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# UK Government's plans for fusion regulation and international collaboration

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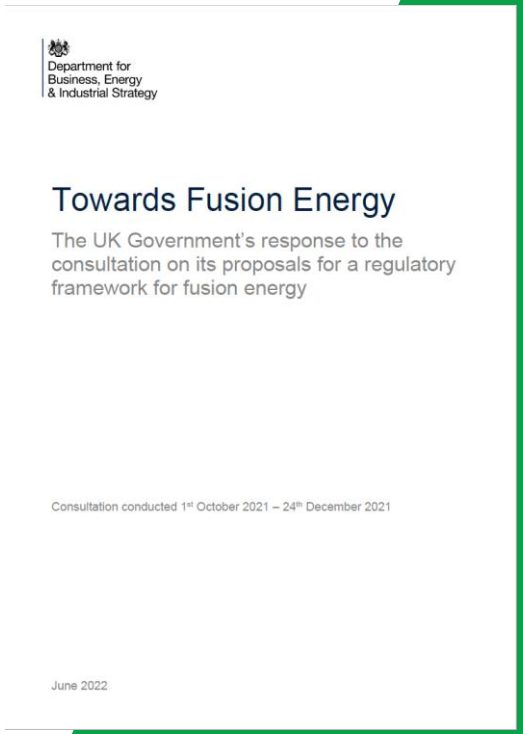
# Overview and timeline

- **Early 2019**: UK Government begins working with regulators and technical specialists to build understand of current regulatory framework and fusion technologies
- **June 2021:** The independent Regulatory Horizons Council (RHC) produced a report on the regulation of fusion energy in the UK whose recommendations helped to inform the Government's work.
- **October 2021:** UK Government published proposals for a regulatory framework in the Green Paper Towards Fusion Energy. 58 responses to the consultation(over **October-December 2021)** from the public, industry, academia & other fusion stakeholders around the world were received.
- **June 2022:** UK Government published its response to the consultation
- **July 2022:** Energy Bill introduced to Parliament
- **October 2023:** Energy Act became UK law



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# How UK fusion regulation works now

- In order for a fusion facility to be developed and operated in a lawful way, it must go through permitting and consenting processes governed by the relevant regulators, the Environment Agency (EA) and the Health and Safety Executive (HSE). This is consistent with how other radiation sources such as cyclotrons in the medical sector and large-scale industrial irradiators are regulated.

- Environmental Permitting Regulations (EPR) are enforced by the EA and are applicable to fusion energy facilities. The EPR require operators of ‘regulated facilities’ to obtain a permit for, or to register, certain activities and so the EPR provides for ongoing supervision by regulators of activities which could harm the environment.

- The Health and Safety Executive are responsible for several regulations applicable to fusion energy facilities, including the Health and Safety at Work etc Act, the Ionising Radiation Regulations and the Radiation (Emergency Preparedness and Public Information) Regulations.

- The regulatory process requires fusion energy facilities to go through approval stages, ongoing compliance and engagement.

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# Fusion Hazards and Accident Scenarios

- UKAEA Fusion Safety Authority provided technical support to HM Government in considering hazards and their implications.

- Conducted a literature review of studies into potential accident scenarios to understand implications of damage to confinement systems. Most significant (radiological) hazards are tritium and activated materials – these are critical to identifying ‘bounding accident scenarios’ through which we can determine overall proportionality.

- From this, the Government concluded that **the maximum hazard of fusion would be of a similar magnitude to those associated with other major industrial activities successfully regulated by EA and HSE.**

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# Government Decisions

## The Government has legislated to make clear in law the regulatory treatment of fusion energy.

**Fusion energy facilities: nuclear site licence not required**

(1) Section 1 of the Nuclear Installations Act 1965 (restriction of certain nuclear installations to licensed sites) is amended as follows.

(2) After subsection (2) insert—
(2A) Subsection (1) does not apply to a fusion energy facility.
(2B) In subsection (2A), “fusion energy facility” means a site that is—
a) used for the purpose of installing or operating any plant designed or adapted for the production of electrical energy or heat by fusion, and
b) not also used for the purpose of installing or operating a nuclear reactor.”

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# Next Steps

The Government is putting in place a programme of work with safety, security and environmental experts, regulators and industry, to take forward its plans for regulation. This will include:

- Fusion specific guidance
- A Fusion National Policy Statement
- A position on the applicability of third party liabilities to fusion
- Developing approaches to safeguards / export controls

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# Agile Nations

- The UK is one of the founding members of the Agile Nations, an inter-governmental regulatory cooperation network designed to foster co-operation on innovative regulatory practice. https://www.gov.uk/government/groups/agile-nations.
- A global approach to regulating fusion energy facilities in a proportionate way will help to build public confidence in fusion, promote innovation, and facilitate the commercialisation and deployment of this emerging technology.
- The UK is leading a working group looking at this subject, working closely with Japan. This group published high-level recommendations for fusion regulation on 16 October 2023.

