

# Appendix: Annual Social Cost Estimates

## 2025 Update, NYS Value of Carbon Guidance

The following tables provide the U.S. Social Cost of Greenhouse Gases (SC-GHG) values for use in New York State as described in the DEC (2025) Value of Carbon guidance. The outputs of three different models were averaged, the Data-driven Spatial Climate Impact Model (DSCIM)<sup>1</sup>, the Greenhouse Gas Impact Value Estimator (GIVE)<sup>2</sup>, and a meta-analysis damage function based on Howard and Sterner (2017)<sup>3</sup>. Model outputs for each 10-year interval 2020-2050 were averaged, rounded to the nearest integer, and annualized by interpolating between time intervals.

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<sup>1</sup> Rode, A. et al. 2021. Estimating a social cost of carbon for global energy consumption. *Nature*. 598: 308-314. <https://doi.org/10.1038/s41586-021-03883-8>

<sup>2</sup> Rennert, K. et al. 2022. Comprehensive evidence implies a higher social cost of CO<sub>2</sub>. *Nature*. 610: 687-692. <https://doi.org/10.1038/s41586-022-05224-9>.

<sup>3</sup> P. Howard and T. Sterner, "Few and not so far between: a meta-analysis of climate damage estimates," *Environ. Resource Econ.* 68 (2017): 197-225, <https://doi.org/10.1007/s10640-017-0166-z>.

Table A1: Social cost of carbon dioxide (CO<sub>2</sub>), 2020-2050 (in 2020 dollars per metric ton CO<sub>2</sub>)

Year	Discount Rate		
	2.5%	2.0%	1.5%
2020	117	193	337
2021	119	197	341
2022	122	200	346
2023	125	204	351
2024	128	208	356
2025	130	212	360
2026	133	215	365
2027	136	219	370
2028	139	223	375
2029	141	226	380
2030	144	230	384
2031	147	234	389
2032	150	237	394
2033	153	241	398
2034	155	245	403
2035	158	248	408
2036	161	252	412
2037	164	256	417
2038	167	259	422
2039	170	263	426
2040	173	267	431
2041	176	271	436
2042	179	275	441
2043	182	279	446
2044	186	283	451
2045	189	287	456
2046	192	291	462
2047	195	296	467
2048	199	300	472
2049	202	304	477
2050	205	308	482

See DEC (2025) "Establishing a Value of Carbon"

Table A2: Social cost of methane (CH<sub>4</sub>), 2020-2050 (in 2020 dollars per metric ton CH<sub>4</sub>)

Year	Discount Rate		
	2.5%	2.0%	1.5%
2020	1,257	1,648	2,305
2021	1,324	1,723	2,391
2022	1,390	1,799	2,478
2023	1,457	1,874	2,564
2024	1,524	1,950	2,650
2025	1,590	2,025	2,737
2026	1,657	2,101	2,823
2027	1,724	2,176	2,910
2028	1,791	2,252	2,996
2029	1,857	2,327	3,083
2030	1,924	2,403	3,169
2031	2,002	2,490	3,270
2032	2,080	2,578	3,371
2033	2,157	2,666	3,471
2034	2,235	2,754	3,572
2035	2,313	2,842	3,673
2036	2,391	2,929	3,774
2037	2,468	3,017	3,875
2038	2,546	3,105	3,975
2039	2,624	3,193	4,076
2040	2,702	3,280	4,177
2041	2,786	3,375	4,285
2042	2,871	3,471	4,394
2043	2,955	3,566	4,502
2044	3,040	3,661	4,610
2045	3,124	3,756	4,718
2046	3,209	3,851	4,827
2047	3,293	3,946	4,935
2048	3,378	4,041	5,043
2049	3,462	4,136	5,151
2050	3,547	4,231	5,260

See DEC (2025) "Establishing a Value of Carbon"

Table A3: Social cost of nitrous oxide (N<sub>2</sub>O), 2020-2050 (in 2020 dollars per metric ton N<sub>2</sub>O)

