

INNOVATIVE MITIGATION PARTNERSHIPS FOR ASPHALT
 AND CONCRETE TECHNOLOGIES ACT

MAY 23, 2024.—Committed to the Committee of the Whole House on the State of
 the Union and ordered to be printed

Mr. LUCAS, from the Committee on Science, Space, and Technology,
 submitted the following

R E P O R T

[To accompany H.R. 7685]

The Committee on Science, Space, and Technology, to whom was referred the bill (H.R. 7685) to strengthen and enhance the competitiveness of American industry through the research and development of advanced technologies to improve the efficiency of cement, concrete, and asphalt production, 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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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 “Innovative Mitigation Partnerships for Asphalt and Concrete Technologies Act” or the “IMPACT Act”.

SEC. 2. ADVANCED CEMENT, CONCRETE, AND ASPHALT PRODUCTION RESEARCH PROGRAM.

(a) PROGRAM.—Part I of subtitle C of title V of the Infrastructure Investment and Jobs Act (Public Law 117–58) is amended by inserting after section 40522 the following new section:

“SEC. 40523. ADVANCED CEMENT, CONCRETE, AND ASPHALT PRODUCTION RESEARCH PROGRAM.

“(a) DEFINITIONS.—In this section:

“(1) ADVANCED PRODUCTION.—The term ‘advanced production’ means production of cement, concrete, or asphalt with one or more of the following improvements with respect to the production of commercially available cement, concrete, or asphalt:

“(A) Improved cost-effectiveness.

“(B) Improved quality, durability, engineering performance, and resilience.

“(C) Improved efficiency of resource consumption and material demand.

“(2) ALTERNATIVE FUELS.—The term ‘alternative fuels’ means any solid, liquid, or gaseous materials, or a combination thereof, used to replace or supplement any portion of fuels used in combustion or pyrolysis for low-emissions cement, concrete, or asphalt.

“(3) COMMERCIALLY AVAILABLE.—The term ‘commercially available’, with respect to cement, concrete, and asphalt, means that the cement, concrete, or asphalt is—

“(A) readily and widely available for purchase in the United States; and

“(B) produced using a production method of cement, concrete, or asphalt products, as applicable, that is widely in use.

“(4) ELIGIBLE ENTITY.—The term ‘eligible entity’ means any of the following:

“(A) An institution of higher education.

“(B) An appropriate State or Federal entity, including a federally funded research and development center of the Department.

“(C) A nonprofit research institution.

“(D) A private entity.

“(E) Any other relevant entity the Secretary determines appropriate.

“(F) A partnership or consortium of two or more entities described in subparagraphs (A) through (E).

“(5) ENGINEERING PERFORMANCE-BASED STANDARD.—The term ‘engineering performance-based standard’ means an existing engineering standard with respect to which the requirements applicable to such standard are stated in terms of required results, with criteria for verifying compliance rather than specific composition, design, or procedure.

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

“(7) LOW-EMISSIONS CEMENT, CONCRETE, AND ASPHALT.—The term ‘low-emissions cement, concrete, and asphalt’ means cement, concrete, asphalt binder, or asphalt mixture that reduces, to the maximum extent practicable, greenhouse gas or directly-related copollutant emissions to levels below commercially available cement, concrete, or asphalt.

“(8) RURAL AREA.—The term ‘rural area’ has the meaning given such term in section 343(a) of the Consolidated Farm and Rural Development Act (7 U.S.C. 1991(a)).

“(b) ESTABLISHMENT.—Not later than 180 days after the date of the enactment of this section, the Secretary shall establish a program of research, development, demonstration, and commercial application of advanced tools, technologies, and methods for advanced production and use of low-emissions cement, concrete, and asphalt in order to—

“(1) increase the technological and economic competitiveness of industry and production in the United States;

“(2) expand and increase the stability of supply chains through enhanced domestic production, nearshoring, and cooperation with allies;

“(3) achieve measurable greenhouse gas or directly related copollutant emissions reductions in the production processes for cement, concrete, and asphalt products; and

“(4) create quality domestic jobs.

“(c) REQUIREMENTS.—In carrying out the program under subsection (b), the Secretary shall—

“(1) coordinate with the programs and activities authorized under title VI of division Z of the Consolidated Appropriations Act, 2021 (relating to industrial and manufacturing technologies) and the amendments made by such title;

“(2) coordinate across all relevant program offices of the Department, including the Office of Science, the Advanced Research Projects Agency-Energy, the Office of Clean Energy Demonstrations, the Office of Energy Efficiency and Renewable Energy, the Office of Fossil Energy, the Office of Industrial Efficiency and Decarbonization, the Office of Manufacturing and Energy Supply Chains, and the Office of Nuclear Energy;

“(3) leverage, to the extent practicable, the research infrastructure of the Department, including scientific computing user facilities, x-ray light sources, neutron scattering facilities, and nanoscale science research centers; and

“(4) conduct research, development, demonstration, and commercial application of the advanced production of low-emissions cement, concrete, and asphalt that have the potential to increase domestic production and employment in both advanced and commercially available processes.

