

116TH CONGRESS
1ST SESSION

S. _____

To establish a cost of greenhouse gases for carbon dioxide, methane, and nitrous oxide to be used by Federal agencies, and for other purposes.

IN THE SENATE OF THE UNITED STATES

Mr. BENNET (for himself, Mr. WHITEHOUSE, Mr. VAN HOLLEN, Ms. HARRIS, Mr. CARDIN, Mrs. FEINSTEIN, Mr. MERKLEY, Mr. WYDEN, Ms. SMITH, Mr. CARPER, Mrs. GILLIBRAND, Ms. HIRONO, Ms. KLOBUCHAR, Mr. SCHATZ, Mr. MARKEY, Mr. HEINRICH, and Ms. CORTEZ MASTO) introduced the following bill; which was read twice and referred to the Committee on _____

A BILL

To establish a cost of greenhouse gases for carbon dioxide, methane, and nitrous oxide to be used by Federal agencies, 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 “Carbon Pollution
5 Transparency Act”.

6 **SEC. 2. FINDINGS.**

7 Congress finds that—

1 (1) sound economic and policy analyses require
2 that the economic benefits of reducing climate
3 change be considered together with the costs of poli-
4 cies and measures to reduce greenhouse gas emis-
5 sions;

6 (2) climate change, if not addressed, is pro-
7 jected to inflict substantial damage on the economy
8 and people of the United States;

9 (3) according to the Congressional Budget Of-
10 fice, the Government Accountability Office, and the
11 Office of Management and Budget, the impacts of
12 climate change are—

13 (A) costing United States taxpayers bil-
14 lions of dollars annually; and

15 (B) putting pressure on the Federal budg-
16 et;

17 (4) the expenditures by the Federal Govern-
18 ment resulting from the effects of climate change
19 are projected to increase, and reducing greenhouse
20 gas emissions presents an opportunity to minimize
21 those expenditures;

22 (5) between calendar years 2008 and 2015, the
23 United States reduced carbon pollution from the en-
24 ergy sector by nearly 10 percent, while the economy
25 grew more than 10 percent;

1 (6) more than 1,200 companies are taking the
2 cost of climate change into consideration in business
3 decisions;

4 (7) estimates of the costs of greenhouse gases
5 provide a method and measure, grounded in sci-
6 entific and economic research, for monetizing—

7 (A) the costs of greenhouse gas emissions;

8 and

9 (B) the benefits of reducing greenhouse
10 gas emissions;

11 (8) the National Academies of Sciences, Engi-
12 neering, and Medicine has provided detailed rec-
13 ommendations for improving the estimate of the
14 costs of greenhouse gases for the purpose of regu-
15 latory analysis;

16 (9) the reduction of greenhouse gas emissions
17 by other countries benefits the United States by re-
18 ducing climate risks to the United States, and the
19 reduction of greenhouse gas emissions by the United
20 States benefits other countries;

21 (10) in light of the global nature of the problem
22 of greenhouse gas emissions, the interests of the
23 United States would be maximized if the United
24 States were to use a calculation method of the cost
25 of climate pollution that reflects global damages;

1 (11) due to the nature of climate change risks,
2 the returns on mitigation may pay off in periods
3 that would otherwise involve substantial losses;

4 (12) economic theory and evidence suggests
5 that, for actions with intergenerational consequences
6 such as the consequences of climate change, a dis-
7 count rate approximately equal to or less than the
8 long-term yield on the debt of the Treasury of the
9 United States may be appropriate; and

10 (13) it is imperative that the academic commu-
11 nity continue research on the cost of greenhouse
12 gases.

13 **SEC. 3. DEFINITIONS.**

14 In this Act:

15 (1) **CALCULATION METHOD.**—The term “cal-
16 culation method” means the method by which the
17 costs of greenhouse gases are calculated in accord-
18 ance with subsections (a), (b), and (c) of section 4,
19 respectively.

