

CLEAN INDUSTRIAL TECHNOLOGY ACT OF 2019

AUGUST 14, 2020.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Ms. JOHNSON of Texas, from the Committee on Science, Space, and Technology, submitted the following

R E P O R T

[To accompany H.R. 4230]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science, Space, and Technology, to whom was referred the bill (H.R. 4230) 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, having considered the same, reports favorably thereon with an amendment and recommends that the bill as amended do pass.

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I. AMENDMENT

The amendment is as follows:

Strike all after the enacting clause and insert the following:

SECTION 1. SHORT TITLE.

This Act may be cited as the “Clean Industrial Technology Act of 2019” or the “CIT Act of 2019”.

SEC. 2. PURPOSE.

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

- (1) the technological and economic competitiveness of industry and manufacturing in the United States; and
- (2) the emissions reduction of nonpower industrial sectors.

SEC. 3. INDUSTRIAL EMISSIONS REDUCTION TECHNOLOGY DEVELOPMENT PROGRAM.

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

“SEC. 454. INDUSTRIAL EMISSIONS REDUCTION TECHNOLOGY DEVELOPMENT PROGRAM.

“(a) DEFINITIONS.—In this section:

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

“(2) ELIGIBLE ENTITY.—The term ‘eligible entity’ means—

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

“(B) an institution of higher education;

“(C) a nongovernmental organization;

“(D) a National Laboratory;

“(E) a private entity; and

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

“(3) EMISSIONS REDUCTION.—

“(A) IN GENERAL.—The term ‘emissions reduction’ means the reduction, to the maximum extent practicable, of net nonwater greenhouse gas emissions to the atmosphere by energy services and industrial processes.

“(B) EXCLUSION.—The term ‘emissions reduction’ does not include the elimination of carbon embodied in the principal products of industrial manufacturing.

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

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

“(b) INDUSTRIAL EMISSIONS REDUCTION TECHNOLOGY DEVELOPMENT PROGRAM.—

“(1) IN GENERAL.—Not later than 1 year after the date of enactment of the CIT Act of 2019, the Secretary, in coordination with the Director and in consultation with the heads of relevant Federal agencies, National Laboratories, industry, and institutions of higher education, shall establish a crosscutting research, development, and demonstration program to further the development and commercial application of innovative industrial emissions reduction technologies that—

“(A) increase the technological and economic competitiveness of industry and manufacturing in the United States; and

“(B) achieve emissions reduction in nonpower industrial sectors.

“(2) COORDINATION.—In carrying out the program, the Secretary shall, to the maximum extent practicable—

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

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

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

“(3) LEVERAGE OF EXISTING RESOURCES.—In carrying out the program, the Secretary shall leverage, to the maximum extent practicable—

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

“(B) public-private partnerships.

“(c) FOCUS AREAS.—The program shall focus on, to the maximum extent practicable,—

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

“(A) achieve emissions reduction in high-emissions industrial materials production processes, including production processes for iron, steel, steel mill products, aluminum, cement, concrete, glass, pulp, paper, and industrial ceramics;

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

“(i) through electrification of heating processes;

“(ii) through renewable heat generation technology;

“(iii) through combined heat and power; and

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

“(C) achieve emissions reduction in chemical production processes;

“(D) leverage smart manufacturing technologies and principles, digital manufacturing technologies, and advanced data analytics to develop advanced technologies and practices in information, automation, monitoring, computation, sensing, modeling, and networking that—

“(i) simulate manufacturing production lines;

“(ii) monitor and communicate production line status;

“(iii) manage and optimize energy productivity and cost throughout production; and

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

“(E) leverage the principles of sustainable manufacturing and sustainable chemistry to minimize the negative environmental impacts of manufacturing while conserving energy and resources, including—

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

“(ii) by minimizing waste from industrial processes; and

“(iii) by reducing resource intensity; and

“(F) increase the energy efficiency of industrial processes;

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

“(A) high-performance lightweight materials; and

“(B) substitutions for critical materials and minerals;

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

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

“(5) carbon capture technologies for industrial processes;

“(6) high-performance computing to develop advanced materials and manufacturing processes contributing to the focus areas described in paragraphs (1) through (5), including—

“(A) modeling, simulation, and optimization to design energy efficient and sustainable products; and

“(B) the use of digital prototyping and additive manufacturing to enhance product design;

“(7) other technologies that achieve net-zero emissions in nonpower industrial sectors as determined by Secretary in coordination with the Director;

“(8) incorporation of sustainable and green chemistry and engineering principles, practices, and methodologies, as the Secretary determines appropriate; and

“(9) other research or technology areas identified in the Emissions Reduction Roadmap authorized in section 455.

“(d) GRANTS, CONTRACTS, COOPERATIVE AGREEMENTS, AND DEMONSTRATION PROJECTS.—

“(1) GRANTS.—In carrying out the program, the Secretary shall award grants on a competitive basis to eligible entities for projects that the Secretary determines would best achieve the goals of the program.

“(2) CONTRACTS AND COOPERATIVE AGREEMENTS.—In carrying out the program, the Secretary may enter into contracts and cooperative agreements with eligible entities and Federal agencies for projects that the Secretary determines would further the purposes of the program.

“(3) DEMONSTRATION PROJECTS.—In supporting technologies developed under this section, the Secretary shall fund demonstration projects that test and validate technologies described in subsection (c).

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

“(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary to carry out the demonstration projects authorized in subsection (d)(3)—

- “(1) \$20,000,000 for fiscal year 2020;
- “(2) \$80,000,000 for fiscal year 2021;
- “(3) \$100,000,000 for fiscal year 2022;
- “(4) \$150,000,000 for fiscal year 2023; and
- “(5) \$150,000,000 for fiscal year 2024.

“(f) COORDINATION.—The Secretary shall carry out the activities authorized in this section in accordance with section 203 of the Department of Energy Research and Innovation Act (42 U.S.C. 18631).”

(b) TECHNICAL AMENDMENT.—The table of contents of the Energy Independence and Security Act of 2007 (Public Law 110–140; 121 Stat. 1494) is amended by inserting after the item relating to section 453 the following:

“Sec. 454. Industrial emissions reduction technology development program.”

SEC. 4. INDUSTRIAL TECHNOLOGY INNOVATION ADVISORY COMMITTEE.

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

“SEC. 455. INDUSTRIAL TECHNOLOGY INNOVATION ADVISORY COMMITTEE.

“(a) DEFINITIONS.—In this section:

“(1) COMMITTEE.—The term ‘Committee’ means the Industrial Technology Innovation Advisory Committee established under subsection (b).

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

“(3) EMISSIONS REDUCTION.—The term ‘emissions reduction’ has the meaning given the term in section 454(a).

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

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

“(c) MEMBERSHIP.—

“(1) APPOINTMENT.—The Committee shall be comprised of not fewer than 15 members, who shall be appointed by the Secretary, in coordination with the Director.

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

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

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

“(C) not less than 3 representatives of the research community, which shall include academia and National Laboratories;

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

“(E) not less than 6 representatives of industry, the collective expertise of which shall cover every focus area described in section 454(c);

“(F) not less than 1 representative of a State government; and

“(G) any other individual whom the Secretary, in coordination with the Director, determines to be necessary to ensure that the Committee is comprised of a diverse group of representatives of industry, academia, independent researchers, and public and private entities.

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

“(d) DUTIES.—

“(1) IN GENERAL.—The Committee shall—

“(A) in consultation with the Secretary and the Director, develop the missions and goals of the program, which shall be consistent with the purposes of the program described in section 454(b)(1);

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

- “(i) by identifying and evaluating any technologies being developed by the private sector or other Federal agencies relating to the focus areas described in section 454(c);
- “(ii) by identifying technology gaps in the private sector in those focus areas, and making recommendations to address those gaps;

- “(iii) by surveying and analyzing factors that prevent the adoption of emissions reduction technologies by the private sector; and
- “(iv) by recommending technology screening criteria for technology developed under the program to encourage adoption of the technology by the private sector; and
- “(C) develop the roadmap described in paragraph (2).
- “(2) EMISSIONS REDUCTION ROADMAP.—
 - “(A) PURPOSE.—The purpose of the roadmap developed under paragraph (1)(C) is to set forth a plan for achieving the goals of the program established in section 454(b)(1), including for the focus areas described in section 454(c).
 - “(B) CONTENTS.—The roadmap developed under paragraph (1)(C) shall—
 - “(i) specify near-term and long-term qualitative and quantitative objectives relating to each focus area described in section 454(c), including research, development, demonstration, and commercial application objectives;
 - “(ii) leverage existing roadmaps relevant to the program in section 454(b)(1) and the focus areas in section 454(c);
 - “(iii) specify the anticipated timeframe for achieving the objectives specified under clause (i);
 - “(iv) include plans for developing emissions reduction technologies that are globally cost-competitive; and
 - “(v) identify the appropriate role for investment by the Federal Government, in coordination with the private sector, to achieve the objectives specified under clause (i).
- “(e) MEETINGS.—
 - “(1) FREQUENCY.—The Committee shall meet not less frequently than 2 times per year, at the call of the Chair.
 - “(2) INITIAL MEETING.—Not later than 30 days after the date on which the members are appointed under subsection (b), the Committee shall hold its first meeting.
- “(f) COMMITTEE REPORT.—
 - “(1) IN GENERAL.—Not later than 2 years after the date of enactment of the CIT Act of 2019, and not less frequently than once every 3 years thereafter, the Committee shall submit to the Secretary a report on the progress of achieving the purposes of the program.
 - “(2) CONTENTS.—The report under paragraph (1) shall include—
 - “(A) a description of any technology innovation opportunities identified by the Committee;
 - “(B) a description of any technology gaps identified by the Committee under subsection (d)(1)(B)(ii);
 - “(C) a review of the management, technology screening, coordination, and industry utility of the program;
 - “(D) an evaluation of the progress of the program and the research, development, and demonstration activities funded under the program;
 - “(E) any recommended changes to the focus areas of the program described in section 454(c);
 - “(F) a description of the manner in which the Committee has carried out the duties described in subsection (d)(1) and any relevant findings as a result of carrying out those duties;
 - “(G) the roadmap developed by the Committee under subsection (d)(1)(C);
 - “(H) the progress made in achieving the goals set out in that roadmap;
 - “(I) an assessment of the extent to which progress has been made under the program in developing commercial, cost-competitive technologies in each focus area described in section 454(c); and
 - “(J) an assessment of the effectiveness of the program in coordinating efforts within the Department and with other Federal agencies to achieve the purposes of the program.
 - “(g) REPORT TO CONGRESS.—Not later than 60 days after receiving a report from the Committee under subsection (f), the Secretary shall submit a copy of that report to the Committee on Science, Space, and Technology of the House of Representatives, and the Committee on Energy and Natural Resources of the Senate.
 - “(h) APPLICABILITY OF FEDERAL ADVISORY COMMITTEE ACT.—Except as otherwise provided in this section, the Federal Advisory Committee Act (5 U.S.C. App.) shall apply to the Committee.”
 - “(b) TECHNICAL AMENDMENT.—The table of contents of the Energy Independence and Security Act of 2007 (Public Law 110–140; 121 Stat. 1494) (as amended by sec-

tion 3(b)) is amended by inserting after the item relating to section 454 the following:

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

SEC. 5. TECHNICAL ASSISTANCE PROGRAM TO IMPLEMENT INDUSTRIAL EMISSIONS REDUCTION.

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

“SEC. 456. TECHNICAL ASSISTANCE PROGRAM TO IMPLEMENT INDUSTRIAL EMISSIONS REDUCTION.

“(a) DEFINITIONS.—In this section:

“(1) ELIGIBLE ENTITY.—The term ‘eligible entity’ means—

- “(A) a State;
- “(B) a unit of local government;
- “(C) a territory or possession of the United States;
- “(D) a relevant State or local office, including an energy office;
- “(E) a tribal organization (as defined in section 3765 of title 38, United States Code);
- “(F) an institution of higher education;
- “(G) a private entity; and
- “(H) a trade association or technical society.

“(2) EMISSIONS REDUCTION.—The term ‘emissions reduction’ has the meaning given the term in section 454(a).

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

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

“(b) ESTABLISHMENT.—Not later than one year after the date of enactment of the CIT Act of 2019, the Secretary shall establish a program to provide technical assistance to eligible entities to promote the commercial application of emission reduction technologies developed through the program established in section 454(b).

“(c) APPLICATIONS.—

“(1) APPLICATION PROCESS.—The Secretary shall seek applications for technical assistance under the program on a periodic basis, but not less frequently than once every 12 months.

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

- “(A) carrying out a commercial application of technology that has the greatest potential for emissions reduction in nonpower industrial sectors;
- “(B) located in a State that has historically relied on industrial sectors for a substantial portion of the State economy, as determined by the Secretary, taking into account employment data, per capita income, and other indicators of economic output in the State; or
- “(C) located in a State that has experienced significant decline in the economic contribution of industry to the State.”.

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

“Sec. 456. Technical assistance program to implement industrial emissions reduction.”

SEC. 6. COORDINATION OF RESEARCH AND DEVELOPMENT OF ENERGY EFFICIENT TECHNOLOGIES FOR INDUSTRY.

Section 6(a) of the American Energy Manufacturing Technical Corrections Act (42 U.S.C. 6351(a)) is amended—

(1) by striking “Industrial Technologies Program” each place it appears and inserting “Advanced Manufacturing Office”; and

(2) in the matter preceding paragraph (1), by striking “Office of Energy” and all that follows through “Office of Science” and inserting “Department of Energy”.

II. PURPOSE OF THE BILL

The purpose of the bill is to amend the Energy Independence and Security Act of 2007 to establish a research, development, demonstration, and commercial application program for technologies that would reduce emissions from the industrial sector; to establish

a federal advisory committee to guide the focus areas of the program and develop roadmaps to achieve emissions reductions in the industrial sector; and to provide technical assistance to promote the commercial application of relevant industrial emissions reduction technologies. H.R. 4230 is sponsored by Mr. Casten and co-sponsored by Mr. McKinley, Chairwoman Eddie Bernice Johnson, Ms. Radewagen, Mr. Fitzpatrick, Mr. Tonko, Ms. Luria, Mr. Luján, Mr. Veasey, Ms. Bonamici, Ms. Brownley, Mr. Levin (CA), Mr. Swalwell, Ms. Spanberger, Mr. Reed, Ms. Sherrill, Mr. Huffman, Mr. Cuellar, Mr. Visclosky, Ms. Wasserman Schultz, Mr. Bacon, Mr. Pappas, Ms. Stevens, Ms. Stefanik, Mr. Case, Mr. Foster, Ms. Pingree, Mr. Rouda, Mr. Vargas, Ms. Clarke, Mr. Thompson (MS), Mr. Sires, Ms. Wild, Mr. Suozzi, Mr. Peters, Ms. Slotkin, Mr. Gonzalez (TX), Mr. Doyle, Ms. Norton, Ms. Houlahan, Mr. Kim, Ms. Axne, Ms. Wexton, Mr. Lipinski, Mr. McAdams, Mr. Rooney, and Ms. Haaland.

III. BACKGROUND AND NEED FOR THE LEGISLATION

A number of recent reports have indicated a need for prioritizing the reduction of greenhouse gas (GHG) emissions from sectors beyond power generation, for both economic and environmental reasons.^{1,2} In 2017, the transportation sector contributed the highest amount of GHG emissions economy-wide at 28.9%, the power industry contributed the second highest amount at 27.5%, and the industrial sector contributed the third highest at 22.2% of GHG emissions.³ Despite this, the vast majority of federal R&D investments on emissions reduction technologies and methods in the U.S. have focused on the power sector.

Decarbonization of the industrial sector is particularly challenging due to the variety of products and processes involved, and our nation's historical reliance on these products and processes.⁴ Emissions from the industrial sector come from a variety of processes, including: emissions from fossil fuel combustion to generate heat; chemical processes involved in steel and cement production; and the production and use of unsustainable building materials. Thus the technologies to reduce emissions from the industrial sector also take a variety of forms and include investments in: fuel switching; carbon capture; and development of new materials and manufacturing processes.

Our nation's largest investment in the development of technologies to reduce industrial emissions resides in the Advanced Manufacturing Office (AMO) stewarded by the Department of Energy's (DOE's) Office of Energy Efficiency and Renewable Energy. AMO supports a number of R&D projects and partnerships to develop technologies that enable sustainable and energy efficient manufacturing. For example, AMO funds research on combined heat and power; advanced materials; and digital smart manufacturing. AMO also supports manufacturers through targeted tech-

¹ Science, *Net-zero emissions energy systems*, June 2018.

² Third Way, *Industry Matters*, October 2018, <https://www.thirdway.org/report/industry-matters-smarter-energy-use-is-key-for-us-competitiveness-jobs-and-climate-effort>.

³ EPA report, *Inventory of U.S. Greenhouse Gas Emissions and Sinks, 1990–2017*, <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks>.

⁴ C2ES report, *Decarbonizing U.S. Industry*, July 2018.

nical assistance and training programs to improve their energy efficiency.

IV. COMMITTEE HEARINGS

Pursuant to Section 103(i) of H. Res. 6, the Committee designates the following hearings as having been used to develop or consider the legislation:

On March 26, 2019, the Honorable Haley Stevens presiding, the Research and Technology Subcommittee and the Energy Subcommittee of the Committee on Science, Space, and Technology held a joint hearing to examine ways to enable decarbonization of the manufacturing sector in an effort to transition to a carbon-free future, and the role of the Manufacturing USA Institutes in achieving this goal. Witnesses and Members discussed the need for developing technologies that reduce energy use and emissions from the manufacturing sector through investments in research and commercialization programs at the federal level and through the facilitation of public-private partnerships.

WITNESSES

Mr. Ryan Myers, Director of Business Development, DoD for Hexagon Manufacturing Intelligence (Hexagon MI)

Mr. Mike Molnar, Director of the Office of Advanced Manufacturing, National Institute of Standards and Technology (NIST)

Dr. John Hopkins, CEO of the Institute for Advanced Composites Manufacturing Innovation (IACMI)

Ms. Valri Lightner, Acting Director of the Advanced Manufacturing Office, Office of Energy Efficiency and Renewable Energy at the Department of Energy

Dr. Mitchell Dibbs, Associate R&D Director for External Technology—Government Programs, Dow Chemical Company

On June 19, 2019, the Honorable Conor Lamb presiding, the Energy Subcommittee of the Committee on Science, Space, and Technology held a hearing to examine research and development needs to mitigate the environmental impacts of the extraction and use of fossil fuels. This hearing included discussion of the Department of Energy's current work on developing technologies to help decarbonize industrial processes, especially related to carbon capture.

WITNESSES

Ms. Shannon Angielski, Executive Director, Carbon Utilization Research Council

Mr. Elgie Holstein, Senior Director for Strategic Planning, Environmental Defense Fund

Mr. Jeff Bobeck, Director of Energy Policy Engagement, Center for Climate and Energy Solutions

Ms. Erin Burns, Director of Policy, Carbon180

Dr. Erik K. Webb, Senior Manager, Geoscience Research and Applications, Sandia National Laboratories

V. COMMITTEE CONSIDERATION AND VOTES

The Energy Subcommittee of the Committee on Science, Space, and Technology met to consider H.R. 4230 on September 11, 2019 and considered the following amendments to the bill:

Mr. Weber offered an amendment that would remove authorizations of appropriations of funds and would terminate the activities authorized in the bill after the year 2024. *The amendment was defeated by a voice vote.*

Mr. Lipinski offered an amendment that would add sustainable and green chemistry to the list of research focus areas. *The amendment was agreed to by a voice vote.*

Mr. Weber offered an amendment that would remove authorizations of appropriations of funds. *The amendment was defeated by a voice vote.*

Mr. Norman offered an amendment that would terminate the activities authorized in the bill at the end of fiscal year 2024. *The amendment was defeated by a voice vote.*

Mr. Lamb moved that the Committee favorably report the bill, H.R. 4230, as amended, to the Full Committee with the recommendation that the bill be approved. *The motion was agreed to by a voice vote.*

The Committee on Science, Space, and Technology met to consider H.R. 4230 on February 12, 2020 and considered the following amendments to the bill:

Mr. Casten offered a Manager's amendment that would make clarifying and technical fixes throughout the bill, change the authorization levels, and add a definition for "critical material or mineral" to the bill. *The measure was agreed to by a voice vote.*

Mr. Babin offered and withdrew an amendment that would add language to the bill instructing that no research focus area in the bill would preclude the continued use of fossil fuels for power or limit the economic competitiveness of industry and manufacturing in the United States.

