



A Report from EPRI's Generation Sector

June 2010

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### DEAR EPRI GENERATION MEMBERS

Over the last year, with the help of our advisors, we've identified several broad and important industry issues that will drive our R&D agenda. These issues cut across multiple programs and require a holistic approach.

The first deals with thermal plant cycling and load following, and the challenge of quantifying the key impacts to support effective O&M and capital planning, and deciding on mitigation strategies. The second is identifying technically and economically viable options to reduce the carbon footprint of fossil generation assets, ranging from least-cost to more capital-intensive opportunities. The final issue is identifying all factors important to the "migration" of the current generation assets – also known as "glide path" – to support critical decisions.

These issues are extremely challenging and critically important for our industry during this time of economic and regulatory uncertainty. Engagement with our members in addressing these issues provides the basis for effective R&D planning and for leveraging your investment in EPRI technologies across the Sector and Institute.

We've already begun planning in these areas, and we look forward to our continued engagement with each of you as we refine our research portfolio.

Sincerely,

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## CoalFleet for Tomorrow® – Future Coal Generation Options (Program 66)

### *Industry presentations highlight low-CO<sub>2</sub> emission technologies.*

Members of the CoalFleet for Tomorrow® program made two recent presentations on “Low-CO<sub>2</sub>-Emission Fossil Fuel Power Generation Technologies: Research, Development and Demonstrations” at meetings in Concord, North Carolina. The presentations covered the basics of coal-based power options with low-CO<sub>2</sub> emissions profiles and highlighted the work EPRI is doing in the area. On March 19, Jeff Phillips, Rob Steele, and Ron Schoff presented at the 2010 IEEE SoutheastCon to a group of electrical engineers. On April 21, Schoff presented at the Spring 2010 Conference of the Nuclear Nonoperating Owners’ Group, many members of which also own or have an interest in coal-based generation options. For a copy of the presentations, contact Phillips ([jphillip@epri.com](mailto:jphillip@epri.com), 704-595-2738) or Schoff ([rschoff@epri.com](mailto:rschoff@epri.com), 704-595-2554).

### *Member feedback sought on research priorities.*

To ensure alignment of the CoalFleet program’s research areas with the members’ new focus on pending CO<sub>2</sub> legislation and the current economic climate, which have affected the members’ near-term generation plans, the CoalFleet team held strategy breakout sessions during the Program 66 Advisory meeting to solicit member feedback on their current research needs. Initial feedback from the meeting was used to develop a detailed Zoomerang survey, which was sent to additional Program members who were not on hand at the meeting. The survey results have provided good insights and will be used to set research priorities in 2010 and 2011. In general, members said they are looking for more engineering and economic evaluations, updates, and design guides, and are interested in heat rate improvements/cost reduction potential that would be supported by R&D road-mapping, as well as exploration of improvements to existing plants. For more information, contact Jose Marasigan ([jmarasigan@epri.com](mailto:jmarasigan@epri.com), 650-855-8739).

## CO<sub>2</sub> Capture & Storage (Program 165)

### *EPRI joins university consortium developing advanced membranes.*

*Participation in this consortium will keep EPRI abreast of advances in membrane technology for CO<sub>2</sub> separation and enable EPRI-directed R&D.*

As part of its search for breakthrough CO<sub>2</sub> capture technologies, EPRI joined the university-based Membrane Science and Applied Technology (MAST) consortium for the advancement of membrane technology. The MAST Center ([www.mastcenter.org](http://www.mastcenter.org)) is a sponsor-directed, National Science Foundation Multi-site Industry/University Cooperative Research Center (MUC I/UCRC). Participating universities include the University of Colorado, Colorado State University, Clemson University, and the New Jersey Institute of Technology (NJIT).

A meeting of the Industrial Advisory Board, on which EPRI now serves, was held at NJIT to review current projects. The projects are wide-ranging and focused on application of membranes. Sponsors have the option to submit a request for proposals (RFP) to the faculty/researchers in the participating universities for specific research, and EPRI plans to submit one or more RFPs specifically for membranes suitable for CO<sub>2</sub> capture from power plant flue gas or synthetic gas. For more information, contact Abhoyjit Bhowan ([abhown@epri.com](mailto:abhown@epri.com), 650-855-2383).

### *EPRI solvent-based CO<sub>2</sub> capture model coupled to power plant process model.*

*Parallels model development for adsorbents and membranes which will enable energy integration of the capture system with the power plant for minimum energy penalty.*

EPRI has been developing process models for CO<sub>2</sub> capture using solvents, membranes, and adsorbents. The solvent process model has been coupled to a power plant model in ASPEN, and simulations currently are being conducted on base case solvents, such as MEA and DEA, to benchmark the capture and power plant models. The models need additional refinement to establish the baseline cases, and once that effort is completed, systematic optimization studies will be conducted on the combined capture and power plant system to quantify desired CO<sub>2</sub> capture solvent properties. For more information, contact Abhoyjit Bhowan ([abhown@epri.com](mailto:abhown@epri.com), 650-855-2383).

### ***Candidate solvents tested for applicability to phase separation approach.***

*Goal is to find solvent with good kinetics and distinct property differences from carrier solution, to allow separation and transfer of just CO<sub>2</sub>-rich solvent to the regenerator.*

With partial support from EPRI, 3H completed the first phase of its laboratory-scale phase separation process testing. The researchers tested a variety of solvent candidates in a one-meter packed column to assess solvent capacities, temperature profiles, and custom packing materials and design. Temperature-viscosity profiles were developed for different loading conditions. Researchers also conducted corrosion testing on carbon steel coupons. 3H currently is measuring reaction kinetics of loaded solvent in a wetted-wall column. Preparations are under way to size the laboratory unit up to an integrated pilot plant for continued parametric and longer-term testing on synthetic flue gas. For more information, contact Brice Freeman ([bfreeman@epri.com](mailto:bfreeman@epri.com), 650-855-1050).

### ***Solid adsorbent slipstream pilot started up.***

*Capture effective, regeneration operations underperforming.*

Having completed shakedown, EPRI's contractor started sorbent performance testing on the 5 cfm (1 kW) pilot that it developed for this project. The pilot is treating a slipstream of flue gas from Luminant's Martin Lake site using an amine-based sorbent. CO<sub>2</sub> removal was measured as high as 90%. However, the regeneration system is not performing as expected, and analysis is ongoing to resolve the issues. For more information, contact Richard Rhudy ([rrhudy@epri.com](mailto:rrhudy@epri.com), 650-855-2421).

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## **OPERATIONS AND MAINTENANCE**

### **Instrumentation, Controls and Automation (Program 68)**

#### ***Spring Fleet-Wide Monitoring Interest Group meeting focuses on centralized monitoring.***

Thirty-three attendees representing 11 utilities were on hand for EPRI's Fleet-Wide Monitoring Interest Group (FWMIG) May 4-5 in Charlotte, North Carolina. The meeting featured member presentations and roundtable discussions on centralized monitoring and diagnostics. Topics included centralized monitoring implementation plans, the journey to establishing a center, performance monitoring, and considerations for communicating with unit operators. For more information, contact Aaron Hussey ([ahussey@epri.com](mailto:ahussey@epri.com), 704-595-2009).

