

**Calendar No. 269**116<sup>TH</sup> CONGRESS  
1<sup>ST</sup> SESSION**S. 2300****[Report No. 116-148]**

To amend the Energy Independence and Security Act of 2007 to establish a program to incentivize innovation and to enhance the industrial competitiveness of the United States by developing technologies to reduce emissions of nonpower industrial sectors, and for other purposes.

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**IN THE SENATE OF THE UNITED STATES**

JULY 25, 2019

Mr. WHITEHOUSE (for himself, Mrs. CAPITO, Mr. MANCHIN, Mr. BRAUN, Mr. BOOKER, Ms. COLLINS, and Mrs. FEINSTEIN) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

OCTOBER 24, 2019

Reported by Ms. MURKOWSKI, with an amendment

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

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**A BILL**

To amend the Energy Independence and Security Act of 2007 to establish a program to incentivize innovation and to enhance the industrial competitiveness of the United States by developing technologies to reduce emissions of nonpower industrial sectors, 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 “Clean Industrial Tech-  
 5 nology Act of 2019” or the “CIT Act of 2019”.

6 **SEC. 2. PURPOSE.**

7 The purpose of this Act and the amendments made  
 8 by this Act is to encourage the development and evaluation  
 9 of innovative technologies aimed at increasing—

10 (1) the technological and economic competitive-  
 11 ness of industry and manufacturing in the United  
 12 States; and

13 (2) the emissions reduction of nonpower indus-  
 14 trial sectors.

15 **SEC. 3. INDUSTRIAL EMISSIONS REDUCTION TECHNOLOGY**  
 16 **DEVELOPMENT PROGRAM.**

17 (a) IN GENERAL.—The Energy Independence and  
 18 Security Act of 2007 is amended by inserting after section  
 19 453 (42 U.S.C. 17112) the following:

20 **“SEC. 454. INDUSTRIAL EMISSIONS REDUCTION TECH-**  
 21 **NOLOGY DEVELOPMENT PROGRAM.**

22 **“(a) DEFINITIONS.—**In this section:

23 **“(1) DIRECTOR.—**The term ‘Director’ means  
 24 the Director of the Office of Science and Technology  
 25 Policy.

1           “(2) ELIGIBLE ENTITY.—The term ‘eligible en-  
2           tity’ means—

3                   “(A) a scientist or other individual with  
4           knowledge and expertise in emissions reduction;

5                   “(B) an institution of higher education;

6                   “(C) a nongovernmental organization;

7                   “(D) a National Laboratory;

8                   “(E) a private entity; and

9                   “(F) a partnership or consortium of two or  
10          more entities described in subparagraphs (B)  
11          through (E).

12          “(3) EMISSIONS REDUCTION.—

13                   “(A) IN GENERAL.—The term ‘emissions  
14          reduction’ means the reduction, to the max-  
15          imum extent practicable, of net nonwater green-  
16          house gas emissions to the atmosphere by en-  
17          ergy services and industrial processes.

18                   “(B) EXCLUSION.—The term ‘emissions  
19          reduction’ does not include the elimination of  
20          carbon embodied in the principal products of in-  
21          dustrial manufacturing.

22          “(4) INSTITUTION OF HIGHER EDUCATION.—

23          The term ‘institution of higher education’ has the  
24          meaning given the term in section 101 of the Higher  
25          Education Act of 1965 (20 U.S.C. 1001).

1           “(5) PROGRAM.—The term ‘program’ means  
2           the program established under subsection (b)(1).

3           “(b) INDUSTRIAL EMISSIONS REDUCTION TECH-  
4           NOLOGY DEVELOPMENT PROGRAM.—

5           “(1) IN GENERAL.—Not later than 1 year after  
6           the date of enactment of the CIT Act of 2019, the  
7           Secretary, in coordination with the Director and in  
8           consultation with the heads of relevant Federal  
9           agencies, National Laboratories, industry, and insti-  
10          tutions of higher education, shall establish a cross-  
11          cutting industrial emissions reduction technology de-  
12          velopment program of research, development, dem-  
13          onstration, and commercial application to further  
14          the development and commercialization of innovative  
15          technologies that—

16                   “(A) increase the technological and eco-  
17                   nomic competitiveness of industry and manufac-  
18                   turing in the United States; and

19                   “(B) achieve emissions reduction in non-  
20                   power industrial sectors.

21           “(2) COORDINATION.—In carrying out the pro-  
22           gram, the Secretary shall—

23                   “(A) coordinate with each relevant office in  
24                   the Department and any other Federal agency;

1           “(B) coordinate and collaborate with the  
2           Industrial Technology Innovation Advisory  
3           Committee established under section 455; and

4           “(C) coordinate with the energy-intensive  
5           industries program established under section  
6           452.

7           “(3) LEVERAGE OF EXISTING RESOURCES.—In  
8           carrying out the program, the Secretary shall lever-  
9           age, to the maximum extent practicable—

10           “(A) existing resources and programs of  
11           the Department and other relevant Federal  
12           agencies; and

13           “(B) public-private partnerships.

