UK Government

A New Energy Revolution

The UK's Plan for Delivering Fusion Energy

March 2026

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Foreword

Economic growth is the central mission of this Government. The UK's modern Industrial Strategy sets out a bold and credible plan to unlock long-term investment, drive productivity and grow the industries that will underpin sustained economic growth into the future. As a priority sub-sector in the Clean Energy Sector Plan, fusion energy is one of those industries.

The UK's position as a leader in fusion energy R&D is something we should be proud of. In 2021, the UK was the first country in the world to publish a fusion energy strategy, building on the R&D excellence of over 60 years at Culham in Oxfordshire and setting out a pathway to commercialisation. Since then, we have seen rapid progress and growing private sector involvement, reinforcing the UK's position as a global leader in fusion innovation.

Today, the UK is backing fusion research and commercialisation with over £2.5 billion over five years as part of the UK's Plan for Change. Culham Campus is already driving economic growth and capability throughout the Oxford-Cambridge Growth Corridor and right across the country. We are seeing private companies in the UK raise capital, generate revenue, and apply fusion-derived technologies across sectors. We are developing the STEP site at West Burton in Nottinghamshire which will bring thousands of jobs and industrial renewal to the site of a former coal power station.

But the landscape continues to evolve. Other countries have published their own strategies with significant investment into fusion from China, Germany, Japan and the US. The challenge has shifted from research excellence to industrial leadership, through growing and supporting an ecosystem of SMEs; developing strong supply chains; and delivering a commercially viable fusion plant.

The UK is ready to lead this next phase, building a thriving fusion industry from supply chains to developers, creating a skilled workforce, supporting commercialisation and deployment, and catalysing demand through the UK's STEP programme. We are committed to making the UK the best place in the world to develop and deploy fusion energy.

The UK has historically excelled in R&D capability but has not always capitalised its opportunities by turning a technical advantage into a commercial advantage. Fusion cannot be the next in a line of missed opportunities. It is a sector where the UK leads today and can capitalise on tomorrow.

It will help us capture a greater share of foreign direct investment, support high-quality job creation, and strengthen our energy resilience. It is already catalysing investment, creating high-quality jobs, and driving innovation across the country. Fusion is a launchpad for more UK-based advanced manufacturing, greater sovereign engineering excellence, and global leadership in clean energy.

It is a growth story rooted in British ingenuity, industrial ambition, and international leadership, and it is a story we are proud to support.

This strategy, led by the Department for Energy Security and Net Zero and supported across Government, sets out how we will go further, taking decisions for long-term prosperity while delivering tangible benefits now: creating thousands of jobs, attracting new companies and capabilities, while turning the promise of fusion into reality. A reality not just enabled through commercialisation but through innovation, deployment and market creation.

There is evidently a big job to do, requiring collaboration and commitment across government, industry, and academia. Such an undertaking with all its technical and commercial uncertainties will not be without setbacks. Those pursuing and supporting fusion, whether across government or in the private sector, should be bold and not fear these challenges but recognise that they are steps on a journey to a new industrial and energy revolution. And, like every major revolution before it, this will bring not only end-goal benefits but a wave of enabling technologies in its wake that reshape industries and societies.

We are delighted that through this strategy, the pathway for achieving this is not only possible but clear and actionable.

Lord Vallance of Balham

Minister of State for Science, Innovation, Research and Nuclear

Lord Livermore

Financial Secretary to the Treasury

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Executive Summary

The UK is a global leader in fusion energy, built on decades of experience, with unique technological capabilities and a growing fusion sector positioning the UK to capture significant opportunities for economic growth. No other country in the world combines the UK's depth of public research, strategic approach to R&D priorities, scale of government investment, and commitment to first-of-a-kind deployment.

That is why fusion is a frontier industry within our Industrial Strategy and is central to delivering its objectives of higher business investment, stronger supply chains, and good jobs across the UK. With timescales for fusion deployment shortening and investment around the world accelerating, this strategy sets out a clear plan for how the UK will continue to build an industry to remain at the cutting edge of fusion development, support investment and skills, and establish a world-leading policy framework with STEP[1] at the heart of our approach.

The UK's Fusion Energy Objective

Accelerate growth of the UK fusion industry to capture the economic and strategic benefits of fusion through a globally competitive supply chain; UK based power plant design, subsystems and systems integration capabilities; and demonstrating commercial viability through STEP.

We will do this in partnership with the private sector and will ensure that the UK is well positioned to capture the near-term economic benefits of rapidly developing fusion technology such as innovation, creation of secure, well-paid jobs, and the use of commercially valuable new fusion technology in adjacent sectors. We will position the UK capture the significant long-term economic and energy security benefits from a global market expected to be worth between £3tn and £12tn in the future. That is why the UK has announced record breaking funding of over £2.5bn for fusion over five years.

The UK's public sector fusion capability is underpinned by the world leading expertise of the UK Atomic Energy Authority (UKAEA) Group which comprises of:

[1] Spherical Tokamak for Energy Production (STEP) – The Government's first of a kind prototype fusion power plant to be built at West Burton in Nottinghamshire.

UKAEA National Fusion Laboratory[2] – the largest dedicated fusion organisation in the world with decades of expertise through the operation of JET[3] and a comprehensive suite of world-class facilities covering materials, robotics, plasma and tritium handling. Supported by £1.2bn of fusion funding, this strategy sets out how we will continue to leverage the leadership of UKAEA to coordinate R&D priorities and accelerate towards fusion commercialisation and UK global competitiveness.

UK Industrial Fusion Solutions (to become UK Fusion Energy) – UKIFS has been set up initially to deliver the STEP programme. Backed by £1.3bn of Government investment, UKIFS is uniquely placed as one of the best capitalised fusion companies in the world, with genuinely leading technical capabilities, the backing of UKAEA's scientific expertise and the ability to call upon the coordinating power of Government. It will provide the foundation for the UK to develop first of a kind fusion power plants and directly stimulate the growth of the UK supply chain. Working with industrial partners, UKIFS will develop world leading capabilities as a fusion power plant integrator that can design and deploy fusion power plants globally, with the capability to raise external investment in future. **To recognise this ambitious role and its future in the UK fusion energy sector, as part of this strategy we are announcing that we will rename UKIFS as UK Fusion Energy**.

Key Measures

Accelerate R&D

We will invest in the underpinning research and technology needed to solve remaining technical challenges. This includes:

- Turbocharging the UKAEA's status as a world-class centre of fusion R&D, reinforcing its position as a hub for high-tech innovation. This includes investment in unique fusion R&D capabilities such as £180m for tritium breeding through LIBRTI[4]; new international partnerships such as the UKAEA's new H3AT[5] tritium facility working with Eni (Italy) and Kinectrics (Canada); and groundbreaking decommissioning of JET[6];
- Partnering with industry to develop leading technologies such as magnet and gyrotron (microwave) test facilities at West Burton, using the focus provided by STEP and building on decades of world leading research;

[2] Throughout this document, UKAEA National Fusion Laboratory will be referred to as 'UKAEA'. References to the broader UKAEA Group are explicitly identified where relevant.
[3] The Joint European Torus (JET) was one of the world's largest and most powerful fusion machines, hosted at the UKAEA. JET is now entering a first-of-a-kind decommissioning and repurposing phase.
[4] Lithium Breeding for Tritium Innovation (LIBRTI) - a global first of a kind facility aimed at advancing fusion fuel breeding technologies (tritium), one of the key outstanding challenges for delivering fusion. £180m covers funding over 2025/26 – 2029/30, total investment into LIBRTI is £220m.
[5] The UKAEA-Eni Hydrogen-3 Advanced Technology (H3AT) - facility aiming to develop skills and technologies for processing and handling tritium within future fusion power plants.
[6] The Joint European Torus (JET) was one of the world's largest and most powerful fusion machines, hosted at the UKAEA. JET is now entering a first-of-a-kind decommissioning and repurposing phase.

- Investing £45m in the new 'Sunrise' 1.4MW supercomputer, the largest fusion-dedicated AI supercomputer in the world, which will use advanced AI to accelerate fusion design, modelling, and operations; and developing a wider AI Growth Zone to power jobs and economic growth.

Grow investment, supply chains and skills

Use public investment, including through STEP, to unlock private sector investment and stimulate a rich ecosystem of companies working in fusion, from SMEs to multinationals, supported by a pipeline of talent and skills, making the UK a top global destination for private developers, suppliers and investment. This includes:

- A major new phase for STEP backed by £1.3bn, bringing significant economic benefits to the region around the STEP site at West Burton, including thousands of new jobs. This includes the appointment of industrial partners, purchase of the West Burton site, and plans to develop UK Fusion Energy (previously UKIFS) as a pioneering UK systems integrator, partnering with the private sector to develop critical capabilities.
- A UK Fusion Investment Prospectus setting out the offer for global fusion companies and investors wanting to participate in the UK's world-class fusion ecosystem.
- Supporting fusion skills development including the UKAEA's Fusion Opportunities in Skills, Training, Education and Research (FOSTER) programme, aiming to bring over 2000 newly trained individuals into the sector. In addition, working with the Nuclear Skills Taskforce and Department for Education to safeguard the fusion skills pipeline in the long term.
- Unlocking the UK Public Finance Institutions such as the British Business Bank and National Wealth Fund to back British businesses and support investment into the fusion sector and supply chain. We will also explore regional incentives to attract more fusion investment to support the East Midlands fusion cluster building on the Government's cornerstone investment into Starmaker One, a UK fusion investment fund.

Policy innovation

Create a forward-leaning environment for the fusion sector to thrive, further developing the UK's pro-innovation regulatory regime, streamlined planning, and developing the world's first market framework for fusion energy. This includes:

- Publishing a draft National Policy Statement for Fusion (EN-8) in Summer 2026 to simplify the planning regime for fusion companies locating in the UK and publish a roadmap setting out regulatory processes for developers.
- Developing a plan for the UK to be the first country in the world to offer a market framework for fusion energy. By working with the fusion and energy sectors, consumer groups and other stakeholders we will provide providing leading incentives to site fusion facilities in the UK while balancing the need to protect future bill payers.

- Engage the energy insurance market to encourage proportionate insurance of fusion outside of the nuclear pools and standard nuclear exclusion clauses.

Alongside this, we will continue to work with trusted partners around the world, including through our fusion agreements with Canada, Germany, Japan, the US and others as agreed, welcoming the benefits of collaboration as a key part of our approach. We will continue to promote a proportionate approach to regulation through multilateral fora such as the G7 and International Atomic Energy Agency (IAEA) and explore working with other multilateral organisations such as the International Energy Agency (IEA) and G20 where relevant to take a globally coordinated approach to fusion commercialisation.

With the action set out in this strategy and continued focus on commercialisation of fusion technology for both short and long-term economic gain, the UK is ready to play a leading role in the global fusion market.

The Government's vision for fusion energy

Accelerate growth of the UK fusion industry to capture the economic and strategic benefits of fusion through a globally competitive supply chain; UK based power plant design, subsystems and systems integration capabilities; and demonstrating commercial viability through STEP.

Introduction

The UK has exceptional R&D capabilities in fusion, which are already translating into UK economic growth. Since the publication of the UK's first fusion strategy in 2021 the UK sector has developed substantially. We have expanded R&D capability, holistically addressing remaining technical challenges through world-leading facilities across plasma, robotics, materials and unique new capabilities like H3AT and LIBRTI, whilst demonstrating fusion decommissioning through JET. We have created STEP, the UK's flagship programme which will demonstrate a fully integrated fusion power plant and catalyse the wider sector.

This is being achieved in partnership with the private sector, with over 500 companies already involved in the UK fusion sector and more choosing to locate activities in the UK to benefit from this ecosystem.[7]

However, with global investment accelerating, timescales narrowing and the future global fusion market estimated to be worth between £3tn and £12tn in future, both the opportunity and competition are increasing rapidly.[8] This strategy sets out the UK's vision and plan to turn this foundation into real and enduring economic, commercial and strategic value for the UK, now and in the future.

We will use over £2.5bn of Government investment, including through STEP and wider programmes, to stimulate a rich ecosystem of fusion related companies, from SMEs to multinationals, fusion developers to strong supply chains, making the UK a top global destination for investment. This sector will have the flexibility, capacity and capability to serve a future global fusion market, whatever the future mix of technologies.

[7] London Economics, Overview of the UK Fusion sector.
[8] UK Government, Industrial Strategy: Clean Energy Industries Sector Plan.

We will create demand by providing commercial and procurement opportunities for UK companies and making it cheaper and easier for fusion developers and others to operate in the UK. And we will support the supply of technology by turbocharging our world class R&D base with further investment and new facilities, supporting acceleration of commercialisation, investment and tech transfer in both the public and private sectors. By stimulating both supply and demand, we aim to support a long-term cycle of growth that will help anchor fusion companies and supply chains in the UK.

As well as using STEP as a supply chain stimulus and demonstration for fusion technologies, we will develop UK Fusion Energy as a pioneering UK company with systems integration and subsystems capability, partnering with the private sector and able to raise external investment in future.

