

## Nuclear project could solve energy woes--scientist

*Watch the name ... Fell ... another idiot.*

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If scientists succeed in building an experimental nuclear fusion reactor and making it work it could solve the world's energy problems for the next 1,000 years or more, a leading scientist said on Tuesday.

After months of wrangling, France defeated a bid from Japan and signed a deal to build the 10-billion-euro (\$12 billion) experimental reactor at Cadarache in the south of the country.

Ian Fells, of the Royal Academy of Engineering in Britain and an expert on energy conversion, described the ITER (International Thermonuclear Experimental Reactor) project backed by China, the EU, Japan, Russia, South Korea and the United States as a huge physics experiment.

It is one which has enormous potential and could lead to the building of a prototype power station in about 30 years time.

"If we can really make this work, there will be enough electricity to last the world for the next 1,000 to 2,000 years. So it is really quite important but quite difficult to do it," Fells said in an interview.

In terms of the scientific and engineering difficulty involved, he compared it to landing a man on the moon.

"I give it a 50-50 chance of success but the engineering is very difficult," said Fells.

ITER would have an advantage over current nuclear reactors because it would be cleaner. It would not rely on enriched uranium fuel and it would not produce plutonium, which is a concern from a terrorism point of view.

"The technology of this is the science of the hydrogen bomb," Fells said. "You take a couple of hydrogen atoms and you squeeze them together, you fuse them together, and they turn into an atom of helium and produce a great burp of energy."

"This is turning mass into energy as with Einstein's celebrated equation  $E=MC^2$  (energy = mass times the speed of light squared)."

Scientists know it could work because they know the hydrogen bomb works. But the problem they face is trying to do it in a controlled manner so the heat can be used to generate electricity.

ITER seeks to mimic the way the sun produces energy, potentially providing an inexhaustible source of low-cost energy using seawater as fuel.

The hydrogen atom used is deuterium which is a stable isotope of hydrogen.

"The oceans are absolutely stuffed full of it," said Fells.

Although ITER would be cleaner than current nuclear reactors it does pose some problems.

"In the course of the reaction it produces a lot of neutrons and they get into the actual fabric of the machine and over years it becomes radioactive, so there is still a problem of decommissioning," said Fells.

But he added that the potential for the technology, if it can be made to work, is so great it is really worthwhile putting in a large effort to see if it can succeed.