

**Written Statement submitted to the House Subcommittee on Energy and Water
Appropriations for the fiscal year 2010 budget request for DOE/FE program elements.
Statement submitted by Ben Yamagata, Executive Director of the Coal Utilization Research
Council (CURC) April 3, 2009**

Introduction

This statement is submitted on behalf of the membership of the Coal Utilization Research Council (CURC), an organization of coal-using utilities, coal producers, equipment suppliers, universities and institutions of higher learning and several state government entities interested and involved in the use of coal resources and the development of coal-based technologies. The CURC welcomes the opportunity to submit this written statement addressing elements of the fiscal year 2010 budget request for the Department of Energy's fossil energy (DOE/FE) program. Because specific funding levels for the fossil energy program have yet to be released, CURC is not able to make specific comments about the level of funding requested for any given fossil energy program. We would welcome the opportunity to provide the Committee with more detailed comments when such a detailed budget is available to the Committee so directed.

The importance of the DOE/FE RD&D program

The Department of Energy's coal-based fossil energy program conducts research, development, and demonstration (RD&D) to develop advanced technologies which further the Nation's energy security, economic, and environmental goals. These technologies are at the heart of the solutions needed to solve major challenges to our economic well-being -- global climate change, over-reliance on imported fuels, and the need for an adequate supply of energy at affordable prices.

Given the importance of coal to the U.S. energy mix and the challenge of global climate change it is imperative that the Department's Fossil Energy RD&D activities be singularly focused upon the goal of rapidly commercializing carbon capture and storage (CCS) technologies as well as technologies to improve the efficiency by which coal is converted to useful energy (increasing the efficiency of coal power plants will reduce the CO₂ emission for each megawatt-hour of electricity generated). Our ability to achieve these goals can be furthered in DOE/FE programs that support power generation as well as industrial uses of coal. Successful deployment of CCS technologies is viewed by most responsible authorities as essential for addressing global climate change. For example, the Pew Center on Global Climate Change has stated that, "*Carbon Capture and Storage (CCS) is the key enabling technology for a future in which we can continue to use our vast coal resources and protect the climate.*"ⁱ And former British Prime Minister Tony Blair stated in November, 2008: "*The vast majority of new power stations in*

China and India will be coal fired not “may be coal fired” will be. So developing carbon capture and storage technology is not optional, it is literally the essence.”

Finally, various analyses have considered the impact of developing and implementing CCS as part of a climate mitigation strategy and concluded that global mitigation costs could be reduced by more than 30% if CCS is widely deployed. This implies savings of trillions of dollars as the world confronts the challenge of cost-effectively controlling CO₂ emissions.

In short, CCS is crucial to meeting our climate mitigation goals, and it also enables coal to continue to provide energy security and economic benefits to the nation.

Budget principles

Because the Obama Administration has not yet released a detailed FY 2010 DOE/FE budget we are not able to comment with specificity as to the importance or adequacy of those levels. However, within this statement, CURC has made several generalized budget recommendations based upon previous administration budget requests. Importantly, these recommendations strongly reflect CURC’s basic principle that the DOE/FE FY-2010 budget must reflect the need to focus upon the commercialization of carbon management technologies. We believe that with adequate focus and resources, reliable commercial-scale CCS projects can be operational by no later than 2020.

The fossil energy program should be focused almost exclusively upon CO₂ control and reduction activities and should be funded at a level of \$500 million annually. The fossil energy program should include –

- Emphasis upon cost-reducing near-term (within the next decade) carbon management technology improvements, such as those that affect the cost of major components of the CCS system, or cause a significant reduction in the demand for parasitic power by CCS technology, or increase a power plant’s efficiency that would both reduce total CO₂ emissions and add power to operate CCS systems;
- augmented funding for demonstration projects in order to “put steel on the ground” now in order to demonstrate currently available CCS technologies and to gain knowledge from their operation; and
- reconstitute the FE advanced research program as the primary means through which work is conducted on longer-term “breakthrough” technologies that might be high risk, but if successful, could reduce mitigation costs by a large amount and also upon those current technologies in the FE portfolio that fall outside of the 2020 commercialization window.

In addition, CURC believes that there are certain enabling measures, such as finding acceptable ways to address long-term liabilities, resolving underground property rights issues, and perhaps creation of interstate CO₂ pipelines, which require resources for development of data as well as policy analysis.