Development stages

We envisage the UK fusion sector developing in three broad stages, each advancing the UK's fusion programme and industry development in different ways and requiring different types of support from government and private investment. These stages are:

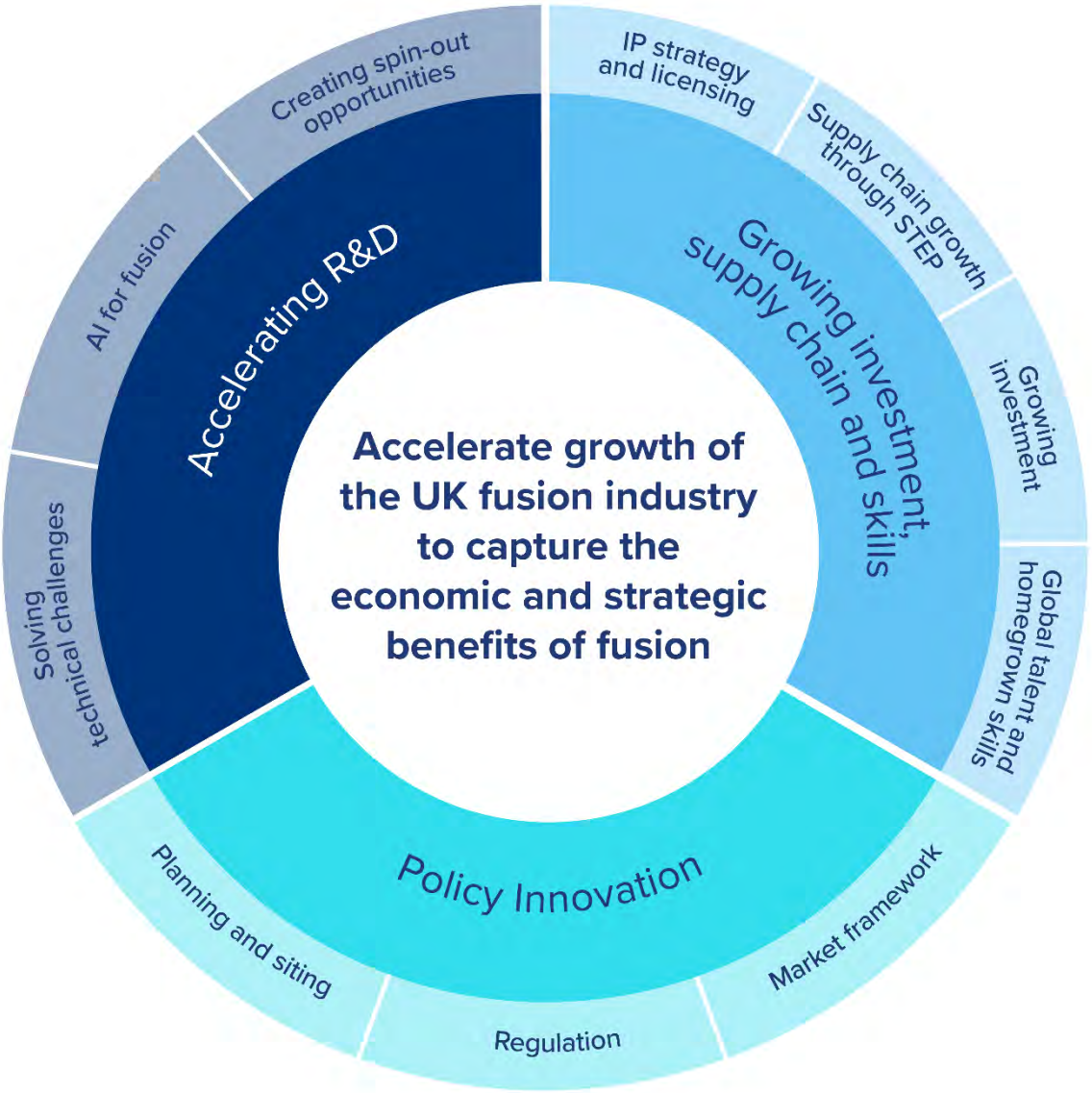
- R&D and near-term technology commercialisation;
- Fusion demonstration and deployment;
- A UK and global fusion energy market.

These are not simply sequential – they overlap and work on the later stages is already underway. Precise timings will be driven by emerging technology and the fusion market. However, the UK needs to be ready to support each of these stages. To do this and deliver the UK's objective this strategy sets out three delivery themes:

- Accelerating R&D;
- Growing investment, supply chains and skills;
- Policy Innovation.

These are summarised in Figure 1. Annex A sets out an overview for how the UK fusion programme fits together and contributes to our objective of fusion sector growth.

Figure 1 – a representation of how the UK's fusion programme contributes to the UK's fusion objective.



R&D and Commercialisation

In the near term, we expect the UK fusion sector, including UKAEA Group and increasing numbers of private companies, to make significant strides towards delivery and the commercial exploitation of fusion technology for both fusion and adjacent markets. For example, we expect UKAEA and wider UK R&D to deliver key advances in plasma science, robotics, materials testing and tritium handling, and UK Fusion Energy will deliver core technical milestones for STEP. We will also see development of new UKAEA R&D capabilities in fusion fuel breeding, material testing and high-performance computing all of which are required for fusion commercialisation.[9]

[9] A summary of the near-term milestones of the UK fusion programme is contained in Annexes B and C.

Fusion companies are already producing spillover benefits from technology exploitation, providing near-term benefits from taxpayer and private sector investment. Private companies globally are also aiming to hit significant milestones demonstrating the key goal of net gain of energy and progressing their paths to deployment. The combination of credible technical progress and near-term commercial opportunities is also starting to attract larger industrial players necessary for deployment, building industrial capability and resilience.

Government investment into UKAEA Group, including STEP, will be a key enabler in this stage, encouraging engagement beyond the immediate supply chain. There are specific opportunities for companies in high temperature superconducting (HTS) magnets; advanced materials; robotics; neutral beams; microwaves & gyrotrons, lasers; plasma processing; and AI for complex dynamic systems.

Adjacent applications for these are meanwhile being developed in sectors such as advanced manufacturing, aerospace, automotive, defence, energy systems, medical technology, space and telecoms.

For example, the UK company Tokamak Energy has established a magnets division which is already exploring the application of HTS magnet technology to other Industrial Strategy frontier and foundational industries in addition to fusion, such as electricity networks, advanced materials, automotive, aerospace and MedTech.

Demonstration and Deployment

As fusion technologies mature, we expect to see more development of integrated fusion systems, in the UK and worldwide. In partnership with the private sector, we will develop UK Fusion Energy as a national champion and systems integrator, underpinned by market leading sub-systems and technology provided by the wider UK sector. Delivering on our Clean Energy Industries Sector Plan, we will back UK based industry and anchor a significant portion of the high-value supply chain in the UK, creating an industrial base used globally to provide major fusion components and systems integration.

This requires focus on the systems and capabilities that the UK will lead in and greater detail on how we will continue to commercially exploit these capabilities to capture economic value.

For example, UK Fusion Energy will partner with UK industry, providing commercial opportunities for companies whilst driving development of a complete fusion plant. Those companies will develop their own capabilities to meet the needs of STEP and also provide wider commercial opportunities.

Amongst the areas we expect to benefit from this approach are: **high temperature superconducting (HTS) magnets** where STEP will provide an incentive for UK based suppliers to scale production and integrate components into full fusion-ready systems; and **Gyrotrons** where there will be a need for the UK supply chain to grow and move from component level expertise to full fusion product delivery. UK Fusion Energy itself will develop the capability to bring together fusion systems into an integrated power plant design, which can be commercially exploited.

In this way, public sector expertise will be commercialised in partnership with industry to help develop the UK supply chain. **This will be valuable not only for STEP itself but will create a vibrant ecosystem for fusion and adjacent companies, providing an attractive destination for wider companies and investors to come and be a part of.**

There are also capabilities that already exist within UKAEA and its partners that are ready for commercialisation, either by spinning out that capability or partnering more closely with industry. Areas of focus here will include:

- neutral beam systems;
- remote maintenance and robotics;
- diagnostics and sensors;
- fusion fuel cycle systems;
- fusion hardened components and materials;
- key materials supply;
- target and laser-based technology from STFC[10] and its partners.

This approach combines public sector and UK industry capability with STEP demand to develop and anchor a UK based supply chain that can service not just STEP but a growing global market.

A UK and global fusion market

Uses of fusion

Even without factoring in the growing needs of AI, global energy demand is expected to roughly double by 2050 and continue to grow onwards.[11] AI will only add to that demand.

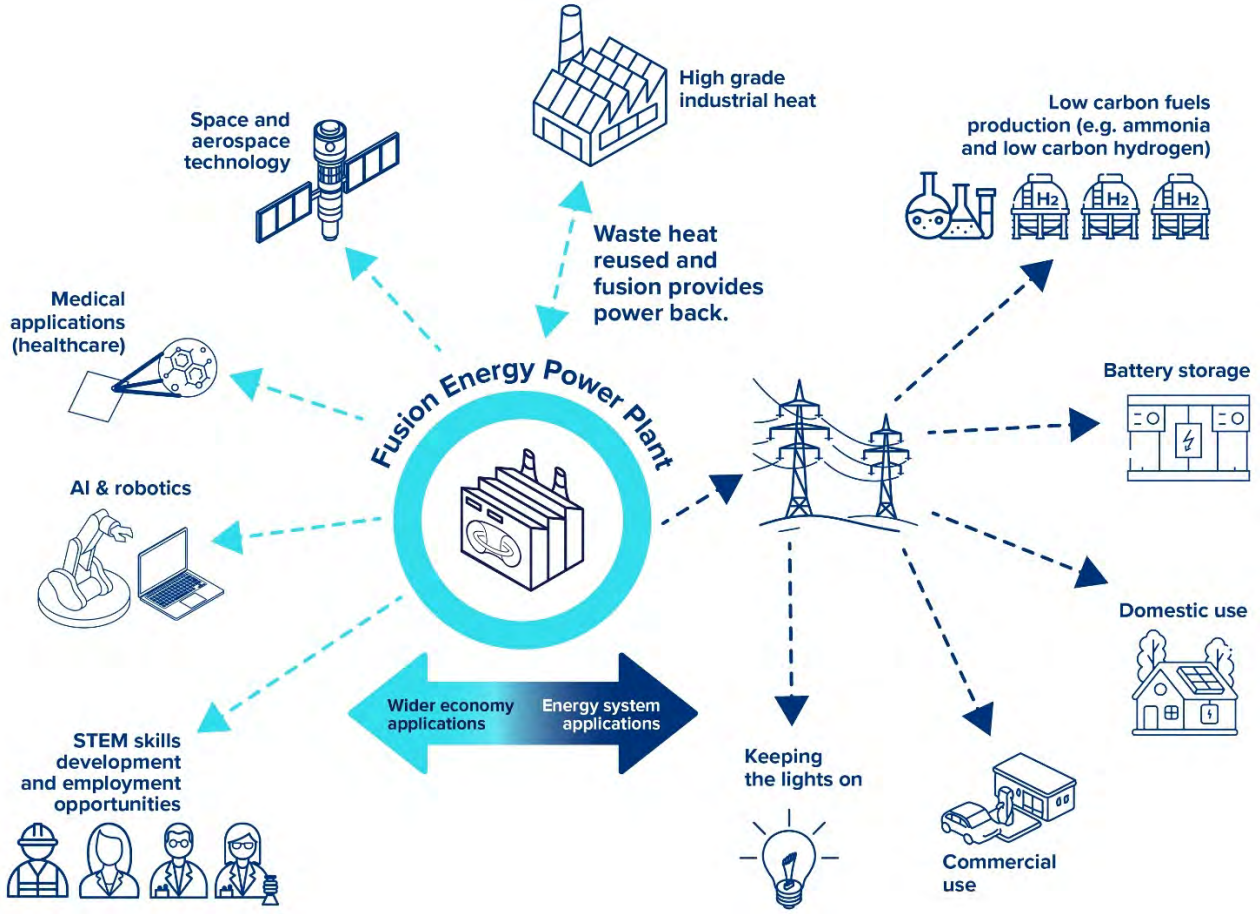
Fusion energy's unique characteristics – clean, abundant, reliable, and safe – make it well-suited to power not just homes and businesses, but also energy-intensive sectors such as industry and data infrastructure. This gives it the potential to be a valuable addition to the UK's future energy mix alongside other clean energy sources.

The Government is already planning for when fusion energy begins to be deployed globally, generating huge economic opportunities for the UK as an exporter of technology and making a significant contribution to meeting future global energy needs.

At the same time, the UK will be demonstrating deployment in the UK itself, with fusion having the potential to significantly strengthen UK energy security alongside other sources. To prepare for this and make it easier to deploy fusion facilities in the UK, we outline a range of policy measures later in this strategy, including in regulation, planning and market frameworks that will strengthen domestic fusion capability.

[10] The Science and Technology Facilities Council (STFC) – a council of the UK Research and Innovation that supports research in astronomy, physics, space science and operates world-class research facilities for the UK.
[11] NESO, Future Energy Scenarios 2025 - Future Energy Scenarios 2025: Pathways to Net Zero.

Figure 2 – Infographic illustrating the wider technology and energy uses of fusion



Collaborating across the UK

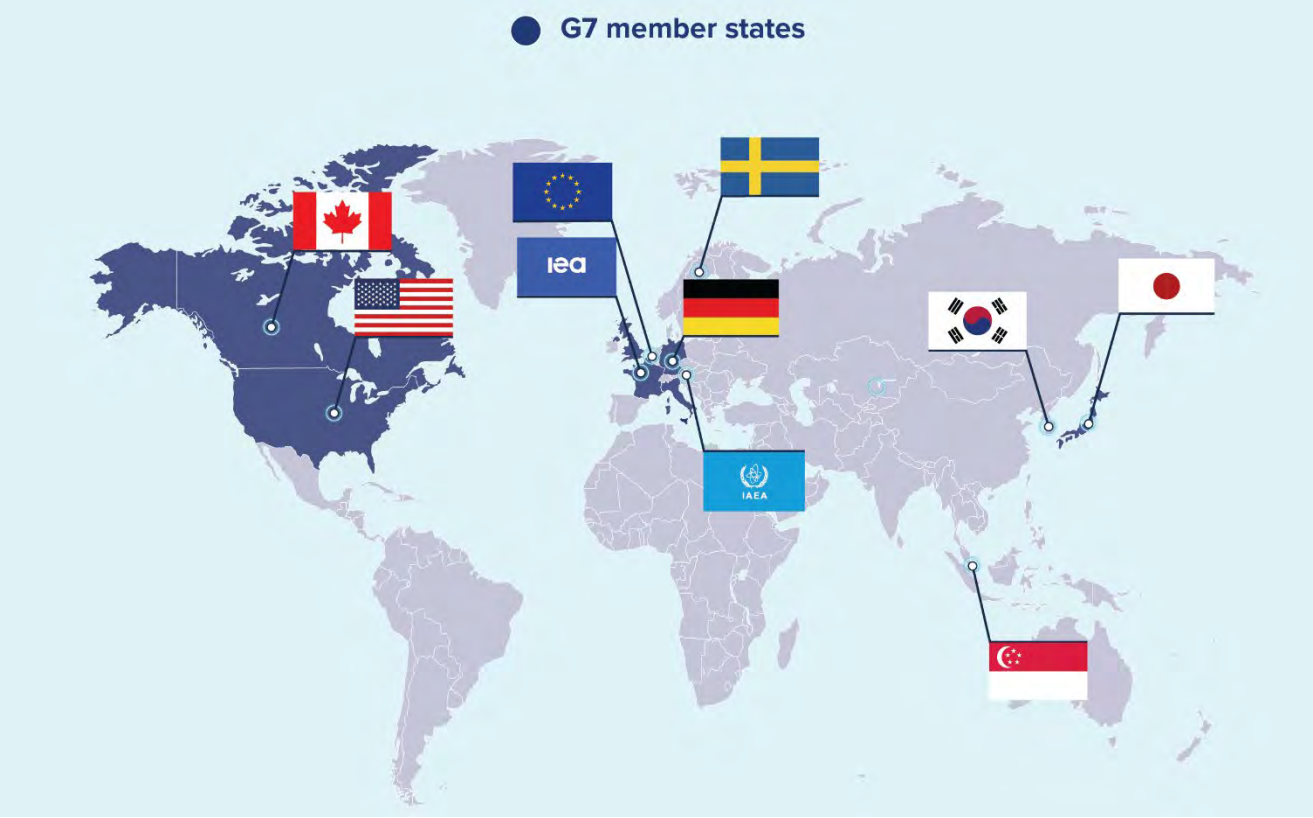
Decisions about deployment of fusion energy are matters for the different nations of the UK. However, Wales, Scotland and Northern Ireland have significant skills and supply chain expertise that can benefit the UK fusion industry overall. The UK Government will work with the devolved governments to ensure that all nations across the UK can benefit from the opportunities of fusion.

