Department of Energy
Washington, DC 20585

May 28, 2009

The Honorable Joe Barton
Ranking Member
Committee on Energy and Commerce
U.S. House of Representatives
Washington, DC 20515-6115

Dear Congressman Barton:

Thank you for your April 20, 2009, letter to Secretary Chu in which you informed us you are conducting oversight of Federal funding and support for large-scale or commercial deployment of carbon capture and sequestration (CCS) technologies. In your letter, you also requested answers to five questions, which I have included as an enclosure.

If you require additional information, please contact me or Mr. Robert Tuttle, Office of Congressional and Intergovernmental Affairs, at (202) 586-5450.

Sincerely,

Victor K. Der
Acting Assistant Secretary
Office of Fossil Energy

Enclosure

Department of Energy
Washington, DC 20585

May 28, 2009

The Honorable Greg Walden
Ranking Member
Subcommittee on Oversight and Investigations
Committee on Energy and Commerce
U.S. House of Representatives
Washington, DC 20515-6115

Dear Congressman Walden:

Thank you for your April 20, 2009, letter to Secretary Chu in which you informed us you are conducting oversight of Federal funding and support for large-scale or commercial deployment of carbon capture and sequestration (CCS) technologies. In your letter, you also requested answers to five questions, which I have included as an enclosure.

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Sincerely,

Victor K. Der
Acting Assistant Secretary
Office of Fossil Energy

Enclosure

Answers to questions posed by Representative Joe Barton and Representative Greg Walden

1. *What types of projects has DOE funded over the past decade to support the commercial deployment of CCS technologies? Please describe the nature of those projects, the timeframe for deployment for each of those projects, and the estimated amounts of funding associated with each of those projects.*

DOE has been funding research and demonstration projects in support of advancing CCS technologies for eventual commercialization. The DOE's Sequestration Program has been in existence for about a decade and has funded a variety of projects on a cost-shared basis to help develop CCS technologies. The research aspect of the Sequestration Program is focused on R&D efforts related to CO_2 capture, geologic sequestration, simulation and risk assessment, monitoring, verification and accounting (MVA), and CO_2 use/re-use. The other major area of the Program is focused on CCS Infrastructure including transport, injection, and geologic storage of CO_2. In this area, DOE is helping to move CCS technology forward by implementing projects in both small-scale field validation and large-scale development projects. This effort is a cost-shared partnership between the DOE and the seven Regional Carbon Sequestration Partnerships which involve a broad range of stakeholders including laboratories, universities, states, industry and others numbering around 350 entities in over 42 states.

The projects under the partnerships will apply CCS technologies for well construction, injection operations, monitoring, and site closure at the project sites and develop best practices for a future CCS industry. The field projects will also address many non-technical issues such as regulatory compliance, liability, pore space ownership, and

public outreach to assist future project developers and to address stakeholders' questions about geologic CCS. In addition, the Program has developed a comprehensive national CO_2 geologic storage atlas that could allow for matching point sources and sinks for CO_2.

Another component of the DOE Program is to leverage other global large-scale CCS projects such as the Weyburn-Midale project with Canada and the Sleipner injection project off the coast of Norway as test beds for technology being developed through the research and infrastructure components of the Sequestration Program. The projects and their implementation are detailed in Roadmaps and Program Plans, Program documents, Project Portfolios, Best Practice Manuals, Factsheets and other reference materials located on DOE's Fossil Energy (FE) and the National Energy Technology Laboratory (NETL) web-sites (see following links for these items: http://www.netl.doe.gov/technologies/carbon_seq/refshelf/refshelf.html , http://www.netl.doe.gov/technologies/carbon_seq/refshelf/project%20portfolio/2008/index.html).

DOE's CCS technology development budget for FY09 is $150 million, of which approximately 1/3 goes toward research and Global Partnerships, while the other 2/3 funds projects in the Infrastructure component (primarily through the Regional Partnerships) of the Program to advance CCS toward commercial demonstration and deployment.

Timeframes for undertaking a project vary depending on the scale and complexity of the project with smallest-scale projects typically lasting 3-4 years in duration and larger-scale (near commercial scale) projects taking upwards of 10+ years to complete. Large-scale

projects may require more time since they are more complex in terms of site selection, characterization, CO_2 injection, and post-injection monitoring.

In addition to the Sequestration Program, DOE is developing a technology base for integrating highly efficient, near-zero-emissions power plants of tomorrow that incorporate advanced CCS technologies upon which commercial demonstrations will be based. For example, the current round of the Clean Coal Power Initiative (CCPI) is focused on demonstrating CCS technologies in coal plants that integrate capture carbon.

All of these efforts will help to prove and advance CCS for future commercial deployment.

2. *Prior to providing funding to support commercial deployment of CCS technologies, has DOE conducted reviews of those projects pursuant to the National Environmental Policy Act of 1969 (NEPA)? If not, please explain the legal basis for not conducting NEPA analyses. If so, please describe (i) the nature of the analyses conducted pursuant to NEPA; (ii) whether an environmental assessment (EA) or an environmental impact statement (EIS) was prepared; and (iii) the length of time required for DOE to complete those NEPA analyses. Please include in this response a description of any reviews conducted by the department pursuant to NEPA in connection with the FutureGen project, and the amount of time required to complete those reviews.*

Prior to funding or engaging in activities involving CCS technologies, DOE has reviewed each project for NEPA compliance purposes. For activities that may have significant impacts on the human environment, DOE has prepared environmental impact statements (EISs). When there was a question as to whether an EIS was required, DOE prepared an environmental assessment (EA) to inform its decision regarding the need for an EIS.