Year	Discount Rate		
	2.5%	2.0%	1.5%
2020	35,232	54,139	87,284
2021	36,180	55,364	88,869
2022	37,128	56,590	90,454
2023	38,076	57,816	92,040
2024	39,024	59,041	93,625
2025	39,972	60,267	95,210
2026	40,920	61,492	96,796
2027	41,868	62,718	98,381
2028	42,816	63,944	99,966
2029	43,764	65,169	101,552
2030	44,712	66,395	103,137
2031	45,693	67,645	104,727
2032	46,674	68,895	106,316
2033	47,655	70,145	107,906
2034	48,636	71,394	109,495
2035	49,617	72,644	111,085
2036	50,598	73,894	112,674
2037	51,578	75,144	114,264
2038	52,559	76,394	115,853
2039	53,540	77,644	117,443
2040	54,521	78,894	119,032
2041	55,632	80,304	120,809
2042	56,744	81,714	122,586
2043	57,855	83,124	124,362
2044	58,966	84,535	126,139
2045	60,078	85,945	127,916
2046	61,189	87,355	129,693
2047	62,301	88,765	131,469
2048	63,412	90,176	133,246
2049	64,523	91,586	135,023
2050	65,635	92,996	136,799

See DEC (2025) "Establishing a Value of Carbon"

Table A4: Social cost of HFC-125, 2020-2050 (in 2020 dollars per metric ton HFC-125)

Year	Discount Rate		
	2.5%	2.0%	1.5%
2020	232,286	315,768	451,739
2021	241,383	326,580	464,723
2022	250,480	337,393	477,707
2023	259,576	348,205	490,691
2024	268,673	359,017	503,675
2025	277,770	369,829	516,659
2026	286,867	380,641	529,643
2027	295,964	391,453	542,627
2028	305,060	402,265	555,611
2029	314,157	413,078	568,595
2030	323,254	423,890	581,579
2031	333,088	435,483	595,381
2032	342,923	447,076	609,182
2033	352,757	458,670	622,984
2034	362,592	470,263	636,786
2035	372,426	481,856	650,588
2036	382,260	493,450	664,389
2037	392,095	505,043	678,191
2038	401,929	516,637	691,993
2039	411,764	528,230	705,795
2040	421,598	539,823	719,596
2041	432,515	552,668	734,797
2042	443,432	565,513	749,998
2043	454,348	578,358	765,199
2044	465,265	591,203	780,399
2045	476,182	604,048	795,600
2046	487,099	616,893	810,801
2047	498,015	629,738	826,001
2048	508,932	642,583	841,202
2049	519,849	655,428	856,403
2050	530,766	668,273	871,604

See DEC (2025) "Establishing a Value of Carbon"

Table A5: Social cost of HFC-134a, 2020-2050 (in 2020 dollars per metric ton HFC-134a)

Year	Discount Rate		
	2.5%	2.0%	1.5%
2020	83,030	109,418	153,157
2021	87,068	114,055	158,545
2022	91,105	118,692	163,933
2023	95,143	123,329	169,321
2024	99,180	127,966	174,709
2025	103,218	132,602	180,097
2026	107,255	137,239	185,485
2027	111,293	141,876	190,873
2028	115,330	146,513	196,261
2029	119,368	151,150	201,649
2030	123,405	155,787	207,037
2031	127,919	160,931	212,965
2032	132,433	166,075	218,894
2033	136,947	171,219	224,822
2034	141,461	176,362	230,750
2035	145,975	181,506	236,679
2036	150,489	186,650	242,607
2037	155,002	191,794	248,536
2038	159,516	196,938	254,464
2039	164,030	202,082	260,392
2040	168,544	207,226	266,321
2041	173,432	212,789	272,707
2042	178,320	218,352	279,092
2043	183,208	223,916	285,478
2044	188,097	229,479	291,864
2045	192,985	235,042	298,250
2046	197,873	240,606	304,636
2047	202,761	246,169	311,022
2048	207,649	251,733	317,408
2049	212,538	257,296	323,793
2050	217,426	262,859	330,179

