



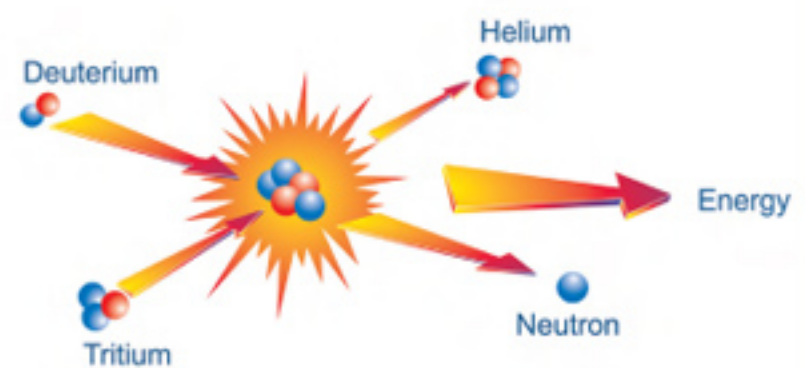
# What is fusion?

**Fusion is the process that powers the sun and other stars providing heat and light to sustain life on Earth.**

To make fusion happen, a hot gas (plasma) has to be heated to over 100 million degrees which fuses the nuclei together.

In the sun and stars, it is gravity that "holds" the hot plasma. On Earth, magnetic fields are needed to hold the plasma.

Since the 1950s, scientists have been investigating different ways to hold the plasma with magnetic fields. The 'tokamak' configuration, upon which JET and now ITER are based, has been the most successful.



*The Fusion Process (Courtesy:ITER)*

## The Fusion Process

The usual fusion fuels are deuterium and tritium -forms of hydrogen. Deuterium can be extracted from water. Tritium, on the other hand, is not available naturally and must be bred from lithium which is abundant in the Earth's crust.

Only 150 Kg of deuterium and 2-3 tonnes of lithium are needed for a full year

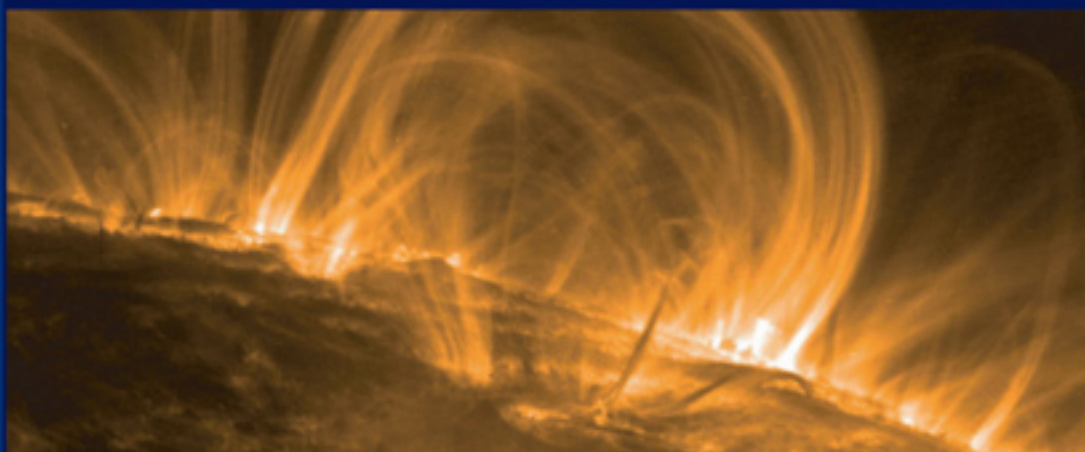
of electricity supply for one million persons.

The "tokamak" has been the most successful concept to confine fusion plasmas up to now.

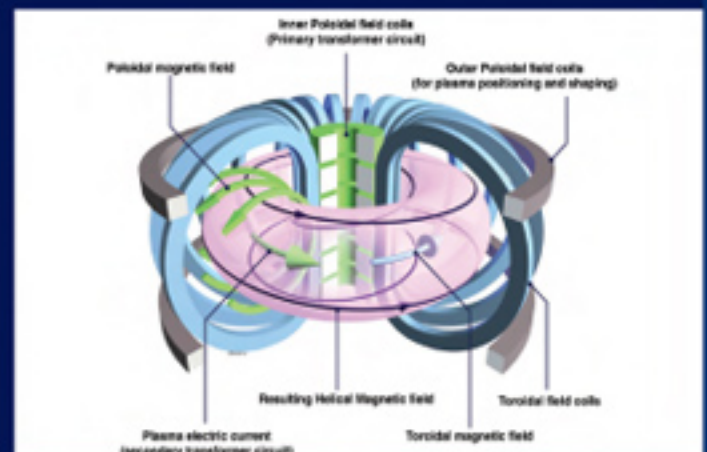
"Alternative" concepts, such as stellarators, are also being developed to prepare for fusion power plants.



*In a tokamak the plasma is held in a doughnut-shaped vessel. Using special coils, a magnetic field is generated, which causes the plasma particles to run around in spirals, without touching the wall of the chamber. (Courtesy: EFDA).*



*Gravity holds plasma in the sun*



*Magnetic fields hold plasma on Earth*