Nuclear experts seek to advance ITER fusion project

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Tractors working on the future International Thermonuclear Experimental Reactor (ITER) site in Cadarache, southern France, in 2008. An explosion in costs has cast a cloud over a multi-billion-dollar nuclear fusion project aiming to make the power that fuels the Sun a practical energy source on Earth.

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Delays, rocketing costs and financing problems have hit the International Thermonuclear Experimental Reactor (ITER) whose consortium members start a meeting on Tuesday aiming to get the project back on course.

ITER was set up by the European Union, which has a 45-percent share,

China, India, South Korea, Japan, Russia and the United States to research a clean and limitless alternative to dwindling fossil fuel reserves by testing nuclear fusion.

Work is to start at the test reactor site at Cadarache in southern France next month, but the cost now worries many members.

The total estimated bill for the EU, the main backer, has doubled to 7.2 billion euros (9.2 billion dollars), with the overall cost now reckoned to be around 15 billion euros.

The meeting on Tuesday and Wednesday in Cadarche of ITER's council members marks the start of the construction phase and comes after the EU pledged to pump in extra funds to keep the project going.

The European Commission, the EU executive arm, this month offered to fork out an extra 1.4 billion euros to fulfil Europe's commitment to the project, but this needs the approval of EU member states.

ITER's administrative headquarters and two buildings housing equipment will be the first to be started.

This week's meeting is also expected to name Japanese physicist Osamu Motojima as ITER's new boss, to replace his compatriot Kaname Ikeda.

Launched in 2006 after years of debate, the scheme aims to build a testbed to see whether fusion, so far achieved in a handful of labs at great cost, can be a feasible power source.

Nuclear fusion entails forcing together the nuclei of light atomic elements in a super-heated plasma, held in a doughnut-shaped chamber called a tokamak, so that they make heavier elements and in so doing release energy.

ITER's council decided last November to abandon its goal of 2018 to obtain the first plasma, and in March it said November 2019 was its new target.

ITER is designed to produce 500 megawatts of power for extended periods, 10 times the energy needed to keep the energy-generating plasma -- a form of radioactive gas -- at extremely high temperatures.

It will also test a number of key technologies for fusion including the heating, control and remote maintenance that will be needed for a full-scale fusion power station.

Preliminary trials would use only hydrogen. Key experiments using tritium and deuterium that can validate fusion as a producer of large amounts of power would not take place until 2026.

The process of nuclear fusion, used by the sun and other stars, would be safe and have negligible problems of waste, say its defenders.

In contrast, nuclear fission, which entails splitting the nucleus of an atom to release energy, remains dogged by concerns about safety and dangerously radioactive long-term waste.

If ITER is a success, the next step would be to build a commercial reactor, a goal likely to be further decades away.

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