

110TH CONGRESS  
1ST SESSION

# S. 2323

To provide for the conduct of carbon capture and storage technology research, development, and demonstration projects, and for other purposes.

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IN THE SENATE OF THE UNITED STATES

NOVEMBER 7, 2007

Mr. KERRY introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

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## A BILL

To provide for the conduct of carbon capture and storage technology research, development, and demonstration projects, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*  
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Carbon Capture and  
5 Storage Technology Act of 2007”.

6 **SEC. 2. DEFINITIONS.**

7 In this Act:

8 (1) SECRETARY.—The term “Secretary” means  
9 the Secretary of Energy.

1           (2) **TASK FORCE.**—The term “Task Force”  
2           means the interagency task force established by sec-  
3           tion 5(a)(1).

4 **SEC. 3. CARBON DIOXIDE SEQUESTRATION COMMERCIAL**  
5 **DEMONSTRATION PROJECTS.**

6           (a) **IN GENERAL.**—The Secretary shall establish a  
7           competitive grant program to provide grants or other fi-  
8           nancial assistance to at least 3, but not more than 5, 8-  
9           year commercial demonstration projects to demonstrate  
10          the long-term effects of sequestration of carbon dioxide in  
11          deep geological formations, of which—

12                 (1) not less than 2 of those projects shall be  
13                 conducted in deep saline aquifers; and

14                 (2) the remainder may be conducted in saline  
15                 aquifers combined with storage in established oil or  
16                 gas fields.

17          (b) **PROJECT REQUIREMENTS.**—A commercial dem-  
18          onstration project provided assistance under subsection  
19          (a) shall—

20                 (1) involve injections of at least 1,000,000 tons  
21                 of carbon dioxide each year;

22                 (2) include intensive characterization and moni-  
23                 toring of the site for the commercial demonstration  
24                 project in order to evaluate—

1 (A) the security of the storage of carbon  
2 dioxide over the period during which the com-  
3 mercial demonstration project is being carried  
4 out;

5 (B) any leakage from the site over the pe-  
6 riod during which the commercial demonstra-  
7 tion project is being carried out; and

8 (C) the security of the storage of carbon  
9 dioxide, including the likelihood of leakage from  
10 the site after the project has ceased to operate;

11 (3) include development of best practices for in-  
12 jecting, permitting, and managing the storage area;

13 (4) require full integration of data from the  
14 commercial demonstration project; and

15 (5) include an evaluation of the most cost-effi-  
16 cient ways in which to—

17 (A) undertake sequestration of carbon di-  
18 oxide;

19 (B) integrate sequestration with the cap-  
20 ture and transportation of carbon dioxide;

21 (C) effectively monitor and verify the in-  
22 jected carbon dioxide; and

23 (D) identify and manage hazards and risks  
24 associated with storage.

1 (c) APPLICATION.—To be eligible to receive assist-  
2 ance under subsection (a), an entity shall submit to the  
3 Secretary an application at such time, in such manner,  
4 and containing such information as the Secretary may re-  
5 quire.

6 (d) LOCATION.—In providing assistance under this  
7 section, the Secretary shall select commercial demonstra-  
8 tion projects that are in locations that—

9 (1) are geologically and geophysically diverse;  
10 (2) represent a range of population densities;

11 and

12 (3) are in close proximity to—

13 (A) utilities and industrial settings; and

14 (B) large-scale existing and planned coal-  
15 fired generation facilities.

16 (e) COST-SHARING REQUIREMENT.—

17 (1) IN GENERAL.—Except as provided in para-  
18 graph (2), the non-Federal share of the cost of car-  
19 rying out a commercial demonstration project under  
20 subsection (a) shall be not less than 20 nor more  
21 than 50 percent, as determined by the Secretary.

22 (2) EXCEPTION.—The Secretary may waive the  
23 non-Federal share required under paragraph (1) as  
24 the Secretary determines to be appropriate.

25 (f) REPORTS TO CONGRESS.—

1           (1) INITIAL REPORT.—As soon as practicable,  
2           but not later than 8 years, after the date of enact-  
3           ment of this Act, the Secretary shall submit to the  
4           appropriate committees of Congress a report that  
5           describes the preliminary results of—

6                   (A) any commercial demonstration projects  
7                   carried out under this section; and

8                   (B) the evaluation conducted under sub-  
9                   section (b)(5).

10          (2) FINAL REPORT.—After any demonstration  
11          projects have been operated for a sufficient period of  
12          time to gather meaningful data and performance  
13          metrics, as determined by the Secretary, but not  
14          later than 10 years after the date of enactment of  
15          this Act, the Secretary shall submit to the appro-  
16          priate committees of Congress a final report that in-  
17          cludes the information required under paragraph  
18          (1).

