



Fusion and The Fusion Cluster

**Valerie Jamieson, The Fusion Cluster manager, NIA fusion
group meeting, 24 May 2022**

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Covering



The fusion landscape



The Fusion Cluster



How to get involved

Fusion is transforming from science experiment to commercial reality



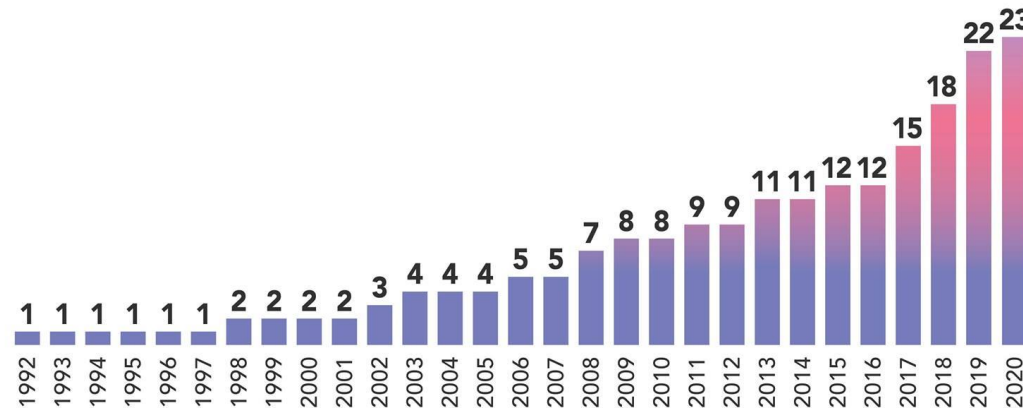
October 2021

- 23 private fusion companies (more in stealth mode)
- 52 per cent founded in past 5 years
- Raised \$1.9 bn in funding

10. NUMBER OF PRIVATE FUSION COMPANIES IN EXISTENCE BY YEAR

FUSION
INDUSTRY
ASSOCIATION

UK Atomic
Energy
Authority



#FusionIndustry2021

©FIA/UKAEA The Global Fusion Industry in 2021

Fusion is a global endeavour

2. COMPANIES BY LOCATION

FUSION
INDUSTRY
ASSOCIATION



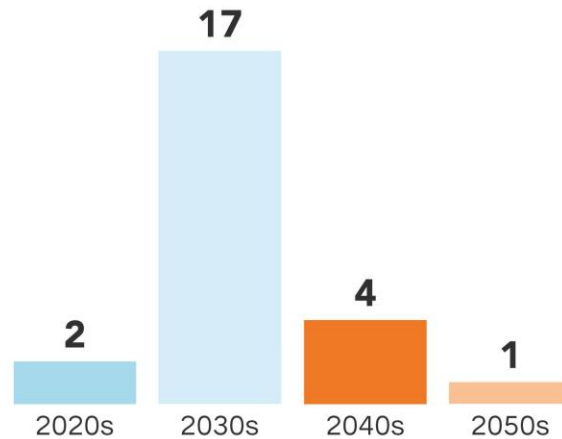
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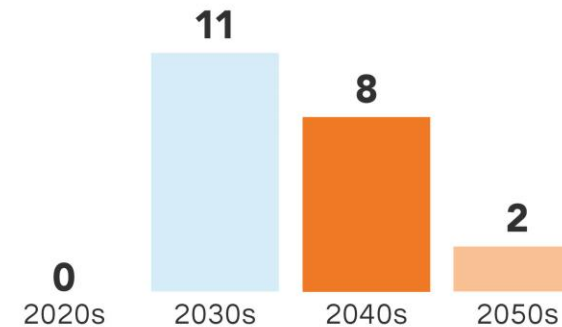
Private fusion companies have ambitious timescales

7. WHEN WILL FUSION FIRST POWER THE GRID SOMEWHERE IN THE WORLD?

FUSION
INDUSTRY
ASSOCIATION



8. WHEN WILL FUSION FIRST BE USED FOR SPACE PROPULSION?



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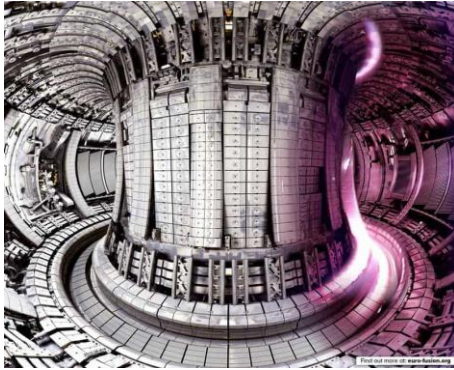
Six months is a long time in private fusion

May 2022

- Several new companies have emerged from stealth mode
- Private fusion investment has increased from \$1.9 bn to \$4.2 bn
 - Commonwealth Fusion Systems, MA, has raised \$2 bn
- In the UK
 - General Fusion \$322 m
 - Tokamak Energy \$153 m
 - First Light Fusion \$107 m
- Huge technical progress

Milestones in UK fusion 2021/22

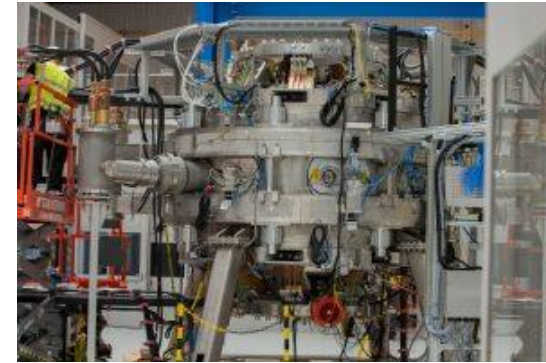
Significant progress in private and public fusion across a diversity of approaches



JET's record-breaking fusion energy. Will run til end 2023



MAST-U tokamak, divertor breakthrough



Tokamak Energy achieved 100 million degree plasma



First Light Fusion demonstrated fusion



General Fusion building demonstrator power plant at Culham

The cluster's purpose

Fusion energy is too complex for any one organisation to achieve alone

The Fusion Cluster brings together the right people and organisations to get to fusion faster

Who is it for?

