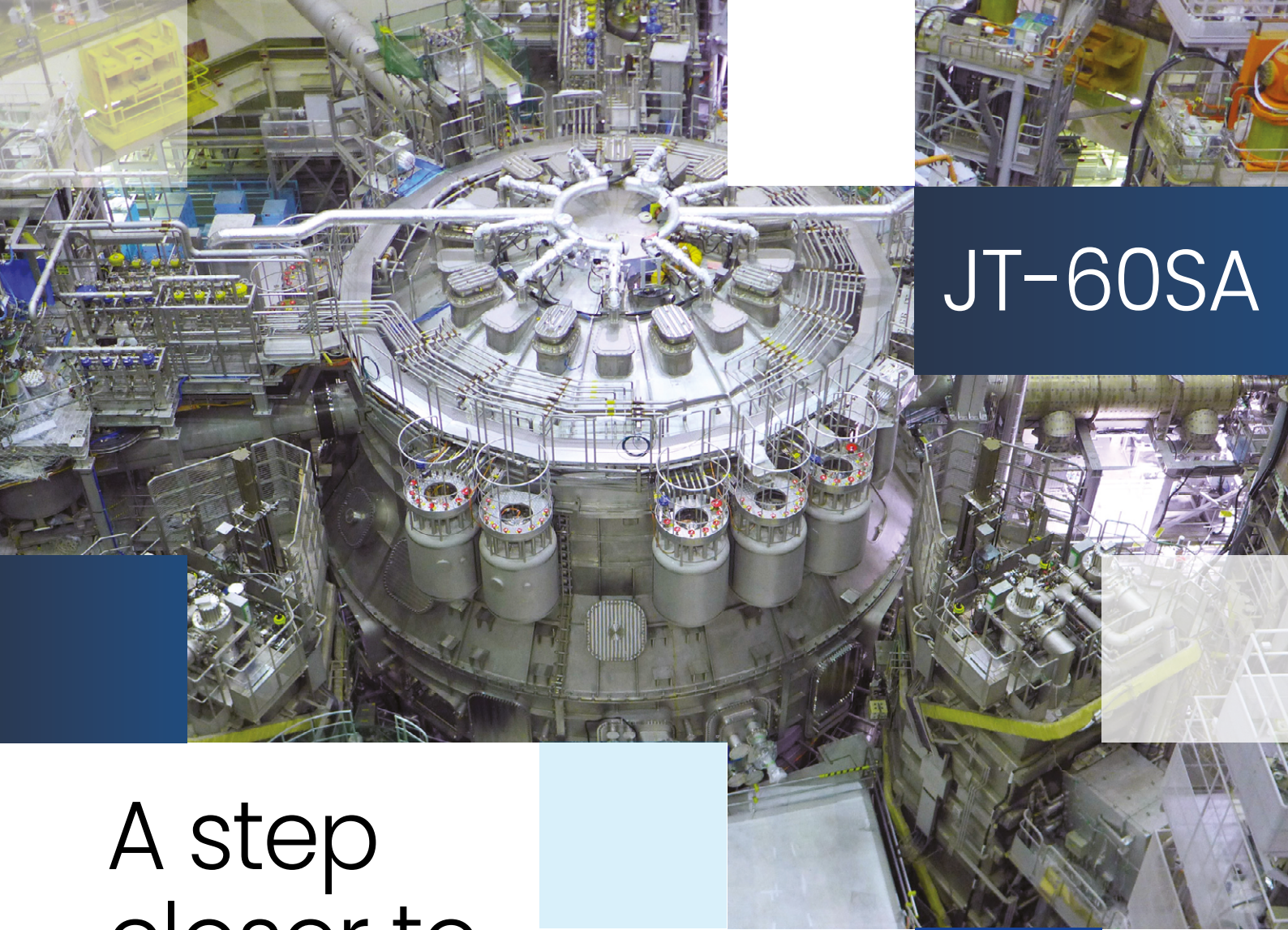
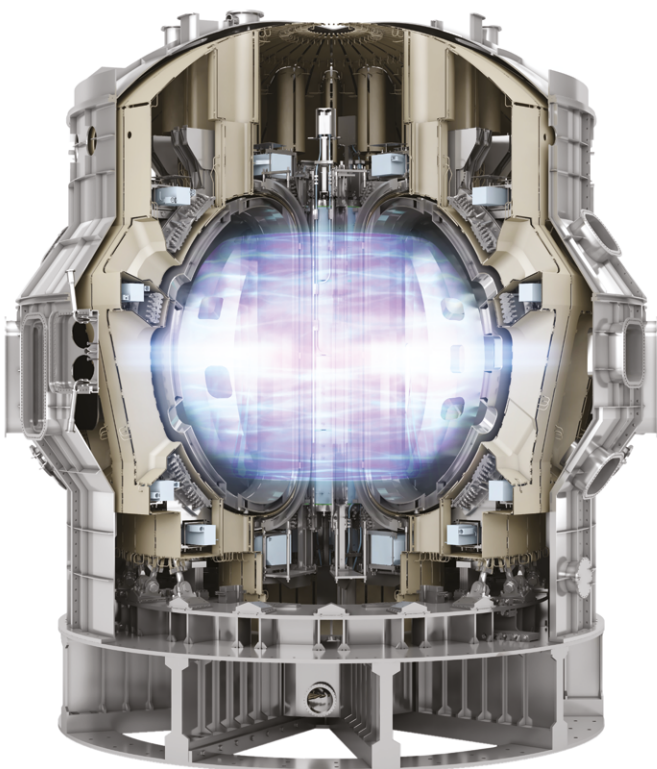




