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2D SESSION

# H. R. 7685

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IN THE SENATE OF THE UNITED STATES

SEPTEMBER 24, 2024

Received; read twice and referred to the Committee on Energy and Natural  
Resources

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## AN ACT

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.

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

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “Innovative Mitigation  
3 Partnerships for Asphalt and Concrete Technologies Act”  
4 or the “IMPACT Act”.

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

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

11 **“SEC. 40523. ADVANCED CEMENT, CONCRETE, AND AS-**  
12 **PHALT PRODUCTION RESEARCH PROGRAM.**

13 “(a) DEFINITIONS.—In this section:

14 “(1) ADVANCED PRODUCTION.—The term ‘ad-  
15 vanced production’ means production of cement,  
16 concrete, or asphalt with one or more of the fol-  
17 lowing improvements with respect to the production  
18 of commercially available cement, concrete, or as-  
19 phalt:

20 “(A) Improved cost-effectiveness.

21 “(B) Improved quality, durability, engi-  
22 neering performance, and resilience.

23 “(C) Improved efficiency of resource con-  
24 sumption and material demand.

25 “(2) ALTERNATIVE FUELS.—The term ‘alter-  
26 native fuels’ means any solid, liquid, or gaseous ma-

1 materials, or a combination thereof, used to replace or  
2 supplement any portion of fuels used in combustion  
3 or pyrolysis for low-emissions cement, concrete, or  
4 asphalt.

5 “(3) **COMMERCIALLY AVAILABLE.**—The term  
6 ‘commercially available’, with respect to cement, con-  
7 crete, and asphalt, means that the cement, concrete,  
8 or asphalt is—

9 “(A) readily and widely available for pur-  
10 chase in the United States; and

11 “(B) produced using a production method  
12 of cement, concrete, or asphalt products, as ap-  
13 plicable, that is widely in use.

14 “(4) **ELIGIBLE ENTITY.**—The term ‘eligible en-  
15 tity’ means any of the following:

16 “(A) An institution of higher education.

17 “(B) An appropriate State or Federal enti-  
18 ty, including a federally funded research and  
19 development center of the Department.

20 “(C) A nonprofit research institution.

21 “(D) A private entity.

22 “(E) Any other relevant entity the Sec-  
23 retary determines appropriate.

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

4           “(5) ENGINEERING PERFORMANCE-BASED  
5           STANDARD.—The term ‘engineering performance-  
6           based standard’ means an existing engineering  
7           standard with respect to which the requirements ap-  
8           plicable to such standard are stated in terms of re-  
9           quired results, with criteria for verifying compliance  
10          rather than specific composition, design, or proce-  
11          dure.

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

16          “(7) LOW-EMISSIONS CEMENT, CONCRETE, AND  
17          ASPHALT.—The term ‘low-emissions cement, con-  
18          crete, and asphalt’ means cement, concrete, asphalt  
19          binder, or asphalt mixture that reduces, to the max-  
20          imum extent practicable, greenhouse gas or directly-  
21          related copollutant emissions to levels below commer-  
22          cially available cement, concrete, or asphalt.

23          “(8) RURAL AREA.—The term ‘rural area’ has  
24          the meaning given such term in section 343(a) of

1 the Consolidated Farm and Rural Development Act  
2 (7 U.S.C. 1991(a)).

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

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

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

16 “(3) achieve measurable greenhouse gas or di-  
17 rectly related copollutant emissions reductions in the  
18 production processes for cement, concrete, and as-  
19 phalt products; and

20 “(4) create quality domestic jobs.

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

23 “(1) coordinate with the programs and activi-  
24 ties authorized under title VI of division Z of the  
25 Consolidated Appropriations Act, 2021 (relating to

1 industrial and manufacturing technologies) and the  
2 amendments made by such title;

3 “(2) coordinate across all relevant program of-  
4 fices of the Department, including the Office of  
5 Science, the Advanced Research Projects Agency-  
6 Energy, the Office of Clean Energy Demonstrations,  
7 the Office of Energy Efficiency and Renewable En-  
8 ergy, the Office of Fossil Energy, the Office of In-  
9 dustrial Efficiency and Decarbonization, the Office  
10 of Manufacturing and Energy Supply Chains, and  
11 the Office of Nuclear Energy;

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

17 “(4) conduct research, development, demonstra-  
18 tion, and commercial application of the advanced  
19 production of low-emissions cement, concrete, and  
20 asphalt that have the potential to increase domestic  
21 production and employment in both advanced and  
22 commercially available processes.

