



The Fusion Market in the UK

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Prepared for NIA Supply Chain Workshop

Kyoto Fusioneering: A Company of Builders

A revenue-generating, concept-agnostic fusion technology developer and system integrator serving public and private fusion programs worldwide.

2019 founding
150+ team members
\$110m+ raised

\$40m+ in sales contract
\$25m+ in grants



Tokyo, Japan;
Kyoto, Japan



Seattle, U.S.



Culham, U.K.



Karlsruhe, Germany



Chalk River, Canada

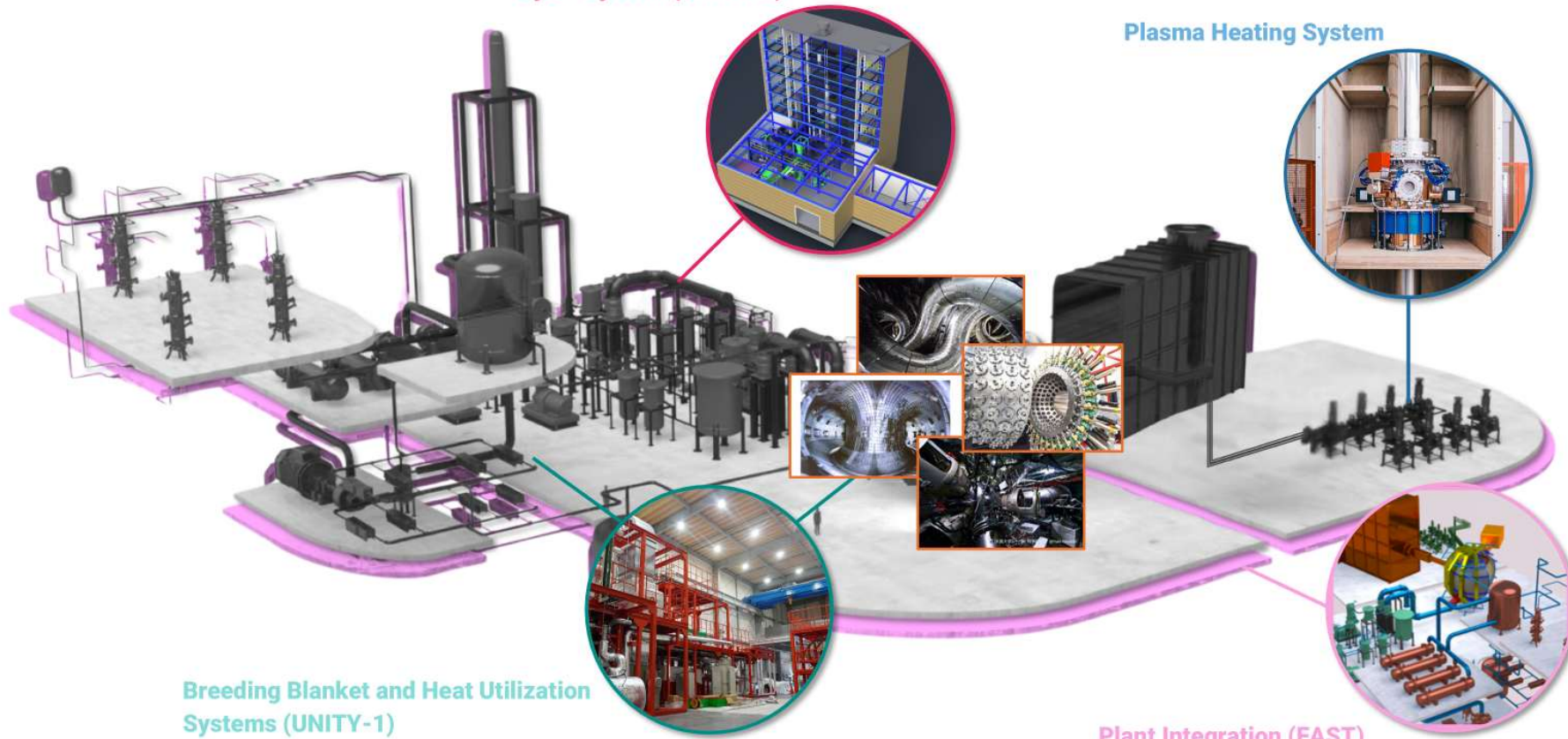
* Joint venture with Canadian Nuclear Laboratories

Whilst ~ others solve the plasma confinement and control....

