

A Giant Fusion Reactor Hotter than the Sun to Provide Unlimited Clean Energy Without Waste Marks Milestone

(adapted from [the Goodnews Network](#))

Fill in the gaps with the words in the box:

assembled - consortium - engineering - fission - freezer - fuse - hotter - hydrogen - magnets - meltdowns - plasma - setbacks - underway - unlimited

ITER (International Thermonuclear Experimental Reactor) is one of humanity's most-complex projects ever attempted—a giant nuclear fusion reactor, a machine that could produce relatively amounts of clean power.

It is being built collaboratively by a of 35 nations—China, India, Japan, Korea, Russia, and the United States, alongside the 28 states of the European Union plus Switzerland - and its cost amounts to 20 billion euro.

Conceived decades ago in 1985, ITER, which finally launched in 2006, has been delayed due to numerous

Fusion technology is based on the model of what happens in the sun, but unlike nuclear , with conventional nuclear reactors, fusion produces 4-times as much energy without the risk of , and virtually no waste or exhaust of any kind.

The ITER requires millions of different components over 5 years to create a reactor weighing over 23,000 tons. Required for atomic fusion to be achieved, 3,000 tons of super-heavy will be linked together with 124 miles (200 kilometers) of superconducting cables.

Construction is in Saint Paul-lez-Durance, southern France, with major components arriving this year from China, Japan, and other member states.

When operational, the parts will be kept at -452F (-269C) by the world's largest cryogenic This part is important since the fuel, heavy atoms gathered from sea water, will need to be heated to between 150 and 300 million celsius—ten times than the core of the sun inside a doughnut-shaped machine at the center of the reactor called a tokamak.

At this incredible heat and pressure the gaseous hydrogen fuel becomes a —a hot, electrically charged gas, which will eventually cause the atoms to overcome their magnetic repulsion and together, hence the term “nuclear fusion”. When this happens, immense amounts of energy is released that will power the components and magnets as well as anything it's connected to, with nothing but neutrons and helium leftover.

‘First Plasma’ is scheduled for December 2025, which will mark the official start of ITER’s operation, with first power to be generated ten years later.

[Video](#)