

115TH CONGRESS  
1ST SESSION

# H. R. 4586

To provide for the National Academies to study and report on a research agenda to advance the understanding of albedo modification strategies, and for other purposes.

---

## IN THE HOUSE OF REPRESENTATIVES

DECEMBER 7, 2017

Mr. MCNERNEY (for himself and Ms. EDDIE BERNICE JOHNSON of Texas) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

---

## A BILL

To provide for the National Academies to study and report on a research agenda to advance the understanding of albedo modification strategies, 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 “Geoengineering Re-  
5 search Evaluation Act of 2017”.

6 **SEC. 2. FINDINGS.**

7 Congress finds the following:

8 (1) Many significant scientific studies have con-  
9 cluded that the climate is changing. The Fifth As-

1        assessment Report of the Intergovernmental Panel on  
2        Climate Change found that even under the most  
3        stringent carbon constrained scenario, mean global  
4        surface temperature will still increase.

5            (2) If unmitigated, continued rises in tempera-  
6        ture will have severe impacts on human health, the  
7        global economy, and United States national security,  
8        damaging both earth and human systems.

9            (3) Cutting carbon pollution is still the best  
10       way to mitigate climate change because it prevents  
11       further global temperature rise, whereas climate  
12       intervention is a higher risk reaction to already ele-  
13       vated greenhouse gas levels.

14           (4) However, the United States and other na-  
15       tions may also need to consider climate intervention  
16       strategies, beginning with carbon dioxide removal  
17       and sequestration, including biological sequestration,  
18       and potentially extending to albedo modification.

19           (5) In 2015, the National Academies published  
20       two reports that outline the research needs and eth-  
21       ical questions for climate intervention, addressing  
22       carbon dioxide removal and sequestration and albedo  
23       modification. These reports found that currently  
24       there is insufficient information to effectively evalu-

1       ate, let alone deploy, strategies for large-scale cli-  
2       mate interventions.

3               (6) Many carbon dioxide removal options are  
4       relatively low risk and effective, but they are cur-  
5       rently limited by cost and lack of technical maturity,  
6       and some may have significant local environmental  
7       impacts. Albedo modification shows evidence of  
8       being temporarily effective at cooling the planet, but  
9       at a currently unknown cost to and impact on the  
10      environment.

11              (7) The Academies' reports recommended in-  
12      vesting in the research and development of methods  
13      of carbon dioxide removal and disposal at scales that  
14      would impact the climate. They also recommended  
15      the development and implementation of a dedicated  
16      albedo modification research program that furthers  
17      basic climate science, understanding of human inter-  
18      action with the climate system, and improved detec-  
19      tion of changes in radiative forcing.

20              (8) The Academies further recommended the  
21      development of a clear framework for governance of  
22      albedo modification research that would adjust gov-  
23      ernance of specified types of research according to  
24      the magnitude and nature of a project's expected  
25      impact on radiative forcing and climate. Such a

1 structure should ensure transparency in the research  
2 process, extend governance requirements beyond  
3 those of general research, and engage civil society  
4 and other nontraditional stakeholders in decision-  
5 making. Large, high-risk projects should not be im-  
6 plemented without thorough consideration of the  
7 outcomes of smaller-scale, low-risk projects.

8 **SEC. 3. NATIONAL ACADEMIES REPORTS.**

9 (a) PHASE I REPORT; RESEARCH STRATEGY FOR AL-  
10 BEDO MODIFICATION.—

11 (1) IN GENERAL.—Not later than 3 months  
12 after the date of enactment of this Act, the Sec-  
13 retary of Energy, in consultation with the Adminis-  
14 trator of the National Oceanographic and Atmos-  
15 pheric Administration, the Administrator of the Na-  
16 tional Aeronautics and Space Administration, the  
17 Director of the National Science Foundation, the Di-  
18 rector of the National Institute of Standards and  
19 Technology, and other Federal agencies as appro-  
20 priate, shall contract with the National Academies to  
21 conduct a study and develop a report recommending  
22 a research agenda for advancing understanding of  
23 albedo modification strategies that involve atmos-  
24 pheric interventions, including marine cloud bright-

1 ening, stratospheric aerosol albedo modification, and  
2 cirrus cloud modification.

3 (2) REPORT CONTENT.—The report described  
4 in paragraph (1) shall, at a minimum—

5 (A) identify priorities for laboratory stud-  
6 ies, model development and experiments, com-  
7 puting capabilities, process-based studies, small-  
8 scale field experiments, engineering studies, and  
9 long-term, large-scale observations, including  
10 space-based observations;

11 (B) provide guidance on how to define field  
12 experimentation that has a “de minimis” im-  
13 pact; and

14 (C) identify, where relevant, how the rec-  
15 ommended research efforts would provide bene-  
16 fits in advancing other areas of science.

17 (3) TIMELINE.—The Secretary of Energy shall  
18 encourage the National Academies, to the extent  
19 practicable, to complete the Phase I report no later  
20 than 9 months after the date of the execution of the  
21 contract described in paragraph (1).

22 (b) PHASE II REPORT; FRAMEWORK FOR RESEARCH  
23 GOVERNANCE.—

24 (1) IN GENERAL.—No more than 30 days after  
25 completion of the Phase I report described in sub-

1 section (a), the Secretary of Energy, in consultation  
2 with appropriate Federal agencies, shall contract  
3 with the National Academies to conduct a study and  
4 develop a report that provides specific guidance on  
5 governance mechanisms for the proposed albedo  
6 modification research agenda developed in Phase I.  
7 The proposed research governance approaches  
8 should seek to maximize the benefits of research  
9 while minimizing risks.

10 (2) REPORT CONTENT.—The report described  
11 in paragraph (1) shall, at a minimum—

12 (A) take into account legal, ethical, social,  
13 political, economic, and other potentially impor-  
14 tant ramifications of albedo modification re-  
15 search;

16 (B) examine what types of research gov-  
17 ernance, beyond those that already exist, may  
18 be needed for albedo modification research; and

19 (C) identify the types of research that  
20 would require such governance, potentially  
21 based on the magnitude of their expected im-  
22 pact on radiative forcing, their potential for  
23 detrimental direct and indirect effects, and  
24 other considerations.

1           (3) **TIMELINE.**—The Secretary of Energy shall  
2           encourage the National Academies, to the extent  
3           practicable, to complete the Phase II report no later  
4           than 9 months after the date of the execution of the  
5           contract described in paragraph (1).

6           (4) **ADDITIONAL CONSIDERATIONS.**—

7           (A) **LIMITATION.**—The report described in  
8           this subsection shall not address governance for  
9           deployment of albedo modification.

10          (B) **INPUT.**—The Secretary of Energy  
11          shall ensure that the process for the develop-  
12          ment of the report described in this subsection  
13          includes input from civil society organizations  
14          and other relevant stakeholders.

15 **SEC. 4. IMPLEMENTATION PLAN.**

16          Not later than 90 days after completion of the Phase  
17          II report described in section 3(b), the Director of the Of-  
18          fice of Science and Technology Policy, in coordination with  
19          all relevant Federal agencies, shall submit to Congress an  
20          implementation plan for geoengineering research and re-  
21          search governance. In preparing such implementation  
22          plan, the Director shall take into consideration the rec-  
23          ommendations included in the Phase II report and in the  
24          Phase I report described in section 3(a).

1 **SEC. 5. DEFINITION.**

2       In this Act, the term “National Academies” means  
3 the National Academies of Sciences, Engineering, and  
4 Medicine.

○