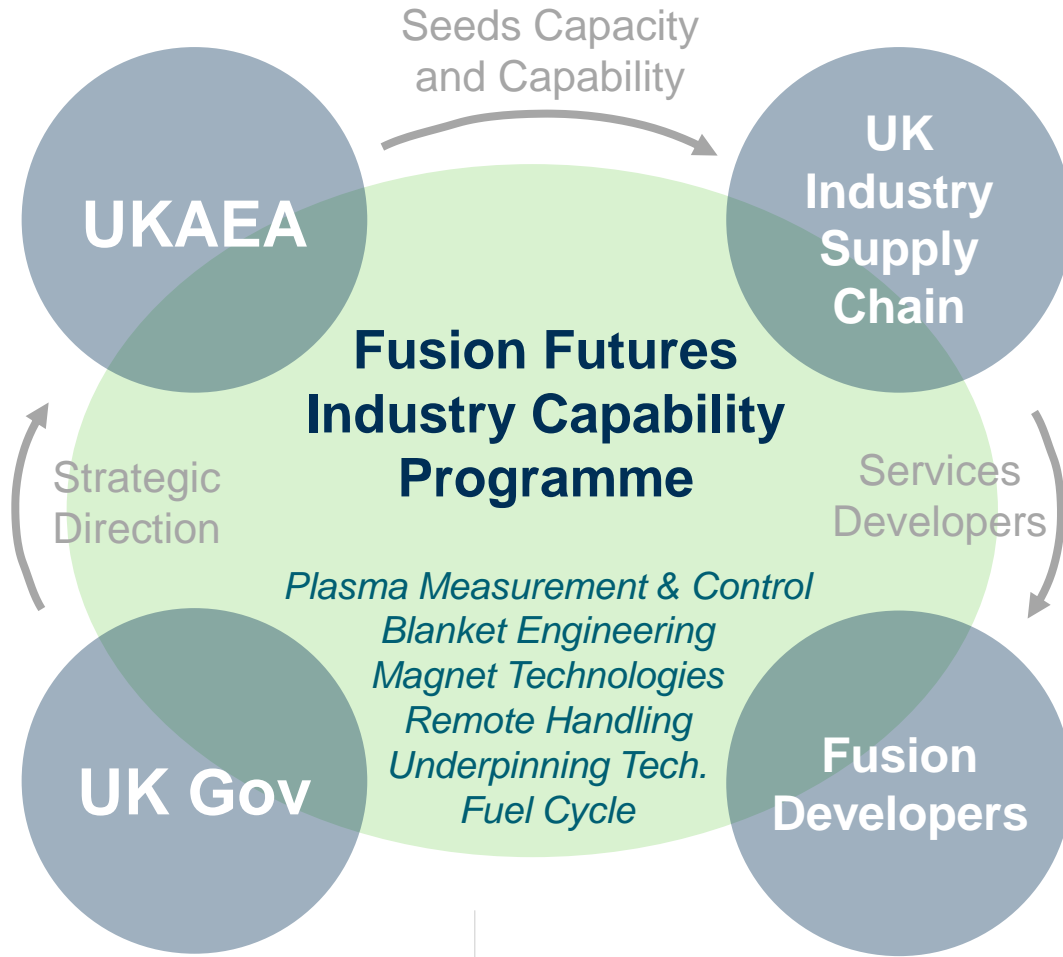
## Intelligent Customer

- Engages industry and developers
- Develops sustainable fusion
- Enhanced partnerships



## Sets Economic Strategy

- Provides funding
- Approves programme
- Benefits from UK growth and export potential



