

# Argus Coal Daily

US Coal Market Prices, News and Analysis

Volume 10, 161, August 23, 2006

## Forward OTC Market Assessments

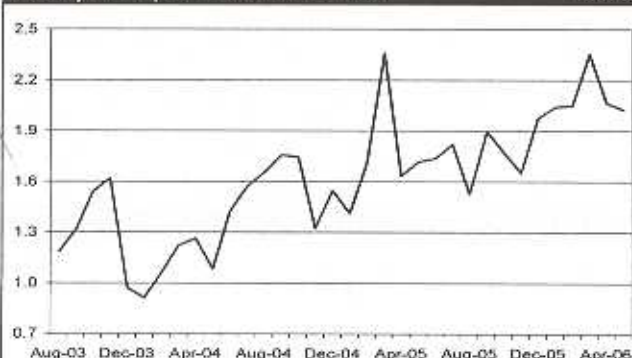
Nymex-spec OTC				\$/ton
	Bid	Ask	Midpoint	Change
September	46.00	48.00	47.00	+0.13
October	46.50	48.25	47.38	+0.13
Q4 2006	47.00	49.00	48.00	
Q1 2007	49.00	50.00	49.50	+0.25
Q2 2007	49.00	51.00	50.00	+0.50
2007	49.50	51.50	50.50	+0.25

CSX <1% Sulfur Rail OTC				\$/ton
September	48.00	49.50	48.75	-0.25
October	48.50	49.50	49.00	-0.25
Q4 2006	48.50	50.00	49.25	
Q1 2007	49.00	50.00	49.50	
Q2 2007	48.25	49.25	48.75	
2007	47.00	49.00	48.00	

PRB 8800 Rail OTC				\$/ton
September	8.00	9.00	8.50	-0.30
October	8.50	9.35	8.93	
Q4 2006	8.30	9.45	8.88	
Q1 2007	9.40	10.60	10.00	-0.03
Q2 2007	10.25	11.20	10.73	-0.10
2007	10.00	12.00	11.00	-0.93

PRB 8400 Rail OTC				\$/ton
September	6.60	7.40	7.00	-0.20
October	6.70	7.45	7.08	-0.18
Q4 2006	6.90	7.65	7.28	
Q1 2007	7.50	8.60	8.05	-0.28
Q2 2007	7.90	8.70	8.30	-0.35
2007	8.00	9.00	8.50	-0.45

Monthly US Imports of Colombian Coal mm tons



## IGCC economics examined

Power companies are faced with some tough choices as they plan new generating capacity to meet growing electricity demand. Gas is priced out of the market for baseload generation compared with the more abundant domestic supplies of coal, but increasingly stringent environmental regulations mean that complex pollution control systems are required to control emissions from the dirtier fuel.

Two designs are battling it out for investors' money. There are updated versions of pulverized coal (PC), a tried and tested technology. And then there is integrated-gasification combined-cycle (IGCC), an emerging technology that holds plenty of promise, but still has a lot to prove. To make matters more complicated, both technologies are continually improving, leaving power plant developers to make a very "close call." Electric Power Research Institute (EPRI) director of Generation Strategy Dalton told *Argus*.

"We see it as a horse race, and depending on what timeframe you are looking at, the horse race is different," he said.

IGCC plants take the coal and turn it into a synthetic gas, removing most of the pollutants in the process. IGCC proponents tout the ability of coal gasification — thanks to the higher concentration of CO<sub>2</sub> produced compared with PC combustion — to one day make carbon capture and storage a real option for mitigating climate change. But the only IGCC plants currently

*Continued on page 3*

## Market Overview

Forward Powder River Basin coal was lower in a trading session that started the day with little volume but finished out with a slew of trades for Western coal. Eastern coal remained rangebound in its new, lower levels, moving slightly higher in the day for most delivery periods but finding no sustained support for continued price increases. The Eastern barge market remained focused on shifting premiums for more-forward deliveries over prompt coal moves. The market for coal continues to seek next-direction following stockpile builds that have weighed on short-term demand.

