United States DOE Awards

Airborne won two awards from US Department of Energy

Airborne evaluated against all new multi-pollutant systems

No other multi-pollutant technology won a single award in Round 1 or Round 2 of Clean Coal Power Initiative…Airborne won both rounds

http://www.netl.doe.gov/File%20Library/Research/Coal/major%20demonstrations/ccpi/Proj220.pdf

http://www.netl.doe.gov/research/coal/major-demonstrations/clean-coal-power-initiative/ccpi-airborne_r2

United States DOE Awards

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January 15, 2003

Secretary of Energy Announces First Projects to Meet President's Commitment to New Clean Coal Technologies

$1.3 Billion of Projects Aimed at Developing New Technologies for Administration's Clear Skies and Climate Change Initiatives

Washington, DC - Secretary of Energy Spencer Abraham today announced the first eight projects chosen by the Department of Energy in the initial phase of President Bush's Clean Coal Power Initiative.

The projects, valued at more than $1.3 billion, are expected to help pioneer a new generation of innovative power plant technologies that could help meet the President's Clear Skies and Climate Change initiatives.

"The level of interest expressed in the first competition was tremendous," Secretary Abraham said. "That is a clear indication of the potential to develop and apply technology to improve our energy security through the use of coal, our most abundant natural resource."

The projects are the first in a series of competitions to be run by the Energy Department to implement President Bush's 10-year, $2 billion commitment to clean coal technology. If all upcoming negotiations are successful, the department expects to award approximately $316 million to these initial projects. Private sector participants would contribute just over $1 billion, well in excess of the department's requirement for 50 percent private sector cost-sharing.

New Technologies for Clear Skies

Three of the projects are directed at new ways to comply with the President's Clear Skies initiative which calls for dramatic reductions in air pollutants from power plants over the next decade-and-a-half. They were proposed by:

- **LG&E Energy Corporation, Louisville, KY,** which proposes to install an advanced air pollution control system on a 524-megawatt unit of the Ghent Generating Station, located on the Ohio River northeast of Carrollton, KY. The new technology, called the "Airborne Process," is believed capable of removing 99.5 percent of the plant's sulfur dioxide emissions, 90 percent of its nitrogen oxide pollutants, and 90 percent of the mercury in the coal, while turning the byproducts into a high-quality granular fertilizer. The Energy Department would provide **$31 million of the project's $120** million total cost.

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New Mexico Coal-Fired Power Plant to Demonstrate Multi-Pollutant Controls

Project Will Help Meet President's Commitment to Clean Coal and Address National Energy Priorities

Santa Fe, NM - Secretary of Energy Spencer Abraham today announced that Peabody Energy's Mustang Energy Project has been selected to receive a grant from the Department of Energy under the second round of competition in President Bush's 10-year, $2 billion Clean Coal Power Initiative (CCPI).

The technologies developed under CCPI will help maintain abundant coal resources as a cornerstone of the Nation's future domestic energy portfolio, particularly for power generation. The priorities for this round of competition were technology advancements for gasification-based electricity production, advanced mercury control, and sequestration or sequestration-readiness.

"Peabody Energy is undertaking a vital challenge that has the very real potential of not only improving our Nation's energy security, but improving our environment as well," Secretary Abraham said. "The Peabody Mustang Clean Coal Project, including its unique Airborne Process, advances the President's Clean Coal Power Initiative by enabling us to make maximum use of coal, our most abundant energy resource. But the project is unique in that it also advances President Bush's Clear Skies Initiative by controlling harmful emissions from the plant, and doing so at a success rate we don't often see in an industrial setting."

The Peabody Mustang Clean Coal Project teams Peabody Energy with co-sponsor **Airborne Clean Energy,** along with Veolia Water North America, and Icon Construction, in a commercial-scale demonstration of the "Airborne Process" scrubber, regeneration system, and fertilizer production systems at the Mustang Energy Company LLC's 300 megawatt coal-fired Mustang Generating Station in Milan, New Mexico.