Mr. Weber offered and withdrew an amendment that would add a Sense of Congress that prioritizing research and development for all innovative energy technologies, including research to develop and improve the efficiency of fossil and nuclear power technologies, is necessary to maintain the technological and economic competitiveness of industry and manufacturing in the United States.

Chairwoman Johnson moved that the Committee favorably report the bill, H.R. 4230, as amended, to the House of Representatives with the recommendation that the bill be approved. *The motion was agreed to by a voice vote.*

VI. SUMMARY OF MAJOR PROVISIONS OF THE BILL

The Clean Industrial Technology Act (H.R. 4230) would authorize a cross-cutting research, development, and demonstration program at the Department of Energy for the development of technologies to reduce emissions from the industrial sector, planned in collaboration with industry partners.

VII. SECTION-BY-SECTION ANALYSIS (BY TITLE AND SECTION)

Sec. 1. Short title

“Clean Industrial Technology Act of 2019”

Sec. 2. Purpose

This section outlines the purposes of the bill, which are to encourage the development and evaluation of technologies that increase the technological and economic competitiveness of U.S. industry and manufacturing and decrease the emissions of the industrial sector.

Sec. 3. Industrial Emissions Reduction Technology Development Program

This section establishes a cross-cutting research, development, demonstration, and commercial application program to further the development and commercialization of economic and competitive technologies that reduce emissions from the industrial sector. The program focuses on several areas, including reducing emissions from production processes for iron, steel, aluminum, cement, and chemical production processes; reducing emissions from high temperature heat generation; smart manufacturing; sustainable manufacturing; energy efficiency; alternative materials; net-zero emissions fuels; shipping, aviation, and long-distance transportation; carbon capture; and high-performance computing. This section authorizes \$20,000,000 for fiscal year 2020, \$80,000,000 for fiscal year 2021, \$100,000,000 for fiscal year 2022, \$150,000,000 for fiscal year 2023, and \$150,000,000 for fiscal year 2024 in funding for demonstration projects.

Sec. 4. Industrial Technology Innovation Advisory Committee

This section authorizes a Federal Advisory Committee comprised of members from relevant federal agencies, labor groups, academia, national labs, nonprofit organizations, and industry. The advisory committee is directed to work with the Secretary to develop missions and goals of the program established in section 3, as well as to develop industry-specific roadmaps to reduce emissions from the industrial sectors and processes identified in section 3.

Sec. 5. Technical Assistance Program to Implement Industrial Emissions Reduction

This section authorizes a program to provide technical assistance to eligible entities to promote the commercial application of technologies that reduce emissions from industrial sectors.

VIII. COMMITTEE VIEWS

The Committee intends that the research, development, demonstration, and commercial application program authorized in this legislation be cross-cutting in nature, involving all relevant program offices at the Department of Energy to execute its mission, including the Advanced Manufacturing Office, the Office of Fossil Energy, the Office of Nuclear Energy, and the Office of Science, and to build from existing activities at the Department of Energy at these and other offices. The Committee also intends that the awards distributed under this program cover a range of projects

and technologies, including demonstration projects, based on the maturity of the science and technology in each relevant industrial sector.

IX. COST ESTIMATE

Pursuant to clause 3(c)(2) of rule XIII of the Rules of the House of Representatives, the Committee adopts as its own the estimate of new budget authority, entitlement authority, or tax expenditures or revenues contained in the cost estimate prepared by the Director of the Congressional Budget Office pursuant to section 402 of the Congressional Budget Act of 1974.

X. CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

H.R. 4230, CIT Act of 2019			
As ordered reported by the House Committee on Science, Space, and Technology on February 12, 2020			
By Fiscal Year, Millions of Dollars	2020	2020-2025	2020-2030
Direct Spending (Outlays)	0	0	0
Revenues	0	0	0
Increase or Decrease (-) in the Deficit	0	0	0
Spending Subject to Appropriation (Outlays)	2	812	not estimated
Statutory pay-as-you-go procedures apply?	No	Mandate Effects	
Increases on-budget deficits in any of the four consecutive 10-year periods beginning in 2031?	No	Contains intergovernmental mandate?	No
		Contains private-sector mandate?	No

H.R. 4230 would require the Department of Energy (DOE), along with the Office of Science and Technology Policy and other federal agencies, to encourage the development of technologies that increase the competitiveness of industry and manufacturing and reduce emissions in the nonpower industrial sector. Under the program, DOE would award grants, sponsor demonstration projects, and provide technical assistance. The bill also would establish a committee consisting of members from the public and private sectors to advise DOE on the program, develop a strategic plan, and report results.

For this estimate, CBO assumes that the bill will be enacted in fiscal year 2020. Under that assumption, DOE could incur some costs in 2020, but CBO expects that most of the costs would be incurred in 2021 and later. Any spending would be subject to the availability of appropriated funds.

H.R. 4230 would authorize the appropriation of specified amounts for each year from 2020 through 2024 for DOE to sponsor demonstration projects. To estimate the cost of implementing other provisions in the bill, CBO considered the costs of similar DOE programs. For example, DOE allocated about \$100 million annually in recent years for research and development programs that focus on manufacturing processes. Similarly, the department allocated between \$3 million and \$20 million annually for comparable technical

assistance programs, and it allocated less than \$500,000 annually for comparable advisory committees.

On that basis, CBO estimates the authorization in 2020 for the other provisions in the bill would be \$110 million, with that amount growing by about \$3 million each year to account for anticipated inflation. Based on historical spending patterns for similar programs, CBO estimates that implementing H.R. 4230 would cost \$812 million over the 2020–2025 period.

The costs of the legislation, detailed in Table 1, would largely fall within budget function 270 (energy).

TABLE 1.—ESTIMATED INCREASES IN SPENDING SUBJECT TO APPROPRIATION UNDER H.R. 4230

	By fiscal year, millions of dollars—						
	2020	2021	2022	2023	2024	2025	2020–2025
Demonstration Projects:							
Authorization	20	80	100	150	150	0	500
Estimated Outlays	*	16	45	78	107	105	351
Other Provisions:							
Estimated Authorization	110	112	115	118	121	124	700
Estimated Outlays	2	35	82	107	114	121	461
Total Changes:							
Estimated Authorization	130	192	215	268	271	124	1,200
Estimated Outlays	2	51	127	185	221	226	812

* = between zero and \$500,000.

On February 18, 2020, CBO transmitted a cost estimate for S. 2300, the CIT Act of 2019, as reported by the Senate Committee on Energy and Natural Resources on October 24, 2019. The two pieces of legislation are similar, and CBO's estimated costs reflect the differences between the bills. In particular, H.R. 4230 would authorize specific amounts for demonstration projects and S. 2300 would not.

The CBO staff contact for this estimate is Aaron Krupkin. The estimate was reviewed by H. Samuel Papenfuss, Deputy Director of Budget Analysis.

XI. FEDERAL MANDATES STATEMENT

H.R. 4230 contains no unfunded mandates.

XII. COMMITTEE OVERSIGHT FINDINGS AND RECOMMENDATIONS

The Committee's oversight findings and recommendations are reflected in the body of this report.

XIII. STATEMENT ON GENERAL PERFORMANCE GOALS AND OBJECTIVES

Pursuant to clause (3)(c) of House rule XIII, the goals of H.R. 4230 are to incentivize innovation and to enhance the industrial competitiveness of the United States by developing technologies to reduce emissions in the industrial sector.

XIV. FEDERAL ADVISORY COMMITTEE STATEMENT

The functions of the advisory committee authorized in H.R. 4230 are not currently being nor could they be performed by one or more

agencies or by enlarging the mandate of another existing advisory committee.

XV. DUPLICATION OF FEDERAL PROGRAMS

Pursuant to clause 3(c)(5) of rule XIII of the Rules of the House of Representatives, the Committee finds that no provision of H.R. 4230 establishes or reauthorizes a program of the federal government known to be duplicative of another federal program, including any program that was included in a report to Congress pursuant to section 21 of Public Law 111–139 or the most recent Catalog of Federal Domestic Assistance.

XVI. EARMARK IDENTIFICATION

Pursuant to clause 9(e), 9(f), and 9(g) of rule XXI, the Committee finds that H.R. 4230 contains no earmarks, limited tax benefits, or limited tariff benefits.

XVII. APPLICABILITY TO THE LEGISLATIVE BRANCH

The Committee finds that H.R. 4230 does not relate to the terms and conditions of employment or access to public services or accommodations within the meaning of section 102(b)(3) of the Congressional Accountability Act (Public Law 104–1).

XVIII. STATEMENT ON PREEMPTION OF STATE, LOCAL, OR TRIBAL LAW

This bill is not intended to preempt any state, local, or tribal law.

XIX. CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3(e) of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italics, and existing law in which no change is proposed is shown in roman):

ENERGY INDEPENDENCE AND SECURITY ACT OF 2007

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) **SHORT TITLE.**—This Act may be cited as the “Energy Independence and Security Act of 2007”.

(b) **TABLE OF CONTENTS.**—The table of contents of this Act is as follows:

Sec. 1. Short title; table of contents.

* * * * *

TITLE IV—ENERGY SAVINGS IN BUILDINGS AND INDUSTRY

* * * * *

Subtitle D—Industrial Energy Efficiency

* * * * *

Sec. 454. Industrial emissions reduction technology development program.

Sec. 455. Industrial Technology Innovation Advisory Committee.
Sec. 456. Technical assistance program to implement industrial emissions reduction.

* * * * *

TITLE IV—ENERGY SAVINGS IN BUILDINGS AND INDUSTRY

* * * * *

Subtitle D—Industrial Energy Efficiency

* * * * *

SEC. 454. INDUSTRIAL EMISSIONS REDUCTION TECHNOLOGY DEVELOPMENT PROGRAM.

(a) DEFINITIONS.—In this section:

(1) DIRECTOR.—The term “Director” means the Director of the Office of Science and Technology Policy.

(2) ELIGIBLE ENTITY.—The term “eligible entity” means—

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

(B) an institution of higher education;

(C) a nongovernmental organization;

(D) a National Laboratory;

(E) a private entity; and

(F) a partnership or consortium of 2 or more entities described in subparagraphs (B) through (E).

(3) EMISSIONS REDUCTION.—

(A) IN GENERAL.—The term “emissions reduction” means the reduction, to the maximum extent practicable, of net nonwater greenhouse gas emissions to the atmosphere by energy services and industrial processes.

(B) EXCLUSION.—The term “emissions reduction” does not include the elimination of carbon embodied in the principal products of industrial manufacturing.

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

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

(b) INDUSTRIAL EMISSIONS REDUCTION TECHNOLOGY DEVELOPMENT PROGRAM.—

(1) IN GENERAL.—Not later than 1 year after the date of enactment of the CIT Act of 2019, the Secretary, in coordination with the Director and in consultation with the heads of relevant Federal agencies, National Laboratories, industry, and institutions of higher education, shall establish a crosscutting research, development, and demonstration program to further the development and commercial application of innovative industrial emissions reduction technologies that—

(A) increase the technological and economic competitiveness of industry and manufacturing in the United States; and

- (B) achieve emissions reduction in nonpower industrial sectors.
- (2) COORDINATION.—In carrying out the program, the Secretary shall, to the maximum extent practicable—
- (A) coordinate with each relevant office in the Department and any other Federal agency;
- (B) coordinate and collaborate with the Industrial Technology Innovation Advisory Committee established under section 455; and
- (C) coordinate with the energy-intensive industries program established under section 452.
- (3) LEVERAGE OF EXISTING RESOURCES.—In carrying out the program, the Secretary shall leverage, to the maximum extent practicable—
- (A) existing resources and programs of the Department and other relevant Federal agencies; and
- (B) public-private partnerships.
- (c) FOCUS AREAS.—The program shall focus on, to the maximum extent practicable,—
- (1) industrial production processes, including technologies and processes that—
- (A) achieve emissions reduction in high-emissions industrial materials production processes, including production processes for iron, steel, steel mill products, aluminum, cement, concrete, glass, pulp, paper, and industrial ceramics;
- (B) achieve emissions reduction in medium- and high-temperature heat generation, including—
- (i) through electrification of heating processes;
- (ii) through renewable heat generation technology;
- (iii) through combined heat and power; and
- (iv) by switching to alternative fuels, including hydrogen;
- (C) achieve emissions reduction in chemical production processes;
- (D) leverage smart manufacturing technologies and principles, digital manufacturing technologies, and advanced data analytics to develop advanced technologies and practices in information, automation, monitoring, computation, sensing, modeling, and networking that—
- (i) simulate manufacturing production lines;
- (ii) monitor and communicate production line status;
- (iii) manage and optimize energy productivity and cost throughout production; and
- (iv) model, simulate, and optimize the energy efficiency of manufacturing processes;
- (E) leverage the principles of sustainable manufacturing and sustainable chemistry to minimize the negative environmental impacts of manufacturing while conserving energy and resources, including—
- (i) by designing products that enable reuse, refurbishment, remanufacturing, and recycling;
- (ii) by minimizing waste from industrial processes; and
- (iii) by reducing resource intensity; and
- (F) increase the energy efficiency of industrial processes;

(2) *alternative materials that produce fewer emissions during production and result in fewer emissions during use, including—*

- (A) *high-performance lightweight materials; and*
- (B) *substitutions for critical materials and minerals;*

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

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

(5) *carbon capture technologies for industrial processes;*

(6) *high-performance computing to develop advanced materials and manufacturing processes contributing to the focus areas described in paragraphs (1) through (5), including—*

(A) *modeling, simulation, and optimization to design energy efficient and sustainable products; and*

(B) *the use of digital prototyping and additive manufacturing to enhance product design;*

(7) *other technologies that achieve net-zero emissions in nonpower industrial sectors as determined by Secretary in coordination with the Director;*

(8) *incorporation of sustainable and green chemistry and engineering principles, practices, and methodologies, as the Secretary determines appropriate; and*

(9) *other research or technology areas identified in the Emissions Reduction Roadmap authorized in section 455.*

(d) *GRANTS, CONTRACTS, COOPERATIVE AGREEMENTS, AND DEMONSTRATION PROJECTS.—*

(1) *GRANTS.—In carrying out the program, the Secretary shall award grants on a competitive basis to eligible entities for projects that the Secretary determines would best achieve the goals of the program.*

(2) *CONTRACTS AND COOPERATIVE AGREEMENTS.—In carrying out the program, the Secretary may enter into contracts and cooperative agreements with eligible entities and Federal agencies for projects that the Secretary determines would further the purposes of the program.*

(3) *DEMONSTRATION PROJECTS.—In supporting technologies developed under this section, the Secretary shall fund demonstration projects that test and validate technologies described in subsection (c).*

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

(e) *AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary to carry out the demonstration projects authorized in subsection (d)(3)—*

(1) *\$20,000,000 for fiscal year 2020;*

(2) *\$80,000,000 for fiscal year 2021;*

(3) *\$100,000,000 for fiscal year 2022;*

(4) *\$150,000,000 for fiscal year 2023; and*

(5) *\$150,000,000 for fiscal year 2024.*

(f) *COORDINATION.—The Secretary shall carry out the activities authorized in this section in accordance with section 203 of the Department of Energy Research and Innovation Act (42 U.S.C. 18631).*

SEC. 455. INDUSTRIAL TECHNOLOGY INNOVATION ADVISORY COMMITTEE.

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

(1) **COMMITTEE.**—*The term “Committee” means the Industrial Technology Innovation Advisory Committee established under subsection (b).*

(2) **DIRECTOR.**—*The term “Director” means the Director of the Office of Science and Technology Policy.*

(3) **EMISSIONS REDUCTION.**—*The term “emissions reduction” has the meaning given the term in section 454(a).*

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

(b) **ESTABLISHMENT.**—*Not later than 180 days after the date of enactment of the CIT Act of 2019, the Secretary, in coordination with the Director, shall establish an advisory committee, to be known as the “Industrial Technology Innovation Advisory Committee”.*

(c) **MEMBERSHIP.**—

(1) **APPOINTMENT.**—*The Committee shall be comprised of not fewer than 15 members, who shall be appointed by the Secretary, in coordination with the Director.*

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

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

(B) *not less than 2 representatives of labor groups;*

(C) *not less than 3 representatives of the research community, which shall include academia and National Laboratories;*

(D) *not less than 2 representatives of nongovernmental organizations;*

(E) *not less than 6 representatives of industry, the collective expertise of which shall cover every focus area described in section 454(c);*

(F) *not less than 1 representative of a State government;*

(G) *any other individual whom the Secretary, in coordination with the Director, determines to be necessary to ensure that the Committee is comprised of a diverse group of representatives of industry, academia, independent researchers, and public and private entities.*

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

(d) **DUTIES.**—

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

(A) *in consultation with the Secretary and the Director, develop the missions and goals of the program, which shall be consistent with the purposes of the program described in section 454(b)(1);*

(B) *advise the Secretary and the Director with respect to the program—*

(i) *by identifying and evaluating any technologies being developed by the private sector or other Federal*

agencies relating to the focus areas described in section 454(c);

(ii) by identifying technology gaps in the private sector in those focus areas, and making recommendations to address those gaps;

(iii) by surveying and analyzing factors that prevent the adoption of emissions reduction technologies by the private sector; and

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

(C) develop the roadmap described in paragraph (2).

(2) EMISSIONS REDUCTION ROADMAP.—

(A) PURPOSE.—The purpose of the roadmap developed under paragraph (1)(C) is to set forth a plan for achieving the goals of the program established in section 454(b)(1), including for the focus areas described in section 454(c).

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

(i) specify near-term and long-term qualitative and quantitative objectives relating to each focus area described in section 454(c), including research, development, demonstration, and commercial application objectives;

(ii) leverage existing roadmaps relevant to the program in section 454(b)(1) and the focus areas in section 454(c);

(iii) specify the anticipated timeframe for achieving the objectives specified under clause (i);

(iv) include plans for developing emissions reduction technologies that are globally cost-competitive; and

(v) identify the appropriate role for investment by the Federal Government, in coordination with the private sector, to achieve the objectives specified under clause (i).

(e) MEETINGS.—

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

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

(f) COMMITTEE REPORT.—

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

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

(A) a description of any technology innovation opportunities identified by the Committee;

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

(C) a review of the management, technology screening, coordination, and industry utility of the program;

(D) an evaluation of the progress of the program and the research, development, and demonstration activities funded under the program;

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

(F) a description of the manner in which the Committee has carried out the duties described in subsection (d)(1) and any relevant findings as a result of carrying out those duties;

(G) the roadmap developed by the Committee under subsection (d)(1)(C);

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

(I) an assessment of the extent to which progress has been made under the program in developing commercial, cost-competitive technologies in each focus area described in section 454(c); and

(J) an assessment of the effectiveness of the program in coordinating efforts within the Department and with other Federal agencies to achieve the purposes of the program.

(g) **REPORT TO CONGRESS.**—Not later than 60 days after receiving a report from the Committee under subsection (f), the Secretary shall submit a copy of that report to the Committee on Science, Space, and Technology of the House of Representatives, and the Committee on Energy and Natural Resources of the Senate.

(h) **APPLICABILITY OF FEDERAL ADVISORY COMMITTEE ACT.**—Except as otherwise provided in this section, the Federal Advisory Committee Act (5 U.S.C. App.) shall apply to the Committee.

SEC. 456. TECHNICAL ASSISTANCE PROGRAM TO IMPLEMENT INDUSTRIAL EMISSIONS REDUCTION.

(a) **DEFINITIONS.**—In this section:

(1) **ELIGIBLE ENTITY.**—The term “eligible entity” means—

(A) a State;

(B) a unit of local government;

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

(D) a relevant State or local office, including an energy office;

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

(F) an institution of higher education;

(G) a private entity; and

(H) a trade association or technical society.

(2) **EMISSIONS REDUCTION.**—The term “emissions reduction” has the meaning given the term in section 454(a).

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

(4) **PROGRAM.**—The term “program” means the program established under subsection (b).

(b) **ESTABLISHMENT.**—Not later than one year after the date of enactment of the CIT Act of 2019, the Secretary shall establish a program to provide technical assistance to eligible entities to promote

the commercial application of emission reduction technologies developed through the program established in section 454(b).