KF is building the rest

Deuterium-Tritium Fuel
Cycle System (UNITY-2)

Plasma Heating System



Breeding Blanket and Heat Utilization
Systems (UNITY-1)

Plant Integration (FAST)

Developing Critical Plant Systems for Fusion Power Plant



Key areas

Plasma Heating System (Gyrotrons, NBI)

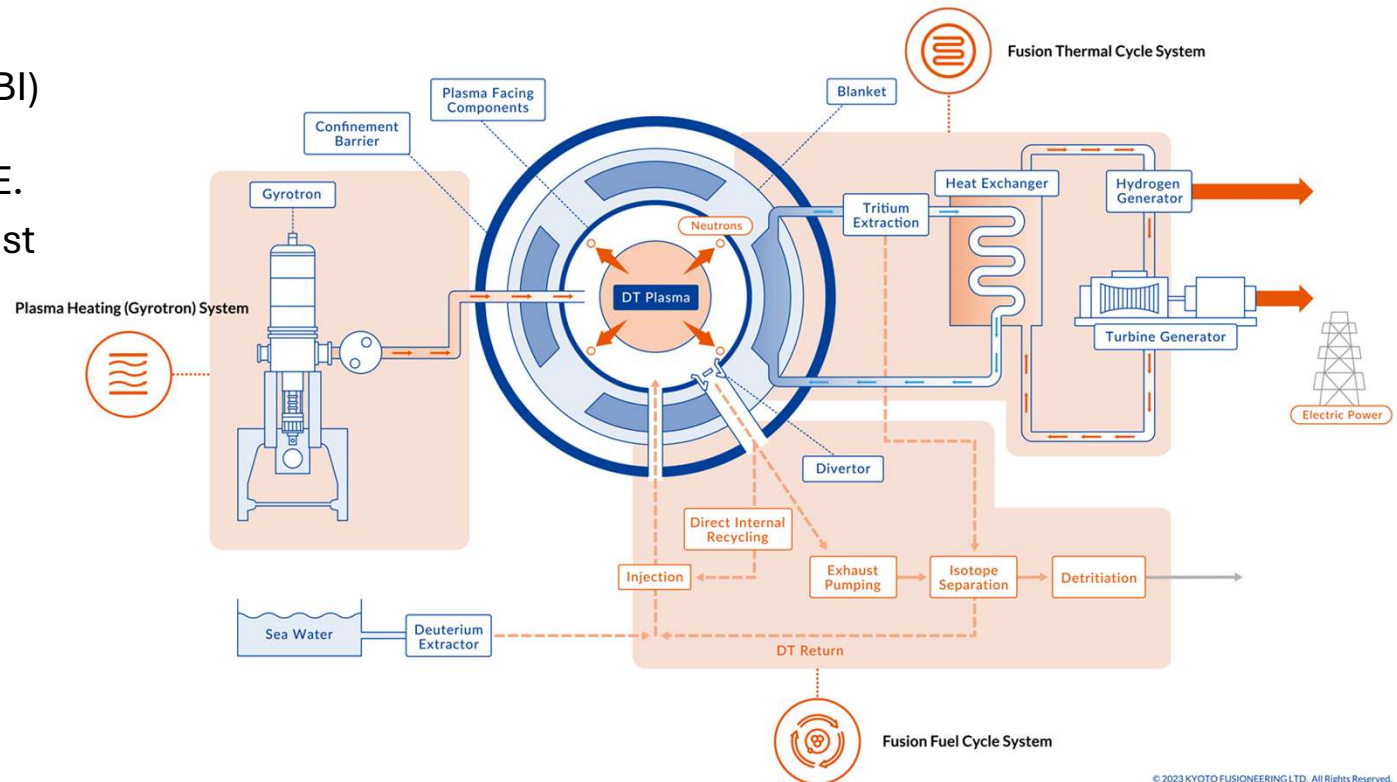
- Required for heating in tokamaks, stellarators, mirrors, and other MFE.
- 5~10% of the entire fusion plant cost

