

118TH CONGRESS
2D SESSION

H. R. 7073

IN THE SENATE OF THE UNITED STATES

SEPTEMBER 25, 2024

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

AN ACT

To improve public-private partnerships and increase Federal research, development, and demonstration related to the evolution of next generation pipeline systems, 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 “Next Generation Pipe-
3 lines Research and Development Act”.

4 **SEC. 2. DEFINITIONS.**

5 In this Act:

6 (1) **DEPARTMENT.**—The term “Department”
7 means the Department of Energy.

8 (2) **ELIGIBLE ENTITY.**—The term “eligible enti-
9 ty” means—

10 (A) an institution of higher education (as
11 such term is defined in section 101(a) of the
12 Higher Education Act of 1965 (20 U.S.C.
13 1001(a))), including historically Black colleges
14 and universities (within the meaning of the
15 term “part B institution” in section 322 of the
16 Higher Education Act of 1965 (20 U.S.C.
17 1061)), Tribal colleges and universities (as such
18 term is defined in section 316 of the Higher
19 Education Act of 1965 (20 U.S.C. 1059c)), and
20 minority serving institutions (including the enti-
21 ties described in any of paragraphs (1) through
22 (7) of section 371(a) of the Higher Education
23 Act of 1965 (20 U.S.C. 1067q(a)));

24 (B) a nonprofit research organization;

1 (C) a National Laboratory (as such term is
2 defined in section 2 of the Energy Policy Act of
3 2005 (42 U.S.C. 15801));

4 (D) a private commercial entity;

5 (E) a partnership or consortium of two or
6 more entities described in subparagraphs (A)
7 through (D) that leverages existing Department
8 efforts; or

9 (F) any other entity the Secretary deter-
10 mines appropriate.

11 (3) SECRETARY.—The term “Secretary” means
12 the Secretary of Energy.

13 (4) TECHNICAL STANDARDS.—The term “tech-
14 nical standard” has the meaning given such term in
15 section 12(d)(5) of the National Technology Trans-
16 fer and Advancement Act of 1995 (15 U.S.C. 272
17 note).

18 **SEC. 3. COORDINATION.**

19 In carrying out this Act—

20 (1) the Secretary shall avoid unnecessary dupli-
21 cation and achieve shared mission goals by coordi-
22 nating with the Administrator of the Pipeline and
23 Hazardous Materials Safety Administration of the
24 Department of Transportation and across all rel-

1 evant program offices at the Department of Energy,
2 including—

3 (A) the Office of Science;

4 (B) the Office of Fossil Energy and Car-
5 bon Management;

6 (C) the Office of Energy Efficiency and
7 Renewable Energy;

8 (D) the Office of Cybersecurity, Energy
9 Security, and Emergency Response;

10 (E) the Advanced Research Projects Agen-
11 cy–Energy;

12 (F) the Office of Clean Energy Dem-
13 onstrations; and

14 (G) any other cross-cutting program office
15 determined appropriate;

16 (2) the Secretary of Transportation shall ensure
17 participation of and coordination with the Secretary
18 of Energy of—

19 (A) the Pipeline and Hazardous Materials
20 Safety Administration of the Department of
21 Transportation; and

22 (B) any other program office of the De-
23 partment of Transportation determined appro-
24 priate; and

1 (3) the Secretary shall coordinate with the Di-
2 rector of the National Institute of Standards and
3 Technology, the Secretary of the Interior, and the
4 heads of other relevant Federal agencies, as appro-
5 prium.

6 **SEC. 4. ADVANCED PIPELINE MATERIALS AND TECH-**
7 **NOLOGIES DEMONSTRATION INITIATIVE.**

8 (a) IN GENERAL.—Subtitle E of title III of division
9 D of the Infrastructure Investment and Jobs Act (Public
10 Law 117–58) is amended by adding at the end the fol-
11 lowing new section:

12 **“SEC. 40344. ADVANCED PIPELINE MATERIALS AND TECH-**
13 **NOLOGIES DEMONSTRATION INITIATIVE.**

14 “(a) ESTABLISHMENT OF INITIATIVE.—The Sec-
15 retary shall establish a demonstration initiative (in this
16 section referred to as the ‘Initiative’) under which the Sec-
17 retary, through a competitive merit review process, shall
18 award financial assistance to eligible entities to carry out
19 demonstration projects on low- to mid-technology readi-
20 ness level subjects to achieve deployment of technologies
21 that—

22 “(1) are applicable to pipelines and associated
23 infrastructure, including liquefied natural gas facili-
24 ties and underground and above ground gas and liq-
25 uid fuel storage facilities; and

1 “(2) involve the development of next generation
2 pipeline systems, components, and related tech-
3 nologies.

