

**THE BOLDEST ENDEAVOURS
START WITH A PRACTICAL STEP**



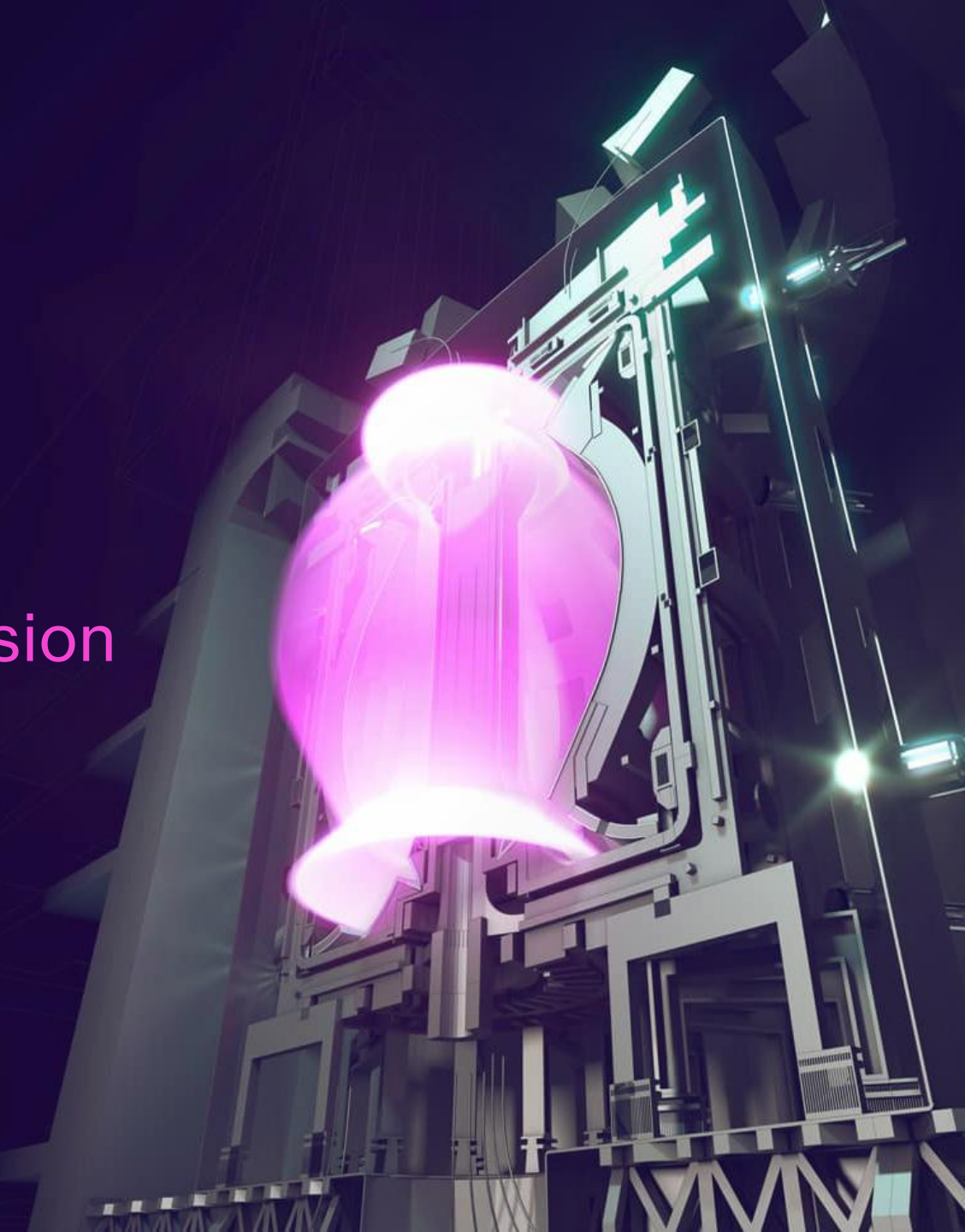
STEP Fusion: More Than A Power Plant

Possibility to Reality; A National Mission

Dutch Fusion Day – 8 May 2026

Debbie Kempton

Director of Engineering, UK Fusion Energy

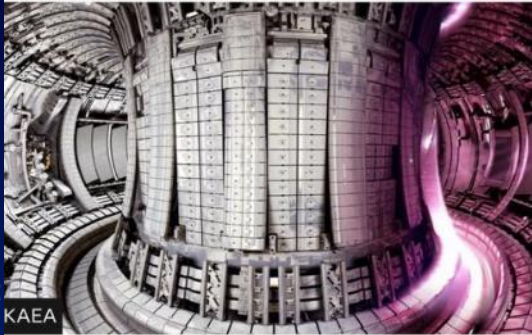


From Lab to Grid – Industrial Growth Focus

Increasing confidence and investment



Fusion energy industry gets £2.5bn funding boost



The nuclear fusion reactor at Culham in Oxfordshire was decommissioned last year

UK Government

A New Energy Revolution

The UK's Plan for Delivering Fusion Energy

March 2026

UK Atomic Energy Authority

Strategy 2026-2030

UK FUSION ENERGY LTD STRATEGY

The boldest endeavours start with a practical STEP

“ UK Fusion Energy is one of the world's leading fusion companies. The government completely backs the UK Fusion Energy mission set out in this document, to build on our national strengths to take fusion from the lab to the grid, delivering major benefits to the UK now and for generations to come. ”