19          (g) AUTHORIZATION OF APPROPRIATIONS.—There is  
20          authorized to be appropriated to carry out this section  
21          \$1,600,000,000 for the period of fiscal years 2008  
22          through 2015.

1 **SEC. 4. CARBON DIOXIDE CAPTURE DEMONSTRATION**  
2 **PROJECTS.**

3 (a) IN GENERAL.—The Secretary shall establish a  
4 competitive grant program under which the Secretary  
5 shall provide grants to at least 3, but not more than 5,  
6 commercial demonstration projects for the capture of car-  
7 bon emissions from coal-fired power plants.

8 (b) PROJECT REQUIREMENTS.—

9 (1) IN GENERAL.—A commercial demonstration  
10 project provided assistance under this section shall  
11 involve a coal-fired power plant with a nameplate ca-  
12 pacity of at least 250, but not more than 500,  
13 megawatts.

14 (2) PRIORITY.—The Secretary shall give pri-  
15 ority to integrated proposed commercial demonstra-  
16 tion projects that would combine the capture of car-  
17 bon dioxide with sequestration in deep geological for-  
18 mations.

19 (c) APPLICATION.—To be eligible to receive assist-  
20 ance under subsection (a), an entity shall submit to the  
21 Secretary an application at such time, in such manner,  
22 and containing such information as the Secretary may re-  
23 quire.

24 (d) COST-SHARING REQUIREMENT.—

25 (1) IN GENERAL.—Except as provided in para-  
26 graph (2), the non-Federal share of the cost of car-

1       rying out a commercial demonstration project under  
2       subsection (a) shall be not less than 50 percent.

3           (2) EXCEPTION.—The Secretary may waive the  
4       non-Federal share required under paragraph (1) if  
5       the Secretary determines that—

6           (A) the technology that is the subject of  
7       the commercial demonstration project is critical  
8       and the technology risk is relatively high; and

9           (B) there are insufficient resources to pro-  
10      vide the non-Federal share.

11       (e) AUTHORIZATION OF APPROPRIATIONS.—There is  
12      authorized to be appropriated to carry out this section  
13      \$2,400,000,000 for the period of fiscal years 2008  
14      through 2015.

15      **SEC. 5. CARBON CAPTURE AND STORAGE REGULATIONS.**

16       (a) INTERAGENCY TASK FORCE.—

17           (1) IN GENERAL.—There is established an  
18      interagency task force to develop regulations pro-  
19      viding guidelines and practices for the capture and  
20      storage of carbon dioxide.

21           (2) MEMBERSHIP.—The Task Force shall be  
22      composed of—

23           (A) the Secretary;

24           (B) the Administrator of the Environ-  
25      mental Protection Agency; and

1           (C) the Secretary of the Interior (acting  
2           through the Director of the United States Geo-  
3           logical Survey).

4           (3) CHAIRPERSON.—The Administrator of the  
5           Environmental Protection Agency shall be the chair-  
6           person of the Task Force.

7           (4) CONSULTATION.—In developing regulations  
8           under this section, the Task Force shall consult  
9           with—

10                   (A) industry experts;

11                   (B) legal experts; and

12                   (C) technical experts.

13           (5) REQUIREMENTS.—The regulations devel-  
14           oped by the Task Force shall—

15                   (A) take into account existing underground  
16                   injection control program requirements of the  
17                   Environmental Protection Agency;

18                   (B) address the certification and closure of  
19                   carbon dioxide capture and storage sites;

20                   (C) address the potential appropriate  
21                   transfer of liability to governmental entities;

22                   (D) provide mechanisms to ensure, mon-  
23                   itor, and verify the safe transportation and  
24                   storage of carbon dioxide;



1           (E) provide estimate of the costs of car-  
2           rying out the regulations; and

3           (F) take into account the outcomes of  
4           demonstration projects.

5           (6) PROPOSED REGULATIONS.—Not later than  
6           3 years after the date of enactment of this Act, the  
7           Task Force shall submit to the appropriate commit-  
8           tees of Congress the proposed regulations developed  
9           by the Task Force.

10          (b) PROMULGATION.—Not later than 18 months  
11          after the date on which the proposed regulations are sub-  
12          mitted under subsection (a)(6), the Administrator of the  
13          Environmental Protection Agency shall promulgate the  
14          regulations.

15          (c) UPDATE.—Not later than 3 years after the date  
16          of promulgation of the regulations under subsection (b),  
17          the Administrator of the Environmental Protection Agen-  
18          cy shall update the regulations as necessary to take into  
19          account the results of demonstration projects carried out  
20          under sections 3 and 4.