## Executive Briefing

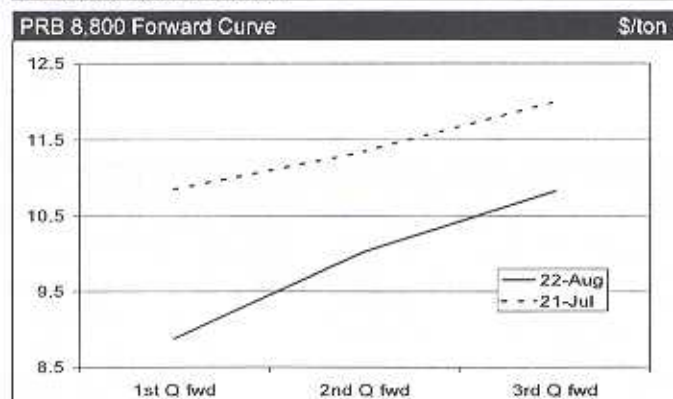
- IGCC economics examined
- OTC: Premium evaluations continue
- Alcoa, Vigo Coal open Illinois mine
- Cowboy Coal goes to Bull Mountain
- DOE provides CO<sub>2</sub> capture update
- French firm Alstom wins KCP&L contract

Argus Daily Spark Spreads				\$/MWh
	Timing	Gas	Coal	Coal Change
Cinergy	Daily	3.29	38.88	+3.75
	September	-3.99	29.13	+2.50
	Winter	-15.37	54.59	+2.75
PJM	Daily	6.37	45.75	-6.25
	September	11.89	48.50	+2.50
	Winter	-19.94	77.78	+3.25
New England	Daily	2.60	36.32	-4.00
	September	11.86	43.57	
	Winter	27.68	116.34	+3.50
New York A	Daily	-5.12	34.30	-1.25
	September	6.11	42.30	+2.25
	Winter	-1.77	79.69	+3.25
Southern Co	Daily	0.59	34.21	-1.50
	September	11.09	45.15	-2.00
	Winter	-0.33	38.13	-0.50
TVA	Daily	1.26	35.63	+1.75
	September	-6.77	60.07	+2.00
	Winter	9.22	41.57	+1.50
N. Illinois	Daily	13.13	41.57	
	September	3.35	61.52	+1.75
	Q4 2006			

Cinergy Emissions Adjusted OTC Coal Prices					\$/ton
	Delivered Price	SO2 Adjusted	NOX Adjusted	SO2 & NOX Adjusted	
<b>Nymex-spec Barge OTC</b>					
September	56.50	70.08	63.51	77.09	
Q4 2006	57.50	71.08	64.51	78.09	
<b>CSX Rail OTC</b>					
September	60.75	74.30	68.05	81.60	
Q4 2006	61.25	74.80	68.55	82.10	
<b>PRB 8800 Rail OTC</b>					
September	23.50	28.27	28.64	33.41	
Q4 2006	23.88	28.64	29.02	33.79	
<b>PRB 8400 Rail OTC</b>					
September	22.00	26.55	26.91	31.46	
Q4 2006	22.28	26.83	27.18	31.74	

OTC Broker Index							\$/ton
	Sept.	Change	Q4 2006	Change	August Avg.	Q4 2006 Avg. (July)	
Nymex-spec	47.00	-0.04	47.83	-0.25	48.61	48.49	
CSX <1%	49.12	-0.03	49.42	-0.02	46.41	47.15	
PRB 8,400	6.95	-0.29	7.00	-0.35	8.10	8.11	
PRB 8,600	8.53	-0.32	8.50	-0.38	10.73	10.72	

See methodology at end of report.