20 (2) **COMMITTEE.**—The term “Committee”
21 means the Costs of Greenhouse Gases Scientific Re-
22 view Committee established under section 7(a).

23 (3) **COSTS OF GREENHOUSE GASES.**—

24 (A) **IN GENERAL.**—The term “costs of
25 greenhouse gases” means the monetized present

1 discounted values, in dollars, of the current and
2 future net costs to society that result from—

3 (i) 1 ton of emissions of a specific
4 greenhouse gas in a specific year, includ-
5 ing, but not limited to, damage relating
6 to—

7 (I) a change in net agricultural
8 productivity;

9 (II) energy use;

10 (III) human health;

11 (IV) property damage from in-
12 creased flood risk and sea level rise;
13 and

14 (V) to the maximum extent prac-
15 ticable, the value of the effect on eco-
16 system services due to climate change;
17 and

18 (ii) the monetized present discounted
19 values of the current and future net bene-
20 fits to society from a 1-ton reduction of
21 emissions of a specific greenhouse gas in a
22 specific year, including a reduction in any
23 damage described in clause (i).

24 (B) INCLUSIONS.—The term “costs of
25 greenhouse gases” includes—

- 1 (i) the cost of carbon dioxide;
- 2 (ii) the cost of methane;
- 3 (iii) the cost of nitrous oxide; and
- 4 (iv) the cost of any other greenhouse
- 5 gas estimated by the Working Group.

6 (4) WORKING GROUP.—The term “Working

7 Group” means the Interagency Working Group on

8 the Costs of Greenhouse Gases established under

9 section 5(a).

10 **SEC. 4. COST OF CARBON DIOXIDE, COST OF METHANE,**

11 **AND COST OF NITROUS OXIDE.**

12 (a) COST OF CARBON DIOXIDE.—In developing any

13 rulemaking that requires a regulatory impact analysis,

14 making any substantial procurement decision for which

15 the cost of carbon dioxide is not applied before the date

16 on which a revised version of the costs of greenhouse gases

17 is finalized, the head of any Federal agency shall consider

18 and document the cost of carbon dioxide in accordance

19 with the amounts specified in the following table:

**Cost of Carbon Dioxide, 2010 Through 2050 (in 2007
Dollars per Metric Ton of Carbon Dioxide), Dis-
count Rate and Statistic**

Year	5 Percent Average	3 Percent Average	2.5 Per- cent Av- erage	High Im- pact (95th Percentile at 3 Per- cent Dis- count Rate)
2010	\$10	\$31	\$50	\$86

Cost of Carbon Dioxide, 2010 Through 2050 (in 2007 Dollars per Metric Ton of Carbon Dioxide), Discount Rate and Statistic—Continued

Year	5 Percent Average	3 Percent Average	2.5 Percent Average	High Impact (95th Percentile at 3 Percent Discount Rate)
2011	\$11	\$32	\$51	\$90
2012	\$11	\$33	\$53	\$93
2013	\$11	\$34	\$54	\$97
2014	\$11	\$35	\$55	\$101
2015	\$11	\$36	\$56	\$105
2016	\$11	\$38	\$57	\$108
2017	\$11	\$39	\$59	\$112
2018	\$12	\$40	\$60	\$116
2019	\$12	\$41	\$61	\$120
2020	\$12	\$42	\$62	\$123
2021	\$12	\$42	\$63	\$126
2022	\$13	\$43	\$64	\$129
2023	\$13	\$44	\$65	\$132
2024	\$13	\$45	\$66	\$135
2025	\$14	\$46	\$68	\$138
2026	\$14	\$47	\$69	\$141
2027	\$15	\$48	\$70	\$143
2028	\$15	\$49	\$71	\$146
2029	\$15	\$49	\$72	\$149
2030	\$16	\$50	\$73	\$152
2031	\$16	\$51	\$74	\$155
2032	\$17	\$52	\$75	\$158
2033	\$17	\$53	\$76	\$161

Cost of Carbon Dioxide, 2010 Through 2050 (in 2007 Dollars per Metric Ton of Carbon Dioxide), Discount Rate and Statistic—Continued

