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(Original Signature of Member)

118TH CONGRESS
1ST SESSION

H. R. _____

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.

IN THE HOUSE OF REPRESENTATIVES

Mr. WEBER of Texas introduced the following bill; which was referred to the Committee on _____

A BILL

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,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Next Generation Pipe-
5 lines Research and Development Act”.

6 **SEC. 2. DEFINITIONS.**

7 In this Act:

1 (1) DEPARTMENT.—The term “Department”
2 means the Department of Energy.

3 (2) ELIGIBLE ENTITY.—The term “eligible enti-
4 ty” means—

5 (A) an institution of higher education (as
6 such term is defined in section 101(a) of the
7 Higher Education Act of 1965 (20 U.S.C.
8 1001(a))), including historically Black colleges
9 and universities (within the meaning of the
10 term “part B institution” in section 322 of the
11 Higher Education Act of 1965 (20 U.S.C.
12 1061)), Tribal colleges and universities (as such
13 term is defined in section 316 of the Higher
14 Education Act of 1965 (20 U.S.C. 1059e)), and
15 minority serving institutions (including the enti-
16 ties described in any of paragraphs (1) through
17 (7) of section 371(a) of the Higher Education
18 Act of 1965 (20 U.S.C. 1067q(a)));

19 (B) a nonprofit research organization;

20 (C) a National Laboratory (as such term is
21 defined in section 2 of the Energy Policy Act of
22 2005 (42 U.S.C. 15801));

23 (D) a private commercial entity;

24 (E) a partnership or consortium of two or
25 more entities described in subparagraphs (A)

1 through (D) that leverages existing Department
2 efforts; or

3 (F) any other entity the Secretary deter-
4 mines appropriate.

5 (3) SECRETARY.—The term “Secretary” means
6 the Secretary of Energy.

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

12 **SEC. 3. COORDINATION.**

13 In carrying out this Act—

14 (1) the Secretary shall avoid unnecessary dupli-
15 cation and achieve shared mission goals by coordi-
16 nating with the Administrator of the Pipeline and
17 Hazardous Materials Safety Administration of the
18 Department of Transportation and across all rel-
19 evant program offices at the Department of Energy,
20 including—

21 (A) the Office of Science;

22 (B) the Office of Fossil Energy and Car-
23 bon Management;

24 (C) the Office of Energy Efficiency and
25 Renewable Energy;

1 (D) the Office of Cybersecurity, Energy
2 Security, and Emergency Response;

3 (E) the Advanced Research Projects Agen-
4 cy–Energy;

5 (F) the Office of Clean Energy Dem-
6 onstrations; and

7 (G) any other cross-cutting program office
8 determined appropriate;

9 (2) the Secretary of Transportation shall ensure
10 participation of and coordination with the Secretary
11 of Energy of—

12 (A) the Pipeline and Hazardous Materials
13 Safety Administration of the Department of
14 Transportation; and

15 (B) any other program office of the De-
16 partment of Transportation determined appro-
17 priate; and

18 (3) the Secretary shall coordinate with the Di-
19 rector of the National Institute of Standards and
20 Technology, the Secretary of the Interior, and the
21 heads of other relevant Federal agencies, as appro-
22 priate.

1 **SEC. 4. ADVANCED PIPELINE MATERIALS AND TECH-**
2 **NOLOGIES DEMONSTRATION INITIATIVE.**

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

7 **“SEC. 40344. ADVANCED PIPELINE MATERIALS AND TECH-**
8 **NOLOGIES DEMONSTRATION INITIATIVE.**

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

17 “(1) are applicable to pipelines and associated
18 infrastructure, including liquefied natural gas facili-
19 ties and underground and above ground gas and liq-
20 uid fuel storage facilities; and

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

24 “(b) DEMONSTRATION PROJECT FOCUS AREAS.—In
25 carrying out the Initiative, the Secretary shall select dem-
26 onstration projects that best advance research undertaken

1 by the Department and the Department of Transportation
2 and incorporate a range of technology focus areas, which
3 may include the following:

4 “(1) Advanced leak detection and mitigation
5 tools and technologies.