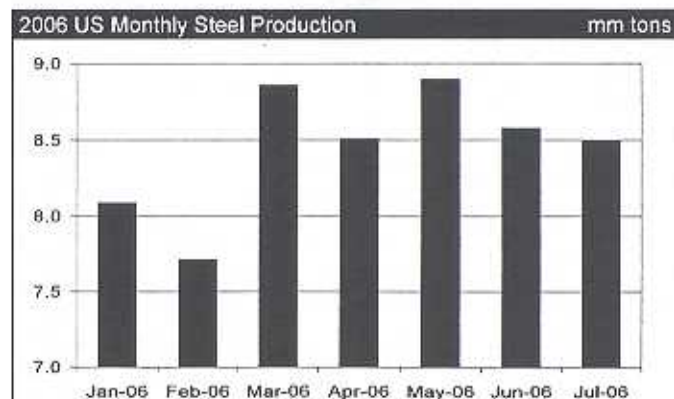
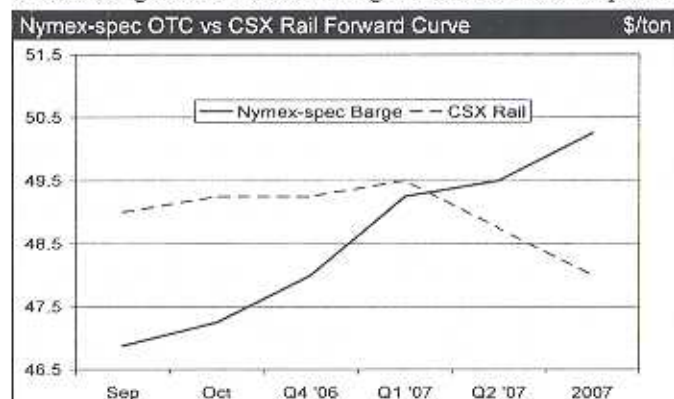
## OTC: Premium evaluations continue

Over-the-counter coal forwards prices showed signs of nascent strengthening in the day for more-forward specifications, but largely moved sideways in a sustained focus on inter-delivery-period premiums.

Nymex-spec barge coal trade was the most active in the day, moving a series of deals mid-day after a quiet morning. Powder River Basin trade picked up in afternoon, marking calendar-year 2007 deals for 8,800 Btu and 8,400 Btu coal, with another of the 8,400 ex-Cold Creek deals that have been seen on the market in the past few weeks. The more-forward Western coal was notably lower, down 75¢ for prompt-year delivery.

Trade for Eastern barge coal was spread across delivery periods, with both prompt-quarter, second-quarter and Q4 2007 trades changing hands at the end of the day in a very slight strengthening. The market continued to evaluate premiums for more-forward over more-prompt coal deliveries, with the spread between Q2'07 over Q1'07 narrowing 5¢ in the day.

The Association of American Railroads took credit for the sixth consecutive month of inventory builds in 2006 during June, saying that record coal moves by its member railroads had enabled the stockpile build. Rail deliveries have broadly improved, and dramatically improved in a calendar year comparison for PRB product, but rail shipments were aided by notably lower demand for coal as the weather remained moderate and other forms of baseload generation were running harder over the same period.