Lord Vallance of Balham - Minister for Science, Innovation, Research and Nuclear

- Increasing international focus (US, China, EU, UK, Korea)
- Estimated energy market estimated at **£3-12 trillion**
- Private investment **c. £13 Bn**, most in recent years
- Significant mergers, public-traded companies
- Power-purchase agreements in **£ hundred mullions**

- Fusion allocated **£2.5Bn** over 5-years in SR25
- UK lead on R&D, regulatory regime and cross-party support.
- Key part of UK governments energy, R&D and industrial plans
- New UK , UKAEA and UK Fusion Energy **strategies**
- Industrial growth and commercialisation to **secure value**.
- From R&D towards **commercial reality** at increasing pace.

UK FUSION ENERGY LTD STRATEGY

The boldest endeavours start with a practical STEP

“ UK Fusion Energy is one of the world’s leading fusion companies. The government completely backs the UK Fusion Energy vision set out in this document, to build on our national strengths to take fusion from the lab to the grid, delivering major benefits to the UK and for generations to come. ”

Lord Vallance of Balham
– Minister for Science, Innovation, Research and Nuclear.

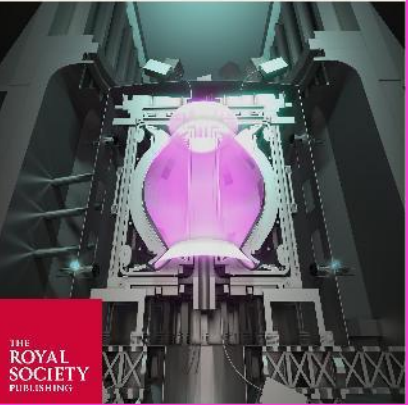


What is STEP Fusion?

Much more than a prototype plant

SPHERICAL TOKAMAK FOR ENERGY PRODUCTION

- Pioneering, prototype fusion powerplant that will demonstrate net energy, fuel self-sufficiency and a route to the commercial viability of fusion.
- Presently a UK government programme, driven through public-private partnership & international collaborations.
- Flagship project at heart of new UK Fusion strategy, delivered by UK Fusion Energy.
- Anchor project at West Burton for Trent Supercluster vision to build a green energy cluster in the East Midlands.
- Route to a new fusion industry in the UK, for the world.