6 “(2) Novel materials, including alloy and non-
7 metallic materials, to improve integrity for new and
8 existing pipelines, such as pipeline coatings, sleeves,
9 and liners, and corrosion resistant materials, includ-
10 ing maximum and minimum flow rates and immu-
11 nity to electrical discharge processes.

12 “(3) Technologies and methods for retrofitting
13 existing pipelines, resolving material compatibility
14 issues, and minimizing leakage, such as field protec-
15 tive coatings and material treatment.

16 “(4) Advanced manufacturing approaches for
17 producing, fitting, and coupling pipelines, including
18 the fabrication of higher performance pipeline mate-
19 rials and new extrusion technologies or methods to
20 join ultra-high strength and corrosion resistant ma-
21 terials at a scale for distribution.

22 “(5) Advanced sensor technologies and proc-
23 esses that enable real-time or in situ monitoring of
24 pipeline assets to assess and mitigate leaks, both in-

1 ternal and external to the pipeline, which may in-
2 clude the following:

3 “(A) Wireless sensors, such as surface
4 acoustic wave sensors.

5 “(B) Advanced and cost-effective electro-
6 chemical sensors.

7 “(C) Distributed fiber optic sensors.

8 “(D) Autonomous sensor systems, includ-
9 ing uncrewed aircraft.

10 “(E) Optical methods.

11 “(F) Multi-use platforms for diverse
12 sources.

13 “(G) Hybrid data-analysis platforms.

14 “(6) Advanced computational, data analytics,
15 and machine learning models to achieve the fol-
16 lowing:

17 “(A) Multiscale modeling, characterization,
18 and optimization of transmission and distribu-
19 tion systems and components to aid in planning
20 for optimized and resilient infrastructure.

21 “(B) Correlation between sensor and emis-
22 sions data at all operational points and across
23 a variety of scales to assure system integrity
24 spanning large areas.

1 “(C) Accurate material lifecycle predictions
2 and simulation platforms to forecast pipeline
3 health.

4 “(D) Secure real time autonomous moni-
5 toring and repair capabilities.

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

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

10 “(8) Autonomous robotic and patch tech-
11 nologies for inspection and repair.

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

14 “(10) Strategies and technologies for integrated
15 cybersecurity considerations and countering
16 cyberattacks.

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

22 “(12) Tools to evaluate geographical pipeline
23 data for the feasibility of repurposing existing infra-
24 structure for safe and effective transport and use of
25 alternative fuels, blends, and carbon dioxide.

1 “(13) Tools and technologies applicable to im-
2 proving the safety, operation, and efficiency of lique-
3 fied natural gas facilities and gas and liquid fuel
4 storage facilities.

5 “(c) SELECTION REQUIREMENTS.—In selecting eligi-
6 ble entities for demonstration projects under the Initiative,
7 the Secretary shall, to the maximum extent practicable,
8 take the following actions:

9 “(1) Encourage regional diversity among eligi-
10 ble entities, including participation by such entities
11 located in rural States.

12 “(2) Prioritize technological diversity among eli-
13 gible entities.

14 “(3) Prioritize a diverse mix of energy, sub-
15 stances, fuel sources, and byproducts, including the
16 following:

17 “(A) Gas and liquid hydrocarbons, includ-
18 ing natural gas, renewable natural gas, meth-
19 ane, ethane, and liquefied natural gas.

20 “(B) Carbon dioxide.

21 “(C) Hydrogen.

22 “(D) Biofuels.

23 “(E) Water.

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

4 “(G) Blends of gases or liquids, including
5 hydrogen blends.

6 “(H) Any other source the Secretary deter-
7 mines appropriate.

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

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

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

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

19 “(d) LOCATION.—To the maximum extent prac-
20 ticable, demonstration projects under the Initiative shall
21 be located on sites with existing research infrastructure
22 or with the ability to coordinate with existing Department
23 user facilities and research centers.

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

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

3 “(2) the Office of Fossil Energy and Carbon
4 Management,

5 pursuant to paragraphs (1) and (6), respectively, of sec-
6 tion 10771 of subtitle O of title VI of the Research and
7 Development, Competition, and Innovation Act (enacted
8 as division B of Public Law 117–167), there is authorized
9 to be appropriated to the Secretary of Energy to carry
10 out this section \$45,000,000 for fiscal year 2024, and
11 \$50,000,000 for each of fiscal years 2025 through 2028.