## Delivers Programme

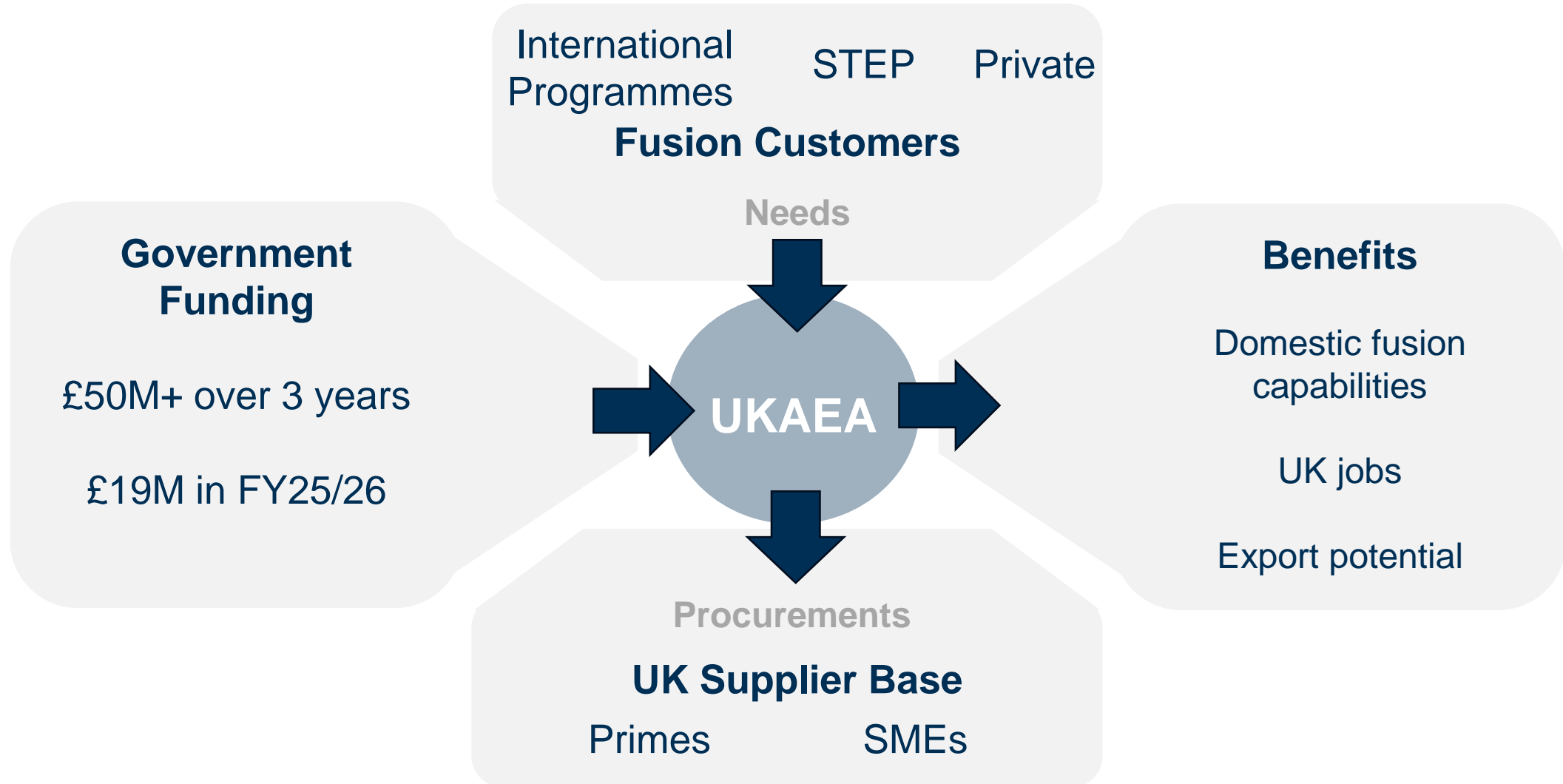
- Influences programme shape & delivery methods
- Enhanced SME readiness
- Opportunities in adjacent markets
- Enhanced capability and capacity

## Develops Fusion

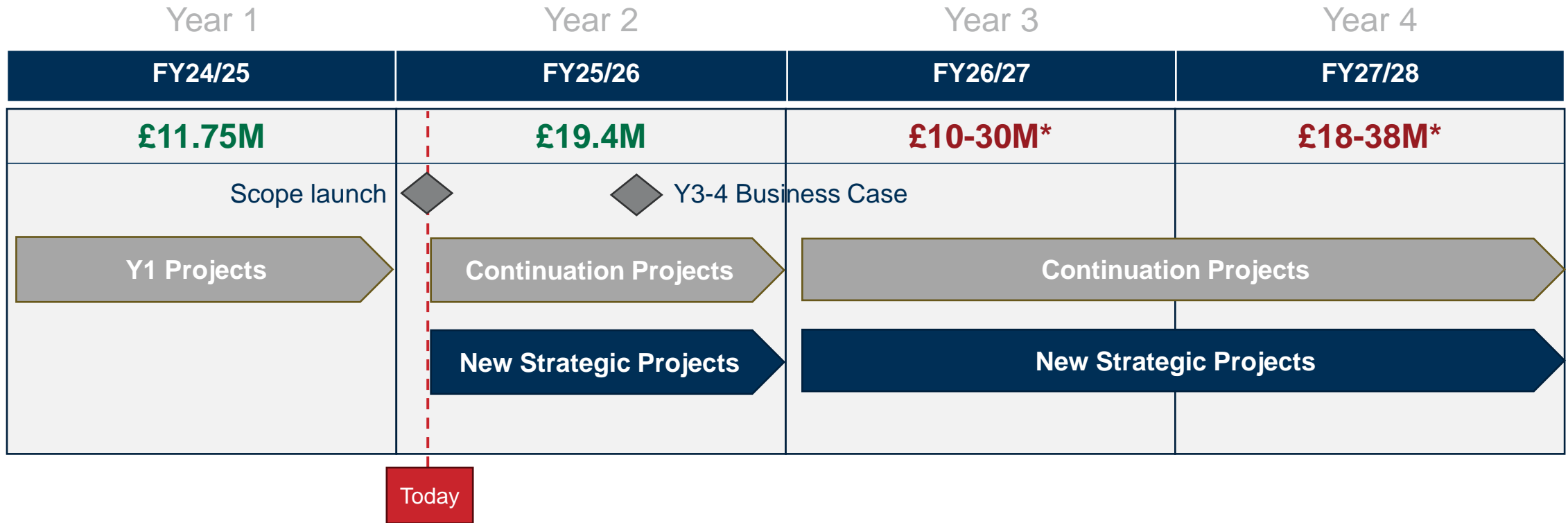
- Influences programme shape & capabilities
- Benefits from capable supply chain