#### ***Instrumentation, Controls, and Automation Interest Group Meeting open for registration.***

An Instrumentation, Controls, and Automation Interest Group Meeting was held June 9, 2010 in Las Vegas, Nevada during the International Society of Automation (ISA) Power Industry Division (POWID) Controls & Instrumentation Symposium. This meeting featured open discussion and presentations on advanced controls, equipment monitoring, and plant startup automation solutions. For more information, contact Aaron Hussey ([ahussey@epri.com](mailto:ahussey@epri.com), 704-595-2509). To register, please visit EPRI's Event Calendar.

### **Maintenance Management & Technology (Program 69)**

#### ***Remaining life predictions of power plant equipment.***

*New products allow plants to use current equipment status to predict run-times.*

EPRI is continuing development of two new products that provide power plant technical staff with the resources necessary to make and document remaining life predictions of power plant equipment. The products, the *Fossil Component Remaining Useful Life (RUL) Database* and *Fossil Component Risk Advisor*, indicate the current status of plant equipment based upon equipment monitoring and equipment assessment results. Given these conditional inputs, these two products provide guidance on typical run-times predicted and actual run-times that have been experienced throughout the industry. Utilities also can track the accuracy of their predictions over time to evaluate their internal forecasting capabilities and refine their methods. These improved forecasting capabilities will enable organizations to make more risk-informed decisions relating to budget plans, such as allocating funds and resources for outages, staffing, spares, etc.

A product design review for this project was held May 18, 2010. A prototype test-version of these products is on schedule to be completed by the close of 2010, with beta-versions and production-versions of these software products scheduled to be released in 2011. For more information, contact Brian Hollingshaus ([bhollingshaus@epri.com](mailto:bhollingshaus@epri.com), 704-595-2579).

## **Fossil Maintenance Applications Center (FMAC) (Program 104)**

### ***FMAC Guideline on HRSG segmented-casing feedwater pumps.***

*Design improvements suggested for improving reliability.*

The FMAC researched and compiled in this report (1020274), which provides substantial new information about and technical solutions for a commonly used, but relatively unreliable, segmented pump installed on many of the most frequently used heat recovery combustion turbine designs. Initially, the project team worked with maintenance staff at a number of plants to gather information and determine the cause of the reduced reliability of the pumps. Next, the team presented the issues and experiences to the Fossil Pump Users Group to get expert input on self-help and common issue resolution. The group quickly identified several generic issues and guided the team to solutions that members of the group already had tested. Special factors include nozzle-loading issues with the piping connections (the most important causal factor); changes to the coupling style to be more forgiving; lubrication cooling modifications; and torque requirements of the mounting bolts were considered.

The team then developed a set of improvements to be evaluated by architect engineering design firms and owners to reduce or eliminate the damage being introduced by inadequate system design considerations that resulted in excessive vibration. The Fossil Pump Users Group's prompt and expert input to the research has led to reliability improvements.

The next meeting will be held in Pittsburgh, Pennsylvania during the week of Aug. 16, 2010. For more information, contact Ray Chambers ([rchambers@epri.com](mailto:rchambers@epri.com), 704-595-2580).

## **Operations Management & Technology (Program 108)**

### ***Sixth EPRI Plant Managers Forum held; next Forum scheduled.***

Fourteen companies were represented at the sixth meeting of the EPRI Plant Managers Forum, hosted by Luminant in Dallas. Topics included equipment reliability, operations procedure quality, Lean Maintenance, safety, and corrective action. This semiannual meeting featured significant participation by combined-cycle plant managers, with a breakout session on the second day. EPRI will continue to broaden the scope of the Plant Manager Forum to include more agenda time on combined-cycle plant issues in parallel with pulverized coal plant issues in breakout sessions.

The next meeting is scheduled for August 24-25 in Allentown, Pennsylvania, hosted by PPL Generation. Registration is available on EPRIweb. For more information, contact Steve Hesler ([shesler@epri.com](mailto:shesler@epri.com), 704-595-2680).

### ***EPRI Alarm Annunciator Applications Guidelines implementations show promise.***

*Guidelines allow plant operators to rely more on alarm systems for early warnings of off-normal conditions that warrant attention and action.*

EPRI has implemented the *EPRI Alarm Management and Annunciator Applications Guidelines* (1014316) at two coal-fired generation stations with positive results. Implementation involved developing an implementable alarm philosophy; analyzing alarms to determine the bad actors; and eliminating those bad actors which create the largest percentage of alarms constantly requiring unnecessary operator response. These efforts also have included a detailed review of all alarms in the unit in a documentation and rationalization process that eliminates unnecessary alarms, and documents the basis for all plant alarming conditions. The reference document is maintained to guide operator responses and understanding of alarm conditions and creates a basis for future alarm changes.

A similar alarm management project was initiated with a kickoff meeting the week of June 7 at Arizona Public Service's Red Hawk Combined Cycle Generating Station. *EPRI Alarm Annunciator Applications Guidelines* will be used as a reference to guide this effort, which includes alarm philosophy development, alarm analysis, bad actor resolution, documentation, and rationalization. One challenge specifically related to this plant is the large number of routine startup and shutdown cycles experienced. Unique demands are placed on alarm management during these periods, and advanced alarm management processes may be required to improve operator situation evaluation and response. Because there are a number of similar two-on-one combined cycle plants across the country, the lessons learned from this application should be applicable to many other facilities. For more information, contact Wayne Crawford ([wcrawford@epri.com](mailto:wcrawford@epri.com), 704-595-2727).

#### ***Using handheld computers for operator rounds.***

*New report will assist utilities considering transition from paper to electronic data collection.*

A recent EPRI report, *Best Practices for the Application of Handheld Computers to Operator Rounds* (1017638) describes lessons learned from several plants and industry experiences on the use of handheld computers for the collection of data during operator rounds. Included is information on the hardware, with descriptions of different types and sizes of computers, and barcode and radio frequency identification technology. The information provided in this report can assist utilities considering a transition from paper to electronic data collection in operator rounds, as well as those which recently made the transition and need assistance in reaping the full benefits of the technology. For more information, contact Wayne Crawford ([wcrawford@epri.com](mailto:wcrawford@epri.com), 704-595-2727).

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## **MAJOR COMPONENT RELIABILITY**

#### ***New employees join MCR staff.***

Grant Lanthorn student intern in Program 65 for last two years while attending the University of North Carolina at Charlotte (UNCC), became a full-time employee June 1 as a project engineer. Prior to returning to school to obtain his engineering degree, he served in the U.S. Army and completed two tours in Iraq. Lanthorn will support the MCR staff with the completion of project work in the steam turbine-generator area.