See DEC (2025) "Establishing a Value of Carbon"

Table A6: Social cost of HFC-143a, 2020-2050 (in 2020 dollars per metric ton HFC-143a)

Year	Discount Rate		
	2.5%	2.0%	1.5%
2020	389,606	551,623	819,009
2021	402,822	567,862	839,137
2022	416,039	584,101	859,266
2023	429,255	600,340	879,395
2024	442,472	616,579	899,523
2025	455,688	632,818	919,652
2026	468,904	649,056	939,781
2027	482,121	665,295	959,910
2028	495,337	681,534	980,038
2029	508,554	697,773	1,000,167
2030	521,770	714,012	1,020,296
2031	535,992	731,198	1,041,381
2032	550,014	748,385	1,062,467
2033	564,136	765,572	1,083,552
2034	578,257	782,758	1,104,638
2035	592,379	799,944	1,125,723
2036	606,501	817,131	1,146,808
2037	620,623	834,318	1,167,894
2038	634,744	851,504	1,188,979
2039	648,866	868,690	1,210,065
2040	662,988	885,877	1,231,150
2041	678,948	905,242	1,254,724
2042	694,908	924,608	1,278,299
2043	710,868	943,973	1,301,873
2044	726,828	963,339	1,325,447
2045	742,788	982,704	1,349,021
2046	758,748	1,002,070	1,372,595
2047	774,708	1,021,435	1,396,170
2048	790,668	1,040,801	1,419,744
2049	806,628	1,060,166	1,443,318
2050	822,588	1,079,532	1,466,892

See DEC (2025) "Establishing a Value of Carbon"

Table A7: Social cost of HFC-32, 2020-2050 (in 2020 dollars per metric ton HFC-32)

Year	Discount Rate		
	2.5%	2.0%	1.5%
2020	39,585	51,945	73,132
2021	41,910	54,553	76,095
2022	44,236	57,161	79,058
2023	46,562	59,769	82,021
2024	48,887	62,377	84,984
2025	51,212	64,985	87,947
2026	53,538	67,593	90,910
2027	55,864	70,201	93,873
2028	58,189	72,809	96,836
2029	60,514	75,417	99,800
2030	62,840	78,025	102,763
2031	65,629	81,129	106,258
2032	68,418	84,232	109,753
2033	71,207	87,336	113,248
2034	73,997	90,439	116,743
2035	76,786	93,543	120,238
2036	79,575	96,646	123,733
2037	82,364	99,750	127,228
2038	85,153	102,854	130,723
2039	87,942	105,957	134,218
2040	90,731	109,061	137,713
2041	93,757	112,422	141,485
2042	96,782	115,783	145,257
2043	99,808	119,144	149,029
2044	102,833	122,505	152,801
2045	105,858	125,866	156,573
2046	108,884	129,227	160,345
2047	111,909	132,588	164,117
2048	114,935	135,949	167,889
2049	117,960	139,310	171,661
2050	120,986	142,671	175,433

See DEC (2025) "Establishing a Value of Carbon"

Table A8: Social cost of HFC-23, 2020-2050 (in 2020 dollars per metric ton HFC-23)

