

WINDS OF CHANGE?

CHINA RETHINKS NUCLEAR POWER

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In the wake of the partial meltdown of nuclear reactors at the Fukushima plant in Japan, China announced it would shelve plans for vast expansion of its nuclear power capacity, at least temporarily, until more stringent safety checks are performed. Construction will eventually resume, but with a potentially scaled-back role for nuclear power and with solar and wind energy picking up some of the slack. If nuclear remains a small fraction of China's total energy mix (just 2 percent today, compared with America's 20 percent), and Beijing looks to solar and wind for future energy growth in the era of climate change, the boost to those industries could make renewables cost-competitive with fossil fuels much earlier than previously projected.

The announcement marked a significant policy change. As recently as January, after reporting a breakthrough in nuclear fuel reprocessing technology, China reaffirmed its commitment to an expansion of its nuclear energy capacity that would be greater than that of all other countries combined. Construction began on twenty-seven reactors, adding to the existing thirteen. Another fifty-two were planned.

Just days after the earthquake and tsunami struck Japan, China passed into law its Twelfth Five Year Plan, which will serve as the country's economic blueprint until 2015. The primary theme of the plan is sustainable development, with a high priority on securing nonfossil fuel energy sources. New policies include reducing carbon intensity by 17 percent by 2015. That means manufacturing entities would need to emit at least 17 percent less carbon in 2015 than they emitted in 2010 for the same amount of economic output. The plan also mandates ambitious energy-cutting targets, implementation of market mechanisms like cap and trade, and generation of 11.4 percent of total energy from nonfossil fuels by 2015, up from the current 8 percent. Pre-Fukushima, a sizable portion of that 11.4 percent was to come from nuclear sources. That target is being reconsidered.

The planners of the world's second-largest economy are facing a labyrinth of competing constraints. China is the world's largest user of energy, at a time of global shortages and high fossil fuel prices. The ruling party feels compelled to seek continued rapid economic growth in order to employ its people and maintain the image of a country steadily marching toward industrial modernization—lest the party lose its legitimacy and risk a Cairo-style uprising. So China must try to expand economic development, but not its greenhouse gas footprint. China will have to wring more energy from sources like wind and solar. And that is in fact the plan. The country's National Energy Administration said in March that energy from solar sources may double over the next five years, from five to ten gigawatts.

Even if it doesn't reduce the role of nuclear energy, China is emerging as a pacesetter in solar and wind technology. It currently produces half the world's solar panels; in the city of Rizhao, population 3 million, 99 percent of homes have solar hot-water heaters. Last year China reportedly installed three times as much wind-power capacity as the United States, and the pace is expected to increase in the next decade. Even if China were to implement its most ambitious nuclear plan, total energy from that sector in 2020 would be about a third of projected wind output. Without nuclear expansion, wind and solar will need to make up the difference. Renewable energy authorities have indicated they are optimistic about their ability to meet expanded demand.

There are good reasons for China to shelve its nuclear industry for good even without the lesson of Fukushima. Although it is less earthquake prone than Japan, China is not immune to a temblor-triggered disaster. In May 2008 a massive quake, 7.9 on the Richter scale, hit Sichuan province, where many nuclear warheads as well as several reactors and two plutonium plants were located. No significant damage to the nuclear facilities was reported, but there is no guarantee the outcome will always be so fortuitous. After all, before Fukushima three of the largest nuclear accidents in history—Lucens in Switzerland in 1969, Three Mile Island in 1979 and Chernobyl in 1986—were not caused by seismic activity. Like all nuclear facilities, China's plants are vulnerable to human and mechanical

error as well as terrorist attack. And many of the newer plants are in densely populated areas, so fallout from a meltdown could cause massive suffering.

Another drawback of nuclear energy is the vast amount of water required to generate steam and to cool spent fuel rods. China's energy sector, like that of many other countries, competes with agriculture for water, which is in scarce supply-the country has suffered major droughts in the past decade, with some rivers running dry. The problem became so serious that in 2002 Beijing launched the giant South-to-North Water Transfer Project, costing approximately \$62 billion and displacing hundreds of thousands of people who lived along its routes. Worries about food security and grain prices have already led China to express concern about biofuels. Food shortages could result in vastly increased imports, which would drive up global prices. And, as with all other countries that rely on nuclear power, China hasn't solved the problem of storing ever-growing quantities of nuclear waste.

There is no question that China will find it difficult to restrict nuclear energy. It is the type of project the government is best at: large-scale infrastructure requiring extensive government investment and oversight. On the surface, nuclear appears to be a quick fix to two of the most pressing problems facing Beijing: air pollution and the need to become less dependent on foreign energy sources. For this reason, most analysts say growth in nuclear power is inevitable.

The biggest obstacle to a nuclear-free China may be the industry itself. The country has a powerful nuclear interest group that is not likely to yield quietly to restrictions, and the intermingling of business interests and politics strengthens nuclear advocates in China and the United States. In January President Hu Jintao met with Barack Obama in Washington at a state summit, which generated \$45 billion in business between the two countries, with many of the projects advancing nuclear and "clean coal" interests. China's State Nuclear Power Technology Corporation (SNPTC) walked away with a \$5.3 billion deal with US-based Westinghouse, which will provide development, service and maintenance on its AP1000 nuclear technology in Zhejiang and Shandong provinces.

With its pockets full of cash and the prospect of new deals to come, the nuclear lobby didn't skip a beat in responding to Beijing's post-Fukushima freeze. Representatives from the China National Nuclear Corporation issued a statement that its nuclear safety standards were higher than the world average.

The government is split on the issue. Xie Zhenhua, who led the Chinese negotiating team at the UN climate talks in Cancun last year and is vice-chair of the National Development and Reform Commission, the country's most powerful agency, denied there would be any slowdown in the expansion of nuclear power. But Premier Wen Jiabao said China's long- and medium-term nuclear plans would be "adjusted and improved." A month before the meltdowns in Fukushima, a top official from the Energy Research Institute of the NDRC said nuclear targets were too aggressive and could put too much pressure on the industry, resulting in compromised safety. But Tian Shujia, who works in nuclear safety at China's Ministry of Environmental Protection, defended the industry. "The safety of China's nuclear power facilities is guaranteed and China will not abandon its nuclear power plan for fear of slight risks," he said.

Those who watch China closely know there are reasons to doubt the government's commitment to public safety. The reflexive cover-up of the deaths of several workers at one of the Olympic sites in the lead-up to the 2008 Beijing Olympic Games came under international scrutiny. And concern for safety has not slowed China's coal industry, which in 2004 accounted for over 35 percent of the world's production and 80 percent of global coal-mining-related deaths. As of this writing, the government has no plans to implement new nuclear safety measures.

Even so, it is possible that one consequence of the horrific meltdown in Japan will be China's accelerated development of clean and safe energy. With its huge economy, driven by central planning and aggressive government investment, China is the only country building a green-technology industry on a scale that could bring down global prices of solar panels and wind turbines, making them affordable in the developing world. This should be a key part of the global strategy to keep emissions under 350 parts per million, the maximum threshold recommended by climate scientists. For this to happen, solar and wind energy must become cost-competitive not only with nuclear but

with fossil fuels. Given China's size and unique role as world manufacturer and exporter, it is fair to say that it is the best hope for giving solar and wind energy that boost.

As China goes, so goes the rest of the world. □□□
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