Climate Change 2007
The Physical Science Basis
The Working Group I contribution to the IPCC Fourth Assessment Report

Errata

Note. The following is a list of errata and corrections to the above report. In some cases these only affect the version of the report provided on CD-ROM, which was finalised before the printed version of the report.

Please note that there are small colour differences between the CD-ROM and printed versions, and corresponding differences in colour descriptions given in the figure captions, which are not listed here.

	Page	Item	Correction
	ix	**Table of Contents**	Title of Chapter 1 should be: "Historical Overview of Climate Change Science"
	ix	**Table of Contents**	Title of Chapter 3 should be: "Observations: Surface and Atmospheric Climate Change"
	33	**Technical Summary** Table TS.2	A number of species were inadvertently omitted that should have been included in the original table {Table 2.14}. Minor typographical errors (unit, superscripts, and footnotes) have also been corrected. Please see end of this Errata for the complete table {Table 2.14 Errata}.
	38	**Technical Summary** Figure TS.7, Panel A	The bottom left label of the y-axis should read: -1.0 and not -0.1 as given.
	135	**Chapter 2** FAQ 2.1, Figure 1	The red label on the graph should read: "Carbon Dioxide"
	197	**Chapter 2** Figure 2.19	The "j" and "o" labels in the "Black Carbon: Direct" row should be reversed.
	208	**Chapter 2** Figure 2.23	The caption should read: "...instantaneous all-sky RF (bottom panel) and surface forcing (top panel)..."
	212	**Chapter 2** Table 2.14	A number of species were inadvertently omitted that should have been included in the original table. Minor typographical errors (unit, superscripts, and footnotes) have also been corrected. Please see end of this Errata for the complete table.{Table 2.14 Errata}
	223	**Chapter 2** References	The following references should be added: IPCC, 1996: *Climate Change 1995: The Science of Climate Change* [Houghton, J. T., et al. (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 572 pp.
	268	**Chapter 3** Figure 3.17, Panel A	The bottom left label of the y-axis should read: -1.0 and not -0.1 as given.

 indicates that the erratum only occurs in the CD-ROM version of the report.

Errata

Page	Item	Correction
319	**Chapter 3** References	Reference: "Allan, R.P., et al., 2001 …" should be: "Allan, R., et al., 2001: Is there an Indian Ocean dipole, and is it independent of the El Niño - Southern Oscillation? *CLIVAR Exchanges*, **6**, 18-22."
425	**Chapter 5** References	Reference: "Minami, H., Y. Kano, and K. Ogawa, 1998 …" should be: "Minami, H., Y. Kano and K. Ogawa, 1999: Long-term variations of potential temperature and dissolved oxygen of the Japan Sea proper water. *J. Oceanogr.*, **55**, 197-205."
513	**Chapter 7** FAQ 7.1, Figure 1	In Panel (a) the "Land-Based Sink" and "Net Oceanic Sink" labels should be reversed.
523	**Chapter 7** Figure 7.8	The caption should read: "...who used wind speeds taken at the 0.995 sigma level (about 40 m above the sea surface."
546	**Chapter 7** Table 7.7	The range given under the Column "NH_3" for "AR4" for "Natural Sources" in "Oceans" should read: (3-16) and not (3-6) as given.
550	**Chapter 7** Section 7.4.4.2.1	In paragraph 1, line 7, reference to Stevenson et al (2006) should be to: Stevenson et al (2005)
550	**Chapter 7** Section 7.4.4.2.3	In paragraph 1, line 6, reference to Stevenson et al (2005) should be to: Stevenson et al (2006)
580	**Chapter 7** References	The following reference should be added: "Oeschger, H., U. Siegenthaler, and M. Heimann, 1980: The carbon cycle and its perturbation by man. In: *Interactions of Energy and Climate* [W. Bach, J. Pankrath, and J. Williams (eds.)]. Reidel, Dordrecht, pp. 107-127."
635	**Chapter 8** Section 8.6.3.1.2	The heading for Section 8.6.3.1.2 should be: *"Summary of water vapour and lapse rate feedbacks"*
919	**Chapter 11** Section 11.10.1.2	In paragraph 3, line 11, reference to Rowell, 2005 should be to: Rowell, 2006
925	**Chapter 11** Section 11.10.2.2.5	In paragraph 2, line 3, reference to Rowell (2005) should be to: Rowell (2006)
936	**Chapter 11** References	The following reference should be added: "Rowell, D. P., 2006: A demonstration of the uncertainty in projections of UK climate change resulting from regional model formulation. *Climatic Change*, **79**, 243-257
944	**Glossary** Dobson unit (DU)	The definition of Dobson unit should read: "...2.69×10^{20} molecules per square metre"