Year	Discount Rate		
	2.5%	2.0%	1.5%
2020	1,526,737	2,465,328	4,170,157
2021	1,565,408	2,516,877	4,238,232
2022	1,604,079	2,568,426	4,306,308
2023	1,642,750	2,619,975	4,374,383
2024	1,681,421	2,671,525	4,442,458
2025	1,720,092	2,723,074	4,510,533
2026	1,758,763	2,774,623	4,578,608
2027	1,797,434	2,826,172	4,646,683
2028	1,836,105	2,877,722	4,714,758
2029	1,874,775	2,929,271	4,782,833
2030	1,913,446	2,980,820	4,850,908
2031	1,953,709	3,033,412	4,918,782
2032	1,993,971	3,086,005	4,986,655
2033	2,034,233	3,138,598	5,054,529
2034	2,074,495	3,191,190	5,122,402
2035	2,114,757	3,243,782	5,190,275
2036	2,155,020	3,296,375	5,258,149
2037	2,195,282	3,348,968	5,326,022
2038	2,235,544	3,401,560	5,393,896
2039	2,275,806	3,454,152	5,461,769
2040	2,316,068	3,506,745	5,529,642
2041	2,362,467	3,566,837	5,606,181
2042	2,408,865	3,626,930	5,682,719
2043	2,455,263	3,687,022	5,759,258
2044	2,501,662	3,747,115	5,835,796
2045	2,548,060	3,807,207	5,912,334
2046	2,594,459	3,867,299	5,988,873
2047	2,640,857	3,927,392	6,065,411
2048	2,687,255	3,987,484	6,141,950
2049	2,733,654	4,047,577	6,218,488
2050	2,780,052	4,107,669	6,295,026

See DEC (2025) "Establishing a Value of Carbon"

Table A9: Social cost of HFC-227ea, 2020-2050 (in 2020 dollars per metric ton HFC-227ea)

Year	Discount Rate		
	2.5%	2.0%	1.5%
2020	259,192	360,860	527,334
2021	268,449	372,086	541,077
2022	277,706	383,312	554,821
2023	286,963	394,538	568,564
2024	296,221	405,764	582,307
2025	305,478	416,990	596,050
2026	314,735	428,216	609,793
2027	323,992	439,442	623,536
2028	333,249	450,668	637,279
2029	342,506	461,895	651,023
2030	351,763	473,121	664,766
2031	361,693	485,056	679,239
2032	371,622	496,991	693,712
2033	381,551	508,925	708,185
2034	391,480	520,860	722,659
2035	401,409	532,795	737,132
2036	411,339	544,730	751,605
2037	421,268	556,665	766,078
2038	431,197	568,600	780,552
2039	441,126	580,535	795,025
2040	451,055	592,470	809,498
2041	462,206	605,840	825,597
2042	473,358	619,210	841,697
2043	484,509	632,580	857,796
2044	495,660	645,950	873,896
2045	506,811	659,320	889,995
2046	517,962	672,691	906,094
2047	529,114	686,061	922,194
2048	540,265	699,431	938,293
2049	551,416	712,801	954,393
2050	562,567	726,171	970,492

See DEC (2025) "Establishing a Value of Carbon"

Table A10: Social cost of HFC-236fa, 2020-2050 (in 2020 dollars per metric ton HFC-236fa)

Year	Discount Rate		
	2.5%	2.0%	1.5%
2020	981,980	1,593,051	2,706,940
2021	1,006,615	1,625,961	2,750,436
2022	1,031,250	1,658,871	2,793,932
2023	1,055,885	1,691,781	2,837,428
2024	1,080,520	1,724,690	2,880,924
2025	1,105,155	1,757,600	2,924,420
2026	1,129,790	1,790,510	2,967,915
2027	1,154,425	1,823,419	3,011,411
2028	1,179,060	1,856,329	3,054,907
2029	1,203,695	1,889,239	3,098,403
2030	1,228,330	1,922,149	3,141,899
2031	1,253,947	1,955,664	3,185,158
2032	1,279,564	1,989,180	3,228,418
2033	1,305,182	2,022,695	3,271,677
2034	1,330,799	2,056,211	3,314,937
2035	1,356,416	2,089,726	3,358,196
2036	1,382,033	2,123,242	3,401,456
2037	1,407,651	2,156,757	3,444,715
2038	1,433,268	2,190,273	3,487,975
2039	1,458,885	2,223,788	3,531,234
2040	1,484,502	2,257,304	3,574,494
2041	1,514,028	2,295,597	3,623,270
2042	1,543,555	2,333,891	3,672,046
2043	1,573,081	2,372,185	3,720,823
2044	1,602,607	2,410,479	3,769,599
2045	1,632,133	2,448,772	3,818,376
2046	1,661,659	2,487,066	3,867,152
2047	1,691,185	2,525,360	3,915,928
2048	1,720,711	2,563,654	3,964,705
2049	1,750,238	2,601,948	4,013,481
2050	1,779,764	2,640,241	4,062,257