# The UKAEA will act as a “Domestic Agency”



# Programme Future Scope



*\* Subject to funding approval*

Year 2 (2025/26) is a **transition and mobilisation year**

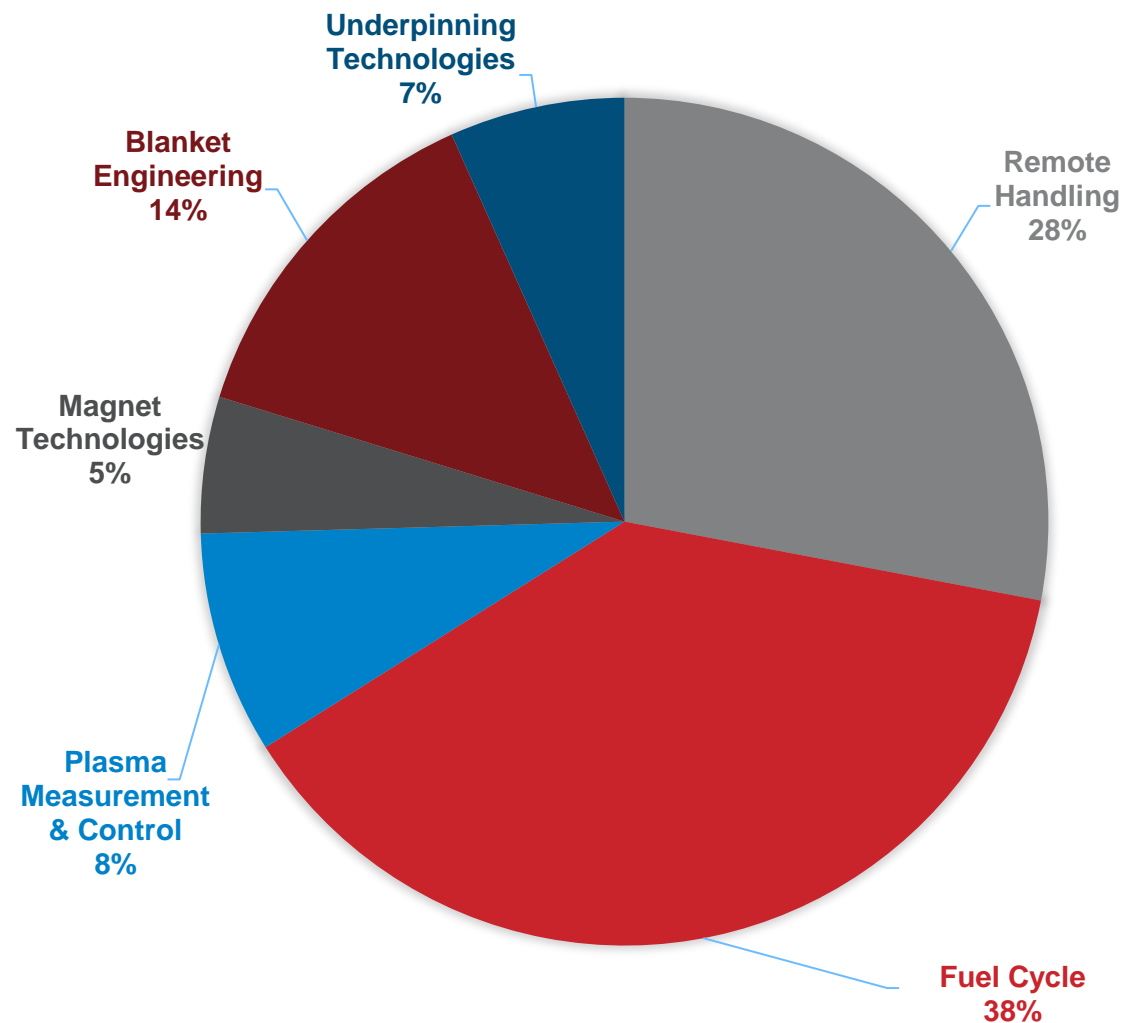
Longer term funding subject to a **Full Business Case & Gov SR Review**

