

EDITORIAL

Japan wins by withdrawing ITER bid

France has won the competition to host the International Thermonuclear Experimental Reactor (ITER), the world's first nuclear-fusion reactor. Japan fought hard to win the project, but in the end the projected cost and the promise of playing a significant role in subsequent research gave Tokyo ample reason to withdraw its bid. That may not have been a bad thing: It is still unclear if one of the most costly projects in history will be worth the price tag. Nevertheless, Japan must now work exceptionally hard to ensure that the program is a success.

Thermonuclear fusion utilizes the same process that powers the sun -- nuclear-fusion reactions -- to produce energy. Scientists at the ITER plant will create nuclear-fusion reactions in a tokamak -- a doughnut-shaped chamber -- by filling it with a plasma of deuterium and lithium and heating it to temperatures of more than 100 million degrees to force the nuclei to fuse.

Fusion offers numerous advantages over other sources of nuclear energy. It is efficient: It is estimated that just 100 grams of deuterium and 3 tons of lithium can produce 1 gigawatt of electricity. It is clean: The radioactive waste that is produced has a short life and there are no carbon-dioxide emissions, so the process does not contribute to global warming. Finally, deuterium, the principal fuel, is found in water, so supplies are abundant.

A large-scale fusion reactor has never been built. The ITER project was launched in 1985, but realization of the dream remains about 30 years in the future. Supporters say it will provide some 10,000 jobs and that a demonstration reactor could be ready by 2040. They say delays are the result of political differences among the six main sponsors of the effort -- Japan, the United States, the European Union, Russia, South Korea and China -- that have blocked progress. Most recently, the U.S. and South Korea backed Japan's bid while Russia, China and the European Union were behind France, essentially replaying the divisions triggered by the Iraq war. Critics claim the science is uncertain and the process too difficult. Moreover, they argue that the project's huge price tag will deprive other energy options of funds.

It is certainly expensive. ITER is projected to cost about 1.3 trillion yen (about \$12 billion) to build, operate and then decommission in an anticipated 35-year period. Under the agreement reached last month, the EU will pay about half of the costs and the other partners will divide the remainder evenly among themselves.

To sweeten the deal, Japan has been promised 20 percent of the projects related to ITER; that makes the program an economic winner for Japan. While paying 10 percent of the costs, Japanese companies and researchers will get twice that in contracts; it is estimated that Japan could get contracts totaling 150 billion yen. Although the main facility will be built in Cadarache (near Marseilles in southern France), several facilities related to the project, such as laboratories and a reactor design center, will be constructed in Japan. In addition, the director general will be a Japanese national, as will 20-30 percent of the researchers at the international organization. As a result, despite withdrawing its bid, Japan is becoming a "quasi-host" of the project.

This put a special burden on Japan. For years, this country has been at the forefront of research on nuclear fusion. The national commitment to the development of safe, clean and efficient energy supplies has been the foundation of Japan's energy policy. In recent years, however, public confidence in the nation's reactor program has been shaken. Numerous accidents, mismanagement and a culture of seeming contempt for the public have undermined popular support for nuclear energy in Japan. The controversies surrounding the Monju fast-breeder-reactor project and the reprocessing facilities at Rokkasho in Aomori Prefecture require this country's nuclear technicians and bureaucrats to redouble their efforts to restore confidence in Japan's nuclear infrastructure. But that is only a first step.

Winning the right to head the new ITER bureaucracy is not just a perk. Given the difficulties that accompany this new technology and the controversies that already surround the project, Japan must work especially hard to direct and coordinate research to ensure that ITER is a success. It will require a very active managerial and technical role. It is certain to be demanding and it is not inaccurate to say that success or failure may well ride on Japanese efforts. "Losing" the ITER bid imposes almost as great a burden on Japan as "winning" would have.

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