Table 2.14 (Errata). *Lifetimes, radiative efficiencies and direct (except for CH_4) GWPs relative to CO_2. For ozone-depleting substances and their replacements, data are taken from IPCC/TEAP (2005) unless otherwise stated. See IPCC AR4 (Forster et al., 2007; Section 2.10.2 and Table 2.14) for details. A number of species were inadvertently omitted that should have been included in the list, and the complete table appears below. Information on the GWPs of these species were included in IPCC TAR (Ramaswamy et al., 2001;Tables 6.7 and 6.8). These species are now included in this Errata to Table 2.14 of IPCC AR4 (Forster et al., 2007), following established procedures and precedents. CO_2 AGWP values from IPCC AR4 (Forster et al., 2007; Section 2.10.2), and estimates of the lifetimes and radiative efficiency of these species (based on TAR and updates from WMO (2002, Chapter 1)), are employed to obtain their GWPs. Estimates of GWPs from SAR‡ are also listed for reference. Minor typographical errors (unit, parenthesis, superscripts, and footnotes) have also been corrected in this Errata.*

Industrial Designation or Common Name	Chemical Formula	Lifetime (years)	Radiative Efficiency (W m^{-2} ppb^{-1})	Global Warming Potential for Given Time Horizon			
				SAR‡ (100-yr)	20-yr	100-yr	500-yr
Carbon dioxide	CO_2	See below[a]	[b]1.4x10^{-5}	1	1	1	1
Methane[c]	CH_4	12[c]	3.7x10^{-4}	21	72	25	7.6
Nitrous oxide	N_2O	114	3.03x10^{-3}	310	289	298	153
Substances controlled by the Montreal Protocol							
CFC-11	CCl_3F	45	0.25	3,800	6,730	4,750	1,620
CFC-12	CCl_2F_2	100	0.32	8,100	11,000	10,900	5,200
CFC-13	$CClF_3$	640	0.25		10,800	14,400	16,400
CFC-113	CCl_2FCClF_2	85	0.3	4,800	6,540	6,130	2,700
CFC-114	$CClF_2CClF_2$	300	0.31		8,040	10,000	8,730
CFC-115	$CClF_2CF_3$	1,700	0.18		5,310	7,370	9,990
Halon-1301	$CBrF_3$	65	0.32	5,400	8,480	7,140	2,760
Halon-1211	$CBrClF_2$	16	0.3		4,750	1,890	575
Halon-2402	$CBrF_2CBrF_2$	20	0.33		3,680	1,640	503
Carbon tetrachloride	CCl_4	26	0.13	1,400	2,700	1,400	435
Methyl bromide	CH_3Br	0.7	0.01		17	5	1
Methyl chloroform	CH_3CCl_3	5	0.06	100*	506	146	45
HCFC-21	$CHCl_2F$	1.7	0.14		530	151	46
HCFC-22	$CHClF_2$	12	0.2	1,500	5,160	1,810	549
HCFC-123	$CHCl_2CF_3$	1.3	0.14	90	273	77	24
HCFC-124	$CHClFCF_3$	5.8	0.22	470	2,070	609	185
HCFC-141b	CH_3CCl_2F	9.3	0.14	600	2,250	725	220
HCFC-142b	CH_3CClF_2	17.9	0.2	1,800	5,490	2,310	705
HCFC-225ca	$CHCl_2CF_2CF_3$	1.9	0.2		429	122	37
HCFC-225cb	$CHClFCF_2CClF_2$	5.8	0.32		2,030	595	181
Hydrofluorocarbons							
HFC-23	CHF_3	270	0.19	11,700	12,000	14,800	12,200
HFC-32	CH_2F_2	4.9	0.11	650	2,330	675	205
HFC-41	CH_3F	2.4	0.02	150	323	92	28
HFC-125	CHF_2CF_3	29	0.23	2,800	6,350	3,500	1,100
HFC-134	CHF_2CHF_2	9.6	0.18	1000	3,400	1,100	335
HFC-134a	CH_2FCF_3	14	0.16	1,300	3,830	1,430	435
HFC-143	CH_2FCHF_2	3.5	0.13	300	1,240	353	107
HFC-143a	CH_3CF_3	52	0.13	3,800	5,890	4,470	1,590
HFC-152	CH_2FCH_2F	0.60	0.09		187	53	16
HFC-152a	CH_3CHF_2	1.4	0.09	140	437	124	38
HFC-161	CH_3CH_2F	0.3	0.03		43	12	3.7
HFC-227ea	CF_3CHFCF_3	34.2	0.26	2,900	5,310	3,220	1,040
HFC-236cb	$CH_2FCF_2CF_3$	13.6	0.23		3,630	1,340	407
HFC-236ea	CHF_2CHFCF_3	10.7	0.3		4,090	1,370	418
HFC-236fa	$CF_3CH_2CF_3$	240	0.28	6,300	8,100	9,810	7,660
HFC-245ca	$CH_2FCF_2CHF_2$	6.2	0.23	560	2,340	693	211
HFC-245fa	$CHF_2CH_2CF_3$	7.6	0.28		3,380	1,030	314
HFC-365mfc	$CH_3CF_2CH_2CF_3$	8.6	0.21		2,520	794	241
HFC-43-10mee	$CF_3CHFCHFCF_2CF_3$	15.9	0.4	1,300	4,140	1,640	500