Evolving the Design

Concept to Preliminary Design



Produce net energy



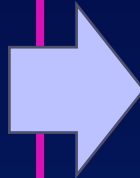
High availability



Minimise cost of construction

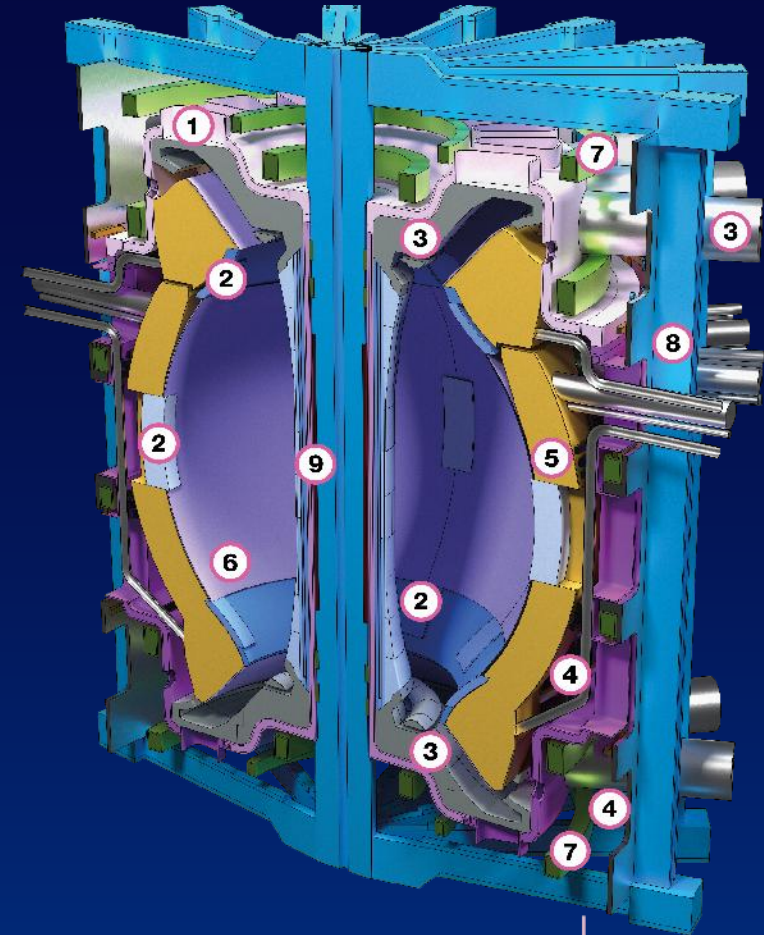


Tritium fuel self-sufficiency



- 1 Vacuum Vessel**
Provides protection and the vacuum necessary to maintain the plasma
- 2 Limiters**
Protect the machine by enforcing an outer limit to the shape of the plasma
- 3 Divertors and Cryopumps**
Remove fusion products and heat from the plasma
- 4 Control Coils**
Correct and fine-tune the position of the plasma, and ensure its stability
- 5 Breeding Blanket**
Capture neutrons to produce tritium, and transfer heat away to generation power
- 6 Outer and Inner First Wall**
Provide protection and transfer radiant heat from the plasma away from the tokamak

- 7 Poloidal Field Coils**
Help to shape and confine the plasma
 - 8 Toroidal Field Coils**
Help confine the plasma, and feature remountable joints for maintenance access
 - 9 Central Solenoid**
Drives current in the plasma during start-up to ensure it can be confined by the magnetic field
- Diagnostics**
Enable real-time measurements of the plasma and tokamak systems
 - External Gyrotrons**
Heat the plasma to fusion conditions and drive current within it, allowing the plasma to be confined by the magnetic field in steady-state
 - Pellet Injectors**
Inject new fuel into the plasma in the form of frozen pellets



A cutaway of an early STEP tokamak design iteration, showing key systems

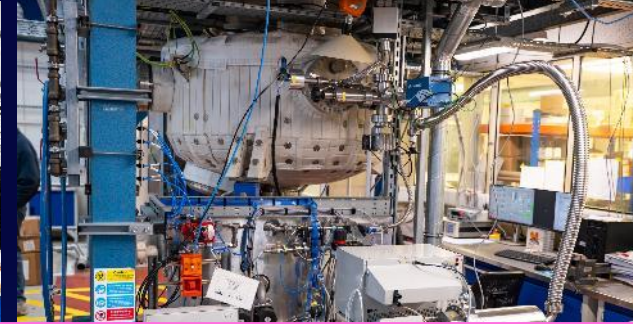
Integration of ALL key drivers into a holistic, plant wide, design

Demonstrating Technology and Improving Design Confidence

Proving it can work; and controlling the IP



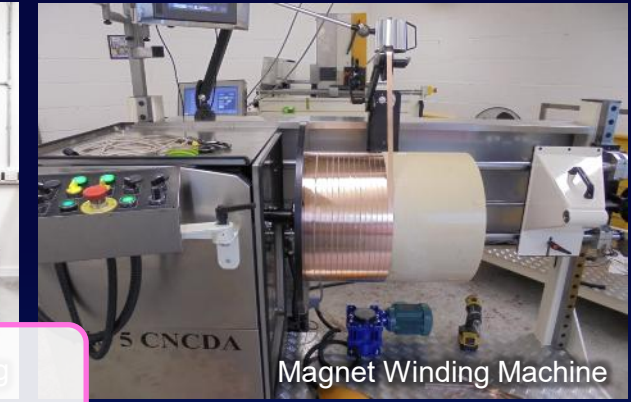
Elsa, Cryogenic Test rig, FTF



Vacuum Pump Test Rig



Materials Testing, Cryo-mechanical Rig



Magnet Winding Machine



Central Column Alignment Rig (Maintenance)

Intellectual Property Patents
74 Applications and Submissions (at various stages)
Over 10 technical areas inc, fuel cycle, magnets, Power & Cooling
Total having been filed now 31



HTS coil test sample (Magnets)



