

Calendar No. 99

112TH CONGRESS }
1st Session }

SENATE

{ REPORT
112-32

DEPARTMENT OF ENERGY CARBON CAPTURE AND SEQUESTRATION PROGRAM AMENDMENTS ACT

JULY 11, 2011.—Ordered to be printed

Mr. BINGAMAN, from the Committee on Energy and Natural
Resources, submitted the following

R E P O R T

[To accompany S. 699]

The Committee on Energy and Natural Resources, to which was referred the bill (S. 699) to authorize the Secretary of Energy to carry out a program to demonstrate the commercial application of integrated systems for long-term geological storage of carbon dioxide, and for other purposes, having considered the same, reports favorably thereon with amendments and recommends that the bill, as amended, do pass.

The amendments are as follows:

1. On page 3, line 7, insert “large-scale” after “10”.
2. Beginning on page 4, line 24, through page 5, line 1, strike “a certification by the appropriate regulatory authority that the project will comply with”.
3. On page 6, line 3, insert “the requirements of” after “with”.
4. On page 6, line 21, insert “requirements” after “following”.
5. On page 15, lines 12 and 13, strike “for each of fiscal years 2010 through 2020”.
6. On page 15, after line 13, add the following:
(c) OFFSET.—Section 708 of the Energy Independence and Security Act of 2007 (42 U.S.C. 17256) is repealed.
7. At the end, add the following:

SEC. . ANNUAL DEPARTMENT OF ENERGY ASSESSMENT.

(a) IN GENERAL.—

- (1) DEPARTMENT OF ENERGY REPORT.—Not later than 1 year after the date of enactment of this Act and annually thereafter until the Secretary of Energy (referred to in this section as the “Secretary”) determines

that technology preventing the emission of, capturing, transporting, permanently storing or sequestering, or putting to beneficial use carbon dioxide is available to the commercial marketplace, the Secretary shall conduct an assessment in accordance with subsection (b) of the existing Federal programs supporting such technology and submit to the appropriate authorizing and appropriating committees of Congress a report on the results of the assessment.

(2) GOVERNMENT ACCOUNTABILITY OFFICE REVIEW.— Not later than 1 year after the first report is provided to the appropriate authorizing and appropriating committees of Congress under paragraph (1) and subsequently as needed until technology preventing the emission of, capturing, transporting, permanently storing or sequestering, and putting to beneficial use carbon dioxide is available to the commercial marketplace, the Comptroller General of the United States shall conduct a review of the report described in paragraph (1) in accordance with subsection (c).

(b) DEPARTMENT OF ENERGY REPORT REQUIREMENTS.— The Secretary shall include in the report required under subsection (a)(1)—

(1) a detailed description of the existing programs, including each major program area, that conduct or support research, development, demonstration, and deployment of technology—

(A) to prevent the emission of carbon dioxide or capture of carbon dioxide from sources, including fossil fuel-based power plants;

(B) to transport carbon dioxide;

(C) to store or sequester captured carbon dioxide permanently; or

(D) to put captured carbon dioxide to beneficial use;

(2) an assessment, based on Federal Government laboratory research experience, available industry research experience, and such other data and information as the Secretary considers useful and appropriate, to determine whether each major program area and principal projects within the areas described in paragraph (1) are designed to, and will, advance fundamental knowledge or achieve significant technical advancement and materially improve the technology base to effectively address the prevention of carbon dioxide emissions or capture of carbon dioxide or the transport, permanent storage, or beneficial use of captured carbon dioxide;

(3) an assessment of the estimated time frame and costs of the Secretary necessary to reasonably conclude that technology will be available to the commercial marketplace; and

(4) an assessment of the barriers and solutions, including policy recommendations, to financing large carbon capture and storage demonstration projects

with a focus on overcoming the impacts of oil price volatility on enhanced oil recovery contracts for carbon dioxide.

(c) GOVERNMENT ACCOUNTABILITY OFFICE REVIEW REQUIREMENTS.—The Comptroller General of the United States shall include in the review required under subsection (a)(2)—

(1) an analysis of the estimated time frames and costs of the Secretary, as reported pursuant to subsection (b)(3);

(2) any recommendations that the Comptroller General considers appropriate and useful to improve the likelihood of achieving technological advancements to mitigate carbon dioxide emissions or to expedite the availability of carbon capture and sequestration technology for the commercial marketplace;

(3) an assessment of any legal or regulatory impediment by any Federal agency or department that has arisen in relation to the deployment of carbon capture and storage technology, including any delays in the permitting of the technology or the construction or operation of any the facility; and

(4) any other analyses the Comptroller General considers necessary or appropriate.

(d) BUDGET REQUEST REPORT.—In the case of the budget request for fiscal year 2013, the President shall include in the budget request of the Secretary for the Fossil Energy Program a report that—

(1) assesses the progress of the Secretary in implementing the recommendations of the Comptroller General of the United States and compares the estimated costs of completing implementation of those recommendations to the requested budget levels; and

(2) an assessment of the progress made for the preceding fiscal year toward achieving the goals of the program for which funding is requested.

PURPOSE OF THE MEASURE

The purpose of S. 699 is to authorize the Secretary of Energy to carry out a program to demonstrate the commercial application of integrated systems for long-term geological storage of carbon dioxide, by providing a Federal indemnity to early adopters of these systems, by providing training programs for State and Tribal organizations, and by assessing the commercial readiness of carbon capture and storage technologies.

BACKGROUND AND NEED

Carbon capture and storage (CCS), often called carbon sequestration, is poised to be a meaningful part of a portfolio of options for addressing global climate change. While scientific and technological challenges remain, CCS holds particular promise for reducing the large amounts of carbon dioxide emitted from the use of fossil fuels in electricity generation and other facilities. Widespread deployment of CCS faces a series of challenges including commercializa-

tion of capture technologies, geologic storage scale-up concerns, and uncertainty about the policy, infrastructure, and economic factors associated with large-scale deployment.

While a number of small-scale CO₂ injection tests have either taken place or are underway, large-scale (greater than 1,000,000 tons CO₂ annually) injections are only now going through the selection and permitting process. More than 25 small injection tests are currently sponsored by the Department of Energy (DOE) Regional Carbon Sequestration Partnership program but increasingly, states and private companies are also undertaking these tests to assist in regional site characterization and to build expertise. The DOE Regional Carbon Sequestration Partnership program has recently entered a third phase that will involve seven larger projects, whose total projected volume of CO₂ to be injected will average about 1,000,000 tons over the life of the project.

The first statutory language to create a CCS research and development program was enacted as part of the Energy Policy Act of 2005. It provided the basic framework for the DOE program where the Regional Carbon Sequestration Partnership program resides. It was amended by the Energy Independence and Security Act of 2007 (EISA). The 2007 law expanded upon the existing 2005 program by creating a third phase of larger CCS demonstration scaled projects that include fully integrated capture, transportation, and sequestration components. Additionally, basic CCS research and development was authorized, including beneficial use and reuse of CO₂ (e.g., CO₂ use for growing algae for biofuels and sequestration in cement, baking soda, or other products).

