

An aerial, semi-transparent view of a modern, multi-story building. The building has a large, circular central atrium. Inside this atrium, a model of a fusion reactor is visible, featuring a glowing purple and pink toroidal structure. The building's exterior is light-colored with a grid-like pattern of windows. The surrounding area includes some greenery and a paved plaza.

STEP - low carbon energy from fusion

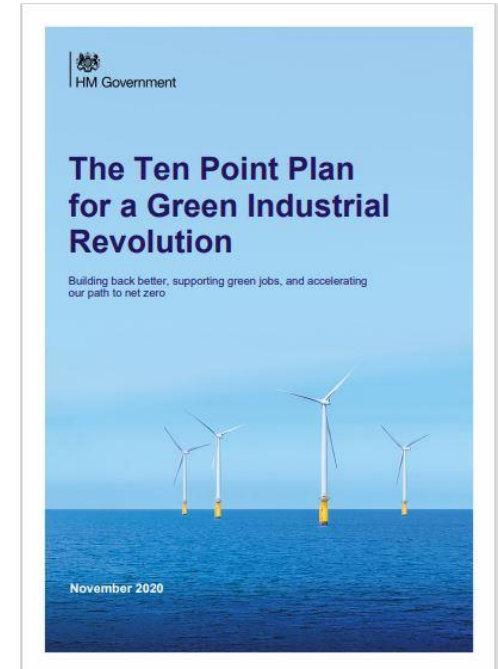
**Setting out the context for
Nottinghamshire**



**Nottinghamshire
County Council**

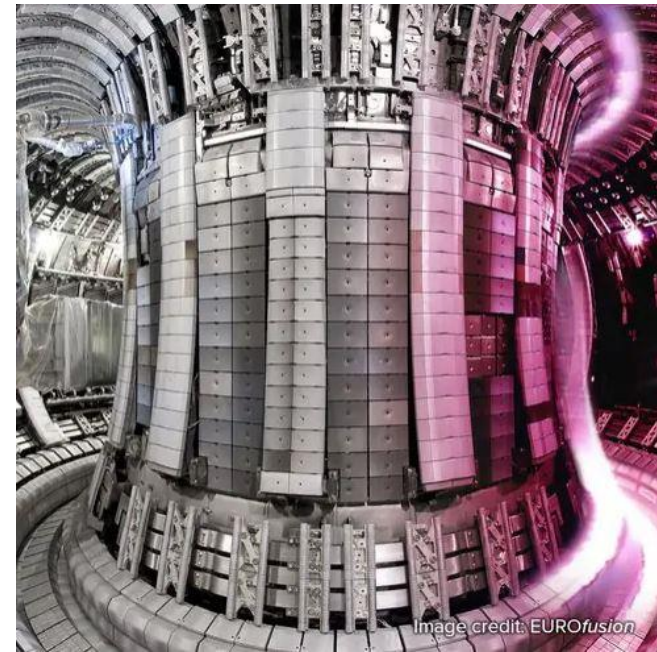
What is STEP?

- Spherical Tokamak for Energy Production (STEP) is a Govt. project to design and construct a commercially viable fusion power plant by 2040.
- Included in Govt's Ten Point Plan for a Green Industrial Revolution - Nov 2020.
- UK Govt. providing £222 million pounds to develop concept design by 2024.
- Fusion would provide reliable and 'limitless' low carbon energy source to meet future demand and growth.
- No high level hazardous waste materials are produced.
- STEP Programme led by the United Kingdom Atomic Energy Authority (UKAEA).



Background Cont..

- STEP comparable in scale and value to a fully operational power station.
- Significant future Govt. funding would be required to construct.
- Consented as a Nationally Significant Infrastructure Project – therefore determined by Central Government.
- Potential for waste heat from fusion to be used for other uses such as hydrogen production.
- The UKAEA undertook a national call for sites in early 2021 to identify potential sites for STEP



Nottinghamshire site nominations

- Two power station sites in Nottinghamshire were nominated as part of the UKAEAs call for sites in March 2021 – West Burton and Ratcliffe on Soar.
- The County Council acted as the nominating body working closely with the landowners, District and Borough Councils and wider stakeholders to prepare the nominations.
- Both sites were shortlisted by the UKAEA.
- Further evidence gathering undertaken at Ratcliffe on Soar.
- West Burton remains as the only reserved bidder



What is fusion?



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What is fusion cont..



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Fusion Power - summary

- An attempt to replicate the processes of the sun on earth
- Differs significantly from nuclear fission
- Zero Greenhouse gas emissions. Only gas produced is Helium which is an inert, non toxic gas. Some low level waste produced.
- Fusion energy is safe – if any disturbance occurs, the plasma cools within seconds and the reaction stops
- The raw materials for energy production (fusion fuel) are found in water and in the earth's crust
- Fusion power is not affected by the weather and can produce energy on demand
- Fusion power stations require less land take than other renewable technologies

STEP strategic opportunities

- Significant value in the region from the design, through to construction, through to operation
- Significant skills will be required for development and operation, these will range from apprentices, through degree and graduate skills, and experienced professionals
- UKAEA has already allocated resources to support an apprentice training scheme and will work with local education and training providers asap
- Key priority identified in Green Growth led by the Midlands Engine
- Nottinghamshire and the region as a World Leader in green energy production

STEP benefits

- Supply chain – the UK already has a thriving private sector fusion industry and a significant proportion of this is in our region
- Design & development stage worth £220m
- In terms of jobs;
 - research into fusion energy shows it is creating 4000 jobs annually (direct employment and related activities)
 - Nuclear power plants employ 500 to 1000 people and construction employs up to 3500 workers at the peak
- Significant private sector investment evidenced between 2002 and 2018 over £1.8bn invested in over 40 start ups
- Estimated £1.5bn inward investment
- It will form the centre of an ecosystem, ultimately supporting thousands of high-quality high-tech jobs

Regional context

- A well developed regional partnership. Strong strategic alignment and network of research and development and high tech sectors.

- The partners collaborating include:

- D2N2 LEP
- East Midlands Freeport
- EDF Energy
- Energy Research Accelerator
- Greater Lincolnshire LEP
- Midlands Engine
- Nuclear AMRC
- Sheffield City Region
- Nottingham Universities



NUCLEAR AMRC



January 2022

UKAEA to request further site-specific information and undertake a technical site visit

February/March 2022

The UKAEA Executive Committee to undertake a site visit. Consultation events with stakeholders and local communities to be undertaken (dates to be confirmed)

Quarter 1 2022

Finalise site development plan based on the assessment work undertaken

Quarter 2 2022

UKAEA to make recommendation to the Secretary of state

Late 2022

Secretary of State to announce the host site

2024

Concept Design Approved

2032

Detailed engineering design and all relevant permissions and consents to build the plant are sought. The intention is to have a fully evolved design and approval to build and construction begins

2040

Operations begin