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Nuclear fusion decision 'urgent'

By Alex Kirby

BBC News Online environment correspondent in Obninsk, Russia

The countries planning to build Iter, the world's biggest nuclear fusion reactor, must choose a site urgently, a Russian scientist says.

Professor Yevgeny Velikov, who has been working on nuclear fusion since 1958, said it was important to decide the site in the next three months.

The countries of the Iter Consortium are deadlocked over whether to build the reactor in France or Japan.

Professor Velikov said a commercial fusion reactor could open in 30 years.

He is the president of the Kurchatov Institute in Moscow, and a member of the Russian Academy of Sciences and of the US National Academy of Engineering.

Political decision

Professor Velikov was speaking at a conference here in Obninsk organised by the International Atomic Energy Agency to mark 50 years of nuclear power.

What the IAEA acknowledges as the world's first nuclear power plant opened in Obninsk in 1954.

Iter - the International Thermonuclear Experimental Reactor - will be the largest global science and engineering project of the next decade, apart from the International Space Station.

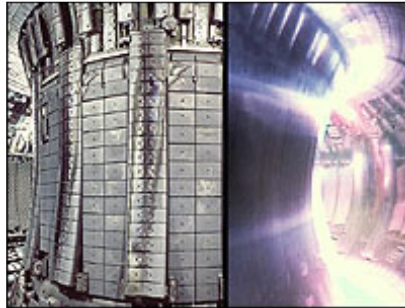
The Consortium includes the European Union, US, Russia, China, Japan, Canada and South Korea.

The EU, Russia and China want the reactor to be built at Cadarache in France, but the US, South Korea and Tokyo support a Japanese site, Rokkasho-mura.

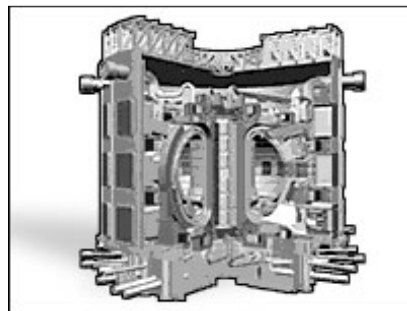
Professor Velikov told BBC News Online: "If there's a decision this year, Iter could start operating eight-and-a-half years later.

"All the design and technical details are settled, and the funding - it's only the site we're waiting for. But that's a very political decision, and an election year in the US is a bad time for agreements.

"It's really important the decision should be made within the next two or three months. I proposed that we should in fact have two sites; one the physical base of the reactor and the other a science centre.



Iter will be able to produce "star power" plasma (right)



“ All the predictions say oil and gas consumption will increase over the next 30 or 40 years. But fusion power will give us a breathing space to phase out fossil fuels ”

Professor Yevgeny Velikov

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"I think this disagreement is the result of some old thinking: we need both sides to think again."

Global demand

Professor Velikov said it would still take another 30 years or so before a demonstration commercial fusion reactor was ready.

Even when it was, he did not expect fission reactors to be phased out, because a world population of up to 10 billion people would need every possible energy source.

He told BBC News Online: "Fission is going to go on. And we'll go on burning fossil fuels too, at least during this century. It's impossible to stop it - people have to drive their cars and heat their homes.

"All the predictions say oil and gas consumption will increase over the next 30 or 40 years. But fusion power will give us a breathing space to phase out fossil fuels."

Nuclear fusion promises virtually limitless and largely pollution-free energy. In a fusion reaction, energy is produced when light atoms - the hydrogen isotopes deuterium and tritium - are fused together to form heavier atoms.

To use controlled fusion reactions on Earth as an energy source, it is necessary to heat a gas to temperatures exceeding 100 million degrees Celsius - many times hotter than the centre of the Sun (itself a giant fusion reactor).


The technical requirements to do this are immense. But the rewards, if it can be made to work at a commercial level, are extremely attractive.

One kilogram of fusion fuel would produce the same amount of energy as 10,000,000 kg of fossil fuel.

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