4 “(b) DEMONSTRATION PROJECT FOCUS AREAS.—In
5 carrying out the Initiative, the Secretary shall select dem-
6 onstration projects that best advance research undertaken
7 by the Department and the Department of Transportation
8 and incorporate a range of technology focus areas, which
9 may include the following:

10 “(1) Advanced leak detection and mitigation
11 tools and technologies.

12 “(2) Novel materials, including alloy and non-
13 metallic materials, to improve integrity for new and
14 existing pipelines, such as pipeline coatings, sleeves,
15 and liners, and corrosion resistant materials, includ-
16 ing maximum and minimum flow rates and immu-
17 nity to electrical discharge processes.

18 “(3) Technologies and methods for retrofitting
19 existing pipelines, resolving material compatibility
20 issues, and minimizing leakage, such as field protec-
21 tive coatings and material treatment.

22 “(4) Advanced manufacturing approaches for
23 producing, fitting, and coupling pipelines, including
24 the fabrication of higher performance pipeline mate-
25 rials and new extrusion technologies or methods to

1 join ultra-high strength and corrosion resistant ma-
2 terials at a scale for distribution.

3 “(5) Advanced sensor technologies and proc-
4 esses that enable real-time or in situ monitoring of
5 pipeline assets to assess and mitigate leaks, both in-
6 ternal and external to the pipeline, which may in-
7 clude the following:

8 “(A) Wireless sensors, such as surface
9 acoustic wave sensors.

10 “(B) Advanced and cost-effective electro-
11 chemical sensors.

12 “(C) Distributed fiber optic sensors.

13 “(D) Autonomous sensor systems, includ-
14 ing uncrewed aircraft.

15 “(E) Optical methods.

16 “(F) Multi-use platforms for diverse
17 sources.

18 “(G) Hybrid data-analysis platforms.

19 “(6) Advanced computational, data analytics,
20 and machine learning models to achieve the fol-
21 lowing:

22 “(A) Multiscale modeling, characterization,
23 and optimization of transmission and distribu-
24 tion systems and components to aid in planning
25 for optimized and resilient infrastructure.

1 “(B) Correlation between sensor and emis-
2 sions data at all operational points and across
3 a variety of scales to assure system integrity
4 spanning large areas.

5 “(C) Accurate material lifecycle predictions
6 and simulation platforms to forecast pipeline
7 health.

8 “(D) Secure real time autonomous moni-
9 toring and repair capabilities.

10 “(E) Mapping and monitoring of struc-
11 tural health parameters, such as corrosion.

12 “(7) Self-healing and self-repair functionalities,
13 including by chemical treatment methods.

14 “(8) Autonomous robotic and patch tech-
15 nologies for inspection and repair.

16 “(9) Dynamic compressor technologies, includ-
17 ing retrofit kits for existing compressor systems.

18 “(10) Strategies and technologies for integrated
19 cybersecurity considerations and countering
20 cyberattacks.

21 “(11) Technologies and methods to reduce po-
22 tential environmental impacts, including at the at-
23 mospheric and subsurface level, associated with pipe-
24 lines, liquefied natural gas facilities, and gas and liq-
25 uid fuel storage facilities, such as equipment failure.

1 “(12) Tools to evaluate geographical pipeline
2 data for the feasibility of repurposing existing infra-
3 structure for safe and effective transport and use of
4 alternative fuels, blends, and carbon dioxide.

5 “(13) Tools and technologies applicable to im-
6 proving the safety, operation, and efficiency of lique-
7 fied natural gas facilities and gas and liquid fuel
8 storage facilities.

9 “(c) SELECTION REQUIREMENTS.—In selecting eligi-
10 ble entities for demonstration projects under the Initiative,
11 the Secretary shall, to the maximum extent practicable,
12 take the following actions:

13 “(1) Encourage regional diversity among eligi-
14 ble entities, including participation by such entities
15 located in rural States.

16 “(2) Prioritize technological diversity among eli-
17 gible entities.