**75% of funds** expected to be spent in industry



# Year 2 Portfolio – Technology Themes

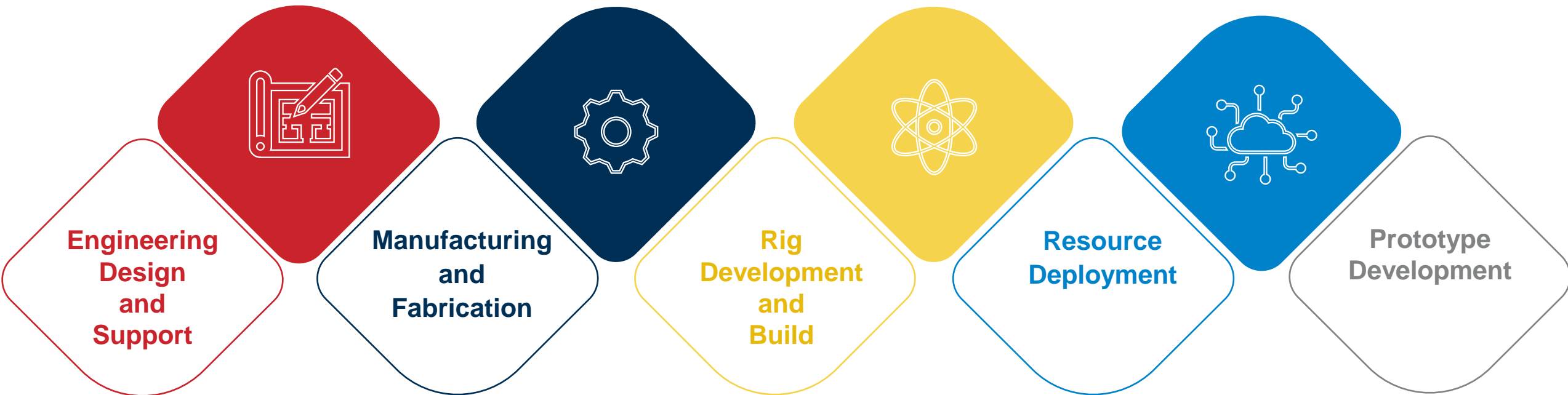
Technology Theme		FY 25/26 Planned Spend
Allocated budget	Remote Handling	£4,299,000
	Fuel Cycle	£5,852,000
	Plasma Measurement & Control	£1,303,000
	Blanket Engineering	£2,083,000
	Underpinning Technologies	£1,027,000
	Magnet Technologies*	£800,000
Unallocated budget		£4,036,000