Zongqi "Sonnie" Sun started June 2 as an NDE project manager after serving as an NDE scientist at GE's Global Research Center in Niskayuna, NY. Sun has a bachelor's degree in synoptic dynamics, a master's degree in acoustics, another MS in electrical engineering, and a PhD in engineering science and mechanics. Sun will support all of Generation R&D with NDE-related project work.

#### **Boiler Life & Availability Improvement Program (Program 63)**

##### ***Solomon Weld Tool featured in Energy-Tech Magazine.***

*Tool allows crews to repair or replace tubing without spreading pendants.*

In power plants, the superheater and reheater tubing is so closely spaced that if damage occurs, maintenance crews have to spread the tubing pendants to reach the damage site and conduct repairs. EPRI's research to develop a new tool—the Solomon Weld Tool—that will allow crews to repair or replace tubing without spreading pendants, reducing change-out time, was featured on the cover of the April issue of *Energy Tech Magazine*. You can read the story at the magazine's website, [www.energy-tech.com](http://www.energy-tech.com). For more information, contact Bill Carson ([bcarson@epri.com](mailto:bcarson@epri.com), 704-595-2698).

#### **Boiler & Turbine Steam & Cycle Chemistry (Program 64)**

##### ***New report: Assessment of Amines for Fossil Plant Applications.***

*Use of amines may provide corrosion control advantages for specific problems.*

Utilizing only ammonia for pH control may be insufficient in some instances to provide ideal pH conditions in the low-pressure (LP) evaporators and economizers of heat recovery steam generators (HRSGs), the phase transition zone (PTZ) of the LP steam turbine, the condensing steam in air-cooled condensers (ACC), and in

locations of two-phase flow-accelerated corrosion (FAC) such as in feedwater heater drains. This report (1017475) provides a technical assessment of neutralizing amines, which may be used in plant cycles to improve these conditions. Findings from this assessment will aid operators and chemists in investigating methods to address specific concerns.

Results of this assessment of chemical and thermal properties of amines, in addition to field information on the application of amines presented in this report, will form the basis for the development of an interim guidance document in 2010 on applications and techniques for the use of amines to remediate specific corrosion problems. For more information, contact Jim Mathews ([jmathews@epri.com](mailto:jmathews@epri.com), 704-595-2544).

***Corrosion product transport monitoring project results detailed in new report.***

*Continuous particle monitoring shows potential as monitoring technique for corrosion control optimization.*

This project demonstrated that particle monitoring technology was able to identify specific areas of particulate iron corrosion product release in real time for both subcritical and supercritical units operating under both reducing and oxidizing conditions. The project also found that the magnitude of particle transport in the power cycle could be affected by chemistry control modifications. These findings, published in *Corrosion Product Transport Monitoring: Continuous On-Line Monitoring Evaluations for Electric Power Generating Stations* (1017482), indicate the potential for particle monitoring technologies to be utilized for real-time corrosion control optimization in fossil power plant condensate, feedwater, and drain systems.

This report forms the basis for a supplemental project to further explore the use of particle monitoring and other technologies for monitoring corrosion to achieve corrosion control optimization. For more information on this project, see *Continuous Fossil Plant Iron Corrosion Product Transport Monitoring and Corrosion Control Optimization* (1020519). For more information, contact Mike Caravaggio ([mcaravaggio@epri.com](mailto:mcaravaggio@epri.com), 704-595-2589).

***Predicting rate of growth of oxide scales in supercritical steam boilers.***

*Results of recent study will assist in determining appropriate scheduling of chemical cleaning.*

A recent EPRI study assembled information to allow the prediction of the growth rate of duplex oxide scales on the surfaces of waterwall tubes in some of the existing fleet of U.S. supercritical steam boilers operating with oxygenated water treatment (OT). In some cases, these oxide scales exhibit similar morphologies to those found in steam-touched superheater and reheater tubing. The information from this study will enable prediction of the rate of oxide growth in the waterwall tubes in relation to local operating conditions, and based on the best available understanding of steam-/water-side oxidation kinetics. Findings of the study have been published in the EPRI report *Growth Characteristics in Waterwall Tubes of Supercritical Units* (1020836). For more information, contact Jim Mathews ([jmathews@epri.com](mailto:jmathews@epri.com), 704-595-2544).

***Effectiveness of chemical cleaning solvents for removal of duplex oxides.***

*Recent EPRI study sought to determine optimum conditions of solvent concentration, temperature, and time to remove oxides.*

An EPRI laboratory study assessed the efficiency and effectiveness of selected chemical cleaning solvents for the removal and dissolution of high-temperature duplex oxides formed *in situ* on the low-alloy ferritic tubing of supercritical boilers. The EPRI study sought to determine the optimum conditions of solvent concentration, temperature, and time to remove the oxides with minimal agitation of the solvent. The development of efficient and effective chemical cleaning processes for supercritical once-through steam generators ensures that these units can maintain a high level of reliability with minimal downtime required for periodic cleaning operations. The results from this research will be incorporated with ongoing and existing EPRI research to provide the basis of interim chemical cleaning guidelines for supercritical fossil plants.

Results of the study have been published in an EPRI report entitled *Evaluation of Solvent Processes for Chemical Cleaning of Supercritical Waterwalls and Removal of Duplex Oxides Formed by High-Temperature In Situ Oxidation of Ferritic Steels* (1020882). For more information, contact Jim Mathews ([jmathews@epri.com](mailto:jmathews@epri.com), 704-595-2544).

## **Fossil Materials & Repair (Program 87)**

***Digital radiography could avoid rotor disassembly for examining steam turbine last-stage blade attachments.***

*Prototype being assembled for lab and field testing.*

Some steam turbine rotor designs rely on “pinned” finger joints for the last stage that are susceptible to cracking, which can lead to failure and unplanned downtime, or to the need for high-cost mechanical repair. EPRI is developing an examination technique using real-time digital radiography that would significantly reduce the time involved in identifying cracking in last-stage steam turbine blade attachments with pinned connections. Owners of turbines with finger joint designs could examine last-stage blade attachments for cracking without disassembly in less than one hour per stage. Development would build on previous application of the technology for detecting cracks in waterwall tubes in fossil boilers.

Conventional nondestructive evaluation techniques such as ultrasonics cannot be used with turbine blades in place because of multiple interfaces in the attachment design that prevent the transmission of ultrasonic energy. Because cracking could occur at any of the attachment fingers, however, examination of the full attachment is needed. Current practice requires complete removal of each of the blades, followed by surface examination using technologies such as liquid penetrant or magnetic particle. This method is time-consuming and presents the possibility of damage during blade removal or replacement.

High-energy radiography presents a promising low-cost alternative by eliminating the need for blade removal. It expands on previous evaluations of complementary metal oxide semiconductor (CMOS) technology as a direct digital radiographic detector, which determined that CMOS can detect cracks in fossil boiler waterwall tubes with tubes in place, and through insulation and other obstructions.

EPRI will assemble a prototype system based on the CMOS technology, optimize the detector parameters for high-energy X-ray sources, and assess its use for identifying cracking in pinned blade attachments. Once the system is assembled and laboratory verification completed, a field trial will be conducted to verify operational feasibility and user friendliness. Initial verification of the capability to detect cracks can be completed within three months, with full procedure optimization completed within one year. For more information, contact Stan Walker ([swalker@epri.com](mailto:swalker@epri.com), 704-595-2581).

