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Good morning, Chairman Boucher and members of the Subcommittee. Thank you for the opportunity to testify on behalf of the Environmental Protection Agency (EPA or Agency). My name is Bill Wehrum and I am the Acting Assistant Administrator for EPA's Office of Air and Radiation. With me this morning is Benjamin Grumbles, EPA's Assistant Administrator for the Office of Water. We both would be pleased to answer any questions the Subcommittee may have with respect to capture and geologic storage of carbon dioxide from power plants, the subject of this hearing.

As you know, the President and this Administration are firmly committed to taking sensible action on climate change. The Administration's policy is science-based, encourages research breakthroughs that lead to technological innovation, and harnesses the power of markets to commercially deploy those technologies.

As my colleague from Department of Energy (DOE) explained, the Administration is actively investigating the prospects for carbon dioxide capture from power plants and other

industrial sources and long-term storage in geologic formations. Our testimony today will focus on EPA's role in ensuring that carbon capture and storage is developed and deployed in a manner that safeguards the environment. We are focusing our efforts on two fronts: (1) partnering with public and private stakeholders to develop an understanding of the environmental aspects of carbon capture and storage that must be addressed for the necessary technologies to become a viable strategy for reducing greenhouse gases; and (2) ensuring carbon dioxide storage is conducted in a manner that protects underground sources of drinking water, as required by the Safe Drinking Water Act. Before discussing each of these EPA efforts in turn, I would like to briefly discuss the role of coal in our nation's energy future.

I. ROLE OF COAL AND CARBON CAPTURE TECHNOLOGIES

Coal is an essential fuel to achieve energy security and increase economic prosperity in the United States. Currently, about 50 percent of electricity in the United States is generated from coal, and at current rates of consumption, U.S. coal reserves are large enough to meet our energy needs for more than 200 years. To achieve our goal of energy security, coal must to continue to play a major role in the generation of electricity in this country. Carbon dioxide capture and storage can potentially make a significant contribution to reducing greenhouse gas emissions from coal-fired electricity generation, while allowing continued use of our ample coal reserves.

To address the potential environmental impact of coal-fired power plants, EPA, DOE, and others are exploring technological innovations that would allow coal to be burned more efficiently and with fewer emissions. Recognizing the importance of advanced coal technology,

EPA is already working to ensure that these new technologies are deployed in an environmentally responsible manner.

II. ADVANCED COAL TECHNOLOGY

EPA is examining how we can facilitate the use of advanced coal technologies through research and the efforts of a recently-convened work group of private and public stakeholders. Through our efforts, we are gaining a better understanding of how the use of carbon dioxide capture technologies could impact existing power plants and affect the siting, engineering, and design of new ones.

At the recommendation of the Clean Air Act Advisory Committee, EPA established the Advanced Coal Technology Work Group in January 2007 to discuss and identify the potential barriers and opportunities to create incentives under the Clean Air Act for the development and deployment of advanced coal technologies and specifically geologic sequestration. The Work Group includes participants from electric utilities, coal companies, equipment manufacturers and pollution control providers, States and Tribes, public utility commissions, environmental and public health organizations, academia, and Federal agencies such as DOE and the Department of Defense.

The Work Group is developing a set of shared recommendations that could be undertaken by various stakeholders (e.g., EPA, DOE, DOD, States, Tribes, utilities, public utility commissions, equipment providers, and environmental and health organizations) to accelerate the development and use of advanced coal technologies. In its work to date, the Work Group has discussed a wide range of issues associated with the commercial use of advanced coal

technologies. We believe that an approach involving a shared set of actions to address some of these issues will provide the greatest opportunity to advance the technology most quickly.

With respect to carbon dioxide capture and storage, key issues identified by the Work Group include: (1) the availability and cost of capture technologies for new and existing pulverized coal and integrated gasification combined cycle power plants and how to encourage "first mover" projects that capture and store carbon dioxide; (2) regulatory and other measures to accelerate the pace of carbon capture and storage; (3) the siting of power plants, including the availability and location of pipeline capacity to transport carbon dioxide to a suitable geologic formation for long-term geologic storage; (4) monitoring and verification to ensure the storage of carbon dioxide is effective; (5) liability concerns associated with carbon capture and storage; (6) legal issues involving property rights implicated by long-term storage; (7) public education and outreach; and (8) the development of the expertise needed to capture carbon dioxide from power plants and store it in suitable geologic formations. These issues will be explored more fully in coming months. The Work Group plans to issue an interim report in June 2007, with the final report planned for January 2008.