\*provisional allocation

# Project Types

## Technology Themes





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# **Commercial Overview**

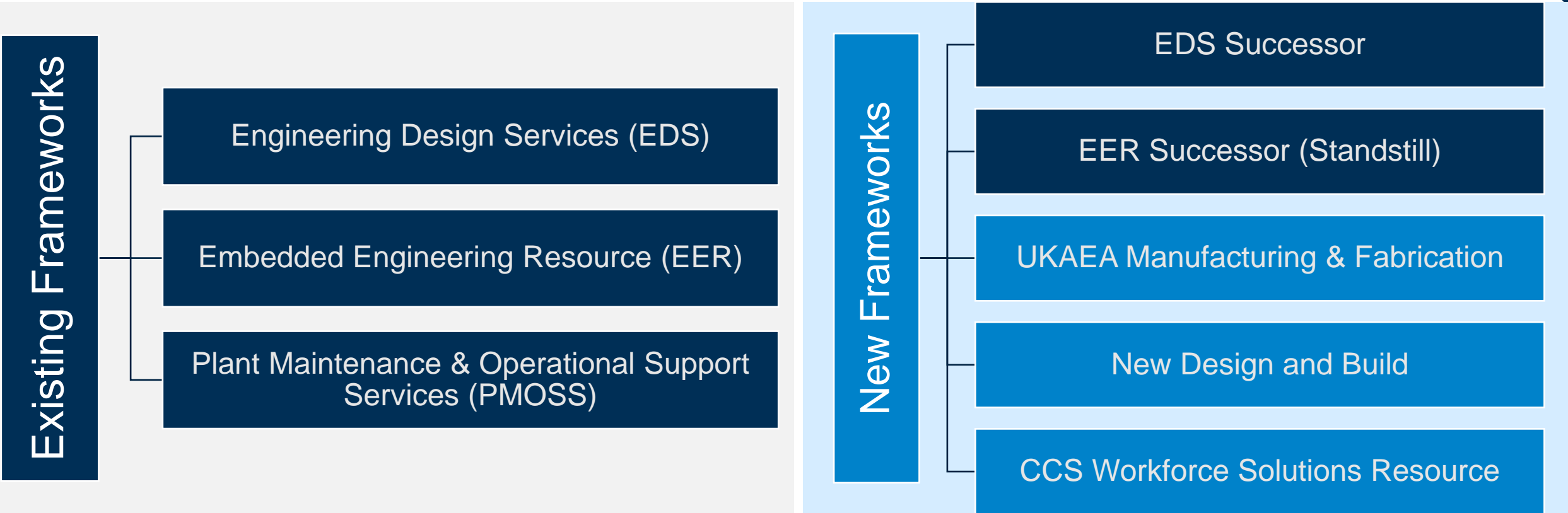
## **Fusion Futures - Industry Capability**

James Woods, Commercial Lead



# Proposed Commercial Strategy

Utilise the new Procurement Regulations - **PA2023** to package and procure projects in the most effective way which will attempt to **lower barriers to entry for new ventures and SME's**