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## **ENVIRONMENTAL CONTROLS**

### **Combustion Performance and NOx Control (Program 71)**

***Latest news from the Particulate Flow Loop test facility.***

*Test results for VARB flow control device.*

A recent EPRI report, *Assessment of Coal Flow Control Devices: Evaluation of the Greenbank Variable Area Rope Breaker (VARB®)* (1020964), describes the results of a test program to investigate the effectiveness of a commercially available flow control device for improving the distribution of pulverized particulate matter in a branching pipe system. The piping system in the test loop was arranged to represent a split from a single pipe to two pipes, a common design at coal-fired power plants. The VARB® device was tested under typical conditions experienced in coal transport piping leading to the burners of a steam generator. For more information, contact Sam Korellis ([skorellis@epri.com](mailto:skorellis@epri.com), 704-595-2703).

***2010 revision to the Guidelines for Ash Deposition is ongoing.***

*Member feedback sought in telephone survey.*

A telephone survey is being conducted by Program 71 for users of the *Guidelines for Solving Ash Deposition in Utility Boilers* (1004891). The guidelines are a three-volume set published in 2003. The survey is to obtain member feedback from their application of the guidelines and experiences with ash deposition. The guideline revisions will be published in an addendum by end of this year. If you have not been contacted and would like more information, contact Jose Sanchez ([josanche@epri.com](mailto:josanche@epri.com), 650-855-2143).

### **Coal pile management interest topics.**

#### *Supplemental project planned.*

Four members have presented potential research area needs in coal pile management, including identifying best practices for coal pile storage, onsite coal blending techniques, preventing coal degradation, and identifying New Source Performance Standards impacts. A telephone conference was scheduled for early June to discuss development of a supplemental project to address these needs. For more information, contact Jose Sanchez ([josanche@epri.com](mailto:josanche@epri.com), 650-855-2143).

### **Portable belt scale test system development.**

#### *Members sought for supplemental project.*

Several members have proposed a supplemental project to conduct a feasibility study prior to the development of a mobile belt scale testing system. The system will streamline and modernize the current practice used to calibrate belt scales and ensure their output is as accurate as possible. The new process has the potential to reduce operation time, reduce testing costs and complexity, allow faster and more frequent calibration, and directly improve coal inventory control accuracy. This multi-funder tailored collaboration project is partially funded and requires two or more additional members to move the project forward. For more information, contact Sam Korellis ([skorellis@epri.com](mailto:skorellis@epri.com), 704-595-2703) or Jose Sanchez ([josanche@epri.com](mailto:josanche@epri.com), 650-855-2143).

### **Meeting at PPL's Brunner Island plant reviews plans for project.**

#### *Project to investigate steam flow impact on circumferential cracking.*

A meeting at PPL's Brunner Island power plant to discuss a planned project investigating steam flow impacts on circumferential cracking was held April 23. This project will assess the impacts of flow imbalances and possible changes in heat transfer characteristics occurring in the supercritical fluid in boiler waterwalls. During the onsite meeting and plant walkdown, possible locations were identified for the soon-to-be-added instrumentation, and a visual assessment was made of the current condition of the previously installed instrumentations. For more information, contact Sylvio Cardoso ([scardoso@epri.com](mailto:scardoso@epri.com), 650-855-1056).

## **Post-Combustion NOx Control (Program 73)**

### **SNCR Interest Group Webcast focuses on TDL ammonia monitors.**

Eleven utility participants joined a recent webcast to discuss current selective noncatalytic reduction (SNCR) NOx reduction performance and operational issues. The current status of tunable diode laser continuous ammonia monitors was discussed, along with project plans for an upcoming deployment of a four-channel ammonia monitoring system for spatial resolution of ammonia slip from a SNCR system. Operational tests will examine the relationship between different SNCR injectors and each of the four line-of-sight ammonia slip measurement paths. The ultimate goal of the project will be to incorporate ammonia slip measurements within the SNCR process control logic. To facilitate technical information sharing, SNCR Interest Group participants are compiling a database of SNCR system characteristics. For more information, contact Rick Himes ([rhimes@epri.com](mailto:rhimes@epri.com), 949-766-8470).

### **Ammonia slip decomposition catalyst proof-of-concept tests completed.**

#### *Additional tests needed for low-sulfur applications.*

A recent EPRI project evaluated the performance of an ammonia decomposition catalyst. Reducing ammonia slip in coal-fired applications may allow SCR operators to maintain or increase NOx removal efficiencies by increasing reagent flow rates without affecting downstream equipment, ash contamination, or ammonia emissions.

Tests were conducted under bench-scale conditions, where stoichiometric ratios of ammonia to NOx, as well as flue gas temperatures, were varied. Test results showed the catalyst's ability to decompose ammonia slip to be quite promising. However, the conversion of SO<sub>2</sub> was higher than that seen in conventional SCR catalysts, potentially ruling out all high-sulfur coal applications. Additional work will be needed to evaluate the catalyst on low-sulfur coal applications, including the effects on elemental mercury. For more information, contact Alex Jimenez ([ajimenez@epri.com](mailto:ajimenez@epri.com), 650-855-2051).



## **Integrated Environmental Controls (Hg, SO<sub>2</sub>, NO<sub>x</sub> and Particulate) (Program 75)**

### ***Polishing device for mercury and SO<sub>2</sub> control shows promise.***

*Tests of a carbon-Teflon tape showed good Hg/SO<sub>2</sub> removals and reasonable lifetime.*

A carbon-Teflon tape developed by Gore to remove mercury and SO<sub>2</sub> from coal-fired flue gas was tested on a bench-scale slipstream reactor for a month downstream of a power plant's wet scrubber. With the reactor running at reasonable plate spacing and flow velocity, the tape initially removed 84% of the mercury in the flue gas and 63% of the residual SO<sub>2</sub>. According to Gore, the SO<sub>2</sub> effectiveness can be further increased by selecting a carbon with elevated reactivity for SO<sub>2</sub>. Although these removal rates dropped noticeably after a month's testing, the results are still encouraging, because they are the longest time the tape has maintained substantive mercury and SO<sub>2</sub> removals. They suggest that this approach could provide Hg/SO<sub>2</sub> polishing after a wet FGD by a compact device. EPRI plans to continue operating the tape for another one to two months to assess its long-term mercury and SO<sub>2</sub> removal effectiveness. For more information, contact Ramsay Chang ([rchang@epri.com](mailto:rchang@epri.com), 650-855-2082).

### ***Key program advances in development of on-site Sorbent Activation Process (SAP).***

*Host sites and funding secured for next development activities of this potentially lower-cost sorbent supply process.*

Southern Company has agreed to host continued development of the 50-lb/hr prototype SAP unit for producing activated carbon (AC) and, possibly, other sorbents. These could include lime production from limestone and co-injection with the AC. Formerly installed at Dynegy's Hennepin station, where it showed that it could produce product comparable to commercial AC, the unit will be installed at the Mercury Research Center located at Gulf Power's Plant Crist.