“(d) STRATEGIC PLAN.—

“(1) IN GENERAL.—Not later than 180 days after the establishment of the program under subsection (b), the Secretary shall develop a 5-year strategic plan identifying research, development, demonstration, and commercial application goals for such program. The Secretary shall submit such plan to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate.

“(2) CONTENTS.—The strategic plan under paragraph (1) shall—

“(A) identify programs at the Department related to the advanced production of low-emissions cement, concrete, and asphalt that support the research, development, demonstration, and commercial application activities described in this section, and the demonstration projects under subsection (f);

“(B) establish technological and programmatic goals to achieve the requirements specified in subsection (c); and

“(C) include timelines for the accomplishment of such goals developed under the plan.

“(3) UPDATES TO PLAN.—Not less than once every two years, the Secretary shall submit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate an updated version of the strategic plan under paragraph (1).

“(e) FOCUS AREAS.—In carrying out the program established in subsection (c), the Secretary shall focus on the following:

“(1) Carbon capture technologies for low-emissions cement, concrete, and asphalt production processes, which may include the following:

“(A) Oxycombustion and chemical looping technologies.

“(B) Precombustion technologies.

“(C) Post combustion technologies.

“(D) Direct carbon dioxide separation technologies.

“(2) Materials, technologies, inputs, and processes that—

“(A) produce fewer greenhouse gas or directly related copollutant emissions during production, use, and end use of cement, concrete, and asphalt;

or

“(B) provide quality, durability, resilience, engineering, or other performance metrics equal to or greater than commercially available products.

“(3) Medium- and high-temperature heat-generation technologies used for the advanced production of low-emissions cement, concrete, and asphalt which may include the following:

“(A) Alternative fuels.

“(B) Renewable heat-generation and storage technology.

“(C) Electrification of heating processes.

“(D) Other clean heat-generation technologies and sources.

“(4) Technologies and practices that increase the efficiency of energy use, natural resource consumption, or material demand, which may include the following:

“(A) Designing products that encourage reuse, refurbishment, remanufacturing, and recycling.

“(B) Minimizing waste, including waste heat, from low-emissions cement, concrete, and asphalt production processes, including through the reuse of waste as a resource in other industrial processes for mutual benefit.

“(C) Increasing the overall energy efficiency of low-emissions cement, concrete, and asphalt production processes, including through life cycle assessments.

“(5) Technologies and approaches to reduce greenhouse gas or directly related copollutant emissions from the advanced production of cement, concrete, and asphalt.

“(6) High-performance computing to develop advanced materials and production processes that may contribute to the focus areas described in paragraphs (1) through (5), including the following:

“(A) Modeling, simulation, and optimization of the design of cost-effective and energy-efficient products and processes.

“(B) The use of digital prototyping and additive production to enhance product design.

“(7) Advanced sensor technologies and methods to monitor and quantify the performance of low-emissions cement, concrete, and asphalt materials at scale and under a variety of conditions.

“(8) Technologies that can be retrofitted at cement, concrete, and asphalt plants that represent the most common facility types in the United States and in other countries, with consideration for field validation of such retrofits.

“(9) Best practices for data standardization and data sharing tools and technologies, in coordination with relevant Federal agencies.

“(10) Fundamental research in chemistry and materials science to identify the following:

“(A) Novel materials and alternative domestic feedstocks and processing operations for the advanced production of low-emissions cement, concrete, and asphalt.

“(B) Improved understanding by eligible entities of the mechanisms that determine the performance and durability of low-emissions cement, concrete, and asphalt over time.

“(f) DEMONSTRATIONS.—

“(1) ESTABLISHMENT.—Not later than 180 days after the date of the enactment of this section, the Secretary, in carrying out the program established in subsection (b), and in collaboration with the Secretary of Transportation, the Administrator of General Services, industry partners, institutions of higher education, and National Laboratories, shall support demonstrations of advanced production of low-emissions cement, concrete, and asphalt that uses either—

“(A) a single technology or practice; or

“(B) a combination of multiple technologies or practices.

“(2) SELECTION REQUIREMENTS.—In carrying out the demonstrations under paragraph (1), the Secretary shall select eligible entities to carry out demonstration projects and to the maximum extent practicable—

“(A) encourage regional diversity among eligible entities, including participation by entities located in rural areas;

“(B) encourage technological diversity among eligible entities; and

“(C) ensure that specific projects selected—

“(i) expand on the existing technology demonstration programs of the Department;

“(ii) are based on the extent of greenhouse gas emissions reductions achieved; and

“(iii) prioritize leveraging matching funds from non-Federal sources.

