Nuclear Fusion

Harnessing fusion on earth would provide sustainable energy on a nearly unlimited scale to supply the needs of a growing world population

Menu

Fusion powers the sun and all the stars of the universe. Harnessing fusion on earth would provide sustainable energy on a nearly unlimited scale to supply the needs of a growing world population. Fusion energy is safe, has no difficult waste issues and is climate friendly.

Why haven't we got fusion yet?

Despite its huge potential, fusion energy is a tough challenge. After many years of research and experiments, the international scientific community is now building ITER to show that fusion energy is possible at an industrial scale.

ITER will be the largest tokamak ever built. A tokamak is a donut-shaped "magnetic bottle" in which fusion takes place. ITER is mostly modelled on the Joint European Torus (JET) JET is currently the world's largest tokamak and holds many scientific records, but these will be surpassed by ITER.

ITER will be the first experiment to produce significant quantities of fusion energy, considerably more than required to operate the machine. Following ITER, the DEMO project will pave the way for commercial fusion electricity.

A European roadmap for fusion

Europe speaks with one voice on fusion – EU countries have long been working together on fusion research, and JET made Europe the world leader in this field. This common European vision is summarised in the Roadmap to Fusion Electricity.

How is the European Union supporting fusion?

The Euratom Research and Training Programme strongly supports fusion research. The European Union hosts ITER and provides a large contribution to the project.

EUROfusion, launched in 2014, carries out research funded jointly by the Euratom and the Member States. EUROfusion manages a comprehensive programme of research projects that contribute to the realisation of the "Roadmap to Fusion Electricity".

A world of innovators

Fusion research already brings benefits to society. Fusion researchers are continually innovating and developing new and advanced technologies with promising applications beyond fusion, in areas such as aeronautics, robotics, medicine, new materials, computing and advanced instrumentation.

The EU rewards the best innovators in fusion through the European Prize for Innovation in Fusion.

Success Stories

Tritium-extracting solution decontaminates nuclear waste

EU-funded researchers have been recognised for their ground-breaking work on recovering and reusing waste material in nuclear fusion reactors.Read more

- The magnetic appeal of fusion technology

Publications

- European consortium for the development of fusion energy

More Publications

Links

- EUROfusion
- ITER
- Fusion for Energy
- Participants Portal