

118TH CONGRESS
2D SESSION

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.

IN THE HOUSE OF REPRESENTATIVES

MARCH 15, 2024

Mr. MILLER of Ohio (for himself and Mrs. FOUSHEE) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

A BILL

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,*

3 **SECTION 1. SHORT TITLE.**

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

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

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

7 **“SEC. 40525. ADVANCED CEMENT, CONCRETE, AND AS-**
8 **PHALT PRODUCTION RESEARCH PROGRAM.**

9 “(a) DEFINITIONS.—In this section:

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

16 “(A) Improved cost-effectiveness.

17 “(B) Improved quality, durability, engi-
18 neering performance, and resilience.

19 “(C) Improved efficiency of resource con-
20 sumption and material demand.

21 “(2) ALTERNATIVE FUELS.—The term ‘alter-
22 native fuels’ means any solid, liquid, or gaseous ma-
23 terials, or a combination thereof, used to replace or
24 supplement any portion of fuels used in combustion
25 or pyrolysis for low-emissions cement, concrete, or
26 asphalt.

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

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

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

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

12 “(A) An institution of higher education.

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

16 “(C) A nonprofit research institution.

17 “(D) A private entity.

18 “(E) Any other relevant entity the Sec-
19 retary determines appropriate.

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

23 “(5) **ENGINEERING PERFORMANCE-BASED**
24 **STANDARD.**—The term ‘engineering performance-
25 based standard’ means an existing engineering

1 standard with respect to which the requirements ap-
2 plicable to such standard are stated in terms of re-
3 quired results, with criteria for verifying compliance
4 rather than specific composition, design, or proce-
5 dure.

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

10 “(7) LOW-EMISSIONS CEMENT, CONCRETE, AND
11 ASPHALT.—The term ‘low-emissions cement, con-
12 crete, and asphalt’ means cement, concrete, asphalt
13 binder, or asphalt mixture that reduces, to the max-
14 imum extent practicable, greenhouse gas and di-
15 rectly-related copollutant emissions to levels below
16 commercially available cement, concrete, or asphalt.

17 “(8) RURAL AREA.—The term ‘rural area’ has
18 the meaning given such term in section 343(a) of
19 the Consolidated Farm and Rural Development Act
20 (7 U.S.C. 1991(a)).

21 “(b) ESTABLISHMENT.—Not later than 180 days
22 after the date of the enactment of this section, the Sec-
23 retary shall establish a program of research, development,
24 demonstration, and commercial application of advanced
25 tools, technologies, and methods for advanced production

1 and use of low-emissions cement, concrete, and asphalt in
2 order to—

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

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

9 “(3) achieve measurable greenhouse gas and di-
10 rectly related copollutant emissions reductions in the
11 production processes for cement, concrete, and as-
12 phalt products; and

13 “(4) create quality domestic jobs.

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

16 “(1) coordinate with the programs and activi-
17 ties authorized under title VI of division Z of the
18 Consolidated Appropriations Act, 2021 (relating to
19 industrial and manufacturing technologies) and the
20 amendments made by such title;

21 “(2) coordinate across all relevant program of-
22 fices of the Department, including the Office of
23 Science, the Advanced Research Projects Agency-
24 Energy, the Office of Clean Energy Demonstrations,
25 the Office of Energy Efficiency and Renewable En-

1 energy, the Office of Fossil Energy, the Office of In-
2 dustrial Efficiency and Decarbonization, the Office
3 of Manufacturing and Energy Supply Chains, and
4 the Office of Nuclear Energy;

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

10 “(4) conduct research, development, demonstra-
11 tion, and commercial application of the advanced
12 production of low-emissions cement, concrete, and
13 asphalt that have the potential to increase domestic
14 production and employment in both advanced and
15 commercially available processes.

16 “(d) STRATEGIC PLAN.—

17 “(1) IN GENERAL.—Not later than 180 days
18 after the establishment of the program under sub-
19 section (b), the Secretary shall develop a 5-year stra-
20 tegic plan identifying research, development, dem-
21 onstration, and commercial application goals for
22 such program. The Secretary shall submit such plan
23 to the Committee on Science, Space, and Technology
24 of the House of Representatives and the Committee
25 on Energy and Natural Resources of the Senate.

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

3 “(A) identify programs at the Department
4 related to the advanced production of low-emis-
5 sions cement, concrete, and asphalt that sup-
6 port the research, development, demonstration,
7 and commercial application activities described
8 in this section, and the demonstration projects
9 under subsection (f);

10 “(B) establish technological and pro-
11 grammatic goals to achieve the requirements
12 specified in subsection (e); and

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

15 “(3) UPDATES TO PLAN.—Not less than once
16 every two years, the Secretary shall submit to the
17 Committee on Science, Space, and Technology of the
18 House of Representatives and the Committee on En-
19 ergy and Natural Resources of the Senate an up-
20 dated version of the strategic plan under paragraph
21 (1).

22 “(e) FOCUS AREAS.—In carrying out the program es-
23 tablished in subsection (e), the Secretary shall focus on
24 the following:

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

4 “(A) Oxycombustion and chemical looping
5 technologies.

6 “(B) Precombustion technologies.

7 “(C) Post combustion technologies.

8 “(D) Direct carbon dioxide separation
9 technologies.

10 “(2) Materials, technologies, inputs, and proc-
11 esses that—

12 “(A) produce fewer greenhouse gas and di-
13 rectly related copollutant emissions during pro-
14 duction, use, and end use of cement, concrete,
15 and asphalt; or

16 “(B) provide quality, durability, resilience,
17 engineering, or other performance metrics equal
18 to or greater than commercially available prod-
19 ucts.

