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STEP
Spherical Tokamak for Energy Production

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Why Fusion?

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Carbon free

Safe

Low land use

Low, manageable waste

Reliable baseload

Virtually limitless fuel

Why Fusion in the UK?

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"The UK is a world leader in the most promising fusion technologies with research capabilities across the technical challenges of fusion. This means that the UK is uniquely well-placed to lead the future commercialisation of this technology."

Powering our Net Zero Future (December 2020)

- UKAEA operates the Joint European Torus (JET), the world's largest tokamak and Europe's flagship experiment. It also operates the UK's first spherical tokamak, recently undergone £55 million upgrade – MAST-U.
- Culham is home to a full ecosystem of fusion R&D facilities, underpinning a body of world-leading expertise.
- The UK has a thriving private sector fusion industry
- The next step is… **STEP**

Why Fusion now?

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Market Pull

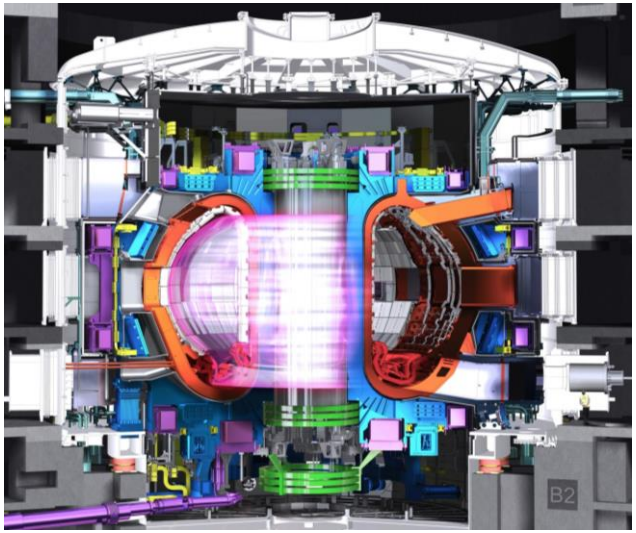
Climate emergency very high in public consciousness

Technical demonstration

ITER will produce 500MW from 50MW input power

Private investment

Over £1.8Bn invested in >40 start-ups



“It’s always 30 years away”

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Why is it different now?

Full D-T Operation in Jet	Yields further advances in fuel understanding
ITER (design and construction)	Game-changing advances in system and component design
ITER (operation)	ITER Plasma learnings are important to STEP
Materials Research	UKAEA-MRF (and others) nuclear materials science capability
MAST-UPGRADE	£55M UKAEA experiment: informs viable plasma scenario
RACE (remote access robotics)	Enables viable maintenance and repair approaches
Surging private sector	Investment is both an enabler and an indicator of viability
Digital design	Enables faster and less costly design optioneering
The approach of the sector	Design driven work

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STEP Mission:

Deliver a UK prototype fusion energy plant, targeting 2040, and a path to commercial viability of fusion.

What is STEP?

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STEP (Spherical Tokamak for Energy production)

Phase 1 – develop concept design - £222 million government funding to achieve this.

Phase 2 – detailed engineering design and permissions and consents as well as pre-construction works.

Phase 3 – manufacturing and construction – targeting operations around 2040.

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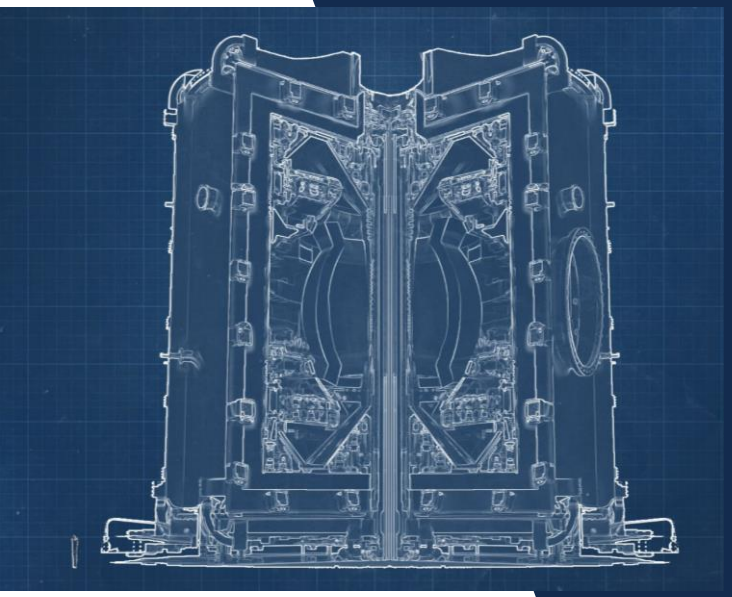
A STEP to delivering fusion



- The site for STEP will have global visibility
- It will form the centre of an ecosystem, ultimately supporting thousands of high-quality high-tech jobs
- It will support economic growth and the training of skilled people
- And it will be an important part of meeting the global net zero challenge

- Site nominations ran Dec 20 – March 21
- 15 sites long listed
- Desktop assessment across this Summer, followed by short listing
- Recommendations to Secretary of State in Summer 2022
- Site selected by Secretary of State by end 2022.

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Thank You

www.step.ukaea.uk

https://www.gov.uk/government/organisations/uk-atomic-energy-authority

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