Breeding Blanket and Heat Utilisation Systems (UNITY-1, UNITY-3)

- Required for 90%+ concepts
- 10~15% of the entire fusion plant cost

Deuterium-Tritium Fuel Cycle System (UNITY-2)

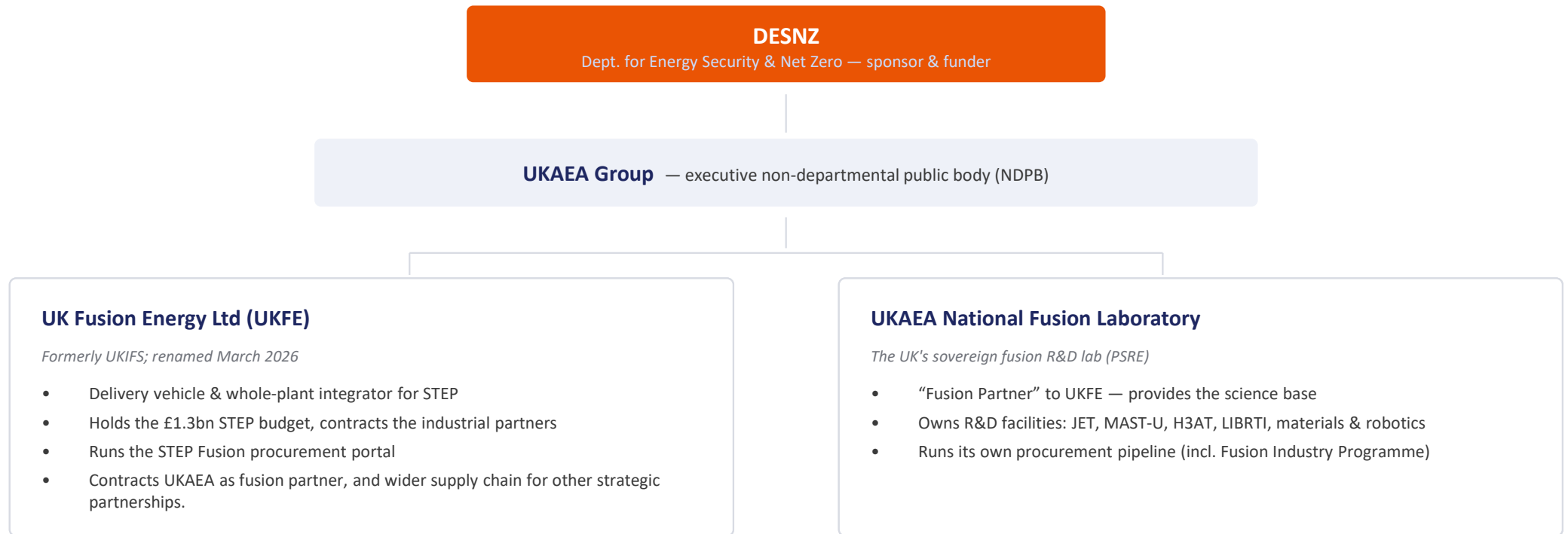
- Required for 95%+ concepts
- 5~10% of the entire fusion plant cost



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The UK is a public sector driven market

The UK fusion market is overwhelmingly public-led. Almost all near-term demand flows through UKAEA Group (UKAEA, or UKFE)