14           “(e) FOCUS AREAS.—The program shall focus on—

15           “(1) industrial production processes, including  
16           technologies and processes that—

17           “(A) achieve emissions reduction in high-  
18           emissions industrial materials production pro-  
19           cesses, including production processes for iron,  
20           steel, steel mill products, aluminum, cement,  
21           glass, pulp, paper, and industrial ceramics;

22           “(B) achieve emissions reduction in  
23           medium- and high-temperature heat generation,  
24           including—

1                   “(i) through electrification of heating  
2                   processes;

3                   “(ii) through renewable heat genera-  
4                   tion technology;

5                   “(iii) through combined heat and  
6                   power; and

7                   “(iv) by switching to alternative fuels,  
8                   including hydrogen;

9                   “(C) achieve emissions reduction in chem-  
10                  ical production processes;

11                  “(D) leverage smart manufacturing tech-  
12                  nologies and principles, digital manufacturing  
13                  technologies, and advanced data analytics to de-  
14                  velop advanced technologies and practices in in-  
15                  formation, automation, monitoring, computa-  
16                  tion, sensing, modeling, and networking that—

17                   “(i) simulate manufacturing produc-  
18                   tion lines;

19                   “(ii) monitor and communicate pro-  
20                   duction line status;

21                   “(iii) manage and optimize energy  
22                   productivity and cost throughout produc-  
23                   tion; and

1                   “(iv) model, simulate, and optimize  
2                   the energy efficiency of manufacturing  
3                   processes;

4                   “(E) leverage the principles of sustainable  
5                   manufacturing to minimize the negative envi-  
6                   ronmental impacts of manufacturing while con-  
7                   serving energy and resources, including—

8                   “(i) by designing products that enable  
9                   reuse, refurbishment, remanufacturing,  
10                  and recycling;

11                  “(ii) by minimizing waste from indus-  
12                  trial processes; and

13                  “(iii) by reducing resource intensity;  
14                  and

15                  “(F) increase the energy efficiency of in-  
16                  dustrial processes;

17                  “(2) alternative materials that produce fewer  
18                  emissions during production and result in fewer  
19                  emissions during use, including—

20                  “(A) innovative building materials;

21                  “(B) high-performance lightweight mate-  
22                  rials; and

23                  “(C) substitutions for critical materials  
24                  and minerals;

1           “(3) development of net-zero emission liquid  
2 and gaseous fuels;

3           “(4) emissions reduction in shipping, aviation,  
4 and long distance transportation, including through  
5 the use of alternative fuels;

6           “(5) carbon capture technologies for industrial  
7 processes;

8           “(6) high-performance computing to develop ad-  
9 vanced materials and manufacturing processes con-  
10 tributing to the focus areas described in paragraphs  
11 (1) through (5), including—

12                   “(A) modeling, simulation, and optimiza-  
13 tion of the design of energy efficient and sus-  
14 tainable products; and

15                   “(B) the use of digital prototyping and ad-  
16 ditive manufacturing to enhance product de-  
17 sign; and

18           “(7) other technologies that achieve net-zero  
19 emissions in nonpower industrial sectors, as deter-  
20 mined by the Secretary, in coordination with the Di-  
21 rector.

22           “(d) GRANTS, CONTRACTS, COOPERATIVE AGREE-  
23 MENTS, AND DEMONSTRATION PROJECTS.—

24                   “(1) GRANTS.—In carrying out the program,  
25 the Secretary shall award grants on a competitive



1 basis to eligible entities for projects that the Sec-  
2 retary determines would best achieve the goals of the  
3 program.

4 “(2) CONTRACTS AND COOPERATIVE AGREE-  
5 MENTS.—In carrying out the program, the Secretary  
6 may enter into contracts and cooperative agreements  
7 with eligible entities and Federal agencies for  
8 projects that the Secretary determines would further  
9 the purposes of the program.

10 “(3) DEMONSTRATION PROJECTS.—In sup-  
11 porting technologies developed under this section,  
12 the Secretary shall fund demonstration projects that  
13 test and validate technologies described in subsection  
14 (e).

15 “(4) APPLICATION.—An entity seeking funding  
16 or a contract or agreement under this subsection  
17 shall submit to the Secretary an application at such  
18 time, in such manner, and containing such informa-  
19 tion as the Secretary may require.

20 “(5) COST SHARING.—In awarding funds under  
21 this section, the Secretary shall require cost sharing  
22 in accordance with section 988 of the Energy Policy  
23 Act of 2005 (42 U.S.C. 16352).

24 “(e) AUTHORIZATION OF APPROPRIATIONS.—

1           “(1) IN GENERAL.—There are authorized to be  
 2           appropriated to the Secretary such sums as are nec-  
 3           essary to carry out this section for each fiscal year  
 4           during which the program is in effect.

5           “(2) DEMONSTRATION PROJECTS.—Subject to  
 6           the amount appropriated under paragraph (1), not  
 7           more than \$650,000,000 shall be used to carry out  
 8           demonstration projects under subsection (d)(3).”.

9           (b) TECHNICAL AMENDMENT.—The table of contents  
 10          of the Energy Independence and Security Act of 2007  
 11          (Public Law 110–140; 121 Stat. 1494) is amended by in-  
 12          serting after the item relating to section 453 the following:  
           “Sec. 454. Industrial emissions reduction technology development program.”.

13 **SEC. 4. INDUSTRIAL TECHNOLOGY INNOVATION ADVISORY**  
 14 **COMMITTEE.**

15          (a) IN GENERAL.—The Energy Independence and  
 16          Security Act of 2007 is amended by inserting after section  
 17          454 (as added by section 3(a)) the following:

18 **“SEC. 455. INDUSTRIAL TECHNOLOGY INNOVATION ADVI-**  
 19 **SORY COMMITTEE.**

20          “(a) DEFINITIONS.—In this section:

21                 “(1) COMMITTEE.—The term ‘Committee’  
 22                 means the Industrial Technology Innovation Advi-  
 23                 sory Committee established under subsection (b).

1           “(2) DIRECTOR.—The term ‘Director’ means  
2           the Director of the Office of Science and Technology  
3           Policy.

4           “(3) EMISSIONS REDUCTION.—The term ‘emis-  
5           sions reduction’ has the meaning given the term in  
6           section 454(a).

7           “(4) PROGRAM.—The term ‘program’ means  
8           the industrial emissions reduction technology devel-  
9           opment program established under section  
10          454(b)(1).

11          “(b) ESTABLISHMENT.—Not later than 180 days  
12          after the date of enactment of the CIT Act of 2019, the  
13          Secretary, in coordination with the Director, shall estab-  
14          lish an advisory committee, to be known as the ‘Industrial  
15          Technology Innovation Advisory Committee’.