Our approach to international collaboration

International collaboration is a key part of accelerating fusion commercialisation and providing both supply side capabilities and demand for fusion technology. The international fusion landscape has shifted markedly in recent years. However, amidst increasing global competition, strategic partnerships continue to have a crucial role in accelerating commercialisation by collaborating on expertise, facilities and derisking R&D development.

Through Fusion Futures and research collaborations, the UK will manage its international relationships to accelerate progress for the UK and our trusted partners, positioning the UK to capitalise as fusion moves from the laboratory towards deployment.

Figure 3 – Summary of UK fusion collaborations



The UK's global fusion collaborations include:

- **Canada:** MoU (Feb 2024).
- **EU:** UK hosted JET and remains open to collaboration with EU and ITER.
- **Germany:** Joint Declaration of Intent (2024), strengthened via Friendship and Bilateral Treaty (July 2025).
- **G7:** UK active in Fusion Energy Working Group and wider G7 activities.
- **IAEA:** UK active in World Fusion Energy Group, Fusion Energy Conference, and work to develop international safety standards.
- **IEA:** UK active in fusion Technology Collaboration Programmes.
- **Japan:** Memorandum of Cooperation (July 2025).
- **RoK:** Global Strategic Partnership and MoU (Nov 2023).
- **Sweden:** Strategic Partnership (Oct 2023) and MoU (Oct 2025).
- **Singapore:** Strategic Partnership (Sept 2023).
- **USA:** Strategic Partnership (Nov 2023), strengthened via Technology Prosperity Deal (Sept 2025), plus LEAPS project with Tokamak Energy.

We will also continue to work through multilateral groups such as the G7 and IAEA. More countries are now implementing regulatory frameworks, demonstrating a sizeable shift in the global approach to fusion commercialisation. While the establishment of these fora are a positive signal for the credibility of fusion development, they cannot be a place of talk and no action.

Without international regulatory harmonisation, the fusion sector risks inconsistent regulation and policies that will be to the detriment of all countries. The IAEA and G7 have the opportunity and platform to shape the landscape of fusion, and the UK will continue to push for regulatory simplification and harmonisation to facilitate global deployment of fusion energy on private sector timescales.

The UK's plan for commercial fusion deployment

Achieving our vision for fusion will require sustained effort from government, industry and public sector bodies with each playing a role to solving the barriers to fusion energy. We will do this through:

Accelerating R&D

- Investing in the underpinning research and technology needed to solve remaining technical challenges, including the world-leading capabilities of UKAEA and partnerships with UK industry.

Growing investment, supply chains and skills

- Using public investment, including through STEP, to unlock private sector investment and stimulate a rich ecosystem of companies working in fusion, from SMEs to multinationals, supported by a pipeline of skills, making the UK a top global destination for private developers, suppliers and investment.

Policy Innovation

- Creating a forward-leaning environment for the fusion sector to thrive, further developing the UK's pro-innovation regulatory regime, streamlined planning, and developing the world's first market framework for fusion energy.

We set out in this section the actions we will take in each of these areas. We also set out a summary of the roles of UKAEA (the National Fusion Laboratory) and UK Fusion Energy (responsible for delivering STEP) in enabling these, both upfront and in relevant sections.

The role of UKAEA Group

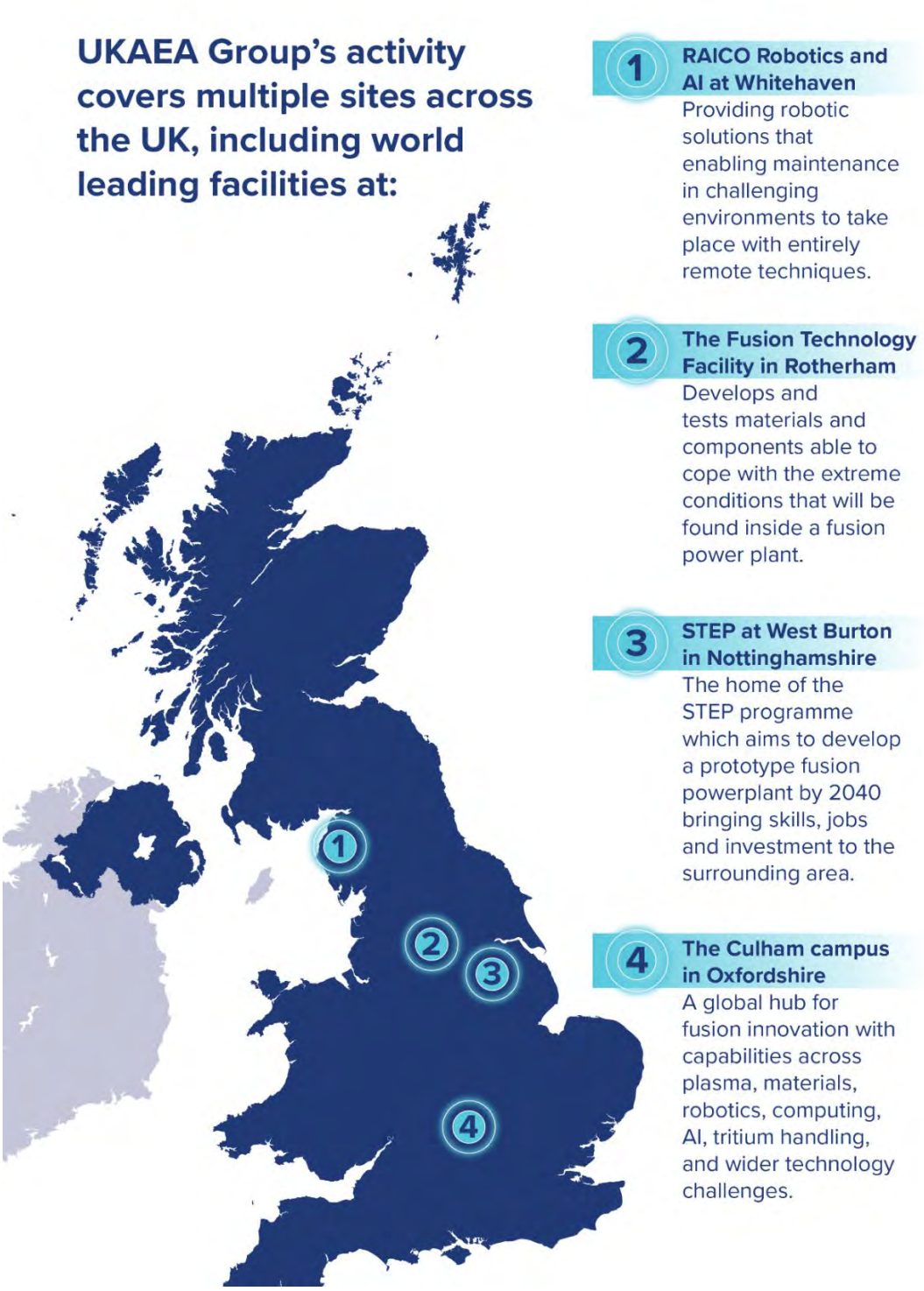
UKAEA Group is the major public sector body for fusion in the UK. It is sponsored by the UK Department of Energy Security and Net Zero (DESNZ) and comprises of:

- **UKAEA National Fusion Laboratory** – the UK's main national laboratory (Public Sector Research Establishment (PSRE)) for fusion, based at Culham in Oxfordshire, and with other sites around the UK. UKAEA strategically drives R&D development, including for STEP and wider applications to maintain national capability and international leadership;
- **UKIFS (to become UK Fusion Energy)** – a UKAEA Group subsidiary company, leading delivery of the STEP prototype power plant at West Burton in Nottinghamshire. UK Fusion Energy will integrate fusion technology in partnership with industry, delivering a complete fusion product, with STEP as the first major programme.

In line with this strategy UKAEA Group has updated its mission to focus on the importance of delivering both scientific and economic benefits for the UK. It is now a single mission in support of the UK's fusion objective:

To lead the delivery of sustainable fusion energy to maximise scientific and UK economic benefit

Figure 4 – a map of the UK illustrating UKAEA Group activity



UK Atomic Energy Authority – National Fusion Laboratory

UKAEA plays a critical role in developing the technical capability across plasma science, robotics, tritium, computing, AI, materials, and wider technology challenges. This has positioned the UK as a world leader in fusion R&D and the Government wants the UKAEA to maintain and build on this position.

The UKAEA National Fusion Lab's role in the Group's mission is to:

Progress foundational research, technology and innovation in support of the UK fusion sector through world-leading fusion expertise and capability.

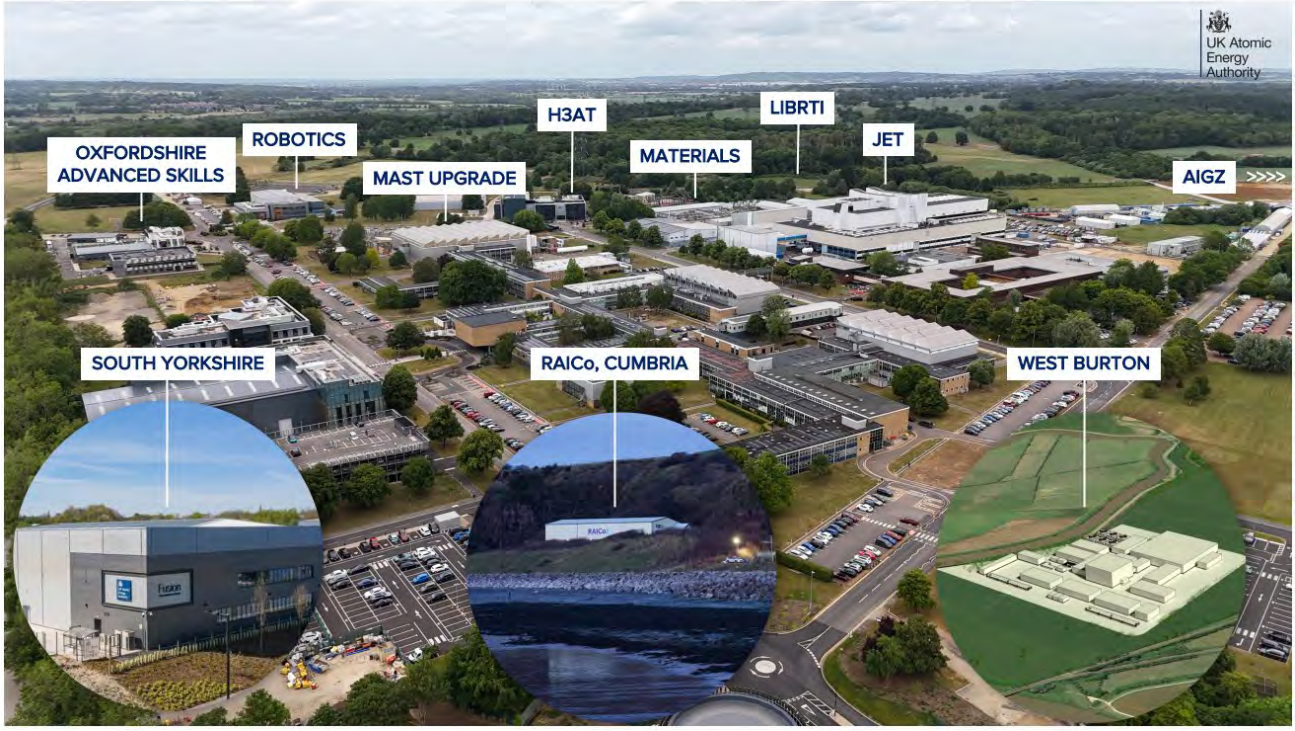
It does this by operating globally unique research facilities, developing innovation and technologies for fusion and adjacent applications, and partnering with UK and overseas collaborators and industry to develop technical solutions to the challenges of fusion.

UKAEA's existing world-leading facilities include:

- MAST-Upgrade (**MAST-U**): The UK's national fusion experiment, investigating novel exhaust concepts, de-risk the spherical tokamak design, and extend physics knowledge in support of the broader fusion programme.
- Materials Research Facility (**MRF)**: Facility that prepares and examines small samples of materials to assess their suitability for fusion power stations.
- Remote Applications in Challenging Environments (**RACE**): providing robotic solutions that enabling maintenance in challenging environments to take place with entirely remote techniques.
- UKAEA **South Yorkshire**: Facilities develop and test materials and components able to cope with the extreme conditions that will be found inside a fusion power plant.
- UKAEA-Eni Hydrogen-3 Advanced Technology (**H3AT**): a world-first tritium research centre, delivered in collaboration with Eni, studying how to process, store and recycle tritium, one of the fuels that will supply fusion power stations in the future.

UKAEA will add to these including through the development of the LIBRTI tritium breeding facility, Sunrise AI facility and Culham AI Growth Zone.

Figure 5 – UKAEA's Culham campus with other UKAEA Group sites and facilities



UKAEA will be critical in delivering the UK strategy and building a strong UK fusion industry. Through its expertise and world leading facilities UKAEA will support the UK fusion sector and supply chain to grow through a variety of mechanisms, including through strategic contracts to grow targeted capability and forming Commercial Partnerships, joint ventures, and investible vehicles for IP-driven opportunities.

This R&D delivery and support of the UK fusion sector will create economic growth opportunities at the local level. Culham is already a global hub for fusion excellence, bringing companies, investment and jobs into the area and UKAEA has the opportunity to create similar economic growth around sites in Rotherham and Cumbria as well as using on the Oxford-Cambridge Growth Corridor to build on benefits around Culham.

UKAEA also acts as the fusion partner for the STEP programme, working with UK Fusion Energy alongside industrial partners, who in turn will bring construction and engineering expertise to STEP. A growing fusion programme and industry brings the opportunity to further benefit local communities, particularly around the site of STEP in West Burton, Nottinghamshire.

Figure 6 – DESNZ Secretary of State in front of MAST-U while visiting Culham

UK Industrial Fusion Solutions (UKIFS) – to become UK Fusion Energy

UKIFS is uniquely positioned to be a world leading fusion systems integrator and plant operator, bringing together the full set of capabilities, information, and whole plant understanding needed to reach an integrated fusion powerplant design. Its holistic approach - optimising net power, fuel self-sufficiency and a route to commercial levels of plant availability simultaneously – based on leading R&D and industrial integration, gives it a strategic advantage. **To reflect the ambition and expectation that Government has for the organisation, and its future as a commercially focused organisation in the UK fusion sector, we are announcing as part of this strategy that we will rename UKIFS as UK Fusion Energy**.

With a budget of £1.3bn up to 2029, UK Fusion Energy is uniquely placed as one of the best capitalised fusion companies in the world, with genuinely leading technical capabilities, the backing of UKAEA's scientific expertise and the ability to call upon the coordinating power of Government. UK Fusion Energy is being developed as a pioneering, major UK company with systems integration and subsystems capability, partnering with private sector construction and engineering companies and able to raise external investment in future.

