

Calendar No. 100112TH CONGRESS
1ST SESSION**S. 757****[Report No. 112-33]**

To provide incentives to encourage the development and implementation of technology to capture carbon dioxide from dilute sources on a significant scale using direct air capture technologies.

IN THE SENATE OF THE UNITED STATES

APRIL 7 (legislative day, APRIL 5), 2011

Mr. BARRASSO (for himself, Mr. BINGAMAN, Mr. ENZI, and Mr. HOEVEN) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

JULY 11, 2011

Reported by Mr. BINGAMAN, with an amendment

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

A BILL

To provide incentives to encourage the development and implementation of technology to capture carbon dioxide from dilute sources on a significant scale using direct air capture technologies.

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

1 **SECTION 1. CARBON DIOXIDE CAPTURE TECHNOLOGY**

2 **PRIZE.**

3 (a) FINDINGS.—Congress finds that—

4 (1) flue gases from coal-fired electric generating
5 facilities typically have carbon dioxide concentrations
6 of approximately 17 percent by volume;

7 (2) it is possible to separate carbon dioxide
8 from dilute sources and even the atmosphere, which
9 has a carbon dioxide concentration of 0.038 percent,
10 but substantial advances in research and technology
11 will be necessary to provide the separation in an eco-
12 nomical manner;

13 (3) developing practical separations of carbon
14 dioxide from dilute sources is important to the fu-
15 ture development of energy technology;

16 (4) economical onsite separation of atmospheric
17 carbon dioxide can help leverage the use of carbon
18 dioxide in energy applications such as enhanced oil
19 recovery and enhanced geothermal systems at re-
20 mote sites; and

21 (5) authorizing the Secretary of Energy to pro-
22 vide a technology prize for separation of carbon di-
23 oxide from dilute sources can provide the impetus
24 for developing the novel technologies that will be
25 needed in the future as part of the national energy
26 system of the United States.

1 (b) PURPOSE.—It is the purpose of this section to
 2 provide incentives to encourage the development and im-
 3 plementation of technology to capture carbon dioxide from
 4 dilute sources on a significant scale using direct air cap-
 5 ture technologies.

6 (c) CARBON DIOXIDE CAPTURE TECHNOLOGY
 7 PRIZE.—Section 1008 of the Energy Policy Act of 2005
 8 (42 U.S.C. 16396) is amended by adding at the end the
 9 following:

10 “(g) CARBON DIOXIDE CAPTURE TECHNOLOGY
 11 PRIZE.—

12 “(1) DEFINITIONS.—In this subsection:

13 “(A) BOARD.—The term ‘Board’ means
 14 the Carbon Dioxide Capture Technology Advi-
 15 sory Board established by paragraph (6).

16 “(B) DILUTE.—The term ‘dilute’ means a
 17 concentration of less than 1 percent by volume.

18 “(C) INTELLECTUAL PROPERTY.—The
 19 term ‘intellectual property’ means—

20 “(i) an invention that is patentable
 21 under title 35, United States Code; and

22 “(ii) any patent on an invention de-
 23 scribed in clause (i).

1 “(D) SECRETARY.—The term ‘Secretary’
2 means the Secretary of Energy or designee, in
3 consultation with the Board.

4 “(2) AUTHORITY.—Not later than 1 year after
5 the date of enactment of this subsection, as part of
6 the program carried out under this section, the Sec-
7 retary shall establish and award competitive tech-
8 nology financial awards for carbon dioxide capture
9 from media in which the concentration of carbon di-
10 oxide is dilute.

11 “(3) DUTIES.—In carrying out this subsection,
12 the Secretary shall—

13 “(A) subject to paragraph (4), develop spe-
14 cific requirements for—

15 “(i) the competition process;

16 “(ii) minimum performance standards
17 for qualifying projects; and

18 “(iii) monitoring and verification pro-
19 cedures for approved projects;

20 “(B) establish minimum levels for the cap-
21 ture of carbon dioxide from a dilute medium
22 that are required to be achieved to qualify for
23 a financial award described in subparagraph
24 (C);

25 “(C) offer financial awards for—

1 “(i) a design for a promising capture
2 technology;

3 “(ii) a successful bench-scale dem-
4 onstration of a capture technology;

5 “(iii) a design for a technology de-
6 scribed in clause (i) that will—

7 “(I) be operated on a demonstra-
8 tion scale; and

9 “(II) achieve significant reduc-
10 tion in the level of carbon dioxide; and

11 “(iv) an operational capture tech-
12 nology on a commercial scale that meets
13 the minimum levels described in subpara-
14 graph (B); and

15 “(D) submit to Congress—

16 “(i) an annual report that describes
17 the progress made by the Board and re-
18 cipients of financial awards under this sub-
19 section in achieving the demonstration
20 goals established under subparagraph (C);
21 and

22 “(ii) not later than 1 year after the
23 date of enactment of this subsection, a re-
24 port that describes the levels of funding

1 that are necessary to achieve the purposes
2 of this subsection.