16          “(c) MEMBERSHIP.—

17                  “(1) APPOINTMENT.—The Committee shall be  
18                  comprised of not fewer than 14 members, who shall  
19                  be appointed by the Secretary, in coordination with  
20                  the Director.

21                  “(2) REPRESENTATION.—Members appointed  
22                  pursuant to paragraph (1) shall include—

23                          “(A) not less than 1 representative of each  
24                          relevant Federal agency, as determined by the  
25                          Secretary;

1           ~~“(B) not less than 2 representatives of~~  
2           ~~labor groups;~~

3           ~~“(C) not less than 3 representatives of the~~  
4           ~~research community, which shall include aca-~~  
5           ~~demia and National Laboratories;~~

6           ~~“(D) not less than 2 representatives of~~  
7           ~~nongovernmental organizations;~~

8           ~~“(E) not less than 6 representatives of in-~~  
9           ~~dustry, the collective expertise of which shall~~  
10          ~~cover every focus area described in section~~  
11          ~~454(e); and~~

12          ~~“(F) any other individual whom the Sec-~~  
13          ~~retary, in coordination with the Director, deter-~~  
14          ~~mines to be necessary to ensure that the Com-~~  
15          ~~mittee is comprised of a diverse group of rep-~~  
16          ~~resentatives of industry, academia, independent~~  
17          ~~researchers, and public and private entities.~~

18          ~~“(3) CHAIR.—The Secretary shall designate a~~  
19          ~~member of the Committee to serve as Chair.~~

20          ~~“(d) DUTIES.—~~

21           ~~“(1) IN GENERAL.—The Committee shall—~~

22           ~~“(A) in consultation with the Secretary~~  
23           ~~and the Director, develop the missions and~~  
24           ~~goals of the program, which shall be consistent~~

1 with the purposes of the program described in  
2 section 454(b)(1); and

3 “(B) advise the Secretary and the Director  
4 with respect to the program—

5 “(i) by identifying and evaluating any  
6 technologies being developed by the private  
7 sector relating to the focus areas described  
8 in section 454(e);

9 “(ii) by identifying technology gaps in  
10 the private sector in those focus areas; and  
11 making recommendations to address those  
12 gaps;

13 “(iii) by surveying and analyzing fac-  
14 tors that prevent the adoption of emissions  
15 reduction technologies by the private sec-  
16 tor; and

17 “(iv) by recommending technology  
18 screening criteria for technology developed  
19 under the program to encourage adoption  
20 of the technology by the private sector; and

21 “(C) develop the roadmap described in  
22 paragraph (2).

23 “(2) EMISSIONS REDUCTION ROADMAP.—

24 “(A) PURPOSE.—The purpose of the road-  
25 map developed under paragraph (1)(C) is to

1 achieve the goals of the program in the focus  
2 areas described in section 454(e).

3 “(B) CONTENTS.—The roadmap developed  
4 under paragraph (1)(C) shall—

5 “(i) specify near-term and long-term  
6 qualitative and quantitative objectives re-  
7 lating to each focus area described in sec-  
8 tion 454(e), including research, develop-  
9 ment, demonstration, and commercial ap-  
10 plication objectives;

11 “(ii) specify the anticipated timeframe  
12 for achieving the objectives specified under  
13 clause (i);

14 “(iii) include plans for developing  
15 emissions reduction technologies that are  
16 globally cost-competitive; and

17 “(iv) identify the appropriate role for  
18 investment by the Federal Government, in  
19 coordination with the private sector, to  
20 achieve the objectives specified under  
21 clause (i).

22 “(e) MEETINGS.—

23 “(1) FREQUENCY.—The Committee shall meet  
24 not less frequently than 2 times per year, at the call  
25 of the Chair.

1           “(2) INITIAL MEETING.—Not later than 30  
2 days after the date on which the members are ap-  
3 pointed under subsection (b), the Committee shall  
4 hold its first meeting.

5           “(f) COMMITTEE REPORT.—

6           “(1) IN GENERAL.—Not later than 2 years  
7 after the date of enactment of the CIT Act of 2019,  
8 and not less frequently than once every 3 years  
9 thereafter, the Committee shall submit to the Sec-  
10 retary a report on the progress of achieving the pur-  
11 poses of the program.

12           “(2) CONTENTS.—The report under paragraph  
13 (1) shall include—

14           “(A) a description of any technology inno-  
15 vation opportunities identified by the Com-  
16 mittee;

17           “(B) a description of any technology gaps  
18 identified by the Committee under subsection  
19 (d)(1)(B)(ii);

20           “(C) recommendations for improving tech-  
21 nology screening criteria and management of  
22 the program;

23           “(D) an evaluation of the progress of the  
24 program and the research and development  
25 funded under the program;

1           “(E) any recommended changes to the  
2 focus areas of the program described in section  
3 454(e);

4           “(F) a description of the manner in which  
5 the Committee has carried out the duties de-  
6 scribed in subsection (d)(1) and any relevant  
7 findings as a result of carrying out those duties;

8           “(G) the roadmap developed by the Com-  
9 mittee under subsection (d)(1)(C);

10           “(H) the progress made in achieving the  
11 goals set out in that roadmap;

12           “(I) a review of the management, coordina-  
13 tion, and industry utility of the program;

14           “(J) an assessment of the extent to which  
15 progress has been made under the program in  
16 developing commercial, cost-competitive tech-  
17 nologies in each focus area described in section  
18 454(e); and

19           “(K) an assessment of the effectiveness of  
20 the program in coordinating efforts within the  
21 Department and with other Federal agencies to  
22 achieve the purposes of the program.