21          (d) ENFORCEMENT.—The Administrator of the Envi-  
22          ronmental Protection Agency shall be responsible for en-  
23          forcement of, and inspections relating to, the regulations  
24          promulgated under subsections (b) and (c).

1 **SEC. 6. CARBON DIOXIDE CAPTURE AND STORAGE RE-**  
2 **SEARCH AND DEVELOPMENT.**

3 (a) CARBON DIOXIDE CAPTURE TECHNOLOGIES.—  
4 The Director of the Office of Science, in consultation with  
5 the Assistant Secretary for Fossil Energy, shall carry out  
6 a program for the research and development of potential  
7 technologies and approaches for the capture of carbon di-  
8 oxide, including the capture of carbon dioxide—

9 (1) through coal gasification and related cap-  
10 ture technologies;

11 (2) in air-blown pulverized coal combustion fa-  
12 cilities;

13 (3) in oxy-fueled pulverized coal combustion fa-  
14 cilities;

15 (4) through lower-cost separation of oxygen  
16 from air at power plants; and

17 (5) through advanced concepts and biological  
18 systems.

19 (b) CARBON DIOXIDE STORAGE TECHNOLOGIES.—

20 (1) IN GENERAL.—The Secretary, in consulta-  
21 tion with the Secretary of the Interior, shall carry  
22 out a program for the research and development of  
23 carbon dioxide storage technologies, including—

24 (A) the improved understanding of geologi-  
25 cal carbon dioxide sequestration processes and  
26 characteristics;

1 (B) simulation activities at carbon dioxide  
2 storage sites established under this Act or any  
3 other Act; and

4 (C) identification, management, and miti-  
5 gation of hazards and risks.

6 (2) RECOMMENDATIONS.—Based on the re-  
7 search and development activities conducted under  
8 paragraph (1), the Secretary shall develop recom-  
9 mendations for optimal carbon dioxide storage fea-  
10 tures, practices, and conditions.

11 (c) AUTHORIZATION OF APPROPRIATIONS.—There  
12 are authorized to be appropriated for the conduct of activi-  
13 ties under—

14 (1) subsection (a)(1) \$100,000,000 for each of  
15 fiscal years 2008 through 2012;

16 (2) paragraphs (2) and (3) of subsection (a)  
17 \$100,000,000 for each of fiscal years 2008 through  
18 2012;

19 (3) subsection (a)(4) \$100,000,000 for each of  
20 fiscal years 2008 through 2012; and

21 (4) subparagraphs (A) and (B) of subsection  
22 (b)(1) \$50,000,000 for each of fiscal years 2008  
23 through 2012.

1 **SEC. 7. CARBON DIOXIDE STORAGE CAPACITY ASSESS-**  
2 **MENT.**

3 (a) DEFINITIONS.—In this section—

4 (1) ASSESSMENT.—The term “assessment”  
5 means the national assessment of capacity for car-  
6 bon dioxide completed under subsection (f).

7 (2) CAPACITY.—The term “capacity” means the  
8 portion of a storage formation that can retain car-  
9 bon dioxide in accordance with the requirements (in-  
10 cluding physical, geological, and economic require-  
11 ments) established under the methodology developed  
12 under subsection (b).

13 (3) ENGINEERED HAZARD.—The term “engi-  
14 neered hazard” includes the location and completion  
15 history of any well that could affect potential stor-  
16 age.

17 (4) RISK.—The term “risk” includes any risk  
18 posed by geomechanical, geochemical, hydrogeologi-  
19 cal, structural, and engineered hazards.

20 (5) SECRETARY.—The term “Secretary” means  
21 the Secretary of the Interior, acting through the Di-  
22 rector of the United States Geological Survey.

23 (6) STORAGE FORMATION.—The term “storage  
24 formation” means a deep saline formation, unmine-  
25 able coal seam, or oil or gas reservoir that is capable

1 of accommodating a volume of industrial carbon di-  
2 oxide.

3 (b) METHODOLOGY.—Not later than 1 year after the  
4 date of enactment of this Act, the Secretary shall develop  
5 a methodology for conducting an assessment under sub-  
6 section (f), taking into consideration—

7 (1) the geographical extent of all potential stor-  
8 age formations in all States;

9 (2) the capacity of the potential storage forma-  
10 tions;

11 (3) the injectivity of the potential storage for-  
12 mations;

13 (4) an estimate of potential volumes of oil and  
14 gas recoverable by injection and storage of industrial  
15 carbon dioxide in potential storage formations;

16 (5) the risk associated with the potential stor-  
17 age formations; and

18 (6) the Carbon Sequestration Atlas of the  
19 United States and Canada that was completed by  
20 the Department of Energy in April 2006.

