



**FUSION  
FOR  
ENERGY**

**BRINGING  
THE POWER  
OF THE SUN  
TO EARTH**

**Fusion:**

**abundant, safe  
and clean energy  
for the future**



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## SECURING EUROPE'S ENERGY NEEDS

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Energy holds the key to our economic prosperity and social well-being. Europe, however, imports 60% of the energy it consumes at a cost of 1 billion EUR per day.

Our continent is vulnerable to geopolitical tensions, attacks on its infrastructure, and market volatility.

We need to lower our dependence on third countries and lower the use of fossil fuels to fight climate change, which is responsible for human and financial losses amounting to 487 billion over the last 40 years in the EU.

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**Europe needs a sustainable energy mix ensuring autonomy, safety, prosperity and well-being.**

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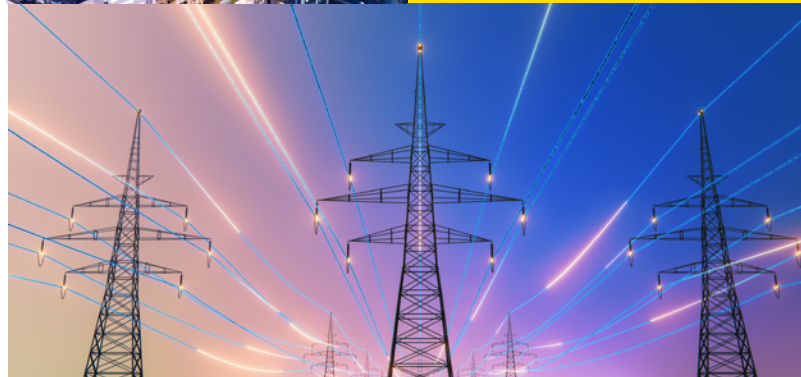
# 2050

Europe needs to cut greenhouse emissions by **80–95%**



## 1 billion EUR

is the price we pay daily in Europe for the energy we import



# NO CO<sub>2</sub>

emissions and  
no long-lasting  
radioactive waste are  
produced with **fusion**



# 60 kg

of fusion fuel generate  
the equivalent  
amount of energy of  
**250 000 tonnes** of oil



## FUSION IS PART OF THE SOLUTION

Now is the time to pave the way for a low-carbon economy and combat climate change. Europe is at the forefront of developing fusion—one of the most promising long-term options that could change the future.

Fusion is the process that powers the sun and other stars. It holds the key to safe, unlimited and clean power supply offering us greater autonomy, security, resilience and comes with far-reaching benefits:

- **The fuels required are abundant**, enough to last millions of years, reducing our dependence on other fuels which often generate international tension.
- **Small amounts of fuel can generate plenty of energy**: 60 kg of fusion fuel can provide the same amount of energy as 250 000 tonnes of oil.
- **No greenhouse gas emissions** or long-lasting radioactive waste are produced and fusion power plants would be inherently safe posing very low risks to populations in the vicinity.
- Fusion power plants will offer **steady and reliable energy**, complementing renewables in providing a “baseload” electricity.

# FUSION FOR ENERGY

## THE EU ORGANISATION FOR THE DEVELOPMENT OF FUSION ENERGY

Fusion for Energy (F4E) is responsible for large-scale, first-of-a-kind technological projects, counting on a large pool of experts and an impressive supply chain across Europe.

Our mission is threefold:

- **Partnering with European industry** to provide equipment and expertise to ITER, and other fusion projects such as JT-60SA, DONES.
- **Developing the talent** and knowledge for the construction and operation of commercial fusion power plants in Europe.
- **Paving the way for** a transition from research to a competitive European **industrial fusion sector** that can drive economic growth.

Its pool of talent and expertise, together with its unparalleled access to industry and fusion laboratories have converted F4E into an innovation hub that brings together Europe's fusion community.



F4E is headquartered in **Barcelona**, with offices in **Cadarache** (France) and **Garching** (Germany).