Year	5 Percent Average	3 Percent Average	2.5 Percent Average	High Impact (95th Percentile at 3 Percent Discount Rate)
2034	\$18	\$54	\$77	\$164
2035	\$18	\$55	\$78	\$168
2036	\$19	\$56	\$79	\$171
2037	\$19	\$57	\$81	\$174
2038	\$20	\$58	\$82	\$177
2039	\$20	\$59	\$83	\$180
2040	\$21	\$60	\$84	\$183
2041	\$21	\$61	\$85	\$186
2042	\$22	\$61	\$86	\$189
2043	\$22	\$62	\$87	\$192
2044	\$23	\$63	\$88	\$194
2045	\$23	\$64	\$89	\$197
2046	\$24	\$65	\$90	\$200
2047	\$24	\$66	\$92	\$203
2048	\$25	\$67	\$93	\$206
2049	\$25	\$68	\$94	\$209
2050	\$26	\$69	\$95	\$212

1 (b) COST OF METHANE.—In developing any rule-
2 making that requires a regulatory impact analysis, making
3 any substantial procurement decision for which the cost
4 of methane is not applied before the date on which a re-
5 vised version of the costs of greenhouse gases is finalized,

1 the head of any Federal agency shall consider and docu-
 2 ment the cost of methane in accordance with the amounts
 3 specified in the following table:

**Cost of Methane, 2010 Through 2050 (in 2007 Dollars
 per Metric Ton of Methane), Discount Rate and
 Statistic**

Year	5 Percent Average	3 Percent Average	2.5 Per- cent Av- erage	High Im- pact (95th Percentile at 3 Per- cent Dis- count Rate)
2010	\$370	\$870	\$1,200	\$2,400
2011	\$380	\$910	\$1,200	\$2,500
2012	\$400	\$940	\$1,300	\$2,600
2013	\$420	\$970	\$1,300	\$2,700
2014	\$440	\$1,000	\$1,300	\$2,700
2015	\$450	\$1,000	\$1,400	\$2,800
2016	\$470	\$1,100	\$1,400	\$2,900
2017	\$490	\$1,100	\$1,500	\$3,000
2018	\$510	\$1,100	\$1,500	\$3,000
2019	\$520	\$1,200	\$1,500	\$3,100
2020	\$540	\$1,200	\$1,600	\$3,200
2021	\$560	\$1,200	\$1,600	\$3,300
2022	\$590	\$1,300	\$1,700	\$3,400
2023	\$610	\$1,300	\$1,700	\$3,500
2024	\$630	\$1,400	\$1,800	\$3,600
2025	\$650	\$1,400	\$1,800	\$3,700
2026	\$670	\$1,400	\$1,900	\$3,800
2027	\$700	\$1,500	\$1,900	\$3,900
2028	\$720	\$1,500	\$2,000	\$4,000

**Cost of Methane, 2010 Through 2050 (in 2007 Dollars
per Metric Ton of Methane), Discount Rate and
Statistic—Continued**

Year	5 Percent Average	3 Percent Average	2.5 Per- cent Av- erage	High Im- pact (95th Percentile at 3 Per- cent Dis- count Rate)
2029	\$740	\$1,600	\$2,000	\$4,100
2030	\$760	\$1,600	\$2,000	\$4,200
2031	\$790	\$1,600	\$2,100	\$4,300
2032	\$820	\$1,700	\$2,100	\$4,500
2033	\$850	\$1,700	\$2,200	\$4,600
2034	\$880	\$1,800	\$2,200	\$4,700
2035	\$900	\$1,800	\$2,300	\$4,900
2036	\$930	\$1,900	\$2,400	\$5,000
2037	\$960	\$1,900	\$2,400	\$5,100
2038	\$990	\$2,000	\$2,500	\$5,200
2039	\$1,000	\$2,000	\$2,500	\$5,400
2040	\$1,000	\$2,000	\$2,600	\$5,500
2041	\$1,100	\$2,100	\$2,600	\$5,600
2042	\$1,100	\$2,100	\$2,700	\$5,700
2043	\$1,100	\$2,200	\$2,700	\$5,800
2044	\$1,200	\$2,200	\$2,800	\$5,900
2045	\$1,200	\$2,300	\$2,800	\$6,100
2046	\$1,200	\$2,300	\$2,900	\$6,200
2047	\$1,300	\$2,400	\$2,900	\$6,300
2048	\$1,300	\$2,400	\$3,000	\$6,400
2049	\$1,300	\$2,500	\$3,000	\$6,500
2050	\$1,300	\$2,500	\$3,100	\$6,700