“(3) REPORTS.—The Secretary shall submit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate—

“(A) not less frequently than once every two years for the duration of the demonstrations under paragraph (1), a report describing the performance of such demonstration; and

“(B) if any such demonstration is terminated, an assessment of the success of, and education provided by, the measures carried out by such demonstration.

“(4) TERMINATION.—The Secretary may terminate the demonstratives under paragraph (1) if the Secretary determines that sufficient low-emissions cement, concrete, and asphalt produced through advanced production are commercially available domestically at a price comparable to the price of cement, concrete, and asphalt produced through traditional methods of production.

“(g) TECHNICAL ASSISTANCE PROGRAM.—

“(1) IN GENERAL.—The Secretary, in consultation with the Secretary of Transportation, the Secretary of Commerce (acting through the Director of the National Institute of Standards and Technology), the Administrator of General Services, the Administrator of the Environmental Protection Agency, and appropriate representatives of relevant standards development organizations, shall provide technical assistance to eligible entities to carry out an activity described

in paragraph (2) to promote the commercial application of technologies for the production and use of low-emissions cement, concrete, and asphalt.

“(2) ACTIVITIES DESCRIBED.—An activity referred to in paragraph (1) is any of the following:

“(A) Efforts related to collecting data that could be used in the updating of local codes, specifications, and standards to engineering performance-based standards.

“(B) A lifecycle assessment of the final product.

“(C) An environmental impact comparison between different cements, concretes, and asphalts.

“(D) A techno-economic assessment.

“(E) An environmental permitting or other regulatory process.

“(F) An evaluation or testing activity.

“(G) Any other activity that promotes the commercial application of technologies developed through the program under subsection (b).

“(3) APPLICATIONS.—The Secretary shall seek applications for technical assistance under this subsection—

“(A) on a competitive basis; and

“(B) on a periodic basis, but not less frequently than once every 12 months.

“(4) REGIONAL CENTERS.—The Secretary may designate or establish one or more regional centers to provide technical assistance to eligible entities to carry out the activity described in paragraph (2)(A).

“(h) ADDITIONAL COORDINATION.—

“(1) MANUFACTURING USA.—In carrying out this section the Secretary shall consider—

“(A) leveraging the resources of relevant existing Manufacturing USA Institutes described in section 34(d) of the National Institute of Standards and Technology Act (15 U.S.C. 278s(d));

“(B) integrating program activities into a relevant existing Manufacturing USA Institute; or

“(C) awarding financial assistance, consistent with section 34(e) of the National Institute of Standards and Technology Act (15 U.S.C. 278s(e)), to a person or group of persons to assist the person or group of persons in planning, establishing, or supporting a Manufacturing U.S.A. institute focused on advanced production of low-emissions cement, concrete, and asphalt.

“(2) OTHER FEDERAL AGENCIES.—In carrying out this section, the Secretary shall coordinate with other Federal agencies, including the Department of Defense, the Department of Transportation, and the National Institute of Standards and Technology, that are carrying out research and development initiatives to increase industrial competitiveness and achieve measurable greenhouse gas or directly related copollutant emissions reductions through the advanced production of cement, concrete, and asphalt.

“(i) SUNSET.—This section shall terminate seven years after the date of the enactment of this section.

“(j) RESEARCH SECURITY.—The activities authorized under this section shall be applied in a manner consistent with subtitle D of title VI of the Research and Development, Competition, and Innovation Act (enacted as division B of Public Law 117–167 (42 U.S.C. 19231 et seq.)).

“(k) RULE OF CONSTRUCTION.—Nothing in this section may be construed to amend, alter, or affect the authorities of the Secretary to define, establish, or enforce new environmental industry standards for, or related to, cement, concrete, or asphalt.”

(b) CLERICAL AMENDMENT.—The table of contents in section 1(b) of the Infrastructure Investment and Jobs Act is amended by inserting after the item relating to section 40522 the following new item:

“Sec. 40523. Advanced cement, concrete, and asphalt production research program.”.

PURPOSE AND SUMMARY

H.R. 7685 directs the Department of Energy (DOE) to establish a program of research, development, demonstration, and commercial application of advanced tools, technologies, and methods for advanced production and use of low-emissions cement, concrete, and asphalt. In carrying out this program, the Secretary is directed to focus on a range of key technology areas, including heat generation,

carbon capture, resource efficiency, and high-performance computing, and to leverage the research infrastructure of the Department, as practicable. It also authorizes DOE to provide technical assistance to eligible entities in order to utilize the unique technical expertise of DOE in increasing the efficiency of current production processes.

