Table 1. Forcings and Efficacies for Greenhouse Gases

GHG Changes	Run Names	Fi	Fa[a]	Fa[a']	Fs	Fs*[b]	δTo	ΔTs	Ei	Ea	Es	Es*	Fe[c]
1 × CO_2 = 291 ppm													
0.125 × CO_2	E2CO2E	−12.68	−10.94	–	−10.30	−10.10	−0.61	−4.56	0.78	0.90	0.95	0.98	−9.84
0.25 × CO_2	E2CO2Q	−8.88	−7.74	−7.56	−7.44	−7.21	−0.43	−3.32	0.81	0.92	0.96	0.99	−7.16
0.5 × CO_2	E2CO2H	−4.61	−4.07	−3.99	−3.91	−3.84 ± 0.27	−0.22	−1.78 ± 0.05	0.83	0.94	0.98 ± 0.03	1.00	−3.84
1.25 × CO_2	E2c1Q	1.44	1.30	1.29	1.32	1.23 ± 0.14	0.07	0.58 ± 0.03	0.88	0.97	0.95 ± 0.05	1.03	1.26
1.5 CO_2	**E2c1H**	**2.64**	**2.39**	**2.37**	**2.38**	**2.11**	**0.12**	**1.10**	**0.90**	**1.00**	**1.00**	**1.13**	**2.38**
2 × CO_2	E2c2	4.52	4.12	4.08	4.11	3.95 ± 0.11	0.22	1.96 ± 0.02	0.93	1.02	1.03 ± 0.01	1.07	4.22
4 × CO_2	E2c4	9.27	8.53	8.41	8.58	8.14	0.45	4.06	0.95	1.03	1.02	1.08	8.77
8 × CO_2	E2c8	14.65	13.53	13.29	13.97	13.37	0.73	7.02	1.04	1.12	1.09	1.13	15.16
Specified Changes													
W-M GHGs(1880→2000)[d]	E2GHG	2.52	2.40	2.31	2.55	2.54 ± 0.10	0.14	1.21 ± 0.02	1.04	1.09	1.02 ± 0.02	1.03	2.61
CO_2 (291→370 ppm)[d]	No Runs	1.55	1.40	–	–	–	–	–	–	–	–	–	–
CH_4 (837→1752 ppb)[d]	No Runs	0.51	0.53	–	–	–	–	–	–	–	–	–	–
CH_4 (837→3504 ppb)	E2CH4x2	1.10	1.15	1.05	1.20	1.18 ± 0.12	0.07	0.59 ± 0.01	1.15	1.10	1.05 ± 0.02	1.07	1.27
CH_4 (837→9000 ppb)	E2CH4x5	2.11	2.17	2.00	2.28	2.29	0.13	1.14	1.16	1.13	1.08	1.07	2.46
N_2O (278→316 ppb)[d]	No Runs	0.15	0.15	–	–	–	–	–	–	–	–	–	–
N_2O (278→1898 ppb)	E2N2Ox6	3.55	3.47	3.28	3.62	3.49	0.21	1.67	1.02	1.04	1.00	1.04	3.62
MPTGs + OTGs (2000)[d]	No Runs	0.30	0.30	–	–	–	–	–	–	–	–	–	–
CFC11 + CFC12 (4 × 2000)	E2CFCx4	1.02	1.04	1.01	1.41	1.38	0.08	0.64	1.34	1.32	0.97	0.99	1.37
Stratospheric H_2O by CH_4 Oxidation													
1880 to 2000 CH_4	E2ch4-E2o	—	—	—	0.061	0.036 ± 0.01	0.000	0.027 ± 0.01	—	—	0.96 ± 0.31	1.49	0.058
none to 2000 CH_4	E2ch4-noch4	—	—	—	0.105	0.108 ± 0.06	0.002	0.042 ± 0.02	—	—	0.87 ± 0.34	0.85	0.091
O_3 (1880→2000)													
Whole Atmosphere	E2oz	0.438	0.281	–	0.256	0.203 ± 0.12	0.019	0.107 ± 0.02	0.53	0.82	0.90 ± 0.13	1.14	0.231
Troposphere	E2ozT	0.408	0.337	0.300	0.335	0.276 ± 0.09	0.015	0.128 ± 0.03	0.68	0.82	0.83 ± 0.16	1.00	0.276

[a]Fa uses tropopause defined by *WMO* [1957], while Fa′ uses the *Hansen et al.* [2002] tropopause.
[b]Fs* is asymptotic (ΔTs→0) planetary flux imbalance based on first 10 years of simulation with the specified agent.
[c]Fe = EaFa = EsFs = $\Delta Ts/(\Delta Ts/Fa)_{1.5\times CO2} = \Delta Ts/0.463$.
[d]Greenhouse gas amounts are 1880–2000 changes from *Hansen and Sato* [2004]. MPTGs are Montreal Protocol trace gases, and OTGs are other trace gases tabulated by *Hansen and Sato* [2004].