

[DISCUSSION DRAFT]

118TH CONGRESS
2D SESSION

H. R. _____

To require the Administrator of the National Oceanic and Atmospheric Administration, in coordination with the Secretary of Energy, to establish a marine carbon dioxide removal and verification, research and development, and demonstration program, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

M. _____ introduced the following bill; which was referred to the
Committee on _____

A BILL

To require the Administrator of the National Oceanic and Atmospheric Administration, in coordination with the Secretary of Energy, to establish a marine carbon dioxide removal and verification, research and development, and demonstration program, 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 “Marine Carbon Dioxide
5 Removal Research and Development Act of 2024”.

1 **SEC. 2. DEFINITIONS.**

2 In this Act:

3 (1) ADMINISTRATOR.—The term “Adminis-
4 trator” means the Administrator of the National
5 Oceanic and Atmospheric Administration.

6 (2) APPROPRIATE COMMITTEES OF CON-
7 GRESS.—The term “appropriate committees of Con-
8 gress” means the following:

9 (A) The Committee on Science, Space, and
10 Technology of the House of Representatives.

11 (B) The Committee on Natural Resources
12 of the House of Representatives.

13 (C) The Committee on Commerce, Science,
14 and Transportation of the Senate.

15 (D) The Committee on Energy and Nat-
16 ural Resources of the Senate.

17 (3) DIRECTOR.—The term “Director” means
18 the Director of the Office of Science and Technology
19 Policy.

20 (4) INDIAN TRIBE.—The term “Indian Tribe”
21 has the meaning given such term in section 4 of the
22 Indian Self-Determination and Education Assistance
23 Act (25 U.S.C. 5304).

24 (5) MARINE CARBON DIOXIDE REMOVAL.—The
25 term “marine carbon dioxide removal” (commonly
26 referred to as “ocean-based carbon dioxide re-

1 (A) Establish the goals, priorities, and
2 metrics for a plan to accelerate research, devel-
3 opment, and short-, medium-, and long-term
4 demonstration of marine carbon dioxide removal
5 in the United States.

6 (B) Support Federal marine carbon dioxide
7 removal research, development, demonstration,
8 and commercial application activities, to achieve
9 the goals, priorities, and metrics established
10 pursuant to subparagraph (A).

11 (C) Partner with industry, universities,
12 and other entities as the Administrator deter-
13 mines appropriate to leverage knowledge and
14 resources.

15 (D) Support activities to develop a marine
16 carbon dioxide removal and measurement, mon-
17 itoring, reporting, and verification science, tech-
18 nology, and engineering workforce pipeline.

19 (E) Develop ecosystem impact assessments
20 to understand the effects on marine ecosystems,
21 including culturally and economically significant
22 species, of marine carbon dioxide removal.

23 (F) Oversee measurement, monitoring, re-
24 porting, and verification of marine carbon diox-

1 ide removal approaches undertaken by research-
2 ers or other entities pursuant to this Act.

3 (G) Assess the ability of marine carbon di-
4 oxide removal approaches to durably remove
5 carbon dioxide from the atmosphere.

6 (H) Research and develop tools, sensors,
7 and models to collect and represent baseline in-
8 formation on metocean, geotechnical, geo-
9 physical, and biological conditions in marine en-
10 vironments that can effectively demonstrate du-
11 rable carbon dioxide storage.

12 (I) Conduct lifecycle assessments of atmos-
13 pheric carbon dioxide removed by a marine car-
14 bon dioxide removal approach specified in sub-
15 section (c).

16 (J) Conduct research to establish potential
17 environmental responses to marine carbon diox-
18 ide removal projects, and provide a detailed risk
19 assessment of potential harms.

20 (K) Develop advanced materials capable of
21 enduring harsh environmental conditions.

22 (L) Develop tools or mechanisms to avoid
23 or minimize conflicts or create synergies be-
24 tween marine carbon dioxide removal research,

1 development, demonstration, and commercial
2 application activities and other ocean uses.

3 (M) Avoid conflicts with or harm to exist-
4 ing marine protected areas.

5 (N) Avoid or minimize any adverse impacts
6 of marine carbon dioxide removal research, de-
7 velopment, demonstration, and commercial ap-
8 plication activities on coastal communities, In-
9 dian Tribes, and Native Hawaiian communities,
10 and maximize the participation of such commu-
11 nities and Indian Tribes in such activities with
12 co-design principles.

13 (O) Develop education and outreach mate-
14 rials to engage with the public on the benefits
15 and risks of marine carbon dioxide removal.

16 (P) Require each recipient of Program
17 funding to certify such recipient understands
18 and will follow the research and development
19 Code of Conduct developed under section 4(d).