BACKGROUND AND NEED FOR LEGISLATION

The Innovative Mitigation Partnerships for Asphalt and Concrete Technologies (IMPACT) Act, aims to strengthen and enhance the competitiveness of American manufacturing through the research and development of advanced technologies to improve the efficiency of cement, concrete, and asphalt production. This legislation complements and builds on previous efforts led by the Science Committee to increase the competitiveness of U.S. industries while achieving significant reductions in emissions from manufacturing processes.

While recent emphasis has been placed on reducing power sector greenhouse gas (GHG) emissions, the ability to substantially reduce GHGs in the industrial sector remains a challenge. Cement, concrete, and asphalt production practices are of particular importance to the industrial sector and play a fundamental role in supporting U.S. infrastructure, national defense, and economic security. Yet these production processes are one of largest manufacturing related sources of carbon dioxide. Globally, cement facilities account for 8% of anthropogenic carbon dioxide emissions. Simultaneously, projected demand for cement is expected to increase 12% by 2050.

To address this pressing challenge, there is a need for federal investment in next-generation cement, concrete, and asphalt emission reduction technologies. The U.S. Department of Energy supports the research and development of industrial emission reduction technologies primarily through its Office of Energy Efficiency and Renewable Energy and its Advanced Manufacturing Office. H.R. 7685 directs the Secretary to carry out activities in coordination with relevant programs of DOE, other federal agencies including NIST's Manufacturing USA Institutes, and with relevant programs and activities authorized in the Energy Act of 2020.

LEGISLATIVE HISTORY

H.R. 7685 was introduced on March 15, 2024, by Representative Max Miller (R-OH) and is cosponsored by Representative Valerie Foushee (D-NC).

SECTION-BY-SECTION

Section 1. Short title

The short title of this legislation is “Innovative Mitigation Partnerships for Asphalt and Concrete Technologies Act” or the “IMPACT Act.”

Section 2. Advanced cement, concrete, and asphalt production research program

This section amends the Infrastructure Investment and Jobs Act by inserting a new Section 40525 establishing an advanced cement, concrete, and asphalt production research program at the Department of Energy.

Subsection (a) provides definitions related to advanced production, alternative fuels, commercially available, eligible entities, engineering performance-based standard, institutions of higher education, low-emissions cement, concrete, and asphalt, and rural areas.

Subsection (b) directs the Secretary of Energy, within 180 days, to establish a program of research, development, demonstration, and commercial application of advanced tools, technologies, and methods for advanced production and use of low-emissions cement, concrete, and asphalt.

Subsection (c) ensures the program is carried out in coordination with all programs and activities related to industrial and manufacturing technologies authorized in the Energy Act of 2020, and all relevant program offices of the Department of Energy. This subsection also directs the program to leverage the existing research infrastructure of DOE.

Subsection (d) directs the Secretary to develop a 5-year strategic plan identifying research, development, demonstration, and commercial application goals for the program.

Subsection (e) provides focus areas of the program, including heat generation, carbon capture, resource efficiency, and high-performance computing.

Subsection (f) directs the Secretary, in collaboration with the Secretary of Transportation, the Administrator of General Services, industry partners, institutions of higher education, and National Laboratories, to support demonstrations of advanced production of low-emissions cement, concrete, and asphalt. This subsection ensures regional and technological diversity among demonstration projects.

Subsection (g) establishes a technical assistance program for eligible entities seeking to promote the commercial application of technologies for the production and use of low-emissions cement, concrete, and asphalt. This program is to be carried out by DOE in consultation with the Secretary of Transportation, the Director of the National Institute of Standards and Technology, the Administrator of General Services, and the Administrator of the Environmental Protection Agency.

Subsection (h) ensures the activities authorized by this bill leverage the resources of existing Manufacturing USA Institutes of NIST, integrate activities into existing Manufacturing USA Institutes, and assist in planning, establishing, or supporting a Manufacturing USA Institute focused on advanced production of low-emissions cement, concrete, and asphalt.

Subsection (i) requires the program to terminate seven years after the date of enactment unless reauthorized.

Subsection (j) requires all authorized activities under this bill be conducted in compliance with research security provisions established by the CHIPS and Science Act.

Subsection (k) clarifies that nothing in this bill amends, alters, or affects the authorities of the Secretary to define, establish, or enforce new environmental industry standards for, or related to, cement, concrete, or asphalt.

RELATED COMMITTEE HEARINGS

Pursuant to clause 3(c)(6) of rule XIII, the following hearing was used to develop or consider H.R. 7685.

On September 14, 2023, the Full Committee held a hearing entitled *An Update on the Department of Energy's Science and Technology Priorities*. Members and the witness discussed DOE's goals and priorities for its civilian research, development, demonstration, and commercial application programs.