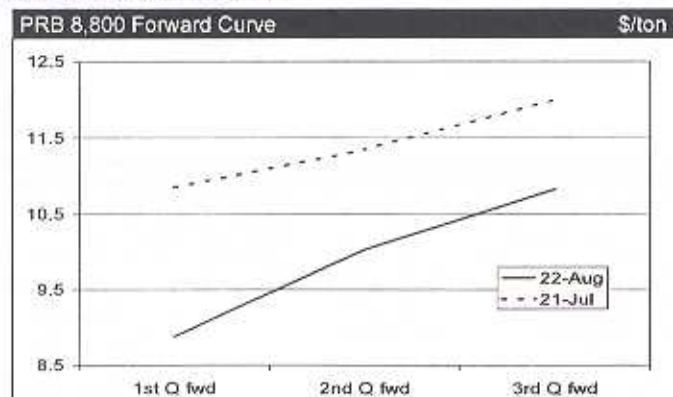


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Palo Verde	Daily	9.22	41.57	+1.50
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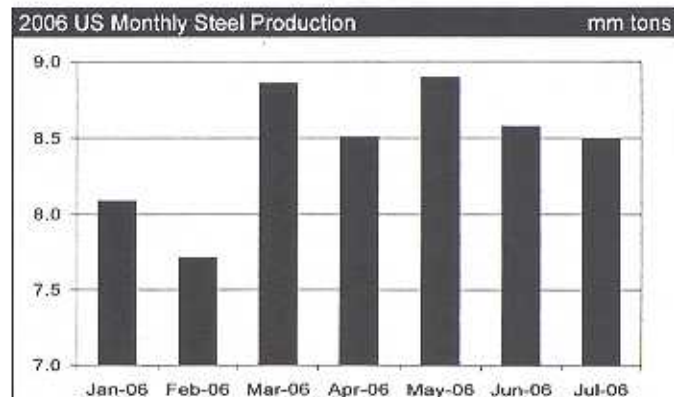
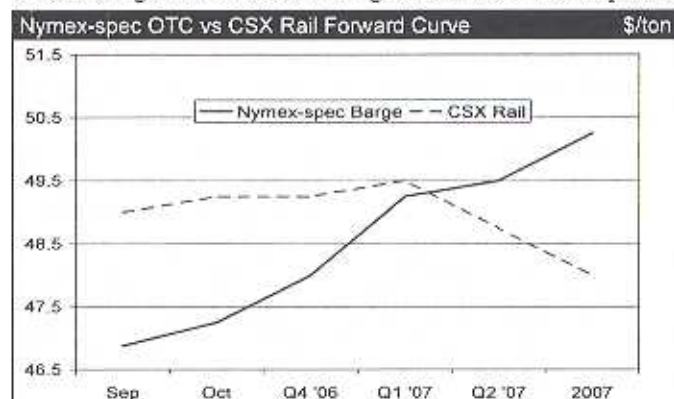
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completely eroded when IGCC is competing with ultra-super-critical PC, except in the case of lignite, where IGCC is 10 pct less polluting.

But when CO<sub>2</sub> capture technology is added in, the energy penalty puts IGCC ahead.

In 2000, the energy penalty for CO<sub>2</sub> scrubbing on a PC plant was estimated to be nearly six times as high as capturing carbon from an IGCC facility. Since then, the gap has narrowed considerably.

EPRI says laboratory work on post-combustion CO<sub>2</sub> capture suggests the energy penalty for PC plants could be slashed from nearly 30 pct to around 10 pct. EPRI is partnering with Alstom to build a 5MW pilot facility for a chilled-ammonia CO<sub>2</sub> scrubber, with tests expected to start next year.

The work of Alstom and other vendors like Mitsubishi, Powerspan and Fluor on CO<sub>2</sub> scrubbers could see PC and IGCC become competitive on both cost and emissions performance in the 2015-2020 timeframe, Dalton said.

For that reason, choosing between IGCC and PC will be tough even for those utilities that expect the US to ultimately regulate GHG emissions, he said.

"I think it is an extremely difficult choice because there are a lot of unknowns. The simplest being what are the requirements for carbon going to be," Dalton said.

The recent decisions of TXU and AEP to choose PC over IGCC for their PRB-fueled plants highlights one of the variables that will govern technology decisions: fuel type. Another will be elevation. The thinner air at high altitudes lowers the capacity rating of an IGCC's turbine and requires a larger oxygen separation unit for the gasifier. For this reason, last year's energy bill calls for an IGCC demonstration project to be built in a western state at an altitude of above 4,000ft. The project must also be fueled with western coal.

