

117TH CONGRESS
1ST SESSION

H. R. 2821

To provide for a coordinated Federal program to accelerate plastics waste reduction and support recycling research and development for the economic and national security of the United States, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

APRIL 22, 2021

Ms. STEVENS (for herself, Mr. GONZALEZ of Ohio, Ms. JOHNSON of Texas, and Mr. LUCAS) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

A BILL

To provide for a coordinated Federal program to accelerate plastics waste reduction and support recycling research and development for the economic and national security of the United States, 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 “Plastic Waste Reduc-

5 tion and Recycling Research Act”.

6 **SEC. 2. FINDINGS.**

7 Congress makes the following findings:

1 (1) It is estimated that global production of
2 plastic has increased from 2,000,000 tons of plastic
3 per year in 1950 to 400,000,000 tons per year
4 today, and of the 8.3 billion metric tons of plastic
5 ever produced globally, 6.3 billion metric tons has
6 become plastic waste.

7 (2) The United States has failed to invest in
8 the development of domestic recycling markets, tech-
9 nology and materials to make the recycling process
10 more available and efficient, and as a result, the
11 United States recycles only 9 percent of its plastic
12 waste.

13 (3) For more than 2 decades, the United States
14 and other developed nations sold and exported
15 106,000,000 metric tons of recyclable plastics to
16 China, but in 2018 China issued a ban on contami-
17 nated United States plastics.

18 (4) Following the 2018 China ban, more and
19 more United States communities are sending recy-
20 clable items to landfills or incinerators.

21 (5) As recycling programs have moved toward
22 single-stream curbside recycling, more recyclable
23 items are mixed with non-recyclable items, resulting
24 in fewer potentially recyclable items actually being
25 recycled and turned into new, valuable products.

1 (6) The resin identification coding system in
2 use today has not been substantially updated since
3 its creation in 1988.

4 (7) Characterizing the type and recyclability of
5 different types of plastics in use today requires up-
6 dated standards.

7 (8) Separating and processing the many dif-
8 ferent types of plastics as well as the heterogenous
9 materials containing multiple layers of different
10 plastic types commonly in use today will require new
11 sorting and recycling technologies.

12 (9) There are currently limited private or public
13 investments in research and development to improve
14 plastic waste reduction, recycling technologies, or
15 other technologies and processes to reduce the
16 amount and impact of plastic waste.

17 (10) The Federal Government can play an im-
18 portant role in supporting research and development
19 and facilitating standards, tools, and technologies
20 needed across the different stages of the plastics
21 production and recycling ecosystem.

22 **SEC. 3. DEFINITIONS.**

23 In this Act:

1 (1) COMMITTEE.—The term “Committee”
2 means the Interagency Committee established or
3 designated under section 5.

4 (2) DIRECTOR.—The term “Director” means
5 the Director of the Office of Science and Technology
6 Policy.

7 (3) PARTICIPATING AGENCIES.—The term
8 “participating agencies” means the agencies under
9 section 5(c).

10 (4) PROGRAM.—The term “Program” means
11 the Plastic Waste Reduction and Recycling Research
12 Program established under section 4.

13 (5) MARINE DEBRIS.—The term “marine de-
14 bris” has the meaning provided in the Marine De-
15 bris Act (33 U.S.C. 1956).

16 **SEC. 4. PLASTIC WASTE REDUCTION AND RECYCLING RE-**
17 **SEARCH PROGRAM.**

18 (a) ESTABLISHMENT; PURPOSES.—The Director,
19 acting through the Committee and each of the partici-
20 pating agencies, shall establish and implement a program
21 to be known as the “Plastic Waste Reduction and Recy-
22 cling Research Program”. The purposes of the Program
23 shall be to—

24 (1) improve the global competitiveness of the
25 United States plastics recycling industry;

1 (2) ensure United States leadership in plastic
2 waste reduction, reuse, and recycling research and
3 innovation;

4 (3) support United States leadership in the de-
5 velopment of national and international standards
6 for sustainable plastics design and plastic recycling
7 infrastructure, technologies and processes; and

8 (4) mitigate any harmful effects of plastic waste
9 and plastic waste recycling on the environment.