Witness:

- The Honorable Jennifer Granholm, Secretary of Energy, U.S. Department of Energy

COMMITTEE CONSIDERATION

On March 20, 2024, the Committee on Science, Space, and Technology met in open session to consider H.R. 7685.

Rep. Miller offered a Manager's Amendment, which made minor technical and conforming changes to the text of the bill. The amendment was adopted by voice vote.

Rep. Sorensen offered an amendment to add further sections to align the bill with a similar Senate version of the bill. The amendment was withdrawn without consideration.

Chairman Lucas moved that the Committee favorably report the bill, H.R. 7685, as amended, to the House of Representatives with the recommendation that the bill be approved. The motion was agreed to by a recorded vote of 38 yeas and 0 nays, a quorum being present.

ROLL CALL VOTES

Clause 3(b) of rule XIII requires the Committee to list the record votes on the motion to report legislation and amendments thereto. The following reflects the record votes taken during the Committee consideration:

House Committee on Science, Space, and Technology
 118th Congress
 Full Committee Markup

Bill # HR 7685
 Motion to report HR 7685 to the House, as amended

Majority	Aye	No	Present
Frank Lucas, Oklahoma	1		
Bill Posey, Florida	1		
Randy Weber, Texas	1		
Brian Babin, Texas	1		
Jim Baird, Indiana	1		
Daniel Webster, Florida	1		
Mike Garcia, California	1		
Stephanie Bice, Oklahoma	1		
Jay Obernolte, California	1		
Chuck Fleischmann, Tennessee	1		
Darrell Issa, California			
Rick Crawford, Arkansas	1		
Claudia Tenney, New York	1		
Ryan Zinke, Montana	1		
Scott Franklin, Florida	1		
Dale Strong, Alabama	1		
Max Miller, Ohio	1		
Rich McCormick, Georgia	1		
Mike Collins, Georgia	1		
Brandon Williams, New York	1		
Tom Kean, New Jersey	1		
Minority	Aye	No	Present
Zoe Lofgren, California	1		
Suzanne Bonamici, Oregon	1		
Haley Stevens, Michigan	1		
Jamaal Bowman, New York	1		
Deborah Ross, New Carolina	1		
Eric Sorensen, Illinois	1		
Andrea Salinas, Oregon	1		
Val Foushee, North Carolina	1		
Kevin Mullin, California	1		
Jeff Jackson, North Carolina	1		
Emilia Sykes, Ohio	1		
Maxwell Frost, Florida	1		
Yadira Caraveo, Colorado	1		
Summer Lee, Pennsylvania	1		
Jennifer McClellan, Virginia	1		
Gabe Amo, Rhode Island	1		
Sean Casten, Illinois	1		
Paul Tonko	1		
Total	38	0	

Date: 3/20/24

Result?	Agreed To: [X]		
	Not Agreed To: []		
	Withdrawn: []		
<i>Voice Vote</i>	<i>Ayes</i>	<i>Nays</i>	<i>Present</i>
	38	0	

APPLICATION OF LAW TO THE LEGISLATIVE BRANCH

The Committee finds that H.R. 7685 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).

STATEMENT OF OVERSIGHT FINDINGS AND RECOMMENDATIONS
OF THE COMMITTEE

In compliance with clause 3(c)(1) of rule XIII and clause (2)(b)(1) of rule X, the Committee's oversight findings and recommendations are reflected in the descriptive portions of this report.

STATEMENT OF GENERAL PERFORMANCE GOALS AND OBJECTIVES

Pursuant to clause (3)(c)(4) of rule XIII, the goal of H.R. 7685 is to strengthen and enhance the competitiveness of American industry through the research and development of advanced technologies to improve the efficiency of cement, concrete, and asphalt production.

DUPLICATION OF FEDERAL PROGRAMS

Pursuant to clause 3(c)(5) of rule XIII, the Committee finds that no provision of H.R. 7685 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 identified in the most recent Catalog of Federal Domestic Assistance.

FEDERAL ADVISORY COMMITTEE ACT

The Committee finds that the legislation does not establish or authorize the establishment of an advisory committee within the definition of section 5(b) of the Federal Advisory Committee Act.

UNFUNDED MANDATE STATEMENT

The Committee adopts as its own the estimate of Federal mandates prepared by the Director of the Congressional Budget Office pursuant to section 423 of the Unfunded Mandates Reform Act.

EARMARK IDENTIFICATION

Pursuant to clauses 9(e), 9(f), and 9(g) of rule XXI, the Committee finds that H.R. 7685 does not include any congressional earmarks, limited tax benefits, or limited tariff benefits.