JT-60SA

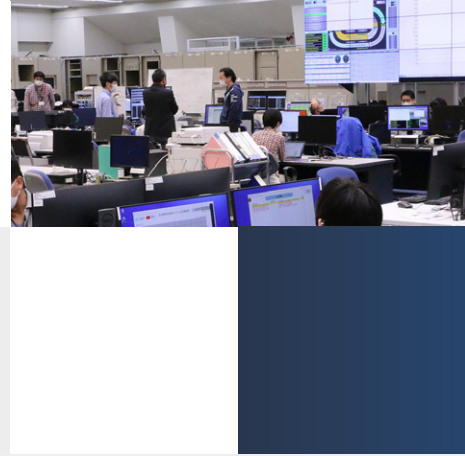
A step closer to fusion energy



What is JT-60SA?

JT-60SA (Japan Torus-60 Super Advanced) is currently the world's largest tokamak- a device using superconducting magnets to confine the plasma. It results from an international agreement in the field of science between Europe and Japan, known as "Broader Approach". It is hosted by Japan's National Institutes for Quantum Science and Technology (QST) in Naka. Its aim is to study advanced plasma scenarios in order to provide ITER, and future fusion power plants, with new knowledge.

Over 500 researchers from Europe and Japan have been involved, and more than 70 suppliers have contributed to manufacturing its components. Works started in 2007 and were completed in 2020 with the end of assembly. After a series of improvements, first plasma operations started at the end of 2023. In the coming years, further upgrades and operation campaigns are scheduled to help the scientific community break new ground in fusion.



How will JT-60SA operate?

JT-60SA is a toroidal (doughnut-shaped) device, known as "Tokamak", which operates with hydrogen isotopes. When heated to very high temperatures, the gas becomes plasma—the fourth state of matter. In the case of JT-60SA the gas will be heated to 200 million °C and will be magnetically confined for up to 100 seconds with the help of a powerful magnet system consisting of 28 superconducting coils operating in different parts of the machine.

Key facts & figures:

Plasma current: **5.5 MA**
 Toroidal magnetic field: **2.25 Tesla**
 Plasma major radius: **3 m**
 Plasma minor radius: **<1.18 m**
 Plasma volume: **130 m³**
 Heating power: **40 MW (during 100 s)**
 Weight: **2600 tonnes**
 Size: **13,7 m diameter**
15,4 m height

Who contributes?

The European Union and Japan designated two organisations to co-ordinate their respective contribution:

- **Fusion for Energy (F4E)**, the EU body managing Europe's contribution to ITER and the development of fusion energy, located in Barcelona, Spain
- **National Institutes for Quantum and Radiological Science and Technology (QST)**, located in Naka, Japan

Several European countries also provided components and services:

- **EUROfusion**, the European consortium consisting of 31 laboratories in the field of fusion, Germany
- **Studiecentrum voor Kernenergie** – Centre d'Etude de l'énergie Nucléaire (SCK-CEN), Belgium
- **Karlsruhe Institute of Technology (KIT)**, Germany
- **Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT)**, Spain
- **Commissariat à l'Energie Atomique et aux Energies Alternatives (CEA)**, France
- **Consorzio RXF and CNR**, Italy
- **Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile (ENEA)**, Italy

The teams contributing to this device have been praised for the spirit of collaboration, the efficient management and execution. On the basis of the experience acquired, Europe and Japan will help the scientific and industrial community to take a step closer to fusion, which has the potential to provide safe and climate-friendly energy. New knowledge will be shared with ITER, the biggest international experiment in this field, and ultimately help scientists to design future fusion power plants.

FOR FURTHER INFORMATION

www.f4e.europa.eu
www.jt60sa.org
www.energy.ec.europa.eu