UK Fusion Energy will be a national champion, leading and integrating the capability and know-how to deliver the commercial fusion energy plants of the future, by leading the design, build and operation of STEP and by developing the capacity and capability in the UK supply chain to support and service these activities now and in the future.

UK Fusion Energy's role in the UKAEA Group Mission is to:

Deliver STEP and successive fusion power plants by acting as a national fusion systems integrator and working with industrial partners to develop and deploy the technologies and capabilities required.

Through STEP, UK Fusion Energy is building the internal capability, digital information baseline, model-based systems engineering expertise, site knowledge at West Burton and state support required to integrate complex subsystems into an operable plant.

UK Fusion Energy will play a critical role in delivering the UK strategy and building a strong UK fusion industry. It will catalyse a wider ecosystem of fusion and supply chain companies able to service STEP and private sector developments but also develop near-term commercial revenue opportunities and supply the wider global fusion sector, beyond the STEP prototype and into future deployment. The delivery of STEP will also give UK Fusion Energy expertise that it can export and Intellectual Property (IP) that it can license into the fusion industry and adjacent sectors whilst playing an essential role in supporting the delivery of new private sector fusion plants. It will do this through genuine partnerships – not simply transactional procurement.

UK Fusion Energy will create unique value through:

- De-risking a future fleet of fusion powerplants;
- Developing UK industrial capability and supply chains;
- Creating long-term economic and sovereign benefit for the UK.

Figure 7 – The West Burton site before STEP construction

Transforming the site of the former coal-fired West Burton power station into the home of STEP will act as a powerful catalyst for jobs, investment and long-term growth across the East Midlands and wider Trent Valley. By repurposing a site that has powered the UK for generations, UK Fusion Energy will help anchor a thriving clean-energy cluster, attracting high-tech industries and delivering meaningful economic and social impact for local communities. UK Fusion Energy will continue to work closely with the Trent Clean Energy Supercluster[12], East Midlands Combined County Authority (EMCCA) and other local stakeholders as part of this.

Whilst no decision has yet been taken on exact timing, UK Fusion Energy's setup as a limited company provides the Government with flexibility over its structure ability to raise its own finance in future and opportunity to develop a commercial culture from the start.

As UK Fusion Energy develops, the Government will consider the freedoms needed to ensure UK Fusion Energy can operate more fully as a commercially oriented entity which can operate in full partnership with the private sector, including investors, to fulfil its objective to support a world-leading UK fusion sector.

UK Fusion Energy's value will therefore not solely be in delivering STEP but in the ability to deliver a fully integrated fusion powerplant solution, relevant subsystems, and associated knowhow, partnering with industry and playing a key long-term role in the UK fusion sector.

[12] Supercluster - East Midlands Combined County Authority.

Accelerating R&D

Invest in the underpinning research and technology needed to solve remaining technical challenges, including the world-leading capabilities of UKAEA and partnerships with UK industry.

Solving technical challenges

UKAEA Group plays a crucial role in reducing technical uncertainty to increase market confidence. This requires specific, clear, technical outcomes that demonstrate progress towards fusion commercialisation. The UK will focus on areas of strength that have the biggest impact for the UK economy, putting investment where it is most needed to accelerate development and anchor capability in the UK.

To do this, we will turbocharge the UKAEA's status as a world-class centre of fusion R&D, reinforcing its position as a hub for high-tech innovation, and utilising its position to strategically drive R&D progress. This includes:

- **Lithium Breeding for Tritium Innovation (LIBRTI) – fusion fuel breeding**

A £180m investment through Fusion Futures into LIBRTI, the global first-of-a-kind facility for designing tritium breeding blankets, one of the greatest remaining technical challenges for fusion.[13]

- **'Sunrise' AI facility – Advanced computation driving fusion R&D**

Investing £45m on the 'Sunrise' 1.4MW supercomputer, using advanced AI at to accelerate fusion design, modelling, and operations.

- **UKAEA-Eni H3AT Tritium Loop Facility – unlocking the full fuel cycle for fusion**

A new collaboration between UKAEA and Italian global integrated energy company, Eni, to conduct research and development activities for fusion, beginning with the construction of the Tritium Loop Facility which will be built in collaboration with Canadian electricity lifecycle company, Kinectrics. H3AT will be the UK's world leading research centre for processing, storing, and recycling tritium for fusion power plants.

Table 1 sets out the core deliverables that the Government has asked UKAEA Group to deliver alongside their broader activities, to demonstrate credible progress towards fusion energy. Both organisations will report against these deliverables in their annual reports.

In addition, the overview in Annex A and technical outcomes in Annex C illustrates the breath of the UK's fusion R&D programme and how they fit together, which will be further explored in UKAEA and UK Fusion Energy's organisational strategies.

[13] This is a continuation of funding. Total DESNZ investment into LIBRTI is £220m.

Table 1 – UKAEA core deliverables

Capability	Facilities / Programmes	2030 core deliverables	UK strategic outcomes	UK capability	How this supports fusion commercialisation
Plasma	MAST-U STEP	**Develop fusion physics knowledge with MAST-U** By June 2028 - Complete the fifth and sixth MAST-U experimental campaigns	Derisk STEP technical design and continue to develop IP	A self-sustaining burning plasma configuration for spherical tokamaks	Help enable 'net gain' for spherical tokamaks
Tritium	LIBRTI H3AT STEP JDR	**Commercialise UK-based tritium capability** By May 2026 - Commercialise UKAEA-developed Tritium Technology by partnering with industry	Attract investment and establish international leadership in a nascent market	A full tritium fuel cycle and handling capabilities for integration into power plant designs	All fusion power plants will require their own fuel breeding to meet demand for tritium

Capability	Facilities / Programmes	2030 core deliverables	UK strategic outcomes	UK capability	How this supports fusion commercialisation
Materials	MRF LIBRTI CHIMERA STEP	**Build the globally unique LIBRTI facility** By July 2027 – Demonstrate Multiphysics Platform to predict LIBRTI tritium output and By March 2028 - Complete LIBRTI building at Culham to begin installation of neutron source	First mover advantage in fusion fuel breeding technology	A commercially feasible fuel breeder design Materials able to withstand fusion conditions on timescales that enables feasible operation of fusion power plants	New materials are required to enable commercial viability of fusion by decreasing maintenance times

Capability	Facilities / Programmes	2030 core deliverables	UK strategic outcomes	UK capability	How this supports fusion commercialisation
Robotics	RACE RAICO STEP	**Commercialise UK-based robotics capability** By December 2027 - Commercialise UKAEA developed robotics capabilities for application into global fission, fusion, clean energy and other technology markets	Attract investment and establish internati onal leadership in a nascent market	A suite of robotic solutions that enable maintenance and decommissioning of fusion reactors	Remote maintenance is needed for fusion due to the extreme environment
Fusion Integration, Engineering , and Deployment	STEP	**Technology Development** By Summer 2028 – UK Fusion Energy will have completed magnet and gyrotron test facility construction at West Burton	Demonstrate technical risk reduction increasing the investment potential of UK Fusion Energy and develop valuable test bed capability that can be commercially exploited	A holistic detailed powerplant design	A fusion powerplant design will be developed that can be exported and deployed around the world

Advancing AI for fusion

Huge strides in artificial intelligence (AI) have been made since the publication of the UK's first fusion strategy. The Government's "AI for Science Strategy" sets out how the UK will maintain its global scientific leadership and shape the transformation of science by AI. Our vision is centred around building a data landscape that facilitates transformative research; ensuring researchers have access to compute resource at sufficient scale; building multi-disciplinary research communities; and capitalising on rapid developments in autonomous laboratory infrastructure and general-purpose AI science tools.[14]

Fusion is one of the five priority areas identified on the basis of existing UK strength, opportunities for AI-driven progress, and alignment with wider UK objectives including the UK's modern Industrial Strategy, within which Fusion and AI are both frontier industries.[15]

Whilst fusion could play a significant role in powering the AI datacentres of the future, AI will first play a key role in making fusion happen. AI applications for fusion energy, including through international AI research partnerships, can accelerate progress towards commercialised fusion energy. The Government's AI Opportunities Action Plan announced the UKAEA's Culham Campus as the UK's first AI Growth Zone (AIGZ).[16]

This presents a unique opportunity to bring together world-leading scientific expertise and build a hub that will cement the UK's position at the forefront of fusion delivery. UKAEA Group will work with DESNZ, Department for Science, Innovation and Technology (DSIT) and UK Research and Innovation (UKRI) to maximise the benefits of the AIGZ for both fusion and wider UK science.

This work also aligns with the Government's forthcoming AI for Clean Energy Strategy, due to be published in Autumn 2026, which will set out a coherent framework for how AI can be deployed across the energy system to support decarbonisation, security and economic growth. Advances in AI for fusion provide an early example of how targeted investment in AI can accelerate clean energy innovation while strengthening the UK's long-term energy resilience.

Building on this, the Government is investing £45m into Sunrise, a 1.4MW supercomputer dedicated towards utilising AI for fusion energy. Sunrise will be a focused, mission-driven AI/HPC system accelerating the work of the UK's world-leading fusion scientists and work with other UK AI clusters such as Isambard-AI and Dawn.

[14] UK Government, AI for Science Strategy.
[15] UK Government, The UK's Modern Industrial Strategy 2025.
[16] UK Government, AI Opportunities Action Plan.

By June 2026, UKAEA will begin operations of Sunrise, expected to be the most powerful fusion-dedicated AI supercomputer in the world, whilst continuing to develop the AI Growth Zone at the Culham Campus

UKRI will engage on opportunities to exploit sovereign AI capability including fusion and net zero at the AIGZ in Culham

The work of Sunrise is likely to include both AI for discovery, where computing power can be turned to uncovering new knowledge, structures, or design options; and AI for automation, where AI is tasked to perform existing tasks faster, cheaper, more safely, and at a larger scale than is possible without it. In practice, this means:

- Accelerating **simulation, surrogates and design** – where AI could simplify simulations or learn the behaviour of complex systems such as plasmas to turn simulations that might take weeks or months into mere minutes or hours work
- Boosting **data management, and the 'digital thread'** – Making UKAEA's fusion research and experimental data consistent, accessible, and electronically readable. With this overhaul, AI can shortlist the most promising options to explore further, making fusion research much quicker.
- Enhancing **experimental operations and control** in real-time diagnostics. In this field, AI can be trained to spot anomalies and flag any issues.
- Supporting **plant operations, maintenance and robotics** by monitoring for risks in real time, pre-empting maintenance requirements, and manage physical robots to improve safety and keep people out of hazardous areas.
- Progressing **materials design**, where AI could rapidly screen 'candidate materials' for use in reactors, highlighting those most promising for use in extreme environments.
- Aiding plant managers with **energy use** – plotting the best times to draw from the grid for cheap power.

Our goal is to prepare fusion data for AI applications to ensure that researchers from both SMEs and academic institutions can access data, supporting greater collaboration and engagement with industry partners.

Case study: AI-accelerated plasma turbulence models

Artificial intelligence is transforming fusion research by enabling ultra-fast "surrogate models" of turbulent plasma. High-fidelity "gyrokinetic" simulations are the gold standard but runs can take days or even weeks on a supercomputer.

To break this bottleneck, we are working with AI specialists at JKU Linz and Emmi AI, using state-of-the-art vision transformers, to build the world's first 5D, and crucially "non-linear" gyrokinetic surrogate model GyroSwin.[17] Vision transformers are a form of AI originally developed for analysing complex images and video, where they excel at spotting subtle patterns. Here, we apply the same idea to plasma simulations.

Large sets of simulations are generated to provide the required training data. Then, rather than directly fitting turbulent heat and particle fluxes, the AI is trained to predict step-by-step the full 5D plasma. Once trained, these surrogates can accurately reproduce the underlying simulations in a matter of seconds.

This makes it possible to rapidly test candidate tokamak designs, explore operating scenarios at scale, and embed turbulence physics into whole-device and system codes, helping to increase plasma performance and reducing risk for future devices.

Figure 8 – Picture showing a fusion plasma simulation embedded into a fusion tokamak - Image credit: UKAEA

Driving Innovation and spin-out opportunities

UKAEA has a key role in supporting innovation and the growth of the UK fusion industry in its broadest sense. Over the last three years UKAEA has made considerable progress in developing an innovation and commercialisation culture.

[17] Modelling a star in a jar – in seconds | UKAEA Fusion Energy.

This includes:

- Creating a dedicated Innovation team to work hand in hand with the technical experts to identify, develop and complete commercialisation;
- Providing proof of concept funding which allows the fast-paced development of these technologies and understanding of markets;
- Creating a wide network across other sectors to allow fast paced market discovery and routes to adoption of fusion technologies into other sectors;
- Establishing commercialisation events to exhibit potential fusion spin-out companies to investors and potential industrial partners;
- Championing entrepreneurship with training within UKAEA in partnership with Innovate UK[18];
- Offering access to a growing portfolio of fusion-derived intellectual property, ready to be adopted, adapted, and scaled by industry partners.

UKAEA will continue to strengthen a culture of innovation and transfer of their capability into commercial vehicles that can support the entire fusion ecosystem with the greater freedom and flexibility that the private sector can deliver.

UK Research and Innovation (UKRI) programmes

UKRI is the UK's national funding agency for research and innovation. It brings together seven research councils, Innovate UK, and Research England to support science, technology, and industrial innovation. UKRI provides funding, infrastructure, and collaborative platforms to support critical technology development that strengthens the UK's position in global research.

The Engineering and Physical Sciences Research Council (EPSRC) plays an important role in supporting UKAEA R&D activities providing £77m from 2022 - 2027 in peer reviewed research grants to scientists using UKAEA capabilities and assets.[19] This is a critical role that ensures the highest quality, science driven research continues to provide a pipeline of innovation and cutting-edge technology. UKRI also provides an important role in bringing industry and academia together such as:

- Tokamak Energy and the University of Birmingham to advance fusion shielding systems;
- First Light Fusion, Imperial College London, the University of York, and the University of Oxford to apply novel AI techniques to inertial fusion approaches.

[18] Innovate UK, UKAEA ICURe Engage Fusion.
[19] UKRI, UKAEA/EPSRC Fusion Grant 2022/27.

UKRI will continue support for science exploration of UK fusion as a frontier industry of the Industrial Strategy's Clean Energy Industries Sector Plan

Case study: UPLiFT

The UK Programme of Laser Inertial Fusion Technology for Energy (UPLiFT) is led by the Central Laser Facility (CLF) within the Science and Technology Facilities Council (STFC), in collaboration with universities, and funded by DESNZ. The project is driving advances in high-energy laser and target technologies for laser driven Inertial Fusion Energy (IFE), including advanced laser systems, target injection, cryogenics, and power plant concepts.

Producing these targets is exceptionally difficult: they must be perfectly spherical with mirror smooth surfaces. Producing these targets in the required quantities also remains a significant challenge.

UPLiFT is strengthening the UK's capabilities by training more researchers in fusion targetry and investing in state of the art manufacturing technologies, positioning the UK as a global leader in this field.