23           “(g) REPORT TO CONGRESS.—Not later than 60 days  
24 after receiving a report from the Committee under sub-  
25 section (f), the Secretary shall submit a copy of that re-



1 port to the Committee on Science, Space, and Technology  
 2 of the House of Representatives, the Committee on En-  
 3 ergy and Natural Resources of the Senate, and any other  
 4 relevant Committee of Congress.

5 “(h) **APPLICABILITY OF FEDERAL ADVISORY COM-**  
 6 **MITTEE ACT.**—Except as otherwise provided in this sec-  
 7 tion, the Federal Advisory Committee Act (5 U.S.C. App.)  
 8 shall apply to the Committee.”.

9 (b) **TECHNICAL AMENDMENT.**—The table of contents  
 10 of the Energy Independence and Security Act of 2007  
 11 (Public Law 110–140; 121 Stat. 1494) (as amended by  
 12 section 3(b)) is amended by inserting after the item relat-  
 13 ing to section 454 the following:

“Sec. 455. Industrial Technology Innovation Advisory Committee.”.

14 **SEC. 5. TECHNICAL ASSISTANCE PROGRAM TO IMPLEMENT**  
 15 **INDUSTRIAL EMISSIONS REDUCTION.**

16 (a) **IN GENERAL.**—The Energy Independence and  
 17 Security Act of 2007 is amended by inserting after section  
 18 455 (as added by section 4(a)) the following:

19 **“SEC. 456. TECHNICAL ASSISTANCE PROGRAM TO IMPLE-**  
 20 **MENT INDUSTRIAL EMISSIONS REDUCTION.**

21 “(a) **DEFINITIONS.**—In this section:

22 “(1) **ELIGIBLE ENTITY.**—The term ‘eligible en-  
 23 tity’ means—

24 “(A) a State;

25 “(B) a unit of local government;

1           “(C) a territory or possession of the  
2           United States;

3           “(D) a relevant State or local office, in-  
4           cluding an energy office;

5           “(E) a tribal organization (as defined in  
6           section 3765 of title 38, United States Code);

7           “(F) an institution of higher education;  
8           and

9           “(G) a private entity.

10          “(2) EMISSIONS REDUCTION.—The term ‘emis-  
11          sions reduction’ has the meaning given the term in  
12          section 454(a).

13          “(3) INSTITUTION OF HIGHER EDUCATION.—  
14          The term ‘institution of higher education’ has the  
15          meaning given the term in section 101 of the Higher  
16          Education Act of 1965 (20 U.S.C. 1001).

17          “(4) PROGRAM.—The term ‘program’ means  
18          the program established under subsection (b).

19          “(b) ESTABLISHMENT.—Not later than 180 days  
20          after the date of enactment of the CIT Act of 2019, the  
21          Secretary shall establish a program to provide technical  
22          assistance to eligible entities to carry out an activity de-  
23          scribed in subsection (e).

24          “(e) ACTIVITIES DESCRIBED.—An activity referred  
25          to in subsection (b) is any of the following activities ear-

1 ried out for the purpose of achieving emissions reduction  
2 in nonpower industrial sectors:

3           “(1) Adopting emissions reduction technologies.

4           “(2) Establishing goals and priorities to accel-  
5 erate the development and evaluation of relevant  
6 technologies.

7           “(3) Developing collaborations across States,  
8 local governments, and territories and possessions of  
9 the United States.

10           “(4) Reviewing the appropriate emissions re-  
11 duction options for a particular eligible entity.

12           “(5) Developing a roadmap for emissions reduc-  
13 tion for a particular eligible entity.

14           “(6) Any other activity determined appropriate  
15 by the Secretary.

16           “(d) APPLICATIONS.—

17           “(1) IN GENERAL.—An eligible entity desiring  
18 technical assistance under the program shall submit  
19 to the Secretary an application at such time, in such  
20 manner, and containing such information as the Sec-  
21 retary may require.

22           “(2) APPLICATION PROCESS.—The Secretary  
23 shall seek applications for technical assistance under  
24 the program on a periodic basis, but not less fre-  
25 quently than once every 12 months.

1           “(3) PRIORITIES.—In selecting eligible entities  
2           for technical assistance under the program, the Sec-  
3           retary shall give priority to an eligible entity—

4                   “(A) carrying out an activity that has the  
5                   greatest potential for achieving emissions reduc-  
6                   tion in nonpower industrial sectors;

7                   “(B) located in a State that has histori-  
8                   cally relied on industrial sectors for a substan-  
9                   tial portion of the State economy, as deter-  
10                  mined by the Secretary, taking into account  
11                  employment data, per capita income, and other  
12                  indicators of economic output in the State; or

13                  “(C) located in a State that has experi-  
14                  enced significant decline in the economic con-  
15                  tribution of industry to the State.

16           “(e) AUTHORIZATION OF APPROPRIATIONS.—There  
17           are authorized to be appropriated to the Secretary such  
18           sums as are necessary to carry out this section for each  
19           fiscal year during which the program is in effect.”.

20           (b) TECHNICAL AMENDMENT.—The table of contents  
21           of the Energy Independence and Security Act of 2007  
22           (Public Law 110–140, 121 Stat. 1494) (as amended by  
23           section 4(b)) is amended by inserting after the item relat-  
24           ing to section 455 the following:

“Sec. 456. Technical assistance program to implement industrial emissions re-  
duction.”.

1 **SEC. 6. COORDINATION OF RESEARCH AND DEVELOPMENT**  
2 **OF ENERGY EFFICIENT TECHNOLOGIES FOR**  
3 **INDUSTRY.**

4 Section 6(a) of the American Energy Manufacturing  
5 Technical Corrections Act (42 U.S.C. 6351(a)) is amend-  
6 ed—

7 (1) by striking “Industrial Technologies Pro-  
8 gram” each place it appears and inserting “Ad-  
9 vanced Manufacturing Office”; and

10 (2) in the matter preceding paragraph (1), by  
11 striking “Office of Energy” and all that follows  
12 through “Office of Science” and inserting “Depart-  
13 ment of Energy”.