As a result of the Work Group's discussions, we are developing an understanding of the different aspects of carbon dioxide capture and storage that need to be examined and addressed if geologic carbon dioxide storage is to become a viable strategy for reducing greenhouse gases on a large commercial scale. Addressing these issues will require an integrated approach that focuses on providing incentives and reducing barriers (e.g., economic, legal) for "first mover" projects and in the process paves the way for the ability to store carbon dioxide in geologic formations in the future.

In further support of advanced coal technology, EPA is contributing to existing research to advance carbon dioxide capture technology. The Research Triangle Institute (RTI) was recently awarded a three-year, $4 million cooperative agreement from DOE to continue the development of a carbon dioxide capture technology that is based on an inexpensive, dry, reusable sorbent. The technology has been in development at RTI for the past five years and is designed to reduce carbon dioxide emissions at coal-fired power plants, as well as natural gas plants, cement plants, and petroleum refineries. RTI is currently working with EPA's Office of Research and Development (ORD) to further develop the technology at the bench-scale and will continue to work with ORD, as well as several other companies and organizations, to demonstrate the technology at ORD's pilot-scale Multipollutant Combustion Research Facility at the Research Triangle Park, NC campus.

III. GEOLOGIC CARBON DIOXIDE STORAGE

Another focus of the Agency is the development of risk management strategies to ensure that carbon dioxide injection and long-term geologic storage are conducted in an environmentally responsible manner. After realizing the potential future importance of this technology, the Office of Air and Radiation and the Office of Water began working together on this issue. We determined that the underground injection of carbon dioxide is subject to the Underground Injection Control (UIC) Program of the Safe Drinking Water Act (SDWA), which regulates injection activities to protect current and future sources of drinking water. In carrying out our responsibilities under the Safe Drinking Water Act, EPA's goal is to ensure protective, effective storage of carbon dioxide injection in suitable geologic formations.

EPA has more than 30 years of experience overseeing the UIC Program. Under this program, EPA works closely with States to ensure that underground injection is conducted in a manner that protects ground water and drinking water. There is a significant amount of expertise and experience in transporting and injecting carbon dioxide, particularly in the oil and gas sector. Annually, billions of gallons of fluids are injected via wells which are authorized under State and Federal Underground Injection Control Programs. Approximately 35 million tons of carbon dioxide are injected annually and, in the Southwest United States, there is an extensive infrastructure to transport and inject carbon dioxide for enhanced oil and gas recovery. Although the knowledge gained from these activities is extremely useful, we do not have experience in integrated carbon dioxide capture and storage technologies on a commercial scale for coal-fired power plants. Developing this expertise is essential to ensuring the potential utility of carbon dioxide capture and storage technology.

DOE's research efforts to integrate and demonstrate carbon dioxide capture and storage will go a long way toward reducing costs and providing the data needed for EPA and States to develop appropriate risk management strategies. My DOE colleague's testimony lays out the Department's plans to develop this critical technology. In the next year or so, DOE, acting through its Regional Partnerships, will implement many field tests of carbon dioxide injection throughout the country in a variety of geologic settings. DOE will also conduct a smaller number of larger tests and ultimately include commercial-scale projects such as FutureGen, a $1 billion project to create the world's first zero-emissions fossil fuel plant, and other industry sponsored efforts.

To support these policies, EPA has developed UIC permitting guidance that recommends treatment of injection wells associated with research and development projects as "experimental

technology" wells, which are covered under our existing regulations. Our goal is to provide guidance that facilitates permits while encouraging environmentally responsible injection activities. Another goal of the guidance is to promote information exchange between project proponents and regulators, which will eventually support the development of a long-term management strategy for future geologic carbon dioxide storage projects and answer public questions about the emerging technology. The guidance recommends a workable UIC permitting approach for the next several years while more data are gathered to determine the most appropriate management framework for large-scale commercial deployment of geologic carbon dioxide storage.

IV. CONCLUSION

EPA understands that making environmentally responsible use of the nation's large reserves of coal is important for public health, the environment, economic growth, and energy security. We are committed to working with DOE and our other public and private partners to accelerate the important work underway to realize the significant potential of carbon dioxide capture and geologic storage of coal-fired power plant emissions.