Major Projects with Quick Starts & Jobs Creation
Office of Clean Coal

Summary of Projects and Job Creation

The following table outlines the near-term possibilities for projects that capture and sequester carbon from coal-based systems. The potential jobs associated with these activities are listed along with likely construction and operation dates. Since the funding is primarily for construction and associated activities, a rough estimate of 30 job years per $1 million dollars expended was used.

COAL/CCS PROJECTS & JOBS CREATION

PROGRAM/PROJECT	GOV'T FUNDING ($Million)	INDUSTRY FUNDING ($Million)	TOTAL FUNDING ($Million)	AWARD DATE	CONSTRUCT	OPERATE	TOTAL JOB YEARS
Current CCPI	440	660	1,100	2010	late 2011	2014	33,000
CCPI Plus $1000M for Additional Projects	1000	1000	2,000	2010	late 2011	2014	60,000
FutureGen	1,300	1300	2,600	2009	2011	2013	78,000
KEMPER IGCC Demo	295	1600	1,895	12/5/2008	2010	2013	56,850
Current Regional Partnership Initiative	700	300	1,000	2008	2010	2012	30,000
RP with additional 7-10 Projects	2,100	900	3,000	2010	late 2011	2014	90,000
Ramgen	30	30	60	2009	2010	2012	1,800
Total Job Years Including Fund Infusion							349,650

Context

Carbon dioxide capture and storage (CCS) is a technology that is indispensable in dealing with concerns about energy and climate. The International Energy Agency (IEA) has identified CCS as the most important way to mitigate CO_2 emissions in coal-based power. This past summer, the G8 Nations called for advancing CCS internationally, and called for 20 major demonstrations by 2020. The U.S. agreed to sponsor at least 10 of these, which will all come from DOE's Clean Coal program. Most will come from our Regional Carbon Sequestration Partnerships; others will come from a Third Round of the Clean Coal Power Initiative and from FutureGen. All of these projects will create many high-value domestic jobs, enhance and expand our power generation infrastructure, and stimulate economic development, while at the same time advancing overall energy security and climate goals.

DOE's clean coal program is accelerating deployment of advanced high-efficiency coal-generating technologies, including CCS. A panel of independent international experts assembled by the IEA earlier this year found that DOE's Regional Carbon Sequestration Partnerships constitute the world's most ambitious capture and storage program. The experts found that it will significantly advance the cause of CCS in the U.S., Canada and internationally. The next few years should yield enormous experience in design, construction and operation, and lead toward greater energy and environmental security on a global scale.

Sequestration Program Projects

The DOE's Sequestration Program is focused on developing a portfolio of technologies with significant potential to reduce GHG emissions. Several ongoing large-scale geologic storage projects would benefit from an infusion of funding. These include several projects that were going to utilize CO_2 captured from power plants, but because of market and regulatory uncertainty they are in jeopardy of being delayed and/or cancelled. Government funding for their construction either directly in the Sequestration Program or through DOE's Clean Coal Power Initiative would permit them to continue. This would permit utilization of CO_2 captured from power plants and thus create infrastructure needed for CCS technologies. Much better compression technology and additional large-scale storage tests are needed and would benefit from additional funding.

Regional Partnership Program: To validate that CCS is a viable method of mitigating CO_2 emissions by storing billions of tons in diverse geologic formations (saline, coal, and depleted oil and gas fields) the following must be accomplished:

- Undertake field testing in representative formations across the U.S. and North America so that information is available to support wide scale deployment of CCS
- Through field testing of CCS technologies, support will be granted for the regulatory and policy development process for permitting, for public outreach, and will help resolve issues related to ownership and liability
- Development of characterization, site requirements, operations protocols, and simulation models that can be implemented in commercial CCS projects

These goals can only be accomplished through the testing of CCS at an adequate scale, duration, and geographic and geologic diversity.

DOE currently has seven Regional Carbon Sequestration Partnerships (RCSP) conducting field tests across North America to support wide scale deployment of CCS. Several of the RCSP projects had planned to utilize anthropogenic sources of CO_2 from capture facilities that were to be built at fossil-fuel power plants. However, because of economic, market, and regulatory uncertainty, the building of these capture facilities may be delayed and/or cancelled. Funding to support the construction and operation of these capture facilities would create jobs, and needed CCS infrastructure, plus permit the original storage project to continue and to utilize an anthropogenic source of CO_2.