14 **SECTION 1. SHORT TITLE.**

15 *This Act may be cited as the “Clean Industrial Tech-*  
16 *nology Act of 2019” or the “CIT Act of 2019”.*

17 **SEC. 2. PURPOSE.**

18 *The purpose of this Act and the amendments made by*  
19 *this Act is to encourage the development and evaluation of*  
20 *innovative technologies aimed at increasing—*

21 (1) *the technological and economic competitive-*  
22 *ness of industry and manufacturing in the United*  
23 *States; and*

24 (2) *the emissions reduction of nonpower indus-*  
25 *trial sectors.*

1 **SEC. 3. INDUSTRIAL EMISSIONS REDUCTION TECHNOLOGY**  
 2 **DEVELOPMENT PROGRAM.**

3 (a) *IN GENERAL.*—*The Energy Independence and Se-*  
 4 *curity Act of 2007 is amended by inserting after section*  
 5 *453 (42 U.S.C. 17112) the following:*

6 **“SEC. 454. INDUSTRIAL EMISSIONS REDUCTION TECH-**  
 7 **NOLOGY DEVELOPMENT PROGRAM.**

8 “(a) *DEFINITIONS.*—*In this section:*

9 “(1) *DIRECTOR.*—*The term ‘Director’ means the*  
 10 *Director of the Office of Science and Technology Pol-*  
 11 *icy.*

12 “(2) *ELIGIBLE ENTITY.*—*The term ‘eligible enti-*  
 13 *ty’ means—*

14 “(A) *a scientist or other individual with*  
 15 *knowledge and expertise in emissions reduction;*

16 “(B) *an institution of higher education;*

17 “(C) *a nongovernmental organization;*

18 “(D) *a National Laboratory;*

19 “(E) *a private entity; and*

20 “(F) *a partnership or consortium of 2 or*  
 21 *more entities described in subparagraphs (B)*  
 22 *through (E).*

23 “(3) *EMISSIONS REDUCTION.*—

24 “(A) *IN GENERAL.*—*The term ‘emissions re-*  
 25 *duction’ means the reduction, to the maximum*  
 26 *extent practicable, of net nonwater greenhouse*

1           *gas emissions to the atmosphere by energy serv-*  
2           *ices and industrial processes.*

3           “(B) *EXCLUSION.*—*The term ‘emissions re-*  
4           *duction’ does not include the elimination of car-*  
5           *bon embodied in the principal products of indus-*  
6           *trial manufacturing.*

7           “(4) *INSTITUTION OF HIGHER EDUCATION.*—*The*  
8           *term ‘institution of higher education’ has the meaning*  
9           *given the term in section 101 of the Higher Education*  
10          *Act of 1965 (20 U.S.C. 1001).*

11          “(5) *PROGRAM.*—*The term ‘program’ means the*  
12          *program established under subsection (b)(1).*

13          “(b) *INDUSTRIAL EMISSIONS REDUCTION TECH-*  
14          *NOLOGY DEVELOPMENT PROGRAM.*—

15          “(1) *IN GENERAL.*—*Not later than 1 year after*  
16          *the date of enactment of the CIT Act of 2019, the Sec-*  
17          *retary, in consultation with the Director, the heads of*  
18          *relevant Federal agencies, National Laboratories, in-*  
19          *dustry, and institutions of higher education, shall es-*  
20          *tablish a crosscutting industrial emissions reduction*  
21          *technology development program of research, develop-*  
22          *ment, demonstration, and commercial application to*  
23          *further the development and commercialization of in-*  
24          *novative technologies that—*

1           “(A) increase the technological and eco-  
2           nomic competitiveness of industry and manufac-  
3           turing in the United States;

4           “(B) increase the viability and competitive-  
5           ness of United States industrial technology ex-  
6           ports; and

7           “(C) achieve emissions reduction in  
8           nonpower industrial sectors.

9           “(2) COORDINATION.—In carrying out the pro-  
10          gram, the Secretary shall—

11           “(A) coordinate with each relevant office in  
12           the Department and any other Federal agency;

13           “(B) coordinate and collaborate with the In-  
14           dustrial Technology Innovation Advisory Com-  
15           mittee established under section 455; and

16           “(C) coordinate and seek to avoid duplica-  
17           tion with the energy-intensive industries pro-  
18           gram established under section 452.

19           “(3) LEVERAGE OF EXISTING RESOURCES.—In  
20          carrying out the program, the Secretary shall lever-  
21          age, to the maximum extent practicable—

22           “(A) existing resources and programs of the  
23           Department and other relevant Federal agencies;  
24           and

25           “(B) public-private partnerships.



1       “(c) *FOCUS AREAS.*—*The program shall focus on—*

2               “(1) *industrial production processes, including*  
3 *technologies and processes that—*

4                       “(A) *achieve emissions reduction in high-*  
5 *emissions industrial materials production proc-*  
6 *esses, including production processes for iron,*  
7 *steel, steel mill products, aluminum, cement,*  
8 *glass, pulp, paper, and industrial ceramics;*

9                       “(B) *achieve emissions reduction in*  
10 *medium- and high-temperature heat generation,*  
11 *including—*

12                               “(i) *through electrification of heating*  
13 *processes;*

14                               “(ii) *through renewable heat generation*  
15 *technology;*

16                               “(iii) *through combined heat and*  
17 *power; and*

18                               “(iv) *by switching to alternative fuels,*  
19 *including hydrogen and nuclear energy;*

20                       “(C) *achieve emissions reduction in chem-*  
21 *ical production processes, including by incor-*  
22 *porating, if appropriate and practicable, prin-*  
23 *ciples, practices, and methodologies of sustain-*  
24 *able, green chemistry and engineering;*