In a parallel effort, with support from EPRI's Technology Innovation program, the project will design, fabricate, and assess the long-term performance of a more robust and more automated full-scale SAP unit over a 3- to 6-month period at two to three power plant sites. Dynegy has agreed to be the first host site at its Hennepin Unit 2 (225 MWe PRB-fired with TOXECON baghouse). For more information, contact Ramsay Chang ([rchang@epri.com](mailto:rchang@epri.com), 650-855-2082) or Cassie Shaban ([cshaban@epri.com](mailto:cshaban@epri.com), 650-855-2345).

## **Particulate & Opacity Control (Program 76)**

### ***ROPE power supply startup successful.***

*Important milestone in development of advanced power supply for collecting high-resistivity fly ash.*

The goal of the Rapid Onset Pulse Energization (ROPE) power supply is to collect high-resistivity fly ash without resorting to flue gas conditioning. This is done by producing a uniform corona discharge over the entire length of the discharge electrodes, which results in effective particle charging while allowing the use of low-current densities for ash collection (hence, less performance-inhibiting back corona). Two ROPE units, upgraded based on lessons learned during the previous tests, now have operated successfully for more than 30 days, energizing two precipitator fields at Southern Company's Plant Gadsden.

The upgrades include redesign of the silicon-controlled rectifier (SCR) snubber circuitry and software changes to the core power supply's controller. The positive results were achieved despite operation at conditions that deliberately stress the components. The next step, to test the particulate capture performance of the ESP fields equipped with these power supplies was scheduled to begin in mid-May. For more information, contact Bruce Scherer ([bscherer@epri.com](mailto:bscherer@epri.com), 419-517-4217).

### ***Fourth test campaign of SO<sub>3</sub> concentrations along the flue gas path completed.***

*Results will be compared with model predictions to help modelers fine tune their models.*

Tests of SO<sub>3</sub> concentrations were completed in late April at eight locations from the furnace exit to the economizer outlet. One goal of this effort is to provide SO<sub>3</sub> modelers with a set of data spanning the boiler zones in which SO<sub>3</sub> is formed or depleted, which they can use to challenge the individual mechanisms in their models. The other goal is to seek a better understanding of the SO<sub>3</sub> formation and depletion mechanisms in a boiler, which could lead to SO<sub>3</sub> mitigation strategies that are less dependent on, or avoid, alkali sorbet

injection. The results currently are being analyzed and will be compared with model predictions once all input data (coal properties, boiler design, operating conditions during the tests) have been obtained. For more information, contact George Offen ([goffen@epri.com](mailto:goffen@epri.com), 650-855-8942).

### **Continuous Emissions Monitoring (Program 77)**

#### ***Low-level mercury measurement project under way.***

*Goal is to determine the accuracy of mercury CEMs at flue gas concentrations expected when power plants are controlled for mercury.*

EPRI began to test two commercial instrumental mercury CEMs and a sorbent trap (Appendix K) system on the flue gas from a gas-fired pilot combustor spiked with very small amounts of mercury. Results to date in this clean environment have been positive. Experimentally, the mercury spiking system provided a stable output with both elemental and oxidized mercury, and initial review of the data indicated that the three measurement approaches gave identical results under these “clean conditions.” The measured background levels without the pilot in operation have been very stable at 0.025 µg/m<sup>3</sup>. EPRI now is testing the monitor responses with SO<sub>2</sub> and NO<sub>x</sub> added to the flue gas matrix, to be followed by runs with the pilot combustor firing coal. For more information, contact Chuck Dene ([cdene@epri.com](mailto:cdene@epri.com), 650-855-2425).

#### ***Study on discrepancies between methods of calibrating mercury CEMs confirms one cause reported in the literature.***

*Additional tests are needed to resolve the discrepancy.*

Tests investigating the potential losses of mercury in the standards solutions confirmed the literature reports of losses and low concentration when the solution acid content is lowered during dilution of the standard gas. Both Tekran and Hovacal have clarified their recommendations to highlight the importance of maintaining a minimum acid strength. However, this still does not appear to be the source of the discrepancy observed when calibrations are attempted with elemental versus ionic mercury. Future tests will cross-correlate the output of the two standards (head space elemental and oxidized mercury solutions) with the sorbent trap reference method. For more information, contact Chuck Dene ([cdene@epri.com](mailto:cdene@epri.com), 650-855-2425).

### **Coal Combustion Product Use (Program 78)**

#### ***EPA releases proposal for national regulation of CCP disposal.***

*Two options proposed by EPA, both stating support for beneficial use of CCPs.*

On May 3, EPA announced the release for public comment of first-ever national regulations governing disposal of CCPs. The proposal offers two options: regulation as a special waste under the Resource Conservation and Reclamation Act’s (RCRA) Subtitle C hazardous waste provisions, or regulation under its Subtitle D non-hazardous waste provisions. In both cases, beneficial uses that EPA considers to “encapsulate” or “fix” any hazardous pollutants in the product would remain exempt from the national regulation. EPA is seeking comments on the two options as well as the scope of the beneficial use exemptions. EPRI will be meeting with its advisors to determine if there is any additional research that may help address some of the questions and issues raised in the proposal. For more information, contact Ken Ladwig ([keladwig@epri.com](mailto:keladwig@epri.com), 262-754-2744).

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## **COMBUSTION TURBINES**

### **Heat Recovery Steam Generator (HRSG) Dependability (Program 88)**

#### ***Solomon Weld Tool featured in Energy-Tech Magazine.***

*Tool allows crews to repair or replace tubing without spreading pendants.*

In power plants, the superheater and reheater tubing is so closely spaced that if damage occurs, maintenance crews have to spread the tubing pendants to reach the damage site and conduct repairs. EPRI’s research to develop a new tool—the Solomon Weld Tool—that will allow crews to repair or replace tubing without spreading pendants, reducing change-out time, was featured on the cover of the April issue of *Energy Tech Magazine*. You can read the story at the magazine’s website, [www.energy-tech.com](http://www.energy-tech.com). For more information, contact Bill Carson ([bcarson@epri.com](mailto:bcarson@epri.com), 704-595-2698).

## **Renewable Generation (Program 84)**

### ***Assessment of concentrating photovoltaic (CPV) industry published.***

*Includes company profiles, market study, and company contacts.*

A new EPRI report, *2009 Concentrating Photovoltaic Solar Technology Assessment* (1020895), investigates manufacturers of concentrating photovoltaic (CPV) systems with a special emphasis on companies that may be ready to deploy one or more 50-MW systems by 2012. The report has three main sections: detailed profiles of 10 companies that appear likely to be able to field utility-scale deployments by 2012; a market study and forecast for CPV over the period 2012–2020; and an appendix listing contacts and other information. For more information, contact Travis Coleman ([tcoleman@epri.com](mailto:tcoleman@epri.com), 650-855-2009).

