

Seven Nation Group to Pursue Fusion Energy Research

By David McAlary
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The United States and several other nations have signed a \$13 billion agreement to develop a form of nuclear power in a process called fusion. They will cooperate to build an experimental reactor intended to mimic the way stars make energy, with the hope that the research will eventually lead to a plentiful supply of cheap, clean and safe power.



Ministers pose at the EU Commission headquarters in Brussels after signing the ITER agreement

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The seven-party consortium brings together the United States, the European Union, Japan, Russia, China, South Korea, and India to build the International Thermonuclear Experimental Reactor, or ITER for short, in southern France.

At a signing ceremony in Brussels, U.S. delegate Raymond Orbach said the project will be carried out on an unprecedented scale for the betterment of a world dependent on fossil fuels, such as oil and coal.

"ITER has the potential to free the quickly growing global economy and population from the looming constraints of decreasing energy supplies and the unfortunate effects of environmental degradation," said Raymond Orbach.

ITER began with an agreement at the 1985 U.S.-Soviet Geneva Summit. It was one result of a plan to develop joint activities to help reduce Cold War tensions. Other nations joined later.

But Congress ordered the government to withdraw in 1998 because it considered the original reactor design too expensive. Faced with a sharp drop in the budget, the remaining ITER members redesigned the reactor at half the cost, making it attractive again to the United States, which rejoined in 2003.

Raymond Orbach says fusion is the energy that powers stars.

"The fusion process is one of the most powerful ways of producing energy that nature has devised," he said. "As examples of that, I simply suggest you look at the stars and realize how our sun is powered. So what we are trying to do is to take advantage of this quite remarkable property of nature that literally keeps us alive."

In fusion, the nuclei of light elements, such as hydrogen, fuse together inside stars to make heavier elements, such as helium. The fusing process gives off tremendous amounts of energy.

Using fusion to generate power there would be none of the greenhouse gas byproducts of the

sort fossil fuels emit. Nor would fusion produce radioactive material as does the other form of nuclear energy, called fission. The source of hydrogen for the energy-producing reaction would be water.

The ITER reactor will use doughnut-shaped magnetic coils to induce an electric current in a mixture of charged particles, making conditions hot enough to create fusion reactions like those inside stars.

Plans call for the eight-year construction of the reactor to begin next year after the parties formally ratify the agreement. Officials hope to have the unit working by the year 2040. They predict that if all goes well, fusion could provide 10 to 20 percent of the world's energy by the end of the century.

But environmental groups oppose the project. At the Washington branch of Friends of the Earth, Eric Pica says the program is a tremendous waste of money for the slight hope of producing fusion energy.

"You can make better investments by investing in renewable energy and energy conservation," said Eric Pica. "We know these things will save energy and reduce our fossil fuel dependence now."

But Raymond Orbach, the Department of Energy's science director, says not pursuing fusion research would be an outrage.

"We would be telling our world population that they do not have a chance of achieving the standard of living that the rest of us enjoy," he said. "That is how serious it is if we do not pursue this opportunity."

The European Union's Science and Research Commissioner, Janez Potocnik, told the Brussels signing ceremony that ITER is a new model for large-scale global scientific and technical cooperation.

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