Europe's fusion innovation hub with **experts in engineering, manufacturing, project management and industrial procurement.**



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# ITER THE BIGGEST INTERNATIONAL FUSION EXPERIMENT

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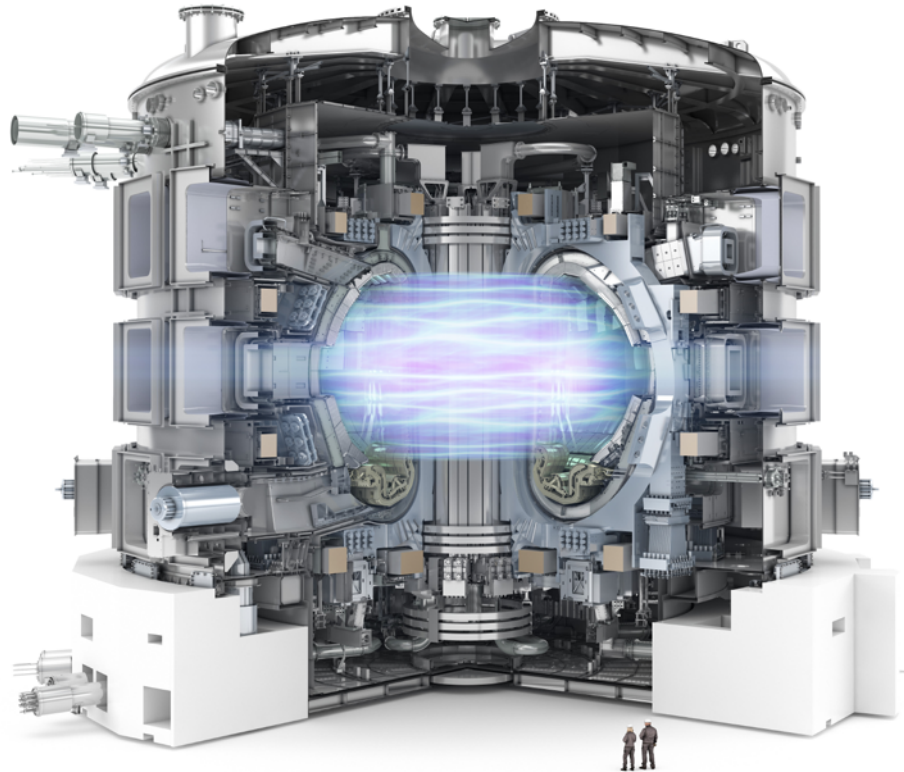
ITER brings together half of the world's population and 80% of the global GDP through the participation of China, Europe, Japan, India, the Republic of Korea, the Russian Federation and the United States. The experiment is in Cadarache (France).

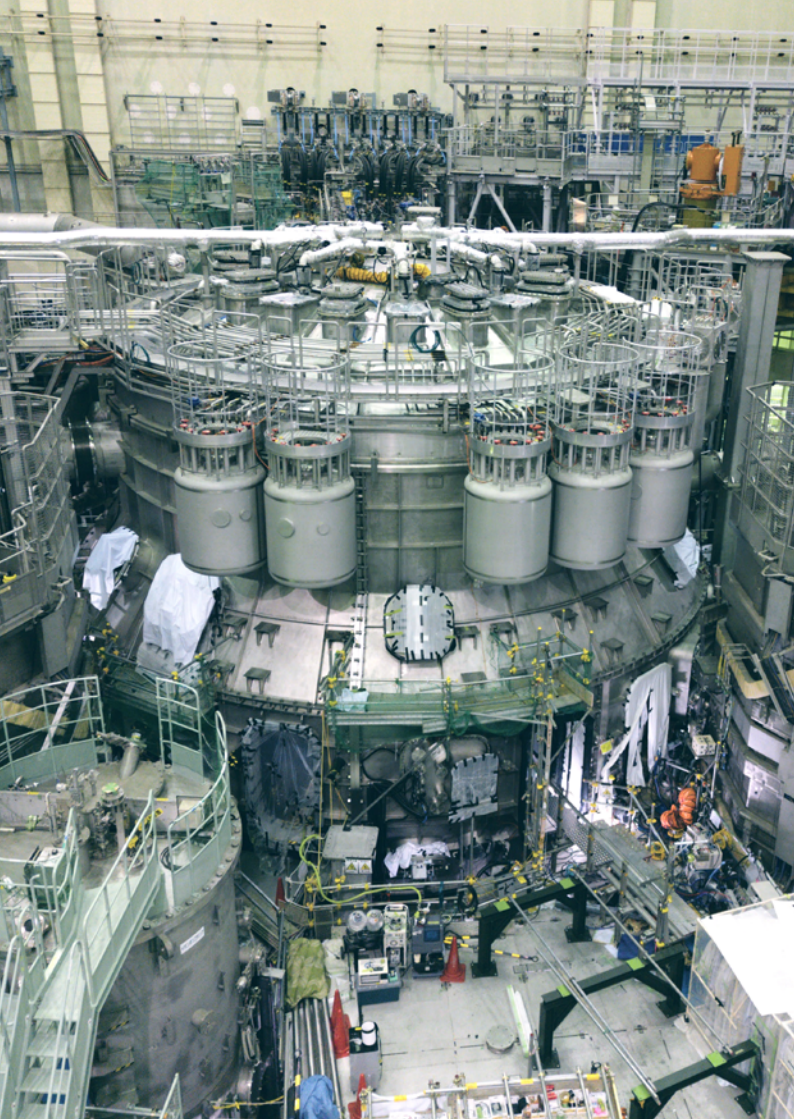
Europe is responsible for almost half of the components and nearly all buildings. Through F4E, industry, SMEs and laboratories are provided with a one-of-a-kind opportunity to manufacture equipment and test key technologies that will be essential to delivering fusion. Scientists will have the opportunity to study a 'burning plasma' that will release for the first time more energy than that used to produce it.