- Private fusion companies
- UKAEA and STEP
- Suppliers from specialist SMEs to multinationals in a wide range of enabling technologies
- Spillover and adjacent industries
- Academia
- Investors
- UK-wide with centres of gravity in Culham, South Yorkshire and STEP site
- But emerging need for citizen-facing role

Clusters at Harwell

Space

105 organisations on site employing 1,100 people

- 19% growth per annum in number of employees
- £105m investment in the **National Satellite Test Facility**

Health Tec

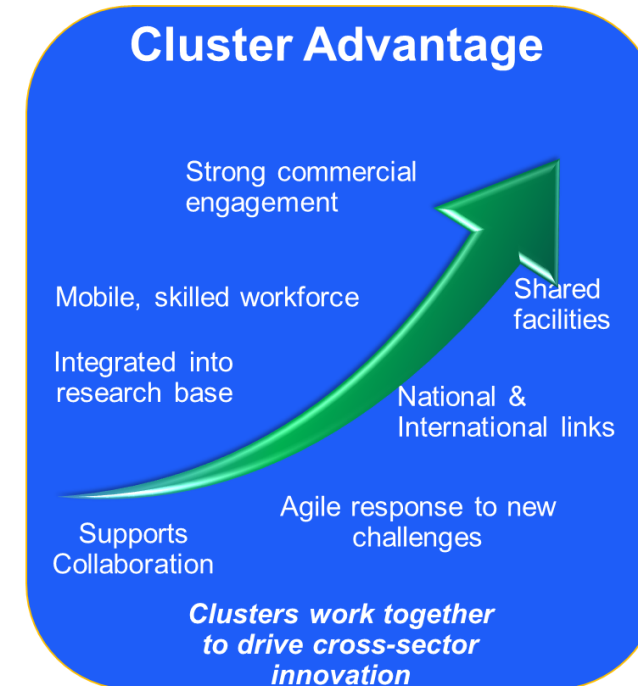
>100 organisations in cluster, including 60 on site employing >1,250 people

- Recent investments: £198 **Vaccines Manufacturing and Innovation Centre**, £30m **Nucleic Acid Therapy Accelerator**, £103 **Rosalind Franklin Institute**, DIT Life Sciences Opportunity Zone designation

Energy Tec

>100 organisations in the wider cluster encompassing 57 companies on site, large facilities, employs > 1,000 people

- Rapid expansion, launched in May 2018
- £74m investment in the **Faraday Institution** HQ based at Harwell



What the cluster offers



Access to talent

Strong talent pool, breadth of skills, depth of experience, prospective employees attracted to multiple opportunities



Customers and
collaborators

Range of companies, support for start-ups, flexible office space, access to world-leading facilities



Joint marketing

Strong brand identity, marketing assets, events to showcase cluster to prospective clients and external stakeholders



Knowledge sharing

Newsletters, workshops, round-tables, networking events, and shared spaces to enable easy collaboration

The Fusion Cluster is not a membership organisation and free to join

Start-up advisory board

- 16 members from private fusion companies, academia, suppliers, laser fusion research, investment, Harwell campus
- Term will run til June 2022
- Select on-going board members



first light

HARWELL



generalfusion

Jacobs

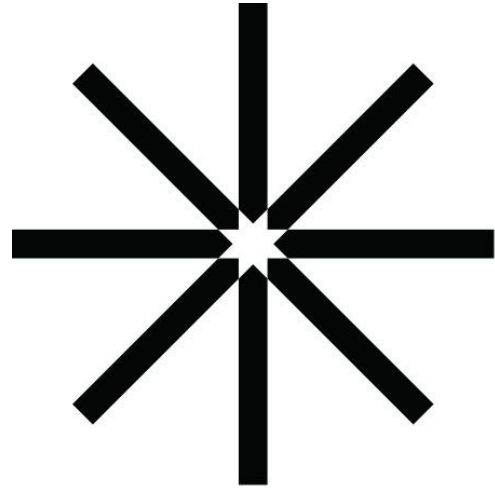


PROSUS



More than 100 recipients of monthly newsletter from 60 companies

- Private fusion companies
 - Tokamak Energy, General Fusion, First Light Fusion, Renaissance Fusion, Commonwealth Fusion Systems
- Suppliers (a selection listed here)
 - Jacobs, Assystems, Atkins, Doosan Babcock, Frazer Nash
 - IBM, Element Six, Oxford Sigma, TWI, Porvair, Konecranes
- Investors and government organisations



THE FUSION CLUSTER

What's in store

- Complete brand identity
- Produce marketing collateral, brochure and website
- Launch events, including annual showcase
- Establish working groups
- Understand capabilities in the UK and build strategy to address gaps
- Engage with government (not lobbying)
- Understand skills gap and build strategy to address it
- Build international image
- Drive investment



**MORE EXPERTISE WITHIN A 10 MILE RADIUS
OF CULHAM THAN IN WHOLE OF CANADA**



Michael Cappello, General Fusion

Sign up for The Fusion Cluster monthly newsletter and events



To get involved email
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