Since the passage of the EISA, the Department of the Interior has completed several of the EISA mandates within its jurisdiction by beginning a national carbon dioxide geological storage assessment that is being conducted by the US Geological Survey and by completing a study of the issues related to CCS project implementation on federal lands. In addition, DOE's CCS programs have received substantial funding that has helped to implement many of the programs outlined in the EISA, including advanced geologic site characterization, industrial carbon capture and sequestration work, a third round of Clean Coal Power Initiative solicitations, and workforce training and development.

Many stakeholders believe that large-scale CCS demonstration projects will not move forward without liability protection, in addition to adequate project financing. At present, many industry stakeholders cite major concerns with the existing petroleum production regulations, as they may or may not apply to geological carbon sequestration, as well as a lack of a clear framework for closing down a CCS site. The provision of liability protections is one way to increase the willingness of project developers to participate in both privately and federally-funded CCS demonstration projects.

As CCS projects grow in both scale and number, there will be an increasing need to train qualified regulators to oversee the permitting, operation, and closure of geologic sequestration sites as well. Therefore it is necessary to create a grant program to assist in the training of State and Tribal agency personnel who oversee the regulatory aspects of CCS.

S. 699 is needed to support research, development and demonstration efforts being conducted by the Department of Energy

and the private sector, and to ensure substantial progress in demonstrating full commercial deployment of CCS technologies.

LEGISLATIVE HISTORY

S. 699 was introduced by Senator Bingaman on March 31, 2011. Senators Barrasso, Rockefeller, and Murkowski are original cosponsors, and Senators Tester, Udall, and Hoeven have been added as cosponsors. The Committee on Energy and Natural Resources held a hearing on the bill on Thursday, May 12, 2011. The Committee considered the bill at its business meeting on Thursday, May 26, 2011. The Committee adopted seven amendments to the bill and ordered the bill, as amended, favorably reported.

Similar legislation, S. 1013, was introduced by Senator Bingaman during the 111th Congress, and the Committee held a hearing on it on May 14, 2009. S. Hrg. 111–50.

COMMITTEE RECOMMENDATION

The Senate Committee on Energy and Natural Resources, in open business session on May 26, 2011, by voice vote of a quorum present, recommends that the Senate pass S. 699, if amended as described herein. Mr. Lee, Mr. Paul (by proxy), and Mr. Heller asked that they be recorded as voting no.

COMMITTEE AMENDMENTS

The Committee adopted seven amendments during its consideration of S. 699. The first four clarify the text. The fifth reduces the authorization of appropriations from \$10 million annually for each of fiscal years 2010 through 2020 to a total of \$10 million. The sixth repeals section 708 of the Energy Independence and Security Act of 2007, 42 U.S.C. 17256, which authorized appropriation of \$10 million for university-based research and development grants to study carbon capture and sequestration using various types of coal. The seventh amendment adds a new section 4 to the bill, which requires the Department of Energy to conduct an annual assessment of existing federal programs supporting CCS technologies; requires the Government Accountability Office to review the Department's annual reports, recommend improvements, and assess legal or regulatory impediments; and requires the President to assess the Department's progress in implementing the GAO recommendations and its progress in achieving the program's goals.

SECTION-BY-SECTION ANALYSIS

Section 1 provides a short title.

Section 2(a) adds a new section 963A to the Energy Policy Act of 2005 to provide for financial and technical assistance for up to 10 large-scale carbon dioxide geologic storage demonstration projects.

New section 963A(a) defines key terms used in the section.

Section 963A(b) directs the Secretary of Energy to carry out a program, in addition to the program already authorized under section 963 of the Energy Policy Act of 2005, to demonstrate the commercial application of long-term geologic storage of carbon dioxide from industrial sources.

Section 963A(c) authorizes the Secretary to enter into cooperative agreements for up to 10 large-scale demonstration projects.

Sections 963A(d) and (e) specify selection criteria, terms, and conditions for demonstration projects receiving assistance under section 963A, to ensure that certain requirements have been met and that the project will be conducted in a manner that minimizes the potential liability exposure of the Federal government under any indemnity provided pursuant to section 963A(g). The Secretary of Energy will provide the certificate of closure since the Department of Energy will be providing indemnity for rigorously monitored, compliant sites.

Section 963A(f) lays out the requirement for closure of demonstration project sites. Only after these requirements are met can title for the site, and responsibility for its long-term stewardship, transfer to the Federal government. The criteria are science based, and must be met for a period of 10 years, beginning after the carbon dioxide plume has come into near equilibrium conditions with the geological formation (mainly, the velocity of the plume as it moves in the subsurface begins to decelerate and/or formation pressures stop increasing, but instead hold steady or decrease, for example). Thus, for example, if it takes 25 years for such equilibration to take place, then the earliest the land could move into post-closure would be 35 years after injection activities cease.

Section 963A(g) authorizes the Secretary of Energy to indemnify large-scale demonstration projects from liability for personal, property, and environmental damages in excess of their insurance coverage or other financial protection that they may be required to maintain. Liability resulting from the project operator's intentional misconduct or gross negligence is expressly excluded. The Secretary is required to charge a fee for providing indemnification, in an amount that reflects the net present value of the payments that the Government may have to make, taking into account the likelihood of an incident requiring the Government to make indemnification payments. In addition, subsection (g) permits the Secretary to enter into indemnification agreements in advance of appropriations and authorizes the Attorney General to defend or settle claims against project operators if it is determined that the Government may have to make payments under the indemnity agreement. The Secretary is required to make a determination on project selection within one year of receiving each application. There is a limitation on the amount of indemnification for each demonstration project of \$10,000,000,000 (adjusted every five years for inflation).

Section 963A(h) allows projects under this section to be sited on Federal land, subject to relevant conditions by the Secretary of Agriculture or the Secretary of the Interior (with respect to lands under their jurisdiction).

Section 963A(i) allows the Secretary of Energy to take title (or administrative transfer) of lands containing closed geological storage sites from the projects under this section, for long-term stewardship. It also includes mandatory spending to cover the costs associated with maintaining these sites for purposes of public health and safety protection, in perpetuity.

Section 2(b) makes technical and conforming changes to section 963 of the Energy Policy Act of 2005 and sections 703 and 704 of the Energy Independence and Security Act of 2007.

Section 3 authorizes a grant program to provide State and tribal agencies involved in carbon storage projects to help train personnel in the regulatory and site managerial aspects of carbon storage.

Section 4 authorizes an annual assessment of existing Federal programs supporting carbon capture and storage technologies. This assessment will consider the success of supporting programs in advancing technologies, identify any barriers for commercial deployment, and provide time and cost estimates required for commercial deployment of carbon capture and storage technologies. Each annual assessment must be reviewed annually by the GAO, who is tasked with providing recommendations to the President.

COST AND BUDGETARY CONSIDERATIONS

S. 699—Department of Energy Carbon Capture and Sequestration Program Amendments of 2011

Summary: S. 699 would authorize the creation of a new program at the Department of Energy (DOE) to demonstrate systems for storing carbon dioxide produced by industrial sources, including measures that would indemnify recipients for certain liabilities and allow DOE to take title to the sites for long-term stewardship. The bill also would create and repeal authorizations of appropriations for certain grants related to carbon sequestration projects.

