American Power Giant To Use CO_2 Capture At Coal-Fired Power Plants

American Electric Power (AEP), one of the largest electric utilities in the United States, is preparing to install carbon capture technology on two coal-fired power plants which will be the first commercial use of technologies to significantly reduce CO_2 emissions from existing plants.

The first project is expected to complete its product validation phase in 2008 and begin commercial operation in 2011. AEP Chairman Michael Morris said the company had been utilising advancements in technology for more than 100 years.

"This long heritage makes us very comfortable taking action on carbon emissions and accelerating advancement of the technology", Morris said. "Technology development needs are often cited as an excuse for inaction. We see these needs as an opportunity for action."

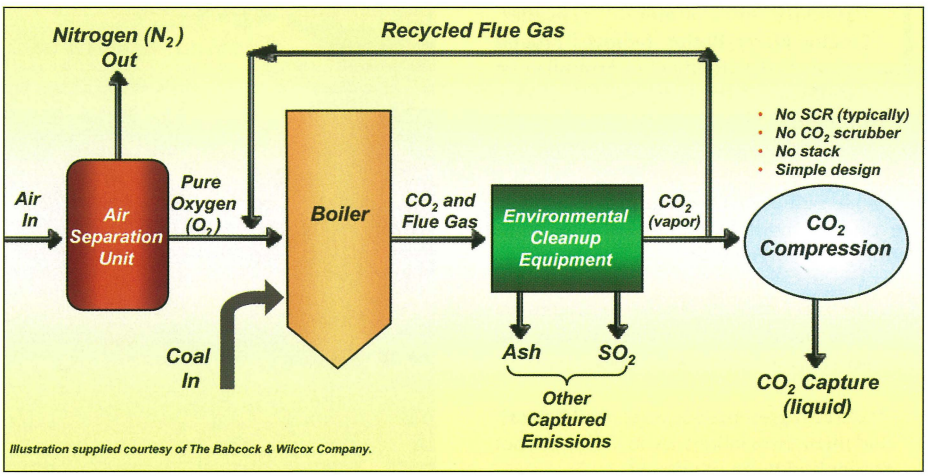
He said with the US Congress expected to take action on greenhouse gas issues in climate legislation, now is the time to advance this technology for commercial use. "And we will continue working with Congress as it crafts climate policy", he said. "It is important that the US climate policy be well thought out, establish reasonable targets and timetables, and include mechanisms to prevent trade imbalances that would damage the US economy."

AEP has signed a memorandum of understanding (MOU) with Alstom, a worldwide leader in equipment and services for power generation and clean coal, for post-combustion carbon capture technology using Alstom's Chilled Ammonia Process.

This technology will first be installed on AEP's 1300 MW Mountaineer Plant in New Haven, West Virginia, as a 30 MW thermal product validation in mid-2008, where up to 100,000 metric tons of CO_2 will be captured per year. The captured CO_2 will be designated for geological storage in deep saline aquifers at the site.

Following the completion of product validation at Mountaineer, AEP will install Alstom's system on one of the 450 MW electric coal-fired units at its Northeastern station in Oologah, Oklahoma. Plans are for the commercial-scale system to be operational at Northeastern Station in late 2011. It is expected to capture about 1.5 million metric tons of CO_2 a year. The CO_2 captured at Northeastern Station will be used for enhanced oil recovery.

Morris said Alstom's system captures CO_2 by isolating the gas from the power plant's other flue gases and can significantly increase the efficiency of the CO_2 capture process. The system chills the flue gas, recovering large quantities of water for recycle, and then utilises a CO_2 absorber in a similar way to absorbers used in systems that reduce sulphur dioxide (SO_2) emissions. The remaining low concentration of ammonia in the clean flue gas is captured by cold-water wash and returned to the absorber. The CO_2 is compressed for enhanced oil recovery or storage.



Near-zero emissions using oxy-fuel combustion technology.

In laboratory testing sponsored by Alstom, EPRI and others, the process has demonstrated the potential to capture more than 90 percent of CO_2 at a cost that is far less expensive than other carbon capture technologies. It is applicable for use on new power plants as well as for the retrofit of existing coal-fired power plants.

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AEP has also signed an MOU with The Babcock & Wilcox Company (B&W) for a feasibility study of oxy-coal combustion technology. "B&W will complete a pilot demonstration of the technology this summer at its 30 MW thermal Clean Environment Development Facility in Alliance, Ohio", Morris said.

"Following this demonstration, AEP and B&W will conduct a retrofit feasibility study that will include selection of an existing AEP plant site for commercial-scale installation of the technology and cost estimates to complete that work. Once the retrofit feasibility study is completed, detailed design engineering and construction estimates to retrofit an existing AEP plant for commercial-scale CO_2 capture will begin."

Morris said at the commercial scale, the captured CO_2 will likely be stored in deep geologic formations. The oxy-coal combustion technology is expected to be in service on an AEP plant in 2012-2015.

He said B&W, in collaboration with American Air Liquide Inc., has been developing oxy-coal combustion, a technology that utilises pure oxygen for the combustion of coal. "Current generation technologies use air, which contains nitrogen that is not utilised in the combustion process and is emitted with the flue gas", Morris said. "By using pure oxygen, oxy-coal combustion excludes nitrogen and leaves a flue gas that is a relatively pure stream of CO_2 that is ready for capture and storage."

The oxy-coal combustion process will use a standard, cryogenic air separation unit to provide relatively pure oxygen to the combustion process. This oxygen is mixed with recycled flue gas in a proprietary mixing device to replicate air, which may then be used to operate a boiler designed for regular air firing. The exhaust gas, consisting primarily of CO_2, is first cleaned of traditional pollutants, then compressed and purified before storage.

Morris said AEP is achieving its greenhouse gas reductions through a broad portfolio of actions. These include power plant efficiency improvements, renewable generation such as wind and biomass co-firing, off-system greenhouse gas reduction projects, reforestation projects and the potential purchase of emission credits through the Chicago Carbon Exchange. ■

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