23 “(d) STRATEGIC PLAN.—

24 “(1) IN GENERAL.—Not later than 180 days  
25 after the establishment of the program under sub-

1 section (b), the Secretary shall develop a 5-year stra-  
2 tegic plan identifying research, development, dem-  
3 onstration, and commercial application goals for  
4 such program. The Secretary shall submit such plan  
5 to the Committee on Science, Space, and Technology  
6 of the House of Representatives and the Committee  
7 on Energy and Natural Resources of the Senate.

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

10 “(A) identify programs at the Department  
11 related to the advanced production of low-emis-  
12 sions cement, concrete, and asphalt that sup-  
13 port the research, development, demonstration,  
14 and commercial application activities described  
15 in this section, and the demonstration projects  
16 under subsection (f);

17 “(B) establish technological and pro-  
18 grammatic goals to achieve the requirements  
19 specified in subsection (e); and

20 “(C) include timelines for the accomplish-  
21 ment of such goals developed under the plan.

22 “(3) UPDATES TO PLAN.—Not less than once  
23 every two years, the Secretary shall submit to the  
24 Committee on Science, Space, and Technology of the  
25 House of Representatives and the Committee on En-

1 energy and Natural Resources of the Senate an up-  
2 dated version of the strategic plan under paragraph  
3 (1).

4 “(e) FOCUS AREAS.—In carrying out the program es-  
5 tablished in subsection (c), the Secretary shall focus on  
6 the following:

7 “(1) Carbon capture technologies for low-emis-  
8 sions cement, concrete, and asphalt production proc-  
9 esses, which may include the following:

10 “(A) Oxycombustion and chemical looping  
11 technologies.

12 “(B) Precombustion technologies.

13 “(C) Post combustion technologies.

14 “(D) Direct carbon dioxide separation  
15 technologies.

16 “(2) Materials, technologies, inputs, and proc-  
17 esses that—

18 “(A) produce fewer greenhouse gas or di-  
19 rectly related copollutant emissions during pro-  
20 duction, use, and end use of cement, concrete,  
21 and asphalt; or

22 “(B) provide quality, durability, resilience,  
23 engineering, or other performance metrics equal  
24 to or greater than commercially available prod-  
25 ucts.



1           “(3) Medium- and high-temperature heat-gen-  
2           eration technologies used for the advanced produc-  
3           tion of low-emissions cement, concrete, and asphalt  
4           which may include the following:

5                   “(A) Alternative fuels.

6                   “(B) Renewable heat-generation and stor-  
7                   age technology.

8                   “(C) Electrification of heating processes.

9                   “(D) Other clean heat-generation tech-  
10                  nologies and sources.

11           “(4) Technologies and practices that increase  
12           the efficiency of energy use, natural resource con-  
13           sumption, or material demand, which may include  
14           the following:

15                   “(A) Designing products that encourage  
16                   reuse, refurbishment, remanufacturing, and re-  
17                   cycling.

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

23                   “(C) Increasing the overall energy effi-  
24                   ciency of low-emissions cement, concrete, and

1 asphalt production processes, including through  
2 life cycle assessments.

3 “(5) Technologies and approaches to reduce  
4 greenhouse gas or directly related copollutant emis-  
5 sions from the advanced production of cement, con-  
6 crete, and asphalt.

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

11 “(A) Modeling, simulation, and optimiza-  
12 tion of the design of cost-effective and energy-  
13 efficient products and processes.

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

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

20 “(8) Technologies that can be retrofitted at ce-  
21 ment, concrete, and asphalt plants that represent  
22 the most common facility types in the United States  
23 and in other countries, with consideration for field  
24 validation of such retrofits.

1           “(9) Best practices for data standardization  
2           and data sharing tools and technologies, in coordina-  
3           tion with relevant Federal agencies.

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

6                   “(A) Novel materials and alternative do-  
7                   mestic feedstocks and processing operations for  
8                   the advanced production of low-emissions ce-  
9                   ment, concrete, and asphalt.

10                   “(B) Improved understanding by eligible  
11                   entities of the mechanisms that determine the  
12                   performance and durability of low-emissions ce-  
13                   ment, concrete, and asphalt over time.