21 (c) COORDINATION.—

22 (1) FEDERAL COORDINATION.—

23 (A) CONSULTATION.—The Secretary shall  
24 consult with the Secretary of Energy and the  
25 Administrator of the Environmental Protection

1 Agency on issues of data sharing, format, devel-  
2 opment of the methodology, and content of the  
3 assessment required under this title to ensure  
4 the maximum usefulness and success of the as-  
5 sessment.

6 (B) COOPERATION.—The Secretary of En-  
7 ergy and the Administrator shall cooperate with  
8 the Secretary to ensure, to the maximum extent  
9 practicable, the usefulness and success of the  
10 assessment.

11 (2) STATE COORDINATION.—The Secretary  
12 shall consult with State geological surveys and other  
13 relevant entities to ensure, to the maximum extent  
14 practicable, the usefulness and success of the assess-  
15 ment.

16 (d) EXTERNAL REVIEW AND PUBLICATION.—On  
17 completion of the methodology under subsection (b), the  
18 Secretary shall—

19 (1) publish the methodology and solicit com-  
20 ments from the public and the heads of affected  
21 Federal and State agencies;

22 (2) establish a panel of individuals with exper-  
23 tise in the matters described in paragraphs (1)  
24 through (5) of subsection (b) composed, as appro-  
25 priate, of representatives of Federal agencies, insti-

1       tutions of higher education, nongovernmental organi-  
2       zations, State organizations, industry, and inter-  
3       national geoscience organizations to review the  
4       methodology and comments received under para-  
5       graph (1); and

6               (3) on completion of the review under para-  
7       graph (2), publish in the Federal Register the re-  
8       vised final methodology.

9       (e) PERIODIC UPDATES.—The methodology devel-  
10      oped under this section shall be updated periodically (in-  
11      cluding at least once every 5 years) to incorporate new  
12      data as the data becomes available.

13      (f) NATIONAL ASSESSMENT.—

14              (1) IN GENERAL.—Not later than 2 years after  
15      the date of publication of the methodology under  
16      subsection (d)(1), the Secretary, in consultation with  
17      the Secretary of Energy and State geological sur-  
18      veys, shall complete a national assessment of capac-  
19      ity for carbon dioxide in accordance with the meth-  
20      odology.

21              (2) GEOLOGICAL VERIFICATION.—As part of  
22      the assessment under this subsection, the Secretary  
23      shall carry out a drilling program to supplement the  
24      geological data relevant to determining storage ca-

1       capacity of carbon dioxide in geological storage forma-  
2       tions, including—

3               (A) well log data;

4               (B) core data; and

5               (C) fluid sample data.

6               (3) PARTNERSHIP WITH OTHER DRILLING PRO-  
7       GRAMS.—As part of the drilling program under  
8       paragraph (2), the Secretary shall enter, as appro-  
9       priate, into partnerships with other entities to collect  
10      and integrate data from other drilling programs rel-  
11      evant to the storage of carbon dioxide in geologic  
12      formations.

13              (4) INCORPORATION INTO NATCARB.—

14              (A) IN GENERAL.—On completion of the  
15      assessment, the Secretary of Energy shall incor-  
16      porate the results of the assessment using the  
17      NatCarb database, to the maximum extent  
18      practicable.

19              (B) RANKING.—The database shall include  
20      the data necessary to rank potential storage  
21      sites for capacity and risk, across the United  
22      States, within each State, by formation, and  
23      within each basin.

24              (5) REPORT.—Not later than 180 days after  
25      the date on which the assessment is completed, the



1 Secretary shall submit to the Committee on Energy  
2 and Natural Resources of the Senate and the Com-  
3 mittee on Science and Technology of the House of  
4 Representatives a report describing the findings  
5 under the assessment.

6 (6) PERIODIC UPDATES.—The national assess-  
7 ment developed under this section shall be updated  
8 periodically (including at least once every 5 years) to  
9 support public and private sector decisionmaking.

10 (g) AUTHORIZATION OF APPROPRIATIONS.—There is  
11 authorized to be appropriated to carry out this section  
12 \$30,000,000 for the period of fiscal years 2008 through  
13 2012.

14 **SEC. 8. TECHNOLOGY-SHARING AGREEMENTS.**

15 The Secretary, in coordination with the Secretary of  
16 State, shall offer to enter into agreements with each of  
17 the countries of China and India, and any other country  
18 that is heavily dependent on coal-fired power plants for  
19 electricity generation, to pursue agreements under which  
20 the countries subject to an agreement shall—

21 (1) fund and demonstrate carbon dioxide cap-  
22 ture and storage technologies;

23 (2) share and transfer knowledge and informa-  
24 tion relating to those technologies; and

- 1 (3) provide training with respect to those tech-
- 2 nologies.

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