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**ITER is key to testing fusion technologies like no other experiment to date.**

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## **JT-60SA**

### **AN EXPERIMENT PAVING THE WAY TO ITER**

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Resulting from the scientific collaboration between Europe and Japan, known as the “Broader Approach”, JT-60SA is the most powerful fusion device until ITER is operational.

Thanks to this experiment, scientists will be trained, and new knowledge will be generated that will influence the progress of other fusion projects. It is located in Naka (Japan) and started operating in 2023. F4E together with several European countries have provided personnel or manufacturing components.

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**JT-60SA is offering  
invaluable expertise.  
Delivered by 80  
companies and involving  
at least 280 scientists.**

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## POSITIONING EUROPE IN THE FUSION RACE

To reap the commercial benefits of this technology, F4E is engaging with an impressive supply chain of companies and laboratories across Europe, involved in the production of components. Through their involvement, new know-how and spin-offs are generated. Investing in fusion also helps Europe to become a champion of cleaner technologies.

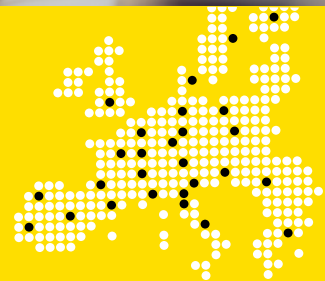
Our companies gain skills, expertise, innovate and create smart jobs for the future. Furthermore, the collaboration between small and big enterprises creates partnerships, makes them competitive and helps them tap into new markets.

To address the energy challenges of the future Europe needs vision and conviction to develop fusion to the point where it is part of our future energy mix.

The Draghi report highlights the strategic importance of fusion energy together with the need for continued investment, and collaboration, so that this technology becomes commercially viable.

# 2700

European contractors  
collaborating with F4E



in more than **25**  
countries







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## F4E SHAPING THE FUTURE OF FUSION ENERGY

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At least **40**  
technology transfers  
and breakthroughs

Generating new  
**knowledge**, mastering  
**key technologies**, and  
investing in **future  
talent**.



With its experience in manufacturing components for ITER, JT-60SA, and other fusion experiments, F4E can play a key role not only in ensuring the success of these projects but in delivering fusion in Europe.

F4E is bringing together industry and research organisations to fill in knowledge gaps in key technologies needed for the technical and commercial viability of fusion through its Technology Development Programme and other initiatives.

We need to ensure the best return of investment from Europe's involvement so that our citizens enjoy abundant, safe and clean energy in future.

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**Providing knowledge and  
commercial incentives  
to deliver fusion in  
Europe.**

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## **Fusion for Energy**

The European Joint Undertaking for ITER  
and the Development of Fusion Energy

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Fusion for Energy  
receives funding  
from the European  
Union budget

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