Union Calendar No. 188

110TH CONGRESS
1ST SESSION

H. R. 1933

[Report No. 110–301]

To amend the Energy Policy Act of 2005 to reauthorize and improve the carbon capture and storage research, development, and demonstration program of the Department of Energy, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

APRIL 18, 2007

Mr. UDALL of Colorado introduced the following bill; which was referred to the Committee on Science and Technology

AUGUST 3, 2007

Additional sponsors: Mr. SALAZAR, Mr. MARSHALL, Mr. SCHIFF, Mr. GORDON, Mr. COSTELLO, Ms. MCCOLLUM of Minnesota, Mr. HARE, and Ms. EDDIE BERNICE JOHNSON of Texas

AUGUST 3, 2007

Reported with an amendment, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed

[Strike out all after the enacting clause and insert the part printed in italic]

[For text of introduced bill, see copy of bill as introduced on April 18, 2007]

A BILL

To amend the Energy Policy Act of 2005 to reauthorize and improve the carbon capture and storage research, development, and demonstration program of the Department of Energy, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Department of Energy Carbon Capture and Storage Research, Development, and Demonstration Act of 2007".

SEC. 2. CARBON CAPTURE AND STORAGE RESEARCH, DEVELOPMENT, AND DEMONSTRATION PROGRAM.

(a) AMENDMENTS.—Section 963 of the Energy Policy Act of 2005 (42 U.S.C. 16293) is amended—

*(1) in the section heading, by striking "**RESEARCH AND DEVELOPMENT**" and inserting "**AND STORAGE RESEARCH, DEVELOPMENT, AND DEMONSTRATION**";*

(2) in subsection (a)—

(A) by striking "research and development" and inserting "and storage research, development, and demonstration"; and

(B) by striking "capture technologies on combustion-based systems" and inserting "capture and storage technologies related to electric power generating systems";

(3) in subsection (b)—

(A) in paragraph (3), by striking "and" at the end;

(B) in paragraph (4), by striking the period at the end and inserting "; and"; and

(C) by adding at the end the following:

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

(4) by striking subsection (c) and inserting the following:

"(c) PROGRAMMATIC ACTIVITIES.—

"(1) FUNDAMENTAL SCIENCE AND ENGINEERING RESEARCH AND DEVELOPMENT AND DEMONSTRATION SUPPORTING CARBON CAPTURE AND STORAGE TECHNOLOGIES.—

"(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 store carbon dioxide, or to learn how to use carbon dioxide in products

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 and the field testing of carbon sequestration and carbon use activities, including—

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

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

"(iii) modeling and simulation of geological sequestration field demonstrations;

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

"(v) research and development of new and advanced technologies for carbon use,

including recycling and reuse of carbon dioxide.

"(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 geological 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;

"(vi) deep geologic systems containing basalt formations; and

"(vii) high altitude terrain oil and gas fields.

"(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 geological formations;

"(iii) to refine storage capacity estimated for particular geological formations;

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

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

"(vi) to assess and ensure the safety of operations related to geological storage 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 storage that are funded by the Department of Energy; and

"(viii) to support Environmental Protection Agency efforts, in consultation with other agencies, to develop a scientifically sound regulatory framework to enable commercial-scale sequestration operations while safeguarding human health and underground sources of drinking water.

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

"(A) IN GENERAL.—The Secretary shall conduct not less than 7 initial large-volume sequestration tests, not including the FutureGen project, for geological containment of carbon dioxide (at least 1 of which shall be international in scope) to validate information on the cost and feasibility of commercial deployment of technologies for geological containment of carbon dioxide.