10 (b) PROGRAM ACTIVITIES.—In carrying out the Pro-
11 gram, the Director, acting through the Committee and
12 each of the participating agencies, shall carry out activities
13 that include the following:

14 (1) Supporting research, development, and dem-
15 onstration of plastics technologies optimized for
16 recyclability, plastics recycling technologies, plastic
17 reusability, bio-based plastics, biodegradable plastics,
18 remediation, including bioremediation of plastic
19 waste, recyclability and remediation of plastic-based
20 textiles, and environmental impacts of plastic waste.

21 (2) Supporting and facilitating public-private
22 partnerships to leverage knowledge and resources to
23 accelerate research, development, and demonstration
24 in plastic waste reduction, including plastics recy-
25 cling, plastics reusability, plastic waste remediation

1 and other areas consistent with the purposes of this
2 Act.

3 (3) Interagency planning and coordination of
4 Federal research and development of plastic waste
5 reduction and recycling technologies and plastic
6 waste remediation.

7 (4) Promoting research collaboration with inter-
8 national partners, as appropriate.

9 **SEC. 5. COORDINATION BY INTERAGENCY COMMITTEE.**

10 (a) INTERAGENCY COMMITTEE.—Not later than 180
11 days after the date of enactment of this Act, the Director,
12 acting through the National Science and Technology
13 Council, shall establish or designate an Interagency Com-
14 mittee to coordinate Federal programs and activities in
15 support of plastic waste reduction and recycling and plas-
16 tic waste remediation research and development under the
17 Program.

18 (b) CO-CHAIRS.—The Committee shall be co-chaired
19 by the Director of the Office of Science and Technology
20 Policy or designee and a representative from an agency
21 participating in the Committee, as selected by the Director
22 of the Office of Science and Technology Policy.

23 (c) AGENCY PARTICIPATION.—The Committee shall
24 include representatives from—

1 (1) the National Institute of Standards and
2 Technology;

3 (2) the National Science Foundation;

4 (3) the Department of Energy;

5 (4) the Environmental Protection Agency;

6 (5) the Department of Transportation;

7 (6) the National Oceanic and Atmospheric Ad-
8 ministration;

9 (7) the Department of Agriculture; and

10 (8) any other Federal agency as considered ap-
11 propriate by the Director of the Office of Science
12 and Technology Policy.

13 (d) RESPONSIBILITIES.—The Committee shall—

14 (1) provide for interagency coordination of Fed-
15 eral plastics reduction and recycling and plastic
16 waste remediation research, development, and dem-
17 onstration, standards development, and education
18 and training activities and programs of Federal de-
19 partments and agencies undertaken pursuant to the
20 Program;

21 (2) develop definitions for the following terms
22 to guide the activities of the Program—

23 (A) recycle;

24 (B) recyclability;

25 (C) remediation;

- 1 (D) advanced recycling;
- 2 (E) advanced plastics;
- 3 (F) biobased plastics;
- 4 (G) biodegradable plastics;
- 5 (H) microplastic;
- 6 (I) nanoplastic; and
- 7 (J) pyroplastic;

8 (3) develop and update every 3 years a strategic
9 plan, to be made publicly available, for plastic waste
10 reduction and recycling and plastic waste remedi-
11 ation that—

12 (A) establishes goals, priorities, and
13 metrics for guiding and evaluating the activities
14 of the Program; and

15 (B) describes—

16 (i) how the Program will determine
17 and prioritize areas of plastic waste reduc-
18 tion and recycling and plastic waste reme-
19 diation for Federal research investments;

20 (ii) the Program's support for long-
21 term funding for interdisciplinary plastic
22 waste reduction and recycling research, de-
23 velopment, demonstration, standards devel-
24 opment, education, and public outreach ac-
25 tivities;

(iii) how Federal agencies participating in the Program will collaborate with industry and with local governments, as appropriate; and

(iv) how the program will help move the results of research out of the laboratory and into commercial or municipal application; and

(C) with respect to the previous 3 years, provides a summary of—

(i) federally funded plastic waste reduction and recycling and plastic waste remediation research, development, and demonstration;

(ii) the adoption of improved plastic waste reduction and recycling technologies by Federal, State, and local governments and private entities; and

(iii) other related activities for the previous 3 years; and

(4) consider input from universities, State and local governments, scientific societies, and public, private and nonprofit plastic recycling manufacturers and organizations in the development of the

1 goals, priorities and metrics required under para-
2 graph (3)(A).