CBO estimates that implementing this bill would increase net discretionary spending by \$68 million over the 2012–2016 period, assuming appropriation of the necessary amounts. Pay-as-you-go procedures apply because enacting the legislation would affect net direct spending. However, CBO estimates that such spending would be negligible over the 2012–2021 period. Enacting this bill would not affect revenues.

S. 699 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA).

Estimated cost to the Federal Government: The estimated budgetary impact of S. 699 is shown in the following table. The costs of this legislation fall within budget function 270 (energy).

By fiscal year, in millions of dollars—												
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2012– 2016	2012– 2021
CHANGES IN SPENDING SUBJECT TO APPROPRIATION												
Estimated Author- ization Level	10	10	10	10	50	51	52	54	55	56	90	358
Estimated Outlays	8	12	12	8	28	46	52	53	54	56	68	329
CHANGES IN DIRECT SPENDING												
Estimated Budget Authority ^a	0	0	0	10,700	10,900	11,200	11,400	11,700	12,000	12,200	21,600	80,100
Estimated Outlays	0	0	*	*	*	*	*	*	*	*	*	*

Note: * = net outlays between —\$500,000 and \$500,000.

^a The budget authority for the indemnifications authorized by the bill would be recorded in the year that DOE enters into a cooperative agreement. The estimated budget authority shown in this table represents the maximum amount authorized by the bill for each project, including adjustments for inflation. The actual amount of such potential liabilities could be much smaller than the authorized levels.

Basis of estimate: For this estimate, CBO assumes that S. 699 will be enacted near the end of fiscal year 2011, that the necessary amounts for implementing the bill will be appropriated for each fiscal year, and that outlays will occur at the historical rates for similar activities.

Spending subject to appropriation

CBO estimates that implementing S. 699 would increase net discretionary spending by \$68 million over the 2012–2016 period and \$329 million over the 2012–2021 period. That estimate includes the net effects of provisions that would increase spending for carbon sequestration projects, authorize grants to state and tribal governments involved in regulating such projects, and repeal an existing authorization for grants to universities to perform research related to carbon capture and storage.

Increased Spending for Carbon Sequestration Projects. The cooperative agreements authorized by S. 699 would supplement other forms of federal assistance for carbon sequestration projects. For example, section 963 of the Energy Policy Act of 2005 authorized appropriations for a research, development, and demonstration program on carbon sequestration through 2015. CBO anticipates that projects that have received funding under DOE's existing programs would be eligible for the types of assistance authorized by this bill, assuming they meet the eligibility criteria in the bill. Therefore, S. 699 would effectively extend the existing authorization of appropriations to support carbon sequestration projects beyond the scheduled expiration in 2015.

By authorizing DOE to continue a carbon sequestration program beyond 2015, S. 699 would effectively authorize appropriations for those activities in 2016 and later years. Based on information from DOE about recent levels of funding for carbon sequestration projects and related administrative activities, CBO estimates that fully funding those activities in 2016 would require appropriations totaling \$40 million. That estimate assumes that funding for carbon sequestration projects, including monitoring and other administrative costs, remains in line with funding provided in recent years.

In addition, CBO expects that implementing S. 699 would expand DOE's administrative workload to manage existing carbon sequestration projects whose sponsors would choose to enter into cooperative agreements for indemnification under the bill. Based on the status of such projects, CBO anticipates that DOE would approve seven indemnification agreements by 2021, some of which would occur during the 2012–2016 period covered by this estimate. We also expect that those projects would qualify for additional technical and financial assistance under the bill. Thus, we estimate that fully funding S. 699 would require additional appropriations of about \$10 million annually over the 2012–2016 period. That estimate is based on historical trends in spending for reviewing other technically complex applications and assumes that some of the sponsors of DOE's existing carbon sequestration projects would enter into cooperative agreements under S. 699 and receive modest increases in technical and financial assistance under the bill.

In total, assuming appropriation of the necessary amounts, CBO estimates that implementing S. 699 would increase discretionary spending related to carbon sequestration by \$68 million over the 2012–2016 period. That estimate is based on historical spending patterns for existing activities.

Grants to State, Local, and Tribal Governments. S. 699 would authorize the appropriation of \$10 million for grants to local governments to establish programs to train workers involved with reg-

ulating carbon sequestration projects and other related projects, such as transportation systems. Based on historical spending patterns for similar activities, CBO estimates that fully funding the proposed grant program would cost \$10 million over the 2012–2016 period.

Repeal Authorization for Grants to Universities. S. 699 would repeal a provision of law that authorizes the appropriation of \$10 million for grants to universities to carry out research related to carbon capture and storage. According to DOE, that program, which was originally authorized under the Energy Independence and Security Act of 2007, has received no funding to date. CBO estimates that the proposed repeal would reduce authorized spending by \$10 million over the 2012–2016 period, assuming appropriations are reduced consistent with S. 699.

Direct spending

Injecting carbon dioxide into geologic formations is being studied as a way of removing greenhouse gas from the atmosphere. DOE, the Environmental Protection Agency (EPA), and other agencies are in the process of examining the use of such technologies on a commercial scale. S. 699 would authorize DOE to enter into as many as 10 cooperative agreements to provide financial and technical assistance to large-scale demonstration projects that would provide for the long-term geologic storage of carbon dioxide produced by industrial sources.

Under the proposed cooperative agreements, DOE would be authorized to indemnify the recipients for damages resulting from the demonstration projects, subject to certain conditions. Project sponsors would be required to comply with certain performance standards and provide financial assurances at levels specified by EPA and other federal agencies. Except in cases of gross negligence, the government would indemnify the recipients for liabilities that exceed the value of those financial assurances, subject to a limit of \$10 billion per project, or a total of \$100 billion (plus adjustments for inflation). The bill also would require project developers to pay a fee equal to the estimated net present value of indemnification payments. Once DOE certifies that a project meets all of the closure requirements, the department also could take ownership of the site.

Enacting the federal indemnification and stewardship provisions in S. 699 would affect direct spending. S. 699 would waive the Anti-Deficiency Act to allow DOE to sign indemnification agreements in advance of appropriation acts and would provide a permanent, indefinite appropriation for any costs incurred by DOE to indemnify sponsors and remediate sites that come under government ownership. The proceeds from indemnification fees would be deposited in the Treasury as miscellaneous receipts, which are a credit against direct spending.

Indemnification Costs. Unintended releases of carbon dioxide from geologic storage systems could pose risks to human health, property, and natural resources, including drinking water. Because the demonstration projects would be designed to store carbon dioxide permanently, the liability for such events would span several decades. Project sponsors would be required by the bill and existing EPA regulations to demonstrate their ability to cover costs that

may arise in developing, operating, and plugging wells as well as closing sites, responding to emergencies, and performing remedial actions. Thus, CBO estimates that the indemnification authority would be used primarily to cover costs resulting from events that may occur after a site has been closed, which probably would occur well after 2021.