20 (Q) Establish a unified marine carbon di-
21 oxide removal data management strategy to en-
22 sure data collected pursuant to this Act are
23 safeguarded and made findable and accessible
24 for subsequent research and decision-making
25 pursuant to subchapter II of chapter 3 of part

1 I of title 5, United States Code, and preserve
2 and curate such data and metadata in accord-
3 ance with chapter 31 of title 44, United States
4 Code.

5 (2) DOE.—In carrying out the Program, the
6 Secretary shall carry out the following:

7 (A) Designate the Office of Fossil Energy
8 and Carbon Management of the Department of
9 Energy to coordinate with the Biological and
10 Environmental Research Program of the Office
11 of Science of the Department, and other offices
12 of the Department, to ensure the efficient ex-
13 change of information, research, and resources
14 regarding marine carbon dioxide removal.

15 (B) Support, coordinate with, and augment
16 the ability of the Administrator to carry out the
17 activities described in paragraph (1).

18 (C) Leverage existing Department invest-
19 ments efficiently to advance Program goals and
20 priorities established under paragraph (1).

21 (c) MARINE CARBON DIOXIDE REMOVAL AP-
22 PROACHES SPECIFIED.—Marine carbon dioxide removal
23 approaches specified in this subsection may include the
24 following:

25 (1) Nutrient fertilization.

1 (2) Ocean alkalinity enhancement.

2 (3) Electrochemical engineering methods, such
3 as direct ocean capture.

4 (4) Artificial upwelling and downwelling.

5 (d) INTERAGENCY COORDINATION.—In carrying out
6 the Program, the Administrator and the Secretary shall
7 coordinate with the heads or appropriate designees of the
8 following Federal departments and agencies:

9 (1) The Department of Defense.

10 (2) The Department of Interior.

11 (3) The Department of State.

12 (4) The Environmental Protection Agency.

13 (5) The National Aeronautics and Space Ad-
14 ministration.

15 (6) The National Institute of Standards and
16 Technology.

17 (7) The National Science Foundation.

18 (8) The White House Council on Environmental
19 Quality.

20 (9) The White House Office of Science and
21 Technology Policy.

22 (10) Any other Federal department or agency
23 the Administrator determines appropriate.

24 (e) FUNDING.—

1 (1) IN GENERAL.—To carry out the Program,
2 there are authorized to be appropriated to the Ad-
3 ministrator the following:

4 (A) \$24,000,000 for fiscal year 2025.

5 (B) \$30,000,000 for fiscal year 2026.

6 (C) \$35,000,000 for fiscal year 2027.

7 (D) \$40,000,000 for fiscal year 2028.

8 (E) \$50,000,000 for fiscal year 2029.

9 (2) SOURCES.—Funds necessary to carry out
10 the activities of the Program shall be made available
11 each fiscal year from existing funds for—

12 (A) the National Oceanic and Atmospheric
13 Administration, as determined by the Adminis-
14 trator; and

15 (B) the Department of Energy, as deter-
16 mined by the Secretary.

17 **SEC. 4. MARINE CARBON DIOXIDE REMOVAL AND**
18 **VERIFICATION STEERING COMMITTEE.**

19 (a) DESIGNATION.—Not later than 180 days after
20 the date of the enactment of this Act, the Director shall
21 establish a Steering Committee on marine carbon dioxide
22 removal and verification research and development (in this
23 section referred to as the “Steering Committee”) in ac-
24 cordance with chapter 10 of title 5, United States Code
25 (commonly referred to as the “Federal Advisory Com-

1 mittee Act’). The Steering Committee shall be responsible
2 for advising the Program.

3 (b) COMPOSITION AND STAFF.—

4 (1) IN GENERAL.—The Director may appoint,
5 and assign duties to, a Chair and such other full-
6 and part-time administrative employees of the Steer-
7 ing Committee as the Director determines necessary
8 to the performance of the Steering Committee’s
9 functions.

10 (2) MEMBERSHIP.—The Steering Committee
11 shall consist of not more than 15 members ap-
12 pointed by the Director—

13 (A) who are representatives of industry,
14 universities, Federal laboratories, or nonprofit
15 organizations, and who are qualified to provide
16 advice and information on marine carbon diox-
17 ide removal;

18 (B) from Indian Tribes or Native Hawai-
19 ian communities with expertise on coastal com-
20 munity concerns and needs related to marine
21 carbon dioxide removal; and

22 (C) with expertise in relevant social dis-
23 ciplines related to marine carbon dioxide re-
24 moval.

1 (3) GEOGRAPHIC REPRESENTATION.—To the
2 maximum extent practicable, the Director shall en-
3 sure Steering Committee members represent an ap-
4 propriate balance of geographic interests.