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

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

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

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

19 (a) IN GENERAL.—Subject to the availability of ap-
20 propriations, the Secretary, in consultation with the Sec-
21 retary of Transportation and the Director of the National
22 Institute of Standards and Technology, and in coordina-
23 tion with the demonstration initiative established pursuant
24 to section 40344 of the Infrastructure Investment and

1 Jobs Act (Public Law 117–58), as added by section 4,
2 shall establish within the Department a joint research and
3 development program (referred to in this Act as the “Joint
4 Program”) to carry out research projects that—

5 (1) develop cost-effective advanced materials
6 and technologies for pipeline transportation systems
7 at different scales;

8 (2) enable the commercialization of innovative
9 materials and technologies for pipeline transpor-
10 tation systems;

11 (3) support the development of technical stand-
12 ards of innovative materials and technologies for
13 pipeline transportation systems; and

14 (3) are at a low technology readiness level and
15 not pursued by the Pipeline Safety Research Pro-
16 gram of the Pipeline and Hazardous Materials Safe-
17 ty Administration of the Department of Transpor-
18 tation.

19 (b) MEMORANDUM OF UNDERSTANDING.—Not later
20 than one year after the date of the enactment of this Act,
21 the Secretary shall enter into or update an existing memo-
22 randum of understanding with the Secretary of Transpor-
23 tation and the Director of the National Institute of Stand-
24 ards and Technology to administer the Joint Program.

1 Such memorandum shall require each participating agency
2 to—

3 (1) identify unique research capabilities to con-
4 tribute while avoiding duplication of existing efforts;
5 and

6 (2) include cost sharing and cost reimburse-
7 ment abilities among participating agencies, includ-
8 ing any training or resource outlays that will be re-
9 quired.

10 (c) INFRASTRUCTURE.—In carrying out the Joint
11 Program, the Secretary, the Secretary of Transportation,
12 and the Director of the National Institute of Standards
13 and Technology shall—

14 (1) use existing research infrastructure at—

15 (A) Department of Energy facilities, in-
16 cluding National Laboratories;

17 (B) Department of Transportation initia-
18 tives, including any such initiatives carried out
19 through the Pipeline and Hazardous Materials
20 Safety Administration; and

21 (C) the National Institute of Standards
22 and Technology; and

23 (2) develop new infrastructure for potential
24 projects, if appropriate.

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

8 (e) SELECTION OF PROJECTS.—To the maximum ex-
9 tent practicable, the Secretary, the Secretary of Transpor-
10 tation, and the Director of the National Institute of
11 Standards and Technology shall ensure the following with
12 respect to the Joint Program:

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

16 (2) Projects represent an appropriate balance of
17 the following:

18 (A) Larger, higher-cost projects.

19 (B) Smaller, lower-cost projects.

20 (3) To the maximum extent practicable,
21 projects are transferred between participating agen-
22 cies based on the stage of research and capabilities
23 of each agency.

24 (f) PRIORITY.—In carrying out the Joint Program,
25 the Secretary, the Director of the National Institute of

1 Standards and Technology, and the Secretary of Trans-
2 portation shall, through consultation with the demonstra-
3 tion initiative established pursuant to section 40344 of the
4 Infrastructure Investment and Jobs Act (Public Law 117–
5 58), as added by section 4, to identify and advance areas
6 of research most needed for demonstration projects under
7 such demonstration initiative, give priority to research and
8 demonstration projects that—

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

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

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

19 (h) **SUNSET.**—This section shall terminate five years
20 after the date of the enactment of this section.

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

22 (a) **IN GENERAL.**—In carrying out the demonstration
23 initiative established pursuant to section 40344 of the In-
24 frastructure Investment and Jobs Act (Public Law 117–
25 58), as added by section 4, and the Joint Program and

1 subject to the availability of appropriations, the Secretary
2 shall establish a National Pipeline Modernization Center
3 (referred to in this Act as the “Center”), which shall focus
4 on collaborating with industry and stakeholders to coordi-
5 nate and carry out research, development, and demonstra-
6 tion projects focused on commercializing cost-effective
7 products and procedures aligned with the goals and prior-
8 ities set forth by the Department.