With ultra high-resolution 3D printing, CLF can now fabricate fuel shells faster, with greater reliability and reduced complexity. This innovation shortens research and development cycles and lowers the overall cost of IFE studies.

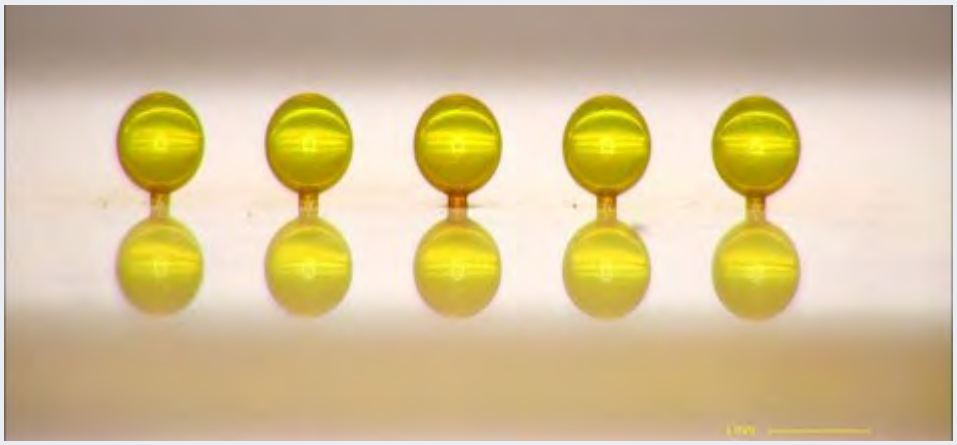


Figure 9 - Ultra high-resolution 3D printed target capsules produced using 2 photon polymerisation (2PP) technology.

Growing investment, supply chains and skills

Use public investment, including through STEP, to unlock private sector investment and stimulate a rich ecosystem of companies working in fusion, from SMEs to multinationals, supported by a pipeline of skills, making the UK a top global destination for private developers, suppliers and investment.

The global fusion sector has already raised nearly $10bn in private capital and while that figure is rapidly increasing year-on-year, power plant development will be capital intensive, and substantially more finance and wider support will be needed to nurture and attract companies, create a robust supply chain, and support deployment in the UK and around the world.[20]

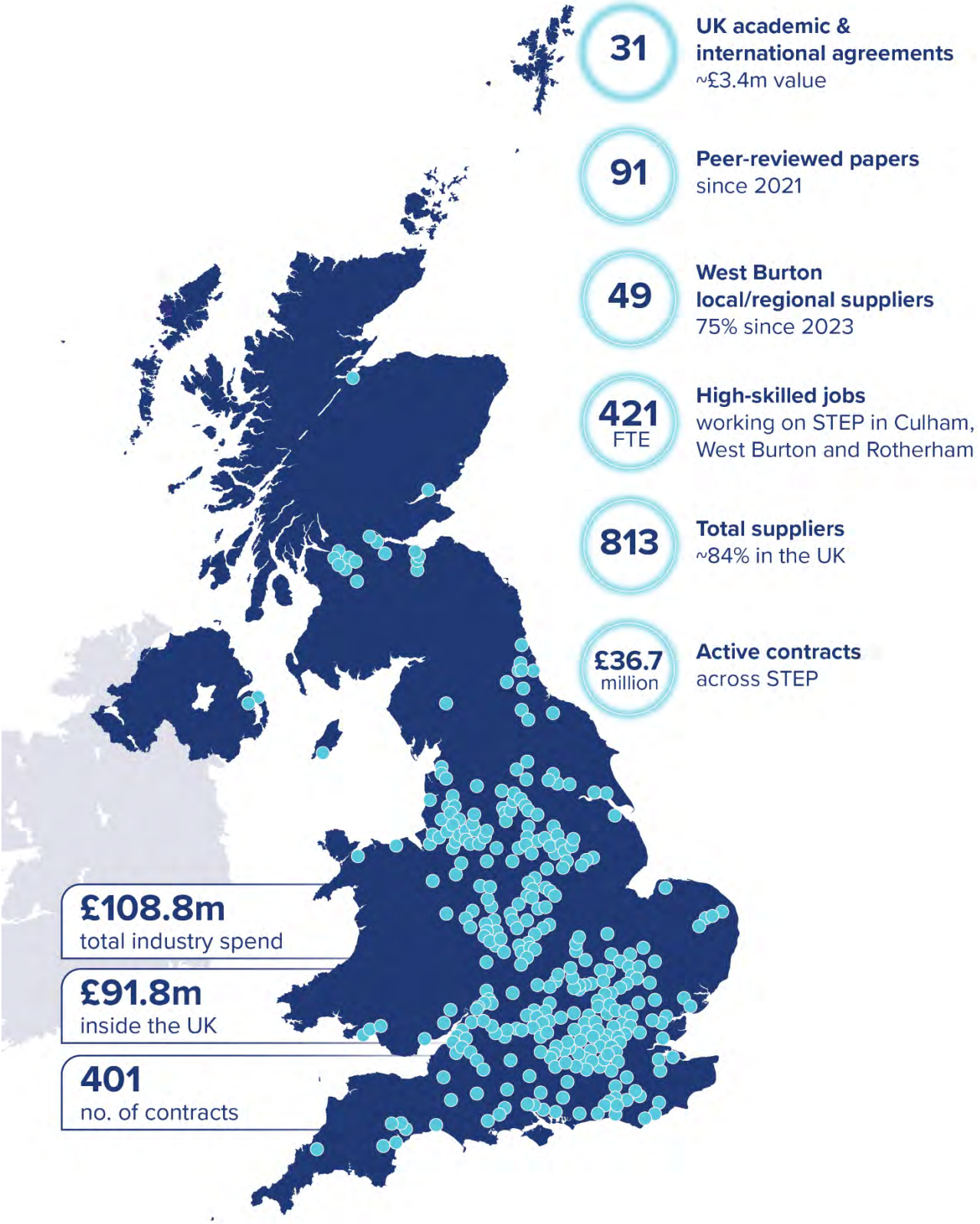
As fusion development accelerates there will be increasingly significant opportunities for private investment in the fusion industry. In the near term, fusion-related companies are already generating technologies with revenue streams, providing the opportunity for investment in innovation and in the fusion supply chain as these technologies are commercialised in adjacent sectors. More widely, we are starting to see the first examples of private offtake agreements as major investors wake up to the huge potential of fusion energy. As we move towards deployment, there will be greater opportunities for both energy companies and wider investors to be involved in fusion deployment at scale and the supporting supply chain.

The UK Government has demonstrated that it is committed to exploring alternative ways to unlock investment into infrastructure. Recent initiatives such as the Mansion House Accord and Sterling 20 will unlock up to £50bn in investment from pension funds.[21]

UK Fusion Energy itself has secured significant public sector funding for the next stage of the STEP programme which will increase investment into the UK supply chain. However, over time UK Fusion Energy will also aim to secure private investment into the organisation to accelerate delivery and serve as a catalyst for driving talent and private capital into the UK fusion sector. Progressing the STEP Programme will retire technical risk and prove the commercial value of specific technologies, as well as generating valuable IP in systems integration and subsystems that UK Fusion Energy will look to exploit commercially for economic growth.

[20] Fusion Industry Association, The global fusion industry in 2025.
[21] UK Government, Pension schemes back British growth; UK Government, Britain's biggest pension funds back regional growth drive.

Figure 10 – STEP benefits to January 2026.



Creating Demand Signals

For the fusion supply chain to scale up, suppliers need to have confidence in future demand. While fusion companies spent $434 million on supply chain in 2024, nearly double the previous year, and anticipate a further 25% increase in 2025, 81% of suppliers still cite uncertainty as a major barrier.[22] This risk aversion is compounded by the perception of fusion as a high-risk, long-term market.

STEP, alongside private sector deployment, will be a significant source of demand, stimulating the development of the wider sector including private sector deployment. UK Fusion Energy will directly provide revenue opportunities for companies in the UK fusion supply chain through contracts to deliver STEP, which will be worth hundreds of millions of pounds over the next few years and provide significant opportunity to develop key capabilities. The ecosystem developed around STEP will also support private development in the UK and demand from adjacent sectors for fusion spinout technology.

Spherical Tokamak for Energy Production (STEP)

STEP will create thousands of jobs, supporting redevelopment of the UK's industrial heartlands around its site in West Burton, Nottinghamshire - formerly home to a coal power plant. STEP will be an anchor for regional growth in the longer term by catalysing development of a fusion cluster in the region including through a business park on site and ties to the wider Trent Clean Energy Supercluster work in the region.

To catalyse the wider fusion sector, STEP will involve integration of industry to utilise its capability and capacity. This has the dual benefit of maximising the chances of success of the programme, by integrating private engineering and construction expertise with public R&D expertise, whilst directly stimulating development of the private fusion sector.

Finally, STEP is engaging with UK regulators to ensure alignment between the needs for fusion power plant deployment and regulation whilst upskilling the regulators on fusion technology. The UK Government also sees STEP having an important role in easing the way for future power plants by itself going through the UK regulatory and planning process.

As part of the Government's significant investment in fusion until 2030, STEP will demonstrate tangible progress towards fusion commercialisation and economic benefits for the UK through jobs, developing skills and developing technology in adjacent sectors. Key deliverables include:

[22] Fusion Industry Association, The fusion industry supply chain 2025.

Establish an integrated delivery team: By April 2026 UK Fusion Energy will have selected and contracted for a long-term Construction Partner, ensuring STEP has the capability and capacity to be successful and bringing the UK private sector supply chain into the fusion industry. The Construction Partner, working alongside the existing UKAEA Fusion Partner, will be fully integrated into the STEP delivery team by October 2026.

Technology Development: By Summer 2028 UK Fusion Energy, in partnership with its Fusion and Construction Partners and local authorities, will have completed magnet and gyrotron test facility construction on West Burton site and the surrounding region.

Build a UK fusion industry: By Spring 2028 UK Fusion Energy will have agreed strategic relationships with critical suppliers of fusion technologies, establishing long-term access to capability, capacity and specialist sub-systems and components essential for STEP and wider fusion commercialisation.

Redevelop the site of a former coal fired power plant: By March 2029 UK Fusion Energy will have submitted the Development Consent Order (DCO) for STEP Fusion, demonstrating it has met all required planning, environmental, and regulatory standards required of nationally significant infrastructure. This will pave the way for Government DCO approval and UK Fusion Energy commencement of main plant construction and other key activities to achieve STEP

Creating Regional Incentives

Tax credits are widely used globally to incentivise investment into key industries and fusion is already eligible for the UK's national R&D tax credit offer of 20%. However, we want to do more to ensure that the UK's offer to fusion investors and companies is world leading. As part of the UK's Industrial Strategy, the UK Government launched the Industrial Strategy Zones Action Plan to bring together the UK's Freeports and Investment Zones programmes under a shared identity – Industrial Strategy Zones, and to accelerate their delivery through enhanced government support.

Industrial Strategy Zones exist in 22 places across the UK and include a range of different incentives to attract investment and develop city regions and clusters. They all aim to deliver sector growth through three stages of development:

1. **Creating investible sites and places**: bringing sites, facilities and infrastructure forward, ready for investors;

2. **Landing investment and supporting local businesses to invest**: promoting Industrial Strategy Zones, working with businesses to secure investment and support their growth;

3. **Growing clusters and supporting local economic growth**: capitalising on early investment to attract a wider supply chain and foster a cluster, while reinvesting in the local economy and communities.

The UK already has a world leading cluster for fusion energy development at Culham. We will explore opportunities at West Burton and the Trent Valley to strengthen our second cluster for fusion commercialisation and deployment in the East Midlands. These sites provide the ideal location to expand our second fusion cluster with an existing local skills base, workforce and grid connections.

The UK Government will explore further incentives to attract more fusion investment to support the East Midlands fusion cluster.

IMPACTS AND BENEFITS OF STEP FUSION

SKILLS

A STEP Fusion Skills Collaboration in the East Midlands is working to develop the required training and qualifications programmes around the West Burton site to ensure the successful construction and operation of the prototype plant.

Alongside the UKAEA's national fusion skills programmes, this work will drive a significant expansion of opportunities to upskill or access jobs in fusion, clean energy, engineering, advanced manufacturing and more.

SUPPLY CHAIN

STEP Fusion is embedding major construction and engineering partners into the programme to increase capacity and capability to de-risk the programme whilst catalysing development of a UK supply chain, both to build the prototype plant and to tackle the technical challenges that unlock commercial fusion.

Even in this pre-construction phase, the programme is already working with businesses both regionally and nationally to build the required capability.

Once a Construction Partner is in place in Spring 2026, this work will accelerate and key industry contracts will be agreed.

TECHNOLOGY DEMONSTRATION

As the STEP programme's Fusion Partner, the UKAEA continues to accelerate the pathway to deliver and manage the fusion reactions needed for commercial powerplants. The MAST-Upgrade research facility is testing our understanding of spherical tokamak plasmas and their control, whilst other programmes advance fusion technologies, such as LIBRTI which will help us understand how to 'breed' Tritium fuel, all the while working with business to ensure that the UK builds its industrial capability.

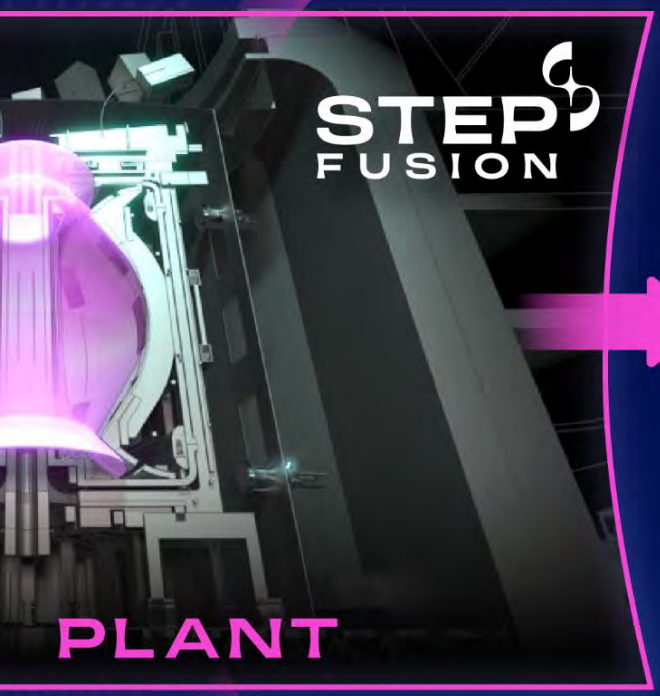
UKFE is developing world-leading systems integration capability to draw together all sub-system-specific technologies into one coherent whole for powerplants which will genuinely become commercially deployable. STEP Fusion is working with industry to develop the technology required for commercial fusion, which is predicted to be a multi-trillion pound sector in the coming years, and we are already seeing spillovers in other sectors, from space, to medicine and defence.