COMMITTEE COST ESTIMATE

Pursuant to clause 3(d)(1) of rule XIII, the Committee adopts as its own the cost estimate prepared by the Director of the Congressional Budget Office pursuant to section 402 of the Congressional Budget Act of 1974. At the time this report was filed, the estimate was not yet available.

NEW BUDGET AUTHORITY, ENTITLEMENT AUTHORITY,
AND TAX EXPENDITURES

Pursuant to clause 3(c)(2) of rule XIII, the Committee finds that H.R. 7685 would result in no new or increased budget authority, entitlement authority, or tax expenditures or revenues.

CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

Pursuant to clause 3(c)(3) of rule XIII, at the time this report was filed, the cost estimate prepared by the Director of the Congressional Budget Office pursuant to section 402 of the Congressional Budget Act of 1974 was not available.

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 (new matter is printed in italics and existing law in which no change is proposed is shown in roman):

INFRASTRUCTURE INVESTMENT AND JOBS ACT

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) **SHORT TITLE.**—This Act may be cited as the “Infrastructure Investment and Jobs Act”.

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

Sec. 1. Short title; table of contents.

* * * * *

DIVISION D—ENERGY

* * * * *

TITLE V—ENERGY EFFICIENCY AND BUILDING INFRASTRUCTURE

* * * * *

Subtitle C—Industrial Energy Efficiency

PART I—INDUSTRY

Sec. 40521. Future of industry program and industrial research and assessment centers.

Sec. 40522. Sustainable manufacturing initiative.

Sec. 40523. *Advanced cement, concrete, and asphalt production research program.*

* * * * *

DIVISION D—ENERGY

* * * * *

**TITLE V—ENERGY EFFICIENCY AND
BUILDING INFRASTRUCTURE**

* * * * *

Subtitle C—Industrial Energy Efficiency

PART I—INDUSTRY

* * * * *

SEC. 40523. ADVANCED CEMENT, CONCRETE, AND ASPHALT PRODUCTION RESEARCH PROGRAM.

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

(1) **ADVANCED PRODUCTION.**—*The term “advanced production” means production of cement, concrete, or asphalt with one or more of the following improvements with respect to the production of commercially available cement, concrete, or asphalt:*

(A) *Improved cost-effectiveness.*

(B) *Improved quality, durability, engineering performance, and resilience.*

(C) *Improved efficiency of resource consumption and material demand.*

(2) **ALTERNATIVE FUELS.**—*The term “alternative fuels” means any solid, liquid, or gaseous materials, or a combination thereof, used to replace or supplement any portion of fuels used in combustion or pyrolysis for low-emissions cement, concrete, or asphalt.*

(3) **COMMERCIALLY AVAILABLE.**—*The term “commercially available”, with respect to cement, concrete, and asphalt, means that the cement, concrete, or asphalt is—*

(A) *readily and widely available for purchase in the United States; and*

(B) *produced using a production method of cement, concrete, or asphalt products, as applicable, that is widely in use.*

(4) **ELIGIBLE ENTITY.**—*The term “eligible entity” means any of the following:*

(A) *An institution of higher education.*

(B) *An appropriate State or Federal entity, including a federally funded research and development center of the Department.*

(C) *A nonprofit research institution.*

(D) *A private entity.*

(E) *Any other relevant entity the Secretary determines appropriate.*

(F) *A partnership or consortium of two or more entities described in subparagraphs (A) through (E).*

(5) **ENGINEERING PERFORMANCE-BASED STANDARD.**—*The term “engineering performance-based standard” means an existing engineering standard with respect to which the requirements applicable to such standard are stated in terms of required results, with criteria for verifying compliance rather than specific composition, design, or procedure.*

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

(7) **LOW-EMISSIONS CEMENT, CONCRETE, AND ASPHALT.**—*The term “low-emissions cement, concrete, and asphalt” means ce-*

ment, concrete, asphalt binder, or asphalt mixture that reduces, to the maximum extent practicable, greenhouse gas or directly-related copollutant emissions to levels below commercially available cement, concrete, or asphalt.

(8) *RURAL AREA.*—The term “rural area” has the meaning given such term in section 343(a) of the Consolidated Farm and Rural Development Act (7 U.S.C. 1991(a)).

(b) *ESTABLISHMENT.*—Not later than 180 days after the date of the enactment of this section, the Secretary shall establish a program of research, development, demonstration, and commercial application of advanced tools, technologies, and methods for advanced production and use of low-emissions cement, concrete, and asphalt in order to—

(1) increase the technological and economic competitiveness of industry and production in the United States;

(2) expand and increase the stability of supply chains through enhanced domestic production, nearshoring, and cooperation with allies;

(3) achieve measurable greenhouse gas or directly related copollutant emissions reductions in the production processes for cement, concrete, and asphalt products; and

(4) create quality domestic jobs.