Table 2.14 (continued)

Industrial Designation or Common Name	Chemical Formula	Lifetime (years)	Radiative Efficiency (W m^{-2} ppb^{-1})	Global Warming Potential for Given Time Horizon			
				SAR‡ (100-yr)	20-yr	100-yr	500-yr
Perfluorinated compounds							
Sulphur hexafluoride	SF_6	3,200	0.52	23,900	16,300	22,800	32,600
Nitrogen trifluoride	NF_3	740	[d]0.21		12,300	17,200	20,700
PFC-14	CF_4	50,000	[e]0.10	6,500	5,210	7,390	11,200
PFC-116	C_2F_6	10,000	0.26	9,200	8,630	12,200	18,200
PFC-218	C_3F_8	2,600	0.26	7,000	6,310	8,830	12,500
PFC-318	c-C_4F_8	3,200	0.32	8,700	7,310	10,300	14,700
PFC-3-1-10	C_4F_{10}	2,600	0.33	7,000	6,330	8,860	12,500
PFC-4-1-12	C_5F_{12}	4,100	0.41	7,500	6,510	9,160	13,300
PFC-5-1-14	C_6F_{14}	3,200	0.49	7,400	6,600	9,300	13,300
PFC-9-1-18	$C_{10}F_{18}$	>1,000[f]	0.56		>5,500	>7,500	>9,500
trifluoromethyl sulphur pentafluoride	SF_5CF_3	800	0.57		13,200	17,700	21,200
Perfluorocyclopropane	c-C_3F_6	>1000	0.42		>12,700	>17,340	>21,800
Fluorinated ethers							
HFE-125	CHF_2OCF_3	136	0.44		13,800	14,900	8,490
HFE-134	CHF_2OCHF_2	26	0.45		12,200	6,320	1,960
HFE-143a	CH_3OCF_3	4.3	0.27		2,630	756	230
HCFE-235da2	$CHF_2OCHClCF_3$	2.6	0.38		1,230	350	106
HFE-245cb2	$CH_3OCF_2CF_3$	5.1	0.32		2,440	708	215
HFE-245fa2	$CHF_2OCH_2CF_3$	4.9	0.31		2,280	659	200
HFE-254cb2	$CH_3OCF_2CHF_2$	2.6	0.28		1,260	359	109
HFE-347mcc3	$CH_3OCF_2CF_2CF_3$	5.2	0.34		1,980	575	175
HFE-347pcf2	$CHF_2CF_2OCH_2CF_3$	7.1	0.25		1,900	580	175
HFE-356pcc3	$CH_3OCF_2CF_2CHF_2$	0.33	0.93		386	110	33
HFE-449sl (HFE-7100)	$C_4F_9OCH_3$	3.8	0.31		1,040	297	90
HFE-569sf2 (HFE-7200)	$C_4F_9OC_2H_5$	0.77	0.3		207	59	18