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

24 “(A) Alternative fuels.

1 “(B) Renewable heat-generation and stor-
2 age technology.

3 “(C) Electrification of heating processes.

4 “(D) Other clean heat-generation tech-
5 nologies and sources.

6 “(4) Technologies and practices that increase
7 the efficiency of energy use, natural resource con-
8 sumption, or material demand, which may include
9 the following:

10 “(A) Designing products that encourage
11 reuse, refurbishment, remanufacturing, and re-
12 cycling.

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

18 “(C) Increasing the overall energy effi-
19 ciency of low-emissions cement, concrete, and
20 asphalt production processes, including through
21 life cycle assessments.

22 “(5) Technologies and approaches to reduce
23 greenhouse gas and directly related copollutant emis-
24 sions from the advanced production of cement, con-
25 crete, and asphalt.

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

5 “(A) Modeling, simulation, and optimiza-
6 tion of the design of cost-effective and energy-
7 efficient products and processes.

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

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

14 “(8) Technologies that can be retrofitted at ce-
15 ment, concrete, and asphalt plants that represent
16 the most common facility types in the United States
17 and in other countries, with consideration for field
18 validation of such retrofits.

19 “(9) Best practices for data standardization
20 and data sharing tools and technologies, in coordina-
21 tion with relevant Federal agencies.

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

24 “(A) Novel materials and alternative do-
25 mestic feedstocks and processing operations for

1 the advanced production of low-emissions ce-
2 ment, concrete, and asphalt.

3 “(B) Improved understanding by eligible
4 entities of the mechanisms that determine the
5 performance and durability of low-emissions ce-
6 ment, concrete, and asphalt over time.

7 “(f) DEMONSTRATIONS.—

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

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

19 “(B) a combination of multiple tech-
20 nologies or practices.

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

1 “(A) encourage regional diversity among
2 eligible entities, including participation by enti-
3 ties located in rural areas;

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

6 “(C) ensure that specific projects se-
7 lected—

8 “(i) expand on the existing technology
9 demonstration programs of the Depart-
10 ment;

11 “(ii) are based on the extent of green-
12 house gas emissions reductions achieved;
13 and

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

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

20 “(A) not less frequently than once every
21 two years for the duration of the demonstra-
22 tions under paragraph (1), a report describing
23 the performance of such demonstration; and

24 “(B) if any such demonstration is termi-
25 nated, an assessment of the success of, and

1 education provided by, the measures carried out
2 by such demonstration.

3 “(4) TERMINATION.—The Secretary may termi-
4 nate the demonstratives under paragraph (1) if the
5 Secretary determines that sufficient low-emissions
6 cement, concrete, and asphalt produced through ad-
7 vanced production are commercially available domes-
8 tically at a price comparable to the price of cement,
9 concrete, and asphalt produced through traditional
10 methods of production.

11 “(g) TECHNICAL ASSISTANCE PROGRAM.—

12 “(1) IN GENERAL.—The Secretary, in consulta-
13 tion with the Secretary of Transportation, the Sec-
14 retary of Commerce (acting through the Director of
15 the National Institute of Standards and Tech-
16 nology), the Administrator of General Services, and
17 the Administrator of the Environmental Protection
18 Agency, shall provide technical assistance to eligible
19 entities to carry out an activity described in para-
20 graph (2) to promote the commercial application of
21 technologies for the production and use of low-emis-
22 sions cement, concrete, and asphalt.

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

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

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

7 “(C) An environmental impact comparison
8 between different cements, concretes, and as-
9 phalts.

10 “(D) A techno-economic assessment.

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

13 “(F) An evaluation or testing activity.

14 “(G) Any other activity that promotes the
15 commercial application of technologies devel-
16 oped through the program under subsection (b).

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

20 “(A) on a competitive basis; and

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

23 “(4) REGIONAL CENTERS.—The Secretary may
24 designate or establish one or more regional centers

1 to provide technical assistance to eligible entities to
2 carry out the activity described in paragraph (2)(A).

3 “(h) ADDITIONAL COORDINATION.—

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

6 “(A) leveraging the resources of relevant
7 existing Manufacturing USA Institutes de-
8 scribed in section 34(d) of the National Insti-
9 tute of Standards and Technology Act (15
10 U.S.C. 278s(d));

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

14 “(C) awarding financial assistance, con-
15 sistent with section 34(e) of the National Insti-
16 tute of Standards and Technology Act (15
17 U.S.C. 278s(e)), to a person or group of per-
18 sons to assist the person or group of persons in
19 planning, establishing, or supporting a Manu-
20 facturing U.S.A. institute focused on advanced
21 production of low-emissions cement, concrete,
22 and asphalt.

23 “(2) OTHER FEDERAL AGENCIES.—In carrying
24 out this section, the Secretary shall coordinate with
25 other Federal agencies, including the Department of

1 Defense, the Department of Transportation, and the
2 National Institute of Standards and Technology,
3 that are carrying out research and development ini-
4 tiatives to increase industrial competitiveness and
5 achieve measurable greenhouse gas and directly re-
6 lated copollutant emissions reductions through the
7 advanced production of cement, concrete, and as-
8 phalt.

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

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

17 “(k) RULE OF CONSTRUCTION.—Nothing in this sec-
18 tion may be construed to amend, alter, or affect the au-
19 thorities of the Secretary to define, establish, or enforce
20 new environmental industry standards for, or related to,
21 cement, concrete, or asphalt.”.

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

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