18 “(3) Prioritize a diverse mix of energy, sub-
19 stances, fuel sources, and byproducts, including the
20 following:

21 “(A) Gas and liquid hydrocarbons, includ-
22 ing natural gas, renewable natural gas, meth-
23 ane, ethane, and liquefied natural gas.

24 “(B) Carbon dioxide.

25 “(C) Hydrogen.

1 “(D) Biofuels.

2 “(E) Water.

3 “(F) Substances in the hydrogen supply
4 chain, including ammonia and liquid organic
5 hydrogen carriers.

6 “(G) Blends of gases or liquids, including
7 hydrogen blends.

8 “(H) Any other source the Secretary deter-
9 mines appropriate.

10 “(4) Prioritize projects that leverage and are
11 complementary to existing energy infrastructure.

12 “(5) Prioritize projects that leverage matching
13 funds from non-Federal sources.

14 “(6) Ensure that selected projects are coordi-
15 nated with or expand on the existing technology
16 demonstration programs of the Department.

17 “(7) Evaluate projects and topics for technical
18 performance and economic feasibility as part of
19 lifecycle assessments for return on investment im-
20 pact.

21 “(8) Prioritize projects that can quantifiably re-
22 duce the environmental impacts of pipelines and as-
23 sociated infrastructure on air, water, or soil quality
24 in all regions of the United States, especially in un-
25 derserved and rural communities.

1 “(d) LOCATION.—To the maximum extent prac-
2 ticable, demonstration projects under the Initiative shall
3 be located on sites with existing research infrastructure
4 or with the ability to coordinate with existing Department
5 user facilities and research centers.

6 “(e) AUTHORIZATION OF APPROPRIATIONS.—Out of
7 funds authorized to be appropriated for—

8 “(1) the Office of Energy Efficiency and Re-
9 newable Energy, and

10 “(2) the Office of Fossil Energy and Carbon
11 Management,

12 pursuant to paragraphs (1) and (6), respectively, of sec-
13 tion 10771 of subtitle O of title VI of the Research and
14 Development, Competition, and Innovation Act (enacted
15 as division B of Public Law 117–167), there is authorized
16 to be appropriated to the Secretary of Energy to carry
17 out this section \$45,000,000 for fiscal year 2025, and
18 \$50,000,000 for each of fiscal years 2026 through 2029.

19 “(f) SUNSET.—This section shall terminate five years
20 after the date of the enactment of this section.”.

21 (b) CLERICAL AMENDMENT.—The table of contents
22 in section 1(b) of the Infrastructure Investment and Jobs
23 Act is amended by inserting after the item relating to sec-
24 tion 40343 the following new item:

“Sec. 40344. Advanced pipeline materials and technologies demonstration ini-
tiative.”.

1 **SEC. 5. JOINT RESEARCH AND DEVELOPMENT PROGRAM.**

2 (a) IN GENERAL.—Subject to the availability of ap-
3 propriations, the Secretary, in consultation with the Sec-
4 retary of Transportation and the Director of the National
5 Institute of Standards and Technology, and in coordina-
6 tion with the demonstration initiative established pursuant
7 to section 40344 of the Infrastructure Investment and
8 Jobs Act (Public Law 117–58), as added by section 4,
9 shall establish within the Department a joint research and
10 development program (referred to in this Act as the “Joint
11 Program”) to carry out research projects that—

12 (1) develop cost-effective advanced materials
13 and technologies for pipeline transportation systems
14 at different scales;

15 (2) enable the commercialization of innovative
16 materials and technologies for pipeline transpor-
17 tation systems;

18 (3) support the development of technical stand-
19 ards of innovative materials and technologies for
20 pipeline transportation systems; and

21 (4) are at a low technology readiness level and
22 not pursued by the Pipeline Safety Research Pro-
23 gram of the Pipeline and Hazardous Materials Safe-
24 ty Administration of the Department of Transpor-
25 tation.

1 (b) MEMORANDUM OF UNDERSTANDING.—Not later
2 than one year after the date of the enactment of this Act,
3 the Secretary shall enter into or update an existing memo-
4 randum of understanding with the Secretary of Transpor-
5 tation and the Director of the National Institute of Stand-
6 ards and Technology to administer the Joint Program.
7 Such memorandum shall require each participating agency
8 to—

9 (1) identify unique research capabilities to con-
10 tribute while avoiding duplication of existing efforts;
11 and

12 (2) include cost sharing and cost reimburse-
13 ment abilities among participating agencies, includ-
14 ing any reviews, approvals, trainings, or resource
15 outlays that will be required.

