

The French Nuclear Lesson
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The French nuclear experience is now making waves around the world. France, which receives 77 percent of its electricity from nuclear energy, says that the fuel source will remain integral to its energy mix and is necessary to meet global air emissions standards set by the Kyoto Protocol.

That thinking is beginning to creep into the mainstream in this country, with some high-powered companies participating in a consortium to build the next-generation nuclear reactor. It's also a position now being examined by the whole European Union, which has agreed to cut its greenhouse gas emissions by 5 percent from its 1990 levels by 2012. Member nations there must decide how they will meet that goal -- a turning point that has caused those countries to seriously evaluate nuclear energy.

"The French people are aware that nuclear doesn't create a lot of greenhouse gas emissions thought to cause global warming," says Dario Alvarez, vice president of energy issue matters for Invest in France Agency, the foreign investment arm of the French government. "Nuclear is therefore getting more and more positive reviews and public support. Still, there's strong opposition from environmental groups but they are not the majority. The trend today is keep on with the nuclear program."

A survey conducted by France's Energy Observatory in 2003 indicated that 47 percent of France's population being in favor of nuclear energy, compared to 41 percent opposed. That majority has prompted the French government to enact in July a new energy bill that continues the nuclear energy program and the construction of nuclear reactors. It was crunch time for the French Parliament as many of the 58 nuclear reactors there need to be replaced in 2015, based on a 40-year reactor life.

France, meantime, was selected to serve as the official site for the world's first nuclear fusion reactor. Unlike fission that splits atoms such as uranium, fusion unites them and releases more powerful energy. The project, which will start in 2006 and take seven years to build, is a risky venture that critics say could fall on its face.

France began its nuclear energy program in the 1940s and expanded it in the 1970s as a way to avoid foreign dependence on fossil fuels, which at the time comprised about 80 percent of its fuel mix. The country has gone through a re-examination of its energy objectives and determined that nuclear power is cost effective, safe and environmentally sensitive. It's a decision, however, that appears to run counter to that of Germany and Sweden, which have said they would like to phase-out their nuclear programs.

Companies such as EDF International North America, a unit of Electricite de France, and Duke Energy, Entergy Corp. and Exelon Energy have united under the NuStart Energy Development umbrella to build the first advanced nuclear reactor in the United States in 30 years. Nine others, which include General Electric and Westinghouse, are part of the consortium that will get \$4 million in federal funds and select a site by October. Such a plant could get permitted by 2010 and be built by 2014, if conditions are right.

"This Agreement is the next step on the road to a new generation of nuclear energy plants," says Marilyn Kray, president of NuStart and a vice president of Exelon. "We need the energy price stability and fuel diversity that new nuclear plants can provide."

Strong Opposition

Altogether, nuclear power makes up 44 percent of the generation mix in Sweden, 39 percent in Switzerland, 29 percent in Germany, 28 percent in Japan, 23 percent in the United Kingdom and 20 percent in the United States. About 440 nuclear power plants exist worldwide while the Atomic Energy Agency says that 32 nuclear power plants are under construction.

China, for example, has given preliminary approval to four new nuclear reactors there. That would increase the country's total reliance on nuclear energy from 1.3 percent today to about 5 percent by 2020. And in the United States, Dominion Resources, Entergy Corp. and Exelon Corp. have filed for permits to build nuclear reactors, all under the Bush administration's Nuclear Power 2010 Initiative.

At the same time, existing nuclear facilities in the United States have increased production from 557 million megawatt-hours in 1990 to 778 million megawatt hours in 2002 -- the equivalent of building 25 new power plants. And, according to Platts' Global Nuclear Group, the operation and maintenance of such plants in 2002 continued to fall to a record low median of 1.59 cents per kilowatt-hour. That is less than the 3 cents a kilowatt-hour it takes to run a coal plant.

The issues surrounding nuclear safety and waste disposal equally affect all countries considering this option. In France, for example, engineers thought the best way to get rid of the spent fuel was to bury it underground in storage in two sites there and in ventilated wells to control the temperature. An underground research laboratory in eastern France is now researching more effective ways to bury such waste. The United States, meanwhile, is considering placing all radioactive waste in Yucca Mountain outside Las Vegas -- a move that is controversial and if unsuccessful could doom the future of nuclear power in this country.

All countries are mindful of Three Mile Island, as well as the Chernobyl nuclear accident. As a result of these incidents, nuclear remains a tough sell. In this country, no new plants have been ordered in 30 years. At the same time, environmental groups point to an MIT study that says if nuclear power is to have any significant effect on climate change then it would require building at least 1,000 new reactors worldwide.

"Nuclear power creates far more problems than it solves, and is not the answer to global warming, says David Hamilton, director of the Sierra Club's Global Warming and Energy Program. "It is too dangerous and too expensive. Clean energy, like renewable energy and energy efficiency, is a cheaper and safer solution. Using clean energy, we can reduce seven times the greenhouse gas emissions for the same price as a new generation of power plants." Despite strong opposition to nuclear power, the global community now faces certain economic and environmental realities. The demand for energy is going up and fuel prices are increasingly volatile. Nations also want energy independence and fuel diversity. And most developed nations must now abide by the terms of the Kyoto Protocol that seeks to curb greenhouse gas emissions. France, for example, must reduce those emissions by 75 percent by 2050, necessitating its reliance on nuclear energy.

The French have certainly embraced the implementation of nuclear energy and others around the globe are opening up to it. Nuclear energy's fate in other countries is still unknown. But the pressure to give it increasing consideration will only intensify as nations grapple to cut emissions and diversify their fuel portfolios.