Tactical Procurement Tenders




# FFIC Design & Build Framework

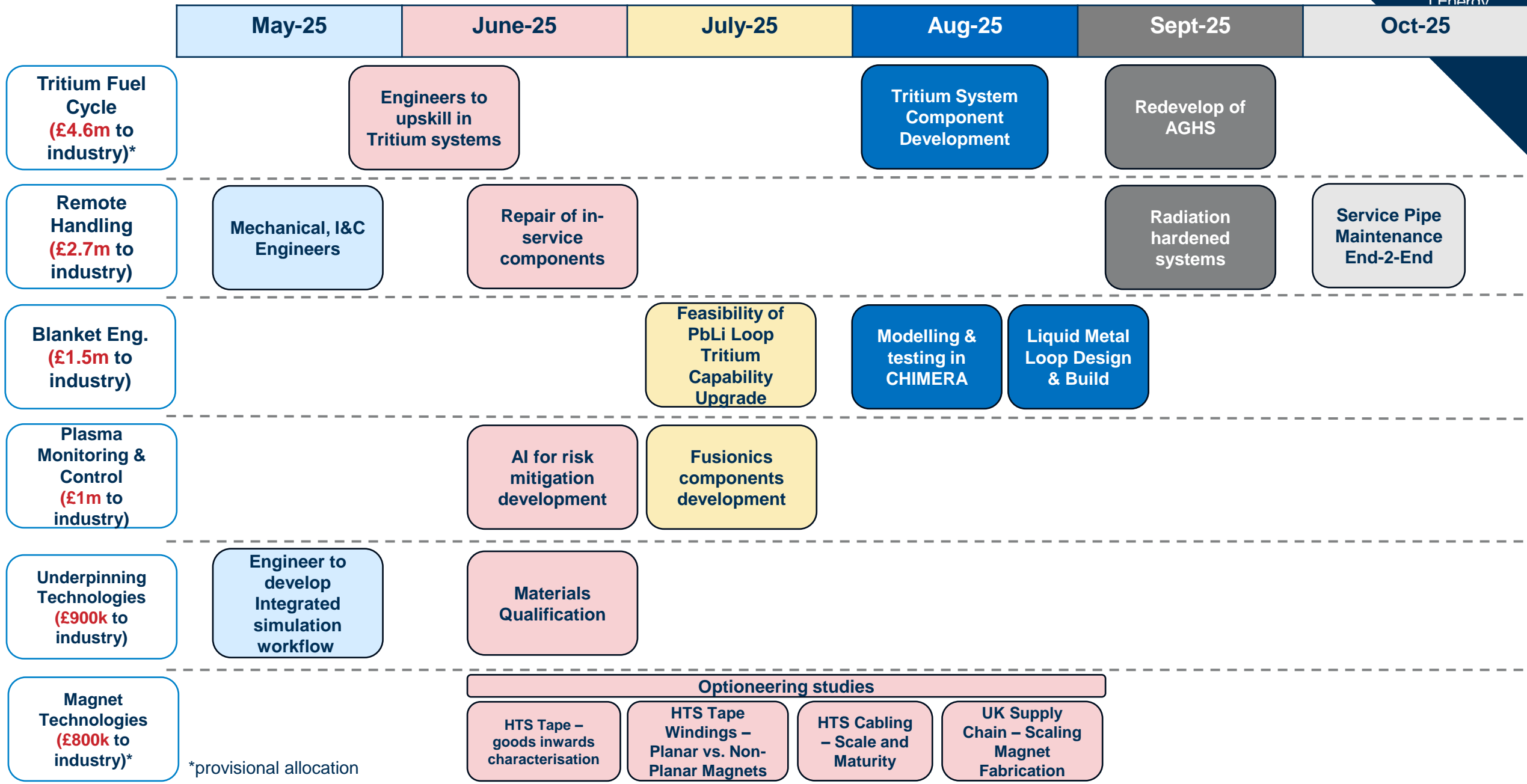
## Design & Build FW1

Design, build, integration and interface requirements

- |   |                           |   |   |
|---|---------------------------|---|---|
|  | 1 year +                  |  | FF-IC Programme specific                      |
|  | Total Value Up To = £9.5m |  | New PA23 Regs: Competitive Flexible Procedure |
|  | Webinar Jan 2025 ✓        |  | ITP April 2025                                |
|  | Award May 2025            |  | Multiple Approved Suppliers                   |

 A range of projects related to tritium systems, fusion technology, radiation-hardened components, control systems, and materials testing.

# Developing projects pipeline



\*provisional allocation

# Year 2 Upcoming Proposed Opportunities



Theme	Project	Estimated Value	Route to Market
Remote Handling	Develop technologies, hardware trials and the whole life-cycle repair scenario within fusion environments.	£300k £100K	Direct Award EER Framework
Remote Handling	Develop and demonstrate scalable solutions E-2-E for breaking and making service pipe connections in fusion environments.	£420k £190k	Tender EER Framework
Remote Handling	Design, development and demonstration of techniques for radiation hardened electronics.	£700k £300k £320k	Tender EDS Framework EER Framework
Plasma Measuring & Control	Develop hardware and software components and services relevant to fusionic control systems	£700k	Tender
Plasma Measuring & Control	Utilising AI methods to increase the robustness of key stability control problems, and the effectiveness of protection systems.	£250k	Tender
Blanket Engineering	Design, Build, Commission a Lead Lithium Loop with design to be delivered in FY25/26	£1,250k	Design & Build
Blanket Engineering	Design and build package for experimental models to be tested in CHIMERA comprising of set activities each year.	£200k	Tender
Blanket Engineering	Feasibility design study for PbLi Loop Tritium Capability Upgrade with Model Validation	£135k	EDS Framework
Tritium Fuel Cycle	Development of Tritium Extraction Systems in preparation for design and development of Tritium components	£100k	EDS Framework
Tritium Fuel Cycle	Decommissioning, design and construction of tritium plant and equipment within the JET AGHS facility to host tritium test rigs and experiments.	£2,760k	Design & Build
Tritium Fuel Cycle	Upskilling of framework engineers through various projects i.e. design and development of off the shelf pumps, tritium system design knowledge and tritium system commissioning experience for DELPHI.	£600k	EER Framework
Underpinning Technologies	Establish and develop a qualification capability for fusion materials (structural steels)	£550k	Tender
Underpinning Technologies	Utilising framework engineers to develop an integrated simulation workflow	£120k	EER Framework
Magnet Technologies*	Developing optioneering studies for individual categories of HTS tape, HTS tape windings, HTS cabling and UK supply chain	£800k	Tender

\*provisional allocation



## UKAEA - Commercial Team – Key Objectives

“Understand and **challenge** existing commercial and procurement strategies, developing **innovative solutions** to meet the needs of the organisation.”





