

# Clean Coal

By Al Senia

### News Flash >>>

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### EPRI REFOCUSSES

**Under new leadership, the principal utility research organization is intent on devising new strategies for tackling global warming.**

Steve Specker, the new president and CEO of the Electric Power Research Institute (EPRI), said, "The largest research challenge is dealing with CO<sub>2</sub> constraints." Specker succeeds Kurt Yeager, EPRI president emeritus.

"Eighty percent of what we do will help utilities deal with carbon constraints," Specker said. "We have to start working on these technologies now to have them ready 10 years from now. We are assuming that whatever constraints will be in place will be substantial."

A variety of strategies will be necessary for the industry.

"In a carbon-constrained world, you cannot rule out nuclear," Specker said. In addition, there is "a lot of work to do to develop coal technology," he said.

### NEW WAYS TO COMBAT GLOBAL WARMING

Clean coal-burning energy technology is set to move into the industry mainstream, propelled by new technology developments, important strategic alliances and changing economic circumstances.

Some energy industry executives are beginning to lay the groundwork now for a series of coal-gasification plants that would come online by 2010 and beyond. Most of these plants will utilize Integrated Gasification Combined Cycle (IGCC) technology, which combines coal gasification and combined cycle techniques to provide superior thermal efficiency and lower emissions than do traditional coal-burning plants. That could dramatically transform the coal industry's competitive landscape and place an unexpected financial burden on utility executives tied to traditional coal-burning plants. Such facilities are less expensive to build and operate now, but they may not be by the end of the decade when new, cleaner technologies move to the coal industry's forefront.

Utility companies, such as Cinergy, American Electric Power and others, are already getting behind IGCC, which could provide them a strong early competitive edge if the technology meets its potential. "I'm optimistic that the time is right for IGCC," says Bob Moreland, general manager of analytical and investment engineering for Cinergy. "The driver is that we think this is the way to go to build up our baseline energy capacity."

Cinergy's PSI Energy along with General Electric Co. and Bechtel signed a letter of intent to study the feasibility of constructing an IGCC generating station that would produce 500 to 600 megawatts of energy to help meet increased demand during the next decade. The study is expected to be completed early in 2005, when a formal contract could be signed. GE and Bechtel are developing a standard commercial offering for IGCC projects in the United States. IGCC proponents view this as a key breakthrough because the standard offering will streamline the planning process, bring down costs of plant construction and minimize the financial risk of utility companies considering IGCC. Previously, the utilities had to separately arrange and contract for each phase of IGCC plant development.

"The fact that GE is trying to put this together is very attractive to Cinergy," explains Moreland. "A utility doesn't have to buy all the bits and pieces and try to put an IGCC plant together itself."

### CLEAN COAL BENEFITS

IGCC proponents believe the technology, if successful, would reaffirm coal as the clear king of the energy landscape in the United States. They see the technology delivering economically viable, cost-efficient, environmentally sound energy for decades to come.

"IGCC seems to be the best option with the most flexibility," says David Hadley, an Indiana utility commissioner who chairs a commission exploring clean coal alternatives. "There has been a real change in thinking over the last 18 months among utility executives. They are increasingly aware of the environmental issues surrounding the use of coal. It (IGCC) is more economical than retrofitting an existing (coal) plant, potentially."

Andrew Spahn, director of grants and research for the National Association of Regulatory Utility Commissioners, notes that more than 100 base load coal plants have been planned during the next four years. He figures IGCC technology could make such plants economically and environmentally feasible because the energy produced is almost as clean as natural gas. "We are going to be building coal plants, regardless," Spahn says. "If you can build them cleanly, it makes the economics of coal more affordable and cleans up the air."