3 ~~“(4) PUBLIC PARTICIPATION.—In carrying out~~
4 ~~paragraph (3)(A), the Board shall—~~

5 ~~“(A) provide notice of and, for a period of~~
6 ~~at least 60 days, an opportunity for public com-~~
7 ~~ment on, any draft or proposed version of the~~
8 ~~requirements described in paragraph (3)(A);~~
9 ~~and~~

10 ~~“(B) take into account public comments~~
11 ~~received in developing the final version of those~~
12 ~~requirements.~~

13 ~~“(5) PEER REVIEW.—No financial awards may~~
14 ~~be provided under this subsection until the proposal~~
15 ~~for which the award is sought has been peer re-~~
16 ~~viewed in accordance with such standards for peer~~
17 ~~review as are established by the Secretary.~~

18 ~~“(6) CARBON DIOXIDE CAPTURE TECHNOLOGY~~
19 ~~ADVISORY BOARD.—~~

20 ~~“(A) ESTABLISHMENT.—There is estab-~~
21 ~~lished an advisory board to be known as the~~
22 ~~‘Carbon Dioxide Capture Technology Advisory~~
23 ~~Board’.~~

24 ~~“(B) COMPOSITION.—The Board shall be~~
25 ~~composed of 9 members appointed by the Presi-~~

1 dent, by and with the advice and consent of the
2 Senate, who shall provide expertise in—

3 “(i) climate science;

4 “(ii) physics;

5 “(iii) chemistry;

6 “(iv) biology;

7 “(v) engineering;

8 “(vi) economics;

9 “(vii) business management; and

10 “(viii) such other disciplines as the
11 Secretary determines to be necessary to
12 achieve the purposes of this subsection.

13 “(C) TERM; VACANCIES.—

14 “(i) TERM.—A member of the Board
15 shall serve for a term of 6 years.

16 “(ii) VACANCIES.—A vacancy on the
17 Board—

18 “(I) shall not affect the powers of
19 the Board; and

20 “(II) shall be filled in the same
21 manner as the original appointment
22 was made.

23 “(D) INITIAL MEETING.—Not later than
24 30 days after the date on which all members of

1 the Board have been appointed, the Board shall
2 hold the initial meeting of the Board.

3 “(E) MEETINGS.—The Board shall meet
4 at the call of the Chairperson.

5 “(F) QUORUM.—A majority of the mem-
6 bers of the Board shall constitute a quorum,
7 but a lesser number of members may hold hear-
8 ings.

9 “(G) CHAIRPERSON AND VICE CHAIR-
10 PERSON.—The Board shall select a Chairperson
11 and Vice Chairperson from among the members
12 of the Board.

13 “(H) COMPENSATION.—Each member of
14 the Board may be compensated at not to exceed
15 the daily equivalent of the annual rate of basic
16 pay in effect for a position at level V of the Ex-
17 ecutive Schedule for each day during which the
18 member is engaged in the actual performance of
19 the duties of the Board.

20 “(I) DUTIES.—The Board shall advise the
21 Secretary on carrying out the duties of the Sec-
22 retary under this subsection.

23 “(7) INTELLECTUAL PROPERTY.—

24 “(A) IN GENERAL.—As a condition of re-
25 ceiving a financial award under this subsection;

1 an applicant shall agree to vest the intellectual
2 property of the applicant derived from the tech-
3 nology in 1 or more entities that are incor-
4 porated in the United States.

5 “(B) RESERVATION OF LICENSE.—The
6 United States—

7 “(i) may reserve a nonexclusive, non-
8 transferable, irrevocable, paid-up license,
9 to have practiced for or on behalf of the
10 United States, in connection with any in-
11 tellectual property described in subpara-
12 graph (A); but

13 “(ii) shall not, in the exercise of a li-
14 cense reserved under clause (i), publicly
15 disclose proprietary information relating to
16 the license.

17 “(C) TRANSFER OF TITLE.—Title to any
18 intellectual property described in subparagraph
19 (A) shall not be transferred or passed, except to
20 an entity that is incorporated in the United
21 States, until the expiration of the first patent
22 obtained in connection with the intellectual
23 property.