5 (c) TRANSACTION OF BUSINESS.—

6 (1) QUORUM.—A majority of members of the
7 Steering Committee shall constitute a quorum, but
8 one or more such members may hold hearings.

9 (2) DECISION-MAKING.—All decisions of the
10 Steering Committee shall be by majority vote of
11 members present, in person or via live video partici-
12 pation.

13 (3) MEETINGS.—The Steering Committee shall
14 meet at appropriate times and at the call of the
15 Chair or upon the request of a majority of its mem-
16 bers.

17 (d) ESTABLISHMENT OF NATIONAL RESEARCH
18 PLAN.—

19 (1) IN GENERAL.—The Steering Committee, in
20 consultation with each Marine Carbon Dioxide Re-
21 moval and Verification Research Center established
22 pursuant to section 5, shall develop and periodically
23 update a National Research Plan for research, devel-
24 opment, testing, evaluation, and demonstration of

1 marine carbon dioxide removal, and shall carry out
2 the following:

3 (A) Assess the current understanding of
4 marine carbon dioxide removal, the role such
5 activities could play in reducing atmospheric
6 carbon dioxide concentrations, reducing pres-
7 sures on land-based carbon capture approaches,
8 and any environmental, social, economic, or
9 other benefits or risks resulting from the ad-
10 vancement and scale-up of such activities.

11 (B) Develop a comprehensive Code of Con-
12 duct to ensure the impacts of research activities
13 are understood and accounted for as such ac-
14 tivities progress.

15 (C) Describe research pathways that
16 progress from theory to field testing, including
17 laboratory, mesocosm, and modeling research
18 that describes when field tests are appropriate.

19 (D) Establish a working definition of the
20 threshold mass of carbon dioxide removal that
21 delineates between demonstration and deploy-
22 ment of marine carbon dioxide removal.

23 (E) Assess freshwater environments, in-
24 cluding the Great Lakes, for the suitability and
25 scalability of marine carbon dioxide removal.

1 (F) Establish performance-based criteria
2 for prioritizing resources to support marine car-
3 bon dioxide removal activities that show the
4 most promise in terms of efficacy, scalability,
5 and safety, among other relevant factors.

6 (G) Report on the most current state of
7 knowledge for any marine carbon dioxide re-
8 moval approach investigated under the Pro-
9 gram, including relating to the following:

10 (i) Lifecycle net carbon dioxide re-
11 moval from the atmosphere and expected
12 duration of storage.

13 (ii) The scalability and cost per ton of
14 carbon dioxide removed from the atmos-
15 phere.

16 (iii) The potential co-benefits.

17 (iv) The potential environmental, eco-
18 logical, or societal impacts.

19 (H) Include an updated summary of feder-
20 ally funded marine carbon dioxide removal, re-
21 search, and development, demonstration, and
22 commercial application activities.

23 (2) ENVIRONMENTAL ASSESSMENTS.—The Na-
24 tional Research Plan under paragraph (1) shall in-
25 clude environmental assessments of the following lo-

1 cations to serve as potential marine carbon dioxide
2 removal research zones for specific approaches:

3 (A) Any network of existing regional ma-
4 rine research facilities suitable for marine car-
5 bon dioxide removal research and development.

6 (B) Naval test ranges and other military
7 installations and facilities of the Department of
8 Defense.

9 (C) Wind energy areas and decommis-
10 sioned oil platforms designated by the Depart-
11 ment of the Interior.

12 (D) Desalination plants, hydropower
13 plants, and waterpower areas designated by the
14 Department of Energy or other Federal depart-
15 ments or agencies.

16 (E) Wave energy sources, ocean thermal
17 energy sources, floating solar energy sources,
18 and other relevant energy sources, to meet the
19 energy needs of marine carbon dioxide removal.

20 (F) Farms for bivalves, crustaceans, or
21 other shell builders, as well as coral reefs, that
22 could biologically benefit from increased ocean
23 alkalinity.

24 (G) Such other locations the Steering
25 Committee considers appropriate.

1 (3) CONSIDERATION.—In assessing the suit-
2 ability of locations for marine carbon dioxide re-
3 moval research zones under paragraph (2) for the
4 National Research Plan under paragraph (1), the
5 Steering Committee shall consider the following fac-
6 tors:

7 (A) The potential for research projects in
8 the location proposed to enhance scientific un-
9 derstanding of carbon dioxide removal.

10 (B) The environmental and social effects of
11 designating such location as a marine carbon
12 dioxide removal research zone.

13 (C) The extent to which any effects identi-
14 fied by subparagraph (B) could impact Federal,
15 State, local, Tribal, and territorial goals with
16 respect to environmental protection or ecological
17 restoration.