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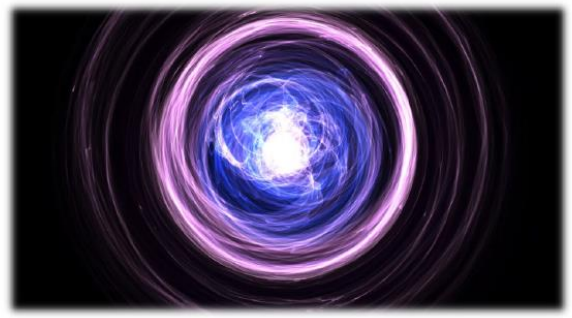
# Fusion Strategy

- **October 2021** - The UK publishes its first Fusion Strategy
- **July 2022** – Energy Bill introduced to Parliament
- **October 2022** – West Burton selected as home of STEP fusion plant
- **October 2023** – The UK publishes the next stage of the UK's fusion strategy and announces up to £650m of new investment into Fusion Futures
- **November 2023** – The UK announces Strategic Partnership with USA



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# Fusion Strategy

| INTERNATIONAL | SCIENTIFIC AND TECHNICAL | COMMERCIAL |
|---|---|---|
| Bilaterals | JET | STEP |
| Multilaterals | World leading R&D facilities | FIP |
| Collaboration agreements | STEP | Support to industry |
| Fusion Futures | Fusion Futures | Fusion Futures |

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# International Collaboration

### USA

Agreement between UKAEA and Commonwealth Fusion Systems. Cooperation agreement on physical sciences including fusion.

### CANADA

Discussions on regulation as part of agile nations and bilaterals.

### JAPAN

£12m robotics deal for fusion and nuclear decommissioning; discussions on regulation as part of Agile Nations.

### SOUTH KOREA

MoU on remote handling for fusion powerplants; bilaterals on regulation and R&D collaboration.

### SINGAPORE

A Strategic Partnership including sharing information on fusion energy was announced on 7 September 2023.

### IAEA (VIENNA)

UK has been heavily involved in the IAEA's fusion regulation work including hosting the Fusion Energy Conference 2023.

### EU

The UK has hosted JET since 1983 and we remain open to collaboration with the EU and ITER.

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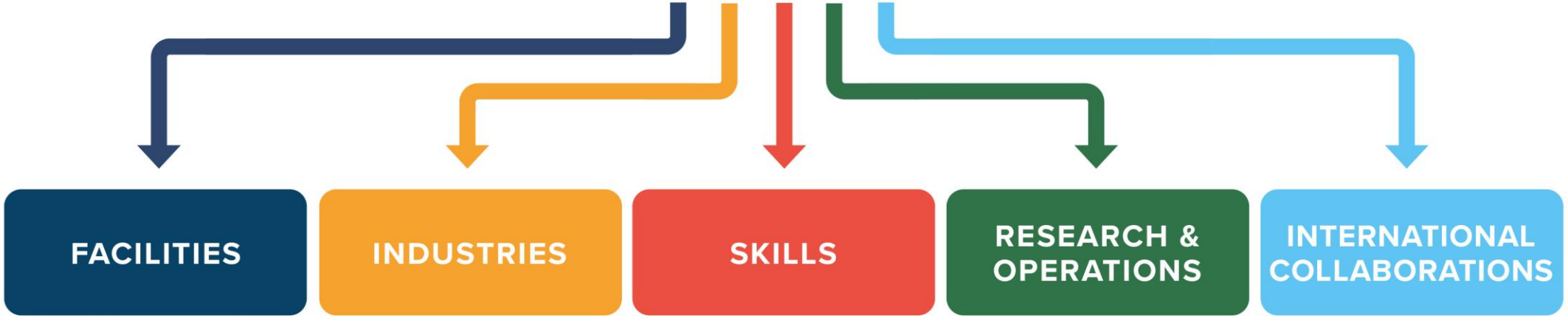
# International Collaboration – what's next?

- As part of Fusion Futures, the UK will aim to invest up to £25m to maintain existing and explore new international collaborations.
- Build on existing collaborations with international partners to share expertise and accelerate the development of fusion technology.
- Develop options to support the UK inertial fusion sector through collaborations with key strategic partners.

UK Atomic Energy Authority

# $800M FUSION FUTURES PROGRAMME



# Facilities

| Workstream | Funding | Description |
|---|---|---|
| Fuel Cycle Testing Facility | £200 million | Develop technology in breeding fuel for fusion power plants, which will provide opportunities for the UK to become a world leader and exporter in tritium intellectual property |
| Technology Transfer Hub | £18 million | Strengthening connections between the UK's leading research organisations and other programmes worldwide, with a focus on commercialising fusion research |
| Growing and improving the Culham campus in Oxfordshire | £50 million | Building new premises to create vibrant concentrations of fusion companies, and helping drive inward investment into the UK |

# International Collaborations

The UK remains open to collaboration with the EU, ITER and other international partners, and international collaboration will form a key part of this new programme of work.

| Workstream | Funding | Description |
|---|---|---|
| **International Collaborations** | **£25m** | Enhance international collaborations on fusion R&D, to export UK expertise and make best use of global knowledge to accelerate fusion energy |

# Industries

| Workstream | Funding | Description |
|---|---|---|
| **Upskilling Industry** | **£200m** | vital R&D ensuring industry can develop and design components for future fusion powerplants |
| **STEP prototypes** | **£11m** | support the STEP programme and upskill UK industry to help deliver it |

# Skills

| **Workstream** | Funding | Description |
|---|---|---|
| **Skills** | **£50m** | Train over 2,200 people over the next 5 years by working with business and universities to expand fusion training programmes |

We aim to create a pipeline of skilled people at all levels qualification levels and focusing on geographical diversity

# Research & Operations

Further £60m to continue existing research taking place under Euratom and to facilitate access to operational machines and facilities.

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# Thank you for listening