Divertor Architecture



WB MDC

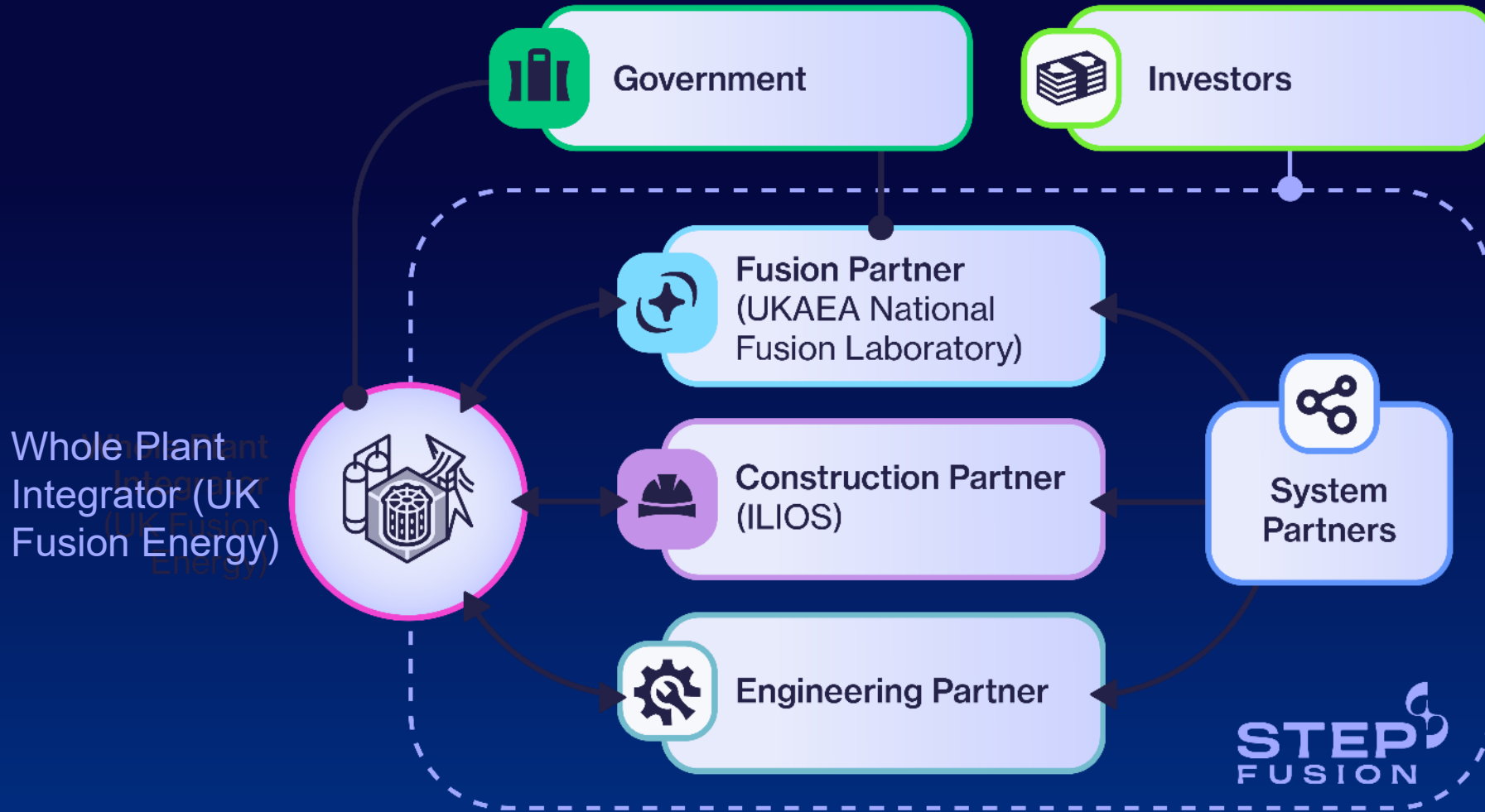


West Burton Site - Tech Demo Infra

Early Conceptual Design

UK Fusion Energy Ltd. the National Fusion Systems Integrator

Delivering STEP Fusion and successive power plants



System Partner Opportunities

- Controls
- Test Operations
- Digital (short and long term)
- Wider Plant
- Product Development
- Systems Engineering Capability

