

**U.S. House of Representatives Committee on Science, Space, and
Technology Subcommittees on Environment and Energy**

EPA Power Plant Regulations:

Is the Technology Ready?

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Thank you for the opportunity to address this very important topic.

Carbon Capture and Storage as well as Carbon Capture Utilization and Storage (CCS/CCUS) are critically important to our nation, and I am glad Members of Congress are taking the time to understand the state of today's technology. CCUS is both an environmental solution and an important component of a business strategy. It is a business strategy that allows companies to meet EPA greenhouse gas (GHG) regulations, increase domestic oil production, and create domestic jobs by means of CO₂-EOR. CCUS also is necessary to assure a diversified domestic energy portfolio for energy security. It also helps minimize future rapid escalations in electricity prices, allowing a real "All of the Above" energy portfolio that includes our most abundant domestic resources – clean fossil energy from coal, oil, and natural gas.

Studies have verified that implementation of CCUS technology is necessary to comply with EPA's proposed New Source Performance Standard (NSPS) regulation and meet the GHG targets necessary for limiting CO₂ emissions to our atmosphere. However, commercial CCUS technology currently is not available to meet EPA's proposed rule. The cost of current CO₂ capture technology is much too high to be commercially viable and places the technology at similar economic thresholds of alternative clean, carbon-free energy alternatives currently being subsidized.

CCUS is also necessary to achieve President Obama's June 25th Climate Action Plan, a comprehensive program of domestic GHG emission reductions, adaptation measures, and international activities to address climate change. Global climate change, as the name indicates,

must be addressed globally in order to make a difference. The world is and will remain dependent on fossil fuels for many decades to come to provide low cost, readily available and reliable energy.

The President's Plan can only be achieved through the broad global deployment of low cost, commercially viable technology for capturing and permanently and safely storing/utilizing CO₂ from all fossil energy sources. Technology exists for separation and capture of CO₂ at the plant, but it increases the cost of generated electricity by about 80%. CO₂ pipeline technology is mature, but can face siting issues. While injection of CO₂ into deep geologic storage formations is being evaluated, it has only been done successfully on a relatively small scale at a few sites around the globe. And the Department of Energy's (DOE) Regional Carbon Sequestration Partnerships are still developing the needed data base to help analyze the success of its deployment. Saline injection also faces regulatory barriers, such as liability for leakage extending 50 years beyond the time injection ceases, and unresolved property rights issues. CO₂ injection into oil bearing geologies for Enhanced Oil Recovery (EOR) has been practiced safely for over 50 years. Although the geologies are known to have permanence for storage, the long-term measurement, monitoring, and verification of these geologies has not been practiced for CO₂ storage.

DOE, in partnership with industry, is pursuing a research, development, and demonstration (RD&D) program to address all of these issues, especially CO₂ capture cost reduction, but affordable solutions may be decades away with the current level of funding and resultant R&D strategy. Moreover, the timing of retirement of existing coal-fired units, based on

age and regulatory pressures, and the modest amount of new domestic power plant capacity resulting in part from the weak economic recovery, could lead to further delays in commercializing this necessary technology in our country. Internationally, however, the drive to provide electricity to those in developing nations is in full force and the year-over-year demand for coal globally is up 20% due to the pressure to eliminate energy poverty.

The DOE's coal research and development funding levels must be increased to enable the pursuit of demonstration projects to move transformational, low cost CCUS technology from the laboratory to the commercial marketplace in a timely manner. The sequester and persistently low budget request numbers have resulted in cuts to coal R&D at rates significantly lower than other DOE programs. An additional \$100 million per year directed at low-cost, transformational CCUS could enable the demonstration of commercially viable CO₂ capture technology within ten years. While a considerable amount of technical risk would be required to undertake a program with this short of a schedule, it can be done.

Such risk could be made manageable through the build-out of DOE's extensive scientific and engineering CCUS database, along with the scaling and system integration experience provided by the major CCS demonstration projects – such as the Kemper Project, scheduled to go on line in 2014.

These demonstration projects were funded with stimulus dollars. However, the stimulus dollars were focused on near term jobs creation and had associated “sunset clauses” not typically part of demonstration program funding. Sunset clauses force the demonstration of first of kind technologies on an “artificial” legislated schedule – not a schedule determined by the

management of risks associated with the scaling and integration of complex new technologies and the acquisition of financing for multi-billion dollar first-of-a-kind plants. While a large amount of stimulus monies were provided, they were sufficient to cover only about 20% or less of the costs of many of the major fossil/CCS/CCUS power plant demonstration projects. This required DOE's project partners to acquire billions of dollars in financing for technically and financially risky projects during a period that the U.S. was going through a deep recession – not easily done. This takes much time and effort to accomplish. The stimulus funding sunset provisions scheduled for September 2015 allow for very little time to secure such financing and many good projects could be lost as a result. The Congress may wish to consider extending the sunset provisions and also allowing DOE to transfer stimulus funding between ongoing projects to maximize success.

It is obvious that there is a need for continued funding as is defined by technologies that are not deemed to be “commercially available.” To summarize, in my opinion, it is disingenuous to state that the technology is “ready” and it is wrong to underfund to assure failure if the true goal is “All of the Above.”