16 (c) INFRASTRUCTURE.—In carrying out the Joint
17 Program, the Secretary, the Secretary of Transportation,
18 and the Director of the National Institute of Standards
19 and Technology shall—

20 (1) use existing research infrastructure at—

21 (A) Department of Energy facilities, in-
22 cluding National Laboratories;

23 (B) Department of Transportation initia-
24 tives, including any such initiatives carried out

1 through the Pipeline and Hazardous Materials
2 Safety Administration; and

3 (C) the National Institute of Standards
4 and Technology; and

5 (2) develop new infrastructure for potential
6 projects, if appropriate.

7 (d) GOALS AND METRICS.—The Secretary, the Sec-
8 retary of Transportation, and the Director of the National
9 Institute of Standards and Technology shall develop goals
10 and metrics for each agency in meeting technological
11 progress under the Joint Program, consistent with exist-
12 ing United States energy safety, resilience, and security
13 policies.

14 (e) SELECTION OF PROJECTS.—To the maximum ex-
15 tent practicable, the Secretary, the Secretary of Transpor-
16 tation, and the Director of the National Institute of
17 Standards and Technology shall ensure the following with
18 respect to the Joint Program:

19 (1) Projects are carried out under conditions
20 that represent a variety of geographies, physical con-
21 ditions, and market constraints.

22 (2) Projects represent an appropriate balance of
23 the following:

24 (A) Larger, higher-cost projects.

25 (B) Smaller, lower-cost projects.

1 (3) To the maximum extent practicable,
2 projects are transferred between participating agen-
3 cies based on the stage of research and capabilities
4 of each agency.

5 (f) PRIORITY.—In carrying out the Joint Program,
6 the Secretary, the Director of the National Institute of
7 Standards and Technology, and the Secretary of Trans-
8 portation shall, through consultation with the demonstra-
9 tion initiative established pursuant to section 40344 of the
10 Infrastructure Investment and Jobs Act (Public Law 117–
11 58), as added by section 4, to identify and advance areas
12 of research most needed for demonstration projects under
13 such demonstration initiative, give priority to research and
14 demonstration projects that—

15 (1) are likely to be of value to such demonstra-
16 tion initiative; and

17 (2) are done in coordination with, or advance
18 knowledge critical to, the National Pipeline Mod-
19 ernization Center established pursuant to section 6.

20 (g) RELATION TO EXISTING LAW.—Nothing in this
21 section may be construed to change existing agency roles,
22 responsibilities, or areas of expertise as described in sec-
23 tion 12 of the Pipeline Safety Improvement Act of 2002
24 (Public Law 107–355; 49 U.S.C. 60101 note).

1 (h) SUNSET.—This section shall terminate five years
2 after the date of the enactment of this section.

3 **SEC. 6. NATIONAL PIPELINE MODERNIZATION CENTER.**

4 (a) IN GENERAL.—In carrying out the demonstration
5 initiative established pursuant to section 40344 of the In-
6 frastructure Investment and Jobs Act (Public Law 117–
7 58), as added by section 4, and the Joint Program and
8 subject to the availability of appropriations, the Secretary
9 shall establish a National Pipeline Modernization Center
10 (referred to in this Act as the “Center”), which shall focus
11 on collaborating with industry and stakeholders to coordi-
12 nate and carry out research, development, and demonstra-
13 tion projects focused on commercializing cost-effective
14 products and procedures aligned with the goals and prior-
15 ities set forth by the Department.

16 (b) SELECTION.—The Secretary shall administer the
17 Center in conjunction with an eligible entity pursuant to
18 an agreement between the Department and such entity.
19 Such entity shall be selected on a competitive, merit-re-
20 viewed basis.

21 (c) EXISTING CENTERS.—In administering the Cen-
22 ter, the Secretary shall prioritize higher education energy-
23 related research centers in existence as of the date of the
24 enactment of this Act.

1 (d) PERIOD OF PERFORMANCE.—An agreement
2 under subsection (b) shall be for a period of not more than
3 five years, subject to the availability of appropriations.