See DEC (2025) "Establishing a Value of Carbon"

Table A11: Social cost of HFC-245fa, 2020-2050 (in 2020 dollars per metric ton HFC-245fa)

Year	Discount Rate		
	2.5%	2.0%	1.5%
2020	50,968	66,809	93,635
2021	53,785	69,993	97,278
2022	56,603	73,177	100,922
2023	59,420	76,361	104,565
2024	62,238	79,545	108,209
2025	65,055	82,729	111,852
2026	67,872	85,913	115,496
2027	70,690	89,097	119,139
2028	73,507	92,281	122,783
2029	76,325	95,466	126,426
2030	79,142	98,650	130,070
2031	82,421	102,327	134,243
2032	85,701	106,005	138,417
2033	88,980	109,682	142,590
2034	92,259	113,360	146,763
2035	95,538	117,037	150,937
2036	98,817	120,715	155,110
2037	102,096	124,392	159,283
2038	105,375	128,070	163,457
2039	108,655	131,747	167,630
2040	111,934	135,425	171,803
2041	115,466	139,380	176,276
2042	118,998	143,336	180,749
2043	122,530	147,292	185,222
2044	126,062	151,247	189,694
2045	129,594	155,203	194,167
2046	133,127	159,159	198,640
2047	136,659	163,114	203,113
2048	140,191	167,070	207,585
2049	143,723	171,026	212,058
2050	147,255	174,981	216,531

See DEC (2025) "Establishing a Value of Carbon"

Table A12: Social cost of sulfur hexafluoride (SF6), 2020-2050 (in 2020 dollars per metric ton SF6)

Year	Discount Rate		
	2.5%	2.0%	1.5%
2020	3,481,851	5,944,602	10,617,510
2021	3,559,770	6,050,643	10,757,578
2022	3,637,689	6,156,683	10,897,645
2023	3,715,607	6,262,724	11,037,712
2024	3,793,526	6,368,765	11,177,780
2025	3,871,445	6,474,805	11,317,847
2026	3,949,364	6,580,846	11,457,914
2027	4,027,282	6,686,887	11,597,981
2028	4,105,201	6,792,928	11,738,049
2029	4,183,120	6,898,968	11,878,116
2030	4,261,038	7,005,009	12,018,183
2031	4,340,493	7,110,189	12,152,657
2032	4,419,949	7,215,370	12,287,130
2033	4,499,404	7,320,550	12,421,604
2034	4,578,859	7,425,730	12,556,077
2035	4,658,314	7,530,911	12,690,551
2036	4,737,769	7,636,091	12,825,025
2037	4,817,224	7,741,271	12,959,498
2038	4,896,679	7,846,452	13,093,972
2039	4,976,134	7,951,632	13,228,445
2040	5,055,589	8,056,812	13,362,919
2041	5,146,796	8,176,382	13,513,896
2042	5,238,002	8,295,952	13,664,874
2043	5,329,209	8,415,522	13,815,852
2044	5,420,415	8,535,091	13,966,830
2045	5,511,621	8,654,661	14,117,807
2046	5,602,828	8,774,231	14,268,785
2047	5,694,034	8,893,801	14,419,763
2048	5,785,241	9,013,370	14,570,740
2049	5,876,447	9,132,940	14,721,718
2050	5,967,653	9,252,510	14,872,696

See DEC (2025) "Establishing a Value of Carbon"