(c) **APPLICATIONS.**—

(1) **APPLICATION PROCESS.**—*The Secretary shall seek applications for technical assistance under the program on a periodic basis, but not less frequently than once every 12 months.*

(2) **PRIORITIES.**—*In selecting eligible entities for technical assistance under the program, the Secretary shall give priority to an eligible entity—*

(A) carrying out a commercial application of technology that has the greatest potential for emissions reduction in nonpower industrial sectors;

(B) located in a State that has historically relied on industrial sectors for a substantial portion of the State economy, as determined by the Secretary, taking into account employment data, per capita income, and other indicators of economic output in the State; or

(C) located in a State that has experienced significant decline in the economic contribution of industry to the State.

* * * * *

AMERICAN ENERGY MANUFACTURING TECHNICAL CORRECTIONS ACT

* * * * *

SEC. 6. COORDINATION OF RESEARCH AND DEVELOPMENT OF ENERGY EFFICIENT TECHNOLOGIES FOR INDUSTRY.

(a) **IN GENERAL.**—As part of the research and development activities of the [Industrial Technologies Program] *Advanced Manufacturing Office* of the Department of Energy, the Secretary of Energy (referred to in this section as the “Secretary”) shall establish, as appropriate, collaborative research and development partnerships with other programs within the [Office of Energy Efficiency and Renewable Energy (including the Building Technologies Program), the Office of Electricity Delivery and Energy Reliability, and the Office of Science] *Department of Energy* that—

(1) leverage the research and development expertise of those programs to promote early stage energy efficiency technology development;

(2) support the use of innovative manufacturing processes and applied research for development, demonstration, and commercialization of new technologies and processes to improve efficiency (including improvements in efficient use of water), reduce emissions, reduce industrial waste, and improve industrial cost-competitiveness; and

(3) apply the knowledge and expertise of the [Industrial Technologies Program] *Advanced Manufacturing Office* to help achieve the program goals of the other programs.

(b) **REPORTS.**—Not later than 2 years after the date of enactment of this Act and biennially thereafter, the Secretary shall submit to Congress a report that describes actions taken to carry out subsection (a) and the results of those actions.

* * * * *

XX. PROCEEDINGS OF THE SUBCOMMITTEE MARKUP

**MARKUPS:
H.R. 4091, ARPA-E
REAUTHORIZATION ACT OF 2019; AND
H.R. 4230, CLEAN INDUSTRIAL
TECHNOLOGY ACT OF 2019**

MARKUP
BEFORE THE
SUBCOMMITTEE ON ENERGY
OF THE
COMMITTEE ON SCIENCE, SPACE, AND
TECHNOLOGY
HOUSE OF REPRESENTATIVES
ONE HUNDRED SIXTEENTH CONGRESS

FIRST SESSION

SEPTEMBER 11, 2019

Serial No. CP: 116-7

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C O N T E N T S

September 11, 2019

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**MARKUPS:
H.R. 4091, ARPA-E
REAUTHORIZATION ACT OF 2019; AND
H.R. 4230, CLEAN INDUSTRIAL
TECHNOLOGY ACT OF 2019**

WEDNESDAY, SEPTEMBER 11, 2019

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Subcommittee met, pursuant to notice, at 10:07 a.m., in room 2318, Rayburn House Office Building, Hon. Conor Lamb [Chairman of the Subcommittee] presiding.

Chairman LAMB. Good morning. The Subcommittee will come to order. Without objection, the Chair is authorized to declare recess at any time. Pursuant to Committee rule 2(e) and House rule XI, the Chair announces that he may postpone roll call votes.

Pursuant to notice, the Subcommittee on Energy meets to consider the following measures: H.R. 4091, the *ARPA-E Reauthorization Act of 2019*, and H.R. 4230, the *Clean Industrial Technology Act of 2019*.

I'm pleased to consider these two bipartisan bills today. I think they are absolutely essential to our Nation's clean energy future. They were considered at three hearings earlier this Congress where we brought together experts from industry, academia, and the Department of Energy (DOE). We talked about ARPA-E and also R&D (research and development) to reduce emissions from the manufacturing sector.

I'm an original cosponsor of H.R. 4091, the bipartisan *ARPA-E Reauthorization Act*, which Chairwoman Johnson took the lead on and we introduced in July. ARPA-E (Advanced Research Projects Agency-Energy) was first authorized by this Committee back in 2007. I think it has tremendous promise to help us solve one of our longest-term challenges, which is the future of low-carbon energy production in this country. Congress recognized this back then, and we have maintained our leadership in this research overall, creating jobs benefiting the energy sector and of course the environment, but we think there's a lot more we can do.

Groundbreaking research involves a high level of risk, some of which the private sector is able to take, but a lot of it, it can't bear alone, so we have our part to play. The first appropriation for ARPA-E was \$400 million, and it was made exactly 10 years ago.

In that time, ARPA-E and the people it's given grants to have done incredible work, but the budget has had stagnant, if any, growth. I don't believe in that. I think that when the government is doing something right and doing it well, especially in cooperation with other segments of our society, that's an occasion to double down, especially on a challenge this important.

So this bill answers the call of the National Academies and the leading energy think tanks, who have all called for significantly increasing ARPA-E's budget to allow them to do even more of the great work they're already doing. This will ensure that ARPA-E actually has the impact we want it to have, not just individual excellent projects but an overall sector-wide impact that can help us change the future of energy in this country.

Many people have recognized this, and that's why the ARPA-E reauthorization bill is now endorsed by those ranging from the U.S. Chamber of Commerce to the Natural Resources Defense Council (NRDC), the American Gas Association, and the American Council for Renewable Energy. You don't always see those groups on the same side of an individual piece of legislation, but in this case we have all their support, and I thank them for that.

The second bill we're looking at today is H.R. 4230, the *Clean Industrial Technology Act*, which is introduced by my colleague Representative Casten, and it is also a bipartisan bill. We've made a lot of strides in the past couple of decades in reducing greenhouse gas emissions from the power sector, but we still have a real uphill climb when it comes to manufacturing in heavy industry. That's about 25 percent of our Nation's emissions, yet only about 6 percent of the Department of Energy's research budget has been dedicated to this. And we have no national plan devoted to solving this problem.

So this bill will help address those issues by authorizing a cross-agency DOE-led R&D and demonstration program to advance these technologies from industrial sources of emissions including steel, cement, chemical production, and industrial heat. Importantly, this program will operate in collaboration with stakeholders from industry and labor groups to make sure that people who are essentially the boots on the ground in the sectors have a say in the investment we're going to make as a Nation.

DOE has succeeded with large demonstration projects before, so after the basic science and the basic research is done actually showing it can be done on a large commercial scale. We've done that most recently and prominently with the nearly \$200 million investment in a commercial-scale, post-combustion, carbon-capture coal-fired power plant in Thompsons, Texas, known as Petra Nova.

This bill, like the others, has support from a wide array of stakeholders and groups, including the National Association of Manufacturers, the American Chemistry Council, the United Steelworkers, the BlueGreen Alliance, the Union of Concerned Scientists, the Clean Air Task Force, again, not players that you usually see on the same side of the field, but in this case we have them.

So we think it's essential to ensure that American manufacturers can access these new technologies and the technologies that are still to come so that they will remain competitive throughout the 21st century and the fact that they will have a competitive edge

in the 21st century because of the demand that you're going to have for some of this clean energy.

My Republican colleagues who have signed on to support these important bills have recognized that innovation must play a key role in doing our work here. And I just urge my colleagues on both sides of the aisle again to consider supporting these bills. I look forward to advancing them out of the Subcommittee today.

[The prepared statement of Chairman Lamb follows:]

I am pleased to consider two bipartisan bills today that are essential to securing our nation's clean energy future. These bills were considered at three hearings earlier this Congress that brought together expert witnesses from industry, academia, and the Department of Energy to discuss two important topics: the Advanced Research Projects Agency - Energy, or ARPA-E, and research and development to reduce emissions from the manufacturing sector.

I am very proud to be an original cosponsor of H.R. 4091, the bipartisan *ARPA-E Reauthorization Act of 2019*, which Chairwoman Johnson and I introduced in July. First authorized by this Committee in 2007, ARPA-E was designed to address some of the unique challenges of advancing new clean energy technologies.

In its creation of ARPA-E Congress recognized the necessity of developing transformational technologies in the energy sector. By maintaining our leadership in research, we're creating jobs here in America, benefiting the energy sector and mitigating climate change. We're making our power safer and more sustainable, and improving our economy.

Groundbreaking research involves a high level of risk. The private sector is understandably unable to take on these risks alone and make all of the investments we so badly need to transition our energy infrastructure into the twenty-first century.

ARPA-E received its first appropriation of \$400 million exactly ten years ago, and in that time has made significant strides in supporting the development of groundbreaking energy projects. However, to this day, the budget of this transformational agency has seen only marginal growth. This bill answers the call of the National Academies and leading energy think tanks and analysts to significantly increase ARPA-E's budget to allow the agency to scale up the excellent work that it is already doing. The authorizations in this bill will ensure that ARPA-E has the resources it needs to make a truly transformational impact on our nation's energy sector.

This bill is now endorsed by those ranging from the U.S. Chamber of Commerce to the Natural Resources Defense Council, the American Gas Association, and the American Council for Renewable Energy. It's pretty rare to receive support from this broad array of groups for the same piece of legislation, and I certainly appreciate the range of stakeholders who have weighed in on the legislation.

The second bill we are considering today is H.R. 4230, the bipartisan *Clean Industrial Technology Act* introduced by my colleague Rep. Casten. Over the past several decades, we have made significant strides to reduce greenhouse gas emissions from the power sector. But it is critical we recognize the role that other sectors of the economy play in contributing emissions to the atmosphere.

In particular, the manufacturing sector contributes nearly 25% of our nation's emissions, and yet only 6% of the Department of Energy's research budget is dedicated to developing technologies to help reduce emissions from manufacturing. Furthermore, we currently have no national plan devoted to solving this problem.

H.R. 4230 will help address these important issues by authorizing a cross-agency, DOE-led research, development, and demonstration program to advance technologies that will help reduce emissions from industrial sources of emissions including: steel and cement production, chemical production, and industrial heat. The research program will operate in collaboration with stakeholders from industry and labor groups to ensure that those who will work most closely with these technologies have a say in our nation's investment in their development. The Department of Energy has succeeded with large demonstration projects, like when they provided nearly \$200M to demonstrate the addition of a commercial-scale post-combustion carbon capture technology to a coal-fired power plant in Thompsons, Texas, commonly known as Petra Nova.

This bill has significant support from a wide array of stakeholders, such as the National Association of Manufacturers and the American Chemistry Council, the Steelworkers and the Blue Green Alliance, the Union of Concerned Scientists and the Clean Air Task Force.

Ensuring American manufacturers can access technologies to make them increasingly sustainable will ensure the domestic manufacturing industry remains competitive through the 21st Century. We need to give these companies, firms, factories and workers the assets and resources they need to compete and succeed in the international market - and sustainability, I believe, is one of the key components in doing so.

My Republican colleagues who have signed on to support these important pieces of legislation have recognized the essential role that innovation must play in achieving this goal. I urge my colleagues on both sides of the aisle to support these bills and look forward to advancing them out of our Subcommittee today.

Chairman LAMB. And with that I now recognize the Ranking Member Mr. Weber for his opening remarks.

Mr. WEBER. Good morning. And thank you, Chairman Lamb, for the opportunity to speak on H.R. 4091, the *ARPA-E Reauthorization Act of 2019* and H.R. 4230, the *Clean Industrial Technology Act of 2019*.

During my tenure on the Science Committee, we've had an incredible track record for passing bipartisan legislation. Just last Congress, 32 of the 34 bills from this Committee, an outstanding 94 percent, received bipartisan support. In fact, this Energy Subcommittee only worked in a bipartisan fashion, with all nine energy-related bills passing the House with bipartisan support from Science Committee Members.

Now, we certainly had different opinions on a whole range of policy issues, but at the end of the day, when it came to legislating, we focused on the areas where we indeed had common ground. Unfortunately, that is not the case this Congress, and today, we are holding yet another partisan markup in my opinion.

The two bills we will consider today may be characterized as bipartisan because of a single cosponsor, which, by the way, is not a Member of this Committee because once again both bills propose reckless budget increases without including any offsets in spending, something I simply cannot and will not support.

The first, H.R. 4091, the *ARPA-E Reauthorization Act of 2019*, would actually increase ARPA-E's authorization by, listen to this, 173 percent to \$1 billion with a B in Fiscal Year 2024. This funding level is both unrealistic and unproductive. Such a high rate of increase would be challenging for any program to effectively manage, but ARPA-E is particularly unsuited for the task. And with the small staff it has, this will be extremely difficult.

Now, I want to acknowledge that this bill does make important policy reforms to DOE's ARPA-E program, building off those, I might add, in Ranking Member Lucas' bipartisan ARPA-E legislation that passed the House last Congress. While I support these reforms, we don't need to drastically increase ARPA-E's funding to implement them.

It is unfortunate that we are unable to meet in the middle and reach a compromise on funding for this program. I'll be the first to admit I, and many of my conservative colleagues on this Committee, have been skeptical of ARPA-E, and I have voted many times to cut spending for the program. But I believe that Ranking Member Lucas' most recent ARPA-E bill, which has nearly identical policy reforms paired with authorization levels that were supported by both Chairwoman Johnson last Congress and this Committee, is a responsible compromise approach. I encourage the Chairman and the Committee to consider that legislation.

The second bill we will consider today, H.R. 4230, the *Clean Industrial Technology Act of 2019*, seeks to develop technologies to reduce emissions in industrial sectors. And while I agree that there is a need for collaboration in developing new technologies to reduce emissions, I'm concerned that we're rushing to move to a major authorization without doing our homework.

For example, I support the establishment of the Federal Advisory Committee in section 4 of the bill, but before we authorize a new program, shouldn't we first make sure this advisory committee has developed an effective research roadmap and goals for that program? Don't we want the experts from industry, academia, and the agencies to be able to weigh in before blindly committing taxpayer dollars?

This legislation also includes language that delegates authority for setting spending levels through the appropriators. If we don't know how much a program should cost, we have no business authorizing that program. Why don't we take the time to hear from stakeholders on what is needed and let's do our job?

We all support basic research. We all want to see the United States remain a leader in energy technology. And we can and should work together to send bipartisan legislation to the House floor.

So, in closing, I want to emphasize that I support the intent behind both of these bills, but unfortunately, I cannot and will not support a bill where we haven't done our due diligence on where we're making promises that we simply cannot keep. So let's stop wasting time. Let's get back to work on the areas that we can all agree and get our job done. Mr. Chairman, I yield back.

[The prepared statement of Mr. Weber follows:]

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Now, we certainly had different opinions on a whole range of policy issues. But at the end of the day, when it came to legislating, we focused on the areas where we had common ground. Unfortunately, that is not the case this Congress - and today we are holding yet another partisan markup.

The two bills we will consider today may be characterized as bipartisan because of a single cosponsor, but that support does not come from Members of this Committee. Because once again, both bills propose reckless budget increases without including any offsets in spending - something I simply cannot support.

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Now I want to acknowledge that this bill does make important policy reforms to DOE's ARPA-E program, building off those in Ranking Member Lucas's bipartisan ARPA-E legislation that passed the House last Congress. While I support these reforms, we don't need to drastically increase ARPA-E's funding to implement them.

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And I'll be the first to admit - I and many of my conservative colleagues on this Committee have been skeptical of ARPA-E, and I have voted many times to cut spending for this program.

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For example, I support the establishment of the federal advisory committee in section four of this bill.

But before we authorize a new program, shouldn't we first make sure this advisory committee has developed an effective research roadmap and goals for that program? Don't we want the experts from industry, academia, and the agencies to be able to weigh in before blindly committing taxpayer dollars?

This legislation also includes language that delegates authority for setting spending levels to the appropriators.

If we don't know how much a program should cost, we have no business authorizing that program. Let's take the time to hear from stakeholders on what is needed, and do our job.

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In closing, I want to emphasize that I support the intent behind both of these bills. But unfortunately, I can't support a bill where we haven't done our due diligence, or where we are making promises we can't keep.

Let's stop wasting time, and get back to work on the areas where we can all agree.

30

24

H.R. 4230
Chairman LAMB. We will now consider H.R. 4230, the *Clean Industrial Technology Act of 2019*, and the clerk will please report the bill.

The CLERK. H.R. 4230, a bill.
[The bill follows:]

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.....
(Original Signature of Member)

116TH CONGRESS
1ST SESSION

H. R. _____

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.

IN THE HOUSE OF REPRESENTATIVES

Mr. Casten introduced the following bill; which was referred to the Committee
on _____

§
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".

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1 SEC. 2. PURPOSE.

2 The purpose of this Act and the amendments made
3 by this Act is to encourage the development and evaluation
4 of innovative technologies aimed at increasing—

5 (1) the technological and economic competitive-
6 ness of industry and manufacturing in the United
7 States; and

8 (2) the emissions reduction of nonpower indus-
9 trial sectors.

**10 SEC. 3. INDUSTRIAL EMISSIONS REDUCTION TECHNOLOGY
11 DEVELOPMENT PROGRAM.**

12 (a) IN GENERAL.—The Energy Independence and
13 Security Act of 2007 is amended by inserting after section
14 453 (42 U.S.C. 17112) the following:

**15 “SEC. 454. INDUSTRIAL EMISSIONS REDUCTION TECH-
16 NOLOGY DEVELOPMENT PROGRAM.**

17 “(a) DEFINITIONS.—In this section:

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

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

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

25 “(B) an institution of higher education;

26 “(C) a nongovernmental organization;

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1 “(D) a National Laboratory;

2 “(E) a private entity; and

3 “(F) a partnership or consortium of 2 or
4 more entities described in subparagraphs (B)
5 through (E).

6 “(3) EMISSIONS REDUCTION.—

7 “(A) IN GENERAL.—The term ‘emissions
8 reduction’ means the reduction, to the max-
9 imum extent practicable, of net nonwater green-
10 house gas emissions to the atmosphere by en-
11 ergy services and industrial processes.

12 “(B) EXCLUSION.—The term ‘emissions
13 reduction’ does not include the elimination of
14 carbon embodied in the principal products of in-
15 dustrial manufacturing.

16 “(4) INSTITUTION OF HIGHER EDUCATION.—

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

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

22 “(b) INDUSTRIAL EMISSIONS REDUCTION TECH-
23 NOLOGY DEVELOPMENT PROGRAM.—

24 “(1) IN GENERAL.—Not later than 1 year after
25 the date of enactment of the CIT Act of 2019, the

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1 Secretary, in coordination with the Director and in
2 consultation with the heads of relevant Federal
3 agencies, National Laboratories, industry, and insti-
4 tutions of higher education, shall establish a cross-
5 cutting industrial emissions reduction technology de-
6 velopment program of research, development, dem-
7 onstration, and commercial application to further
8 the development and commercialization of innovative
9 technologies that—

10 “(A) increase the technological and eco-
11 nomic competitiveness of industry and manufac-
12 turing in the United States; and

13 “(B) achieve emissions reduction in
14 nonpower industrial sectors.

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

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

19 “(B) coordinate and collaborate with the
20 Industrial Technology Innovation Advisory
21 Committee established under section 455; and

22 “(C) coordinate with the energy-intensive
23 industries program established under section
24 452.

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

4 “(A) existing resources and programs of
5 the Department and other relevant Federal
6 agencies; and

7 “(B) public-private partnerships.