Industrial Growth and Partnerships

Whole Plant and System Partners



**UK Atomic
Energy
Authority**

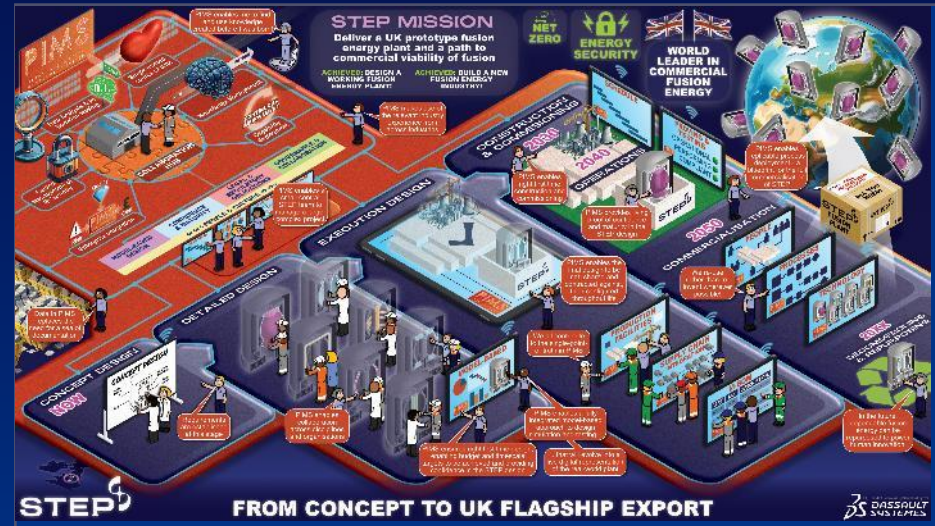
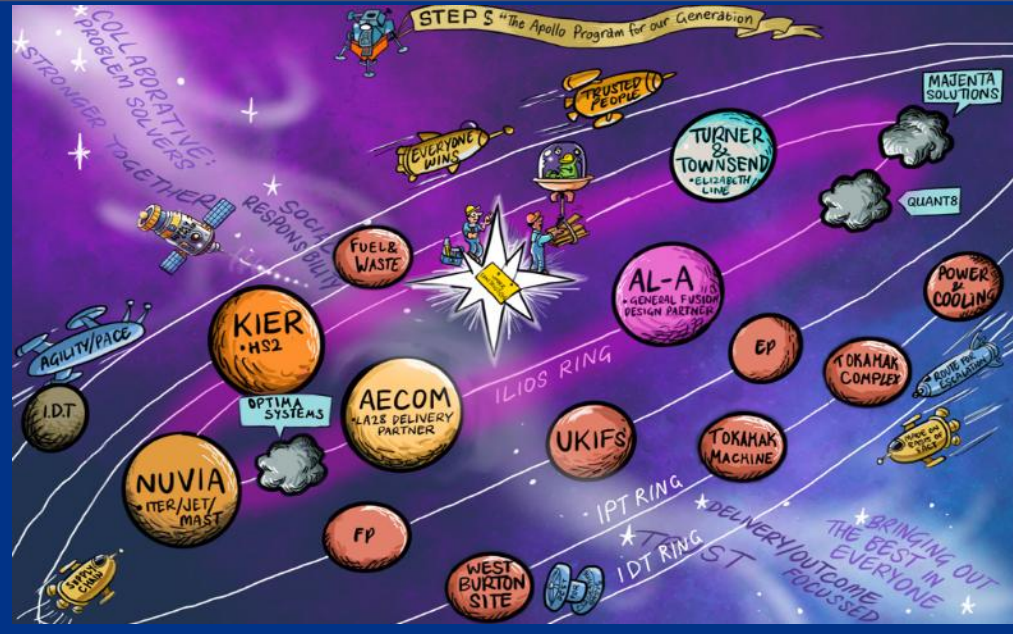
Fusion Partner



