China says it knows how to reprocess nuclear fuel (Update 2)

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A water-cooling tower emits a cloud of steam from a coal-fired power station in Beijing. Chinese scientists say they have developed nuclear fuel reprocessing technology that could effectively end uranium supply concerns, according to state media, as Beijing strives for energy security.

Chinese scientists have mastered the technology for reprocessing fuel from nuclear power plants, potentially boosting the supplies of carbon-free electricity to keep the country's economy booming, state television reported Monday.

The breakthrough will extend by many times the amount of power that can be generated from China's nuclear plants as fissile and fertile materials are recovered to be new fuel, CCTV said.

Several European countries, Russia, India and Japan already reprocess nuclear fuel - the actual materials used to make nuclear energy - to separate and recover the unused uranium and plutonium, reduce waste and safely close the nuclear cycle.

The CCTV report gave no details on whether or when China would begin reprocessing on an industrial scale.

China overtook the United States as the world's largest energy consumer in 2009, years before it was expected to do so, according to the Paris-based International Energy Agency.

But it is heavily dependent on coal, a major pollutant. It has 13 nuclear power plants in use now and ambitiously plans to add potentially hundreds more.

Reprocessing nuclear fuel costs significantly more than using it once and storing it as waste. It is also controversial because extracted plutonium can be used in nuclear weapons, although China has long had a nuclear arsenal.

U.S. commercial reprocessing of plutonium was halted by then-President Jimmy Carter because of nuclear proliferation worries. Then-President George W. Bush proposed a resumption, but the National Research Council found it not economically justifiable. President Barack Obama scrapped the Bush effort.

Recovered plutonium and - when prices are high - uranium can be re-used. Some reactors can use other reprocessed components, potentially multiplying the amount of energy that results from the original uranium fuel by about 60 times.

Wang Junfeng, project director for the state-run China National Nuclear

Corporation, told CCTV the Chinese scientists employed a chemical process that was effective and safe.

"In this last experiment, we made a preparation of standard quality uranium products and standard quality plutonium products, so we can say we were successful," Wang said.

CCTV said the country has enough fuel now to last up to 70 years and the breakthrough could yield enough to last 3,000 years.

To produce that amount of fuel, however, China would have to build a hugely expensive and highly dangerous breeder reactor, said Matthew Bunn, an expert on the Chinese nuclear program at Harvard University's John F. Kennedy School of Government.

Rather than build a breeder reactor or even start reprocessing on a commercial scale, China should simply store used fuel for the next several decades while safer and less expensive technology emerges, Bunn said.

"Reprocessing the spent fuel is much more dangerous," Bunn said, adding that it increased the risk of nuclear terrorism if recovered fuel were stolen.

CCTV says the details of the process the Chinese scientists developed after 20 years' work are being kept secret. The technologies used in other countries also are considered industrial secrets and generally not shared.

Bunn said China build a pilot-scale reprocessing plant several years ago but repeatedly postphoned using it, possibly because of technical problems.

"My interpretation of this statement is that they have resolved whatever

issues were delaying that," Bunn said.

China's total 2009 energy consumption, including sources ranging from oil and coal to wind and solar power, was equal to 2.265 billion tons of oil, compared with 2.169 billion tons used by the U.S., the IEA said.

The consumption boom reflects China's transformation from a nation of subsistence farmers to one of workers increasingly trading bicycles for cars and buying air conditioners and other energy-hungry home electronics.

That has also bestowed on China status as the world's biggest polluter, although Beijing has long pointed at developed nations in climate change talks and resists international pressure for it to take a larger role in curbing greenhouse gas emissions.