The $79 million project, for which the Energy Department will provide $19.7 million, will develop an innovative and cost-competitive multi-pollutant control process for achieving 99.5 percent removal of sulfur dioxide, 98 percent removal of SO3 (sulfuric acid mist precursor), 98 percent removal of nitrogen oxides, and 90 percent total system removal of mercury from plant emissions, while turning the byproducts into a high-quality high-value granular fertilizer.

The Clean Coal Power Initiative, initiated by President Bush in 2002, is an innovative technology demonstration program that fosters more efficient clean coal technologies for use in new and existing electric power generating facilities in the United States. Candidate technologies are demonstrated at full-scale to ensure proof-of-operation prior to commercialization.

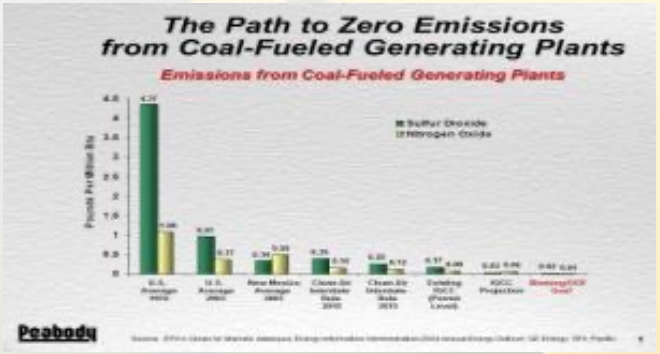
Technologies emerging from the program will help to meet the President's new environmental objectives for America embodied in the Clear Skies Initiative, Global Climate Change Initiative, FutureGen, and the Hydrogen Initiative. Early CCPI demonstrations emphasize technologies that are applicable to existing power plants and also include construction of new plants. Later demonstrations will include systems

Endorsed by Renowned Governmental, Research and Commercial Entities

Electric Power Research Institute

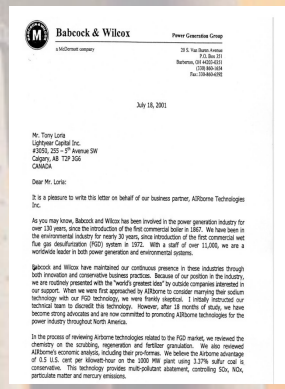
"The Airborne Process has demonstrated 99.5% capture of both SO2 and SO3...and removed both NOx and Hg at levels near 100%.

The development of the Airborne Process as a regenerable process overcomes two perceived drawbacks of conventional sodium scrubbing while simultaneously providing NOx and Hg removal. By regenerating the sodium bicarbonate, the high reagent cost is reduced while providing a saleable fertilizer product"



Babcock & Wilcox

After 18 months of study we have become strong advocates and are now committed to promoting Airborne Pollution Control for the power industry throughout North America"



US DOE

Significant environmental, security, and economic benefits to the Nation will result from the successful demonstration and commercialization of the Airborne…"

Support from China and Canada Government

Canadian Former Prime Minister Stephen Harper witnessed Airborne's Signing Ceremony for an Agreement with a company in China on Nov. 8th 2014. Also, on the same day, Murray and other 9 Canadian company CEOs were invited to a welcome banquet hosted by China's **Premier LiKeqiang** in the Great Hall of People

Sino-US Energy Cooperation Program Member

Blue Sky Nominee Award （2016）

Airborne has been awarded by UNIDO and Other orgs the BLUE SKY NOMINEE Award in June 2016. Airborne Technology was listed one of the “Global Top Investment Scenarios to Apply New Technologies for Renewable Energy Utilizations”

Worldwide Advocacy from US Government

Airborne has been awarded worldwide advocacy from the US Commercial Service. Additionally the US government helped Airborne fight and win a patent dispute in China.