### CHANGING MARKETS

External developments also play a role in the rise of IGCC. Worldwide natural gas shortages and rising oil prices are combining to make coal a more attractive option, especially in the United States where there is an abundant supply. Furthermore, a clean coal-burning IGCC plant costs only between 10 and 20 percent more to build than a traditional coal plant - not terribly prohibitive when energy executives factor in likely future prohibitions on CO<sub>2</sub> and other emissions, as well as the cost of retrofitting existing coal plants. Finally, large companies such as GE, Bechtel, Fluor, Peabody Coal and others are



taking a close look at IGCC and developing a cookie-cutter approach to design and engineering that is driving development costs down.

The U.S. Department of Energy, meanwhile, is pushing a Clean Coal Power Initiative to create commercial-scale demonstrations of proprietary technologies designed to improve emissions from coal-fueled electric generating plants. This is also fueling a renewed interest in clean coal.

One such grant for nearly \$20 million was given to Peabody Energy Corp. to build an ultra-clean \$500 million coal power plant in northwestern New Mexico. Construction is expected to take three to four years, but Peabody needs to line up partners, investors and customers for the 300-megawatt plant's energy before breaking ground. Under the proposal for what is dubbed the Mustang Energy Project, Peabody and other partners would demonstrate new technology to reduce emissions to minuscule levels. The byproducts from the pollution control effort would create enough granular fertilizer for one million acres of farmland. Although still in the planning stage, the Mustang project is significant because it underscores the federal government's commitment to seed clean coal technology development.

According to GE Energy, in an IGCC system coal is converted into syngas, which after cleanup is used as the primary fuel for the gas turbine in

a combined-cycle system. The cleanup process is more efficient and carries a lower cost than traditional post-combustion cleanup methods. A GE Energy spokesman says the company believes "the time is rapidly approaching for IGCC to assume a greater role in coal-based power generation." Among the factors providing the momentum are:

- Gasification has become more reliable and is already used in the petrochemical and chemical processing industries.
- The technology is benefiting from continued advancements in natural gas turbine technology.
- Current plant design incorporates more advanced technology and has moved beyond the mere prototype stage.
- IGCC can be used to not only produce power from coal, but also syngas from the gasification process that can be used to produce higher-value chemicals.

Despite these positives, IGCC still contains several uncertainties. Capital costs for the plants are high. It's not clear if state utility regulators will be willing to pass the higher costs on to ratepayers or place more of a financial burden on the utilities. Although IGCC technology has been around for awhile, it's

**▲ Sunrise over the Millmerran Power Project site in Australia, as steam blows commence early in the morning. The plant uses effluent from a sewage treatment plant 56 miles away as a water source.**

**“The time is rapidly approaching for IGCC to assume a greater role in coal-based power generation.”**



**The Quezon Power Project's boiler building rises out of the ground as the plant takes shape on the east coast of Luzon in the Philippines.**

the current worldwide spike in energy prices that's instigating a new look at the technology. If prices swoon, so could interest in IGCC and clean coal. Finally, while GE, Bechtel and others have grand ambitions for IGCC, much of the focus still remains in the planning stage.

Despite this, many officials believe energy industry executives need to pay close attention to the potential impact of IGCC on their businesses. "This next year is pivotal in the deal-making process for utility executives," says Illinois Commissioner Hadley. "A lot of folks are looking at options. The time is now to start planning for energy that is going to be delivered in the next decade."

As the energy planning process gains momentum, even much of the environmental lobby is lining up behind IGCC. David Hawkins, director of the climate sector of the National Resources Defense Council, says it would do a lot to clean up the domestic coal industry. "It's not as clean as a natural gas plant, but it's the cleanest you can get," says Hawkins, adding that an estimated 120 gigawatts of new domestic coal capacity will be needed between now and 2025.