Magnets System Partner

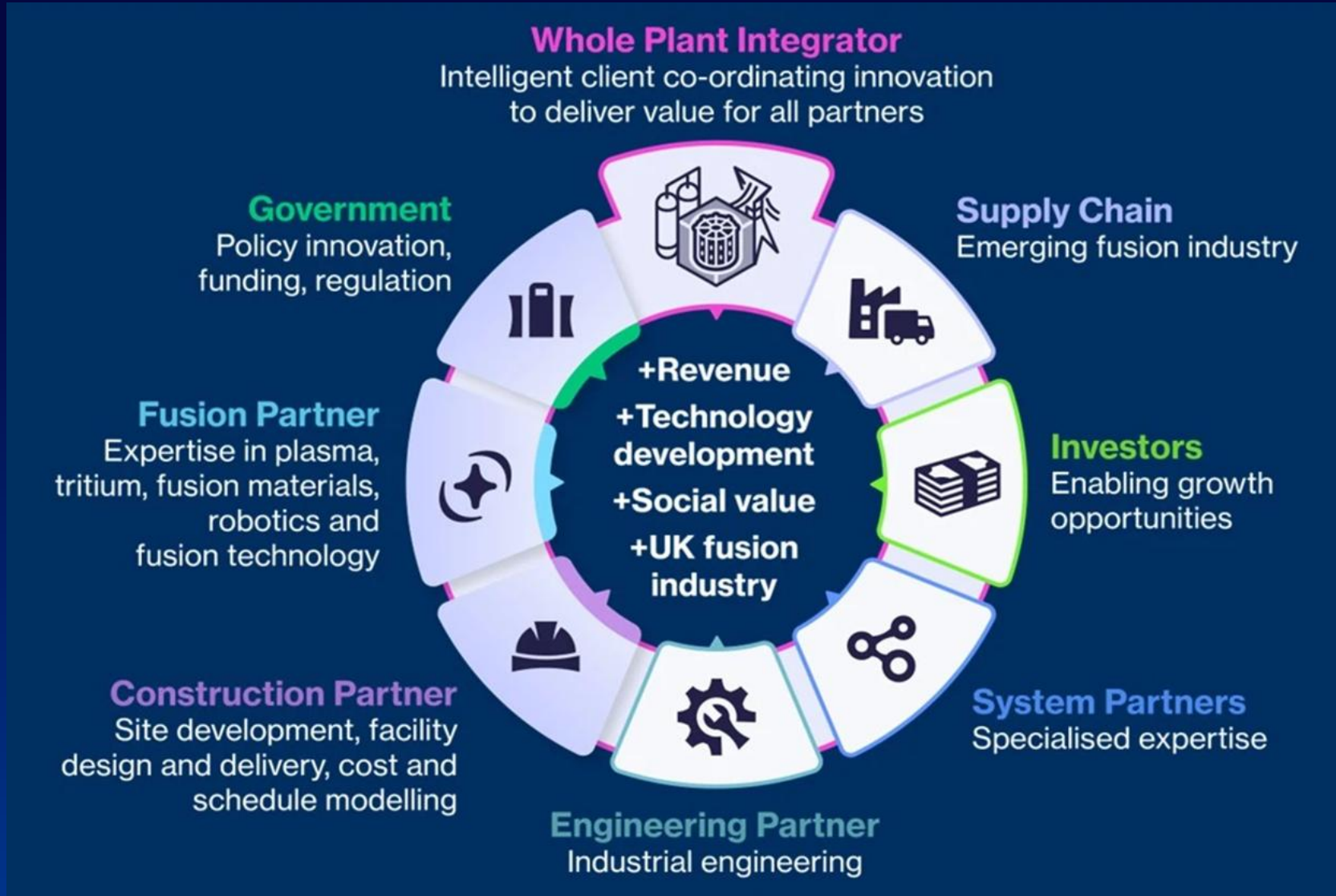


Construction Partner



UK Fusion Energy Ltd. the National Fusion Systems Integrator

Investor Opportunities

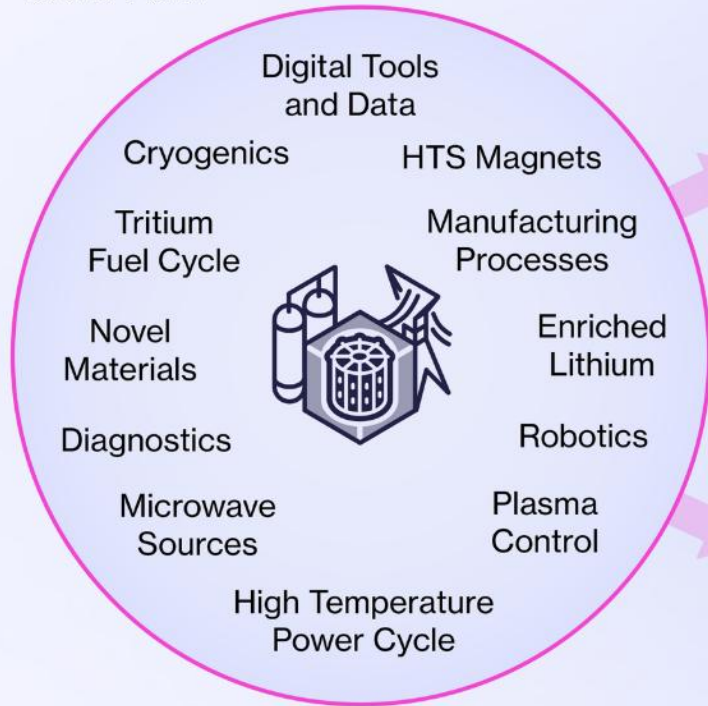


Adjacent Markets



STEP Fusion Programme

Technologies developed for STEP Fusion



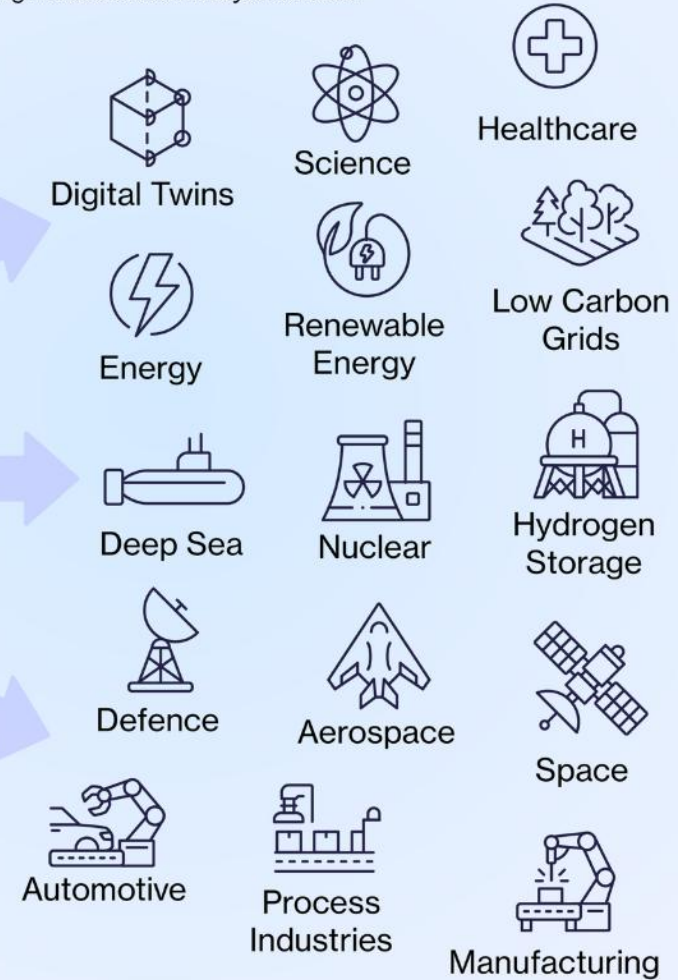
UK Fusion Industry

Companies deploying or supplying technology to the global fusion energy sector, e.g. power plants, fuel cycle, services.