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

9 “(1) industrial production processes, including
10 technologies and processes that—

11 “(A) achieve emissions reduction in high-
12 emissions industrial materials production proc-
13 esses, including production processes for iron,
14 steel, steel mill products, aluminum, cement,
15 glass, pulp, paper, and industrial ceramics;

16 “(B) achieve emissions reduction in
17 medium- and high-temperature heat generation,
18 including—

19 “(i) through electrification of heating
20 processes;

21 “(ii) through renewable heat genera-
22 tion technology;

23 “(iii) through combined heat and
24 power; and

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- 1 “(iv) by switching to alternative fuels,
2 including hydrogen;
3 “(C) achieve emissions reduction in chem-
4 ical production processes;
5 “(D) leverage smart manufacturing tech-
6 nologies and principles, digital manufacturing
7 technologies, and advanced data analytics to de-
8 velop advanced technologies and practices in in-
9 formation, automation, monitoring, computa-
10 tion, sensing, modeling, and networking that—
11 “(i) simulate manufacturing produc-
12 tion lines;
13 “(ii) monitor and communicate pro-
14 duction line status;
15 “(iii) manage and optimize energy
16 productivity and cost throughout produc-
17 tion; and
18 “(iv) model, simulate, and optimize
19 the energy efficiency of manufacturing
20 processes;
21 “(E) leverage the principles of sustainable
22 manufacturing to minimize the negative envi-
23 ronmental impacts of manufacturing while con-
24 serving energy and resources, including—

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- 1 “(i) by designing products that enable
2 reuse, refurbishment, remanufacturing,
3 and recycling;
4 “(ii) by minimizing waste from indus-
5 trial processes; and
6 “(iii) by reducing resource intensity;
7 and
8 “(F) increase the energy efficiency of in-
9 dustrial processes;
10 “(2) alternative materials that produce fewer
11 emissions during production and result in fewer
12 emissions during use, including—
13 “(A) innovative building materials;
14 “(B) high-performance lightweight mate-
15 rials; and
16 “(C) substitutions for critical materials
17 and minerals;
18 “(3) development of net-zero emissions liquid
19 and gaseous fuels;
20 “(4) emissions reduction in shipping, aviation,
21 and long distance transportation, including through
22 the use of alternative fuels;
23 “(5) carbon capture technologies for industrial
24 processes;

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1 “(6) 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 (5), including—

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

8 “(B) the use of digital prototyping and ad-
9 ditive manufacturing to enhance product de-
10 sign; and

11 “(7) other technologies that achieve net-zero
12 emissions in nonpower industrial sectors as deter-
13 mined by Secretary in coordination with the Direc-
14 tor.

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

17 “(1) GRANTS.—In carrying out the program,
18 the Secretary shall award grants on a competitive
19 basis to eligible entities for projects that the Sec-
20 retary determines would best achieve the goals of the
21 program.

22 “(2) CONTRACTS AND COOPERATIVE AGREE-
23 MENTS.—In carrying out the program, the Secretary
24 may enter into contracts and cooperative agreements
25 with eligible entities and Federal agencies for

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1 projects that the Secretary determines would further
2 the purposes of the program.

3 “(3) DEMONSTRATION PROJECTS.—In sup-
4 porting technologies developed under this section,
5 the Secretary shall fund demonstration projects that
6 test and validate technologies described in subsection
7 (c).

8 “(4) APPLICATION.—An entity seeking funding
9 or a contract or agreement under this subsection
10 shall submit to the Secretary an application at such
11 time, in such manner, and containing such informa-
12 tion as the Secretary may require.

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

17 “(e) AUTHORIZATION OF APPROPRIATIONS.—

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

22 “(2) DEMONSTRATION PROJECTS.—Of the
23 amount appropriated under paragraph (1), not more
24 than \$650,000,000 shall be used to carry out dem-
25 onstration projects under subsection (d)(3).”.

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1 (b) TECHNICAL AMENDMENT.—The table of contents
 2 of the Energy Independence and Security Act of 2007
 3 (Public Law 110–140; 121 Stat. 1494) is amended by in-
 4 serting after the item relating to section 453 the following:

“Sec. 454. Industrial emissions reduction technology development program.”.

5 **SEC. 4. INDUSTRIAL TECHNOLOGY INNOVATION ADVISORY**
 6 **COMMITTEE.**

7 (a) IN GENERAL.—The Energy Independence and
 8 Security Act of 2007 is amended by inserting after section
 9 454 (as added by section 3(a)) the following:

10 **“SEC. 455. INDUSTRIAL TECHNOLOGY INNOVATION ADVI-**
 11 **SORY COMMITTEE.**

12 “(a) DEFINITIONS.—In this section:

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

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

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

22 “(4) PROGRAM.—The term ‘program’ means
 23 the industrial emissions reduction technology devel-
 24 opment program established under section
 25 454(b)(1).

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

6 “(c) MEMBERSHIP.—

7 “(1) APPOINTMENT.—The Committee shall be
8 comprised of not fewer than 14 members, who shall
9 be appointed by the Secretary, in coordination with
10 the Director.

11 “(2) REPRESENTATION.—Members appointed
12 pursuant to paragraph (1) shall include—

13 “(A) not less than 1 representative of each
14 relevant Federal agency, as determined by the
15 Secretary;

16 “(B) not less than 2 representatives of
17 labor groups;

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

21 “(D) not less than 2 representatives of
22 nongovernmental organizations;

23 “(E) not less than 6 representatives of in-
24 dustry, the collective expertise of which shall

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1 cover every focus area described in section
2 454(e); and

3 “(F) any other individual whom the Sec-
4 retary, in coordination with the Director, deter-
5 mines to be necessary to ensure that the Com-
6 mittee is comprised of a diverse group of rep-
7 resentatives of industry, academia, independent
8 researchers, and public and private entities.

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

11 “(d) DUTIES.—

12 “(1) IN GENERAL.—The Committee shall—

13 “(A) in consultation with the Secretary
14 and the Director, develop the missions and
15 goals of the program, which shall be consistent
16 with the purposes of the program described in
17 section 454(b)(1); and

18 “(B) advise the Secretary and the Director
19 with respect to the program—

20 “(i) by identifying and evaluating any
21 technologies being developed by the private
22 sector relating to the focus areas described
23 in section 454(e);

24 “(ii) by identifying technology gaps in
25 the private sector in those focus areas, and

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1 making recommendations to address those
2 gaps;

3 “(iii) by surveying and analyzing fac-
4 tors that prevent the adoption of emissions
5 reduction technologies by the private sec-
6 tor; and

7 “(iv) by recommending technology
8 screening criteria for technology developed
9 under the program to encourage adoption
10 of the technology by the private sector; and

11 “(C) develop the roadmap described in
12 paragraph (2).

13 “(2) EMISSIONS REDUCTION ROADMAP.—

14 “(A) PURPOSE.—The purpose of the road-
15 map developed under paragraph (1)(C) is to
16 achieve the goals of the program in the focus
17 areas described in section 454(c).

18 “(B) CONTENTS.—The roadmap developed
19 under paragraph (1)(C) shall—

20 “(i) specify near-term and long-term
21 qualitative and quantitative objectives re-
22 lating to each focus area described in sec-
23 tion 454(c), including research, develop-
24 ment, demonstration, and commercial ap-
25 plication objectives;

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1 “(ii) specify the anticipated timeframe
2 for achieving the objectives specified under
3 clause (i);

4 “(iii) include plans for developing
5 emissions reduction technologies that are
6 globally cost-competitive; and

7 “(iv) identify the appropriate role for
8 investment by the Federal Government, in
9 coordination with the private sector, to
10 achieve the objectives specified under
11 clause (i).

12 “(e) MEETINGS.—

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

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

20 “(f) COMMITTEE REPORT.—

21 “(1) IN GENERAL.—Not later than 2 years
22 after the date of enactment of the CIT Act of 2019,
23 and not less frequently than once every 3 years
24 thereafter, the Committee shall submit to the Sec-

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1 retary a report on the progress of achieving the pur-
2 poses of the program.

3 “(2) CONTENTS.—The report under paragraph
4 (1) shall include—

5 “(A) a description of any technology inno-
6 vation opportunities identified by the Com-
7 mittee;

8 “(B) a description of any technology gaps
9 identified by the Committee under subsection
10 (d)(1)(B)(ii);

11 “(C) recommendations for improving tech-
12 nology screening criteria and management of
13 the program;

14 “(D) an evaluation of the progress of the
15 program and the research and development
16 funded under the program;

17 “(E) any recommended changes to the
18 focus areas of the program described in section
19 454(e);

20 “(F) a description of the manner in which
21 the Committee has carried out the duties de-
22 scribed in subsection (d)(1) and any relevant
23 findings as a result of carrying out those duties;

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

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1 “(II) the progress made in achieving the
2 goals set out in that roadmap;

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

5 “(J) an assessment of the extent to which
6 progress has been made under the program in
7 developing commercial, cost-competitive tech-
8 nologies in each focus area described in section
9 454(e); and

10 “(K) an assessment of the effectiveness of
11 the program in coordinating efforts within the
12 Department and with other Federal agencies to
13 achieve the purposes of the program.

14 “(g) REPORT TO CONGRESS.—Not later than 60 days
15 after receiving a report from the Committee under sub-
16 section (f), the Secretary shall submit a copy of that re-
17 port to the Committee on Science, Space, and Technology
18 of the House of Representatives, the Committee on En-
19 ergy and Natural Resources of the Senate, and any other
20 relevant Committee of Congress.

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

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

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

6 **SEC. 5. TECHNICAL ASSISTANCE PROGRAM TO IMPLEMENT**
 7 **INDUSTRIAL EMISSIONS REDUCTION.**

8 (a) IN GENERAL.—The Energy Independence and
 9 Security Act of 2007 is amended by inserting after section
 10 455 (as added by section 4(a)) the following:

11 **“SEC. 456. TECHNICAL ASSISTANCE PROGRAM TO IMPLE-**
 12 **MENT INDUSTRIAL EMISSIONS REDUCTION.**

13 “(a) DEFINITIONS.—In this section:

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

16 “(A) a State;

17 “(B) a unit of local government;

18 “(C) a territory or possession of the
 19 United States;

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

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

24 “(F) an institution of higher education;

25 and

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1 “(G) a private entity.

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

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

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

11 “(b) ESTABLISHMENT.—Not later than 180 days
12 after the date of enactment of the CIT Act of 2019, the
13 Secretary shall establish a program to provide technical
14 assistance to eligible entities to promote the commercial
15 application of emission reduction technologies in nonpower
16 industrial sectors.

17 “(c) APPLICATIONS.—

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

23 “(2) APPLICATION PROCESS.—The Secretary
24 shall seek applications for technical assistance under

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1 the program on a periodic basis, but not less fre-
2 quently than once every 12 months.

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

6 “(A) carrying out a commercial application
7 of technology that has the greatest potential for
8 emissions reduction in nonpower industrial sec-
9 tors;

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

16 “(C) located in a State that has experi-
17 enced significant decline in the economic con-
18 tribution of industry to the State.

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

23 (b) TECHNICAL AMENDMENT.—The table of contents
24 of the Energy Independence and Security Act of 2007
25 (Public Law 110–140; 121 Stat. 1494) (as amended by

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1 section 4(b)) is amended by inserting after the item relat-
2 ing to section 455 the following:

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

3 **SEC. 6. COORDINATION OF RESEARCH AND DEVELOPMENT**
4 **OF ENERGY EFFICIENT TECHNOLOGIES FOR**
5 **INDUSTRY.**

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

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

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

Chairman LAMB. Without objection, the bill is considered as read and open to amendment at any point. I recognize Mr. Casten to present his remarks on the bill.

Mr. CASTEN. Thank you, Mr. Chair.

The climate crisis is an existential threat to all life on earth. It is urgent, and it is complicated. I have spent the last 20 years of my career trying to do something about it and found myself frustrated for years that when I came to Capitol Hill I would be told this problem is too complicated to move quickly, and I fear that in this moment there's a voice now that says this problem is too urgent to worry about complexity. Both of those paths are suicidal. And this bill is an effort to try to think about some of the complexity in, I think, a thoughtful way.

We have three things we have to do to deal with climate. The first is relatively easy. We have to figure out how to use as little energy as possible per dollar of GDP. We have lots of opportunities to do that—bury, removal. There's a whole host of bills I've been doing—to do that. All of those will grow the economy and lower the CO₂.

The second is really hard. We've got to figure out how to get 100 parts per million (ppm) of CO₂ out of the atmosphere so that our species can survive.

The third is subject to the jurisdiction of this Committee, which is that we have to figure out how to make those materials that our society depends on without fossil fuel input. We have no idea how to make fertilizer without natural gas, how to make steel without coke, silicon without coal, cement. And I don't know how to make a solar panel sitting on a concrete pad without steel, silicon, and cement. And I don't know how to feed 7 billion people without fertilizer.

So if we are going to make sure that we leave a planet to our children that is better than the one we inherited from our parents, we have to figure out how to do that. And that is the purpose of this bill.

If anybody says they already know the answer to those questions, they're lying. They're hard problems, but that's a real opportunity because if you think about as a young chemical engineer you learn names like Haber and Bosch, who invented these technologies to turn natural gas into ammonia; Fischer and Tropsch, who figured out how to take coal and turn it into hydrocarbons that can be used for other things. This is our chance to figure out who are going to be—those names that our children and grandchildren remember as inventing the technologies that allowed us to get by.

So the *Clean Industrial Technology Act of 2019* does exactly that. It directs the Secretary of Energy to establish a Department of Energy-like cross-agency research program to reduce carbon emissions from nonpower industrial sectors. This includes everything from research on lowering carbon emissions from iron and steel production to finding alternative materials for buildings to reducing emissions from shipping, aviation, and other modes of long-distance transportation.

To ensure that these technologies make their way into the private sector, the bill includes a \$650 million authorization for demonstration projects. Realistically, that probably covers three to five

large-scale demonstrations that help provide certainty to industry and help the private sector better implement new lower carbon emission technologies.

In a similar spirit, the bill also authorizes a technical assistance program to allow eligible entities to receive assistance from the DOE in working toward the goal of reducing emissions of nonpower industrial sectors.

In addition, *CITA* would establish a Federal Advisory Committee that would consist of industry, academic, Federal, and labor representatives to help develop the missions and goals of the research program and ensure consistent progress toward achieving those goals and to develop carbon emission-reduction roadmaps in each of the relevant focus areas.

This effort is not ideological. It's about averting the climate crisis. It's about American competitiveness. It's about U.S. manufacturing and industry leading the world in a new industrial revolution. The bill is widely endorsed by the U.S. Chamber of Commerce, the National Association of Manufacturers, the United Steelworkers, the BlueGreen Alliance, NRDC, EDF (Environmental Defense Fund), and the American Chemistry Council. That's a pretty diverse group of folks, and I'm proud to lead this effort alongside Chairwoman Johnson and Congressman McKinley, as well as Senators Whitehouse and Capito. This is bipartisan and bicameral. I'd like to thank all of them for their leadership and dedication and for taking on this issue. And I think that just helps to underscore how important this effort is.

I urge support of the *Clean Industrial Technology Act of 2019*. Thank you, and I yield back.

[The prepared statement of Mr. Casten follows:]

The climate crisis is an existential threat to all life on Earth. It is an urgent crisis. And its one that demands we take action, immediately.

However, that does not mean that the problem is not complex. Our standard of living, our economy, our social safety nets, and our government itself depend on energy access. We cannot allow ourselves to become deluded into thinking that because the problem is urgent, any action will solve the problem. Ignoring the urgency is suicidal. But ignoring the complexity is irresponsible. We must account for **both**.

This means that Congress and policymakers cannot simply issue edicts from on high. And we cannot shy away from expertise. The urgency of this crisis demands we act with seriousness, determination, and in a measured and deliberative manner.

In short, to solve the climate crisis, we must unleash the nerds. And that's hard for politicians. Because nerd-driven policies may not be exciting, flashy, or ready-made for primetime news headlines.

Some of these policies are already known; low-hanging fruit that we could enact tomorrow - like FERC reform, grid modernization, or climate-risk disclosure requirements for public corporations. Others are hard, intractable realities that will require massive mobilizations to solve - such as figuring out how to best pursue carbon removal or deal with communities inundated with the impacts of rising sea-levels.

But, a third bucket involves the need to deal with reducing emissions from sectors for which we have no easy solutions.

While the power sector has proven extremely efficient in reducing greenhouse gas emissions, other sectors, notably the industrial and heavy-duty transportation sectors have struggled to keep pace. In 2017, while the power sector constituted 27.5% of total greenhouse gas emissions domestically, the transportation sector and industrial sectors accounted for 28.9% and 22.2% of emissions, respectively. Despite this, the vast majority of federal R&D investments on emissions reduction technologies and methods in the U.S. have focused on the power sector.

How do we make fertilizer without natural gas? How do we feed billions of people globally without fertilizer?

How do we make silica, cement, or steel without producing CO₂? And if we don't have steel or silica - how do we build the infrastructure of the future needed to lower our emissions whether through building retrofits or solar panels?

How do I ship goods across the country or the globe without bunker fuel?

How do I make pharmaceuticals, cosmetics, and plastics without fossil fuel inputs?

If anyone says they already know the answers to all these questions, they are lying. These are hard questions. I believe we can solve them. But we must dedicate resources to solving them.

The *Clean Industrial Technology Act (CITA) of 2019* does just this by directing the Secretary of Energy to establish a Department of Energy (DOE)-led cross-agency research program to reduce emissions from non-power industrial sectors. This includes everything from research on lowering emissions from iron and steel production, to finding alternative materials for buildings, to reducing emissions from shipping, aviation, and other modes of long-distance transportation.

To ensure that these technologies make their way into the private sector here in the United States, the bill includes a \$650 million authorization for demonstration projects. This will cover 3-5 large scale demonstrations that help provide certainty to industry and help the private sector better implement new lower-emission technologies.

In a similar spirit, the bill also authorizes a technical assistance program to allow eligible entities to receive assistance from DOE in working towards the goal of reducing emissions of non-power industrial sectors.

In addition, CITA would establish a Federal Advisory Committee that would consist of industry, academic, federal, and labor representatives to help develop the missions and goals of the research program and ensure consistent progress towards achieving these goals, as well as to develop emissions reduction roadmaps in each of the relevant focus areas. This is not only important for solving the climate crisis for the future of American competitiveness across the manufacturing sectors.

Names like Haber and Bosch, Bessemer, Fischer and Tropsch, persist today because they invented processes that helped fuel an industrial revolution that enabled us to achieve economic prosperity on a scale previously unimaginable.

The nation or nations which develop and popularize the low-carbon industrial processes of the future, will control the manufacturing economy of tomorrow.

This effort is not ideological. It is about averting the climate crisis. It is about American competitiveness. It is about U.S. manufacturing and industry leading the world in a new industrial revolution.

The bill is widely endorsed including by the U.S. Chamber of Commerce, National Association of Manufacturers (NAM), United Steelworkers, the BlueGreen Alliance, NRDC, EDF, and the American Chemistry Council.

I was proud to lead this effort alongside Chairwoman Johnson and Congressman McKinley, as well as Senators Whitehouse and Capito. I'd like to thank them all for their leadership and dedication to taking on this issue in a bipartisan and bicameral manner. This helps underscore just how essential this effort is.

I urge support of the *Clean Industrial Technology Act of 2019*.

Thank you and I yield back.

Chairman LAMB. Does anyone else wish to be recognized?

Mr. LUCAS. Mr. Chairman?

Chairman LAMB. So recognized.

Mr. LUCAS. Thank you, Chairman Lamb. I want to make just a few brief comments on H.R. 4230, the *Clean Industrial Technology Act of 2019*. This bill directs DOE and the Office of Science and Technology Policy (OSTP) and other relevant Federal agencies and stakeholders to establish a broad cross-cutting program to develop and commercialize technologies that reduce greenhouse gas emissions from nonpowered industrial sectors like manufacturing and material production.

While I'm supportive of the intent behind these efforts, I'm concerned that this bill is putting the cart before the horse. We've had a very limited discussion of this bill in Committee hearings and received no technical comments from OSTP on this legislation. I think establishing the interagency committee to consult with stakeholders on a future research program is wise, but it doesn't make

sense to establish detailed requirements for a brand-new program without considering the recommendations of that committee.

I'm also concerned that the bill could duplicate research already underway. There are a number of existing research initiatives, and the Department of Energy, like those done through the Office of Fossil Energy and EERE's (Office of Energy Efficiency and Renewable Energy's) Advanced Manufacturing Office that already look to improve efficiency and reduce emissions in power production and manufacturing. These efforts could easily be expanded to apply to a broader range of industrial processes. Why not leverage existing government resources by providing policy direction to these programs before we establish something new?

Before I close, I want to make it clear I am supportive of funding cutting-edge research that will help improve efficiency and reduce emissions for energy-intensive industries. But I'd be much more supportive of a bill that established a mechanism for Federal agencies to work with stakeholders before we authorize a detailed program.

And I'd like to take this opportunity, again, to invite my friends across the aisle to the table. There is so much we agree on. In the future, I hope we can work together to do our jobs and develop commonsense, productive, yes, bipartisan legislation.

Chairman, I yield back the balance of my time.

Chairman LAMB. Thank you. Does anyone else wish to be recognized?

