# Home sought for UK's ground-breaking prototype fusion power plant

- UK government has called on local communities across the country to put forward proposals to host the UK's prototype fusion energy power plant
- when complete, the plant will pave the way to a limitless supply of low carbon, clean energy to the UK
- follows Prime Minister's ten-point-plan for a green industrial revolution and the UK's ambition to be the first country in the world to commercialise fusion energy technology

Local communities across the UK are being asked to step forward with proposals to house a prototype fusion power plant in a move that could propel them on to the global stage in a world first. The successful bidder could be first in line for thousands of new local highly-skilled jobs, putting them at the heart of the government's green industrial revolution.

Fusion offers a virtually limitless source of clean electricity by copying the processes that power the sun.

The UK government has today (Wednesday 2 December) invited UK regions and communities to put forward proposals to become the home of STEP – the Spherical Tokamak for Energy Production – the UK's ambitious programme to design and build a prototype fusion plant.

Communities will have until the end of March 2021 to submit their nominations and will need to demonstrate that their local area has just the right mix of social, commercial and technical conditions to host the new plant – such as adequate land conditions, grid connection and water supply.

The successful site will be home to the construction of the plant, targeted for completion by 2040, and will become a global hub for fusion energy and associated industries. This could create thousands of local highly skilled jobs during the construction and operation of the plant, as well as for the local supply chain, while attracting a new science and technology hub for the UK.

This follows the Prime Minister's 10 point plan for a green industrial revolution set out earlier this month which committed to doubling down on the UK's ambition to be the first country in the world to commercialise fusion energy technology, with £222 million allocated to begin the STEP design work.

Business and Energy Secretary Alok Sharma said:

> We want the UK to be a trailblazer in developing fusion energy by capitalising on its incredible potential as a limitless clean energy source that could last for generations to come.

> Communities across the country have an incredible opportunity to secure their place in the history books as the home of STEP, helping the UK to be the first country in the world to commercialise fusion and creating thousands of highly skilled jobs to drive our green industrial revolution.

STEP will be delivered through the UK Atomic Energy Authority which carries out fusion energy research on behalf of the government.

In addition to its £222 million commitment to STEP, the government has also invested £184 million by 2025 in new fusion facilities, infrastructure and apprenticeships at the Culham Science Centre in Oxfordshire, providing further support to this important centre of fusion and innovation.

UK Atomic Energy Authority CEO Professor Ian Chapman said:

> STEP is about moving from research and development to delivery.
>
> It will prove that fusion is not a far-off dream, but a dawning reality with the UK leading the commercial development of fusion power and positioning itself as a pioneer in sustainable fusion energy.
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> To achieve this ambitious goal will require all the ingenuity and application of the UK's science and engineering industry and we look forward to working with industrial partners in the years ahead, not just to invest, but also to support the technical evolution of the programme.
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> We are confident that working together with partners in the UK and around the world will enable the UK to bring a revolutionary technology to market.

A recent independent study by London Economics found that the UK economy has gained £1.4 billion from the government's direct investment in fusion energy over the past decade.

## UK Atomic Energy Authority

The UK Atomic Energy Authority (UKAEA) carries out fusion energy research on behalf of the UK government at Culham Science Centre near Oxford. UKAEA oversees Britain's fusion programme, headed by the MAST Upgrade (Mega Amp Spherical Tokamak) experiment. It also hosts the world's largest fusion research facility, JET (Joint European Torus), which it operates for European scientists under a contract with the European Commission.

Fusion research at Culham is funded by the Engineering & Physical Sciences Research Council (EPSRC) and by the European Union under the EURATOM treaty.

More information is available on the UKAEA website and the UKAEA Twitter

account @UKAEAofficial.

## What is fusion energy?

Fusion research aims to copy the process which powers the sun for a new large-scale source of clean energy here on earth. When light atomic nuclei fuse together to form heavier ones, a large amount of energy is released. To do this, fuel is heated to extreme temperatures, 10 times hotter than the centre of the sun, forming a plasma in which fusion reactions take place. A commercial power station will use the energy produced by fusion reactions to generate electricity.

Fusion has a huge potential to be a long-term energy source that is environmentally responsible (with no carbon emissions). It is inherently safe with abundant and widespread fuel resources (the raw materials are found in seawater and the earth's crust).

## What is STEP?

STEP (Spherical Tokamak for Energy Production) is an ambitious programme to design and construct a fusion energy prototype plant, targeting 2040 for completion. It is a UKAEA programme with an initial £222 million funding from the UK government to produce a concept design by 2024. The STEP prototype will be used to research and develop the technology and enable a fleet of commercial plants to follow in the years after 2040. The aim for this first phase of work is to produce a 'concept design' by 2024. This means an outline of the power plant, with a clear view on how we will design each of the major systems. The next phase of work will include detailed engineering design, while all relevant permissions and consents to build the prototype are sought. The final phase is construction, with operations targeted to begin around 2040. The aim is to have a fully evolved design and approval to build by 2032, enabling construction to begin.

Nominations for the STEP siting will likely be coordinated by local authorities with input from a range of partners including landowners, Local Enterprise Partnerships, local businesses and others.

Communities have until the end of March 2021 to submit their initial nominations and assessment of sites will be based on a set of social, commercial and technical criteria, taking around 2 years to complete. On conclusion of this assessment UKAEA will make a recommendation to the Secretary of State for Business, Energy and Industrial Strategy with the successful site announced around the end of 2022.