While most outlays for indemnification costs probably would occur after 2021, the government's obligation to make such payments would be incurred at the time the cooperative agreement is signed. As a result, CBO's estimate includes the amount of budget authority authorized by the bill for indemnification payments. The amounts ultimately paid under such agreements may be much smaller than the amounts authorized by S. 699, however. DOE and other analysts expect that the risks posed by the 10 projects would be relatively small because they would be located in geologic formations that are well understood, and, as demonstration projects, would be subject to extensive monitoring and oversight. The 2006 report of the International Panel on Climate Change, for example, said that well-engineered, well-managed projects might effectively sequester 99 percent of the carbon dioxide over periods of 100 years or more.

Income from Indemnification Fees. For this estimate, CBO assumes that DOE would require firms to pay indemnification fees over the operating life of the facility, based on the volume of carbon dioxide injected each year. Setting a price for such fees would be difficult because agencies and industry lack experience with large-scale geologic storage systems. EPA's regulations, for example, rely on pilot projects, modeling efforts, and experience with other underground injection activities such as enhanced oil and gas recovery. According to some analysts, the value of the financial risks through the operational and post-injection period may be equivalent to less than 20 cents per ton of carbon dioxide.¹ CBO estimates that DOE initially would set rates below that level because most of those estimated risks are associated with operational activities, not long-term storage. Similarly, firms might not seek federal indemnification if they considered the fee to be disproportionate to the projected risks.

Net Effect on Direct Spending. Based on DOE's 2010 plan for carbon storage and sequestration projects, CBO anticipates that DOE would finalize seven indemnification agreements by 2021, that most of those facilities would begin injections after 2015, and that the initial injections would involve relatively low volumes of carbon dioxide. Under those volume, price, and cost assumptions, CBO estimates that implementing the indemnification provisions in S. 699 would have no significant net effect on outlays over the 2012–2021 period. The net budgetary impact of the indemnification regime in subsequent years would depend on the balance between the amounts spent and the amounts collected from fees: it could reduce net direct spending if income from the fees exceeds the nominal value of any payments but would increase net outlays if the costs exceed the amounts paid by recipients of this assistance.

¹Michael Donlan and Chiara Trabucchi, "Valuation of Consequences Arising from CO₂ Mitigation at Candidate CCS Sites in the U.S." *Energy Procedia*, 4(2011), p. 2228.

Finally, CBO estimates that enacting this bill would increase future direct spending for DOE's stewardship and regulatory activities. Such costs probably would be incurred well beyond the 2012–2021 period and would depend on the characteristics of the sites acquired by DOE. While routine monitoring and management expenses probably would average less than \$5 million a year per site (in 2011 dollars), the cost of any remediation activities is unknown.

Pay-As-You-Go considerations: The Statutory Pay-As-You-Go Act of 2010 establishes budget-reporting and enforcement procedures for legislation affecting direct spending or revenues. Enacting S. 699 would affect net direct spending but CBO estimates that those effects would be negligible in each of the fiscal years 2012 through 2021.

Intergovernmental and private-sector impact: S. 699 contains no intergovernmental or private-sector mandates as defined in UMRA. The bill would authorize grants to state and tribal agencies for training employees involved in carbon capture, transportation, and storage projects. Any costs those entities incur to meet grant requirements would result from complying with conditions of federal assistance.

Estimate prepared by: Federal costs: Megan Carroll and Kathleen Gramp; Impact on state, local, and tribal governments: Ryan Miller; Impact on the private sector: Amy Petz.

Estimate approved by: Theresa Gullo, Deputy Assistant Director for Budget Analysis.

REGULATORY IMPACT EVALUATION

In compliance with paragraph 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee makes the following evaluation of the regulatory impact which would be incurred in carrying out the Department of Energy Carbon Capture and Sequestration Program Amendments Act of 2011.

The bill establishes a cooperative assistance program that establishes several statutory and regulatory standards as a condition of receiving Government assistance and indemnification.

No personal information would be collected in administering the program. Therefore, there would be no impact on personal privacy.

Little, if any, additional paperwork would result from the enactment of S. 699.

CONGRESSIONALLY DIRECTED SPENDING

The bill, as reported, does not contain any congressionally directed spending items, limited tax benefits, or limited tariff benefits as defined in rule XLIV of the Standing Rules of the Senate.

EXECUTIVE COMMUNICATIONS

The testimony provided by the Department of Energy at the Committee's May 12, 2011, hearing on S. 757 follows:

STATEMENT OF SCOTT KLARA, DEPUTY LABORATORY DIRECTOR,
NATIONAL ENERGY TECHNOLOGY LABORATORY, DEPARTMENT OF ENERGY

Thank you Chairman Bingaman, Ranking Member Barrasso, and Members of the Committee; I appreciate the opportunity to discuss the Department of Energy's activities to promote the development of carbon capture and storage (CCS) technologies. My testimony will provide an overview of the Department of Energy's (DOE) research efforts in developing CCS technologies. The Administration is still reviewing S. 699 and S. 757 and does not have a position on either bill at this time.

INTERAGENCY TASK FORCE ON CARBON CAPTURE AND STORAGE

Before I discuss the Department's Clean Coal Research Program, I will briefly review the conclusions from the Interagency Task Force on CCS. In August 2010, the final report from the Task Force was issued summarizing the Administration's efforts to develop and deploy CCS technologies, and proposed a plan to overcome the barriers to the widespread, cost-effective deployment of CCS within ten years, with a goal of bringing five to ten commercial demonstration projects online by 2016. This report is the collective work of 14 executive departments and federal agencies, which were tasked with developing a comprehensive and coordinated Federal strategy to speed the commercial development and deployment of clean coal technologies. The task force concluded that while there are no insurmountable technological, legal, institutional, regulatory or other barriers that prevent CCS from playing a role in reducing GHG emissions, early CCS projects face economic challenges related to climate policy uncertainty, first-of-a-kind technology risks, and the current high cost of CCS relative to other technologies.

CLEAN COAL RESEARCH PROGRAM

DOE continues to play a leadership role in the development of clean coal technologies with a focus on CCS. The Clean Coal Research Program administered by DOE's Office of Fossil

Energy and implemented by the National Energy Technology Laboratory is designed to enhance our energy security and reduce environmental concerns over the future use of coal by developing a portfolio of revolutionary clean coal technologies. The Program is well positioned to help overcome the technical challenges associated with the development of clean coal technologies.

The Clean Coal Program, in partnership with the private sector, is focused on maximizing efficiency and environmental performance, while minimizing the costs of these new technologies. In recent years, the Program has been restructured to focus on clean coal technologies with

CCS. The Program pursues the following two major strategies:

- (1) capturing and storing greenhouse gases; and
- (2) improving the efficiency of fossil energy systems.

The first strategy aims to eliminate concerns over emissions of greenhouse gases from fossil fueled energy systems. The second strategy seeks to improve the fuel-to-energy efficiencies of these systems, thus reducing pollutant emissions, water usage, and carbon emissions on a per unit of energy basis. Collectively, these two strategies comprise the Clean Coal Program's approach to ensure that current and future fossil energy plants will have options to meet all emerging requirements for a safe and secure energy future.