Bradley Harker May 16, 2017 at 11:02 AM Details BH

RE: Airborne Advocacy Form for IPR and MOST Project

To: Murray Mortson, Cc: Michael Zhao

Murray.

Your company has been approved for Advocacy. I coordinated the OBOR delegation this weekend and was at the forum.

Now that we have approval, What I need from you is a very specific, laser-like focus on how the embassy can assist you. I would suggest we start with a letter to fax to MOST. In this regard, I need a draft of what you would like in the letter, with very specific verbiage. I also need to know who it should be sent to. I will try to keep the crux of what you provide in the letter.

I have had no time to do anything else but OBOR for the past weeks. I don't have a contact at the Gates foundation, it was just an idea. I will put you in touch with Summit.

Please send me an company introduction email that I can forward to them with a cc to you.

Thanks,

B.

Bradley Harker
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Airborne

Clean Energy For Life

Luzhou Plant

Airborne's first commercial plant in China is at Luzhou

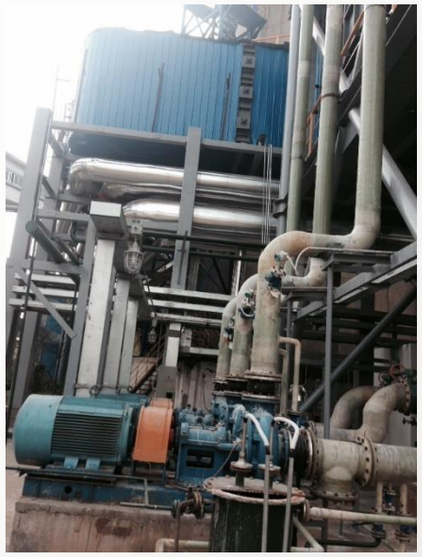
- The Luzhou North Chemical Industries Co project is located 7 km away east uptown Luzhou and 4km north to Yangtze River. The facilities for the project are in their thermal power plant zone

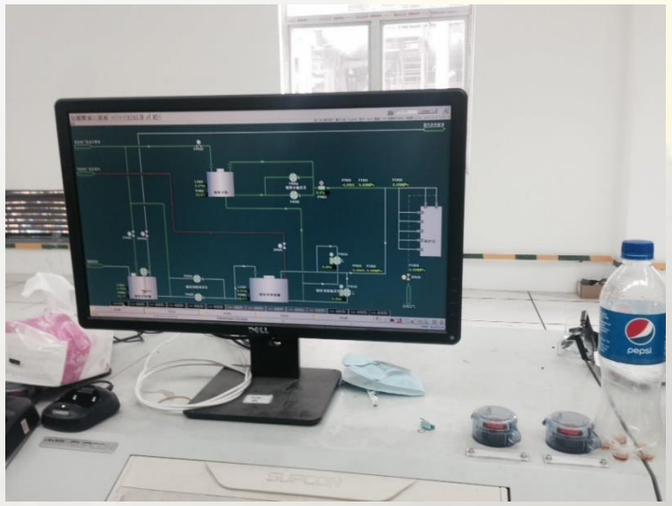
- The flue gas treatment capacity for 2×130t/h boilers (320000m3/h)