9 (b) SELECTION.—The Secretary shall administer the
10 Center in conjunction with an eligible entity pursuant to
11 an agreement between the Department and such entity.
12 Such entity shall be selected on a competitive, merit-re-
13 viewed basis.

14 (c) EXISTING CENTERS.—In administering the Cen-
15 ter, the Secretary shall prioritize higher education energy-
16 related research centers in existence as of the date of the
17 enactment of this Act.

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

21 (e) LOCATION.—The Center shall be located in prox-
22 imity to critical transportation infrastructure connecting
23 to an existing national pipeline transportation system and
24 other Department monitoring assets, as determined by the
25 Secretary.

1 (f) COORDINATION WITH TRAINING AND QUALIFICA-
2 TIONS CENTER.—In carrying out the functions described
3 in subsection (a), the Center shall coordinate and collabo-
4 rate with training centers of the Pipeline and Hazardous
5 Materials Safety Administration of the Department of
6 Transportation to facilitate knowledge sharing among,
7 and enhanced training opportunities for, Federal and
8 State pipeline safety inspectors and investigators.

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

16 **SEC. 7. NIST PIPELINE METROLOGY.**

17 (a) IN GENERAL.—Subject to the availability of ap-
18 propriations, the Director of the National Institute of
19 Standards and Technology shall carry out a program of
20 measurement research, development, demonstration, and
21 standardization to—

- 22 (1) ensure the integrity of pipeline facilities;
23 and
24 (2) support pipeline safety, security, efficiency,
25 sustainability, and resilience.

1 (b) TESTING.—The Director of the National Institute
2 of Standards and Technology, in consultation with the pri-
3 vate sector and international standards organizations,
4 shall support testing, evaluation, and research infrastruc-
5 ture to support the activities described in subsection (a).

6 (c) ALLOCATION OF APPROPRIATIONS.—From
7 amounts appropriated or otherwise made available for the
8 National Institute of Standards and Technology, the Di-
9 rector of the National Institute of Standards and Tech-
10 nology shall allocate up to \$2,500,000 for each of fiscal
11 years 2024 through 2028 to carry out this section.

12 **SEC. 8. AUTHORIZATION OF APPROPRIATIONS.**

13 (a) IN GENERAL.—Out of funds authorized to be ap-
14 propriated for the Office of Energy Efficiency and Renew-
15 able Energy and the Office of Fossil Energy and Carbon
16 Management pursuant to paragraphs (1) and (6), respec-
17 tively, of section 10771 of subtitle O of title VI of the
18 Research and Development, Competition, and Innovation
19 Act (enacted as division B of Public Law 117–167), there
20 is authorized to be appropriated to the Secretary to carry
21 out—

22 (1) section 5, \$20,000,000 for fiscal year 2024,
23 and \$30,000,000 for each of fiscal years 2025
24 through 2028; and

1 (2) section 6, \$10,000,000 for fiscal year 2024,
2 and \$15,000,000 for each of fiscal years 2025
3 through 2028.

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

8 (1) in paragraph (1)—

9 (A) in the matter preceding subparagraph
10 (A), by striking “2026” and inserting “2028”;
11 and

12 (B) in subparagraph (B), by striking
13 “1,200,000,000” and inserting
14 “\$1,100,000,000”; and

15 (2) in subsection (6)—

16 (A) in the matter preceding subparagraph
17 (A), by striking “2026” and inserting “2028”;

18 (B) in subparagraph (A), by striking
19 “600,000,000” and inserting “\$445,000,000”;

20 (C) in subparagraph (B)—

21 (i) by striking “200,000,000” and in-
22 serting “\$100,000,000”; and

23 (ii) by striking “and” after the semi-
24 colon;

25 (D) in subparagraph (C)—

- 1 (i) by striking “1,000,000,000” and
2 inserting “\$900,000,000”; and
3 (ii) by striking the period and insert-
4 ing “; and”; and
5 (E) by adding at the end the following new
6 subparagraph:
7 “(D) \$445,000,000 to carry out pipeline
8 research, development, demonstration, and com-
9 mercial application activities.”.