(c) *REQUIREMENTS.*—In carrying out the program under subsection (b), the Secretary shall—

(1) coordinate with the programs and activities authorized under title VI of division Z of the Consolidated Appropriations Act, 2021 (relating to industrial and manufacturing technologies) and the amendments made by such title;

(2) coordinate across all relevant program offices of the Department, including the Office of Science, the Advanced Research Projects Agency-Energy, the Office of Clean Energy Demonstrations, the Office of Energy Efficiency and Renewable Energy, the Office of Fossil Energy, the Office of Industrial Efficiency and Decarbonization, the Office of Manufacturing and Energy Supply Chains, and the Office of Nuclear Energy;

(3) leverage, to the extent practicable, the research infrastructure of the Department, including scientific computing user facilities, x-ray light sources, neutron scattering facilities, and nanoscale science research centers; and

(4) conduct research, development, demonstration, and commercial application of the advanced production of low-emissions cement, concrete, and asphalt that have the potential to increase domestic production and employment in both advanced and commercially available processes.

(d) *STRATEGIC PLAN.*—

(1) *IN GENERAL.*—Not later than 180 days after the establishment of the program under subsection (b), the Secretary shall develop a 5-year strategic plan identifying research, development, demonstration, and commercial application goals for such program. The Secretary shall submit such plan to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate.

(2) *CONTENTS.*—The strategic plan under paragraph (1) shall—

- (A) identify programs at the Department related to the advanced production of low-emissions cement, concrete, and asphalt that support the research, development, demonstration, and commercial application activities described in this section, and the demonstration projects under subsection (f);
- (B) establish technological and programmatic goals to achieve the requirements specified in subsection (c); and
- (C) include timelines for the accomplishment of such goals developed under the plan.
- (3) *UPDATES TO PLAN.*—Not less than once every two years, the Secretary shall submit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate an updated version of the strategic plan under paragraph (1).
- (e) *FOCUS AREAS.*—In carrying out the program established in subsection (c), the Secretary shall focus on the following:
- (1) Carbon capture technologies for low-emissions cement, concrete, and asphalt production processes, which may include the following:
 - (A) Oxycombustion and chemical looping technologies.
 - (B) Precombustion technologies.
 - (C) Post combustion technologies.
 - (D) Direct carbon dioxide separation technologies.
 - (2) Materials, technologies, inputs, and processes that—
 - (A) produce fewer greenhouse gas or directly related copollutant emissions during production, use, and end use of cement, concrete, and asphalt; or
 - (B) provide quality, durability, resilience, engineering, or other performance metrics equal to or greater than commercially available products.
 - (3) Medium- and high-temperature heat-generation technologies used for the advanced production of low-emissions cement, concrete, and asphalt which may include the following:
 - (A) Alternative fuels.
 - (B) Renewable heat-generation and storage technology.
 - (C) Electrification of heating processes.
 - (D) Other clean heat-generation technologies and sources.
 - (4) Technologies and practices that increase the efficiency of energy use, natural resource consumption, or material demand, which may include the following:
 - (A) Designing products that encourage reuse, refurbishment, remanufacturing, and recycling.
 - (B) Minimizing waste, including waste heat, from low-emissions cement, concrete, and asphalt production processes, including through the reuse of waste as a resource in other industrial processes for mutual benefit.
 - (C) Increasing the overall energy efficiency of low-emissions cement, concrete, and asphalt production processes, including through life cycle assessments.
 - (5) Technologies and approaches to reduce greenhouse gas or directly related copollutant emissions from the advanced production of cement, concrete, and asphalt.
 - (6) High-performance computing to develop advanced materials and production processes that may contribute to the focus

areas described in paragraphs (1) through (5), including the following:

- (A) Modeling, simulation, and optimization of the design of cost-effective and energy-efficient products and processes.
- (B) The use of digital prototyping and additive production to enhance product design.
- (7) Advanced sensor technologies and methods to monitor and quantify the performance of low-emissions cement, concrete, and asphalt materials at scale and under a variety of conditions.
- (8) Technologies that can be retrofitted at cement, concrete, and asphalt plants that represent the most common facility types in the United States and in other countries, with consideration for field validation of such retrofits.
- (9) Best practices for data standardization and data sharing tools and technologies, in coordination with relevant Federal agencies.
- (10) Fundamental research in chemistry and materials science to identify the following:
 - (A) Novel materials and alternative domestic feedstocks and processing operations for the advanced production of low-emissions cement, concrete, and asphalt.
 - (B) Improved understanding by eligible entities of the mechanisms that determine the performance and durability of low-emissions cement, concrete, and asphalt over time.