CORE RESEARCH AND DEVELOPMENT ACTIVITIES

The Clean Coal Program is addressing the key technical challenges that confront the development and deployment of clean coal technologies through research on cost-effective capture technologies; monitoring, verification, and accounting technologies to ensure permanent storage; permitting issues; and development of advanced energy systems. The Program is also actively engaged in interagency efforts to address liability issues, public outreach, and infrastructure needs. As an example, today's commercially available CCS technologies would add around 80 percent to the cost of electricity for a new pulverized coal plant, and around 35 percent to the cost of electricity for a new integrated gasification combined cycle plant. The Program is aggressively pursuing developments to reduce these costs to less than a 35 percent increase in the cost of electricity for pulverized coal energy plants and less than a 10 percent increase in the cost of electricity for new gasification-based energy plants.

Research is focused on developing technology options that dramatically lower the cost of capturing carbon dioxide (CO₂) from fossil fueled energy plants. This research can be categorized into three technical pathways: post-combustion, pre-combustion, and oxycombustion. Post-combustion refers to capturing CO₂ from the stack gas after a fuel has been combusted in air. Pre-combustion refers to a process where a hydrocarbon fuel is gasified to form a mixture of hydrogen and carbon dioxide, and CO₂ is captured from the synthesis gas before it is combusted. Oxy-combustion is an approach where a hydrocarbon fuel is combusted in pure or nearly pure oxygen rather than air, which produces a mixture of CO₂ and water that can easily be separated to produce pure CO₂. Collectively, research in each of these technical pathways is exploring a wide range of approaches such as membranes; oxy-combustion concepts; solid sorbents; CO₂ hydrates; and advanced gas/liquid scrubbing technologies. These efforts cover not only improvements to state-of-the-art technologies but also development of several revolutionary concepts, such as metal organic frameworks, ionic liquids, and enzyme based sys-

tems. Coupling these developments with other advances in efficiency improvements and cost reduction from developments in gasification, turbines, and fuel cells, will help provide a technology base for commercial deployment of fossil energy systems integrated with CCS.

The Department is the primary supporter of the National Carbon Capture Center (NCCC), which is a joint partnership between DOE and industry. The NCCC is a one of a kind, world class facility which offers an opportunity to validate capture technologies on actual gas from a coal fired power plant or gasification facility. Because of the ability to operate under a wide range of process conditions, research at the NCCC can effectively evaluate technologies at various levels of maturity for many different applications.

REGIONAL CARBON SEQUESTRATION PARTNERSHIPS

The Regional Carbon Sequestration Partnerships were created by the DOE in 2003 through a competitive solicitation. The Partnerships were designed to address a range of issues associated with geologic storage of CO₂. The Clean Coal Program has been performing CCS field tests focused on injection, monitoring, verification, accounting and other aspects of geologic storage for many years, and the seven Regional Carbon Sequestration Partnerships are critical to this effort. These Partnerships are comprised of state agencies, universities, and private companies. They represent more than 400 unique organizations in 43 States, and four Canadian Provinces. Geographic differences in fossil fuel use and potential storage sites across the United States dictate the use of regional approaches in addressing CCS, so each Partnership is focused on a specific region of the United States and Canada that hold similar characteristics relating to CCS opportunities.

Together, the Partnerships form a network of capability, knowledge, and infrastructure that will help enable geologic storage technology to play a role in the clean energy economy. They represent regions encompassing 97 percent of coal-fired CO₂ emissions, 97 percent of industrial CO₂ emissions, 96 percent of the total land mass, and essentially all the geologic storage sites that can potentially be available for geologic carbon storage. Regional Partnerships are drilling wells and injecting small quantities of CO₂ to validate the potential of key storage locations throughout the country. To date, the Regional Partnerships have injected over 1 million tons of CO₂ at 18 small scale injection projects throughout the United States and Canada. These tests have helped to validate storage at a small scale and understand the fate of CO₂ in different depositional systems containing saline water, oil, and natural gas. Several large scale projects are also underway that will inject several million tons of CO₂ over the life of the projects. One of these projects has safely and securely injected over 2 million metric tons of CO₂. Several more large-scale field tests will begin later this year.

Over the course of these initiatives, DOE and the Partnerships are addressing key infrastructure issues related to permitting, pore space ownership, site access, liability, public outreach, and education. We are also jointly developing Best Practice Manuals on topics such as site characterization, site construction, operations, monitoring, mitigation, closure, and long-term stewardship. These manuals will serve as guidelines for a future geologic sequestration industry in their regions, and help transfer the lessons learned from DOE's Program to all regional stakeholders.

Finally, DOE and the Partnerships continue to work closely with the Environmental Protection Agency (EPA) and other federal and state agencies in developing CCS regulatory strategies, which will provide additional certainty for future CCS deployments.

DEMONSTRATIONS AT COMMERCIAL-SCALE

The success of the Clean Coal Program will ultimately be judged by the extent to which emerging technologies get deployed in domestic and international marketplaces. Both technical and financial challenges associated with the deployment of new "high risk" coal technologies must be overcome in order to be capable of achieving success in the marketplace. Commercial scale demonstrations help the industry understand and overcome start-up issues, address component integration issues, and gain the early learning commercial experience necessary to reduce risk and secure private financing and investment for future plants.

The Department is implementing large-scale projects through the Regional Partnerships, the Clean Coal Power Initiative (CCPI), and FutureGen. Phase III of the Partnerships is focused on large-scale field tests of geologic carbon sequestration on the order of 1 million metric tons of CO₂ per year, and are addressing the liability, regulatory, permitting, and infrastructure needs of these projects. As described previously in this statement, the Partnerships have brought an enormous amount of capability and experience together to work on the challenges of these large projects.

The CCPI is a cost-shared partnership between the government and industry to develop and demonstrate advanced coal-based power generation technologies at the commercial scale. CCPI demonstrations address the reliability and affordability of the Nation's electricity supply from coal-based generation. By enabling advanced technologies to overcome technical risks involved with scale-up and bringing them to the point of commercial readiness, CCPI accelerates the development of both advanced coal generation technologies and the integration of CCS with both new and existing generation technologies. The CCPI also facilitates the movement of technologies into the marketplace that are emerging from the core research and development activities. The CCPI program received an additional \$800 million from the 2009 American Recovery and Reinvestment Act (Recovery Act) which, in combination

with base funding, was used to fund four active CCPI projects, two pre-combustion and two post-combustion projects.

In addition, a CCPI round II project has been modified to demonstrate CCS at a new integrated gasification combined cycle power plant. We are working closely with the project developers to comply with NEPA, air and water regulatory requirements, and complete initial Front End Engineering & Design (FEED) studies for the facilities. All five of these projects are on track to be operational between 2013 and 2015.

The FutureGen Project intends to conduct novel large-scale testing to accelerate the deployment of a set of advanced oxy-combustion power production technologies integrated with CCS. This project will be the first advanced repowering oxy-combustion project to store CO₂ in a deep saline geologic formation. On August 5, 2010, Secretary of Energy Steven Chu announced an award of \$1 billion in Recovery Act funding to the FutureGen Alliance, Ameren Energy Resources, Babcock & Wilcox, and Air Liquide Process and Construction, Inc., to build FutureGen 2.0, a clean coal repowering program and carbon dioxide storage network. On February 28, 2011, the FutureGen Alliance selected Morgan County, Illinois, as the preferred location for the FutureGen 2.0 CO₂ storage site, visitor center, research, and training facilities.