Xcel Energy recently announced a \$3.5 million study into the prospect of building a 300-350MW IGCC plant tailored to the demonstration project's requirements. The proposed plant would also have CO<sub>2</sub> capture technology installed from day one of operations to meet the requirements of a Colorado law that guarantees cost recovery to the developers of an IGCC plant.

The Western IGCC demonstration project is part of a package of energy bill incentives aimed at speeding the development

of the new technology. The Energy Policy Act of 2005 also provides tax incentives for companies to work on some of the remaining problems with IGCC technology, and 22 projects recently applied for assistance. The Department of Energy is also close to calling for bids from IGCC developers for loan guarantees authorized under the energy bill.

Meanwhile environmental groups at the very least want EPA to force companies to consider IGCC in their project review, something the agency has so far declined to do. EPA is working on a settlement of a lawsuit challenging its position that should be announced soon.

Texas air regulators have also refused to require an IGCC review in air permit applications, a decision that paved the way for TXU's planned PC build.

Should the US put a cap on greenhouse gas emissions in the foreseeable future, the new TXU plants could have their 30-40 year operational life cut short, Clean Air Task Force (CATF) coal transition project director John Thompson told *Argus*.

Today, the US does not have a carbon cap, but prudent power companies need to assume there will be one when picking the technology for their new coal-fired plants, Thompson said. Not only can IGCC shield a utility from the risk of "incredibly high" carbon prices, it can also be used to make other commodities besides electricity, such as substitute natural gas (SNG), he said.

"What is important is to have as much flexibility as possible as you can with a billion-dollar asset," Thompson said. "It's clear to me that an IGCC plant gives you a lot more hedges against unfavorable future conditions."

The environmental movement has thrown its weight behind IGCC based on the widely held view that CO<sub>2</sub> capture for a PC plant carries such a high energy penalty that it's a lost cause.

"If we could do [carbon capture] with conventional coal plants, I sure wouldn't object. But I have significant doubts that they will be economic to employ as a retrofit," Thompson said.

Thompson is a strong supporter of a privately financed Illinois proposal to build a 630MW IGCC plant that can also produce SNG. The project, being developed by the ERORA Group and Tenaska, recently completed its front-end engineering and design (FEED) study — a report that will form the basis for a fixed-price construction contract. The FEED studies for the various IGCC proposals are highly anticipated by the industry, as they will offer the best information yet on the cost differential between building IGCC and PC.

AEP expects to have its FEED studies for Ohio and West Virginia completed by the end of the year, Heydlauff said. Both plants will use GE IGCC technology, and AEP is anticipating the cost differential will be less than some PC proponents expect.

"That number will be of enormous interest and it will become known very fast," Heydlauff said. "They are hoping we'll be no more than 10 pct [over the cost of building a PC]."

EPRI is involved in the preparation of some of the FEED studies and cannot speculate about what they will conclude. But

Steel Output			000s mt	
	July	Year-ago	% Change	3-Month Ave
China	36,091	29,244	23.41%	36,215
Japan	9,858	9,432	4.52%	9,825
US	8,500	7,557	12.48%	8,660
Russia & CIS	10,260	8,400	22.14%	10,253
Asia	55,225	47,771	15.60%	55,371
Europe	14,477	12,756	13.49%	14,943
S. America	3,941	3,696	6.63%	3,760
N. America	11,336	10,199	11.15%	11,493
Total	103,573	90,320	14.67%	104,235



Dalton said the completion of a number of FEED studies before the end of the year will be "absolutely critical" in shaping technology decisions on new power plant projects.

"We think it's going to be critical to get some real data out there," he said.

#### Methodology

*Argus Coal Daily* assesses coal prices in two related but separate markets: the traditional market for physical coal, and over-the-counter (OTC) market for coal. The physical market is a non-transparent market that requires skill and diligence to assess. *Argus* assesses the physical market once a week on Friday for an extensive list of coal grades and locations. The OTC market, known in the international market as a "forward" market, is primarily trade of standardized contracts of a short list of common coals and is used for both financial hedging and physical delivery. *Argus* assesses the forward OTC market every business day for the four most liquid coal contracts.

