Washington University in St. Louis

News Release

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Advancing coal technologies for a global benefit

Peabody continues to support low-carbon energy solutions

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A new facility at Washington University in St. Louis recently began full-scale operations. The "SPOC" facility is the only one of its kind and is poised to help researchers make significant advancements in the reduction of carbon dioxide emissions.

Washington University in St. Louis is committed to cleaner, more sustainable global energy options that involve advancing a wide variety of technologies-- from lowering the carbon footprint of fossil fuel plants, to the development of renewable energy and improving energy storage.

A new research facility, which just began full-scale operations, has poised Washington University's researchers to make significant advancements specifically in the reduction of carbon dioxide emissions generated by coal-fueled power plants. Researchers are using a novel and promising approach called staged pressurized oxy-combustion (SPOC), which harnesses the energy from steam emitted during combustion, thus improving plant efficiency in the carbon capture process.

The work is led by the university's Consortium for Clean Coal Utilization, established in 2008 with support from Peabody and Arch Coal. This research is critical given coal continues to be an important component of the world's energy mix, being both a reliable and low-cost energy source.

In addition to the new SPOC research facility, the consortium operates a state-of-the-art, 1-megawatt research facility where early-stage technologies conceived in Washington University laboratories are evaluated to determine their scalability. These combined facilities make it possible for faculty, international collaborators, students and industry partners to test carbon capture technologies, emission controls, biomass and oxy-coal combustion, and process efficiency improvements.

Beyond Peabody's initial support to establish the consortium, the St. Louis-based coal company has pledged an additional $1.5 million to advance the consortium's on-going research.

"The consortium is deeply grateful to Peabody for their generous support, which has enabled Washington University to continue serving as an international center for advanced low-carbon coal technologies," said Rich Axelbaum, the Stifel and Quinette Jens Professor of Environmental Engineering Science, director of the consortium and professor of energy, environmental and chemical engineering.

"Since the industrial revolution, coal and other fossil fuels have driven unprecedented growth in life span, population, income, education and quality of life, and have done so by providing us with energy 24/7/365. The consortium has worked diligently to advance technologies for the cleaner utilization of coal for a global benefit, and we look forward to further growth and contributions to this important field."

The Consortium for Clean Coal Utilization is one of seven signature partners within Washington University's International Center for Energy, Environment and Sustainability (InCEES). As the consortium approaches its 10th anniversary, other accomplishments, achievements and collaborations stand out:

- **20** research projects have been supported;
- **114** peer-reviewed papers and **one** book have been published;
- **21** Washington University faculty have been supported at the consortium, with **18** international collaborators;
- **Nine** international and **four** U.S. research institutions have partnered with consortium faculty to perform advanced coal research; and
- About **$25 million** has been raised in external funding — **$13.7 million** from industry partners (including Peabody and Arch Coal) and over **$11 million** from government agencies.

"The Consortium for Clean Coal Utilization is a world-class research center and a hub for international collaboration on developing clean energy processes fueled by coal," said Glenn Kellow, Peabody president and chief executive officer. "Coal remains an essential part of the world's energy mix, and technologies are central to continuing to reduce the emissions profile. The consortium has a strong network of global universities and academicians who are all working toward low-carbon systems, and we are pleased to support this work in a meaningful way."

About Peabody

Peabody believes deploying high-efficiency, low-emissions (HELE) technology that is available today and investing long-term in carbon capture technologies must be part of the solution to achieve goals of substantial reductions in greenhouse gas emissions. Peabody has invested $300 million over the past two decades in global partnerships and projects in Australia, China and the United States to deploy today's clean coal technologies and advance next-generation solutions toward near-zero emissions from coal plants.

Peabody is the leading global pure-play coal company, serving power and steel customers in more than 25 countries on six continents. The company offers significant scale, high-quality assets, and diversity in geography and products. Peabody is guided by seven core values: safety, customer focus, leadership, people, excellence, integrity and sustainability. For further information, visit PeabodyEnergy.com.

About Washington University

Washington University is counted among the world's leaders in teaching and research, and it draws students and faculty to St. Louis from all 50 states and more than 100 nations. The total student body is more than 14,000 undergraduate, graduate and professional students.

The approximately 3,400 faculty teach in seven schools: Arts & Sciences, Brown School, Olin Business School, Sam Fox School of Design & Visual Arts, School of Engineering & Applied Science, School of Law and School of Medicine. Twenty-four Nobel laureates have been associated with Washington University, with nine doing the major portion of their pioneering research there.

The university offers more than 90 programs and almost 1,500 courses leading to bachelor's, master's and doctoral degrees in a broad spectrum of traditional and interdisciplinary fields, with additional opportunities for minor concentrations and individualized programs.