14           “(f) DEMONSTRATIONS.—

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

25                           “(A) a single technology or practice; or

1           “(B) a combination of multiple tech-  
2           nologies or practices.

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

8           “(A) encourage regional diversity among  
9           eligible entities, including participation by enti-  
10          ties located in rural areas;

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

13          “(C) ensure that specific projects se-  
14          lected—

15                 “(i) expand on the existing technology  
16                 demonstration programs of the Depart-  
17                 ment;

18                 “(ii) are based on the extent of green-  
19                 house gas emissions reductions achieved;  
20                 and

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

23          “(3) REPORTS.—The Secretary shall submit to  
24          the Committee on Science, Space, and Technology of

1 the House of Representatives and the Committee on  
2 Energy and Natural Resources of the Senate—

3 “(A) not less frequently than once every  
4 two years for the duration of the demonstra-  
5 tions under paragraph (1), a report describing  
6 the performance of such demonstration; and

7 “(B) if any such demonstration is termi-  
8 nated, an assessment of the success of, and  
9 education provided by, the measures carried out  
10 by such demonstration.

11 “(4) TERMINATION.—The Secretary may termi-  
12 nate the demonstratives under paragraph (1) if the  
13 Secretary determines that sufficient low-emissions  
14 cement, concrete, and asphalt produced through ad-  
15 vanced production are commercially available domes-  
16 tically at a price comparable to the price of cement,  
17 concrete, and asphalt produced through traditional  
18 methods of production.

19 “(g) TECHNICAL ASSISTANCE PROGRAM.—

20 “(1) IN GENERAL.—The Secretary, in consulta-  
21 tion with the Secretary of Transportation, the Sec-  
22 retary of Commerce (acting through the Director of  
23 the National Institute of Standards and Tech-  
24 nology), the Administrator of General Services, the  
25 Administrator of the Environmental Protection

1 Agency, and appropriate representatives of relevant  
2 standards development organizations, shall provide  
3 technical assistance to eligible entities to carry out  
4 an activity described in paragraph (2) to promote  
5 the commercial application of technologies for the  
6 production and use of low-emissions cement, con-  
7 crete, and asphalt.

8 “(2) ACTIVITIES DESCRIBED.—An activity re-  
9 ferred to in paragraph (1) is any of the following:

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

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

16 “(C) An environmental impact comparison  
17 between different cements, concretes, and as-  
18 phalts.

19 “(D) A techno-economic assessment.

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

22 “(F) An evaluation or testing activity.

23 “(G) Any other activity that promotes the  
24 commercial application of technologies devel-  
25 oped through the program under subsection (b).

1           “(3) APPLICATIONS.—The Secretary shall seek  
2 applications for technical assistance under this sub-  
3 section—

4                   “(A) on a competitive basis; and

5                   “(B) on a periodic basis, but not less fre-  
6 quently than once every 12 months.

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

11           “(h) ADDITIONAL COORDINATION.—

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

14                           “(A) leveraging the resources of relevant  
15 existing Manufacturing USA Institutes de-  
16 scribed in section 34(d) of the National Insti-  
17 tute of Standards and Technology Act (15  
18 U.S.C. 278s(d));

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

22                           “(C) awarding financial assistance, con-  
23 sistent with section 34(e) of the National Insti-  
24 tute of Standards and Technology Act (15  
25 U.S.C. 278s(e)), to a person or group of per-

1           sons to assist the person or group of persons in  
2           planning, establishing, or supporting a Manu-  
3           facturing U.S.A. institute focused on advanced  
4           production of low-emissions cement, concrete,  
5           and asphalt.

6           “(2) OTHER FEDERAL AGENCIES.—In carrying  
7           out this section, the Secretary shall coordinate with  
8           other Federal agencies, including the Department of  
9           Defense, the Department of Transportation, and the  
10          National Institute of Standards and Technology,  
11          that are carrying out research and development ini-  
12          tiatives to increase industrial competitiveness and  
13          achieve measurable greenhouse gas or directly re-  
14          lated copollutant emissions reductions through the  
15          advanced production of cement, concrete, and as-  
16          phalt.

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

19          “(j) RESEARCH SECURITY.—The activities author-  
20          ized under this section shall be applied in a manner con-  
21          sistent with subtitle D of title VI of the Research and De-  
22          velopment, Competition, and Innovation Act (enacted as  
23          division B of Public Law 117–167 (42 U.S.C. 19231 et  
24          seq.)).



