

## EU gets tough on fusion reactor

### **ITER - NUCLEAR FUSION PROJECT**

The project is estimated to cost \$10bn and will run for 20 years  
It will produce the first sustained fusion reactions  
Final stage before full prototype of commercial reactor is built

### **European research ministers say they are ready to press ahead with the Iter nuclear fusion project even if it means losing Japanese support.**

The multi-billion euro reactor will produce energy from nuclear reactions like the ones that fuel the Sun.

But the international project has been stalled because the parties involved cannot agree on a location to build it.

Now, EU ministers say that if no deal is done soon, they will go it alone with a reactor at Cadarache in France.

"This is not an ultimatum, but we wish to reach a political agreement before the end of the year," French Research Minister Francois D'Aubert told reporters on Friday.

He added: "If the negotiations do not come to a rapid conclusion, the commission has the possibility to choose a different path."

### **Different views**

After the International Space Station, the International Thermonuclear Experimental Reactor (Iter) would be the largest global research and development collaboration.

There are currently six parties involved. The EU has the support of China and Russia to build the reactor at Cadarache.

Japan has the backing of the US and South Korea to construct Iter at Rokkasho in the north of its territory.

A decision on the location should have been made a year ago - but the parties are deadlocked.

Europe would like Japan to stand down and accept a major support role. This would involve a materials testing facility needed for the commercial reactors that could come after Iter.

Japan, however, is adamant that it has the best candidate site and has been upset by the EU's negotiating tactics.

"It is extremely regrettable. We hope that the EU will handle this matter appropriately and honestly," said Takahiro Hayashi, deputy director of the Office of Fusion Energy at Japan's energy ministry.

"There is no deadline for the talks. We will continue until both sides reach an agreement," he told the AFP

news agency.

And the office's director, Satoru Ohtake, told Reuters news agency: "The two sides have different ideas, and therefore we should take time to have good discussions."

He added: "The fact that they are setting a deadline for their rival to make a concession is something like a declaration of war."

### **Technical obstacles**

Unlike in fission reactions, in which atomic nuclei are split to release energy, fusion reactions release energy when nuclei are forced together.

The process is the same as the one that powers the Sun. Achieving stable and sustained reactions on Earth, however, present an immense challenge.

The Iter design is for the reactions to take place inside a 100-million-degree gas (plasma) suspended in an intense doughnut-shaped magnetic field.

Several research facilities, such as the Joint European Torus (JET) project at Culham, UK, have shown this is feasible; but none has so far been able to sustain the reactions for long periods.

Iter will consolidate all that has been learnt over many decades of study. It is expected to produce 500MW of fusion power during pulses of at least 400 seconds.

If it achieves this and its technologies are proven to be practical then the international community would then build a prototype commercial reactor, dubbed Demo.

Fusion could help fill the void as the world moves away from oil, coal and natural gas.

The fusion fuels are plentiful and produce no greenhouse emissions when "burnt". The systems are said to be inherently safe because they shutdown in a malfunction; and although radioactive materials are produced, they are not of the high-level long-lived variety that has so burdened nuclear fission.

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