4 (e) LOCATION.—The Center shall be located in prox-
5 imity to critical transportation infrastructure connecting
6 to an existing national pipeline transportation system and
7 other Department monitoring assets, as determined by the
8 Secretary.

9 (f) COORDINATION WITH TRAINING AND QUALIFICA-
10 TIONS CENTER.—In carrying out the functions described
11 in subsection (a), the Center shall coordinate and collabo-
12 rate with training centers of the Pipeline and Hazardous
13 Materials Safety Administration of the Department of
14 Transportation to facilitate knowledge sharing among,
15 and enhanced training opportunities for, Federal and
16 State pipeline safety inspectors and investigators.

17 (g) DUPLICATION.—The Secretary shall ensure the
18 coordination of, and avoid unnecessary duplication of, the
19 activities under this section with the National Center of
20 Excellence for Liquefied Natural Gas Safety established
21 pursuant to section 111 of the Protecting our Infrastruc-
22 ture of Pipelines and Enhancing Safety Act of 2020 (49
23 U.S.C. 60103 note; Public Law 116–260, div. R, title I).

1 **SEC. 7. NIST PIPELINE METROLOGY.**

2 (a) IN GENERAL.—Subject to the availability of ap-
3 propriations, the Director of the National Institute of
4 Standards and Technology shall carry out a program of
5 measurement research, development, demonstration, and
6 standardization to—

7 (1) ensure the integrity of pipeline facilities;

8 and

9 (2) support pipeline safety, security, efficiency,
10 sustainability, and resilience.

11 (b) TESTING.—The Director of the National Institute
12 of Standards and Technology, in collaboration with the
13 Secretary of the Department of Transportation and in
14 consultation with the private sector and international
15 standards organizations, shall support testing, evaluation,
16 and research infrastructure to support the activities de-
17 scribed in subsection (a).

18 (c) ALLOCATION OF APPROPRIATIONS.—From
19 amounts appropriated or otherwise made available for the
20 National Institute of Standards and Technology, the Di-
21 rector of the National Institute of Standards and Tech-
22 nology shall allocate up to \$2,500,000 for each of fiscal
23 years 2025 through 2029 to carry out this section.

24 **SEC. 8. AUTHORIZATION OF APPROPRIATIONS.**

25 (a) IN GENERAL.—Out of funds authorized to be ap-
26 propriated for the Office of Energy Efficiency and Renew-

1 able Energy and the Office of Fossil Energy and Carbon
2 Management pursuant to paragraphs (1) and (6), respec-
3 tively, of section 10771 of subtitle O of title VI of the
4 Research and Development, Competition, and Innovation
5 Act (enacted as division B of Public Law 117–167), there
6 is authorized to be appropriated to the Secretary to carry
7 out—

8 (1) section 5, \$20,000,000 for fiscal year 2025,
9 and \$30,000,000 for each of fiscal years 2026
10 through 2029; and

11 (2) section 6, \$10,000,000 for fiscal year 2025,
12 and \$15,000,000 for each of fiscal years 2026
13 through 2029.

14 (b) OFFSET.—Section 10771 of subtitle O of title VI
15 of the Research and Development, Competition, and Inno-
16 vation Act (enacted as division B of Public Law 117–167)
17 is amended—

18 (1) in paragraph (1)—

19 (A) in the matter preceding subparagraph
20 (A), by striking “2026” and inserting “2029”;
21 and

22 (B) in subparagraph (B), by striking
23 “1,200,000,000” and inserting
24 “\$1,100,000,000”; and

25 (2) in subsection (6)—

- 1 (A) in the matter preceding subparagraph
2 (A), by striking “2026” and inserting “2029”;
3 (B) in subparagraph (A), by striking
4 “600,000,000” and inserting “\$445,000,000”;
5 (C) in subparagraph (B)—
6 (i) by striking “200,000,000” and in-
7 serting “\$100,000,000”; and
8 (ii) by striking “and” after the semi-
9 colon;
10 (D) in subparagraph (C)—
11 (i) by striking “1,000,000,000” and
12 inserting “\$900,000,000”; and
13 (ii) by striking the period and insert-
14 ing “; and”; and
15 (E) by adding at the end the following new
16 subparagraph:
17 “(D) \$455,000,000 to carry out pipeline
18 research, development, demonstration, and com-
19 mercial application activities.”.

Passed the House of Representatives September 24,
2024.

Attest: KEVIN F. MCCUMBER,
Clerk.