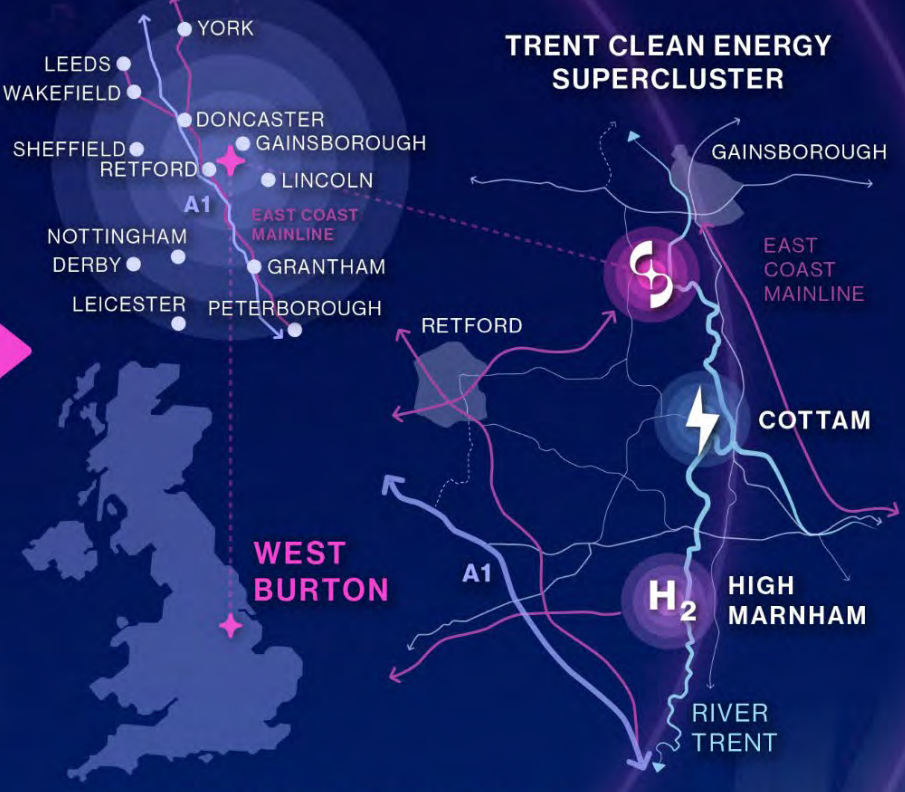
Figure 11 – impacts and benefits of STEP fusion

ECONOMIC IMPACT

STEP Fusion is set to generate around 8,000 construction jobs at its peak in the 2030s, along with around 1,500 operational roles on site once the plant and surrounding ecosystem is up and running. As well as these direct roles, the associated increase in industrial development and the wider supply chain will support other adjacent technologies and spin-off industries that grow from STEP's technological innovation.

These economic benefits will particularly be felt regionally in West Burton and the surrounding area which has a long and proud history of energy production, with five now-decommissioned coal fired power stations in the region.





The 'Trent Clean Energy Supercluster' includes SMR, data centre and clean hydrogen projects - the scale of new, skilled jobs, training and supply chain opportunities is hugely significant and STEP has played a key role in catalysing this.

INVESTMENT

STEP Fusion is acting as a powerful demand signal for the UK fusion sector, providing long-term confidence that attracts wider investment into the UK fusion sector. The programme is already investing heavily in the UK supply chain, embedding major engineering and construction partners to build capability and deliver the prototype plant.

This early commitment strengthens domestic industry and creates the conditions for future growth. STEP Fusion's ambition is to attract significant private investment into UK Fusion Energy itself in the long term.

UK Investment Prospectus - Showcasing Opportunities

The UK’s world-leading fusion infrastructure, growing fusion ecosystem and wider business incentives provide a unique opportunity for fusion investors, developers and supply chain companies to come and create success.

To showcase these opportunities:

The UK Government will shortly publish a UK Fusion Investment Prospectus setting out the offer for global fusion companies and investors wanting to benefit from being part of the UK’s world-class fusion ecosystem, including our key UK capabilities, support and investment programmes.

This will set out the UK’s offer for investors, businesses and entrepreneurs in fusion, bringing commercially relevant information together in one place to be accessible by the fusion sector globally. As the global fusion industry continues to develop with the UK at its heart, we will update the prospectus regularly to ensure it remains an invaluable resource.

Strengthening Intellectual Property Frameworks

The flexibility for UKAEA Group to license IP will be a key enabler of the UK's goal to develop the wider fusion industry. Appropriate licensing for use by the private sector will be needed to enable capability created by the public sector to translate into economic value for UK industry. IP licencing is also essential to the formation of public-private partnerships, joint ventures and other spinout companies. IP licencing needs to be balanced against UK Fusion Energy's requirement to retain control of key IP, to enable it to become a world-leading integrator and operator of fusion power plants.

By the end of 2026, UKAEA Group will develop and implement IP commercialisation strategies which balance retaining control of IP necessary for UK Fusion Energy and UKAEA to deliver their commercial objectives, with the freedoms to support innovation and commercial interests of the private fusion sector and de-risk key UK programmes.

UK Fusion Energy and UKAEA will work with Government to improve access to IP generated by publicly funded programmes to UK companies or companies undertaking activity in the UK, where this is in the UK’s economic interests.

Case study: provided by Tokamak Energy

Tokamak Energy, based in Oxfordshire, is helping position the UK as a global leader in fusion energy and high-temperature superconducting (HTS) technologies. Since its founding in 2009, as a spin out from UKAEA, the company has grown to 300 employees and attracted over £280 million in investment. This includes public investment of £8m from the BBB and a £13.5m contribution to the LEAPS project directly from DESNZ alongside DOE. This reflects not just strong confidence in UK innovation, but UK Government's commitment to supporting UK fusion industry.

Demo 4

In November 2025, Demo4 achieved a breakthrough on the path to commercial fusion energy by becoming the first HTS fusion magnet system to replicate fusion power plant magnetic fields. Continuing tests in 2026, Demo4 represents over a decade of HTS innovation within a purpose-built facility designed to push superconducting technology to new limits. It demonstrates Tokamak's full-stack HTS capabilities, from design and modelling to manufacturing, cryogenics, power systems, integration, and data analysis.

ST40

In December 2025, ST40 set three major performance records: highest plasma current, stored energy, and fusion triple product – all key milestones toward commercial fusion energy. ST40 is the world's highest-field spherical tokamak, serving as a unique testbed for fusion technology and enabling world-class R&D and plant design for government and industry partners. Through 2026, ST40 is undergoing a major upgrade via a public-private partnership with DESNZ and the U.S. Department of Energy. This programme will advance technologies for future fusion power plants, such as radio-frequency heating and lithium systems, and build operational expertise for future fusion systems.

Industrial Growth and Global Partnerships:

Tokamak Energy is also demonstrating the benefits of commercialising technology developed for fusion into new sectors with their new division, TE Magnetics. This new arm of the company is leveraging TE's proprietary HTS technology, protected by over 200 patents, to generate multi-million-pound revenues through partnerships in fast-growing sectors. In 2025, Tokamak Energy supported DARPA's next-generation submarine propulsion programme and acquired Ridgway Machines to strengthen UK-based manufacturing. These developments reinforce the UK's supply chain and industrial capability for advanced energy technologies.

Figure 12 – Image of ST40

Figure 13 – Image of ST40 plasma

Figure 14 – Image of Demo4

Case study: provided by First Light Fusion

The UK is home to world-leading innovation in fusion energy, and First Light Fusion (FLF) exemplifies this leadership. Based in Oxford, FLF is developing a breakthrough approach to Inertial Fusion Energy (IFE) that could deliver clean, cost-competitive power faster and more affordably than conventional methods.

FLF's technology uses "target amplification" – a novel technique that creates extreme conditions without relying on complex, high-power lasers. Instead, it employs simpler, pulsed-power systems to compress and ignite fusion fuel in two stages, a concept known as fast ignition. This approach could achieve energy gains up to 1,000 times the input energy, compared to the current global record of 4.1.

In 2025, FLF published its bold strategy, FLARE – Fusion via Low-power Assembly and Rapid Excitation, outlining a commercially viable pathway to high-gain fusion. By simplifying the reactor driver and shifting performance demands onto the fuel target, FLARE promises reactors that are robust, scalable, and affordable, supporting the UK's ambition for reliable, low-carbon energy.
Beyond energy, FLF's expertise is already delivering value to industry and government. Applications include:

- Extreme Materials & Space: Pressure and velocity amplifiers for high-energy physics and space debris testing – products now in use at leading labs and agencies.
- Defence & Aerospace: Hypervelocity impact testing and advanced diagnostics (high-intensity X-rays) for defence and space, generating revenue with major UK customers.
- Data & Design: Advanced modelling, materials data, and system optimisation for complex industrial applications – first contracts signed and strong cross-sector interest.

FLF's next steps include validating key components, expanding collaborations with UK and international partners, and building the case for a first demonstration reactor. By leveraging early commercial revenues and strengthening supply chains, FLF is accelerating progress toward a future where fusion power supports a resilient, renewable-heavy grid.

FLF's pioneering work positions the UK at the forefront of global fusion innovation, offering a pathway to affordable, clean energy and new industrial capabilities.

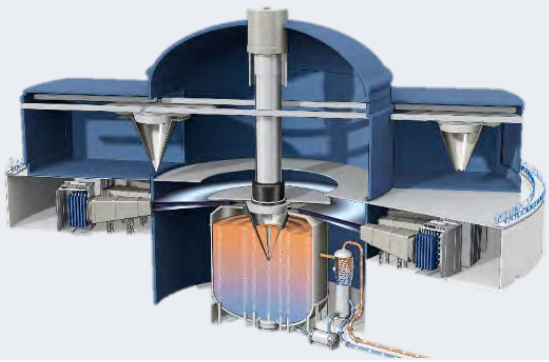


Figure 15 – Image showing First Light Fusion's FLARE Reactor Concept

Utilising Public Finance Institutions

Fusion is one of the UK's frontier Clean Energy Industries in the UK's modern Industrial Strategy, backed by over £2.5bn of capital over five years.

The UK's Public Finance Institutions are actively collaborating more closely and aligning their remits to ensure the support they offer is as joined up as possible. Fusion will be one of many sectors to benefit from this effort.

The UK's investment support offer is designed to support companies at different, crucial stages of development from start-up to scale-up. UK Public Finance Institutions and the different forms of support they offer are summarised below.

British Business Bank (BBB)

Equity and debt financing for fusion SMEs. BBB also invest in funds and directly in companies, crowding in private capital to the venture and growth markets.

- **Direct equity** – focuses on Series A+
- **Loans** – often convert into equity
- **Fund investments** – currently the majority of BBB portfolio, looking to grow direct investment

Key BBB requirements for investment**:**

- **Ticket size** – must be £3m+, close to £10m is more typical, strategic £60m investments are possible
- **UK presence** – companies must be UK based with significant UK operations
- **Technology Readiness Levels (TRL)** – cover a wider range applicable to fusion technologies

National Wealth Fund (NWF)

The NWF will actively engage in fusion supply chain and spin-out technology opportunities that support the UK's sovereign and strategic capabilities, building upon the support offer by the BBB to enable the scale up and commercial deployment of fusion technologies. The NWF will work closely with DESNZ and UKAEA Group to identify opportunities.

Great British Energy (GBE)

Where technologies present crossover opportunities in adjacent clean energy sectors as well as fusion, DESNZ will engage with GBE to explore opportunities to support commercialisation. This work will focus on technologies aligned with GBE's Strategic Plan and individual organisational priorities

UK Export Finance (UKEF)

UKEF will drive the growth of fusion exports by supporting UK exporters, businesses looking to export from the UK and international businesses sourcing goods and services from the UK, by providing support for:

- Working capital loans
- Export insurance
- Guarantees to international buyers

Innovate UK

Innovate UK will support clean energy innovation, including spin outs from fusion research, to enable breakthrough ideas to scale into growing businesses through a blend of financial and non-financial support that reduces commercial risk and attracts investment.

Wider Support Measures

The UK Government has expanded its use of Financial Transactions (FTs) in recent years to crowd in investment and accelerate growth. The Government has already invested £20m in the privately-run **Starmaker One** fusion fund as a first-of-its-kind initiative, and the first early-stage fusion energy venture capital fund outside the US. The Government's cornerstone investment of £20m demonstrates its confidence in the UK fusion sector's potential for growth, expecting to leverage over £100m with investments that will help UK fusion businesses and start-ups in the sector grow and commercialise at scale.

Over this Spending Review period we will explore how we could use innovative funding mechanisms to provide more flexible support for the UK fusion industry. This includes looking at how we might redesign the Fusion Industry Programme (FIP) to provide greater flexibility for participants to pursue commercially valuable technologies, including for adjacent applications.

Place Based Impact Acceleration Account (PBIAA)

PBIAAs are research and innovation clusters designed to boost UK regional growth. They will bring benefits to regional and local economies and communities including new jobs, skills development, private investment, and the growth of start-ups.

UKAEA was awarded a £4.9m grant to develop a nuclear robotics and AI cluster across Cumbria and Oxfordshire to accelerate the decommissioning of the country's nuclear legacy and connect academia with the supply chain.

This cluster expects to create 10 spin-out companies, 200 new jobs and leverage £22.5m in funding.

Supply Chain Centre (SCC)

Last year, a dedicated Supply Chain Centre was established in Department for Business and Trade (DBT), as committed to in the UK's modern Industrial Strategy. As one of the UK's frontier Clean Energy Industries, fusion has and will continue to feature prominently in the SCC's work.

The Government sees strong supply chains as a key part of its mission to drive economic growth – this type of cross-Government attention demonstrates that fusion is at the heart of this effort.

Securing Critical Inputs

Access to critical materials essential for superconductors and other fusion components is limited, posing a long-term risk to supply chain resilience. These materials are also in demand from adjacent sectors such as defence and aerospace, increasing competition.

The UK will seek to build domestic capability for critical materials wherever possible, while recognising that international collaboration will be essential and there will be opportunities for working with other sectors and across government where demands overlap.

DESNZ will work with other government departments to create secure supply chains for strategic materials. We will also work with global partners where it is mutually beneficial to secure access to strategic materials and diversify supply chains.

Developing Fusion Skills

Delivering fusion energy in the UK is not just a technological challenge – it also requires a skilled workforce. The UK already benefits from a world-class fusion workforce and strong academic foundations, but meeting the ambitions of the national fusion strategy will require significant growth and diversification of skills. While the UK has excellent universities and research programmes, traditional pathways alone cannot deliver the scale and breadth of expertise and talent required.

The private sector is expected to require up to an additional 3,000 people to enter the fusion workforce from 2023 to 2030,[23] in addition to those working on STEP which is expected to support around 8,000 construction jobs at its peak in the 2030s[24], and around 1,500 operational roles on site once the plant and surrounding ecosystem is up and running.[25] This does not include jobs that will be supported in the wider ecosystem.