In addition to the CCPI and FutureGen 2.0 projects, the Recovery Act has also helped fund more than 80 additional projects which includes three large scale Industrial CCS demonstrations, ten geologic site characterizations, forty-three university research training projects, seven CCS research training centers, six Industrial CCS projects focused CO₂ reuse, and 14 projects focused on accelerated component development in the core research program.

CONCLUSION

CCS and related clean coal technologies can play a critical role in mitigating CO₂ emissions under many potential future carbon stabilization scenarios. Nevertheless, challenges remain to achieving cost-effective commercial deployment of CCS. The Department's research programs are a vital step to advancing the readiness of clean coal technologies for future commercial deployment. I thank this Committee and its members for allowing me the opportunity to provide an overview of DOE's research efforts in developing CCS technologies and I look forward to your questions. The Administration is still reviewing S. 699 and S. 757 and does not have a position on either bill at this time.

CHANGES IN EXISTING LAW

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, changes in existing law made by the bill, as ordered reported, are shown as follows (existing law proposed to be

omitted is enclosed in black brackets, new matter is printed in italic, existing law in which no change is proposed is shown in roman):

ENERGY POLICY ACT OF 2005

Public Law 109–58, as Amended

* * * * *

TITLE IX—RESEARCH AND DEVELOPMENT

* * * * *

Subtitle F—Fossil Energy

* * * * *

SEC. 963. CARBON CAPTURE AND SEQUESTRATION RESEARCH, DEVELOPMENT, AND DEMONSTRATION PROGRAM.

(a) *DEFINITIONS.—In this section:*

(1) *INDUSTRIAL SOURCE.*—*The term “industrial source” means any source of carbon dioxide that is not naturally occurring.*

(2) *LARGE-SCALE.*—*The term “large-scale” means the injection of over 1,000,000 tons of carbon dioxide from industrial sources over the lifetime of the project.*

[(a)] (b) [In general] *PROGRAM.*—The Secretary shall carry out a 10-year carbon capture and sequestration research, development, and demonstration program to develop carbon dioxide capture and sequestration technologies related to industrial sources of carbon dioxide for use—

(1) in new coal utilization facilities; and

(2) on the fleet of coal-based units in existence on August 8, 2005.

[(b)] (c) *OBJECTIVES.*—The objectives of the program under [subsection (a)] (*subsection (b)*) shall be—

(1) to develop carbon dioxide capture technologies, including adsorption and absorption techniques and chemical processes, to remove the carbon dioxide from gas streams containing carbon dioxide potentially amenable to sequestration;

(2) to develop technologies that would directly produce concentrated streams of carbon dioxide potentially amenable to sequestration;

(3) to increase the efficiency of the overall system to reduce the quantity of carbon dioxide emissions released from the system per megawatt generated;

(4) in accordance with the carbon dioxide capture program, to promote a robust carbon sequestration program and continue the work of the Department, in conjunction with the private sector, through regional carbon sequestration partnerships; and

(5) to expedite and carry out large-scale testing of carbon sequestration systems in a range of geologic formations that will provide information on the cost and feasibility of deployment of sequestration technologies.

[(c)] (d) *PROGRAMMATIC ACTIVITIES.*—

(1) FUNDAMENTAL SCIENCE AND ENGINEERING RESEARCH AND DEVELOPMENT AND DEMONSTRATION SUPPORTING CARBON CAPTURE AND SEQUESTRATION TECHNOLOGIES AND CARBON USE ACTIVITIES—

(A) IN GENERAL.—The Secretary shall carry out fundamental science and engineering research (including laboratory-scale experiments, numeric modeling, and simulations) to develop and document the performance of new approaches to capture and sequester, or use carbon dioxide to lead to an overall reduction of carbon dioxide emissions.

(B) PROGRAM INTEGRATION.—The Secretary shall ensure that fundamental research carried out under this paragraph is appropriately applied to energy technology development activities, the field testing of carbon sequestration, and carbon use activities, including—

(i) development of new or advanced technologies for the capture and sequestration of carbon dioxide;

(ii) development of new or advanced technologies that reduce the cost and increase the efficacy of advanced compression of carbon dioxide required for the sequestration of carbon dioxide;

(iii) modeling and simulation of geologic sequestration field demonstrations;

(iv) quantitative assessment of risks relating to specific field sites for testing of sequestration technologies;

(v) research and development of new and advanced technologies for carbon use, including recycling and reuse of carbon dioxide; and

(vi) research and development of new and advanced technologies for the separation of oxygen from air.

(2) FIELD VALIDATION TESTING ACTIVITIES.—

(A) IN GENERAL.—The Secretary shall promote, to the maximum extent practicable, regional carbon sequestration partnerships to conduct geologic sequestration tests involving carbon dioxide injection and monitoring, mitigation, and verification operations in a variety of candidate geologic settings, including—

(i) operating oil and gas fields;

(ii) depleted oil and gas fields;

(iii) unmineable coal seams;

(iv) deep saline formations;

(v) deep geologic systems that may be used as engineered reservoirs to extract economical quantities of heat from geothermal resources of low permeability or porosity; and

(vi) deep geologic systems containing basalt formations.

(B) OBJECTIVES.—The objectives of tests conducted under this paragraph shall be—

(i) to develop and validate geophysical tools, analysis, and modeling to monitor, predict, and verify carbon dioxide containment;

(ii) to validate modeling of geologic formations;

(iii) to refine sequestration capacity estimated for particular geologic formations;

(iv) to determine the fate of carbon dioxide concurrent with and following injection into geologic formations;

(v) to develop and implement best practices for operations relating to, and monitoring of, carbon dioxide injection and sequestration in geologic formations;

(vi) to assess and ensure the safety of operations related to geologic sequestration of carbon dioxide;

(vii) to allow the Secretary to promulgate policies, procedures, requirements, and guidance to ensure that the objectives of this subparagraph are met in large-scale testing and deployment activities for carbon capture and sequestration that are funded by the Department of Energy; and

(viii) to provide information to States, the Environmental Protection Agency, and other appropriate entities to support development of a regulatory framework for commercial-scale sequestration operations that ensure the protection of human health and the environment.

(3) LARGE-SCALE CARBON DIOXIDE SEQUESTRATION TESTING.—

(A) IN GENERAL.—The Secretary shall conduct not less than 7 initial large-scale sequestration tests, not including the FutureGen project, for geologic containment of carbon dioxide to collect and validate information on the cost and feasibility of commercial deployment of technologies for geologic containment of carbon dioxide. These 7 tests may include any Regional Partnership projects awarded as of December 19, 2007.

(B) DIVERSITY OF FORMATIONS TO BE STUDIED.—In selecting formations for study under this paragraph, the Secretary shall consider a variety of geologic formations across the United States, and require characterization and modeling of candidate formations, as determined by the Secretary.