"(B) DIVERSITY OF FORMATIONS TO BE STUDIED.—In selecting formations for study under this paragraph, the Secretary shall consider a variety of geological 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 DEMONSTRATIONS.—In the process of any acquisition of carbon dioxide for sequestration demonstrations under subparagraph (A), the Secretary shall give preference to purchases of carbon dioxide from industrial and coal-fired electric generation facilities. To the extent feasible, the Secretary shall prefer test projects from industrial and coal-fired electric generation facilities that would facilitate the creation of an integrated system of capture, transportation and storage of carbon dioxide. Until coal-fired electric generation facilities, either new or existing, are operating with carbon dioxide capture technologies, other industrial sources of carbon dioxide should be pursued under this paragraph. 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 metric tons of carbon dioxide annually, or a scale that demonstrably exceeds the necessary thresholds in key

geologic transients to validate the ability continuously to inject quantities on the order of several million metric tons of industrial carbon dioxide annually for a large number of years.

"(4) LARGE-SCALE DEMONSTRATION OF CARBON DIOXIDE CAPTURE TECHNOLOGIES.—

"(A) IN GENERAL.—The Secretary shall carry out at least 3 and no more than 5 demonstrations, that include each of the technologies described in subparagraph (B), for the large-scale capture of carbon dioxide from industrial sources of carbon dioxide, at least 2 of which are facilities that generate electric energy from fossil fuels. Candidate facilities for other demonstrations under this paragraph shall include facilities that refine petroleum, manufacture iron or steel, manufacture cement or cement clinker, manufacture commodity chemicals, and ethanol and fertilizer plants. Consideration may be given to capture of carbon dioxide from industrial facilities and electric generation carbon sources that are near suitable geological reservoirs and could continue sequestration. To ensure reduced carbon dioxide emissions, the Secretary shall take necessary actions to provide for the integra-

tion of the program under this paragraph with the long-term carbon dioxide sequestration demonstrations described in paragraph (3). These actions should not delay implementation of the large-scale sequestration tests authorized in paragraph (3).

"(B) TECHNOLOGIES.—The technologies referred to in subparagraph (A) are precombustion capture, post-combustion capture, and oxycombustion.

"(C) SCOPE OF AWARD.—An award under this paragraph shall be only for the portion of the project that carries out the large-scale capture (including purification and compression) of carbon dioxide, as well as the cost of transportation and injection of carbon dioxide.

"(5) PREFERENCE IN PROJECT SELECTION FROM MERITORIOUS PROPOSALS.—In making competitive awards under this subsection, subject to the requirements of section 989, the Secretary shall give preference to proposals from partnerships among industrial, academic, and government entities.

"(6) COST SHARING.—Activities under this subsection shall be considered research and development activities that are subject to the cost-sharing require-

ments of section 988(b), except that the Federal share of a project under paragraph (4) shall not exceed 50 percent.

"(d) AUTHORIZATION OF APPROPRIATIONS.—

"(1) IN GENERAL.—There are authorized to be appropriated to the Secretary for carrying out this section, other than subsection (c)(3) and (4)—

"(A) $100,000,000 for fiscal year 2008;

"(B) $100,000,000 for fiscal year 2009;

"(C) $100,000,000 for fiscal year 2010; and

"(D) $100,000,000 for fiscal year 2011.

"(2) SEQUESTRATION.—There are authorized to be appropriated to the Secretary for carrying out subsection (c)(3)—

"(A) $140,000,000 for fiscal year 2008;

"(B) $140,000,000 for fiscal year 2009;

"(C) $140,000,000 for fiscal year 2010; and

"(D) $140,000,000 for fiscal year 2011.

"(3) CARBON CAPTURE.—There are authorized to be appropriated to the Secretary for carrying out subsection (c)(4)—

"(A) $180,000,000 for fiscal year 2009;

"(B) $180,000,000 for fiscal year 2010;

"(C) $180,000,000 for fiscal year 2011; and

"(D) $180,000,000 for fiscal year 2012.".

(b) TABLE OF CONTENTS AMENDMENT.—The item relating to section 963 in the table of contents for the Energy Policy Act of 2005 is amended to read as follows:

"Sec. 963. Carbon capture and storage research, development, and demonstration program.".