18 (D) The potential impact on nearby marine
19 protected areas.

20 (E) The potential impact on United States
21 military operations and readiness.

22 (F) Such other factors the Steering Com-
23 mittee considers appropriate.

24 (e) COLLABORATION.—

1 (1) IN GENERAL.—The Steering Committee
2 shall collaborate with the following entities in devel-
3 oping the National Research Plan under subsection
4 (d):

5 (A) Each Marine Carbon Dioxide Removal
6 and Verification Research Center established
7 pursuant to section 5.

8 (B) The Program and all Federal depart-
9 ments and agencies associated with the Pro-
10 gram, including the Federal departments and
11 agencies specified in section 3(d).

12 (2) INCORPORATION.—To the greatest extent
13 practicable, the Steering Committee shall incor-
14 porate findings from relevant interagency working
15 groups, task forces, research programs, or similar
16 bodies into the National Research Plan under sub-
17 section (d).

18 (f) REPORT TO CONGRESS.—Not later than one year
19 after the date of the enactment of this Act and every five
20 years thereafter until 2035, the Steering Committee shall
21 submit the National Research Plan and subsequent up-
22 dates to the appropriate committees of Congress.

1 **SEC. 5. MARINE CARBON DIOXIDE REMOVAL AND**
2 **VERIFICATION RESEARCH CENTER.**

3 (a) ESTABLISHMENT.—The Secretary, in collabora-
4 tion with the Administrator, shall, through a competitive,
5 merit-reviewed process, establish at least one, but not
6 more than five, Centers, each to be known as a “Marine
7 Carbon Dioxide Removal Research and Verification Cen-
8 ter” (in this section referred to as a “Center”), to accel-
9 erate research, development, demonstration, and commer-
10 cial application activities of marine carbon dioxide removal
11 that best advance the priorities of the Program.

12 (b) CONSIDERATION.—In consideration of establish-
13 ment of a Center, the Secretary—

14 (1) shall consider applications from institutions
15 of higher education, research centers, multi-institu-
16 tional collaborations, and any other entity the Sec-
17 retary determines appropriate; and

18 (2) may consider applications from entities co-
19 located with marine energy test centers while avoid-
20 ing duplication.

21 (c) COORDINATION.—The Secretary shall avoid un-
22 necessary duplication of existing marine carbon dioxide re-
23 moval research and development activities of the Depart-
24 ment of Energy, the National Oceanic and Atmospheric
25 Administration, the Environmental Protection Agency,
26 and other related programs, as appropriate.

1 (d) DURATION.—The Secretary shall establish each
2 Center to carry out activities for a period of five years.
3 The Secretary may renew each Center for an additional
4 subsequent period of five years following a merit-based re-
5 view.

6 (e) REQUIREMENTS.—Each Center shall carry out
7 the following:

8 (1) Attract and pool funding, infrastructure,
9 knowledge, and multidisciplinary expertise to make
10 efficient use of resources.

11 (2) Promote the discovery of synergies, such as
12 with desalination, ocean energy, and wastewater
13 treatment, among other relevant factors.

14 (3) Establish relationships with communities
15 and organizations located near research zones, to en-
16 able such communities and organizations to benefit
17 from innovation, workforce capacity building efforts,
18 and job creation resulting from marine carbon diox-
19 ide removal.

20 (4) Integrate social science into marine carbon
21 dioxide removal research and development.

22 (5) Oversee any other activities under the Pro-
23 gram that promote the advancement of marine car-
24 bon dioxide removal.

25 (f) FUNDING.—

1 (1) IN GENERAL.—There are authorized to be
2 appropriated to the Secretary up to \$5,000,000 for
3 each Center established pursuant to this section for
4 each of fiscal years 2025 through 2029 to carry out
5 this section.

6 (2) SOURCE.—Amounts made available to carry
7 out this section shall be derived from amounts ap-
8 propriated or otherwise made available to the De-
9 partment of Energy.

10 **SEC. 6. INTERNATIONAL COOPERATION.**

11 (a) IN GENERAL.—The Administrator, in consulta-
12 tion with the Secretary of State, shall seek effective inter-
13 national action and cooperation to facilitate global meas-
14 urement, monitoring, reporting, and verification of marine
15 carbon dioxide removal and ensure scientifically sound,
16 safe, and responsible research.

17 (b) RESEARCH AND DEVELOPMENT.—The Adminis-
18 trator, in consultation with the Secretary of State, may,
19 in carrying out subsection (a), formulate, present, or sup-
20 port specific proposals in the United Nations or inter-
21 national organizations for the development of appropriate
22 international research and development programs in sup-
23 port of this Act.