

In the Global Energy Rush, Nuclear Gets A Resurgence

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Sixty miles outside [Buenos Aires](#), construction crews soon will be swarming over a partially built concrete dome abandoned 12 years ago, resuming work on [Argentina's](#) long-delayed Atucha II nuclear power plant. They will be in the vanguard of surging interest in nuclear power worldwide.

Faced with evidence that coal- and oil-fired electric plants are overheating the planet, and alarmed by soaring demand for electricity, governments from [South America](#) to [Asia](#) are turning once again to a power source mostly shunned for two decades as too dangerous and too costly.

Globally, 29 nuclear power plants are being built. Well over 100 more have been written into the development plans of governments for the next three decades. [India](#) and [China](#) each are rushing to build dozens of reactors. The [United States](#) and the countries of [Western Europe](#), led by new nuclear champions, are reconsidering their cooled romance with atomic power. International agencies have come on board; even the [Persian Gulf](#) oil states have announced plans for nuclear generators.

"Energy and climate changes can't remain tied to carbon or hydrocarbon," the [European Union's](#) foreign policy chief, [Javier Solana](#), said in October. "They are polluting, and we'll have to find substitute energies, including nuclear energy." It creates heat through nuclear reactions rather than combustion, giving off no carbon dioxide, the most important of the so-called greenhouse gases that trap heat in the Earth's atmosphere.

Utilities are dusting off plans for nuclear plants even though most of the problems that shelved those projects remain. Critics say governments have forgotten the crises of [Three Mile Island](#) and [Chernobyl](#). The costs and time to build the concrete-encased plants far exceed those of conventional plants. There still is no safe permanent storage for the used fuel that will remain radioactive for a million years. Added to these problems are the newly realistic worry of a terrorist attack on a nuclear plant.

"It can be very controversial," Mexican Congressman David Maldonado said of his country's plans to build a \$4 billion nuclear plant in [Veracruz](#). "The things that have happened in years past, going back to Chernobyl, have created a lot of fear here."

In the United States, the Bush administration has strongly pushed nuclear power and backed a 2005 energy bill offering subsidies to utilities to go ahead with projects in a shortened, streamlined regulatory process. The industry talks enthusiastically of 10 to 30 new nuclear plants being started in the next two decades.

Critics say those predictions will stall without long-term subsidies, and they scoff at the administration's explanations that nuclear plants will help battle global warming and reduce dependence on foreign oil. "The Bush administration doesn't believe climate change is a threat unless it is arguing for nuclear power," said Edwin Lyman, a senior staff scientist at the [Union of Concerned Scientists](#) in Washington.

Skeptics contend that the nuclear resurgence is still just talk. In the United States, they note, not a single reactor has been ordered. The high costs and long delays that vexed nuclear construction -- Argentina's Atucha II was 14 years in construction before it was halted -- soon will diminish the atomic ardor in other countries, they say.

"Even with all the respective subsidies, nuclear power plants are still too expensive," Lyman said. "We need to move faster to really take a bite out of greenhouse emissions, and there aren't any scenarios in which nuclear power can do that."

At present, 442 nuclear plants are operating in more than 31 countries, according to the [International Atomic Energy Agency](#) in [Vienna](#). The United States has the most -- 103, which provide about 19.3 percent of the country's electric power. Next is [France](#), with 59, and [Japan](#), with 55. Worldwide, atomic energy accounts for 16 percent of electrical production; the vast majority of electricity is generated by burning coal, oil and natural gas.

But carbon emissions from conventional plants bring "higher global temperatures, rising sea levels that would threaten to submerge coastal regions, prolonged droughts and more frequent violent storms," IAEA Director General [Mohamed ElBaradei](#) warned in [Jakarta, Indonesia](#), in December.

The world's energy needs will rise 51 percent by 2030 because of industrialization and population growth, the [International Energy Agency](#) in [Paris](#) predicts. Add up the carbon-dioxide emissions from all the oil and coal plants that would be built to meet that need, and scientists see an environmental nightmare in the making.

Natural gas is a cleaner fuel for making electricity, but the price has soared. Hydropower from dams has largely topped out at less than 20 percent of the world's electric supply. Alternatives such as solar, thermal and wind power remain a tiny contributor in most countries and would require dramatic economic changes to become substantial sources. To many policymakers, that leaves nuclear.

In [Britain](#), such calculations led to a striking reversal in policy. In 2003, a government white paper called nuclear power an unattractive option; in May, [Prime Minister Tony Blair](#) declared that nuclear power is "back on the agenda with a vengeance."

Blair argued that the technology is a way to ensure British energy security in an unstable world and to combat global climate change -- a top priority of his government. Twenty-three nuclear plants now provide almost 20 percent of the United Kingdom's power, and Blair has called for a new mix of non-polluting sources, including nuclear plants and renewable alternatives.