With tougher rules expected to control CO<sub>2</sub> emissions in future years, Hawkins believes it will be increasingly difficult and expensive to obtain the permits for traditional coal plants, a fact industry

## EXECUTIVE CHECKLIST

Cinergy GM Bob Moreland says industry execs should consider the following:

- Think long-term when evaluating your total project costs.
- Consider new, more stringent regulations that might be applied to future plants.
- Factor in future economic considerations.
- Partner with reputable and financially strong companies
- Realize that clean coal technologies are improving and going mainstream.
- Capitalize on the fact that new plant construction process is now better optimized and less risky.

executives and investors have to factor in as they plan for plants that won't be online for another 10 years. "You have to make sure any new policies in the future won't adversely affect the financial bottom line of the plant you are planning," he says. That alone could help swing the pendulum over to clean burning coal technologies such as IGCC. ☒

**"The time is now to start planning for energy that is going to be delivered in the next decade."**

# GATHERINGS

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## JANUARY 25 – 26

**Transmission Planning & Reliability**  
The Canadian Institute  
Toronto, Canada

## JANUARY 25 – 27

**DistribuTECH**  
PennWell  
San Diego

## JANUARY 31 – FEBRUARY 1

**Capturing Opportunities in Canadian Shale Gas**  
The Canadian Institute  
Calgary, Canada

## JANUARY 31 – FEBRUARY 3

**Annual NOx/PCUG Conference**  
Reinhold Environmental  
Detroit

## FEBRUARY 1 – 3

**5th Wind Energy & Power Markets Conference**  
Electric Utility Consultants, Inc.  
Denver

## FEBRUARY 2

**Gas Storage Conference 2005**  
Ziff Energy Group  
Houston

## FEBRUARY 22 – 23

**4th Annual Rocky Mountain Gas Symposium**  
American Conference Institute  
Denver

## MARCH 1 – 2

**Hydroelectric Power in the Northwest**  
The Northwest Hydroelectric Association (NWhA)  
Portland, OR

## MARCH 9 – 11

**Russia POWER 2005**  
Russia Power  
Moscow

## MARCH 15 – 17

**Metering, Billing & CRM/CIS Australia – New Zealand 2005**  
Synergy  
Melbourne, Australia

## MARCH 15 – 17

**National Facilities Management and Technology Conference/Exposition (NFM&T)**  
Trade Press Publishing Corporation  
Baltimore

## MARCH 16 – 18

**GASMART 2005**  
Natural Gas Intelligence  
New Orleans

## MARCH 17 – 18

**2005 International Geoexchange Conference & Trade Show**  
GeoExchange BC  
Burnaby, BC Canada

## MARCH 22 – 25

**Southeast Regional Gas Conference and Expo**  
Southern Gas Association  
Charlotte, NC

## MARCH 29 – APRIL 1

**16th Annual U.S. Hydrogen Conference and Hydrogen Expo USA**  
National Hydrogen Association  
Washington, D.C.

## APRIL 5 – 7

**ASME Power 2005**  
ASME  
Chicago

## APRIL 5 – 7

**Electric Power 2005**  
Trade Fair group  
Chicago

## APRIL 10 – 13

**Distribution Operating Executives Round Table**  
Southern Gas Association  
New Orleans

## APRIL 13 – 15

**CIS Oil & Gas Summit**  
The Energy Exchange Ltd  
London

## APRIL 26 – 27

**Green Power Mediterranean**  
Green Power Conferences  
Rome

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### EXELON MERGER HARBINGER OF DEALS

The proposed \$12 billion merger between Exelon Corp. and Public Service Enterprise Group of New Jersey may be the leading edge of a wave of acquisitions soon to hit the utility industry.

"Consolidation will continue," said John W. Rowe, head of Exelon and principal architect of the Exelon-PSEG deal. "There will be more and more pressure on utilities to get the efficiency that comes from consolidation."

In an interview with *EnergyBiz* shortly before the announcement of the merger, Rowe suggested all kinds of deals may be in the works – and they will not follow any predictable pattern. "It will become even more haphazard than it has been," he said.

Corbin McNeill Jr., former co-CEO of Exelon, told *EnergyBiz* that he anticipates utilities will grow to own distribution assets in different parts of the country.

"If there are 10 to 15 dominant players across the country, it wouldn't surprise me in 20 years," McNeill said.