- Design and Operations
- Confinement Systems
- Tritium Storage, Transport, Processing Technologies and Services
- Components and Systems
- Maintenance and Inspection Tech
- Control Systems

Adjacent Markets

Companies deploying or supplying technology to other high-value sectors beyond fusion





THE BENEFITS OF STEP FUSION

(ASIDE FROM THE IMMENSE POWER)

**PUTTING THE UK ON
A GLOBAL STAGE**



UK FUSION ENERGY LTD - OFFICIAL - PUBLIC

**POTENTIAL TO CREATE
THOUSANDS OF JOBS**



**POWERING GROWTH
AND REGENERATION**



Jobs and growth

Opportunity and Investment

Currently c. 800 FTEs on STEP with 300+ on-site
UKFE, Whole Plant Partners, Strategic Suppliers

During construction up to c. 8000
All skill sets covering planning, design, construction, etc

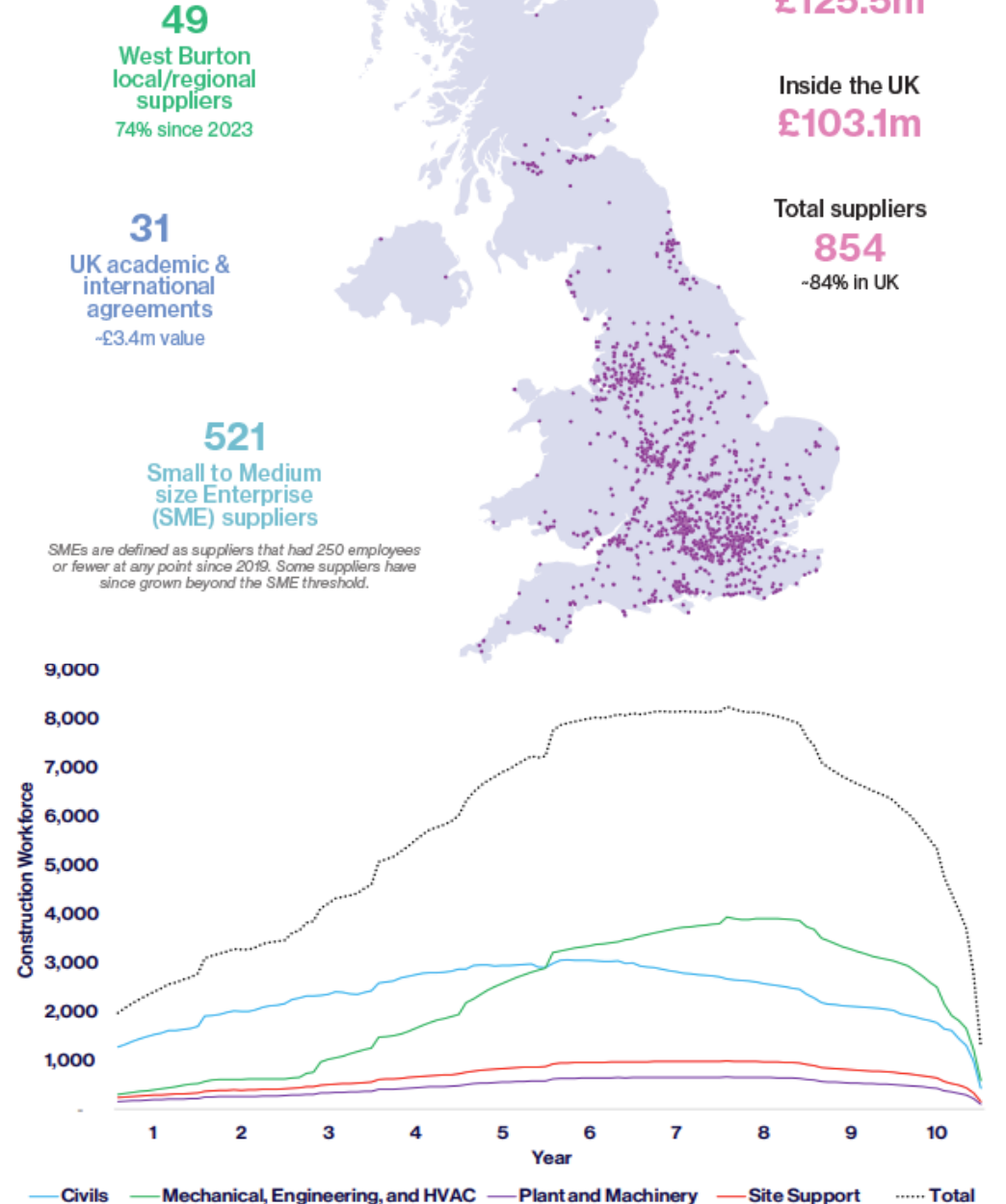
Ongoing Fusion Research and Development
A world-class facility with 1000+ operational staff for decades