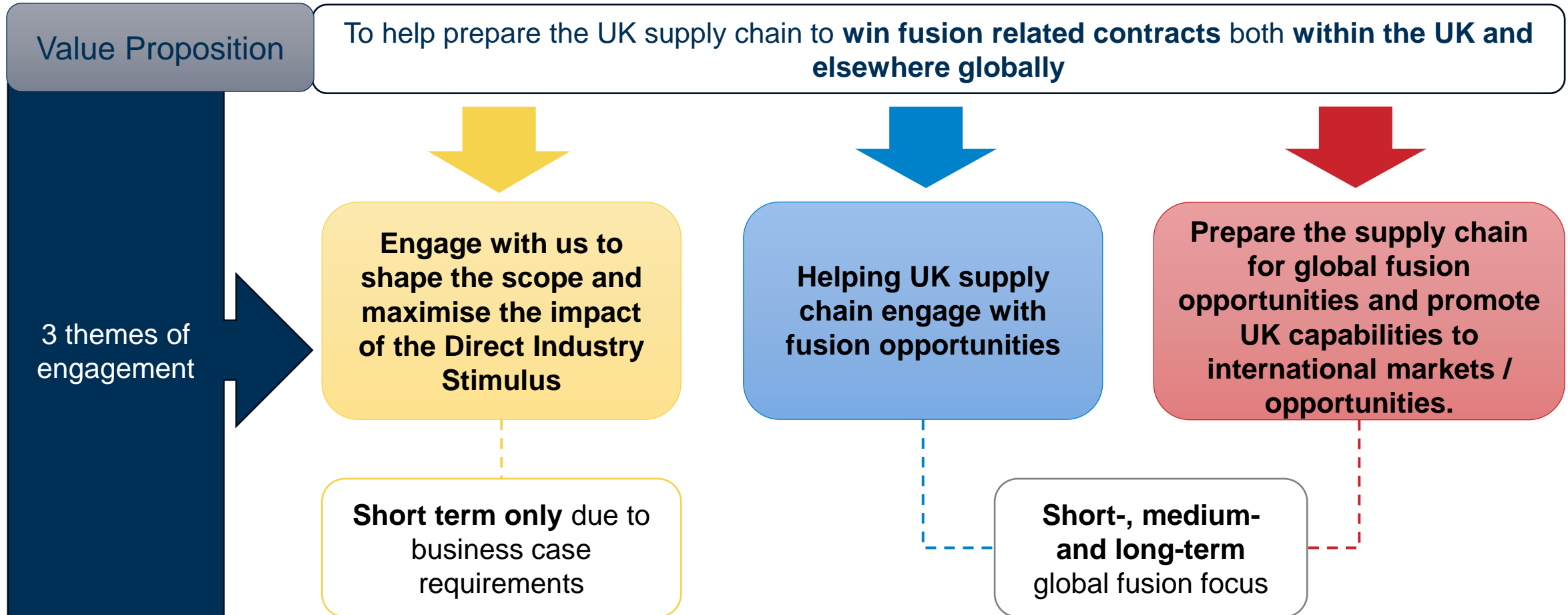
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# **Industry Engagement**

## **Fusion Futures - Industry Capability**

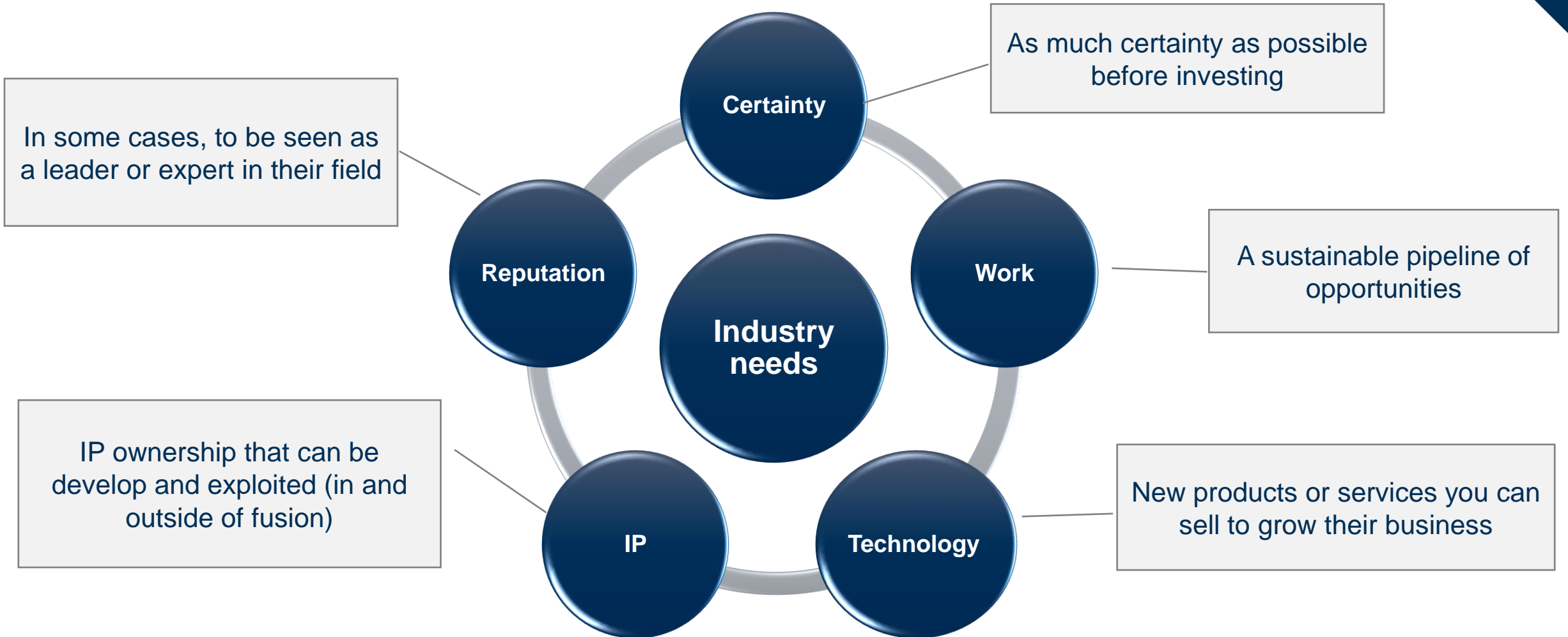
Stuart Harrison, Industry Engagement Consultant