1           “(D) leverage smart manufacturing tech-  
2 nologies and principles, digital manufacturing  
3 technologies, and advanced data analytics to de-  
4 velop advanced technologies and practices in in-  
5 formation, automation, monitoring, computa-  
6 tion, sensing, modeling, and networking to—

7           “(i) model and simulate manufac-  
8 turing production lines;

9           “(ii) monitor and communicate pro-  
10 duction line status;

11           “(iii) manage and optimize energy  
12 productivity and cost throughout produc-  
13 tion; and

14           “(iv) model, simulate, and optimize the  
15 energy efficiency of manufacturing proc-  
16 esses;

17           “(E) minimize the negative environmental  
18 impacts of manufacturing and sustainable chem-  
19 istry while conserving energy and resources, in-  
20 cluding—

21           “(i) by designing products that enable  
22 reuse, refurbishment, remanufacturing, and  
23 recycling;

24           “(ii) by minimizing waste from indus-  
25 trial processes, including through the reuse

1                   *of waste as other resources in other indus-*  
2                   *trial processes for mutual benefit; and*

3                   *“(iii) by increasing resource efficiency;*

4                   *and*

5                   *“(F) increase the energy efficiency of indus-*  
6                   *trial processes;*

7                   *“(2) alternative materials that produce fewer*  
8                   *emissions during production and result in fewer emis-*  
9                   *sions during use, including—*

10                   *“(A) innovative building materials;*

11                   *“(B) high-performance lightweight mate-*  
12                   *rials; and*

13                   *“(C) substitutions for critical materials and*  
14                   *minerals;*

15                   *“(3) development of net-zero emissions liquid*  
16                   *and gaseous fuels;*

17                   *“(4) emissions reduction in shipping, aviation,*  
18                   *and long distance transportation;*

19                   *“(5) carbon capture technologies for industrial*  
20                   *processes;*

21                   *“(6) other technologies that achieve net-zero*  
22                   *emissions in nonpower industrial sectors, as deter-*  
23                   *mined by the Secretary, in consultation with the Di-*  
24                   *rector; and*

1           “(7) *high-performance computing to develop ad-*  
2           *vanced materials and manufacturing processes con-*  
3           *tributing to the focus areas described in paragraphs*  
4           *(1) through (6), including—*

5                   “(A) *modeling, simulation, and optimiza-*  
6                   *tion of the design of energy efficient and sustain-*  
7                   *able products; and*

8                   “(B) *the use of digital prototyping and ad-*  
9                   *ditive manufacturing to enhance product design.*

10          “(d) *GRANTS, CONTRACTS, COOPERATIVE AGREE-*  
11          *MENTS, AND DEMONSTRATION PROJECTS.—*

12                   “(1) *GRANTS.—In carrying out the program, the*  
13                   *Secretary shall award grants on a competitive basis*  
14                   *to eligible entities for projects that the Secretary de-*  
15                   *termines would best achieve the goals of the program.*

16                   “(2) *CONTRACTS AND COOPERATIVE AGREE-*  
17                   *MENTS.—In carrying out the program, the Secretary*  
18                   *may enter into contracts and cooperative agreements*  
19                   *with eligible entities and Federal agencies for projects*  
20                   *that the Secretary determines would further the pur-*  
21                   *poses of the program.*

22                   “(3) *DEMONSTRATION PROJECTS.—In sup-*  
23                   *porting technologies developed under this section, the*  
24                   *Secretary shall fund demonstration projects that test*  
25                   *and validate technologies described in subsection (c).*



1           “(2) *DIRECTOR*.—The term ‘Director’ means the  
2           *Director of the Office of Science and Technology Pol-*  
3           *icy.*

4           “(3) *EMISSIONS REDUCTION*.—The term ‘emis-  
5           *sions reduction’ has the meaning given the term in*  
6           *section 454(a).*

7           “(4) *PROGRAM*.—The term ‘program’ means the  
8           *industrial emissions reduction technology development*  
9           *program established under section 454(b)(1).*

10          “(b) *ESTABLISHMENT*.—Not later than 180 days after  
11          *the date of enactment of the CIT Act of 2019, the Secretary,*  
12          *in consultation with the Director, shall establish an advi-*  
13          *sory committee, to be known as the ‘Industrial Technology*  
14          *Innovation Advisory Committee’.*

15          “(c) *MEMBERSHIP*.—

16                 “(1) *APPOINTMENT*.—The Committee shall be  
17                 *comprised of not fewer than 14 members and not*  
18                 *more than 18 members, who shall be appointed by the*  
19                 *Secretary, in consultation with the Director.*

20                 “(2) *REPRESENTATION*.—Members appointed  
21                 *pursuant to paragraph (1) shall include—*

22                         “(A) *not less than 1 representative of each*  
23                         *relevant Federal agency, as determined by the*  
24                         *Secretary;*

1           “(B) *the Chair of the Secretary of Energy*  
2           *Advisory Board, if that position is filled;*

3           “(C) *not less than 2 representatives of labor*  
4           *groups;*

5           “(D) *not less than 3 representatives of the*  
6           *research community, which shall include aca-*  
7           *demia and National Laboratories;*

8           “(E) *not less than 2 representatives of non-*  
9           *governmental organizations;*

10          “(F) *not less than 6 representatives of*  
11          *small- and large-scale industry, the collective ex-*  
12          *pertise of which shall cover every focus area de-*  
13          *scribed in section 454(c); and*

14          “(G) *any other individuals the Secretary,*  
15          *in coordination with the Director, determines to*  
16          *be necessary to ensure that the Committee is*  
17          *comprised of a diverse group of representatives of*  
18          *industry, academia, independent researchers,*  
19          *and public and private entities.*

20          “(3) *CHAIR.—The Secretary shall designate a*  
21          *member of the Committee to serve as Chair.*