1 (c) COST OF NITROUS OXIDE.—In developing any
 2 rulemaking that requires a regulatory impact analysis,
 3 making any substantial procurement decision for which
 4 the cost of nitrous oxide is not applied before the date
 5 on which a revised version of the costs of greenhouse gases
 6 is finalized, the head of any Federal agency shall consider
 7 and document the cost of nitrous oxide in accordance with
 8 the amounts specified in the following table:

**Cost of Nitrous Oxide, 2010 Through 2050 (in 2007
 Dollars per Metric Ton of Nitrous Oxide), Discount
 Rate and Statistic**

Year	5 Percent Average	3 Percent Average	2.5 Percent Average	High Impact (95th Percentile at 3 Percent Discount Rate)
2010	\$3,400	\$12,000	\$18,000	\$31,000
2011	\$3,500	\$12,000	\$18,000	\$32,000
2012	\$3,700	\$12,000	\$19,000	\$33,000
2013	\$3,800	\$13,000	\$19,000	\$34,000
2014	\$3,900	\$13,000	\$20,000	\$34,000
2015	\$4,000	\$13,000	\$20,000	\$35,000
2016	\$4,200	\$14,000	\$20,000	\$36,000
2017	\$4,300	\$14,000	\$21,000	\$37,000
2018	\$4,400	\$14,000	\$21,000	\$38,000
2019	\$4,600	\$15,000	\$22,000	\$38,000
2020	\$4,700	\$15,000	\$22,000	\$39,000
2021	\$4,900	\$15,000	\$23,000	\$40,000
2022	\$5,000	\$16,000	\$23,000	\$41,000
2023	\$5,200	\$16,000	\$23,000	\$42,000

Cost of Nitrous Oxide, 2010 Through 2050 (in 2007 Dollars per Metric Ton of Nitrous Oxide), Discount Rate and Statistic—Continued

Year	5 Percent Average	3 Percent Average	2.5 Percent Average	High Impact (95th Percentile at 3 Percent Discount Rate)
2024	\$5,400	\$16,000	\$24,000	\$43,000
2025	\$5,500	\$17,000	\$24,000	\$44,000
2026	\$5,700	\$17,000	\$25,000	\$45,000
2027	\$5,900	\$17,000	\$25,000	\$46,000
2028	\$6,000	\$18,000	\$26,000	\$47,000
2029	\$6,200	\$18,000	\$26,000	\$48,000
2030	\$6,300	\$19,000	\$27,000	\$49,000
2031	\$6,500	\$19,000	\$27,000	\$50,000
2032	\$6,800	\$19,000	\$28,000	\$51,000
2033	\$7,000	\$20,000	\$28,000	\$52,000
2034	\$7,200	\$20,000	\$29,000	\$54,000
2035	\$7,400	\$21,000	\$29,000	\$55,000
2036	\$7,600	\$21,000	\$30,000	\$56,000
2037	\$7,800	\$21,000	\$30,000	\$57,000
2038	\$8,000	\$22,000	\$31,000	\$58,000
2039	\$8,200	\$22,000	\$31,000	\$59,000
2040	\$8,400	\$23,000	\$32,000	\$60,000
2041	\$8,600	\$23,000	\$32,000	\$61,000
2042	\$8,800	\$23,000	\$33,000	\$62,000
2043	\$9,100	\$24,000	\$33,000	\$64,000
2044	\$9,300	\$24,000	\$34,000	\$65,000
2045	\$9,500	\$25,000	\$34,000	\$66,000
2046	\$9,800	\$25,000	\$35,000	\$67,000