*Argus* also publishes a series of "OTC Broker Indexes," which are mathematical averages of price assessments provided by certain cooperating brokers. *Argus* publishes these indexes for comparative purposes. The *Argus Coal Daily* Physical Market Assessments published on Fridays take into account a far greater breadth of information and are considered by *Argus* to be the most suitable for use in contract language.

*Argus* holds as a guiding principle that the prices we publish should be assessments, the product of intelligence, skill, and diligent investigation. In markets where volume is greater, deals-based indexes can be constructed. But predominately physical markets like coal need a measure of cross validation and editorial scrutiny, or accuracy and consistency suffer.

**Energy Emissions Adjusted OTC Coal Prices:** Coal delivered to Cinergy region, adjusted for SO<sub>2</sub> and NO<sub>x</sub>. NO<sub>x</sub> values are average emissions seen at Cinergy power hub region. SO<sub>2</sub> values based on each coal's sulfur content. Emissions costs for all coal grades and power markets are published each Friday.

**OTC Broker Index:** OTC Broker Index based on mathematical average of price assessments provided by Evolution Markets LLC, ICAP Energy, United Power Inc. and A.E. Bruggemann.

To see our full methodology, please go to: [www.argusonline.com](http://www.argusonline.com) or email us at [coaldaily@argusmediagroup.com](mailto:coaldaily@argusmediagroup.com) for a copy.

## Alcoa, Vigo Coal open Illinois mine

**Aluminum producer Alcoa and Vigo Coal will open the Friendsville mine near Mount Carmel, Ill., this weekend, Alcoa told *Argus* today.**

The mine will supply coal via rail delivery to Alcoa's aluminum smelter in Warrick, Ind. Alcoa spent \$45 million for the 10-year rights to 2,500 acres of reserves and development of the mine. The mine's 1 million tons/yr production will supply around 45 pct of the smelter's fuel requirements.

The coal from the mine replaces coal from an expired contract with Peabody Energy.

The Warrick plant produces 309,000 metric tonnes of aluminum sheet annually, for products such as cans, said spokesman Kevin Lowery.

Vigo also operates the Cypress Creek mine in Warrick that produced 1.36 million tons in 2005. It shipped 573,059 tons in the first quarter.

## Cowboy Coal goes to Bull Mountain

**Fuels Management Inc. said today it will commercialize its "Cowboy Coal" beneficiation process at the Bull Mountain mine in Montana, with production expected by the second quarter of 2007.**

Fuel Management Inc. (FMI) said it has reached a collaborative agreement with the mine to build a plant at or near the mine. Its de-watering technology upgrades the heat content of Powder River Basin coal, a similar niche to the KFx process, which shipped its first commercial trainload of K-Fuel earlier this month to the Midwest. Both companies aim to supply coal to Eastern coal users trying to meet more stringent standards for mercury and other pollutants without additional controls.

"We will be able to offer a higher Btu, environmentally sound product to our customers and this agreement aids FMI in the commercialization of its promising Cowboy Coal technol-

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ogy," said Jerry Daseler, Bull Mountain Energy Project vice-president of sales and marketing.

FMI has already conducted small-scale testing of Bull Mountain's 10,300-10,400 Btu coal at the Western Research Institute in Laramie, Wyo., said administrative officer Dianne Wyss. A 27-fold scale-up of testing next month by Carrier Vibrating Equipment Inc. in Louisville, Ky., will determine the size of the reactor that will be built and the upgraded heat content of the product, she said. Results are expected in September.

"We are confident it will be profitable but we don't know how profitable," said Wyss.

Cowboy coal differs from K-Fuel in that the coal-drying process is done at ambient pressure and low temperatures in the presence of oxygen, reducing the risk of combustion after treatment, FMI said. Thirty percent of PRB coal is water, and the process removes nearly all of the water, FMI said. The process upgrades PRB coal at a cost of roughly \$15 to \$20/ton.