Enduring Demand and Business Growth
Partnerships for growth, export opportunities

Significant Regional Investment Opportunity
Over £200m annualised average for design, planning and construction estimated in East Midlands alone (AMION report)

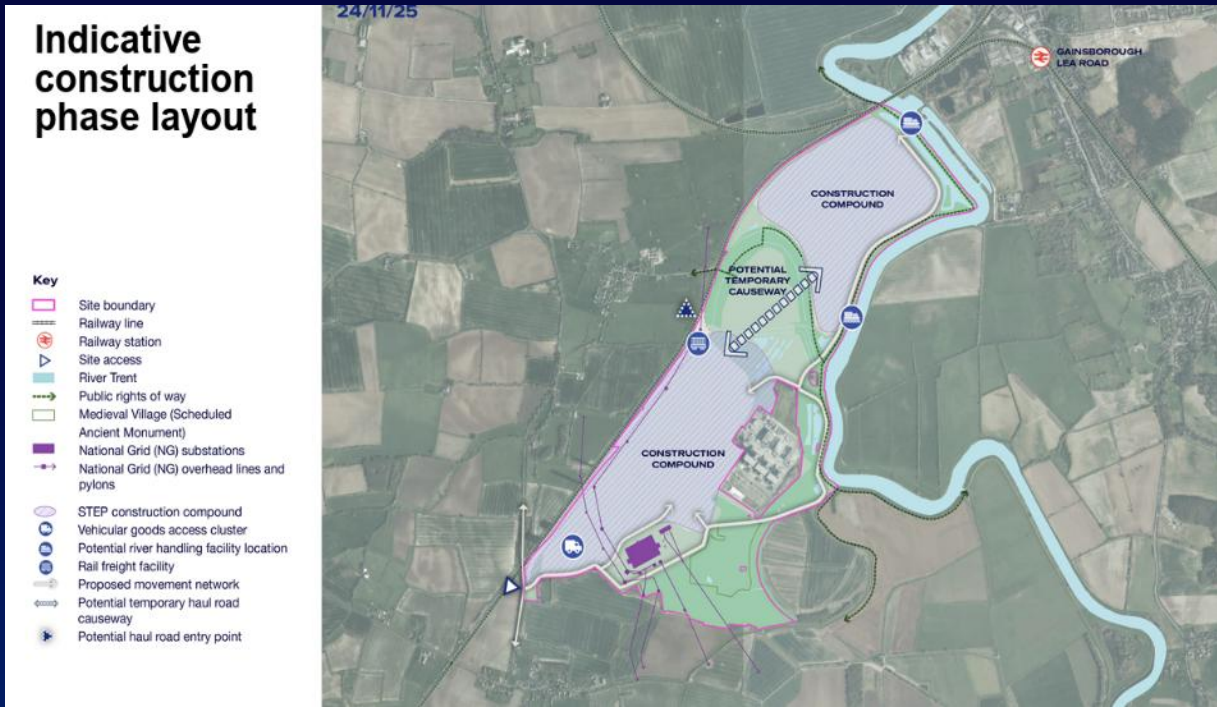
Generational Opportunities
Decades long demand for wide range of goods and services.
The heart of the new commercial fusion industry

STEP Fusion supply chain impact
April 2019 - February 2026



Developing the Site at West Burton

Fossil to Fusion in Action



East Midlands Combined County Authority

Nottinghamshire County Council

Bassetlaw DISTRICT COUNCIL — North Nottinghamshire —

Greater Lincolnshire Combined County Authority

Lincolnshire COUNTY COUNCIL Working for a better future

West Lindsey DISTRICT COUNCIL

STEP FUSION UK Industrial Fusion Solutions

January 2026

PRE-APPLICATION STAGE ONE CONSULTATION DOCUMENT



2024

1



2025



2026

2

What next

Complete Mobilisation for FY26/27

Target over £150m investment across UK & beyond next year

Finalise UKFE Strategy update

Building off UK Fusion policy Spring 2026

Construction Partner Mobilisation

ILIOS on contract and mobilising

Preliminary Design Progress

Complete second Whole Plant Review start Q1

Progress Technology Demonstration

Physical (magnets, HCD) and using Modular Data Centre

West Burton Site

Progress site SPP and test-rig enabling works and design

Contracts

Significant contract and Subcontract opportunities

Regulatory Progress

Assess DCO input; progress JoP; HSE &EA engagement



Thank you, Any questions?

Find the digital copy of our strategy
with the QR code on the right

Or via stepfusion.com/ukfe-strategy-2026