The number of jobs supported by fusion will increase as fusion deployment accelerates. This is a huge opportunity for clean energy jobs across Britain, and we have been clear about our ambition to ensure these jobs have decent pay, the best rights at work and access to trade unions. This expansion will require not only highly specialised skills but also a broad range of capabilities across entrepreneurship, engineering, manufacturing, project management, and operations.

Many of the people who will design, build, and operate fusion power plants or develop and scale new businesses have not yet entered the workforce, making early education and career awareness critical. To achieve this, we must address gaps in training provision, improve accessibility, and attract talent from adjacent sectors.

[23] UKAEA, FOSTER: Fusion Opportunities in Skills, Training, Education and Research.
[24] UKIFS, Pre-Application stage one consultation overview document.
[25] AMION, STEP Programme – Economic and wider impact assessment.

Existing skill programmes

Fusion Opportunities in Skills, Training, Education and Research (FOSTER)

The UK has already made an enviable start to growing its fusion workforce through the UKAEA's FOSTER programme, aiming to bring over 2000 additional people into fusion related training utilising £40m of DESNZ funding through Fusion Futures.[26]

FOSTER is already making a tangible impact. In just 18 months, more than 340 people have entered training, and partnerships are in place to train over 1,000 more. Outreach has reached tens of thousands of school students, new curricula are being developed for apprenticeships, and universities are expanding fusion-related teaching. At the postgraduate level, new master's courses and a dedicated Fusion Engineering Centre for Doctoral Training are creating pathways for future specialists. Professional training and returner initiatives are opening doors for experienced workers to transition into fusion careers. UKAEA is also championing entrepreneurship training within UKAEA through Entrepreneurs in Residence.

By July 2027, UKAEA will support 2000 more apprenticeships, graduates, PhDs and other fusion training opportunities undertaken across the UK in fusion-relevant disciplines since 2024.

The Oxford Advanced Skills centre at Culham, works in partnership with private sector employers to offer high-quality apprenticeships in engineering disciplines, up to degree level. This is creating a pipeline of early career talent not just to UKAEA Group but to local and national employers in key skills shortage areas, combining classroom teaching, hands on experience and employment placement. In 2026 over 500 apprentices are currently enrolled at OAS with an aim to have 150 new apprentices enrolled per year by 2030.

The UK Government has additional existing interventions to increase skills such as the Nuclear Skills Taskforce.[27] To ensure the fusion sector can access critical skills and benefits from existing interventions, we will align with national skills programmes in other sectors and work with local consortia, higher education institutions, and industry to ensure training provision meets future demand.

Fusion Centres for Doctoral Training

Fusion training is not only supported by UKAEA. The Fusion Power Centre for Doctorial Training (CDT) at the University of York has trained over 300 PhD students in fusion-specific skills with £9.5m funded by EPSRC, 100% matched by industry.

UKRI will continue to support fusion skills through the Fusion Power CDT and its engagement with the UKAEA FOSTER programme.

[26] Total DESNZ investment over six years, 2024/25 – 2029/30.
[27] UK Government, New Taskforce to build UK nuclear skills.

Case study: FOSTER

"I never knew I'd like the electrical side of engineering so much until I started my apprenticeship a year ago! In a lot of ways an apprenticeship like this one would be what I'd really have loved to do after school, working on really big science, at a super interesting site, full of super interesting people, bouncing between placements and finding my footing as a technician." ***Joy Wilson***

Joy's previous background was in customer service and hospitality, but she had no clear direction on what her future career path looked like. After applying for an apprenticeship in the Oxfordshire Advanced Skills centre, Joy has now joined UKAEA as a mature electrical engineering apprentice. She was amongst the first cohort of apprentices to undertake a new, complementary on-the-job training programme delivered through the FOSTER programme in collaboration with STFC. This programme taught Joy and her colleagues new, specialist skills relevant to fusion and the quantum industry whilst providing a workplace environment to hone mechanical and electrical skills. With these skills in place, Joy now works in the electronics lab at UKAEA diagnostic on MAST-Upgrade.

"I believe we need to work together as a community to make fusion happen, programmes like FOSTER are vital in this mission. They provide students with guidance, resources, and opportunities to explore fusion from multiple angles, helping them see the different pathways into this multidisciplinary field." ***Michael Crabbe***

Michael is the Co-Founder and Secretary of MancheSTAR, the UK's first student-led fusion society. The FOSTER programme helped Michael create a Minecraft Nuclear Fusion Hackathon, an innovative event where students designed virtual fusion power plants in Minecraft. This event inspired students at the Universities of Liverpool, York, and Sheffield to establish their own fusion societies. Michael is now fuelling his interest in fusion further by transitioning into doctoral research, studying for an EngD at the Fusion Engineering Centre for Doctoral Training (CDT), created in 2025 by the FOSTER programme in collaboration with the Universities of Manchester, Liverpool, Sheffield, and Birmingham. Looking ahead, Michael wants to develop further educational initiatives in collaboration with the FOSTER programme, ensuring they reach a wider audience and help attract top talent into the fusion sector.

Improving fusion sector access

To make commercial fusion a reality, a range of skills will be needed, both generalist and specialists. The fusion sector will need to attract skills and talent from other sectors.

The Energy Skills Passport is an industry-led initiative and supported by the UK and Scottish Governments to help workers from carbon-intensive industries access opportunities in new clean energy sectors. In the Clean Energy Jobs Plan, DESNZ committed to exploring the inclusion of additional clean energy sectors.[28]

DESNZ and the Office for Clean Energy Jobs will explore expansion of the Energy Skills Passport to fusion, which would help oil and gas workers to map qualifications and identify routes into roles in fusion.

The fusion sector offers huge opportunities for UK workers to get good jobs, with fair pay and secure conditions. Government will continue to champion good job quality in the sector as well as across clean energy sectors - including by working closely with trade unions - as outlined in the Clean Energy Jobs Plan.

In addition to creating UK jobs opportunities, there may be exceptional cases where we need to fill critical gaps through recruiting highly skilled professionals from overseas. The UK is committed to attracting and supporting the brightest and best global talent to work, study and thrive in the UK. While domestic training programmes scale up, we will continue to ensure that the fusion sector is supported by the UK's strong visa routes, including the Global Talent Visa and Skilled Worker visa, which enable companies based in the UK to recruit and retain highly skilled professionals from overseas.

Improving the skills pipeline

Many of those who will be designing, building and operating fleets of fusion power plants have not yet entered the workforce. As a sector identified in the UK's Industrial Strategy as providing long term growth for the UK, we must ensure that those making decision in early careers are aware of fusion as a technology and a career and have the option to prepare for a career in the fusion sector.

The UK Government will aim to improve awareness of fusion in compulsory education by ensuring the curriculum allows for the consideration of fusion alongside other energy sectors in the revised English national curriculum, expected to come into effect in 2028.

[28] In Scotland, any expansion of the Energy Skills Passport to nuclear would only be in relation to nuclear decommissioning.

Building a world leading fusion sector requires drawing on the full breadth of skills, backgrounds, and perspectives. While no dedicated UK statistics currently exist on gender representation within the fusion workforce, we know that women remain significantly underrepresented across the wider UK nuclear sector - comprising only around 22% of the total workforce and closer to 15% in engineering and technical roles.[29] This exemplifies the need for the UK to shape a fusion sector that is inclusive, diverse, and intentionally designed to draw on the full breadth of available talent.

To support this, UK Government will work with partners such as Women in Nuclear UK[30], Women in Fusion[31], and the Nuclear Skills Strategy Group[32] to explore opportunities to strengthen all types of diversity and participation within the UK's emerging fusion workforce.

Through these interventions, alongside with the continued development of the sector and outreach work by the UKAEA, UK Fusion Energy and fusion companies, we will continue to increase public awareness of fusion energy to ensure that those in early careers see fusion as a career pathway.

Figure 16 – Image of Secretary of State for DESNZ (right) in OAS classroom with two science technicians.

[29] Cogent Skills, 2024 Nuclear Workforce Assessment.
[30] Women in Nuclear UK..
[31] Women in Fusion.
[32] Nuclear Skills Plan.

Policy innovation

Create a forward-leaning environment for the fusion sector to thrive, including further developing the UK's pro-innovation regulatory regime, streamlined planning, skills development and developing the world's first market framework for fusion energy.

A Future Market Framework

Private investors will have an important role in financing new innovative energy projects, but Government often needs to help shape markets to draw in capital, particularly with new energy technologies when capital costs are still high.

The UK Government has already committed to developing a fusion market framework as part of the UK's Industrial Strategy.[33] We will work with industry, consumer groups and others to develop options for a reasonable pricing framework for fusion energy to derisk fusion deployment, provide confidence to investors and ensure a fair deal for consumers.

The UK Government will develop a plan for the UK to be the first country in the world to offer a market framework for fusion energy. By working with the fusion and energy sectors, consumer groups and other stakeholders we will provide providing leading incentives to site fusion facilities in the UK while balancing the need to protect future bill payers.

Regulation

Regulation is an important lever for Governments to reduce supply chain restraints, speed up deployment and maximise the benefits of fusion while ensuring that people and the environment are protected.

The UK has already led the world in legislating for a proportionate, robust regulatory framework for fusion energy separate to nuclear fission. Our 2021 public consultation[34] underpinned by independent technical advice resulted in Government concluding that responsibility for the regulation of fusion should be with the Environment Agency (EA) and the Health & Safety Executive (HSE), or devolved equivalents, rather than the Office for Nuclear Regulation. This consultation also identified other areas of regulation such as security that the UK Government needs to clarify to create a comprehensive regulatory landscape for fusion development.

[33] UK Government, The UK's Modern Industrial Strategy 2025.
[34] UK Government, Towards fusion energy: proposals for a regulatory framework.

While UK fusion regulation has been developed separate to fission, lessons can be learnt to ensure that regulation is enabling and appropriately balances social need with ensuring robust regulatory outcomes. For example, The Nuclear Regulatory Review 2025 highlighted that the UK is the most expensive place to deploy nuclear fission in the world with the pace and proportionality of regulation central to this outcome.[35]

The UK will build on our pro-innovation approach to ensure proportionality, provide this clarity for investors and developers and continue to support to build capability in readiness for fusion deployment.

The UK Government will provide policy positions across all areas of regulation as needed for fusion deployment by the end of this Parliament.

Regulatory process

Investors and developers require a clear regulatory process to be able to plan with certainty. Part of this is understanding the landscape of planning, safety and environmental protection consents, permits and licenses within the UK and the organisations that will need to be engaged.

DESNZ will publish a roadmap for the fusion regulatory process for deploying a fusion powerplant in the UK by Summer 2026 to give clarity to developers and investors.

Part of providing this certainty to developers will include how industry and regulators can engage ahead of any formal regulatory process to derisk fusion designs and improving regulator familiarisation with specific fusion technologies and their unique aspects.

Fusion regulators are already engaging with industry and are collaborating to develop and publish processes for initial engagement by Summer 2026 with ongoing review to ensure proportionate engagement as the industry develops.

Planning and siting

To make it easier to site fusion facilities in the UK, the UK is creating a clear planning regime for fusion and streamlining approvals for deployment of fusion power plants. We will continue to work towards designation of a Fusion National Policy Statement (EN-8) in 2027 which will bring fusion into the Nationally Significant Infrastructure Project regime and give certainty to investors, communities and developers on appropriate fusion sites.

[35] Nuclear Regulatory Taskforce, Nuclear Regulatory Review 2025.

DESNZ will publish a draft Fusion National Policy Statement (EN-8) by Summer 2026 for public consultation.

EN-8 will guide developers in how to assess suitable sites for fusion energy development and streamline planning approval for fusion power plants. Nonetheless, with a range of fusion technologies expected to be ready for deployment and an increased number of sites potentially suitable, developers may need assistance identifying a site.

For companies who are ready to invest and deploy in the UK, the UK Government can assist in identifying sites for developers who it deems have a clear list of requirements. This includes:

- Flexible, expert project delivery support, with deep expertise across sectors, asset classes and global markets, to drive projects forward.
- Triage services to resolve key delivery barriers such as planning, grids/utility, finance, migration and skills.
- Advisory support to identify key sites and navigate UK regulation and policy landscape.

Separately, National Energy System Operator (NESO) is developing the Strategic Spatial Energy Plan (SSEP) to support a more actively planned approach to energy infrastructure across England, Scotland and Wales between 2030 and 2050. While achieving the UK's Net Zero plans are not dependent on the deployment of fusion, future iterations of the SSEP will need to account for technologies that may be deployed between now and 2050.

When enough information is known about the designs of fusion power plants, the UK Government will ask NESO to incorporate fusion into the appropriate update of the SSEP.

International harmonisation

International harmonisation is crucial for maximising the benefits of fusion and ensuring it can be deployed across the globe. A disproportionate approach to fusion regulation may give little safety benefit but could be a considerable constraint on deployment.

The UK was the first country to clarify its approach to fusion regulation and has since been working to share our learning and evidence building with international counterparts to promote a proportionate risk-based approach to regulation.

The IAEA has a clear role for enabling this international harmonisation and we are glad to see IAEA setting up new fusion specific workstreams. The UK would like to see the IAEA go further and designate specific resource within the DG's office to be responsible for setting the Agency's fusion strategy including an approach to fusion safety standards. As fusion develops, we expect the IAEA to establish a dedicated fusion section containing fusion specialists.

Security and Non-Proliferation

With commercialisation progressing rapidly across the globe and recognising fusion energy as a potential strategic asset for the UK, the Government will ensure that UK capability in a flourishing domestic sector is protected and subject to robust, proportionate regulation that safeguards our national security and supports our non-proliferation commitments.

The Government is developing a fusion-specific security framework ensuring clear roles and responsibilities for regulators.

The Government will work with international partners to close avenues to proliferation without raising unnecessary barriers to innovation and commercialisation.

Fusion liabilities

Cost-effective and tailored provision of insurance for the fusion sector will be a crucial enabler for the deployment of fusion facilities and will be a growth opportunity for UK financial markets.

With the reduced intrinsic hazards of fusion, the Government is confident that the conventional energy generation insurance market is the appropriate avenue for fusion. Replicating the third-party liability arrangements for existing nuclear would unnecessarily stifle the insurance products the market could offer, reduce competition within the market and ultimately inhibit the development of fusion. As such, we believe fusion should not be included within standard nuclear exclusion clauses that were designed for nuclear fission, as other radiological practices are not. The Government is open to working with the market to better understand fusion risks and how the market can protect its interests while ensuring fusion is rated proportionally and in a way that does not stifle innovation and investment.

Over this Parliament, DESNZ will continue to engage the energy insurance market to improve understanding of fusion risks and encourage fusion to be treated outside of nuclear exclusion clauses.

As set out in its consultation on fusion regulation in 2021, the UK Government expects decommissioning principles applicable to other sectors to apply to fusion. This includes ensuring that, through proportionate mechanisms, operators can meet decommissioning costs at the end of the lifetime of a facility or in the unlikely event that operation becomes uneconomical, to avoid taxpayers from bearing this cost.

By Autumn 2027, DESNZ aims to identify a proportionate mechanism to ensure costs for decommissioning can be met by fusion operators.