SEC. 3. REVIEW OF LARGE-SCALE PROGRAMS.

The Secretary of Energy shall enter into an arrangement with the National Academy of Sciences for an independent review and oversight, beginning in 2011, of the programs under section 963(c)(3) and (4) of the Energy Policy Act of 2005, as added by section 2 of this Act, 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.

SEC. 4. SAFETY RESEARCH.

(a) PROGRAM.—The Assistant Administrator for Research and Development of the Environmental Protection Agency shall conduct a research program to determine procedures necessary to protect public health, safety, and the environment from impacts that may be associated with capture, injection, and sequestration of greenhouse gases in subterranean reservoirs.

(b) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated for carrying out this section $5,000,000 for each fiscal year.

SEC. 5. GEOLOGICAL SEQUESTRATION TRAINING AND RESEARCH.

(a) STUDY.—

(1) IN GENERAL.—The Secretary of Energy shall enter into an arrangement with the National Academy of Sciences to undertake a study that—

(A) defines an interdisciplinary program in geology, engineering, hydrology, environmental science, and related disciplines that will support the Nation's capability to capture and sequester carbon dioxide from anthropogenic sources;

(B) addresses undergraduate and graduate education, especially to help develop graduate level programs of research and instruction that lead to advanced degrees with emphasis on geological sequestration science;

(C) develops guidelines for proposals from colleges and universities with substantial capabilities in the required disciplines that wish to implement geological sequestration science programs that advance the Nation's capacity to address carbon management through geological sequestration science; and

(D) outlines a budget and recommendations for how much funding will be necessary to estab-

lish and carry out the grant program under subsection (b).

(2) REPORT.—Not later than 1 year after the date of enactment of this Act, the Secretary of Energy shall transmit to the Congress a copy of the results of the study provided by the National Academy of Sciences under paragraph (1).

(3) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary for carrying out this subsection $1,000,000 for fiscal year 2008.

(b) GRANT PROGRAM.—

(1) ESTABLISHMENT.—The Secretary of Energy, through the National Energy Technology Laboratory, shall establish a competitive grant program through which colleges and universities may apply for and receive 4-year grants for—

(A) salary and startup costs for newly designated faculty positions in an integrated geological carbon sequestration science program; and

(B) internships for graduate students in geological sequestration science.

(2) RENEWAL.—Grants under this subsection shall be renewable for up to 2 additional 3-year

terms, based on performance criteria, established by the National Academy of Sciences study conducted under subsection (a), that include the number of graduates of such programs.

(3) INTERFACE WITH REGIONAL GEOLOGICAL CARBON SEQUESTRATION PARTNERSHIPS.—To the greatest extent possible, geological carbon sequestration science programs supported under this subsection shall interface with the research of the Regional Carbon Sequestration Partnerships operated by the Department of Energy to provide internships and practical training in carbon capture and geological sequestration.

(4) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary for carrying out this subsection such sums as may be necessary.

SEC. 6. UNIVERSITY BASED RESEARCH AND DEVELOPMENT GRANT PROGRAM.

(a) ESTABLISHMENT.—The Secretary of Energy, in consultation with other appropriate agencies, shall establish a university based research and development program to study carbon capture and sequestration using the various types of coal.

(b) GRANTS.—Under this section, the Secretary shall award 5 grants for projects submitted by colleges or universities to study carbon capture and sequestration in conjunction with the recovery of oil and other enhanced elemental and mineral recovery. Consideration shall be given to areas that have regional sources of coal for the study of carbon capture and sequestration.

(c) RURAL AND AGRICULTURAL INSTITUTIONS.—The Secretary shall designate that at least 2 of these grants shall be awarded to rural or agricultural based institutions that offer interdisciplinary programs in the area of environmental science to study carbon capture and sequestration in conjunction with the recovery of oil and other enhanced elemental and mineral recovery.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are to be authorized to be appropriated $10,000,000 to carry out this section.

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