### ***Supplemental project for co-produced geothermal power generation.***

*System would use hot water associated with oil production.*

A recent visit to the Rocky Mountain Oilfield Test Center (RMOTC) near Casper, Wyoming to view an operating binary geothermal power plant has resulted in a potential supplemental project to look at generating geothermal power from hot water associated with oil production. If available in sufficient quantities, this typically low-grade geothermal resource may be feasible for cost-effective power generation. Potential benefits of this type of system include reduced resource risk, lower parasitic loads, and the potential to move cost-effective geothermal power production east of the Rocky Mountains. For more information, contact Travis Coleman ([tcoleman@epri.com](mailto:tcoleman@epri.com), 650-855-2009).

### ***Pressurized biomass gasification tests under way.***

*Tests validating high-pressure feeding system and collecting basic process information.*

EPRI recently completed the first half of a pressurized biomass gasification test at the North Dakota Energy and Environmental Research Center (EERC). Pressurized biomass gasification offers a potential for utility-scale, high-efficiency power generation, but the technology is not as advanced as similar coal gasification processes.

The tests at EERC served two purposes. First, the test series offered an opportunity to validate a new high-pressure biomass feeding system. Typically, high-pressure feeding has been difficult to accomplish with biomass due to the fibrous nature of the feedstock. In the week of testing, the feeding system proved completely reliable with wood feeds of variable moisture. Second, the tests provided basic process information on wood gasification in a transport reactor. A second week of testing is scheduled for summer to further assess the feed system's performance and to operate the gasifier with grass/ag waste feedstock.

The results of both tests will be published in an EPRI report by the end of the year. Additional work is planned (but not currently funded) to develop overall process economics. For more information, contact Dave O'Connor ([doconnor@epri.com](mailto:doconnor@epri.com), 650-855-8970).

### ***Biomass torrefaction research published.***

*Results confirmed feasibility of obtaining range of production parameters.*

An EPRI final report, *Small Scale Testing of Woody and Herbaceous Biomass Torrefaction and Pelletizing* (1020508) details the research, supported under EPRI's Technology Innovation program, which performed production testing of torrefied chips and pellets from seven different biomass species (three woody and four herbaceous). Test results confirmed the feasibility of obtaining a range of production parameters, as per EPRI's proposed technical specifications, and provided lessons learned on process energy efficiency, impact of feedstock moisture, and conditions to obtain good quality pellets from torrefied grasses. The fate of alkali chlorides and other deleterious components was analyzed, and new issues to be further investigated were identified. The torrefaction tests confirmed its potential as a biomass pre-treatment, able to resolve many of the issues that limit application of high ratios of biomass to co-firing with coal in existing utility boilers while contributing to reduced GHG emissions. For more information, contact Luis Cerezo ([lcerezo@epri.com](mailto:lcerezo@epri.com), 704-595-2687).

### **Solar augmented steam cycles for coal plants.**

*EPRI study includes conceptual design and two case studies.*

A recent EPRI study quantitatively evaluated a range of solar augmented steam cycle design options for existing coal power plants. All of the designs use steam generated by a solar field in a conventional coal-powered steam cycle, offsetting some of the fuel required to generate power or boosting power output. The scope of the study included both a conceptual design modeling effort to evaluate a broad range of solar integration design options and two detailed case studies at pulverized coal plants: Tri-State's 233-megawatt Escalante Generating Station and Progress Energy's 712-megawatt Mayo Electric Generating Plant. The project participants were American Electric Power, Progress Energy, Southern Company, and Tri-State Generation and Transmission Association.

The results have been published in three EPRI reports: a conceptual design report and two detailed case study reports. The three reports are available together as an assembled package: *Solar Augmented Steam Cycles for Coal Plants* (1019290). The three reports include: *Solar Augmented Steam Cycles for Coal Plants: Conceptual Design Study* (1018648), *Solar Augmented Steam Cycles for Coal Plants: Development Guideline Manual for Mayo Plant* (1018649), and *Solar Augmented Steam Cycles for Coal Plants: Development Guideline Manual for Escalante Generating Station* (1018650). For more information, contact Cara Libby ([clibby@epri.com](mailto:clibby@epri.com), 650-855-2382).

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## **GENERATION PLANNING**

### **Power Technology, Market Analysis, and Risk (Program 178)**

#### ***Multi-program project on novel CO<sub>2</sub> removal for PNNL.***

*Study to quantify promise of possible "co-sequestration" of CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub>, and mercury.*

EPRI initiated a study on novel CO<sub>2</sub>-removal for the Pacific Northwest National Laboratory (PNNL, a division of Battelle). The goal is to quantify the promise of possible "co-sequestration" of CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub>, and mercury via yet-to-be-defined technology configurations in a very dynamic marketplace. The first phase of research is aimed at technology specification – establishing baselines of the evolving state-of-the-art and exploring alternatives. Later phases will refine the technology analysis and define potential markets, domestically and internationally. The latter will be heavily influenced over the intermediate term by both non-CO<sub>2</sub> anti-coal regulations and natural gas economics. The initial EPRI team has been drawn from both the Generation and Environment sectors. For more information, contact Jeremy Platt ([jplatt@epri.com](mailto:jplatt@epri.com), 650-855-2628).

#### ***2010 agenda for Power Markets & Enterprise Risk R&D.***

*Projects under way in five areas.*

*Power Markets & Enterprise Risk R&D (PS178C) is undertaking project in five areas this year including:*

- Wind, solar, cycling: implications of intermittent generation (wind, solar, fossil cycling) on market forecasting methods and financial risk management methods.
- Long-term portfolio planning under uncertainty: Methods for analyzing long-term portfolio planning strategies, given the substantial uncertainties we face (carbon, renewable standards, technology breakthroughs, fuel pricing, etc.).
- Enterprise risk: Sharing of experiences among energy firms that are undertaking centralized "enterprise risk" efforts; methods to measure and quantify (in dollar terms) types of risks that are intangible (e.g., public relations risk, operations risk, etc.).
- Credit risk: Methods to calculate appropriate levels of collateral in trading activities, particularly given what we have learned about credit risk in the current financial crisis.
- Webcast series: Talks on EPRI research and other industry projects designed to provide insights on market forecasting, financial risk management, and portfolio planning.

To join the webcast invitation list and/or join the member "task forces" for one or more projects, contact Art Altman ([aaltman@epri.com](mailto:aaltman@epri.com), 650-855-8740).

***Plant Barry CCS demonstration holds groundbreaking ceremony.***

*Facility to capture CO<sub>2</sub> and store it at underground site 10 miles from plant.*

Alabama Power and Southern Company broke ground April 14 on the construction of a project to demonstrate carbon capture and sequestration (CCS) at the Barry Electric Generating Plant near Mobile, Alabama. The project is being supported by the U.S. Department of Energy (DOE), Mitsubishi Heavy Industries Ltd. (MHI), and an EPRI collaborative as one of two post-combustion CCS projects in EPRI's Industry Technology Demonstrations program.