Grid Connections

The Government recognises that grid connection delays are a major barrier to growth. We are working closely with NESO, Ofgem and the network companies to accelerate network investment by improving the supply chain, skills and streamlining planning processes. Additionally, the outdated "first come first served" connection queue system created a congested queue that grew to over 800GW, including four times the generation Britain needs by 2030. This exacerbated delays in connecting to the power grid which is a major obstacle for launching new projects on time and within budget.

Alongside queue reforms, Ofgem is undertaking an 'End to End' Review of the connections process. The review aims to strengthen incentives on network companies to deliver timely connections, improve customer service, and provide clearer, more reliable connection agreements.

As set out in the Industrial Strategy, the UK Government is launching a new Connections Accelerator Service (CAS) and have committed to using new powers from the Planning and Infrastructure Act to improve the connections process.

Conclusion

Now is the moment for a step change in ambition to fully realise fusion's potential for economic growth across the UK. With a clear objective and plan for fusion commercialisation, and a vision for the UK's role in a global fusion market, this fusion strategy places the UK at the forefront of fusion development, and fusion development at the heart of our modern Industrial Strategy.

By fostering innovation, addressing market barriers across R&D, investment into the fusion supply chain, and policy frameworks, the UK aims to strengthen and grow the fusion industry. STEP remains our primary lever to overcome these barriers. From demonstrating technical and commercial viability, to creating thousands of jobs and a skills base, to providing the UK with world leading systems integration capability, STEP will continue to play a crucial role in achieving the UK's fusion objective.

International collaboration remains an important part of the UK's fusion strategy. Amidst increasing global competition, strategic partnerships continue to have a crucial role in accelerating commercialisation by collaborating on expertise, facilities and derisking R&D development. The UK will manage its international relationships to accelerate progress for the UK and our partners and is committed to working with other countries and important international organisations such as the IAEA to reduce R&D duplication and harmonise regulations.

Together, these steps provide a comprehensive plan for fusion commercialisation, readying the UK for fusion deployment and a continued ramping up of economic activity over this Parliament - strengthening the case that fusion is not only coming, but that the benefits of fusion have already begun.

Annexes

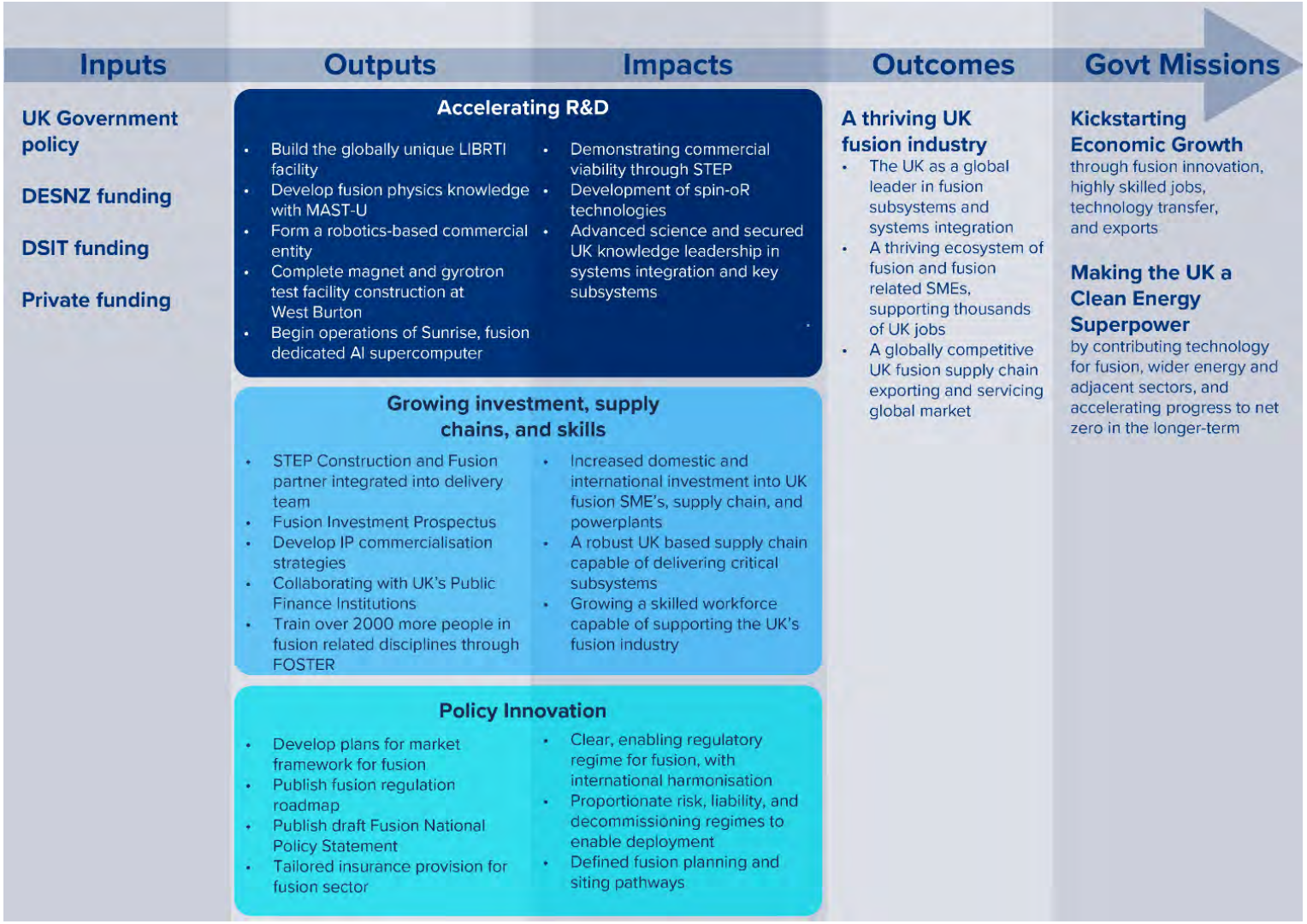
Annex A – Programme Overview

Annex B – Summary of UK fusion actions and milestones

Annex C – Summary of UKAEA Group technical milestones

Annex A – Programme overview

Figure 17 – an indicative overview of how the UK fusion programme contributes to UK Government missions. Outputs are not comprehensive of the entire fusion programme. Annex B and C contain further details on the wider programme.



Annex B – Summary of UK fusion actions and milestones

Table 2 – Summary of UK fusion actions and milestones

Area	2026	2027	2028	2029	Ongoing work
R&D	**UKAEA -** Begin operations of Sunrise while continuing to develop the Culham Campus as the UK's first AIGZ **UKAEA –** Commercialise tritium technology by partnering with industry	**UKAEA -** Demonstrate Multiphysics Platform to predict LIBRTI tritium output **UKAEA -** Commercialise robotics capabilities	**UK Fusion Energy** - Complete magnet and gyrotron test facility construction at West Burton **UKAEA -** Progress the physics basis of spherical tokamaks with MAST-U **UKAEA -** Complete LIBRTI building at Culham	**UKAEA** – further technical outcomes to 2030 are contained in Annex C of the strategy.	**UKRI -** drive science exploration of UK fusion **UKRI** – engage on opportunities to exploit sovereign AI capability including fusion
Investment, supply chain and skills	**UK Government –** publish a Fusion Investment Prospectus **UK Fusion Energy –** Select a Construction Partner for STEP and	**UKAEA** – support training 2000 more people in fusion relevant skills	**UK Fusion Energy -** Agree strategic relationships with critical suppliers of fusion technologies **UK Government** - consider fusion in the UK curriculum alongside	**UK Fusion Energy -** Submit the Development Consent Order (DCO) for STEP to redevelop a former coal fired power plant	**UK Government** – explore further incentives to attract more investment to support East Midlands fusion cluster **UK Fusion Energy and UKAEA** – work with

Area	2026	2027	2028	2029	Ongoing work
	integrate them into the delivery team **UKAEA and UK Fusion Energy** - develop and implement IP commercialisation strategies **DESNZ** – explore expansion of Energy Skills Passport to fusion		other clean energy sectors		Government to improve access to IP. **DESNZ** – work across government and internationally to create secure supply chains for strategic materials **UKRI** – continue to support fusion skills through Fusion Power CDT
Policy	**DESNZ, HSE and EA** – Publish an early engagement process and regulation roadmap for consultation **DESNZ –** Publish the draft EN-8 for consultation	**DESNZ** – identify a mechanism to ensure decommissioning costs can be met by fusion operators			**UK Government** – Develop options for a fusion energy pricing mechanism **UK Government** – provide clarity on all aspects of fusion regulation

Area	2026	2027	2028	2029	Ongoing work
					UK Government - work with international partners to close avenues to proliferation **UK Government** - develop a fusion-specific security framework **DESNZ** - continue to engage the energy insurance market on treating fusion outside of nuclear exclusion clauses **UK Government** – Work with NESO to incorporate fusion into the appropriate update of the SSEP

Annex C – Summary of UKAEA Group technical milestones

Table 3 – UKAEA Group technical outcomes by 2030

UKAEA Groups and facilities		High-level summary of high priority technical outcomes by 2030 that…			
Technical Groups	**Anchor programmes / facilities**	**Access collaborative international capabilities and opportunities**	**Advance science and secure UK knowledge leadership**	**Secure UKAEA-originated capabilities for future commercial exploitation**	**Secure UK-based industrial capabilities**
Plasma	**Main Facilities:** MAST-U **Major Programmes:** UKRI research, STEP (fusion partner)	Reinforced strategic plasma collaborations with the US and European partners	Generated understanding in plasma design and performance Enhanced plasma simulation codes	Exploitation of MAST-U to develop control and operational solutions Harnessed datasets for AI-driven modelling and system development	Engaged UK supply chain in advanced fusion diagnostics
Tritium[37]	**Main Facilities**: UKAEA-Eni H3AT Tritium Loop (under development), Active Tritium R&D Lab facility, Material Detritiation Facility	Established the H3AT loop as an international user-access facility	Generated datasets to underpin digital modelling and design of future power plants	Delivered experimental facilities and data to help develop tritium subsystems and components	Increased capability across Tier 2 and 3 suppliers in tritium technologies

UKAEA Groups and facilities		High-level summary of high priority technical outcomes by 2030 that…			
Technical Groups	**Anchor programmes / facilities**	**Access collaborative international capabilities and opportunities**	**Advance science and secure UK knowledge leadership**	**Secure UKAEA-originated capabilities for future commercial exploitation**	**Secure UK-based industrial capabilities**
	Major Programmes: UKRI research and grants, STEP (fusion partner), JDR & Waste Innovation	Implemented Canadian strategic collaborations Reaffirmed collaboration with European partners in tritium		Improved process plant technologies to inform powerplant scale systems	Partnered with industry to realise new tritium-related opportunities
Materials	**Main Facilities**: Materials Research Facility, LIBRTI (under development) **Major Programmes:** UKRI research and other research grants, LIBRTI fusion fuel capability programme, STEP (fusion partner)	Collaborated in materials research using facilities in and links with USA, Japan, Belgium and Germany Established via LIBRTI programme a UK breeder blanket engineering test capability, with an in-	Developed machine learning strategies, data and models for understanding fusion materials and environments	Established LIBRTI multi-physics platform know-how Developed a range of nuclear (fission and fusion) relevant composites, coatings and shielding	Developed new industrial capabilities in fusion steels, tungsten and composites

UKAEA Groups and facilities		High-level summary of high priority technical outcomes by 2030 that…			
Technical Groups	**Anchor programmes / facilities**	**Access collaborative international capabilities and opportunities**	**Advance science and secure UK knowledge leadership**	**Secure UKAEA-originated capabilities for future commercial exploitation**	**Secure UK-based industrial capabilities**
		silico capability to iterate breeding prediction, for international collaboration			
Robotics	**Main Facilities:** RACE (Culham), RAICo1 (Whitehaven) **Major Programmes:** JDR & Waste Innovation, STEP (fusion partner), ESS Active Cells Facility, LongOps (with TEPCO Japan), UKRI research and other research grants	Handover of ESS active cell facility to ESS Completion of ITER hotcell service contract Supported early remediation activities at Fukushima Daiichi	Developed adaptive control systems for dynamic loads in confined space, in-situ repair technology, and novel welding and cutting tooling and processes	Demonstrated solutions in maintainable magnet technology and mechanical seals Completed JET in-vessel decommissioning with robotic techniques	Realised commercial opportunities originating in UKAEA robotics Developed radiation hardened electronics

UKAEA Groups and facilities		High-level summary of high priority technical outcomes by 2030 that…			
Technical Groups	**Anchor programmes / facilities**	**Access collaborative international capabilities and opportunities**	**Advance science and secure UK knowledge leadership**	**Secure UKAEA-originated capabilities for future commercial exploitation**	**Secure UK-based industrial capabilities**
		Operated Large Hadron Collider beamline inspection at CERN			
Fusion Technology	**Main Facilities**: CHIMERA (under development), ELSA, HIVE and HHF Laser **Major Programmes:** UKRI research and other research grants, STEP (fusion partner)	Secured qualification routes for fusion materials using global standards bodies Reinforced UK thought leadership in integrated design via work on international fusion programmes	Generated datasets, models and skills in fusion technology verification and validation	Expanded commercial service provision in understanding the qualification and development of specific fusion components and systems	Completed delivery of a suite of facilities for the testing and qualification of components and systems

Table 4 – STEP technical milestones over 2026 – 2030

2026	2027	2028	2029	2030
Sub Scale Model Coil testing complete – Proof of principle for coil design	Magnet to plasma interface requirement chill – Fixing key parameters that are basis for tokamak design	Tokamak requirement chill – Full design basis for tokamak agreed	Plant requirement chill - Design basis for remainder of plant agreed	Virtual plasma simulator supporting verification of plasma control algorithms
Interim HPC capability online and supporting plasma scenario development and de-risking	Initial definition of Virtual STEP – the digital architecture aimed at defining an industry - standard foundation for virtual modelling and simulation of fusion plants	Plasma turbulence models verified against test results from range of tokamaks – based on international collaborations	Magnet test facility operational at WB	Construction Design and Management notification of major projects (F10)
Modular data centre and major site IT infrastructure operational at West Burton	Breeder material characterised and tritium recovery method proof of concept	Completed magnet and gyrotron test facility construction on West Burton site and the surrounding region	Submission of the Development Consent Order (DCO)	TF model coil tested at magnet test facility
Agree routing of haul road, location of marine facilities and rail infrastructure	Early enabling works for link roads and utilities on the West Burton Site	Agreed strategic relationships with critical suppliers of fusion technologies	Tranche 2a benefits realised and Business case for Tranche 2b approved	Commence full site construction

Onboarding of Construction Partner

Start of the main construction works for the tokamak site

Integrated Project Teams formed, operating and leading work delivery

Purchasing the freehold for the West Burton site

This publication is available from: www.gov.uk/government/publications/uk-fusion-strategy-2026.

Any enquiries regarding this publication should be sent to us at: newsdesk@energysecurity.gov.uk

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