In order to ensure that CCS can be deployed across the United States, additional large-scale tests are required. An additional 7-10 large volume field projects would result in:

- Geographic diversity – additional states within a regional partnership will gain the working knowledge and technology transfer, public outreach, infrastructure enhancements, training, and knowledge required for large scale deployments
- Geologic diversity - additional technical knowledge in different geologic formations that can be utilized domestically and internationally

For each funding addition of $300 million, DOE could perform an additional large volume field project with the requirement to utilize an anthropogenic source of CO_2. Additional funding of $2.1 billion would allow for selection of at least 7-10 additional large volume field projects and bring in at least an additional $900 million in industry cost-sharing for the projects. This would substantially accelerate the potential for broad commercial deployment of carbon capture and sequestration technology in the utility marketplace following successful demonstration. An additional 90,000 high-value job years would be created.

Ramgen Compression: Compression costs are a significant portion of costs associated with carbon capture and storage. The Ramgen project has an advanced compression technology that can reduce the energy requirement associated with compressing CO_2 to pipeline and wellhead storage requirements. With an infusion of $30 million, deployment could begin in 2010 and would be ready for use in several RCSP projects and other CCS projects.

Major Integrated Advanced Coal with CCS Demonstration Projects

The DOE's Office of Fossil Energy has two major demonstration programs incorporating carbon capture and storage on coal-based systems that would accelerate or improve with an infusion of funding: the Clean Coal Power Initiative (CCPI) Round 3 solicitation and the FutureGen solicitation. An example of these types of projects is a planned Integrated Gasification Combined Cycle (IGCC) plant slated for Kemper County Mississippi, selected under the CCPI Round 2. The system being developed by Southern Company and its partners will add advanced emission controls to make it one of the cleanest, most energy-efficient coal power plants built to date. In addition, carbon capture systems will be installed to remove approximately 25 percent of CO_2. The captured CO_2 would be used off-site for geologic sequestration via enhanced oil recovery. The IGCC facility which will produce roughly 560 megawatts of electricity is scheduled to begin construction in early 2010 and operations in late 2013 and will be owned by the Mississippi Power Company of Gulfport, Mississippi. The total project cost including the CO_2 capture system is $1.92 Billion, total DOE cost-share is $295 Million.

CCPI Round 3: The objective of the Clean Coal Power Initiative Round 3 (CCPI-3) is to demonstrate advanced coal-based systems that capture and sequester, or put to

beneficial reuse, carbon dioxide emissions. DOE issued a Funding Opportunity Announcement on August 11, 2008, to solicit projects that demonstrate commercial scale operation of carbon capture and storage technology, and applications are due to DOE on January 15, 2009. DOE currently has $440 million in funding available to select projects from this solicitation. At this low funding level, DOE anticipates selecting one or two projects at less than 50% funding levels. These selections will be announced in July 2009. Awards are expected to be signed in July 2010. Selection of one or two projects will not allow for demonstration of multiple methods and approaches of carbon dioxide capture and sequestration, limiting DOE's ability to select and evaluate the lowest-cost, highest-efficiency methods. For each funding addition of $350 million, DOE could select an additional project at 50% cost share. Additional funding of $1 billion will allow for selection of 3-5 projects at DOE cost share of 30-50%. Increased Government cost share will significantly reduce project risk and increase success rate. This would accelerate the potential for broad commercial deployment of carbon capture and sequestration technology in the utility marketplace following successful demonstration. An additional 60,000 high-value job years would be created.

FutureGen: The FutureGen program is designed for multiple, commercial-scale demonstrations to integrate coal-fueled power plants with carbon capture and sequestration. Approximately $134 million in DOE funding is currently available from prior appropriations. A total of $246 million in future appropriations is needed in order to fully fund two demonstration projects through the design and NEPA compliance stage of development. That would provide DOE approximately $380 million, which would accelerate projects and decrease the risk of the projects not going forward.