Specific suggestions

Appropriations that historically have been designated for longer-term programs, in our judgment, must be re-directed and focused on those technologies crucial to meeting the principles outlined above. This recommendation by no means should be interpreted as a judgment that promising technologies that could provide very significant benefits towards the cost-effective, efficient use of our Nation's coal resources should not be continued. Simply stated, there are not adequate public resources to do everything that should be done. To this extent, the existing FE fuel cell program as well as the coal fuels and liquids program that received nearly twenty percent of the FE appropriated budget for FY 2009 should be very substantially deferred. There is no question, in our judgment that fuel cells could provide a cleaner and lower cost pathway for power production from coal and other fossil fuels in the future, but if this technology is not likely to be commercially available in a timeframe consistent with our 2020 objective then its funding level should be decreased. Secondly, and particularly in light of the current price of oil and projections that it will rise dramatically once the global recession is over, we believe that there is no longer a Federal role in improving O&G exploration and production technologies. The market provides more than an adequate incentive to develop those technologies. And finally, other programs of equal or greater potential are supported within the FE program but they too may fall outside of the 2020 timeline for commercialization. These technology development areas that might include such endeavors as membrane work or advanced post combustion processes should be supported at minimal levels unless it is determined that they will be commercialized within the 2020 time horizon.

By reducing spending on these programs and redirecting funding into key carbon management technology programs we believe the prospect of achieving immediate (by 2020) CCS goals will be greatly enhanced. Programs that should be candidates for enhanced funding include the following:

- Continuation of and increased focus upon existing gasification programs that support efficiency in the conversion of coal to useful energy and in this way not only is less coal utilized but the power consumed to operate CO₂ capture systems can be generated through greater power plant efficiency. Also funding increases should be made to programs aimed at lowering the costs of oxygen production and increasing the durability of gasifier components.

- Enhancement of funding for FE programs and projects that specifically support technologies that increase the efficiency of coal conversion to energy and that contribute to reducing the costs of CO₂ capture from combustion-based power generation. This emphasis upon advanced combustion would also include increased funding for oxy combustion, advanced solvents for post combustion capture, and increased support for the high temperature materials program for ultrasupercritical cycles.
- Because the majority of CO₂ emissions within the foreseeable future will continue to be generated from the existing coal power generation fleet (in both the United States and abroad) it is vitally important that there also be a major focus upon efficiency improvements and developing capture systems designed to cost effectively retrofit the existing fleet. This means that the existing IEP (innovations for existing plants) program first must be focused almost exclusively upon enhancing carbon management of the existing fleet which includes both carbon capture as well as carbon management through enhanced power plant efficiency. In addition, a modest level of work that is currently underway within the IEP program with respect to water usage should be maintained in that water availability could become a major impediment to efficient and effective use of our coal resources.
- Greater emphasis on carbon management “breakthrough” technologies is warranted. Continuing fuel cell activities and other technology development activity that is very promising but not likely to make significant contributions toward addressing CCS technology commercialization prior to 2020 should be placed into this program account. In this same enhanced program area, the DOE also should focus upon truly innovative approaches to the management of carbon in the utilization of coal. This work could be accomplished in tandem with the Nation’s universities and other national centers of excellence.
- Funding through the DOE’s Regional Carbon Sequestration Partnerships should be increased to accelerate major CO₂ storage demonstration projects. Also, in conjunction with funds made available through the recently enacted economic stimulus package additional funding should be provided to assist industry in characterizing a variety of geologic formations where deep saline storage projects are being identified or undertaken. A principal purpose of these programs should be to acquire greater understanding of underground geology and chemistry with CCS injection.
- And, finally as utilities begin embracing various carbon management technologies we will need programs to train more personnel in these important new areas, both for the

private sector and for public sector employees who regulate the siting and operation of these new carbon storage facilities.

Conclusions:

The stakes have never been higher regarding energy and environmental policy, or the consequences of failing to provide technologies for the future. Our challenge is significant. Success will require commitment, vigilance, and significant resources over an extended period of time. CURC respectfully asks that the Committee provide the Department of Energy the resources it needs to accomplish the important goal of timely development and widespread deployment of carbon management technologies.

Thank you for providing the opportunity for CURC to provide its views to the Committee.

ⁱ Pew Center website, <http://www.pewclimate.org/global-warming-basics/coalfacts.cfm> .