Mr. FOSTER. Yes, Mr. Chair?

Chairman LAMB. Mr. Foster?

Mr. FOSTER. Yes. My colleague, in introducing this, brought up one example, the energy use to produce fertilizer. And I'd just like to highlight the fact that we have to invest both in near-term development as well as fundamental research. There's an interesting company that's actually—it's called Pivot Bio that is now in the field in dozens of States with technology that uses pre-existing bacteria in various ways to make essentially—allow corn to make its own fertilizer. And they have successfully proven roughly a factor of two reduction in the need for fertilizer for corn, which will be transformative when it gets widely deployed.

This was only possible really because of both long-term and short-term Federal investments. You know, the basic understanding of biology is something that the Federal Government has been supporting for generations. And now we're seeing that long-term effort cross the finish line.

And we're also seeing it cross the finish line with Federal investments such as the SBIR (Small Business Innovation Research) program that I believe the award was in 2015 for a company established initially in 2011, that is now proving the technology that may drop the need for fertilizer for corn enormously and maybe even take it to zero.

I think it's part of the job of our Committee to balance fundamental research, I think, that we continue to underinvest in, as well as near-term deployments of things that are approaching the finish line. And so what is in this proposed bill I think does some of both, and I think it's the sort of thing that we should be ramping up.

And with that, I guess I never struck the first word, so I'll unstrike the word that I didn't strike.

Chairman LAMB. They were great words. I'd hate to see them struck. Thank you. Anyone else wish to be recognized?

We'll now proceed with the amendments in the order of the roster. The first amendment on the roster is an amendment offered by the Ranking Member of the Subcommittee, Mr. Weber. He's recognized to offer an amendment.

Mr. WEBER. Thank you, Mr. Chair. I have an amendment at the desk.

Chairman LAMB. The clerk will please report the amendment.

The CLERK. Amendment No. 1, amendment in the nature of a substitute to H.R. 4230 offered by Mr. Weber.

[The amendment of Mr. Weber follows:]

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AMENDMENT IN THE NATURE OF A SUBSTITUTE

TO H.R. **CIT Act for markup**

OFFERED BY M. **Weber (IDTD_001)**

[Page and line numbers refer to version of IDTD 001 with timestamp of August 29, 2019 at 1:39PM noticed by the Committee on Science, Space, and Technology.]

Strike all after the enacting clause and insert the following:

1 SECTION 1. SHORT TITLE.

2 This Act may be cited as the "Clean Industrial Tech-
3 nology Act of 2019" or the "CIT Act of 2019".

4 SEC. 2. PURPOSE.

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

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

11 (2) the emissions reduction of nonpower indus-
12 trial sectors.

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

3 (a) IN GENERAL.—The Energy Independence and
 4 Security 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
 10 the Director of the Office of Science and Technology
 11 Policy.

12 **“(2) ELIGIBLE ENTITY.—**The term ‘eligible en-
 13 tity’ 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
 25 reduction’ means the reduction of net nonwater

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1 greenhouse gas emissions to the atmosphere by
2 energy services and industrial processes.

3 “(B) EXCLUSION.—The term ‘emissions
4 reduction’ does not include the elimination of
5 carbon embodied in the principal products of in-
6 dustrial manufacturing.

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

11 “(5) PROGRAM.—The term ‘program’ means
12 the 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
17 Secretary, in coordination with the Director and in
18 consultation with the heads of relevant Federal
19 agencies, National Laboratories, industry, and insti-
20 tutions of higher education, shall establish a re-
21 search, development, and demonstration program to
22 further the development of innovative industrial
23 emissions reduction technologies that—

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

4 “(B) achieve emissions reduction in
5 nonpower industrial sectors.

6 “(2) FOCUS.—In carrying out the program ro-
7 ferred to in paragraph (1), the Secretary shall, to
8 the maximum extent practicable, focus on research
9 and technology goals established by the emissions re-
10 duction roadmap developed under section 455.

11 “(3) COORDINATION.—In carrying out the pro-
12 gram, the Secretary shall, to the maximum extent
13 practicable—

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

16 “(B) coordinate and collaborate with the
17 Industrial Technology Innovation Advisory
18 Committee established under section 455; and

19 “(C) coordinate with the energy-intensive
20 industries program established under section
21 452.

22 “(4) LEVERAGE OF EXISTING RESOURCES.—In
23 carrying out the program, the Secretary shall lever-
24 age, to the maximum extent practicable—

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1 “(A) existing resources and programs of
2 the Department and other relevant Federal
3 agencies; and

4 “(B) public-private partnerships.

5 “(e) GRANTS, CONTRACTS, COOPERATIVE AGREE-
6 MENTS, AND DEMONSTRATION PROJECTS.—

7 “(1) GRANTS.—In carrying out the program,
8 the Secretary shall award grants on a competitive
9 basis to eligible entities for projects that the Sec-
10 retary determines would best achieve the goals of the
11 program.

12 “(2) CONTRACTS AND COOPERATIVE AGREE-
13 MENTS.—In carrying out the program, the Secretary
14 may enter into contracts and cooperative agreements
15 with eligible entities and Federal agencies for
16 projects that the Secretary determines would further
17 the purposes of the program.

18 “(3) DEMONSTRATION PROJECTS.—In sup-
19 porting technologies developed under this section,
20 the Secretary may fund demonstration projects that
21 test and validate technologies described in subsection
22 (e).

23 “(4) COST SHARING.—In awarding funds under
24 this section, the Secretary shall require cost sharing

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1 in accordance with section 988 of the Energy Policy
2 Act of 2005 (42 U.S.C. 16352).

3 “(d) SUNSET.—The Secretary may not award grants,
4 enter into contracts or cooperative agreements, or take
5 any other action to carry out the program under this sec-
6 tion after September 30, 2024.

7 “(e) SPENDING LIMITATION.—No additional funds
8 are authorized to be appropriated to carry out this section,
9 and this section shall be carried out using amounts other-
10 wise available for such purpose.”

11 (b) TECHNICAL AMENDMENT.—The table of contents
12 of the Energy Independence and Security Act of 2007
13 (Public Law 110–140; 121 Stat. 1494) is amended by in-
14 serting after the item relating to section 453 the following:

“Sec. 454. Industrial emissions reduction technology development program.”

15 **SEC. 4. INDUSTRIAL TECHNOLOGY INNOVATION ADVISORY**
16 **COMMITTEE.**

17 (a) IN GENERAL.—The Energy Independence and
18 Security Act of 2007 is amended by inserting after section
19 454 (as added by section 3(a)) the following:

20 **“SEC. 455. INDUSTRIAL TECHNOLOGY INNOVATION ADVI-**
21 **SORY COMMITTEE.**

22 “(a) DEFINITIONS.—In this section:

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

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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 “(e) 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;

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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

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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

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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, and demonstration objectives;

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

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

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

21 “(e) MEETINGS.—

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

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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 2¹ 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) a review of the management, coordi-
21 nation, and industry utility of the program, in-
22 cluding recommendations for improving and
23 management of the program;

24 “(D) an evaluation of the progress of the
25 program and the research, development, and

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1 demonstration activities funded under the pro-
2 gram;

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

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

9 “(G) the progress made in achieving the
10 goals set out in that roadmap;

11 “(H) an assessment of the effectiveness of
12 the program in coordinating efforts within the
13 Department and with other Federal agencies to
14 achieve the purposes of the program.

15 “(g) TERMINATION.—The Committee shall terminate
16 on September 30, 2024.

17 “(h) REPORT TO CONGRESS.—Not later than 60 days
18 after receiving a report from the Committee under sub-
19 section (f), the Secretary shall submit a copy of that re-
20 port to the Committee on Science, Space, and Technology
21 of the House of Representatives and the Committee on
22 Energy and Natural Resources of the Senate.

23 “(i) APPLICABILITY OF FEDERAL ADVISORY COM-
24 MITTEE ACT.—Except as otherwise provided in this sec-

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1 tion, the Federal Advisory Committee Act (5 U.S.C. App.)
2 shall apply to the Committee.”.

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

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

8 **SEC. 5. TECHNICAL ASSISTANCE PROGRAM TO IMPLEMENT**
9 **INDUSTRIAL EMISSIONS REDUCTION.**

10 (a) IN GENERAL.—The Energy Independence and
11 Security Act of 2007 is amended by inserting after section
12 455 (as added by section 4(a)) the following:

13 **“SEC. 456. TECHNICAL ASSISTANCE PROGRAM TO IMPLE-**
14 **MENT INDUSTRIAL EMISSIONS REDUCTION.**

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

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

18 **“(A) a State;**

19 **“(B) a unit of local government;**

20 **“(C) a territory or possession of the**
21 **United States;**

22 **“(D) a relevant State or local office, in-**
23 **cluding an energy office;**

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

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1 “(F) an institution of higher education;

2 and

3 “(G) a private entity.

4 “(2) EMISSIONS REDUCTION.—The term ‘emis-

5 sions reduction’ has the meaning given the term in

6 section 454(a).

7 “(3) INSTITUTION OF HIGHER EDUCATION.—

8 The term ‘institution of higher education’ has the

9 meaning given the term in section 101 of the Higher

10 Education Act of 1965 (20 U.S.C. 1001).

11 “(4) PROGRAM.—The term ‘program’ means

12 the program established under subsection (b).

13 “(b) ESTABLISHMENT.—Not later than one year

14 after the date of enactment of the CIT Act of 2019, the

15 Secretary shall establish a program to provide technical

16 assistance to eligible entities to promote the commercial

17 application of emission reduction technologies developed

18 through the program established under section 454(b).

19 “(e) SUNSET.—The Secretary may not provide tech-

20 nical assistance or take any other action to carry out the

21 program under this section after September 30, 2024.

22 “(d) SPENDING LIMITATION.—No additional funds

23 are authorized to be appropriated to carry out this section,

24 and this section shall be carried out using amounts other-

25 wise available for such purpose.”.

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15

1 (b) **TECHNICAL AMENDMENT.**—The table of contents
 2 of the Energy Independence and Security Act of 2007
 3 (Public Law 110–140; 121 Stat. 1494) (as amended by
 4 section 4(b)) is amended by inserting after the item relat-
 5 ing to section 455 the following:

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

6 **SEC. 6. COORDINATION OF RESEARCH AND DEVELOPMENT**
 7 **OF ENERGY EFFICIENT TECHNOLOGIES FOR**
 8 **INDUSTRY.**

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

12 (1) by striking “Industrial Technologies Pro-
 13 gram” each place it appears and inserting “Ad-
 14 vanced Manufacturing Office”; and

15 (2) in the matter preceding paragraph (1), by
 16 striking “Office of Energy” and all that follows
 17 through “Office of Science” and inserting “Depart-
 18 ment of Energy”.

19 **SEC. 7. SENSE OF CONGRESS.**

20 It is the sense of Congress that power produced from
 21 fossil fuels is essential for maintaining the global competi-
 22 tiveness of United States manufacturing and industrial
 23 processes, and that these domestic industries are critical

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1 to the prosperity and national security of the United
2 States.



Chairman LAMB. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman for 5 minutes to explain the amendment.

Mr. WEBER. Thank you, Chairman Lamb.

My amendment to H.R. 4230, the *Clean Industrial Technology Act of 2019*, would modify the bill to prioritize the role of the advisory committee, provide limited preliminary authorizations for research and technical assistance programs, and establish a timeline for the sunset of this program. By adopting my amendment, I believe this bill could progress to the full Committee with bipartisan support, which we all know, as the Ranking Member said in earlier comments, gives it the best chance of becoming law.

As I mentioned in my opening statement, I believe this bill has potential. But to put it simply, I think we're trying to run before we walk, Mr. Chairman. My amendment would allow the advisory committee established in section 4 of this bill to develop appropriate technology and research benchmarks through the emissions reduction roadmap.

I don't think any of our colleagues claim to be an expert in industrial emission-reduction technologies, so if we're going to stand up a committee of professionals, I think we should give them the chance to help us develop an effective research program. We should be hearing from stakeholders, academics, and industry representatives who are experts in these relevant fields. By bringing together these individuals with relevant Federal agencies, I'm confident we will receive appropriate near-term and long-term qualitative and quantitative objectives that are actually achievable and realistic.

I know we're all anxious and excited to do our job, but before we write pages of descriptive directions for agencies, maybe we should let the advisory committee do its job and develop an effective research roadmap for that program.

Additionally, my amendment eliminates the, quote, "such sums as are necessary," end quote, authorization language from this bill. As an authorizing committee, I believe it is our responsibility to set the funding levels that we deem are appropriate. Allowing the appropriators to set funding levels concedes one of our greatest responsibilities and I would add privileges. Instead, my amendment would direct DOE to conduct this research using existing funds authorized.

With related research already taking place in the Office of Fossil Energy and EERE, the Department can expand existing work to meet new program goals. And if after hearing from the agency's experts and stakeholders on the advisory committee we believe additional funding is required to accomplish these goals, let's authorize it. But throwing up our hands and leaving our work to the appropriations committee is simply not the solution.

Last, this amendment proposes reasonable sunsets for the programs authorized in this bill. We can't allow programs to continue forever, and sunsets force us to come back to the table, do our job, and see if we're still on the right track.

I don't believe there's anything in this amendment that my colleagues could not support, but since I'd like to give Chairman Lamb and my Democratic colleagues the chance to come back to

the negotiating table and work with us to find a bipartisan compromise on this bill, I'm willing to withdraw this amendment today, Chairman Lamb. Are you willing to work with me to incorporate elements of this amendment before we consider this bill in the full Committee markup? I'm asking for you, Mr. Chairman.

Chairman LAMB. All right. The answer to that is no. I will recognize myself in opposition to your amendment, but I just want to make sure that you're done.

Mr. WEBER. Well, I was sure to make sure that my amendment wasn't done.

Chairman LAMB. Yes.

Mr. WEBER. Or does get done, wasn't done in the negative sense. So the Chairman is not willing to work with me?

Chairman LAMB. We are certainly willing to work with you long-term about the concerns that you've raised, but our plan for today is to vote on 4230 as it is currently written.

Mr. WEBER. With that, I yield back.

Chairman LAMB. Thank you. I will recognize myself in opposition to this amendment.

First, it shouldn't go without—I guess it should go without saying but we won't allow it to, we will continue to work on the areas where our interests and ideas overlap, and I think that has already happened leading to the development of this bill. Like I said before, I think we have a disagreement more about degree rather than kind. I think it involves the amount of money we want to spend and how we spend it. We all agree that reducing carbon emissions in these sectors is necessary.

The reason I oppose this amendment—well, there are several. One is I do think it's part of our job to provide guidance to the DOE and its labs and personnel on what we want them to focus on, and the amendment would remove a lot of that specificity. I've heard that from DOE personnel themselves. I've heard it from researchers at the national labs. They appreciate that direction, and I think that's an important part of our job.

I also think the issue of sunseting the program just respectfully is not well matched to the challenge that we're trying to address here. I mean, we're trying to solve a very, very difficult problem, as Mr. Casten I think very eloquently described, which is to take on this problem of carbon emissions in a sector that has seen very, very little innovation and penetration of new ideas. And so there's no indication to me that the problem itself is going to sunset anytime soon, so I don't know why we would start off by sunseting our attempt to solve that problem. It's going to be with us for quite a while, and it may be something that we want to tailor and fine-tune over time, but I wouldn't call for the ending of it before we even get started.

I also think that eliminating the authorizations for these programs and trying to rely on existing funds, again, it doesn't meet the challenge that we're facing. This is a big thing. It's going to require a lot of sustained investment. It's going to require demonstration programs, which are very expensive but very effective. And so it's not something we can do cheaply, but it's really important. So if the Federal Government is going to be spending money on something, I would think something related to the future of the planet

but especially life on this planet in a way that could sustain economic growth is a pretty good bet to be making.

So for all those reasons I oppose the amendment, and I yield back. I yield back to myself I suppose.

So anyone else wish to be heard on the amendment?

Mr. CASTEN. Move to strike the last word.

Chairman LAMB. You're recognized.

Mr. CASTEN. I want to just respond to a couple of comments because I think I appreciate the spirit but maybe just share a little bit of background. Number one, Energy and Natural Resources in the Senate is having a hearing on this right now as well, so I just want to re-emphasize the point I made in my opening comments that this is a bipartisan, bicameral bill—both in the House and the Senate. This is not something that is coming out of whole cloth for the first time in this Committee.

Number two, I really appreciate the comments you made I guess in the—not your recent ones but the prior ones—those were also good—about whether this is duplicative. Energy consumption in the manufacturing space is an orphan child of the Federal Government. We have an Office of Electricity. The use of energy in the industrial sector, parts of it get done in USDA (United States Department of Agriculture), parts of it gets done in the Census Department, the Manufacturing Consumption of Energy Survey.

It was deeply frustrating to me throughout my career both as an engineer, as a scientist, and as a businessperson that there was no programmatic oversight. And so part of the intent here is to say let's put this in the Department of Energy where people can really go look at this because there's a lot of unfortunate duplication because there is no standup agency that does the stuff, so let's try to consolidate this in one space.

And I think, you know, in the course of that, let's recognize that the funding here—and, look, \$650 million to the average American is a lot of money. Relative to what we spend on energy research, is a drop in the bucket. We spent \$10 billion for energy R&D at DOE in Fiscal Year 2019. We spent \$284 million to fund a \$431 million project to demonstrate carbon capture and utilization in Port Arthur, Texas for methane steam reformers. We spent \$141 million in Decatur to insert CO₂ from an ethanol plant underground.

I could make the case to spend a lot more money because, as Chairman Lamb pointed out, the scope of this problem is not going away. This is a huge chunk of our economy. If you look at the CO₂ emissions broadly speaking depending on the year, you know, 25 percent to 1/3 is from electricity, somewhere of a similar order of magnitude for transportation, the balance for manufacturing. We spend a lot on transportation, we spend a lot on electricity, we spend very little researching this, and if we're going to actually get the carbon down where it needs to be so that we avert the climate crisis, we needed to be of a similar scale here.

So this is a start. I absolutely agree we're going to need to revisit this down the road, but, my God, let's not sunset this program.

Mr. WEBER. Will the gentleman yield?

Mr. CASTEN. I will yield back the balance of my time to the Chair.

Mr. WEBER. Mr. Chair—

Chairman LAMB. Recognized.

Mr. WEBER [continuing]. I move to strike the last word.

Chairman LAMB. Recognized.

Mr. WEBER. I thank you for that. The gentleman from Illinois makes interesting points. Staff has advised me that there's a \$300 million program in DOE that looks at advanced manufacturing.

I want to talk about the sunset for a minute. I'm concerned that the bill, as I said in my comments, actually delegates our responsibility to the appropriators. We are the authorizing committee and glad to be. Does the gentleman from Illinois know of any other process other than sunset that forces us to come back to the table and take a second look and ask, is the program doing well? I yield to the gentlemen.

Mr. CASTEN. I think it's a double-edged sword. If we fund this program and we recognize the scale of the problem, then we will make sure we take it seriously. If we sunset, we are asking whether there are going to be adults at the table the next time this has to come up to revisit it.

Years ago, I was looking at trying to buy a bunch of biomass assets—biopower projects in the United States from a company that had Canadian, United States, and European assets. And when I asked the CEO why he was selling, he said, "because I get a better multiple on my cash-flows in Europe and Canada because my investors discount U.S. energy policy as being fickle and changing in every congressional cycle."

That is my fear of putting sunsets in these massively important programs—

Mr. WEBER. Well—

Mr. CASTEN [continuing]. Because the general public does not trust us to maintain a consistent energy policy.

Mr. WEBER. Reclaiming my time, with all due respect, I understand that, but we're a divided government and the Founders set it up that way. We have 2-year Members in the House, and I know you know this, 6 years in the Senate, and that's the way this government works.

But, again, I want to say that the responsibility should fall to us; it does fall to us. We should consider it a privilege, and we should consider it our job no matter who's in these seats to look out for the American public, the amount of money spent, and make sure there's no duplicative efforts done, there are no duplicative expenditures.

And so I simply want to say that I think the sunset provision is reasonable. I want to echo the fact that I think overseeing this, revisiting this, our job to look at this as the authorizing committee or Subcommittee, however you want to look at it, is important. We should be exercising that authority, that privilege. We should not be delegating it to anybody else. I think the American public doesn't appreciate that. They hired us to do a job. They elected us to do a job. I think we ought to do our job.