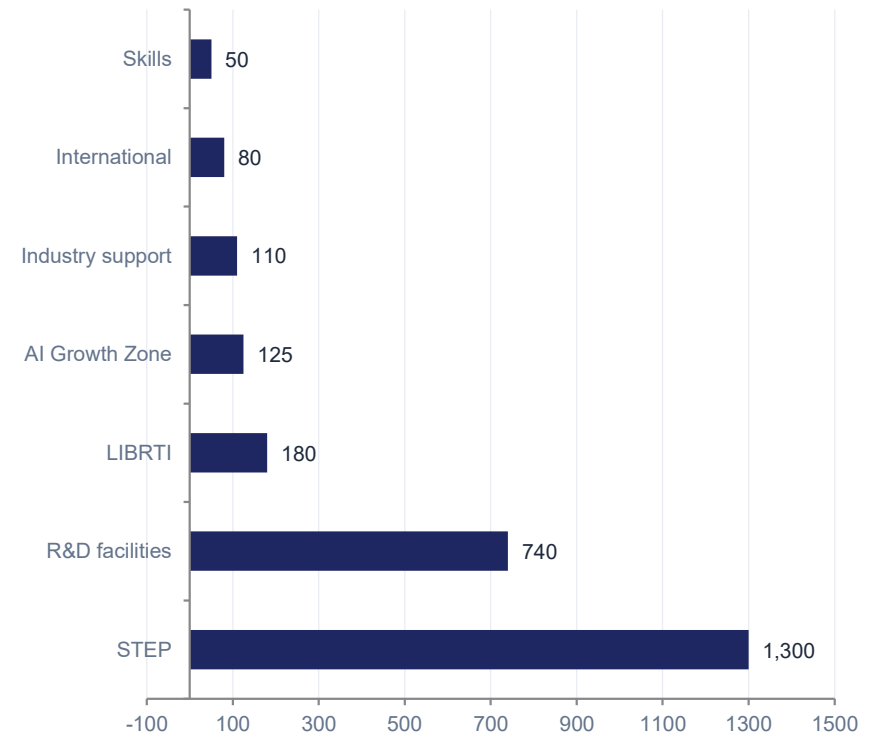
Private Fusion Sphere

- Tokamak Energy: HTS magnets and spherical tokamaks STEP's Magnet Systems Partner (£70m). ,UK Infinity Fusion Consortium, with Type One Energy and AECOM, targeting a 400MWe private stellarator.
- First Light Fusion: inertial (projectile-driven) fusion, FLARE concept. Raised £25m including UKAEA investment, April 2026.
- Kyoto Fusioneering: Plant technology providers for most developers
- Wider ecosystem: A growing cluster of developers and UKAEA spin-outs, supported,

Supply chain spend is directed at the STEP Programme to 2030

- Record UK fusion investment of over £2.5bn across five years (FY2025/26 to FY2029/30). Planned allocation
- STEP alone is ~52% of the public pot. The UKAEA National Fusion Laboratory controls most of the rest: R&D facilities, LIBRTI and fuel technology

Allocation	£m	Routed via
STEP delivery (next phase)	1,300	UK Fusion Energy
R&D infrastructure & facilities	740	UKAEA Nat. Fusion Lab
LIBRTI fuel-technology facility	180	UKAEA
AI Growth Zone at Culham (incl. £45m Sunrise)	125	UKAEA / partners
Industry support & commercialisation	110	UKAEA / DESNZ
International collaborations	80	DESNZ / UKAEA
Fusion skills (2,000+ people)	50	DESNZ / UKAEA



STEP will stimulate the UK fusion programme up to 2040



Spherical Tokamak for Energy Production (STEP)

- The UK's prototype fusion power plant and the single largest fusion opportunity in the market.
- Delivered by UK Fusion Energy as a **public-private integrated delivery team**: UKFE as client and whole-plant integrator, UKAEA as Fusion Partner, plus industrial partners.
- **Site**: West Burton, Nottinghamshire: a former coal power station, chosen October 2022 for existing grid infrastructure and local support.
- **Configuration**: spherical tokamak with high-temperature superconducting magnets, building on MAST-U and JET heritage.
- **Governance**: sponsored by DESNZ

Technical Objectives

- Net electricity > 100 MW to the grid
- Tritium self-sufficiency (breed its own fuel)
- Qualify materials & components under fusion conditions
- Demonstrate a route to affordable lifecycle costs, and a plant-maintenance scheme

