

China sets sights on new global export: nuclear energy

August 24 2016, by Joe Mcdonald



In this June 10, 2005 file photo, workers walk past a part of the Qinshan No. 2 Nuclear Power Plant, China's first self-designed and self-built national commercial nuclear power plant in Qinshan, about 125 kilometers (about 90 miles) southwest of Shanghai, China. Beijing's wants to compete with the United States, France and Russia as an exporter of atomic power technology. (AP Photo/Eugene Hoshiko, File)

On a seaside field south of Shanghai, workers are constructing a nuclear

reactor that is the flagship for Beijing's ambition to compete with the United States, France and Russia as an exporter of atomic power technology.

The Hualong One, developed by two state-owned companies, is one multibillion-dollar facet of the Communist Party's aspirations to transform China into a creator of profitable technology from mobile phones to genetics.

Still, experts say Beijing underestimates how tough it will be for its novice nuclear exporters to sell abroad. They face political hurdles, safety concerns and uncertain global demand following Japan's Fukushima disaster.

China's government-run nuclear industry is based on foreign technology but has spent two decades developing its own with help from Westinghouse Electric Co., France's Areva and EDF and other partners. A separate export initiative is based on an alliance between Westinghouse and a state-owned reactor developer.

The industry is growing fast, with 32 [reactors](#) in operation, 22 being built and more planned, according to the World Nuclear Association, an industry group. China accounted for eight of 10 reactors that started operation last year and six of eight construction starts.

Abroad, builders broke ground in Pakistan last year for a power plant using a Hualong One, supported by a \$6.5 billion Chinese loan. Also last year, Argentina signed a contract to use the reactor in a \$15 billion plant financed by Chinese banks.

Sales come with financing from state banks, a model that helped Chinese companies break into the market for building highways and other public works in Africa and the Middle East. State-owned companies also are

lining up to invest in nuclear power plants in Britain and Romania.

"This is generating significant build-up of skills and industrial experience," said Mycle Schneider, a nuclear energy consultant in Paris, in an email.

Still, Beijing is "seriously underestimating" how hard global sales will be, said Schneider. He said obstacles include strict quality controls, regulations that differ from country to country and competition from the falling cost of wind and solar.

"There is simply no market out there," said Schneider.

At home, Beijing faces public unease about nuclear power following an avalanche of industrial accidents and product safety scandals.

This month, thousands of residents of Lianyungang, north of Shanghai, protested after rumors spread that a facility to process nuclear waste might be built there. Authorities said the city, home to one of China's biggest [nuclear power plants](#), was only one of several being considered. After more protests, they announced the search for a site was suspended.

Overseas, China's nuclear companies face questions over their status as arms of the state.



In this June 10, 2005 file photo, a worker checks the control panel of the No.1 unit of the Qinshan No. 2 Nuclear Power Plant, China's first self-designed and self-built national commercial nuclear power plant in Qinshan, about 125 kilometers (about 90 miles) southwest of Shanghai, China. Beijing's wants to compete with the United States, France and Russia as an exporter of atomic power technology. (AP Photo/Eugene Hoshiko, file)

British Prime Minister Theresa May ordered a security review of plans to allow China General Nuclear Power Corp. to become a minority investor in the planned Hinkley Point C power station being built by EDF.

In response, China's ambassador to London wrote in The Financial Times newspaper that a delay might harm official ties.

The Hualong One under construction in Fuqing, near the southeastern

city of Fuzhou, is a hybrid created by CGN and its main rival, China National Nuclear Corp., after they were ordered in 2011 to merge two competing reactors into a single export product.

Based on French systems of the 1970s and '80s, it belongs to the industry's third generation of reactors, with more advanced safety features and working life of 60 years instead of the previous generation's 40.

CNNC is installing two Hualong One reactors at the Fuqing Nuclear Power Plant, due to go online in 2019 and 2020. The power station also has two Areva units and is building two more.

CGN is building its own version in Fangchenggang on the southern coast near Vietnam and says it wants to seek British regulatory approval of the Hualong One design for possible use in a power plant in Bradwell on Britain's east coast.

China's nuclear industry has yet to report a major accident but reflexive official secrecy makes it hard for outsiders to assess its safety.

Changes in Chinese-designed models based on foreign technology, such as making reactors bigger while using cooling techniques for smaller units, "raise questions about safety and the good judgment of Chinese reactor engineers," said Edward Lyman, a nuclear power specialist for the Union of Concerned Scientists in Washington, in an email.

"It is crucial for countries importing Chinese nuclear technology to rigorously conduct their own oversight over the products they are buying," Lyman said.

China's first commercial nuclear plant went online in 1991 in Qinshan, south of Shanghai in Zhejiang province. Over the next decade, Beijing

tested competing technologies by buying reactors from U.S., Russian, French and other suppliers.

Chinese companies couldn't export models they developed because foreign companies owned the underlying technology.

So last year, Beijing declared [nuclear power](#) one of 16 "national science and technology projects," with generous financial support to develop homegrown know-how.

The ruling party's latest five-year development plan calls for China to have 58 gigawatts of nuclear generating capacity by 2020 and another 30 gigawatts under construction. By 2030, it wants 120 to 150 gigawatts of nuclear capacity supplying 8 to 10 percent of China's power.



In this June 10, 2005 file photo, part of the Qinshan No. 2 Nuclear Power Plant, China's first self-designed and self-built national commercial nuclear power plant, is seen through a Chinese style decoration in Qinshan, about 125 kilometers (about 90 miles) southwest of Shanghai, China. Beijing's wants to compete with the United States, France and Russia as an exporter of atomic power technology. (AP Photo/Eugene Hoshiko, File)

China's status as an important market for global suppliers gives Beijing leverage in acquiring technology. Westinghouse, which was acquired by Japan's Toshiba Corp. in 2006, Areva and France's EDF have had partnerships with Chinese researchers since the early 1990s.

"I see them as customers, competitors and partners," said Jeff Benjamin, Westinghouse's senior vice president for new plants and major projects.

Other global suppliers include GE Hitachi Nuclear Energy, South Korea's KEPCO, Canada's Candu Energy Inc. and Russia's Atomstroyexport.

Westinghouse transferred technology for its latest reactor, the AP1000, to China's State Nuclear Power Technology Corp. in 2007 as part of a transaction that included the sale of four reactors.

The AP1000 became the basis for future Chinese reactor development and Westinghouse agreed to sell reactors with SNPTC. The Chinese partner, which merged with another state company to form the State Power Investment Corp. last year, also developed its own, bigger version, the CAP1400.

The two companies are in talks with Turkey about selling four reactors based on the AP1000.

The AP1000 has been approved by U.S. and British regulators, Benjamin said, while the CAP1400 is just beginning the review process.

"We look forward to participating in the China market for many years to come," he said. Abroad, "there will be markets either SPIC on their own or Westinghouse on our own might not have access to, but together we can gain access."

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