With that, I yield back.

Chairman LAMB. Any further discussion on the amendment?

OK. The vote will occur on the amendment.

All in favor of the amendment, say aye.

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All opposed, say no.

The noes have it, and the amendment is not agreed to.

The next amendment on the roster is an amendment offered by the gentleman from Illinois. He is recognized to offer the amendment.

Mr. LIPINSKI. Mr. Chairman, I have an amendment at the desk.

Chairman LAMB. The clerk will please report the amendment.

The CLERK. Amendment No. 2, amendment to H.R. 4230 offered by Mr. Lipinski of Illinois.

[The amendment of Mr. Lipinski follows:]

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AMENDMENT TO H.R. _____
OFFERED BY MR. LIPINSKI OF ILLINOIS

Page 6, line 22, after “manufacturing” insert “and sustainable chemistry”.

Page 8, line 10, strike “and”.

Page 8, line 14, strike the period and insert “; and”

Page 8, after line 14, insert the following:

1 “(8) incorporation of sustainable and green
2 chemistry and engineering principles, practices, and
3 methodologies, as the Secretary determines appropriate.”
4



Chairman LAMB. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman for 5 minutes to explain the amendment.

Mr. LIPINSKI. Thank you, Mr. Chairman. And I want to thank Mr. Casten for introducing this bill.

My amendment is relatively simple. I think it would be a good addition to this bill. I think we'll hopefully have good bipartisan support on this.

While some industrial emissions are due to the energy required to make products, emissions are also produced as side products of chemical reactions. Thus, it is commonly used to make steel and cement and the processing of many chemicals necessary for countless consumer products—all produce greenhouse gas emissions.

This bill already allows for development of new chemical processes that would result in lower emissions. However, as an engineer and a co-chair of the bicameral Chemistry Caucus, I recognize that a stronger focus on the principles of green and sustainable chemistry might amplify the benefits. Green and sustainable chemistry lowers harmful impacts on the environment and human health by seeking friendlier chemicals, as well as ways to lower-reaction energy requirements. I'm offering this amendment to encourage the Department of Energy's technology development partners to incorporate sustainable chemistry principles as appropriate when carrying out activities described in this bill.

Our partners should be supported if, for example, they seek to prioritize the use of environmentally friendly solvents or renewably sourced starting materials. Additionally, our partners should be encouraged to seek reactions that minimize waste and require lower-reaction temperatures. This amendment provides flexibility for research in all of these areas. The result is an industrial base with a lower environmental impact, including lower emissions.

The world is demanding solutions to climate change and at the same time, consumers are demanding environmentally conscious products. Encouraging new research and development and sustainable chemistry can meet both of these demands. And if we do the work to meet customer demand here in the United States, we'll position ourselves as leaders in the growing global green economy. We will support our manufacturing industrial base, leading to better consumer products and job growth, and we will create a cleaner environment for future generations.

So this amendment will just provide more flexibility to industry partners as they work to make their chemical processes cleaner. I think it would be a good addition to this bill. I thank the Committee for considering this amendment, and I encourage my colleagues to support it. And I yield back.

Chairman LAMB. Is there any further discussion on the amendment?

The vote will occur on the amendment.

All in favor, say aye.

Those opposed, say no.

The ayes have it, and the amendment is agreed to.

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The next amendment on the roster is an amendment offered by the gentlemen from Texas, and he is recognized to offer an amendment.

Mr. WEBER. Thank you, Mr. Chairman. I have an amendment at the desk.

Chairman LAMB. The clerk will please report the amendment.

The CLERK. Amendment No. 3, amendment to H.R. 4230 offered by Mr. Weber.

[The amendment of Mr. Weber follows:]

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AMENDMENT TO H.R. **CIT Act for markup**
OFFERED BY M. **Weber (IDTD_001)**

[Page and line numbers refer to version of IDTD_001 with timestamp of August 23, 2019 at 1:39PM noticed by the Committee on Science, Space, and Technology.]

Page 9, strike lines 17 through 25 and insert the following:

1 “(c) SPENDING LIMITATION.—No additional funds
2 are authorized to be appropriated to carry out this section,
3 and this section shall be carried out using amounts other-
4 wise available for such purpose.”

Page 19, strike lines 19 through 22 and insert the following:

5 “(d) SPENDING LIMITATION.—No additional funds
6 are authorized to be appropriated to carry out this section,
7 and this section shall be carried out using amounts other-
8 wise available for such purpose.”



Chairman LAMB. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize the gentleman for 5 minutes.

Mr. WEBER. Thank you, Chairman.

My amendment would add a sense of Congress to this legislation. This amendment requires the programs authorized in this legislation carried out using the existing appropriations for the Department of Energy. I submitted this amendment today for two reasons. The first is that the Department already receives funding for similar work, and we cannot increase topline spending each time we think we want to set priorities.

The second reason is, that if we decide additional funds are indeed necessary, as I said, we should do our job. We should do our due diligence and authorize the amount that the Department will need each year, not an open-end authorization with zero strings attached. I know we all want zero emissions, but this is a case where zero strings are attached.

Today, DOE's Office of Energy Efficiency and Renewable Energy, or EERE, is funded at almost \$2.4 billion with a B, and the Department's Office of Fossil Energy Research and Development is funded at \$740 million. Within these offices, there already exists programs focused on increasing efficiency and reducing emissions from the manufacturing process that could take on these responsibilities.

So instead of including no-limit authorizations, let's allow the advisory committee established in this bill to do its job like we need to do ours. Let them make recommendations to Congress on the appropriate priorities and technology goals for these programs. Then we can work with Federal agencies to authorize the right amount for the right time period to meet the right goals.

We all know we don't live in a world with unlimited resources, so it's our job to prioritize the resources we do have and make sure we are investing limited Federal dollars in programs that actually benefit the American taxpayer. There's a novel thought. So until we've heard from stakeholders and received enough information to determine if we truly need more funding, let's direct the agencies to carry out this work without increasing topline spending.

I think this is a commonsense proposal, and I encourage my colleagues to support this amendment. Mr. Chairman, I yield back.

Chairman LAMB. Any further discussion on the amendment?

Mr. CASTEN. Yes, Mr. Chairman.

Chairman LAMB. Recognized.

Mr. CASTEN. I want to reiterate what I said before about—we do not appreciate, I think, at nearly the level we need to the scale of this problem. I quite agree we have limited resources. The most limited resource we have is this planet, and that doesn't mean that we spend every dollar we can, but when I had the pleasure over the last recess of going and visiting NOAA (National Oceanic and Atmospheric Administration) and looking at this million-year history and seeing that over the various interglacial periods we have gone roughly from 200 parts per million CO₂ in the atmosphere to 300 and then back down again and then back up, and we do that cycle after cycle after cycle. Since the industrial revolution, we've gone from 300 to 415. The most ambitious plans that are out there among our various Presidential candidates probably turn the cor-

ner at 500. That 100-ppm swing in prior cycles has been about a 5-to-10° C change in the temperature of the planet and 120-meter sea-level rise.

You want to talk about precious resources to conserve, let's talk about the entire eastern seaboard. Let's talk about the State of Florida. This is not a small issue. Six hundred and fifty million dollars is a tiny, tiny, tiny down payment on what our grandchildren are going to demand of us because at the end of the day nobody is going to remember our names on this panel, nobody is going to remember what the borrowing cost is on the bill. They're going to remember whether they have a planet and what we did when facing this existential crisis.

And this is not the entirety of it, don't get me wrong. We have a lot of other things we have to do, but it's a small price to pay for what has to be done.

Thank you. I yield back.

Chairman LAMB. Thank you. And I'll just recognize myself for a moment to say that I'm opposing the amendment as well. I think in line with what Mr. Casten was saying the question really is, pay now or pay later. I mean there's really no doubt that we are going to spend hundreds of billions if not trillions of dollars trying to clean up from climate-related disasters and emergencies and the effect that it will have on our economy. People have already done that work and tallied it up. There's really no doubt that that's going to affect us in a lot of ways—agriculture, I mean, you name it.

And the thing that we often share in common between Democrats and Republicans, at least on this Committee, is that we believe that industry has a role to play here and that we don't want to sacrifice American jobs or American economic growth in the process of changing our grid and changing our country to help contribute to the efforts to save the planet.

And so I think what we have here is a pretty balanced example of bringing in industry input, which is how we got the support of people like the American Chemistry Council and three Republicans so far, and also just trying to create innovation.

And the thing that encourages me is that when you meet with business owners, people in manufacturing, people in the steel industry, where I come from, they desperately want to reduce their own carbon emissions. I mean, it's in every single one of their business plans. And we even see more and more companies now who are tying executive compensation to the reduction of carbon throughout their industrial chain. The point is it isn't enough. We aren't making a big enough dent fast enough, as Mr. Casten was telling us. There's a time element to this.

And so the larger amounts of money that we are trying to authorize and get into these programs—and the reason we oppose doing it with simply existing funding, is if existing funding were enough, we'd be seeing a faster rate of innovation and a faster rate of adoption in industry and fewer, fewer emissions. But we're not seeing that. So clearly there's more we need to do. For those reasons, I oppose the amendment. Does anyone else wish to be heard?

OK. The vote will occur on the amendment.

All in favor, say aye.

Those opposed, say no.

The noes have it, and the amendment is not agreed to.

The next amendment on the roster is an amendment offered by the gentleman from South Carolina. He is recognized to offer an amendment.

Mr. NORMAN. Chairman Lamb, I have an amendment at the desk.

Chairman LAMB. The clerk will please report the amendment.

The CLERK. Amendment No. 4, amendment to H.R. 4230 offered by Mr. Norman.

[The amendment of Mr. Norman follows:]

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AMENDMENT TO H.R. _____**OFFERED BY Mr. NORMAN**

[Page and line numbers refer to version of IDTD_001 with timestamp of August 29, 2019 at 1:39PM noticed by the Committee on Science, Space, and Technology.]

Page 9, after line 25, add the following:

1 “(f) SUNSET.—The Secretary may not award grants,
2 enter into contracts or cooperative agreements, or take
3 any other action to carry out the program under this sec-
4 tion after September 30, 2024.”.

Page 16, after line 20, insert the following (and make such conforming changes as may be necessary):

5 “(g) TERMINATION.—The Committee shall terminate
6 on September 30, 2024.”.

Page 19, after line 22, add the following:

7 “(e) SUNSET.—The Secretary may not provide tech-
8 nical assistance or take any other action to carry out the
9 program under this section after September 30, 2024.”.



Chairman LAMB. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman for 5 minutes.

Mr. NORMAN. Thank you, Chairman Lamb. In light of the previous discussion and respect for everybody's time, I will briefly put this amendment up. Basically, it's what Randy put up, but it's limited. It would establish a sunset for programs and committees established by this legislation.

And, you know, I think of us in our businesses and families we have a look-back period. This does not alter anything with the legislation other than on September 30, 2024, it requires a look back. I think that's a commonsense approach to every program we have. That's our job, as Mr. Weber brought up.

Second, with respect to the debt that was mentioned by my friend from Illinois, this we can all agree on—is something that to curb debt you look at every program. It's just like a credit card. There's no one item. And while this may or may not be a good call, you take a look at it and reevaluate it. It sends a message to the Committee Members that we're looking at the funding.

So with that, I yield back.

Chairman LAMB. Any further comments on the amendment?

OK. And I will recognize myself just briefly to say I oppose the amendment for many of the reasons stated. I do share the concern that my Republican colleagues have about making sure we monitor these programs, look back at them, be sure that they're working adequately. I think, as you can tell from our comments today, the Members on the Democratic side view this as among our highest priorities as a Nation and are very concerned to be sure that we get it right.

So I don't think we see ourselves as having to tie ourselves to holding future hearings and examining whether the money is being spent well, and we think that opposing these sunsets will help provide some assurance both to industry and to the researchers and decisionmakers within DOE itself that this is a commitment we are prepared to make, until the problem is solved. Again, this is not about arbitrary 5-year periods. It's about solving the problem, and that might take us a while. So for those reasons I oppose the amendment.

Does anyone have any further comments?

The vote will occur on the amendment.

All in favor, say aye.

Those opposed, say no.

The noes have it. The amendment is not agreed to.

The next amendment on the roster is an amendment offered by the gentlemen from Texas, and he is recognized to offer an amendment.

Mr. WEBER. Mr. Chairman, I'm not going to offer that amendment at this time. Thank you.

Chairman LAMB. Thank you. OK. Are there any other amendments?

A reporting quorum being present, I move that the Energy Subcommittee of the Committee on Science, Space, and Technology report H.R. 4230, as amended, to the full Committee with the recommendation that the bill be approved.

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Those in favor of the motion will signify by saying aye.

Opposed, no.

The ayes have it, and the bill is favorably agreed to.

Without objection, the motion to reconsider is laid upon the table. I ask unanimous consent that the staff be authorized to make any necessary technical and conforming changes. Without objection, so ordered.

Members will have 2 subsequent calendar days in which to submit supplemental minority or additional views on the measure.

I want to thank the Members for their attendance. This concludes our Subcommittee markup.

[Whereupon, at 11:17 a.m., the Subcommittee was adjourned.]

○

XXI. PROCEEDINGS OF THE FULL COMMITTEE MARKUP

MARKUPS:
**H.R. 2986, THE BETTER ENERGY STORAGE
TECHNOLOGY (BEST) ACT;**
**H.R. 4230, THE CLEAN INDUSTRIAL
TECHNOLOGY (CIT) ACT OF 2019;**
**H.R. 5374, THE ADVANCED GEOTHERMAL
RESEARCH AND DEVELOPMENT ACT OF 2019;**
**H.R. 5428, THE GRID MODERNIZATION
RESEARCH AND DEVELOPMENT
ACT OF 2019; AND**
**H.R. 5760, THE GRID SECURITY RESEARCH
AND DEVELOPMENT ACT**

MARKUP

BEFORE THE

COMMITTEE ON SCIENCE, SPACE, AND
TECHNOLOGY

HOUSE OF REPRESENTATIVES

ONE HUNDRED SIXTEENTH CONGRESS

SECOND SESSION

FEBRUARY 12, 2020

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C O N T E N T S

Wednesday, February 12, 2020

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**Markup on H.R. 2986,
Better Energy Storage Technology Act
or the BEST Act**

**Markup on H.R. 4230, Clean Industrial
Technology Act of 2019 or CIT Act of 2019**

**Markup on H.R. 5374,
Advanced Geothermal Research
and Development Act of 2019**

**Markup on H.R. 5428,
Grid Modernization Research
and Development Act of 2019**

**Markup on H.R. 5760,
Grid Security Research and Development Act**

WEDNESDAY, FEBRUARY 12, 2020

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, DC.

The Committee met, pursuant to notice, at 10 o'clock a.m., in room 2318 of the Rayburn House Office Building, Hon. Eddie Bernice Johnson [Chairwoman of the Committee] presiding.

Chairwoman JOHNSON. Good morning. The Committee will come to order. Without objection, the Chair is authorized to declare recess at any time. Pursuant to Committee rule and the House rules, the Chair announces that she may postpone roll call votes.

Pursuant to notice, the Committee meets to consider the following measures: H.R. 2986, *Better Energy Storage Technology Act*; H.R. 4230, *Clean Industrial Technology Act of 2019*; H.R. 5374, *Advanced Geothermal Research and Development Act of 2019*; H.R. 5428, *Grid Modernization Research and Development Act of 2019*; H.R. 5760, *Grid Security Research and Development Act*.

We welcome all to the Science Committee markup of five good, bipartisan bills. First, we will consider the *Better Energy Storage Technology Act (BEST ACT)*. The *BEST Act* authorizes the Department of Energy to conduct a crosscutting research, development, and demonstration program on energy storage technologies, including batteries and pumped hydro systems. The act requires DOE (Department of Energy) to create a 5-year strategic plan to coordinate research activities among DOE's technology offices.

Renewable energy technology can be intermittent. Strong winds die down, and sunny days turn cloudy. According to the Congressional Research Service, energy storage systems may be a key technology to enabling a reliable, low greenhouse-gas-emitting electric grid comprised of energy generation sources like wind and solar.

Next, we have H.R. 4230, the *Clean Industrial Technology Act of 2019*. The act authorizes an interagency, DOE-led research, development, and demonstration program to advance technologies that will help reduce emissions from the manufacturing sector, including steel and cement production, chemical production, and industrial heat. The research program will be carried out in collaboration with the stakeholders from industry and labor groups. Allowing American manufacturers to access technologies that make them increasingly sustainable will ensure that the domestic manufacturing industry will remain competitive throughout the 21st century.

We will then move to H.R. 5374, the *Advanced Geothermal Research and Development Act of 2019*. I will speak about this bill a little bit later.

Next is H.R. 5428, the *Grid Modernization Research and Development Act of 2019*, which authorizes a broad research, development, and demonstration program on a wide variety of topics pertaining to grid modernization, including smart grid modeling, planning, and controls; hybrid energy systems; and enhanced electric grid integration of technologies like vehicles and building components. Our Nation's electricity grid is undergoing a series of transformations, which includes adapting to a changing electricity generation mix, an increase in smart-grid technologies, and a growing need for improved resilience of the electric power grid. This bill will help lead our Nation in developing the technologies we need by setting forth a comprehensive research agenda by the DOE.

Finally, we'll be considering H.R. 5760, the *Grid Security Research and Development Act*. This bill is an updated version of a bill that Mr. Bera and I introduced, along with many of our Science Committee colleagues, in the previous two Congresses. H.R. 5760 will provide legislative guidance to activities carried out by the re-

cently established DOE Office of Cybersecurity, Energy Security, and Emergency Response. The bill authorizes an interagency research and development program to advance electric grid cybersecurity, physical security, grid resilience, and emergency response efforts. In particular, the bill authorizes activities on the cybersecurity testbeds, education and workforce training and standards, and guidance documents for energy sector cybersecurity practices.

I'm proud that today's bills are supported by a cross-section of interested groups. One or more of today's bills has been endorsed by organizations that include the National Audubon Society, the U.S. Chamber of Commerce, the Information Technology and Innovation Foundation, the Environmental Defense Fund, the National Rural Electric Cooperatives Association, Duke Energy, the Union of Concerned Scientists, the Natural Resources Defense Fund, and the National Association of Manufacturers.

Thank you.

[The statement of Chairwoman Johnson follows:]

Good morning, and welcome to today's Science Committee markup of five good, bipartisan bills.

First, we will consider H.R. 2986, the Better Energy Storage Technology Act. The BEST Act authorizes the Department of Energy to conduct a cross-cutting research, development, and demonstration program on energy storage technologies, including batteries and pumped hydro systems. The Act requires DOE create a 5-year strategic plan to coordinate research activities among DOE's technology offices.

Renewable energy technology can be intermittent. Strong winds die down, and sunny days turn cloudy. According to the Congressional Research Service, energy storage systems may be a key technology to enabling a reliable, low greenhouse gas emitting electric grid comprised of energy generation sources like wind and solar.

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National Audubon Society, the U.S. Chamber of Commerce, the Information Technology & Innovation Foundation (ITIF), the Environmental Defense Fund (EDF), the National Rural Electric Cooperative Association, Duke Energy, the Union of Concerned Scientists, the Natural Resources Defense Fund, and the National Association of Manufacturers.

Chairwoman JOHNSON. I now recognize our Ranking Member for his opening remarks.

Mr. LUCAS. Thank you, Chairwoman Johnson, for holding today's full Committee markup.

The Science Committee has one of the best records in Congress for passing productive, bipartisan legislation, and I'm very pleased to see us upholding that tradition this morning. We've reached bipartisan agreement on the five energy bills being considered today.

Currently, the U.S. energy sector faces a number of critical challenges, and it can be difficult to find the best path forward in a world that increasingly demands cleaner, more reliable, and more affordable energy sources. But it is our job in Congress to set the priorities to address these challenges and focus our limited Federal resources where we can see the best return on investment.

To deliver truly effective solutions, we must take the long-term and big-picture approach. We must support research in fundamental science that drives innovation over a broad range of energy applications and strategically invest in the early stage clean-energy technologies that industry cannot support. We must also provide for R&D (research and development) to modernize and defend our critical energy infrastructure and address the complex energy needs of our Nation's industrial sectors. These are the initiatives that today's bills will address.