Cost of Nitrous Oxide, 2010 Through 2050 (in 2007 Dollars per Metric Ton of Nitrous Oxide), Discount Rate and Statistic—Continued

Year	5 Percent Average	3 Percent Average	2.5 Percent Average	High Impact (95th Percentile at 3 Percent Discount Rate)
2047	\$10,000	\$26,000	\$35,000	\$68,000
2048	\$10,000	\$26,000	\$36,000	\$69,000
2049	\$10,000	\$26,000	\$36,000	\$71,000
2050	\$11,000	\$27,000	\$37,000	\$72,000

1 (d) ADJUSTMENT FOR INFLATION.—The head of a
 2 Federal agency may adjust the costs described in the ta-
 3 bles contained in subsections (a) through (c) for inflation.

4 **SEC. 5. INTERAGENCY WORKING GROUP ON THE COSTS OF**
 5 **GREENHOUSE GASES.**

6 (a) ESTABLISHMENT.—The Director of the Office of
 7 Management and Budget, the Director of the Office of
 8 Science and Technology Policy, and the Chair of the Coun-
 9 cil of Economic Advisers shall establish an interagency
 10 working group, to be known as the “Interagency Working
 11 Group on the Costs of Greenhouse Gases” to carry out
 12 the calculation method revision evaluation described in
 13 section 6.

14 (b) MEMBERSHIP.—The Working Group shall consist
 15 of members from—

16 (1) the Council of Economic Advisers;

- 1 (2) the Office of Science and Technology Policy;
- 2 (3) the National Security Council;
- 3 (4) the National Economic Council;
- 4 (5) the Council on Environmental Quality;
- 5 (6) the Department of Agriculture;
- 6 (7) the Department of Commerce;
- 7 (8) the Department of Energy;
- 8 (9) the Department of the Interior;
- 9 (10) the Department of Transportation;
- 10 (11) the Department of the Treasury;
- 11 (12) the Department of Health and Human
- 12 Services;
- 13 (13) the Environmental Protection Agency;
- 14 (14) the National Oceanic and Atmospheric Ad-
- 15 ministration;
- 16 (15) the Federal Energy Regulatory Commis-
- 17 sion;
- 18 (16) the United States Global Change Research
- 19 Program; and
- 20 (17) the Corps of Engineers.

21 **SEC. 6. CALCULATION METHOD REVISION.**

22 (a) REVISION EVALUATION.—

- 23 (1) IN GENERAL.—Not later than 5 years after
- 24 the date of enactment of this Act, and not less fre-
- 25 quently than once every 5 years thereafter, the

1 Working Group shall carry out a revision evaluation
2 for the cost of carbon dioxide, cost of methane, and
3 cost of nitrous oxide to determine whether a revision
4 of the calculation method of the cost of carbon diox-
5 ide, cost of methane, or cost of nitrous oxide is nec-
6 essary.

7 (2) CONSIDERATIONS.—In carrying out a revi-
8 sion evaluation under paragraph (1) or a revision
9 under subsection (b), the Working Group shall—

10 (A) consider—

11 (i) the findings of the National Acad-
12 emies of Sciences, Engineering, and Medi-
13 cine relating to approaches to estimating
14 the costs of greenhouse gases;

15 (ii) the findings of the Committee
16 under section 7(a)(3);

17 (iii) advancements in scientific and
18 economic research relating to the impacts
19 of climate change and the estimation of the
20 costs of greenhouse gases;

21 (iv) new domestic and international
22 findings;

23 (v) the qualitative costs to society as
24 a result of the categories of damage de-

1 scribed in section 3(3)(A) that cannot be
2 monetized; and

3 (vi) all harm caused by greenhouse
4 gas emissions;