22          “(d) *DUTIES.—*

23                 “(1) *IN GENERAL.—The Committee shall—*

24                         “(A) *in consultation with the Secretary and*  
25                         *the Director, propose missions and goals for the*

1           *program, which shall be consistent with the pur-*  
2           *poses of the program described in section*  
3           *454(b)(1); and*

4           *“(B) advise the Secretary with respect to*  
5           *the program—*

6                   *“(i) by identifying and evaluating any*  
7                   *technologies being developed by the private*  
8                   *sector relating to the focus areas described*  
9                   *in section 454(c);*

10                   *“(ii) by identifying technology gaps in*  
11                   *the private sector in those focus areas, and*  
12                   *making recommendations to address those*  
13                   *gaps;*

14                   *“(iii) by surveying and analyzing fac-*  
15                   *tors that prevent the adoption of emissions*  
16                   *reduction technologies by the private sector;*  
17                   *and*

18                   *“(iv) by recommending technology*  
19                   *screening criteria for technology developed*  
20                   *under the program to encourage adoption of*  
21                   *the technology by the private sector; and*

22           *“(C) develop the strategic plan described in*  
23           *paragraph (2).*

24           *“(2) STRATEGIC PLAN.—*



1           “(A) *PURPOSE.*—*The purpose of the stra-*  
2           *tegic plan developed under paragraph (1)(C) is*  
3           *to achieve the goals of the program in the focus*  
4           *areas described in section 454(c).*

5           “(B) *CONTENTS.*—*The strategic plan devel-*  
6           *oped under paragraph (1)(C) shall—*

7                   “(i) *specify near-term and long-term*  
8                   *qualitative and quantitative objectives relat-*  
9                   *ing to each focus area described in section*  
10                   *454(c), including research, development,*  
11                   *demonstration, and commercial application*  
12                   *objectives;*

13                   “(ii) *specify the anticipated timeframe*  
14                   *for achieving the objectives specified under*  
15                   *clause (i);*

16                   “(iii) *include plans for developing*  
17                   *emissions reduction technologies that are*  
18                   *globally cost-competitive;*

19                   “(iv) *identify the public and private*  
20                   *costs of achieving the objectives specified*  
21                   *under clause (i); and*

22                   “(v) *estimate the economic and em-*  
23                   *ployment impact in the United States of*  
24                   *achieving those objectives.*

25           “(e) *MEETINGS.*—

1           “(1) *FREQUENCY.*—*The Committee shall meet*  
2           *not less frequently than 2 times per year, at the call*  
3           *of the Chair.*

4           “(2) *INITIAL MEETING.*—*Not later than 30 days*  
5           *after the date on which the members are appointed*  
6           *under subsection (b), the Committee shall hold its first*  
7           *meeting.*

8           “(f) *COMMITTEE REPORT.*—

9           “(1) *IN GENERAL.*—*Not later than 2 years after*  
10           *the date of enactment of the CIT Act of 2019, and not*  
11           *less frequently than once every 3 years thereafter, the*  
12           *Committee shall submit to the Secretary a report on*  
13           *the progress of achieving the purposes of the program.*

14           “(2) *CONTENTS.*—*The report under paragraph*  
15           *(1) shall include—*

16                   “(A) *a description of any technology inno-*  
17                   *vation opportunities identified by the Committee;*

18                   “(B) *a description of any technology gaps*  
19                   *identified by the Committee under subsection*  
20                   *(d)(1)(B)(ii);*

21                   “(C) *recommendations for improving tech-*  
22                   *nology screening criteria and management of the*  
23                   *program;*

1           “(D) an evaluation of the progress of the  
2 program and the research and development fund-  
3 ed under the program;

4           “(E) any recommended changes to the focus  
5 areas of the program described in section 454(c);

6           “(F) a description of the manner in which  
7 the Committee has carried out the duties de-  
8 scribed in subsection (d)(1) and any relevant  
9 findings as a result of carrying out those duties;

10          “(G) if necessary, an update to the strategic  
11 plan developed by the Committee under sub-  
12 section (d)(1)(C);

13          “(H) the progress made in achieving the  
14 goals set out in that strategic plan;

15          “(I) a review of the management, coordina-  
16 tion, and industry utility of the program;

17          “(J) an assessment of the extent to which  
18 progress has been made under the program in  
19 developing commercial, cost-competitive tech-  
20 nologies in each focus area described in section  
21 454(c); and

22          “(K) an assessment of the effectiveness of the  
23 program in coordinating efforts within the De-  
24 partment and with other Federal agencies to  
25 achieve the purposes of the program.

1       “(g) *REPORT TO CONGRESS.*—Not later than 60 days  
 2 after receiving a report from the Committee under sub-  
 3 section (f), the Secretary shall submit a copy of that report  
 4 to the Committees on Appropriations and Science, Space,  
 5 and Technology of the House of Representatives, the Com-  
 6 mittees on Appropriations and Energy and Natural Re-  
 7 sources of the Senate, and any other relevant Committee  
 8 of Congress.

9       “(h) *APPLICABILITY OF FEDERAL ADVISORY COM-*  
 10 *MITTEE ACT.*—Except as otherwise provided in this section,  
 11 the Federal Advisory Committee Act (5 U.S.C. App.) shall  
 12 apply to the Committee.”.

13       (b) *TECHNICAL AMENDMENT.*—The table of contents of  
 14 the Energy Independence and Security Act of 2007 (Public  
 15 Law 110–140; 121 Stat. 1494) (as amended by section 3(b))  
 16 is amended by inserting after the item relating to section  
 17 454 the following:

“Sec. 455. Industrial Technology Innovation Advisory Committee.”.