(f) DEMONSTRATIONS.—

(1) ESTABLISHMENT.—Not later than 180 days after the date of the enactment of this section, the Secretary, in carrying out the program established in subsection (b), and in collaboration with the Secretary of Transportation, the Administrator of General Services, industry partners, institutions of higher education, and National Laboratories, shall support demonstrations of advanced production of low-emissions cement, concrete, and asphalt that uses either—

- (A) a single technology or practice; or
- (B) a combination of multiple technologies or practices.

(2) SELECTION REQUIREMENTS.—In carrying out the demonstrations under paragraph (1), the Secretary shall select eligible entities to carry out demonstration projects and to the maximum extent practicable—

- (A) encourage regional diversity among eligible entities, including participation by entities located in rural areas;
- (B) encourage technological diversity among eligible entities; and

(C) ensure that specific projects selected—

- (i) expand on the existing technology demonstration programs of the Department;
- (ii) are based on the extent of greenhouse gas emissions reductions achieved; and
- (iii) prioritize leveraging matching funds from non-Federal sources.

(3) REPORTS.—The Secretary shall submit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate—

(A) not less frequently than once every two years for the duration of the demonstrations under paragraph (1), a report describing the performance of such demonstration; and
 (B) if any such demonstration is terminated, an assessment of the success of, and education provided by, the measures carried out by such demonstration.

(4) *TERMINATION.*—The Secretary may terminate the demonstratives under paragraph (1) if the Secretary determines that sufficient low-emissions cement, concrete, and asphalt produced through advanced production are commercially available domestically at a price comparable to the price of cement, concrete, and asphalt produced through traditional methods of production.

(g) *TECHNICAL ASSISTANCE PROGRAM.*—

(1) *IN GENERAL.*—The Secretary, in consultation with the Secretary of Transportation, the Secretary of Commerce (acting through the Director of the National Institute of Standards and Technology), the Administrator of General Services, the Administrator of the Environmental Protection Agency, and appropriate representatives of relevant standards development organizations, shall provide technical assistance to eligible entities to carry out an activity described in paragraph (2) to promote the commercial application of technologies for the production and use of low-emissions cement, concrete, and asphalt.

(2) *ACTIVITIES DESCRIBED.*—An activity referred to in paragraph (1) is any of the following:

(A) Efforts related to collecting data that could be used in the updating of local codes, specifications, and standards to engineering performance-based standards.

(B) A lifecycle assessment of the final product.

(C) An environmental impact comparison between different cements, concretes, and asphalts.

(D) A techno-economic assessment.

(E) An environmental permitting or other regulatory process.

(F) An evaluation or testing activity.

(G) Any other activity that promotes the commercial application of technologies developed through the program under subsection (b).

(3) *APPLICATIONS.*—The Secretary shall seek applications for technical assistance under this subsection—

(A) on a competitive basis; and

(B) on a periodic basis, but not less frequently than once every 12 months.

(4) *REGIONAL CENTERS.*—The Secretary may designate or establish one or more regional centers to provide technical assistance to eligible entities to carry out the activity described in paragraph (2)(A).

(h) *ADDITIONAL COORDINATION.*—

(1) *MANUFACTURING USA.*—In carrying out this section the Secretary shall consider—

(A) leveraging the resources of relevant existing Manufacturing USA Institutes described in section 34(d) of the National Institute of Standards and Technology Act (15 U.S.C. 278s(d));

(B) integrating program activities into a relevant existing Manufacturing USA Institute; or

(C) awarding financial assistance, consistent with section 34(e) of the National Institute of Standards and Technology Act (15 U.S.C. 278s(e)), to a person or group of persons to assist the person or group of persons in planning, establishing, or supporting a Manufacturing U.S.A. institute focused on advanced production of low-emissions cement, concrete, and asphalt.

(2) OTHER FEDERAL AGENCIES.—In carrying out this section, the Secretary shall coordinate with other Federal agencies, including the Department of Defense, the Department of Transportation, and the National Institute of Standards and Technology, that are carrying out research and development initiatives to increase industrial competitiveness and achieve measurable greenhouse gas or directly related copollutant emissions reductions through the advanced production of cement, concrete, and asphalt.

(i) SUNSET.—This section shall terminate seven years after the date of the enactment of this section.

(j) RESEARCH SECURITY.—The activities authorized under this section shall be applied in a manner consistent with subtitle D of title VI of the Research and Development, Competition, and Innovation Act (enacted as division B of Public Law 117–167 (42 U.S.C. 19231 et seq.)).

(k) RULE OF CONSTRUCTION.—Nothing in this section may be construed to amend, alter, or affect the authorities of the Secretary to define, establish, or enforce new environmental industry standards for, or related to, cement, concrete, or asphalt.

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