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Biggest nuclear fusion project goes to France

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France is to host the world's biggest nuclear fusion reactor, a $12 billion project designed to harness the power of the Sun, it was confirmed on Tuesday.

"Under this declaration, France is chosen as the site," said European Union spokeswoman Antonia Mochane, at a signing ceremony in Moscow attended by the six parties: the EU, US, Russia, Japan, South Korea and China.

The long and sometimes bitter dispute about the siting of the International Thermonuclear Experimental Reactor (ITER) ended Japan withdrew its bid, as reported last week. The 30-year project will now be built at Cadarache in southern France.

The Japanese site had been supported by the US and South Korea, while France was backed by the EU, Russia and China. French President Jacques Chirac said he was "delighted" and thanked those nations for there "unfailing support in the negotiations".

Top job

Alexander Rumyantsev, the head of Russia's atomic energy agency, said

details of ITER's financing still had to be resolved. But under earlier discussions the EU was expected to shoulder 40% of the cost and France 10%, with the rest shared out between the other partners.

Japan also secured a deal to construct the project's main materials research facility in Japan and to set aside 20% of jobs at the head office, including ITER's top post, for Japanese nationals.

The ultimate vision behind of the ITER project is to find a way to harness the power of nuclear fusion, which promises a clean, safe and almost infinite supply. But decades of research to date have not brought that substantially closer.

Nuclear fusion, which powers the Sun and H-bombs, typically involves the fusion of two hydrogen atoms to produce helium. Current nuclear plants use fission – splitting atoms.

Hot plasma

ITER was conceived at an international summit in 1985 as a experimental facility to examine if nuclear fusion can be taken out of the lab and help meet the world's energy needs.

The project presents an immense technological challenge, since fusing atoms will require a plasma heated to 100 million degrees to be contained in an intense magnetic field. The challenge is to do this while ensuring that more energy is produced than consumed.

After the construction programme, experiments would start about 2015 and continue for some 20 years, testing ITER for technological feasability, safety, health and waste management. The reactor would then be decommissioned.

If ITER is successful, a demonstration fusion power plant would be built in the mid-2030s, and - if that goes well - the first commercial fusion plant would be created mid-century to assess economic feasability.

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International Thermonuclear Experimental Reactor
http://www.ofes.fusion.doe.gov/iter.html

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