3 (e) TERMINATION.—The Interagency Committee
4 shall terminate 10 years after the date on which the Com-
5 mittee is established under subsection (a).

6 **SEC. 6. NATIONAL INSTITUTE OF STANDARDS AND TECH-**
7 **NOLOGY.**

8 As part of the Program, the Director of National In-
9 stitute of Standards and Technology shall—

10 (1) establish a science program for character-
11 ization of plastic properties before, during, and after
12 recycling and manufacturing, development of classi-
13 fication systems, and creation of new data tools,
14 techniques, and processes to advance plastics engi-
15 neering and post-consumer plastic recycling and
16 manufacturing;

17 (2) develop innovations for effective and effi-
18 cient measures for processing plastics, including
19 films and textiles, collected for recycling, while con-
20 sidering existing waste streams and future new ma-
21 terials;

22 (3) provide the metrology basis for standards
23 development for plastic sorting infrastructure, proc-
24 essing technologies, classification systems, including
25 for biobased plastics, and recycling by design;

1 (4) develop a clearinghouse to collect and sup-
2 port dissemination of tools, guidelines and standards
3 developed under this section;

4 (5) consult with appropriate stakeholder groups
5 to promote adoption and implementation of such
6 guidelines and standards, including diverse manufac-
7 turing and industry groups, such as packaging, in-
8 cluding food packaging, agriculture, transportation,
9 textile and fashion;

10 (6) support plastics recycling research collabo-
11 ration and coordinate standards development, as ap-
12 propriate, with other agencies, State and local gov-
13 ernments, nonprofit organizations, academia, private
14 sector, and international partners; and

15 (7) establish a program for measurements,
16 methods and standards to assess the environmental
17 impacts of plastics waste, including marine debris,
18 and plastic particles and fibers.

19 **SEC. 7. NATIONAL SCIENCE FOUNDATION.**

20 As part of the Program, the National Science Foun-
21 dation shall—

22 (1) support multidisciplinary basic research on
23 advanced plastics that are designed for recyclability
24 or biodegradation, on plastic waste remediation, on
25 improving recycling technologies for different plas-

1 tics, and on composting and compostable plastics,
2 and on plastic waste valorization;

3 (2) support multidisciplinary research on the
4 environmental and biological effects of plastic waste,
5 and particularly the formation, transport and bio-
6 accumulation of nano- and micro-plastics relevant to
7 plastics recycling and plastic waste remediation;

8 (3) support research on social, behavioral, and
9 economic barriers to the plastic recycling system and
10 development, adoption, and expansion of plastic re-
11 cycling;

12 (4) support, as appropriate, development of
13 interdisciplinary undergraduate and graduate cur-
14 riculum and instructional materials relevant to plas-
15 tics recycling and plastic waste remediation;

16 (5) support research experiences for under-
17 graduate students relevant to plastics recycling and
18 plastic waste remediation; and

19 (6) support plastics recycling research collabo-
20 rations, as appropriate, with other agencies, State
21 and local governments, nonprofit organizations, aca-
22 demia, private sector, and international partners.

23 **SEC. 8. DEPARTMENT OF ENERGY.**

24 As part of the Program, the Secretary of Energy
25 shall—

1 (1) support integrated research, development,
2 and demonstration of—

3 (A) chemical and bio-inspired plastic recycling,
4 including research on the potential environmental
5 impact of chemical recycling technologies;
6

7 (B) advanced plastic synthesis;

8 (C) plastic waste remediation;

9 (D) recyclability-by-design;

10 (E) systems-level strategies for improved
11 plastics separation and recovery; and

12 (F) upcycling of recycled plastics into new
13 high-value plastics, including for food-grade
14 packaging and advanced manufacturing applications;
15

16 (2) coordinate research efforts funded through
17 existing programs across the Department of Energy,
18 including the National Laboratories and relevant
19 Manufacturing USA Institutes under section 34 of
20 the National Institute of Standards and Technology
21 Act (15 U.S.C. 278s); and

22 (3) support plastics recycling research collaborations,
23 as appropriate, with other agencies, State
24 and local governments, nonprofit organizations, academia,
25 private sector, and international partners.