(C) SOURCE OF CARBON DIOXIDE FOR LARGE-SCALE SEQUESTRATION TESTS.—In the process of any acquisition of carbon dioxide for sequestration tests under subparagraph (A), the Secretary shall give preference to sources of carbon dioxide from industrial sources. To the extent feasible, the Secretary shall prefer tests that would facilitate the creation of an integrated system of capture, transportation and sequestration of carbon dioxide. The preference provided for under this subparagraph shall not delay the implementation of the large-scale sequestration tests under this paragraph.

[(D) DEFINITION.—For purposes of this paragraph, the term “large-scale” means the injection of more than 1,000,000 tons of carbon dioxide from industrial sources annually or a scale that demonstrates the ability to inject and sequester several million metric tons of industrial source carbon dioxide for a large number of years.]

(4) PREFERENCE IN PROJECT SELECTION FOR MERITORIOUS PROPOSALS.—In making competitive awards under this subsection, subject to the requirements of section 16353 of this title, the Secretary shall—

(A) give preference to proposals from partnerships among industrial, academic, and government entities; and

(B) require recipients to provide assurances that all laborers and mechanics employed by contractors and subcontractors in the construction, repair, or alteration of new or existing facilities performed in order to carry out a demonstration or commercial application activity authorized under this subsection shall be paid wages at rates not less than those prevailing on similar construction in the locality, as determined by the Secretary of Labor in accordance with subchapter IV of chapter 31 of title 40, and the Secretary of Labor shall, with respect to the labor standards in this paragraph, have the authority and functions set forth in Reorganization Plan Numbered 14 of 1950 (15 Fed. Reg. 3176; 5 U.S.C. Appendix) and section 3145 of title 40.

(5) COST SHARING.—Activities under this subsection shall be considered research and development activities that are subject to the cost sharing requirements of section 16352(b) of this title.

(6) PROGRAM REVIEW AND REPORT.—During fiscal year 2011, the Secretary shall—

(A) conduct a review of programmatic activities carried out under this subsection; and

(B) make recommendations with respect to continuation of the activities.

[(d)] (e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this section—

(1) \$240,000,000 for fiscal year 2008;

(2) \$240,000,000 for fiscal year 2009;

(3) \$240,000,000 for fiscal year 2010;

(4) \$240,000,000 for fiscal year 2011; and

(5) \$240,000,000 for fiscal year 2012.

SEC. 963A. LARGE-SCALE CARBON STORAGE PROGRAM.

(a) DEFINITIONS.—In this section:

(1) INDUSTRIAL SOURCE.—The term “industrial source” means any source of carbon dioxide that is not naturally occurring.

(2) LARGE-SCALE.—The term “large-scale” means the injection of over 1,000,000 tons of carbon dioxide each year from industrial sources into a geological formation.

(3) SECRETARY CONCERNED.—The term “Secretary concerned” means—

(A) the Secretary of Agriculture (acting through the Chief of the Forest Service), with respect to National Forest System land; and

(B) the Secretary of the Interior, with respect to land managed by the Bureau of Land Management (including land held for the benefit of an Indian tribe).

(b) PROGRAM.—In addition to the research, development, and demonstration program authorized by section 963, the Secretary shall carry out a program to demonstrate the commercial applica-

tion of integrated systems for the capture, injection, monitoring, and long-term geological storage of carbon dioxide from industrial sources.

(c) *AUTHORIZED ASSISTANCE.*—In carrying out the program, the Secretary may enter into cooperative agreements to provide financial and technical assistance to up to 10 large-scale demonstration projects.

(d) *PROJECT SELECTION.*—The Secretary shall competitively select recipients of cooperative agreements under this section from among applicants that—

(1) provide the Secretary with sufficient geological site information (including hydrogeological and geophysical information) to establish that the proposed geological storage unit is capable of long-term storage of the injected carbon dioxide, including—

(A) the location, extent, and storage capacity of the geological storage unit at the site into which the carbon dioxide will be injected;

(B) the principal potential modes of geomechanical failure in the geological storage unit;

(C) the ability of the geological storage unit to retain injected carbon dioxide; and

(D) the measurement, monitoring, and verification requirements necessary to ensure adequate information on the operation of the geological storage unit during and after the injection of carbon dioxide;

(2) possess the land or interests in land necessary for—

(A) the injection and storage of the carbon dioxide at the proposed geological storage unit; and

(B) the closure, monitoring, and long-term stewardship of the geological storage unit;

(3) possess or have a reasonable expectation of obtaining all necessary permits and authorizations under applicable Federal and State laws (including regulations); and

(4) agree to comply with each requirement of subsection (e).

(e) *TERMS AND CONDITIONS.*—The Secretary shall condition receipt of financial assistance pursuant to a cooperative agreement under this section on the recipient agreeing to—

(1) comply with all applicable Federal and State laws (including regulations), including a certification by the appropriate regulatory authority that the project will comply with Federal and State requirements to protect drinking water supplies;

(2) in the case of industrial sources subject to the Clean Air Act (42 U.S.C. 7401 et seq.), inject only carbon dioxide captured from industrial sources in compliance with that Act;

(3) comply with all applicable construction and operating requirements for deep injection wells;

(4) measure, monitor, and test to verify that carbon dioxide injected into the injection zone is not—

(A) escaping from or migrating beyond the confinement zone; or

(B) endangering an underground source of drinking water;

(5) comply with applicable well-plugging, post-injection site care, and site closure requirements, including—

- (A)(i) maintaining financial assurances during the post-injection closure and monitoring phase until a certificate of closure is issued by the Secretary; and
- (ii) promptly undertaking remediation activities for any leak from the geological storage unit that would endanger public health or safety or natural resources; and
- (B) complying with the requirements of subsection (f);
- (6) comply with applicable long-term care requirements;
- (7) maintain financial protection in a form and in an amount acceptable to—
 - (A) the Secretary;
 - (B) the Secretary with jurisdiction over the land; and
 - (C) the Administrator of the Environmental Protection Agency; and
- (8) provide the assurances described in section 963(c)(4)(B).

(f) **POST INJECTION CLOSURE AND MONITORING ELEMENTS.**—In assessing whether a project complies with site closure requirements under subsection (e)(5), the Secretary, in consultation with the Administrator of the Environmental Protection Agency, shall determine whether the recipient of financial assistance has demonstrated continuous compliance with each of the following requirements over a period of not less than 10 consecutive years after the plume of carbon dioxide has stabilized within the geologic formation that comprises the geologic storage unit following the cessation of injection activities:

- (1) The estimated location and extent of the project footprint (including the detectable plume of carbon dioxide and the area of elevated pressure resulting from the project) has not substantially changed and is contained within the geologic storage unit.
- (2) The injection zone formation pressure has ceased to increase following cessation of carbon dioxide injection into the geologic storage unit.
- (3) There is no leakage of either carbon dioxide or displaced formation fluid from the geologic storage unit that is endangering public health and safety, including underground sources of drinking water and natural resources.
- (4) The injected or displaced formation fluids are not expected to migrate in the future in a manner that encounters a potential leakage pathway.
- (5) The injection wells at the site completed into or through the injection zone or confining zone are plugged and abandoned in accordance with the applicable requirements of Federal or State law governing the wells.