# Our engagement with the industry revolves around 3 key themes





# What would industry want from an industrial engagement on fusion?





# What does this strategy mean in practice?



We will continue to publish commercial opportunities (in line with the Procurement Act).



Strategic approach to routes to market through dynamic and open frameworks. We remain committed to widening access, especially for SMEs and new entrants, ensuring compliance with the Procurement Act 2023.



We will help the supply chain, in particular SMEs, understand the fusion market.



We will seek **industry input** around the potential for future additional capabilities that may benefit the UK **supply chain capability development**, to increase the potential for winning global fusion work.



We will engage with you, nationally and regionally, and seek opportunities to promote supply chain capabilities in fusion.



We will lead on the development of a global market opportunity mapping exercise, giving a longer-term view, to allow more informed investment decisions.



We will seek to develop IP approaches that benefit both UKAEA and the supply chain.

# Industry input opportunities



## Short term opportunities

The engagement will take place **project by project.**



## For SME's

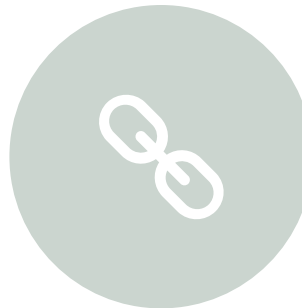
The engagement will take place through our **Central Commercial Function** and their development of an SME Action plan

*(questions on the next slide)*



## Market Map

We will engage with developers, most likely through an **independent market research company.**



## Broader engagement and supply chain shaping

Direct engagement (e.g., booth)

Specific activities where we will reach out publicly.

# Questions



As an SME what would making engaging with UKAEA easier for you?



As a larger company, who should we talk to in your company to help **identify, match and engage SMEs** recognising you may already have an established supply chain?



Would a SME Surgery be of interest to you?



Would a SME Forum be of interest to you?





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**Wrap Up**


**Fusion Futures - Industry Capability**

**24<sup>th</sup> April 2025**

# Can you help?

If you think you have a capability that might be of interest to the fusion industry, talk to us!

We are interested in both **UK and international companies**, in any of the following areas:



WE WANT TO  
HEAR FROM YOU

- Artificial Intelligence
- Materials for fusion power plants
- High performance computing
- Diagnostics
- Plasma control systems
- Magnets
- Plasma heating
- Fuelling fusion

If you think you have something to offer, we want to hear from you!

Contact our team:

[Enquiries@FusionFutures.ukaea.uk](mailto:Enquiries@FusionFutures.ukaea.uk)

# Supplier and SME Information

- Register for all portals:
  - [Find high value contracts in the public sector - GOV.UK](#)
  - [Contracts Finder - GOV.UK](#)
  - [UKAEA Procurement Pipeline - GOV.UK](#)
- [How to bid for government contracts as an SME effectively - GOV.UK](#)
- Consider forming partnerships, consortia with other SMEs and larger companies
- Participate in supplier events, PIN webinars and other engagements
- Use support services & resources to help: [Doing business with government: guide for SMEs - GOV.UK](#)

Visit our  
procurement  
portal



## During Tender Process:

- Read tender documentation carefully and understand requirements
- Feedback through formal tendering process (EU Supply Platform)