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EPRI Details Advanced Coal Generation Technologies to Meet CO_2 Emissions Limits Without Carbon Capture & Storage

PALO ALTO, Calif. - (November 11, 2015) – Carbon capture with underground storage (CCS) is considered by many to be the best option to reduce carbon dioxide (CO_2) emissions from coal-fired power plants. But development and application of CCS systems face significant technology, policy, and cost challenges.

The Electric Power Research Institute (EPRI) looked at several technologies available or in development that have the potential to enable power plants fueled solely by coal to significantly reduce CO_2 emissions through more efficient combustion and use of heat. The results of EPRI's study have been published in a new white paper, *Can Future Coal Power Plants Meet CO_2 Emission Standards Without Carbon Capture and Storage?* (EPRI report 3002006770).

EPRI's paper analyzes current and anticipated U.S. and global CO_2 emission standards for coal plants, identifies key challenges associated with CCS deployment, and provides detailed descriptions of coal-only technologies that are not ready for commercial deployment but that present significant opportunities to reduce CO_2 emissions.

Today's most efficient coal-fired plants are the "ultra-supercritical" plants that produce steam at high temperature (above 593°C or 1100°F) and emit approximately 800 kg (1760 lb) CO_2/MWh. EPRI looked at several technology options for increasing the thermal efficiency of the processes for generating electricity with coal, including:

- Rankine cycles (used by most of today's coal plants) with higher steam temperatures;
- Combined heat and power applications (also known as cogeneration); and
- Coal gasification integrated with one of four systems -- combined cycles (gas turbine plants), supercritical CO_2 Brayton cycles (which use the CO_2 instead of water or steam as the working fluid), solid oxide fuel cells (SOFCs), and "triple cycles" (a combination of combined cycles and SOFCs).

However, none of the options considered in EPRI's analysis are currently commercially available, economically viable, and suitable for broad deployment. National R&D programs in the United States and elsewhere are making progress, but additional public-private R&D investment is needed to accelerate the deployment of many of these technologies.

"It's critically important for the electric power industry to have as many generation technology and fuel options as possible," said EPRI Vice President of Generation Tom Alley. "Reducing emissions will be one of the key drivers as the industry makes decisions about existing assets and about the designs and fuels used in the next generation of power plants. EPRI research like this can be invaluable in informing those decisions."

About EPRI

The Electric Power Research Institute, Inc. (EPRI, www.epri.com) conducts research and development relating to the generation, delivery and use of electricity for the benefit of the public. An independent, nonprofit organization, EPRI brings together its scientists and engineers as well as experts from academia and industry to help address challenges in electricity, including reliability, efficiency, health, safety and the environment. EPRI's members represent more than 90 percent of the electricity generated and delivered in the United States, and international participation extends to 40 countries. EPRI's principal offices and laboratories are located in Palo Alto, Calif.; Charlotte, N.C.; Knoxville, Tenn.; and Lenox, Mass.

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