1 ~~“(8) AUTHORIZATION OF APPROPRIATIONS.—~~

2 There are authorized to be appropriated to carry out
3 ~~this subsection such sums as are necessary.~~

4 ~~“(9) TERMINATION OF AUTHORITY.—The~~

5 Board and all authority provided under this sub-
6 ~~section shall terminate on December 31, 2020.”.~~

7 **SECTION 1. SHORT TITLE.**

8 *This Act may be cited as the “Carbon Dioxide Capture*
9 *Technology Prize Act of 2011”.*

10 **SEC. 2. FINDINGS AND PURPOSE.**

11 (a) *FINDINGS.—Congress finds that—*

12 (1) *flue gases from coal-fired electric generating*
13 *facilities typically have carbon dioxide concentrations*
14 *of approximately 17 percent by volume;*

15 (2) *it is possible to separate carbon dioxide from*
16 *dilute sources and even the atmosphere, which has a*
17 *carbon dioxide concentration of 0.038 percent, but*
18 *substantial advances in research and technology will*
19 *be necessary to provide the separation in an economi-*
20 *cal manner;*

21 (3) *developing practical separations of carbon*
22 *dioxide from dilute sources is important to the future*
23 *development of energy technology;*

24 (4) *economical onsite separation of atmospheric*
25 *carbon dioxide can help leverage the use of carbon di-*

1 *oxide in energy applications such as enhanced oil re-*
2 *covery and enhanced geothermal systems at remote*
3 *sites; and*

4 *(5) authorizing the Secretary of Energy to pro-*
5 *vide a technology prize for separation of carbon diox-*
6 *ide from dilute sources can provide the impetus for*
7 *developing the novel technologies that will be needed*
8 *in the future as part of the national energy system of*
9 *the United States.*

10 *(b) PURPOSE.—The purpose of this Act is to provide*
11 *incentives to encourage the development and implementa-*
12 *tion of technology to capture carbon dioxide from dilute*
13 *sources on a significant scale using direct air capture tech-*
14 *nologies.*

15 **SEC. 3. CARBON DIOXIDE CAPTURE TECHNOLOGY PRIZE.**

16 *Section 703 of the Energy Independence and Security*
17 *Act of 2007 (42 U.S.C. 17251) is amended—*

18 *(1) by redesignating subsection (b) as subsection*
19 *(c);*

20 *(2) by inserting after subsection (a) the fol-*
21 *lowing:*

22 *“(b) CARBON DIOXIDE CAPTURE TECHNOLOGY*
23 *PRIZE.—*

24 *“(1) DEFINITIONS.—In this subsection:*

1 “(A) *BOARD*.—The term ‘Board’ means the
2 *Carbon Dioxide Capture Technology Advisory*
3 *Board established by paragraph (6).*

4 “(B) *DILUTE*.—The term ‘dilute’ means a
5 *concentration of less than 1 percent by volume.*

6 “(C) *INTELLECTUAL PROPERTY*.—The term
7 ‘intellectual property’ means—

8 “(i) *an invention that is patentable*
9 *under title 35, United States Code; and*

10 “(ii) *any patent on an invention de-*
11 *scribed in clause (i).*

12 “(D) *SECRETARY*.—The term ‘Secretary’
13 *means the Secretary of Energy or designee, in*
14 *consultation with the Board.*

15 “(2) *AUTHORITY*.—Not later than 1 year after
16 *the date of enactment of the Carbon Dioxide Capture*
17 *Technology Prize Act of 2011, as part of the program*
18 *carried out under this section, the Secretary shall es-*
19 *tablish and award competitive technology financial*
20 *awards for carbon dioxide capture from media in*
21 *which the concentration of carbon dioxide is dilute.*

22 “(3) *DUTIES*.—In carrying out this subsection,
23 *the Secretary shall—*

24 “(A) *subject to paragraph (4), develop spe-*
25 *cific requirements for—*

1 “(i) the competition process;

2 “(ii) minimum performance standards
3 for qualifying projects; and

4 “(iii) monitoring and verification pro-
5 cedures for approved projects;

6 “(B) establish minimum levels for the cap-
7 ture of carbon dioxide from a dilute medium
8 that are required to be achieved to qualify for a
9 financial award described in subparagraph (C);
10 and

11 “(C) offer financial awards for—

12 “(i) a design for a promising capture
13 technology;

14 “(ii) a successful bench-scale dem-
15 onstration of a capture technology;

16 “(iii) a design for a technology de-
17 scribed in clause (i) that will—

18 “(I) be operated on a demonstra-
19 tion scale; and

20 “(II) achieve significant reduction
21 in the level of carbon dioxide; and

22 “(iv) an operational capture tech-
23 nology on a commercial scale that meets the
24 minimum levels described in subparagraph
25 (B).