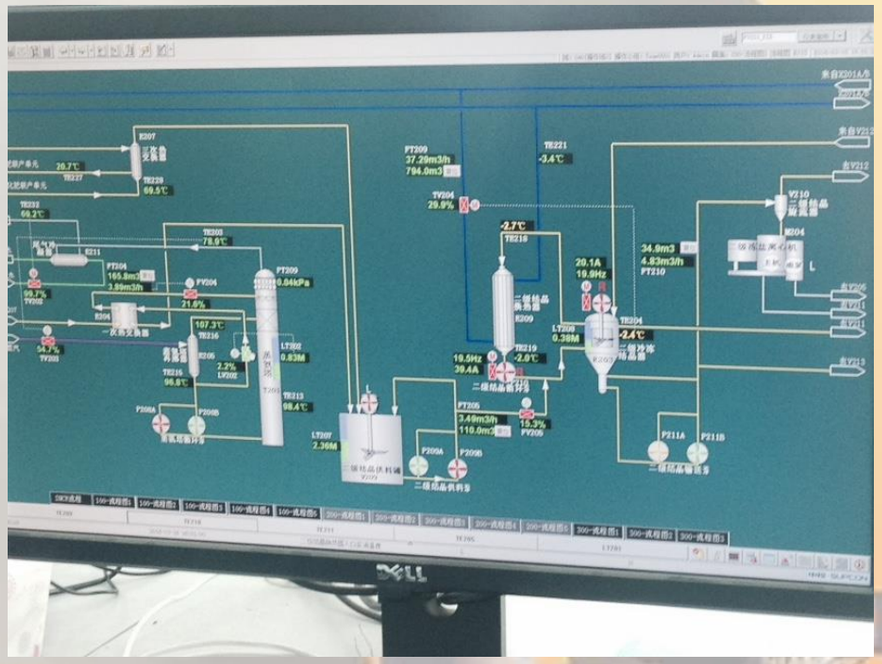
- The production of compound fertilizer is 11335 tons/yr. (AS 10225 tons/yr., AN 1110tons/yr.)The other mixed fertilizer production is 3170 tons/yr.

- Luzhou project achieves >99% DE Sox (designed removal rate is 98%) and 90% DE NOx per the design basis requirements

Luzhou Project Development







Project Performance of Luzhou Project

Item	Check-Instrument/Tester	Origin Flue Gas （mg/Nm3）	Cleaned Flue Gas （mg/Nm3）
SO2 Ultra Low Emission 35mg/Nm3	Germany350	1430	0
	Detector Tube （EPC）	1820	N/A
	Laoying Institute （Client）	1925	1
	CEMS	1890	5
NOx Ultra Low Emission 50mg/Nm3	Germany 350	140	32
	Detector Tube （EPC）	105	30
	Laoying Institute （Client）	203	50
	CEMS	186	35
PM Ultra Low Emission 5/10mg/Nm3	Frozen Drying Method(Client)		2.2
SO3	Chemical Analysis（EPC）	100~150	≤2

Ouija Ceramic Plant

Airborne’s sodium based pollution removal was recently successfully demonstrated in Zibo, China

- Ouija has 2 production lines and a set of drying system. Major fuel of the plant is coal gas, and the flue gas sources are ceramic kiln and dryer. The flue gas volume is 186,000Nm3/hr. Dual alkali method is Ouija's existing deSO2 method, which is not satisfactory and would not comply with China’s flue gas pollutant emission standard.

Ouija Ceramic Plant

- **Comparison of Pollutant Emission Before and After Retrofitting**

Pollutant	Before Airborne's Retrofitting	After Airborne's Retrofitting	China's Ultra Low Emission Standard
SO2	450 mg/Nm3	0.9 mg/Nm3	35mg/Nm3
NO2	280 mg/Nm3	37.1 mg/Nm3	50mg/Nm3
Dust	36 mg/Nm3	14.7mg/Nm3*	5mg/Nm3

**Note : Due to that Ouija's request is to do DE Sox and DE NOx only, Airborne thus has not yet installed any dust removal equipment to the project. Nevertheless, Airborne's wet scrubbing system achieved c.a. 60% dust removal in this project. In a typical project, Airborne actually has the capacity to achieve <5mg/Nm3 dust emission.*

- Through application of Airborne's sodium dry injection and wet scrubbing system, the client will comply with China's ultra low emission standard. Per local EPA's online monitoring data, Ouija's SOx emission is 0.9mg/Nm3, NOx is 37 mg/Nm3. With future installation of Airborne's oxidation layer in the scrubber, Ouija's NOx emission would reach single digit level, which means that Airborne is capable to provide an emission performance that would comply with both today's and future's emission standard.