The EISs and EAs that DOE has prepared for CCS technologies include:

Project	Type of review	Time to complete
Ocean Sequestration of CO_2	EA	2/2000-3/2001
Consol's (WV) coal seams sequestration test	EA	11/2001-3/2003
Carbon Research Center (AL) capture project	EA	6/2008-9/2008
SECARB* Phase III Early Test (MS)	EA	7/2008-3/2009
MGSC** Phase III Large-Scale Field Test (IL)	EA	7/2008-11/2008
MRCSP*** Phase III Sequestration Test (OH)	EA	10/2008-present
Kemper Co. IGCC w/ CO_2 capture (in progress)	EIS	9/2008-12/2009
FutureGen Project	EIS	7/2006-11/2007

*Southeast Regional Partnership
** Midwest Geological Sequestration Consortium
*** Midwest Regional Carbon Sequestration Partnership

3. *Prior to providing funding to support any commercial deployment of CCS technologies, has DOE also conducted reviews or analyses of those projects pursuant to the Endangered Species Act (ESA)? If not, please explain the legal basis for not conducting ESA analyses. If so, please describe (i) the nature of the reviews or analyses conducted pursuant to the ESA; and (ii) the length of time required for DOE to complete those reviews. Please include in this response a description of any review conducted by the department pursuant to the ESA in connection with the FutureGen project, and the amount of time required to complete that review.*

DOE has performed reviews under the Endangered Species Act (ESA), section 106 of the National Historic Preservation Act, and other applicable laws. DOE consulted with tribes and Federal and State agencies as appropriate in conducting those reviews. Under the ESA, DOE contacted the appropriate entities to identify any threatened or endangered species or their critical habitat that might be affected by deployment of CCS technologies. In cases where such species or their critical habitat were identified, DOE conducted field surveys to determine if any threatened or endangered species were present in the vicinity of the deployment. These consultations and field investigations typically required one month or more. In cases where field investigations had to be

conducted within specific seasons of the year, additional time was incurred while waiting for the appropriate season. However, the time required to complete most NEPA reviews usually allowed sufficient time for field investigations without impacting the overall schedule of the NEPA process.

For the FutureGen Project, DOE and the Alliance partners conducted reviews and field investigations of the four alternative sites. Literature surveys were conducted for the corridors of proposed pipelines and transmission lines, as well as the areas of the proposed sequestration facilities. These efforts were completed during the development of the EIS, and compliance with the ESA did not delay completion of the EIS.

4. *Based on DOE's experience in supporting the development of CCS technologies, what factors does DOE anticipate would affect the availability of CCS technology that could be commercially deployed and implemented in an electric generating unit or industrial source?*

The development, demonstration and deployment of CCS technologies face several challenges of both a technical and non-technical nature. The key technical challenges to CCS include addressing the cost and energy penalty of capture, proving permanence, verifying that sufficient storage capacity exists, and developing of best practices for the lifecycle of a CCS project (from site selection through to site closure and post-closure monitoring of a site). The DOE Sequestration Program is directly addressing these challenges in its R&D efforts. DOE is developing a series of Best Practices Manuals that will be utilized in deployment of CCS. Through its research and data gathering, DOE has identified potential capacity to store hundreds of years of CO_2, which is being proven through dozens of field tests. DOE has Program goals to reduce the cost and energy

penalty of capture (mainly attributed to the cost of CO_2 separation and compression) so that CCS technology will result in only a small increase in cost of electricity to consumers.

The numerous field validation and large-scale development tests that DOE is conducting with the Regional Carbon Sequestration Partnerships as part of its Infrastructure component in its Sequestration Program are helping to address the various non-technical issues that a CCS project may face in deployment. Non-technical issues include having to establish the legal, policy and regulatory frameworks to create certainty necessary for wide scale deployment.

A regulatory framework that establishes the permitting required for CO_2 injection for geological sequestration is currently being established by the U.S. EPA. DOE's projects have been instrumental in providing the necessary data and information for EPA's proposed draft rule for a new class of injection wells.

A legal framework is needed to provide certainty in having to deal with ownership of geologic pore space that will store the CO_2 and to address both near- and long-term liability associated with stored CO_2. Insurance companies are starting to offer limited products to cover longer-term liability (50 years) associated with CCS. Liability beyond these time periods still needs to be addressed to facilitate commercial development of CCS.

Ultimately, as with any new technology, public acceptance will be key to CCS deployment. DOE is undertaking extensive public outreach in all of its field injection

tests to educate the public about the workings of CCS and to ensure transparency in all tests. DOE and the Regional Partnerships are working with the public so they will recognize the benefits of CCS, appreciate the reliability and safety of the technology, and ultimately accept its deployment in their communities as a technology to help mitigate global climate change.

5. *Based on DOE's experience in supporting the development of CCS, what is a realistic estimate of the amount of time that would be required for a federal agency to conduct all necessary environmental reviews under NEPA, ESA, and other environmental statutes prior to permitting or funding a commercial-scale CCS demonstration project?*

For major demonstration projects that include the construction of a new power plant with capture facilities, CO_2 pipelines, and geologic sequestration facilities, the time required for DOE to conduct reviews under NEPA, the ESA, the National Historic Preservation Act, and other environmental statutes is typically 18 to 24 months assuming that the project proponent has completed its initial design work and does not make significant alterations to its proposed project. DOE does not issue permits for these projects – EPA and State regulatory agencies do. However, DOE often waits for the project's proponent to develop its permit applications so that the information in these applications can be used in preparing the NEPA documents. Some State and Federal regulatory agencies may choose to wait to issue permits until after DOE completes the NEPA process for the project. Changes in the plans or design of a project that occur after DOE's environmental reviews are underway can delay completion of those reviews. Projects of smaller scope, such as the addition of CO_2 capture and sequestration to an existing power plant, might require less time to complete DOE's environmental reviews.