KFx reports no problems with the stability of its K-Fuel.

The underground Bull Mountain mine, operated by its current owners BMP Investments since mid-2003, transports coal via truck to a rail loadout, but construction of a 35-mile rail spur to BNSF should start soon and be completed by the second half of 2007, Daseler said.

The development of the mine has been delayed by environmental and financial concerns. The mine produced 162,000 tons in 2005, and has ramped up this year with 220,796 tons produced in the first quarter, according to federal data.

Infrastructure is being added to the mine, including a long-wall, with the expectation that volumes could go as high as 10 million tons/yr, Daseler said.

Detroit Edison recently signed a non-binding letter of intent to buy coal from the mine. The mine is expected to supply the Roundup power project that is being redesigned to an 11,000 b/d coal-to-liquids plant, although it has not yet applied to amend its permit. The Roundup plant would be the first CTL plant in Montana.

## DOE provides CO<sub>2</sub> capture update

**Carbon sequestration is poised to become a key technology option in the effort to curb global warming as research continues into post-combustion carbon capture and field tests for underground CO<sub>2</sub> injection begin, federal energy officials said yesterday.**

The lack of post-combustion CO<sub>2</sub> scrubbers capable of serving existing coal-fired power plants without draining their output is a major barrier to winning industry support for any form of carbon regulation in the US.

The annual report of the Carbon Sequestration Program, which is jointly run by the Department of Energy (DOE) and

the National Energy Technology Laboratory (NETL), highlights three potential CO<sub>2</sub>-scrubbing technologies.

Pilot-scale tests of an amine-based CO<sub>2</sub>-capture technology yielded a reduction in the amount of energy needed to sequester carbon from the flue gas, the report said.

Instead of a 30 pct energy penalty for CO<sub>2</sub> scrubbing, University of Texas tests at a 0.3MW facility resulted in an energy penalty of around 28 pct, NETL officials said.

At the same time, "novel" materials are also in development. New sorbents, known as metal organic frameworks, show "great promise" because they may be capable of adsorbing nearly five times as much CO<sub>2</sub> as commercially available adsorbents.

The development of ionic liquids may also improve the efficiency of CO<sub>2</sub>-capture systems that dissolve CO<sub>2</sub> in control solution. Ionic liquids may be able to hold around 66 pct more CO<sub>2</sub> than commercially available solutions, the report says.

As for the storage question, a series of regional partnerships tasked with finding geologic formations in North America capable of long-term carbon storage are beginning to actually inject CO<sub>2</sub> underground. The report says 25 field tests are planned for the validation phase of the long-term storage portion of the program.

"These field tests will expand our understanding of the CO<sub>2</sub> storage option, facilitate more accurate estimates of CO<sub>2</sub> storage capacity, and establish a national infrastructure that may support future carbon sequestration deployments," the report said.

The Carbon Sequestration Program aims to identify technologies by 2012 that have the potential to capture 90 pct of CO<sub>2</sub> emissions from a power plant while raising the cost of generation by less than 10 pct. On the storage side, the program's goal is to find technologies capable of permanently sequestering 99 pct of the CO<sub>2</sub> injected.

## French firm Alstom wins KCP&L contract

**Kansas City Power & Light awarded a \$700 million contract to French engineering firm Alstom to design and build a boiler and air quality controls for the Iatan Generating Station near Weston, Mo.**

The contract is for environmental control systems on the existing 670MW Iatan 1 unit and the boiler and controls for a new 850MW Iatan 2 unit.

The new unit will be completed in 2010, Alstom said.

"Alstom will provide a solution for Iatan 2 that integrates the latest boiler technology with post-combustion air emissions control equipment," said Philippe Joubert, president of Alstom Power Turbo Systems/Power Environment Sector. "For Iatan 1, we will integrate several components to bring the plant up to a very high environmental standard."