18 **SEC. 5. TECHNICAL ASSISTANCE PROGRAM TO IMPLEMENT**  
 19 **INDUSTRIAL EMISSIONS REDUCTION.**

20       (a) *IN GENERAL.*—The Energy Independence and Se-  
 21 curity Act of 2007 is amended by inserting after section  
 22 455 (as added by section 4(a)) the following:

23 **“SEC. 456. TECHNICAL ASSISTANCE PROGRAM TO IMPLE-**  
 24 **MENT INDUSTRIAL EMISSIONS REDUCTION.**

25       “(a) *DEFINITIONS.*—In this section:

1           “(1) *ELIGIBLE ENTITY.*—The term ‘eligible enti-  
2           ty’ means—

3                   “(A) a State;

4                   “(B) a unit of local government;

5                   “(C) a territory or possession of the United  
6           States;

7                   “(D) a relevant State or local office, includ-  
8           ing an energy office;

9                   “(E) a tribal organization (as defined in  
10           section 3765 of title 38, United States Code);

11                   “(F) an institution of higher education; and

12                   “(G) a private entity.

13           “(2) *EMISSIONS REDUCTION.*—The term ‘emis-  
14           sions reduction’ has the meaning given the term in  
15           section 454(a).

16           “(3) *INSTITUTION OF HIGHER EDUCATION.*—The  
17           term ‘institution of higher education’ has the meaning  
18           given the term in section 101 of the Higher Education  
19           Act of 1965 (20 U.S.C. 1001).

20           “(4) *PROGRAM.*—The term ‘program’ means the  
21           program established under subsection (b).

22           “(b) *ESTABLISHMENT.*—Not later than 180 days after  
23           the date of enactment of the CIT Act of 2019, the Secretary  
24           shall establish a program to provide technical assistance to

1 *eligible entities to carry out an activity described in sub-*  
2 *section (c).*

3 “(c) *ACTIVITIES DESCRIBED.*—*An activity referred to*  
4 *in subsection (b) is any of the following activities carried*  
5 *out for the purpose of achieving emissions reduction in*  
6 *nonpower industrial sectors:*

7 “(1) *Adopting emissions reduction technologies.*

8 “(2) *Establishing goals and priorities to accel-*  
9 *erate the development and evaluation of relevant tech-*  
10 *nologies.*

11 “(3) *Developing collaborations across States,*  
12 *local governments, and territories and possessions of*  
13 *the United States.*

14 “(4) *Reviewing the appropriate emissions reduc-*  
15 *tion technologies available for a particular eligible en-*  
16 *tity.*

17 “(5) *Developing a roadmap for implementing*  
18 *emissions reduction technologies for a particular eligi-*  
19 *ble entity.*

20 “(6) *Any other activity determined appropriate*  
21 *by the Secretary.*

22 “(d) *APPLICATIONS.*—

23 “(1) *IN GENERAL.*—*An eligible entity desiring*  
24 *technical assistance under the program shall submit*  
25 *to the Secretary an application at such time, in such*

1        *manner, and containing such information as the Sec-*  
2        *retary may require.*

3            “(2) *APPLICATION PROCESS.*—*The Secretary*  
4        *shall seek applications for technical assistance under*  
5        *the program on a periodic basis, but not less fre-*  
6        *quently than once every 12 months.*

7            “(3) *FACTORS FOR CONSIDERATION.*—*In select-*  
8        *ing eligible entities for technical assistance under the*  
9        *program, the Secretary shall—*

10            “(A) *give priority to—*

11            “(i) *activities carried out with tech-*  
12        *nical assistance under the program that*  
13        *have the greatest potential for achieving*  
14        *emissions reduction in nonpower industrial*  
15        *sectors;*

16            “(ii) *activities carried out in a State*  
17        *in which there are active or inactive indus-*  
18        *trial facilities that may be used or retro-*  
19        *fitted to carry out activities under the focus*  
20        *areas described in section 454(c); and*

21            “(iii) *activities carried out in an eco-*  
22        *nomically distressed area (as described in*  
23        *section 301(a) of the Public Works and Eco-*  
24        *nomical Development Act of 1965 (42 U.S.C.*  
25        *3161(a)); and*

1                   “(B) ensure that—  
 2                    “(i) there is geographic diversity  
 3                   among the eligible entities selected; and  
 4                    “(ii) the activities carried out with  
 5                   technical assistance under the program re-  
 6                   flect a majority of the focus areas described  
 7                   in section 454(c).”.

8           (b) *TECHNICAL AMENDMENT.*—*The table of contents of*  
 9 *the Energy Independence and Security Act of 2007 (Public*  
 10 *Law 110–140; 121 Stat. 1494) (as amended by section 4(b))*  
 11 *is amended by inserting after the item relating to section*  
 12 *455 the following:*

                  “Sec. 456. *Technical assistance program to implement industrial emissions reduc-*  
                   *tion.*”.

13 **SEC. 6. COORDINATION OF RESEARCH AND DEVELOPMENT**  
 14                   **OF ENERGY EFFICIENT TECHNOLOGIES FOR**  
 15                   **INDUSTRY.**

16           Section 6(a) of the *American Energy Manufacturing*  
 17 *Technical Corrections Act (42 U.S.C. 6351(a)) is amend-*  
 18 *ed—*

19                   (1) *by striking “Industrial Technologies Pro-*  
 20 *gram” each place it appears and inserting “Advanced*  
 21 *Manufacturing Office”;* and  
 22                   (2) *in the matter preceding paragraph (1), by*  
 23 *striking “Office of Energy” and all that follows*



- 1 *through “Office of Science” and inserting “Depart-*
- 2 *ment of Energy”.*

Calendar No. 269

116<sup>TH</sup> CONGRESS  
1<sup>ST</sup> Session

**S. 2300**

[Report No. 116-148]

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**A BILL**

To amend the Energy Independence and Security Act of 2007 to establish a program to incentivize innovation and to enhance the industrial competitiveness of the United States by developing technologies to reduce emissions of nonpower industrial sectors, and for other purposes.

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OCTOBER 24, 2019

Reported with an amendment