1 “(4) *PUBLIC PARTICIPATION.*—*In carrying out*
2 *paragraph (3)(A), the Board shall—*

3 “(A) *provide notice of and, for a period of*
4 *at least 60 days, an opportunity for public com-*
5 *ment on, any draft or proposed version of the re-*
6 *quirements described in paragraph (3)(A); and*

7 “(B) *take into account public comments re-*
8 *ceived in developing the final version of those re-*
9 *quirements.*

10 “(5) *PEER REVIEW.*—*No financial awards may*
11 *be provided under this subsection until the proposal*
12 *for which the award is sought has been peer reviewed*
13 *in accordance with such standards for peer review as*
14 *are established by the Secretary.*

15 “(6) *CARBON DIOXIDE CAPTURE TECHNOLOGY*
16 *ADVISORY BOARD.*—

17 “(A) *ESTABLISHMENT.*—*There is estab-*
18 *lished an advisory board to be known as the*
19 *‘Carbon Dioxide Capture Technology Advisory*
20 *Board’.*

21 “(B) *COMPOSITION.*—*The Board shall be*
22 *composed of 7 members appointed by the Presi-*
23 *dent that provide expertise in—*

24 “(i) *climate science;*

25 “(ii) *physics;*

1 “(iii) *chemistry*;

2 “(iv) *biology*;

3 “(v) *engineering*;

4 “(vi) *economics*;

5 “(vii) *business management*; and

6 “(viii) *such other disciplines as the*
7 *Secretary determines to be necessary to*
8 *achieve the purposes of this subsection.*

9 “(C) *INITIAL MEETING.*—*Not later than 30*
10 *days after the date on which all members of the*
11 *Board have been appointed, the Board shall hold*
12 *the initial meeting of the Board.*

13 “(D) *MEETINGS.*—*The Board shall meet at*
14 *the call of the Chairperson.*

15 “(E) *QUORUM.*—*A majority of the members*
16 *of the Board shall constitute a quorum, but a*
17 *lesser number of members may hold hearings.*

18 “(F) *CHAIRPERSON AND VICE CHAIR-*
19 *PERSON.*—*The Board shall select a Chairperson*
20 *and Vice Chairperson from among the members*
21 *of the Board.*

22 “(G) *DUTIES.*—*The Board shall advise the*
23 *Secretary on carrying out the duties of the Sec-*
24 *retary under this subsection.*

25 “(7) *INTELLECTUAL PROPERTY.*—

1 “(A) *IN GENERAL.*—As a condition of re-
2 ceiving a financial award under this subsection,
3 an applicant shall agree to vest the intellectual
4 property of the applicant derived from the tech-
5 nology in 1 or more entities that are incor-
6 porated in the United States.

7 “(B) *RESERVATION OF LICENSE.*—The
8 United States—

9 “(i) may reserve a nonexclusive, non-
10 transferable, irrevocable, paid-up license, to
11 have practiced for or on behalf of the United
12 States, in connection with any intellectual
13 property described in subparagraph (A); but

14 “(ii) shall not, in the exercise of a li-
15 cense reserved under clause (i), publicly dis-
16 close proprietary information relating to the
17 license.

18 “(C) *TRANSFER OF TITLE.*—Title to any in-
19 tellectual property described in subparagraph
20 (A) shall not be transferred or passed, except to
21 an entity that is incorporated in the United
22 States, until the expiration of the first patent ob-
23 tained in connection with the intellectual prop-
24 erty.

1 “(8) *TERMINATION OF AUTHORITY.—The Board*
2 *and all authority provided under this subsection shall*
3 *terminate on the date that is 5 years after the date*
4 *of enactment of the Carbon Dioxide Capture Tech-*
5 *nology Prize Act of 2011.”; and*

6 (3) *in subsection (c) (as redesignated by para-*
7 *graph (1))—*

8 (A) *by striking “There is” and inserting the*
9 *following:*

10 “(1) *IN GENERAL.—There is”;*

11 (B) *by striking “this section” and inserting*
12 *“subsection (a)”;* and

13 (C) *by striking “2013” and inserting “2011*
14 *and \$195,000,000 for each of fiscal years 2012*
15 *and 2013”;* and

16 (D) *by adding at the end the following:*

17 “(2) *CARBON DIOXIDE CAPTURE TECHNOLOGY*
18 *PRIZE.—There is authorized to be appropriated to the*
19 *Secretary to carry out subsection (b) \$10,000,000 for*
20 *the period of fiscal years 2012 through 2016.”.*

Calendar No. 100

112TH CONGRESS
1ST Session

S. 757

[Report No. 112-33]

A BILL

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JULY 11, 2011

Reported with an amendment