The demonstration facility plans to capture and store 100,000 to 150,000 tons of carbon dioxide (CO<sub>2</sub>) per year from the plant's coal-fired electricity production. The CO<sub>2</sub> will be supplied to the DOE's Southeast Regional Carbon Sequestration Partnership (SECARB), which will transport it by pipeline from the plant and store it underground at a site within the area of Citronelle Oil Field, about 10 miles from the plant, operated by Denbury Resources. The Southern States Energy Board is leading the SECARB effort.

"Southern Company is playing a leadership role in developing energy solutions that make technological, economic and environmental sense," said David Ratcliffe, Southern Company chairman, president, and CEO. "Through this project and others, Southern Company and its partners seek to better understand the impacts of reducing CO<sub>2</sub> emissions from electricity generation. The Plant Barry project is designed to demonstrate start-to-finish CCS technology, an important step toward commercialization."

The CO<sub>2</sub> capture technology to be used in this project, called KM-CDRTM, was jointly developed by MHI and the Kansai Electric Power Company Inc. The advanced amine-based solvent process has been demonstrated on smaller scale at a coal-fired generating station in Japan, and is being deployed commercially on natural gas-fired systems around the world. The Barry project represents the largest coal-fired demonstration of this technology.

EPRI's Hank Courtright, Senior VP, Member & External Relations, presented EPRI's perspectives on the key role of CO<sub>2</sub> capture and storage (CCS) in any national effort to achieve the levels of CO<sub>2</sub> reduction being discussed by the U.S. Congress, and the importance of demonstrations such as the AEP and Southern projects in fulfilling that role.

Plant Barry, located in Bucks, Alabama, has a total capacity of generating 2,525 megawatts and includes seven generating units – five coal-fired units and two natural gas-fired combined-cycle units. For more information, contact Andrew Maxson ([amaxson@epri.com](mailto:amaxson@epri.com), 650-855-2334).

***Progress continues on post-combustion integrated capture and storage demonstrations.***

*AEP/Alstom chilled ammonia project continues to accumulate hours of operation and CO<sub>2</sub> injection; preparations for the Southern/MHI KM-CDR™ 25 MW CO<sub>2</sub> project remain on track.*

At AEP's Mountaineer Station, the CO<sub>2</sub> chilled ammonia 20-MW Product Validation Facility has captured approximately 10,000 tonnes of CO<sub>2</sub> since its startup in early September 2009 as it ramps up to full flow and ammonia loading in the solvent while also addressing typical startup issues. Of this amount, about half has been injected into the two storage formations under the plant, and they are accepting the CO<sub>2</sub> with no apparent problems. A recent well integrity test, required by the underground injection permit, detected no CO<sub>2</sub> leakage around the well. EPRI will be scheduled to conduct its first independent performance test as soon as AEP and Alstom determine that the capture unit is operating in a representative mode.

On April 27-28, AEP, in collaboration with the Southern Company and EPRI, hosted an introduction to the two post-combustion CCS projects for invited attendees from six power companies, three railroads, and one coal company. AEP CEO Mike Morris and members of his executive team hosted a dinner at AEP's headquarters, followed by presentations on both the AEP project and the Southern Company/MHI advanced amine process CCS project. The next morning, the participants boarded a bus for New Haven, West Virginia, where they toured the project site at AEP's Mountaineer Plant.

For the project with Southern Company and its capture partner, MHI, EPRI's current efforts are focused on providing information to the DOE contractor in charge of preparing the Environmental Impact Volume, which will contain the data needed to determine and prepare the next level of environmental review for the drilling and injection phase of this DOE-sponsored effort (the storage portion of this project is largely funded by the DOE under its Regional Carbon Sequestration Partnerships program, through the Southeast Carbon Sequestration Project [SECARB], and EPRI is managing that effort). In parallel, EPRI also is preparing the UIC permit. For the capture side of the project, Southern Co. and MHI continue to finalize the design of the 25 MWe pilot and construct infrastructure items. For more information, contact Andrew Maxson ([amaxson@epri.com](mailto:amaxson@epri.com), 650-855-2334).

### ***IGCC with CCS demonstration.***

*Results of two engineering studies published as technical reports and presented in webcast.*

Funders of the IGCC w/CCS demonstration program met April 16 for a webcast presentation of the results of recently completed engineering studies. The studies, published as EPRI technical reports 1020404 and 1020796, evaluated carbon capture retrofit options for the operating Tampa Electric Polk IGCC power plant. Report 1020404, which evaluated conventional chemical and physical solvent-based CO<sub>2</sub> capture processes, was conducted using EPRI Technology Innovation program funds and is available to all EPRI members with access to such reports. The content of report 1020796, which focuses on novel technologies to accomplish the CO<sub>2</sub> capture as well as an approach to purify the CO<sub>2</sub>, was produced with demonstration program funding and is available for purchase.

Both studies evaluated technology options on the basis of thermodynamic performance and capital cost and concluded that there are multiple viable options to consider going forward. For more information, contact Ron Schoff ([rschoff@epri.com](mailto:rschoff@epri.com), 704-595-2554) or Andrew Maxson ([amaxson@epri.com](mailto:amaxson@epri.com), 650-855-2334).

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## **TECHNOLOGY TRANSFER**

### ***2010 Technology Transfer Award Nominations Open.***

*Submission deadline is Aug, 31.*

EPRI annually recognizes members' contributions, leadership, and innovation in applying research results through the Technology Transfer Awards. The nominations are open to recognize members who have championed the successful application of EPRI-sponsored research completed between 2009 and 2010. These awards will be presented at the March 2011 Advisory Meetings. Details on the nomination process, selection, and nomination submittal form are at [www.epri.com](http://www.epri.com) under Applying Results. The deadline for submitting nominations is August 31, 2010.

You can upload the 2009 award recipients, member value success stories, and a video showcasing the voice of the member from the [Technology Transfer Awards page](#). Sharing these successes can help increase the value your investment in the research and development collaborative through greater awareness and application of results. For more information, contact Susan Rodgers ([srodgers@epri.com](mailto:srodgers@epri.com), 704-595-2072).

### ***Stories highlight applications of EPRI results.***

*Three new success stories published.*

Three EPRI member companies recently shared the details of their successes in applying EPRI research results in published success stories:

- [Ameren Improves Reliability at Four Plants](#) (1020480) – Ameren has developed cost-effective ways to improve performance and reliability at four fossil power plants by implementing EPRI's Plant Maintenance Optimization (PMO) and Plant Reliability Optimization (PRO).
- [AEP Explores Root Cause, Corrective Actions for Blade Cracking](#) (1020429) – American Electric Power (AEP) and a group of other owners/operators of General Electric 7FA gas turbines asked EPRI for an independent root cause analysis of failures of the first row (R-0) of the gas turbine compressors.

- [Southern and EPRI Conduct Pilot Project for Fleetwide Monitoring and Diagnostic Center](#) (1020935) – For the last two years, EPRI and Southern Company have collaborated on a pilot project to implement new methodologies and quantify the benefits of a Fleetwide Monitoring and Diagnostic (M&D) Center. Using guidance from EPRI publications and forums, the pilot helped the utility understand the potential for achieving plant performance targets and to plan the fleetwide deployment of the center.

