

Europe and Japan in heated clash over fusion reactor

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A battle has broken out over plans to build a reactor that could harness 'fusion power', source of the sun's energy, for humanity.

European politicians and scientists want to construct a fusion plant in France. But the Japanese are insisting they should be hosts for the £3 billion project.

The row has caused a major diplomatic split: the EU, Russia and China want the International Tokamak Experimental Reactor (Iter) to be constructed at Cadarache in France, while the US, South Korea and Japan want to have it at Rokkasho-mura in Japan. The winner is likely to gain expertise in a technology that could save the planet.

'The chances of Iter working are only 50-50,' said Professor Ian Fells, a former science adviser to the World Energy Council. 'But fusion power would produce little radioactivity, no carbon dioxide, run on fuels that are easy to get and provide the world with most of its electricity requirements for hundreds of years.'

The sun burns by squeezing together the nuclei of hydrogen atoms to create helium nuclei, releasing vast amounts of energy but needing temperatures exceeding 10 million degrees Celsius. Engineers have worked out that the most promising method for containing super-hot hydrogen plasma is within a powerful, doughnut-shaped magnetic field. Such a power plant, a Tokamak reactor, burns hydrogen isotopes called deuterium and tritium to create helium and streams of neutrons that provide the plant's energy.

Small-scale trials have proved successful, such as the fusion reactor Jet (Joint European Torus) at Culham in Oxfordshire, which generated 16 megawatts of power - but soaked up 25 megawatts of electricity to run its magnetic fields and heat its deuterium and tritium plasma.

'It is really just an issue of scale,' said Sir Chris Llewellyn-Smith, head of Culham's fusion programme. 'If we create a reactor that can hold a thousand cubic metres of deuterium and tritium, 10 times more than Jet, we should be able to generate up to a gigawatt of power, the same as big coal-powered generators - which pump out carbon dioxide and spread acid oxides and particulates.' The bigger reactor would generate much more power than it would consume.

Europe and Japan have each raised their stakes to 50 per cent - on condition they become the host. Last month negotiations ended without a resolution. They are due to restart, but it may take months to reach a decision.

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