"In the future, energy security will be almost as important as defense," Blair said in October.

Similar jitters about the reliability -- and price -- of traditional fuels are adding to the rush to nuclear. Japan, as host to the 1997 [Kyoto](#) conference that mandated a global reduction in greenhouse gases, is building three and planning 10 more nuclear plants in the next decade. Its plans are spurred by Japan's wariness over neighboring China's campaign to lock up oil and gas supply contracts with foreign countries.

"The timing of Kyoto Protocol coming into effect and the timing of China endeavoring in its mission to secure natural resources in the world coincide," said Tadao Yanase, director of nuclear energy policy at Japan's Agency for Natural Resources and Energy.

China's plans call for 15 to 30 new nuclear plants by 2020 and even more conventional plants, most of them coal-fired. Its researchers are working on creating smaller, less-expensive nuclear plants. India, with 16 nuclear plants, is building seven more plants and has been promised U.S. help to triple its collection by 2020.

Some nuclear construction will merely keep the status quo. The first big wave of nuclear plants, built in the 1970s and 1980s, are near their planned obsolescence; six have been shut down. Regulators in the United States have extended licenses to 60 years, but other countries are replacing aging plants to make sure the nuclear component of their base supply does not disappear.

Proliferation of nuclear material remains a worry. And another disaster like the [Soviet Union's](#) at Chernobyl in 1986 or a near-disaster like that at [Pennsylvania's](#) Three Mile Island in 1979 would likely freeze the plans for nuclear construction.

"The industry is sticking its head in the sand," said Jim Riccio, a policy analyst at anti-nuclear [Greenpeace](#) in Washington. "They haven't gotten close to addressing safety or security."

Because nuclear fission emits no greenhouse gases, some environmental groups have grudgingly concluded that nuclear power is preferable to global warming. Others still argue that aggressive conservation and a dramatic increase in solar, wind, thermal and biofuelled production can meet future electric needs.

"The voices of opposition have drastically decreased," Yanase said in his office in [Tokyo](#). "They obviously won't say they totally support" nuclear power, "but they are giving a tacit consent."

Industry advocates say the old complaints about nuclear technology have been addressed with simpler and cheaper designs, faster regulatory review, improved security and more operating experience.

"Things have changed," said Adrian Heymer, director of new plant deployment for the [Nuclear Energy Institute](#) in Washington. The industry expects U.S. companies to apply for 11 construction permits by the end of the decade. "When you put it all together, nuclear becomes an attractive package," he said.

Companies and countries that build nuclear plants are riding that pitch. [Westinghouse Electric Co.](#), which has made about half the world's reactors, signed a deal with China in December to help in construction of four nuclear plants there.

"There is a lot of opportunity now -- in [Southeast Asia](#), in the Near East and [Europe](#)," Valery Arabkin, an official at Rosenergoatom, the Russian entity that competes with Westinghouse, said in an interview in [Moscow](#). "These are good markets for [Russia](#)."

Russia is building two reactors in China, two in India and one in [Iran](#). It just signed a \$5.1 billion deal to build two reactors in [Bulgaria](#) and is sniffing out business in [Finland](#), Indonesia and [Egypt](#).

Russia's own nuclear industry is rebounding after years of neglect. [President Vladimir Putin](#) wants to sell the country's natural gas abroad and offset the exported energy by increasing nuclear power production, now provided by 31 reactors. That involves an ambitious program to build 42 more reactors in Russia by 2030, Sergey Kiriyyenko, director of the Federal Nuclear Agency, or Rosatom, said in testimony before parliament last month.

"I don't think it can be done," said Vladimir Sliviyak, co-chairman of Ecodefense, which has been urging the government to use more of the country's natural gas at home and develop wind and hydropower.

Critics say that when the emissions from uranium mining and plant construction are counted, nuclear power is not "carbon-free," as advocates assert. Such environmental concerns have put [Germany](#) on an opposite course from most European countries. Six years ago, Germany committed to shutting down all of its 17 nuclear power plants by 2021, prodded by the Greens party, then part of the government.

The most populous country in Western Europe, Germany will be hard-pressed to compensate for loss of its nuclear power while also meeting promises to reduce greenhouse gas emissions and cut back on gas and oil deliveries from its chief supplier, Russia. Some people are calling for an extension of the nuclear deadline.

But nuclear power remains unpopular among Germans, who often express strong pride over the giant windmills that are an increasingly common sight on the country's plains.

"There really is no support in Germany to rely on nuclear energy as a means to help get rid of fossil fuels," Reinhard Buetikofer, co-chairman of the Greens, said in an interview. "We would have to build another 50 to 60 nuclear power plants in Germany. This is unthinkable."