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Chinese are first customers for Bixby Energy's promising coal-to-gas technology

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Bixby Energy says its units cut carbon-dioxide emissions by 65 percent using a 'closed-loop system' that avoids burning the coal.

Minnesota entrepreneur Bob Walker has closed on the inaugural sale of several coal-to-gas conversion units to industrial customers in China, where it is said a journey of one thousand miles begins with the first step.

Walker, CEO of Bixby Energy Systems of Ramsey, said this week that first sale means "millions" in revenue and will demonstrate a next-generation, "clean-coal" technology that cuts carbon dioxide emissions by two-thirds compared with burning coal and also generates valuable derivative products.

His Chinese customers are "are very aggressive on this technology," he said.

The Bixby process promises an environmentally and financially sound method to extract energy from coal, one of our most plentiful natural resources. A pilot system, run for more than two years, proves the viability and efficiency of the process, Walker said.

"Energy producers and governments from around the world have already visited our facilities and discussions are underway with many," Walker added.

If the Bixby process can be validated and produced on a large scale, it represents a significant breakthrough in terms of creating clean, inexpensive natural gas for fueling industry and power plants, while capturing most of the carbon, which can be sold for industrial purposes instead of vented into the atmosphere, a major source of pollution.

According to a 105-page review of the process published in 2009 by engineering firm MPX Inc. of Knoxville, Tenn., the Bixby process is "built around a series of interdependent patents and processes that allow for the thermal conversion of coal into solid, liquid and gaseous products." The reviewers found that the Bixby engineers "have applied 21st century knowledge in material science, electronic engineering, chemical engineering and fluid dynamics to the problem of achieving the maximum value from coal with the minimum environmental impact."

Both the United States and China have huge coal reserves, but are vexed by carbon emissions that are considered major contributors to global warming. China has moved aggressively over the last couple of years to clean up its industry. The U.S. Congress is considering carbon taxes and markets to provide incentives for major polluters to move toward cleaner technologies.

The patent-pending Bixby process superheats coal in a closed-loop environment to produce "high-quality" synthetic natural gas that can be used for boiler fuel or energy to spin the turbines at electrical generating stations. The Bixby process negates the need for expensive and cumbersome carbon capture and burial methods that environmentalists and some regulators say is needed to stop carbon emissions at coal-fired plants.

The Bixby "devolitization" system superheats coal without burning it in a sealed environment that prevents carbon emissions. It separates the coal into synthetic natural gas, or "syngas," and semi-activated carbon that has commercial value.

'A true inventor entrepreneur'

Walker, 67, is best known as the inventor of the "Sleep Number" bed and the founder of Select Comfort Corp. in 1987. Walker went on to raise about $40 million in private investments over the last decade to bring to market a highly efficient heating stove and to focus on developing "clean-coal" research that could be brought to market.

Bixby is named for Bixby, Minn., through which Walker, a North Dakota native and member of a Chippewa Indian tribe, used to travel regularly while he was developing the stove in northern Minnesota.

"Bob is a true inventor entrepreneur," said Dan Carr, CEO of the Collaborative, a membership organization that matches entrepreneurs and financiers. "It doesn't surprise me at all he's discovering new markets and new opportunities. True story, in 1987, I traded him a bed for a membership in the Collaborative when we were just getting started. We still have it in one of our rooms."

Ramsey-based Bixby Energy Systems opened a 200,000-square-foot factory and testing facility in an abandoned furniture factory in North Carolina several years ago after Walker discovered North Carolina scientists doing promising work on the coal-to-gas process.

Global Partners United, Bixby's sales agent in China, said several months ago that it has a letter of intent for 100 systems after completion of Bixby's demonstration plant in Shaanxi, China. A Beijing municipal-power project eventually could require 1,300 Bixby systems, Global Partners said.

Walker said he could only discuss the first five contracts he has in hand, including a glass factory in Shaanxi province that has been getting its gas from a coal coking plant.

China, which has been criticized for dirty, coal-fired plants, has committed to a massive program of developing and using alternative energy, conservation and new approaches to cut energy use and pollution that have underscored its economic growth over the last 20 years.

The Bixby modules -- 15 feet long, 10 feet wide and 50 feet high -- can process 192 tons of coal a day and create the energy to run an electric turbine that would produce about 6.25 megawatts, or enough to power about 6,000 U.S. homes.

Walker said Chinese concerns are interested in installations at factories, municipal power stations and at coal mines where the gas can be piped inexpensively to wherever it is needed.

Bixby said China has been far more receptive than U.S. coal and utility companies so far, who have yet to face stepped-up, carbon-reduction mandates. However, about half the states, including Minnesota, have entered into regional compacts that call for significant reductions in carbon emissions and production of up to 30 percent of energy from alternative sources over the next quarter century.