1 **SEC. 9. ENVIRONMENTAL PROTECTION AGENCY.**

2 As part of the Program, the Administrator of the En-
3 vironmental Protection Agency shall—

4 (1) conduct and support research, development,
5 and demonstration of innovative plastic waste man-
6 agement solutions, including reduction, reuse, recy-
7 cling, recovery, composting infrastructure for bio-
8 based plastics, composting infrastructure for separa-
9 tion and removal of contamination from plastic
10 waste, and prevention of plastics, including micro-
11 plastics, nanoplastics, and pyroplastics, from enter-
12 ing the air, soil, oceans, and waterways;

13 (2) support and conduct research and analysis
14 on the public health impacts of airborne and water-
15 borne microplastics, nanoplastics, and pyroplastics,
16 including research on routes of exposure, estimates
17 of exposure in different populations, and toxicity as-
18 sessments on animal and aquatic health, including
19 the food chain; and

20 (3) support plastics recycling research collabo-
21 rations, as appropriate, with other agencies, State
22 and local governments, nonprofit organizations, aca-
23 demia, private sector, and international partners.

1 **SEC. 10. NATIONAL OCEANIC AND ATMOSPHERIC ADMINIS-**
2 **TRATION.**

3 As part of the Program, the Administrator of the Na-
4 tional Oceanic and Atmospheric Administration shall—

5 (1) conduct and support research, data collec-
6 tion, and analysis of plastic marine debris and ocean
7 plastic pollution generation and sources, including
8 microplastics, nanoplastics, and pyroplastics;

9 (2) support research and analysis on the health
10 impacts of oceanic microplastics on marine animal
11 health, including the food chain; and

12 (3) support ocean plastic research collabora-
13 tions, as appropriate, with other agencies, State and
14 local governments, nonprofit organizations, aca-
15 demia, private sector, and international partners.

16 **SEC. 11. COMPTROLLER GENERAL REPORT.**

17 Not later than 2 years after the strategic plan re-
18 quired by section 5(d)(3) is first issued, the Comptroller
19 General shall submit a report to Congress that assesses
20 the implementation of the strategic plan by the Committee
21 and participating agencies.

22 **SEC. 12. AUTHORIZATIONS.**

23 There is authorized to be appropriated to carry out
24 activities under this Act—

25 (1) to the National Institute of Standards and
26 Technology—

- 1 (A) \$10,000,000 for fiscal year 2022;
- 2 (B) \$10,650,000 for fiscal year 2023;
- 3 (C) \$11,342,000 for fiscal year 2024;
- 4 (D) \$12,079,000 for fiscal year 2025; and
- 5 (E) \$12,865,000 for fiscal year 2026;

6 (2) to the National Science Foundation—

- 7 (A) \$30,000,000 for fiscal year 2022;
- 8 (B) \$31,950,000 for fiscal year 2023;
- 9 (C) \$34,027,000 for fiscal year 2024;
- 10 (D) \$36,328,000 for fiscal year 2025; and
- 11 (E) \$38,594,000 for fiscal year 2026;

12 (3) to the Department of Energy—

- 13 (A) \$25,000,000 for fiscal year 2022;
- 14 (B) \$26,625,000 for fiscal year 2023;
- 15 (C) \$28,356,000 for fiscal year 2024;
- 16 (D) \$30,199,000 for fiscal year 2025; and
- 17 (E) \$32,162,000 for fiscal year 2026;

18 (4) to the Environmental Protection Agency—

- 19 (A) \$10,000,000 for fiscal year 2022;
- 20 (B) \$10,650,000 for fiscal year 2023;
- 21 (C) \$11,342,000 for fiscal year 2024;
- 22 (D) \$12,079,000 for fiscal year 2025; and
- 23 (E) \$12,865,000 for fiscal year 2026; and

24 (5) to the National Oceanic and Atmospheric
25 Administration—

- 1 (A) \$10,000,000 for fiscal year 2022;
- 2 (B) \$10,650,000 for fiscal year 2023;
- 3 (C) \$11,342,000 for fiscal year 2024;
- 4 (D) \$12,079,000 for fiscal year 2025; and
- 5 (E) \$12,865,000 for fiscal year 2026.

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