First, we'll consider this morning H.R. 2986, the *BEST Energy Storage Technology Act of 2019*. This legislation authorizes a cross-cutting research and development program at the Department of Energy to provide necessary direction on high-priority energy storage technology research and development activities. Advanced grid scale energy storage is an essential component of any comprehensive clean-energy strategy and a priority of the current Administration. Developing our grid scale energy storage ability will accelerate the growth in all kinds of energy production, which can make use of this technology.

Our second bill this morning is H.R. 4230, the *Clean Industrial Technology Act of 2019*. Our Nation's economic stability and national security are tied to the growth of the U.S. industrial sector, yet the demanding energy needs of industry can represent a unique challenge for our clean and secure future energy. This bill establishes a DOE program to support the development of innovative technologies and practices that will reduce industrial sector emissions while maintaining the effectiveness and competitiveness of U.S. industry. It also requires the Secretary to establish a comprehensive strategy to develop the mission and goals for this new program.

While I can't say I agree with every aspect of this legislation, I'd like to thank our friends across the aisle for meeting us at the table to come to an agreement. By having a good-faith discussion, we were able to add responsible funding levels and good governance provisions to H.R. 4230 that will make this legislation a bipartisan product.

Next, we'll consider my bill, H.R. 5374, the *Advanced Geothermal Research and Development Act of 2019*, which authorizes DOE's cutting-edge geothermal research and development activities. This bill establishes a geothermal computing program and includes funding for critical geothermal user facilities that will support the next generation of electricity generation from these vast and largely untapped renewable resources. I would like to thank Chairwoman Johnson for cosponsoring this legislation and working with me to refine it.

While many renewables like wind and solar are already seeing success in the market, early stage technologies like geothermal, which are often far too expensive and risky for industry to take to scale, require Federal support for R&D. By strategically investing in these promising technologies, we can continue to enhance our diverse domestic energy portfolio and bolster U.S. energy independence. While we support next-generation energy technologies and clean-energy strategies, we must also increase our investment in our critical energy infrastructure.

So, finally, the Committee will consider H.R. 5428, the *Grid Modernization Research and Development Act of 2019*, and H.R. 5760, the *Grid Security Research and Development Act*. Together, these two bills authorize DOE's critical work in strengthening our Nation's electric grid against rapidly changing technological challenges. The *Grid Security Research and Development Act* authorizes the Department's critical cybersecurity and emergency response R&D activities and directs DOE to work with relevant Federal agencies to develop cybersecurity best practices. The *Grid Modernization Research and Development Act* authorizes R&D into hybrid energy systems, grid integration, and smart grid modeling, modernizing the grid to improve its overall resilience and flexibility.

I'd like to take this opportunity to thank my good friends across the aisle for working with us on these bills. I appreciate that we can come together to focus on our shared interest in supporting commonsense legislation to maintain U.S. national security, environmental stewardship, economic prosperity, and energy security for years to come. And I'd like to again thank Chairwoman Johnson for holding this markup, and I yield back the balance of my time.

[The statement of Mr. Lucas follows:]

Thank you, Chairwoman Johnson, for holding today's full Committee mark-up.

The Science Committee has one of the best track records in Congress for passing productive, bipartisan legislation, and I'm very pleased to see us upholding that tradition this morning. We've reached bipartisan agreement on the five energy bills being considered today.

Currently, the U.S. energy sector faces a number of critical challenges, and it can be difficult to find the best path forward in a world that increasingly demands cleaner, more reliable, and more affordable energy sources. But it is our job in Congress to set the priorities to address these challenges and focus our limited federal funds where we can see the best return on investment.

To deliver truly effective solutions, we must take the long-term and big picture approach. We must support research in fundamental science that drives innovation over a broad range of energy applications, and strategically invest in the early-stage clean energy technologies that industry cannot support. We must also provide for R&D to modernize and defend our critical energy infrastructure and address the complex energy needs of our nation's industrial sectors. These are the initiatives that today's bills will address.

The first bill we will consider this morning is H.R. 2986, the "Better Energy Storage Technology Act of 2019." This legislation authorizes a cross-cutting research and development program at the Department of Energy (DOE) to provide necessary direction on high-priority energy storage technology research and development activities.

Advanced grid scale energy storage is an essential component of any comprehensive clean energy strategy and a priority of the current administration. Developing our grid scale energy storage ability will accelerate growth in all kinds of energy production, which can make use of this technology.

Our second bill this morning is H.R. 4230, the "Clean Industrial Technology Act of 2019." Our nation's economic stability and national security are tied to the growth of the U.S. industrial sector.

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While I can't say I agree with every aspect of this legislation, I would like to thank our friends across the aisle for meeting us at the table to come to an agreement. By having a good-faith discussion, we were able to add responsible funding levels and good governance provisions to H.R. 4230 that will make this legislation a bipartisan product.

Next we will consider my bill, H.R. 5374, the "Advanced Geothermal Research and Development Act of 2019" which authorizes DOE's cutting-edge geothermal research and development activities. This bill establishes a geothermal computing program and includes funding for critical geothermal energy user facilities that will support the next generation of electricity generation from these vast and largely untapped renewable resources. I would like to thank Chairwoman Johnson for cosponsoring this legislation and for working with me to refine it.

While many renewables like wind and solar are already seeing success in the market, early stage technologies like geothermal, which are often far too expensive and risky for industry to take to scale, require federal support for R&D. By strategically investing in these promising technologies we can continue to enhance our diverse domestic energy portfolio and bolster U.S. energy independence.

While we support next-generation energy technologies and clean energy strategies, we must also increase our investment in our critical energy infrastructure. So finally, the Committee will consider H.R. 5428, the "Grid Modernization Research and Development Act of 2019" and H.R. 5760, the "Grid Security Research and Development Act."

Together, these two bills authorize DOE's critical work in strengthening our nation's electric grid against rapidly changing technological challenges. The Grid Security Research and Development Act authorizes the Department's crucial cybersecurity and emergency response R&D activities and directs DOE to work with relevant Federal agencies to develop cybersecurity best practices. The Grid Modernization Research and Development Act authorizes R&D into hybrid energy systems, grid integration, and smart grid modeling - modernizing the grid to improve its overall resilience and flexibility.

I'd like to take this opportunity to thank my good friends across the aisle for working with us on these bills. I appreciate that we can come together to focus on our shared interest in supporting commonsense legislation to maintain U.S. national security, environmental stewardship, economic prosperity, and energy security for years to come. I'd like to again thank Chairwoman Johnson for holding this markup and I yield back the balance of my time.

Chairwoman JOHNSON. Thank you very much.

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We now will have under consideration 4230, the *Clean Industrial Technology Act of 2019*. The clerk will report the bill.
The CLERK. Committee print of H.R. 4230.
[The bill follows:]

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Committee Print116TH CONGRESS
1ST SESSION**H. R. 4230**

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.

IN THE HOUSE OF REPRESENTATIVES

introduced the following bill; which was referred to the Committee on Science, Space, and Technology

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”.

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1 SEC. 2. PURPOSE.

2 The purpose of this Act and the amendments made
3 by this Act is to encourage the development and evaluation
4 of innovative technologies aimed at increasing—

5 (1) the technological and economic competitive-
6 ness of industry and manufacturing in the United
7 States; and

8 (2) the emissions reduction of nonpower indus-
9 trial sectors.

**10 SEC. 3. INDUSTRIAL EMISSIONS REDUCTION TECHNOLOGY
11 DEVELOPMENT PROGRAM.**

12 (a) IN GENERAL.—The Energy Independence and
13 Security Act of 2007 is amended by inserting after section
14 453 (42 U.S.C. 17112) the following:

**15 “SEC. 454. INDUSTRIAL EMISSIONS REDUCTION TECH-
16 NOLOGY DEVELOPMENT PROGRAM.**

17 “(a) DEFINITIONS.—In this section:

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

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

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

25 “(B) an institution of higher education;

26 “(C) a nongovernmental organization;

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1 “(D) a National Laboratory;
2 “(E) a private entity; and
3 “(F) a partnership or consortium of 2 or
4 more entities described in subparagraphs (B)
5 through (E).

6 “(3) EMISSIONS REDUCTION.—

7 “(A) IN GENERAL.—The term ‘emissions
8 reduction’ means the reduction, to the max-
9 imum extent practicable, of net nonwater green-
10 house gas emissions to the atmosphere by en-
11 ergy services and industrial processes.

12 “(B) EXCLUSION.—The term ‘emissions
13 reduction’ does not include the elimination of
14 carbon embodied in the principal products of in-
15 dustrial manufacturing.

16 “(4) INSTITUTION OF HIGHER EDUCATION.—

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

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

22 “(b) INDUSTRIAL EMISSIONS REDUCTION TECH-
23 NOLOGY DEVELOPMENT PROGRAM.—

24 “(1) IN GENERAL.—Not later than 1 year after
25 the date of enactment of the CIT Act of 2019, the

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1 Secretary, in coordination with the Director and in
2 consultation with the heads of relevant Federal
3 agencies, National Laboratories, industry, and insti-
4 tutions of higher education, shall establish a cross-
5 cutting industrial emissions reduction technology de-
6 velopment program of research, development, dem-
7 onstration, and commercial application to further
8 the development and commercialization of innovative
9 technologies that—

10 “(A) increase the technological and eco-
11 nomic competitiveness of industry and manufac-
12 turing in the United States; and

13 “(B) achieve emissions reduction in
14 nonpower industrial sectors.

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

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

19 “(B) coordinate and collaborate with the
20 Industrial Technology Innovation Advisory
21 Committee established under section 455; and

22 “(C) coordinate with the energy-intensive
23 industries program established under section
24 452.

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

4 “(A) existing resources and programs of
5 the Department and other relevant Federal
6 agencies; and

7 “(B) public-private partnerships.

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

9 “(1) industrial production processes, including
10 technologies and processes that—

11 “(A) achieve emissions reduction in high-
12 emissions industrial materials production pro-
13 cesses, including production processes for iron,
14 steel, steel mill products, aluminum, cement,
15 glass, pulp, paper, and industrial ceramics;

16 “(B) achieve emissions reduction in
17 medium- and high-temperature heat generation,
18 including—

19 “(i) through electrification of heating
20 processes;

21 “(ii) through renewable heat genera-
22 tion technology;

23 “(iii) through combined heat and
24 power; and

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1 “(iv) by switching to alternative fuels,
2 including hydrogen;

3 “(C) achieve emissions reduction in chem-
4 ical production processes;

5 “(D) leverage smart manufacturing tech-
6 nologies and principles, digital manufacturing
7 technologies, and advanced data analytics to de-
8 velop advanced technologies and practices in in-
9 formation, automation, monitoring, computa-
10 tion, sensing, modeling, and networking that—

11 “(i) simulate manufacturing produc-
12 tion lines;

13 “(ii) monitor and communicate pro-
14 duction line status;

15 “(iii) manage and optimize energy
16 productivity and cost throughout produc-
17 tion; and

18 “(iv) model, simulate, and optimize
19 the energy efficiency of manufacturing
20 processes;

21 “(E) leverage the principles of sustainable
22 manufacturing and sustainable chemistry to
23 minimize the negative environmental impacts of
24 manufacturing while conserving energy and re-
25 sources, including—

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1 “(i) by designing products that enable
2 reuse, refurbishment, remanufacturing,
3 and recycling;
4 “(ii) by minimizing waste from indus-
5 trial processes; and
6 “(iii) by reducing resource intensity;
7 and
8 “(F) increase the energy efficiency of in-
9 dustrial processes;
10 “(2) alternative materials that produce fewer
11 emissions during production and result in fewer
12 emissions during use, including—
13 “(A) innovative building materials;
14 “(B) high-performance, lightweight mate-
15 rials; and
16 “(C) substitutions for critical materials
17 and minerals;
18 “(3) development of net-zero emissions liquid
19 and gaseous fuels;
20 “(4) emissions reduction in shipping, aviation,
21 and long distance transportation, including through
22 the use of alternative fuels;
23 “(5) carbon capture technologies for industrial
24 processes;

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1 “(6) 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 (5), including—

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

8 “(B) the use of digital prototyping and ad-
9 ditive manufacturing to enhance product de-
10 sign;

11 “(7) other technologies that achieve net-zero
12 emissions in nonpower industrial sectors as deter-
13 mined by Secretary in coordination with the Direc-
14 tor; and

15 “(8) incorporation of sustainable and green
16 chemistry and engineering principles, practices, and
17 methodologies, as the Secretary determines appro-
18 priate.

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

21 “(1) GRANTS.—In carrying out the program,
22 the Secretary shall award grants on a competitive
23 basis to eligible entities for projects that the Sec-
24 retary determines would best achieve the goals of the
25 program.

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

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

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

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

21 “(e) AUTHORIZATION OF APPROPRIATIONS.—

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

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1 “(2) DEMONSTRATION PROJECTS.—Of the
2 amount appropriated under paragraph (1), not more
3 than \$650,000,000 shall be used to carry out dem-
4 onstration projects under subsection (d)(3).”.

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

9 **SEC. 4. INDUSTRIAL TECHNOLOGY INNOVATION ADVISORY**
10 **COMMITTEE.**

11 (a) IN GENERAL.—The Energy Independence and
12 Security Act of 2007 is amended by inserting after section
13 454 (as added by section 3(a)) the following:

14 **“SEC. 455. INDUSTRIAL TECHNOLOGY INNOVATION ADVI-**
15 **SORY COMMITTEE.**

16 “(a) DEFINITIONS.—In this section:

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

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

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

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

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

10 “(c) MEMBERSHIP.—

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

15 “(2) REPRESENTATION.—Members appointed
16 pursuant to paragraph (1) shall include—

17 “(A) not less than 1 representative of each
18 relevant Federal agency, as determined by the
19 Secretary;

20 “(B) not less than 2 representatives of
21 labor groups;

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

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1 “(D) not less than 2 representatives of
2 nongovernmental organizations;

3 “(E) not less than 6 representatives of in-
4 dustry, the collective expertise of which shall
5 cover every focus area described in section
6 454(e); and

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

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

15 “(d) DUTIES.—

16 “(1) IN GENERAL.—The Committee shall—

17 “(A) in consultation with the Secretary
18 and the Director, develop the missions and
19 goals of the program, which shall be consistent
20 with the purposes of the program described in
21 section 454(b)(1); and

22 “(B) advise the Secretary and the Director
23 with respect to the program—

24 “(i) by identifying and evaluating any
25 technologies being developed by the private

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1 sector relating to the focus areas described
2 in section 454(e);

3 “(ii) by identifying technology gaps in
4 the private sector in those focus areas, and
5 making recommendations to address those
6 gaps;

7 “(iii) by surveying and analyzing fac-
8 tors that prevent the adoption of emissions
9 reduction technologies by the private sec-
10 tor; and

11 “(iv) by recommending technology
12 screening criteria for technology developed
13 under the program to encourage adoption
14 of the technology by the private sector; and

15 “(C) develop the roadmap described in
16 paragraph (2).

17 “(2) EMISSIONS REDUCTION ROADMAP.—

18 “(A) PURPOSE.—The purpose of the road-
19 map developed under paragraph (1)(C) is to
20 achieve the goals of the program in the focus
21 areas described in section 454(e).

22 “(B) CONTENTS.—The roadmap developed
23 under paragraph (1)(C) shall—

24 “(i) specify near-term and long-term
25 qualitative and quantitative objectives re-

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1 relating to each focus area described in sec-
2 tion 454(c), including research, develop-
3 ment, demonstration, and commercial ap-
4 plication objectives;

5 “(ii) specify the anticipated timeframe
6 for achieving the objectives specified under
7 clause (i);

8 “(iii) include plans for developing
9 emissions reduction technologies that are
10 globally cost-competitive; and

11 “(iv) identify the appropriate role for
12 investment by the Federal Government, in
13 coordination with the private sector, to
14 achieve the objectives specified under
15 clause (i).

16 “(e) MEETINGS.—

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

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

24 “(f) COMMITTEE REPORT.—

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

7 “(2) CONTENTS.—The report under paragraph
8 (1) shall include—

9 “(A) a description of any technology inno-
10 vation opportunities identified by the Com-
11 mittee;

12 “(B) a description of any technology gaps
13 identified by the Committee under subsection
14 (d)(1)(B)(ii);

15 “(C) recommendations for improving tech-
16 nology screening criteria and management of
17 the program;

18 “(D) an evaluation of the progress of the
19 program and the research and development
20 funded under the program;

21 “(E) any recommended changes to the
22 focus areas of the program described in section
23 454(e);

24 “(F) a description of the manner in which
25 the Committee has carried out the duties de-

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1 scribed in subsection (d)(1) and any relevant
2 findings as a result of carrying out those duties;

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

5 “(II) the progress made in achieving the
6 goals set out in that roadmap;

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

9 “(J) an assessment of the extent to which
10 progress has been made under the program in
11 developing commercial, cost-competitive tech-
12 nologies in each focus area described in section
13 454(c); and

14 “(K) an assessment of the effectiveness of
15 the program in coordinating efforts within the
16 Department and with other Federal agencies to
17 achieve the purposes of the program.

18 “(g) REPORT TO CONGRESS.—Not later than 60 days
19 after receiving a report from the Committee under sub-
20 section (f), the Secretary shall submit a copy of that re-
21 port to the Committee on Science, Space, and Technology
22 of the House of Representatives, the Committee on En-
23 ergy and Natural Resources of the Senate, and any other
24 relevant Committee of Congress.

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

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

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

10 **SEC. 5. TECHNICAL ASSISTANCE PROGRAM TO IMPLEMENT**
11 **INDUSTRIAL EMISSIONS REDUCTION.**

12 (a) IN GENERAL.—The Energy Independence and
13 Security Act of 2007 is amended by inserting after section
14 455 (as added by section 4(a)) the following:

15 **“SEC. 456. TECHNICAL ASSISTANCE PROGRAM TO IMPLE-**
16 **MENT INDUSTRIAL EMISSIONS REDUCTION.**

17 “(a) DEFINITIONS.—In this section:

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

20 “(A) a State;

21 “(B) a unit of local government;

22 “(C) a territory or possession of the
23 United States;

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

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

3 “(F) an institution of higher education;
4 and

5 “(G) a private entity.

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

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

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

15 “(b) ESTABLISHMENT.—Not later than 180 days
16 after the date of enactment of the CIT Act of 2019, the
17 Secretary shall establish a program to provide technical
18 assistance to eligible entities to promote the commercial
19 application of emission reduction technologies in nonpower
20 industrial sectors.

21 “(c) APPLICATIONS.—

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

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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) PRIORITIES.—In selecting eligible entities
8 for technical assistance under the program, the Sec-
9 retary shall give priority to an eligible entity—

10 “(A) carrying out a commercial application
11 of technology that has the greatest potential for
12 emissions reduction in nonpower industrial sec-
13 tors;

14 “(B) located in a State that has histori-
15 cally relied on industrial sectors for a substan-
16 tial portion of the State economy, as deter-
17 mined by the Secretary, taking into account
18 employment data, per capita income, and other
19 indicators of economic output in the State; or

20 “(C) located in a State that has experi-
21 enced significant decline in the economic con-
22 tribution of industry to the State.

23 “(d) AUTHORIZATION OF APPROPRIATIONS.—There
24 are authorized to be appropriated to the Secretary such

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1 sums as are necessary to carry out this section for each
2 fiscal year during which the program is in effect.”.

3 (b) TECHNICAL AMENDMENT.—The table of contents
4 of the Energy Independence and Security Act of 2007
5 (Public Law 110–140; 121 Stat. 1494) (as amended by
6 section 4(b)) is amended by inserting after the item relat-
7 ing to section 455 the following:

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

8 **SEC. 6. COORDINATION OF RESEARCH AND DEVELOPMENT**
9 **OF ENERGY EFFICIENT TECHNOLOGIES FOR**
10 **INDUSTRY.**

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

14 (1) by striking “Industrial Technologies Pro-
15 gram” each place it appears and inserting “Ad-
16 vanced Manufacturing Office”; and

17 (2) in the matter preceding paragraph (1), by
18 striking “Office of Energy” and all that follows
19 through “Office of Science” and inserting “Depart-
20 ment of Energy”.

Chairwoman JOHNSON. Without objection, the bill is considered as read and open to amendments. I recognize the gentleman from Illinois, Mr. Casten, to briefly speak on his bill.

Mr. CASTEN. I have an amendment at the desk, Madam Chair.

Chairwoman JOHNSON. The clerk will read the amendment.