5 (B) assess any proposed revision of the cal-
6 culation method with respect to—

7 (i) consistency with the state of sci-
8 entific knowledge, as reflected by current,
9 peer-reviewed literature; and

10 (ii) the adequacy with which the pro-
11 posed calculation method identifies and
12 represents key uncertainties and sensitivi-
13 ties;

14 (C) evaluate the harm caused by green-
15 house gas emissions for the period beginning on
16 the date on which the applicable revision eval-
17 uation commences and ending on a date in the
18 future that would allow estimation of the vast
19 majority of discounted climate damages;

20 (D) apply 1 or more discount rates, which
21 shall—

22 (i) account for the intergenerational
23 nature of the harm caused by climate
24 change; and

1 (ii) be consistent with the interest
2 rate of consumption used by Federal agen-
3 cies to reflect climate risk;

4 (E) include values that account for global
5 damages from greenhouse gas emissions;

6 (F) document the calculation method and
7 present results in a manner adequate for the
8 scientific community to understand and assess
9 the calculation method; and

10 (G) make available to researchers the
11 model code for review, use, and modification.

12 (b) REVISION.—

13 (1) CALCULATION METHOD.—If the Working
14 Group makes a determination under subsection
15 (a)(1) that revision of the calculation method is nec-
16 essary, the Working Group shall draft a proposed re-
17 vision of the calculation method.

18 (2) PUBLIC NOTIFICATION AND COMMENT PE-
19 RIOD.—Any proposed revision of the calculation
20 method shall be published in the Federal Register
21 for a period of public comment of not fewer than 90
22 days and include consultation with industry groups.

23 (3) EFFECT OF REVISIONS BY WORKING
24 GROUP.—Any revised calculation method of the cost
25 of carbon dioxide, the cost of methane, or the cost

1 of nitrous oxide developed by the Working Group
2 under paragraph (1) and published under paragraph
3 (2) shall supersede the applicable discount rate value
4 of the cost of carbon dioxide, the cost of methane,
5 or the cost of nitrous oxide under section 4.

6 **SEC. 7. COSTS OF GREENHOUSE GASES SCIENTIFIC RE-**
7 **VIEW COMMITTEE.**

8 (a) ESTABLISHMENT.—

9 (1) IN GENERAL.—Not later than January 1,
10 2021, and not less frequently than once every 5
11 years thereafter, the Director of the Office of Man-
12 agement and Budget, in consultation with the Direc-
13 tor of the Office of Science and Technology Policy
14 and the Chair of the Council of Economic Advisers,
15 shall establish a committee, to be known as the
16 “Costs of Greenhouse Gases Scientific Review Com-
17 mittee”.

18 (2) MEMBERSHIP.—The membership of the
19 Committee shall consist of not fewer than 10 mem-
20 bers, selected by the presidents of the National
21 Academies of Sciences, Engineering, and Medicine,
22 who shall represent scientific fields relevant to the
23 estimation of the costs of greenhouse gases, includ-
24 ing—

25 (A) climate science;

1 (B) climate economics; and

2 (C) decision analysis.

3 (3) DUTIES.—The Committee shall publish a
4 report in which the Committee shall—

5 (A) make a recommendation to the Work-
6 ing Group regarding whether a revision of the
7 calculation method is necessary;

8 (B) if the Committee determines that a re-
9 vision is necessary, recommend scientific data
10 and models to be used by the Working Group
11 in the revision of the calculation method;

12 (C) provide scientific advice to the Work-
13 ing Group on the revision; and

14 (D) provide guidance to the U.S. Global
15 Change Research Program with respect to the
16 research necessary to advance the estimation of
17 the costs of greenhouse gases.

18 (b) TERMINATION.—On the completion of the revi-
19 sion evaluation for which the Committee is established, the
20 Committee shall terminate.

21 (c) AUTHORIZATION OF APPROPRIATIONS.—There
22 are authorized to be appropriated such sums as are nec-
23 essary to administer the Committee.