(g) **INDEMNIFICATION AGREEMENTS.**—

- (1) **DEFINITION OF LIABILITY.**—In this subsection, the term ‘liability’ means any legal liability for—
 - (A) bodily injury, sickness, disease, or death;
 - (B) loss of or damage to property, or loss of use of property; or
 - (C) injury to or destruction or loss of natural resources, including fish, wildlife, and drinking water supplies.
- (2) **AGREEMENTS.**—Not later than 1 year after the date of the receipt by the Secretary of a completed application for a demonstration project, the Secretary may agree to indemnify and

hold harmless the recipient of a cooperative agreement under this section from liability arising out of or resulting from a demonstration project in excess of the amount of liability covered by financial protection maintained by the recipient under subsection (e)(7).

(3) *EXCEPTION FOR GROSS NEGLIGENCE AND INTENTIONAL MISCONDUCT.*—Notwithstanding paragraph (1), the Secretary may not indemnify the recipient of a cooperative agreement under this section from liability arising out of conduct of a recipient that is grossly negligent or that constitutes intentional misconduct.

(4) *COLLECTION OF FEES.*—

(A) *IN GENERAL.*—The Secretary shall collect a fee from any person with whom an agreement for indemnification is executed under this subsection in an amount that is equal to the net present value of payments made by the United States to cover liability under the indemnification agreement.

(B) *AMOUNT.*—The Secretary shall establish, by regulation, criteria for determining the amount of the fee, taking into account—

(i) the likelihood of an incident resulting in liability to the United States under the indemnification agreement; and

(ii) other factors pertaining to the hazard of the indemnified project.

(C) *USE OF FEES.*—Fees collected under this paragraph shall be deposited in the Treasury and credited to miscellaneous receipts.

(5) *CONTRACTS IN ADVANCE OF APPROPRIATIONS.*—

(A) *IN GENERAL.*—Subject to subparagraph (B), the Secretary may enter into agreements of indemnification under this subsection in advance of appropriations and incur obligations without regard to section 1341 of title 31, United States Code (commonly known as the “Anti-Deficiency Act”), or section 11 of title 41, United States Code (commonly known as the “Adequacy of Appropriations Act”).

(B) *LIMITATION.*—The amount of indemnification under this subsection shall not exceed \$10,000,000,000 (adjusted not less than once during each 5-year period following the date of enactment of this section, in accordance with the aggregate percentage change in the Consumer Price Index since the previous adjustment under this subparagraph), in the aggregate, for all persons indemnified in connection with an agreement and for each project, including such legal costs as are approved by the Secretary.

(6) *CONDITIONS OF AGREEMENTS OF INDEMNIFICATION.*—

(A) *IN GENERAL.*—An agreement of indemnification under this subsection may contain such terms as the Secretary considers appropriate to carry out the purposes of this section.

(B) *ADMINISTRATION.*—The agreement shall provide that, if the Secretary makes a determination the United States will probably be required to make indemnity payments under the agreement, the Attorney General—

(i) shall collaborate with the recipient of an award under this subsection; and

(ii) may—

(I) approve the payment of any claim under the agreement of indemnification;

(II) appear on behalf of the recipient;

(III) take charge of an action; and

(IV) settle or defend an action.

(C) SETTLEMENT OF CLAIMS.—

(i) *IN GENERAL.*—The Attorney General shall have final authority on behalf of the United States to settle or approve the settlement of any claim under this subsection on a fair and reasonable basis with due regard for the purposes of this subsection.

(ii) *EXPENSES.*—The settlement shall not include expenses in connection with the claim incurred by the recipient.

(h) *FEDERAL LAND.*—

(1) *IN GENERAL.*—The Secretary concerned may authorize the siting of a project on Federal land under the jurisdiction of the Secretary concerned in a manner consistent with applicable laws and land management plans and subject to such terms and conditions as the Secretary concerned determines to be necessary.

(2) *FRAMEWORK FOR GEOLOGICAL CARBON SEQUESTRATION ON PUBLIC LAND.*—In determining whether to authorize a project on Federal land, the Secretary concerned shall take into account the framework for geological carbon sequestration on public land prepared in accordance with section 714 of the Energy Independence and Security Act of 2007 (Public Law 110–140; 121 Stat. 1715).

(i) *ACCEPTANCE OF TITLE AND LONG-TERM MONITORING.*—

(1) *IN GENERAL.*—As a condition of a cooperative agreement under this section, the Secretary may accept title to, or transfer of administrative jurisdiction from another Federal agency over, any land or interest in land necessary for the monitoring, remediation, or long-term stewardship of a project site.

(2) *LONG-TERM MONITORING ACTIVITIES.*—After accepting title to, or transfer of, a site closed in accordance with this section, the Secretary shall monitor the site and conduct any remediation activities to ensure the geological integrity of the site and prevent any endangerment of public health or safety.

(3) *FUNDING.*—There is appropriated to the Secretary, out of funds of the Treasury not otherwise appropriated, such sums as are necessary to carry out paragraph (2).”.

* * * * *

ENERGY INDEPENDENCE AND SECURITY ACT OF 2007

Public Law 110–140

* * * * *

TITLE VII—CARBON CAPTURE AND SEQUESTRATION

Subtitle A—Carbon Capture and Sequestration Research, Development, and Demonstration

SEC. 701. SHORT TITLE.

This subtitle may be cited as the “Department of Energy Carbon Capture and Sequestration Research, Development, and Demonstration Act of 2007”.

* * * * *

SEC. 703. CARBON CAPTURE.

(a) PROGRAM ESTABLISHMENT.—

* * * * *

(3) PREFERENCES FOR AWARD.—To ensure reduced carbon dioxide emissions, the Secretary shall take necessary actions to provide for the integration of the program under this paragraph with the large-scale carbon dioxide sequestration tests described in [section 963(c)(3) of the Energy Policy Act of 2005 (42 U.S.C. 16293(c)(3))] (section 963(d)(3) of the Energy Policy Act of 2005 (42 U.S.C. 16293(d)(3))), as added by section 702 of this subtitle. These actions should not delay implementation of these tests. The Secretary shall give priority consideration to projects with the following characteristics:

(A) CAPACITY.—Projects that will capture a high percentage of the carbon dioxide in the treated stream and large volumes of carbon dioxide as determined by the Secretary.

(B) SEQUESTRATION.—Projects that capture carbon dioxide from industrial sources that are near suitable geological reservoirs and could continue sequestration including—

(i) a field testing validation activity under section 963 of the Energy Policy Act of 2005 (42 U.S.C. 16293), as amended by this Act; or

(ii) other geologic sequestration projects approved by the Secretary.

* * * * *

SEC. 704. REVIEW OF LARGE-SCALE PROGRAMS.

The Secretary shall enter into an arrangement with National Academy of Sciences for an independent review and oversight, beginning in 2011, of the programs under [section 963(c)(3) of the Energy Policy Act of 2005 (42 U.S.C. 16293(c)(3))] (section 963(d)(3) of the Energy Policy Act of 2005 (42 U.S.C. 16293(d)(3))), as added by section 702 of this subtitle, and under section 703 of this subtitle to ensure that the benefits of such programs are maximized. Not later than January 1, 2012, the Secretary shall transmit to the Congress a report on the results of such review and oversight.

* * * * *