~2040

target for first operations

£1.3bn

committed public funding to this phase

up to £10bn

potential wider programme value

~8,000

peak on-site construction jobs

Fusion systems are at varying levels of technology readiness



System	Function	Indicative TRL	Note
Magnets & HTS coils	Confine and shape the plasma	5–6	UK strength; STEP's first System Partner award (Tokamak Energy)
Vacuum vessel & cryostat	Structural containment, vacuum boundary	7–8	Builds on conventional pressure-vessel fabrication
Blanket & tritium breeding	Breed fuel, extract heat	3–4	Least mature system; focus of the LIBRTI testbed
Divertor & plasma-facing components	Handle extreme heat and particle loads	4–5	Tungsten armour, high-heat-flux engineering
Tritium fuel cycle	Process, recover and recycle fuel	4–5	UK focus area (H3AT, Rh3ova)
Heating & current drive	Heat plasma to fusion conditions	6–7	Adjacent to RF and particle-accelerator industries
Remote handling & robotics	Maintain activated components	5–6	UKAEA's RACE centre; overlaps nuclear decommissioning
Diagnostics & control	Monitor and control the plasma	6–7	UKAEA Diagnostics Centre of Excellence (DICE)
Balance of plant & civils	Site, cooling, power conversion, buildings	8–9	Directly transferable from fission EPC experience

STEP Programme aims to stimulate UK technology development of these systems to enable commercial deployment

STEP will develop a partnership model



STEP focus is currently focused on detailed design and technology maturation

UKFE tiers its supply chain into Whole Plant Partners, System Partners, and the broader strategic supply chain.

Tier / Role	Holder	Value & term	Scope
Fusion Partner	UKAEA (Nat. Fusion Lab)	Core public role	Science base, R&D, tritium & materials expertise
Construction Partner (Whole Plant)	ILIOS — Kier–Nuvia JV (+ AECOM, AL_A, Turner & Townsend)	£197–200m, initial tranche to ~2029	All buildings, infrastructure and site facilities
Engineering Partner (Whole Plant)	Not appointed	TBC	Integrated design & manufacture of the plant
Magnet Systems Partner	Tokamak Energy (TE Magnetics)	£70m, to March 2029	Magnet system and supply chain development
Digital Systems Partner	Dassault Systèmes	£30m	3DEXPERIENCE platform; plant information / digital twin
Future System Partners	Open	Progressive	Blanket/tritium, divertor, remote handling, heating, diagnostics

Formal Procurement Routes

- **STEP Fusion Procurement Portal** — the dedicated gateway for STEP System Partner and supply-chain opportunities (run by UKFE).
- **Find a Tender Service** — high-value public contracts above £138,760; search “UK Atomic Energy Authority.”
- **UKAEA e-tendering (EU Supply)** — all UKAEA opportunities, any value; Contracts Finder for public contracts from £30,000.
- **UKAEA Procurement Pipeline** — published quarterly: Aspirational (1–5 yr view), FIP, Preliminary Market Engagement, and live Tenders.
- **Fusion Industry Programme (FIP)** — UKAEA-funded R&D competitions, contract-based, up to 100% of project cost with shared risk.

Fusion Ecosystem

- **Supplier events & SME surgeries** — annual executive/commercial/SME days; bi-monthly informal surgeries; the UKAEA Supplier Network (LinkedIn) and quarterly newsletter.
- **The Fusion Cluster** — government-supported convening body for UK and overseas fusion companies and their supply chains.
- Fusion Industry Taskforce

Capability Mapping?

From the companies in the room, where do we see existing company capability could benefit UK Fusion?

What might UK companies be interested in? some ideas...



- Specialist supply chain capabilities, including forgings, in-vessel component manufacturing, tritium technologies, in-vessel maintenance, and expertise gained through ITER.
- Opportunities to support the ITER supply chain and leverage existing industry experience.
- UK sovereign manufacturing opportunities, enabling companies to reshore and develop domestic production capabilities.
- Fusion-specific technologies with potential for deployment across future fusion energy programmes.

I would welcome further discussion:
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(Thank You Very Much!)

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