For more information, contact Susan Rodgers ([srodgers@epri.com](mailto:srodgers@epri.com), 704-595-2072) or visit the “[Applying Results](#)” page at [epri.com](http://epri.com).

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## OUTREACH ACTIVITIES

### Legislative

#### ***EPRI Generation Advisory and Sector Council Meetings.***

John Novak, EPRI Executive Director, Federal and Industry Activities, Environment and Generation, gave presentations on “International climate negotiations, climate and energy legislation, EPA regulation of CO<sub>2</sub>, other environmental issues, and the federal budget and the impact on generation options” to the Renewable Generation program advisors, to the CCS program advisors, and to the Generation Sector Council.

#### ***CSLF Financing Roundtable – Commercial and Financial Structuring of Commercial Scale Projects with CCS.***

On April 6, EPRI’s Tom Wilson and Novak participated in a Carbon Sequestration Leadership Forum Roundtable on CO<sub>2</sub> Capture and Storage. The roundtable objective was to engage the investor community in a dialogue on the critical policies and incentives needed to finance and build the initial wave of energy or industrial plants with CCS in the European Union (EU) and North America, leading to recommendations for consideration by G8/G20 deliberations with global impact. Participants in the roundtable included senior representatives from the U.S. Department of Energy, and government, academic, and industry representatives from the EU, Australia, and the U.S. Wilson gave a presentation entitled, “Financial Incentives for Deploying Carbon Capture and Storage: How Much Are They Worth?”

#### ***Meeting with Department of Energy Office of Fossil Energy.***

On April 13, EPRI Generation VP Carolyn Shockley, Generation directors and technical staff, and Novak held an all-day meeting at the Pittsburgh Airport with the DOE Office of Fossil Energy. DOE participants included Office of Fossil Energy Assistant Secretary Jim Markowsky; the deputy assistant secretaries; DOE National Energy Technology Laboratory (NETL) Director Anthony Cugini; NETL Deputy Director Ralph Carrabetta; Director of the Strategic Center for Coal Scott Klara; and Director of Coal Demonstrations Brad Tomer. The meeting was to share information on the RD&D needed to achieve cost and performance goals for advanced coal with CCS, the RD&D under way, and the gaps in RD&D, to reach agreement on the RD&D needs and gaps, and to discuss how to move forward on the needs and gaps. For more information on these activities, contact John Novak ([jnovak@epri.com](mailto:jnovak@epri.com), 202-293-6180).

### EPRI in the news

EPRI and its members recently made headlines in a number of media outlets, including:

#### ***April.***

April 1 – EPRI’s R&D into robotic repair tools for power system components was the cover story for the April issue of *Energy-Tech* magazine.

April 3 – EPRI’s Sixth International Conference on Advances in Materials Technology for Fossil Power Plants was featured in the April issue of *Advanced Materials & Processes*.

April 7 – CoalFleet’s Ron Schoff was interviewed about the status of global CCS development for an article in *Electric Perspectives*.

April 9 – EPRI’s solar hybrid demo projects and its membership in the SolarTAC were cited in a *Renewable Energy World* article about development of parabolic concentrated solar technologies.

April 10 – EPRI’s R&D into concentrating solar photovoltaic (CPV) technologies was featured in an article in *Global Solar Technology* magazine.

April 15 – Art Altman of the Generation Planning team was interviewed by Pauline McCallion of *Energy Risk* magazine for a story on the credit reforms proposed in January by FERC.

April 16 – Great River Energy’s “DryFining” coal drying project and EPRI’s supporting R&D were the subject of an article in *Inside Power Plant*.

April 29 – EPRI research on the levelized cost of wind energy was cited in a *Reason* magazine article about hidden costs associated with developing the wind generation site of Cape Cod.

April 29 – *Denver Business Journal* ran a story about a \$3.1 million grant to the University of Colorado that would enable it to partner with EPRI to study thin liquid ionic membranes that would be used to capture carbon dioxide.

## **May.**

May 1 – EPRI’s work with FirstEnergy on several renewable and other environmental projects was mentioned in a *Toledo Blade* story about the prospects for federal climate change legislation.

May 5 – A *ClimateWire* article about EPA’s solicitation of comments on proposed rules regarding fly ash disposal cites an EPRI analysis that the selling of the material by utilities generates \$5 billion to \$10 annually to coal-burning utilities.

May 14 – EPRI’s R&D on carbon capture and storage (CCS) was cited in a *Greenbiz/World Resources Institute* series of articles coordinated with the annual CCS conference in Pittsburgh.

May 15 – *Electric Light & Power* referenced EPRI’s objective and independent validation of the 90 percent CO<sub>2</sub> capture rate achieved at We Energies’ Pleasant Prairie coal-fired plant.

May 16 – EPRI’s Stu Dalton was quoted about the need for CCS R&D in a *Sydney (Australia) Morning Herald* article based on an interview at the CCS Conference in Pittsburgh.

May 16, 2010 – An article in *Geothermal Digest* noted EPRI’s support for several “cutting-edge” geothermal technologies.

May 17, 2010 – EPRI’s power generation research in the Generation Planning program was cited in an article in *Environmental Noise* about siting of wind turbines.

May 17 – EPRI’s validation of the results from the pilot-scale tests of the Alstom chilled ammonia capture process was cited in an article in *ClimateWire*.

May 20 – Stan Rosinski, manager of renewables generation, and Chuck McGowin, senior project manager for wind R&D, were interviewed by Bill Opalka, editor of *RenewablesBiz Daily* and editor-in-chief of Energy Central, for an article following up on the wind O&M story in the spring issue of the *EPRI Journal*. The story was the lead in the next day’s issue of the publication.

May 25 – EPRI senior VP Hank Courtright was quoted and EPRI Prism and MERGE analysis referenced several times in an *Arkansas Democrat Gazette* article about the challenges associated with producing adequate supplies of electricity while maintaining its affordability.



May 26 – The Solar Technology Acceleration Center (SolarTAC) issued a press release announcing EPRI's membership. The release was picked up by *EnergyBiz*, *MarketWatch*, and *Earthtimes*, among many other media outlets.

May 26 – EPRI's wind power R&D was cited in a *Renewable Power News* article on the history of wind power development in California.

May 26 – *R&D Magazine* ran an article about experiments to engineer a porous compound into a sponge-like substance that soaks up carbon dioxide. The story cited EPRI's role in analyzing new materials for an industrial-scale carbon-capture process.

May 27 – Art Altman was quoted in an *Energy Risk* article suggesting that federal financial overhaul legislation could impose significant collateral problems that will affect their operational capabilities if over-the-counter derivatives products are forced onto an exchange.

For more information about EPRI's Generation Sector communications, please contact Jeff Brehm ([jbrehm@epri.com](mailto:jbrehm@epri.com), 704-595-2521).

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