The CLERK. Amendment to H.R. 4230 offered by Mr. Casten.

Chairwoman JOHNSON. I ask unanimous consent to consider it as read, and we will recognize the gentleman for his explanation.

Mr. CASTEN. Thank you, Madam Chair. As we on this Committee have heard time and time again, climate change poses an existential threat to our health, our economy, our national security, and of course our environment. Spike in heat strokes, childhood asthma cases, and impending 10 percent loss in GDP, increasing political unrest as arable land turns arid and refugee crises loom. The climate crisis is here, and we must address it with all the urgency and complexity that it warrants.

We've begun this response with the lower-hanging fruit, those sectors of the economy and our society that are easy to decarbonize. So we have policies to incentivize power companies and utilities to move their generation away from fossil fuels and toward cleaner sources. We have plans in motion to encourage car companies to produce more efficient vehicles. We've talked about reforming the Federal Energy Regulatory Commission and requiring public corporations to disclose their climate-related risks.

But as meaningful and as important as all that is, we have to acknowledge that we cannot decarbonize the economy without also figuring out how to decarbonize hard-to-decarbonize sectors. We don't know how to make fertilizer without natural gas. We don't know how to make cement without coal. We don't know how to make silicon without coal. And I don't know how to build a solar panel without cement and silicon and steel. And I don't know how to feed seven billion people without natural gas.

The—sorry. The *Clean Industrial Technology Act* that is before us today takes a big step in that direction. The bill directs the Secretary of Energy to establish a Department of Energy-led cross-energy research program to reduce emissions from nonpower industrial sectors. This includes everything from research on lowering emissions from iron and steel production to finding alternative materials to buildings to reducing emissions from shipping, aviation, and other modes of long-distance transportation.

The bill also authorizes \$500 million in spending for demonstration projects to ensure that these technologies can be taken up by the private sector. These projects would aim to not only help the private sector implement cleaner technologies but also to provide certainty to these businesses that the transition can be made smoothly and profitably.

The bill also includes a technical assistance program allowing these private entities in the nonpower industrial sectors to seek assistance from the Department of Energy as they try to reduce their emissions.

Finally, the *Clean Industrial Technology Act* would create a Federal advisory committee comprised of industry, academic, labor, and Federal leaders to guide the industrial technology research program. With more people and perspectives with a seat at the

table, it is my hope that we cannot only ensure consistent progress toward meeting our goals but also develop roadmaps to get there more efficiently.

The transformation to greener manufacturing is not just critical to our planet but also for American competitiveness in the 21st century. We are seeing a kind of industrial revolution around the globe as more countries and companies turned their gaze to zero net emission goals. The demand for clean energy and green products worldwide is staggering, and we must set up the U.S. industrial sector to capitalize on this growth and regain its throne as the economic engine of the world.

This effort is not and should not be ideological. CITA has been endorsed by the Environmental Defense Fund and the United Steelworkers but also by the U.S. Chamber of Commerce. All of our Nations are recognizing that we must decarbonize our industrial sector for the good of the planet, our workers, and our businesses.

I was very proud to lead this effort alongside Chairwoman Johnson and Congressman McKinley, as well as Senators Whitehouse and Capito. I'd like to thank them all for their leadership and dedication and taking on this issue in a bipartisan and bicameral manner. I think it helps underscore just how essential this effort is.

I urge support of this amendment. I urge support of this amendment and the *Clean Industrial Technology Act*. Thank you, and I yield back.

Chairwoman JOHNSON. Thank you very much. Anyone else seeking time?

Mr. LUCAS. Madam Chair?

Chairwoman JOHNSON. Mr. Lucas.

Mr. LUCAS. Thank you, Chairwoman Johnson.

H.R. 4230, the *Clean Industrial Technology Act* or CITA aims to reduce the industrial sector emissions through the establishment of the DOE research development and demonstration program and a Federal advisory committee to guide its priorities. At the Subcommittee markup of this bill I expressed my concerns about authorizing a new program with little consultation with stakeholders. But, as I mentioned in my opening statement, I'm pleased to say that the manager's amendment addresses those concerns and makes bipartisan changes I believe clarify and vastly improve the bill.

In the past, I've also expressed concerns that the program established in this bill has the potential to duplicate existing research. Unfortunately, I think there are still parts of this legislation that might overlap with current programs. For instance, DOD (Department of Defense) programs like the Office of Fossil Energy, the Advanced Manufacturing Office, and the Building Technologies Office are all currently addressing different pieces of this legislation to improve efficiency and reduce emissions in power production and manufacturing. Before establishing something new, I believe we should attempt to leverage existing government resources by providing policy direction to those programs.

With that being said, I want to make it clear that I applaud my colleagues for coming to the table in good faith and making this best effort to address my concerns. Because of that, I'm going to recommend we move this bill out of Committee even when our dif-

ferences can't be fully resolved since bipartisan negotiations can be enough to get the final product to the finish line.

And with that, Madam Chair, I yield back the balance of my time.

Chairwoman JOHNSON. Thank you very much. Anyone else seeking time? Ms. Bonamici.

Ms. BONAMICI. Chairwoman Johnson, I move to strike the last word.

Chairwoman JOHNSON. The gentlelady is acknowledged.

Ms. BONAMICI. Thank you. I first want to thank the Chair and Ranking Member for holding this markup today on these important bills.

According to the Intergovernmental Panel on Climate Change, limiting warming to 1.5 degrees Celsius above preindustrial levels would require unprecedented rates of transformation in many areas, including in the energy and industrial sectors. It's notoriously difficult to decarbonize the industrial sector. Our efforts will require reducing the demand for energy by improving the efficiency of industry production and eliminating additional emissions from industrial processes.

I am pleased to be a cosponsor of the *Clean Industrial Technology Act*, which would direct the Secretary of Energy to establish a cross-agency research program to decarbonize non-power industrial sectors. This research will focus on the most challenging industrial production processes to decarbonize like cement, iron, and steel production, and opportunities to reduce emissions outside the power sector like shipping, aviation, and long-distance transportation.

A cross-agency coordinated Federal research and development program will substantially reduce industrial emissions, and this bill takes an important first step to accelerate the level of innovation necessary to achieve our decarbonization goals.

I want to thank Congressman Casten for his leadership on this bill. I urge my colleagues to support it, and I yield back the balance of my time.

Chairwoman JOHNSON. Thank you very much. Anyone else seeking time?

Seeing none, the Chair then will go to the amendments. We'll proceed with them in the order on the roster. The manager's amendment appears first, and we recognize the gentleman from Illinois to explain his amendment.

Mr. CASTEN. Thank you, Madam Chair. I just want to thank Mr. Lucas, I want to thank you and your staff. I really appreciate the work that you all put in to come up with a bipartisan—

Chairwoman JOHNSON. The clerk will report the amendment.

Mr. CASTEN. I apologize.

The CLERK. Amendment to H.R. 4230 offered by Mr. Casten.

[The amendment of Mr. Casten follows:]

AMENDMENT TO H.R. 4230
OFFERED BY Mr. Casten

Page 3, after line 21, insert the following new paragraph:

1 “(6) CRITICAL MATERIAL OR MINERAL.—The
2 term ‘critical material or mineral’ means a material
3 or mineral that serves an essential function in the
4 manufacturing of a product and has a high risk of
5 a supply disruption, such that a shortage of such a
6 material or mineral would have significant con-
7 sequences for United States economic or national se-
8 curity.”.

Page 4, lines 5 through 9, strike “industrial emissions reduction technology development program of research, development, demonstration, and commercial application to further the development and commercialization of innovative technologies that—” and insert “research, development, and demonstration program to further the development and commercial application of innovative industrial emissions reduction technologies that—”.

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Page 4, line 16, after "shall" insert ", to the maximum extent practicable".

Page 5, line 8, after "on" insert ", to the maximum extent practicable,".

Page 5, line 14, after "cement," insert "concrete,".

Page 7, strike line 13.

Page 7, line 14, strike "(B)" and insert "(A)".

Page 7, line 16, strike "(C)" and insert "(B)".

Page 8, line 6, strike "of the design of" and insert "to design".

Page 8, line 14, strike "and".

Page 8, line 18, strike the period and insert "; and".

Page 8, after line 18, insert the following new paragraph:

1 “(9) other research or technology areas identi-
2 fied in the Emissions Reduction Roadmap author-
3 ized in section 455.”.

Page 9, strike lines 12–16.

Page 9, line 17, strike "(5)" and insert "(4)".

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Strike page 9, line 21 through page 10, line 4 and
insert the following:

1 “(c) AUTHORIZATION OF APPROPRIATIONS.—There
2 are authorized to be appropriated to the Secretary to carry
3 out the demonstration projects authorized in subsection
4 (d)(3)—

5 “(1) \$20,000,000 for fiscal year 2020;

6 “(2) \$80,000,000 for fiscal year 2021;

7 “(3) \$100,000,000 for fiscal year 2022;

8 “(4) \$150,000,000 for fiscal year 2023; and

9 “(5) \$150,000,000 for fiscal year 2024.”.

Page 10, after line 4, insert the following:

10 “(f) COORDINATION.—The Secretary shall carry out
11 the activities authorized in this section in accordance with
12 section 203 of the Department of Energy Research and
13 Innovation Act (42 U.S.C. 18631).”.

Page 11, line 12, strike “14” and insert “15”.

Page 12, line 6, strike “and”.

Page 12, after line 6, insert the following:

14 “(F) not less than 1 representative of a
15 State government; and”.

Page 12, line 7, strike “(F)” and insert “(G)”.

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Page 13, line 1, after “sector” insert “or other Federal agencies”.

Page 13, line 20, strike “achieve the goals of the program in” and insert “set forth a plan for achieving the goals of the program established in section 454(b)(1), including for”.

Page 14, after line 4, insert the following new clause:

1 “(ii) leverage existing roadmaps rel-
2 evant to the program in section 454(b)(1)
3 and the focus areas in section 454(e);”.

Page 14, line 5, strike “(ii)” and insert “(iii)”.

Page 14, line 8, strike “(iii)” and insert “(iv)”.

Page 14, line 11, strike “(iv)” and insert “(v)”.

Page 15, strike lines 15 through 17 and insert the following:

4 “(C) a review of the management, tech-
5 nology screening, coordination, and industry
6 utility of the program;”.

Page 15, line 19, strike “research and development” and insert “research, development, and demonstration activities”.

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Page 16, strike lines 7 through 8.

Page 16, line 9, strike “(J)” and insert “(I)”.

Page 16, line 14, strike “(K)” and insert “(J)”.

Page 16, line 22, strike “, the Committee on Energy and Natural Resources of the Senate, and any other relevant Committee of Congress.” and insert “and the Committee on Energy and Natural Resources of the Senate.”.

Page 18, line 4, strike “and”.

Page 18, line 5, strike the period and insert “; and”.

Page 18, after line 5, insert the following new subparagraph:

1 “(H) a trade association or technical soci-
2 ety.”.

Page 18, line 15, strike “180 days” and insert “one year”.

Page 18, line 19, strike “in nonpower industrial sectors.” and insert “developed through the program established in section 454(b).”

Strike page 18, line 22 through page 19, line 2.

Page 19, line 3, strike “(2)” and insert “(1)”.

Page 19, line 7, strike “(3)” and insert “(2)”.

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Strike page 19, line 23 through page 20, line 2.



Chairwoman JOHNSON. I ask unanimous consent to dispense with the reading, and without objection, so ordered. The Chair now will recognize Mr. Casten for five minutes to explain the amendment.

Mr. CASTEN. Thank you, Madam Chair. The ill-informed rookie from Illinois still would like to thank Mr. Lucas and your staff for your help to work up this bipartisan compromise, and I encourage all to support. Thank you.

Chairwoman JOHNSON. Thank you. Is—are there further comments or recognitions sought for this amendment? Mr. Rooney.

Mr. ROONEY. Thank you, Madam Chairman. Thank you, Mr. Casten, for introducing this legislation and for the participation of my fellow Oklahoman, Ranking Member Lucas.

The manager's amendment makes several changes that provide clarity and direction in establishing a DOE research development and demonstration program. I want to thank my colleagues for working in such a bipartisan manner.

As amended, H.R. 4320, the *Clean Industrial Technology Act*, responsibly addresses a key contributor of carbon emissions. Currently, the U.S. industrial sector accounts for roughly 22 percent of our greenhouse emissions. At the same time, our Nation's economic security relies on the strength and international competitiveness of this sector. For instance, building materials like steel, aluminum, and cement, referred to previously, and the manufacturing processes which produce them are the backbone of many U.S. economic sectors that have no alternative or replacement.

In order to protect our industries and our environment, we must prioritize early stage and innovative R&D, and that's why I'm glad to see H.R. 4320 take this important step in establishing a cross-cutting program to develop and evaluate advanced technologies which can reduce emissions in the industrial sector.

As we put together priorities for this program, we must work with the relevant stakeholders to ensure that we are not forcing them to adopt processes that will undermine U.S. competitiveness. If our manufacturing jobs are sent overseas, in addition to the lost American jobs, we will end up with higher global emissions as well. I hope that the technologies developed through this program can be exported and adopted by other countries. This will ensure the continued United States' leadership in industry and ensure that the cleanest and safest technologies are deployed throughout the world.

This legislation is an important first step. The burden of reducing emissions should be a collective effort, and I am confident that the industrial sector can help pave the way. I yield back the balance of my time.

Chairwoman JOHNSON. Thank you very much. Any further discussion?

If there is no further discussion, the vote occurs on the amendment.

All those in favor, say aye.

Those opposed, say no.

The ayes have it, and the—have it, and the amendment is agreed to.

The next amendment on the roster is an amendment offered by Mr. Babin. He's recognized to offer his amendment.

Mr. BABIN. Yes, ma'am, Madam Chair. I have an amendment at the desk.

Chairwoman JOHNSON. The clerk will report the amendment.

The CLERK. Amendment No. 2, amendment to the Committee print of H.R. 4230—

[The amendment of Mr. Babin follows:]

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AMENDMENT TO
COMMITTEE PRINT OF H.R. 4230
OFFERED BY Mr. Babin

Page 5, line 8, insert "In carrying out the program, no focus area shall preclude the continued use of essential fossil fuels for power or limit the economic competitiveness of industry and manufacturing in the United States." before "The".

Page 5, line 8, insert ", to the maximum extent practicable" after "focus on".



Chairwoman JOHNSON. I ask unanimous consent to dispense with the reading, and without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. BABIN. Yes, ma'am. Thank you for holding this markup, Chairwoman Johnson. My amendment is simple. Fossil fuels are essential to the United States' manufacturing and industrial competitiveness. Over the past two decades Asia has accounted for 90 percent of all coal-fired capacity built worldwide, and the average plant is just 12 years old. They are growing, and they are using fossil fuels to do it. And you can be certain that they will not wait for us based on the promise of clean energy in the future.

I'm supportive of basic research, and I think that some of our fundamental science will lead to breakthroughs that can help reduce carbon emissions across the board in the industrial sector. The intent of this bill is to focus on those areas that produce commercial technologies, but as it stands right now, we cannot abandon our tried and true infrastructure that is dependent upon fossil fuels. Over 80 percent of the United States' energy consumption comes from natural gas, oil, and coal, the three sources that we commonly refer to as fossil fuels. Plus, I would remind you all that America has reduced our emissions by five percent since the early 2000s.

There is an estimated 1.7 trillion barrels of known oil reserves left on Earth. The United States is projected to double our export capacity of liquefied natural gas by the end of 2020. Leaving these two resources untapped is the equivalent of burying money underground and then forgetting the location. Factories, schools, and hospitals are dependent upon reliable power, and turning the switch off would be disastrous. Steel producers, cement kilns, recycling facilities have no other option than fossil fuels at the moment.

As I looked to my right and my left, there is not a single Member here who wouldn't have their district affected if we walked away from fossil energy. With this in mind, there is a middle ground to be found. Carbon capture, materials research, and high-performance computing are all areas where basic research can yield promising results in emissions reduction.

My point and the point of this amendment is this: Don't make fossil fuels the enemy. Emissions are the common enemy, and technology can help mitigate those even in the fossil fuel industry, as we have seen in a field hearing down in Texas just recently. My amendment will send the message that our industries and our manufacturers have nothing to worry about. We're not going to force you to abandon your lifeline of fossil energy. We're here to help, and we're on your side in the fight to reduce carbon emissions. The great State of Texas and many other energy-producing States' economies depend on having open markets free of repressive regulations to continue our amazing prosperity and job creation of late.

I emphasize the importance of this amendment. However, Madam Chair, I will at this time withdraw it and hope that in the future that we keep all of these ideas in mind. I yield back.

Chairwoman JOHNSON. Thank you very much. Any other requests for time?

Hearing none, the next amendment on the roster is an amendment offered by the gentleman from Texas, Mr. Weber. He's recognized to offer his amendment.

Mr. WEBER. Thank you, Madam Chairman. I have an amendment on the ill-informed rookie of Illinois' bill at the desk.

Chairwoman JOHNSON. The clerk will report the amendment.

The CLERK. Amendment No. 3, amendment to Committee print—

[The amendment of Mr. Weber follows:]

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**AMENDMENT TO
COMMITTEE PRINT OF H.R. 4230
OFFERED BY Mr. Weber**

Add at end the following:

1 SEC. 7. SENSE OF CONGRESS.

2 It is the sense of Congress that in order to reduce
3 industrial emissions and maintain the technological and
4 economic competitiveness of industry and manufacturing
5 in the United States, the Secretary must prioritize re-
6 search and development for all innovative energy tech-
7 nologies, including research to develop and improve the ef-
8 ficiency of fossil and nuclear power technologies.



Chairwoman JOHNSON. I ask unanimous consent to dispense with the reading, and without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. WEBER. Thank you, Madam Chair. This amendment would add a sense of Congress to this legislation that in order to reduce U.S. industrial emissions, all the while maintaining our economic competitiveness, we must prioritize research and development for, and I emphasize all innovative energy technologies.

As Ranking Member of the Energy Subcommittee, my amendment states something I feel cannot be stressed enough, that any realistic strategy for our clean energy future must include an all-of-the-above energy R&D approach or, in other words, leave no technology behind. H.R. 4230 or the *Clean Industrial—Industry Technology Act* looks to reduce emissions in the industrial sector through the commercialization of new technologies.

Let me be clear. While I support the overall mission of this bill, I am concerned about the execution. By not clarifying our intent to consider all, and again, I emphasize all clean energy options, we run the risk of stalling innovation in the very technologies we will continue to rely on for many years to come. If our industries and manufacturers want to keep up with the economic boon we are experiencing today while also pursuing new environmentally responsible energy practices, it is absolutely essential that we continue to consider not only renewable energy sources but also fossil energy technologies and advanced nuclear power.

We have already invested billions of dollars into our fossil energy infrastructure, and much of our economy is dependent on it. Why would we abandon our investment when it has proven to work? Instead, we must continue to focus on advanced technologies like cleaner natural gas and carbon capture and utilization technologies. Not only do these initiatives support the economically viable use of fossil fuels, but they also improve our efficiency, their efficiency, and reduce the impact on our environment.

Similarly, in the United States, nuclear power has been established as a clean, safe, and reliable energy source that is actually growing more affordable each and every day, each and every year. Today, we see that private companies are taking the leap in developing advanced reactors that can provide industrial power, clean industrial power. With continued Federal support for early stage R&D, these advanced technologies could deliver cheap, reliable, and emissions-free power around the globe.

The intention of my amendment is not combative. It is to remind Department of Energy and the entire Federal research and development enterprise that we will only find clean energy success with a long-term all-of-the-above approach. No technology should be overlooked, and no proven resource should be abandoned. I hope my message is clear and impactful to my colleagues, and especially the ill-informed rookie from Illinois, who I appreciate sponsoring the bill.

And with that, Madam Chair, I withdraw my amendment. Thank you, and I yield back.

Chairwoman JOHNSON. I thank the gentleman. Are there any other amendments?

A recording—reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 4230, as amended, to the House with the recommendation that the bill will be approved.

Those in favor of the motion will signify by saying aye.

Those opposed, no.

The ayes have it, and the bill is favorably reported.

Without objection, the motion to reconsider is laid on the table, and I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes to the bill. Without objection, so ordered.

The Members will have two subsequent calendar days in which to submit supplementary minority or additional views on the measure.

I want to thank both gentlemen from Texas. I know the history of our State, and I appreciate your participation.