HFE-43-10pccc124 (H-Galden 1040x)	$CHF_2OCF_2OC_2F_4OCHF_2$	6.3	1.37		6,320	1,870	569
HFE-236ca12 (HG-10)	$CHF_2OCF_2OCHF_2$	12.1	0.66		8,000	2,800	860
HFE-338pcc13 (HG-01)	$CHF_2OCF_2CF_2OCHF_2$	6.2	0.87		5,100	1,500	460
	$(CF_3)_2CFOCH_3$	3.4	0.31		1204	343	104
	$CF_3CF_2CH_2OH$	0.4	0.24		147	42	13
	$(CF_3)_2CHOH$	1.8	0.28		687	195	59
HFE-227ea	$CF_3CHFOCF_3$	11	0.40		4,540	1,540	468
HFE-236ea2	$CHF_2OCHFCF_3$	5.8	0.44		3,370	989	301
HFE-236fa	$CF_3CH_2OCF_3$	3.7	0.34		1,710	487	148
HFE-245fa1	$CHF_2CH_2OCF_3$	2.2	0.30		1,010	286	87
HFE 263fb2	$CF_3CH_2OCH_3$	0.2	0.1		38	11	3
HFE-329mcc2	$CHF_2CF_2OCF_2CF_3$	6.8	0.49		3,060	919	279
HFE-338mcf2	$CF_3CH_2OCF_2CF_3$	4.3	0.43		1,920	552	168
HFE-347mcf2	$CHF_2CH_2OCF_2CF_3$	2.8	0.41		1,310	374	114
HFE-356mec3	$CH_3OCF_2CHFCF_3$	0.94	0.30		355	101	31
HFE-356pcf2	$CHF_2CH_2OCF_2CHF_2$	2.0	0.37		931	265	80
HFE-356pcf3	$CHF_2OCH_2CF_2CHF_2$	3.6	0.39		1,760	502	153
HFE 365mcf3	$CF_3CF_2CH_2OCH_3$	0.27	0.11		41	11	4

Table 2.14 (continued)

Industrial Designation or Common Name	Chemical Formula	Lifetime (years)	Radiative Efficiency (W m^{-2} ppb^{-1})	Global Warming Potential for Given Time Horizon			
				SAR‡ (100-yr)	20-yr	100-yr	500-yr
Fluorinated ethers (continued)							
HFE-374pc2	$CHF_2CF_2OCH_2CH_3$	5.0	0.25		1,930	557	169
	- $(CF_2)_4CH$ (OH) -	0.3	0.85		258	73	23
	$(CF_3)_2CHOCHF_2$	3.1	0.41		1,330	380	115
	$(CF_3)_2CHOCH_3$	0.25	0.30		94	27	8.2
Perfluoropolyethers							
PFPMIE	$CF_3OCF(CF_3)CF_2OCF_2OCF_3$	800	0.65		7,620	10,300	12,400
Hydrocarbons and other compounds – Direct Effects							
Dimethylether	CH_3OCH_3	0.015	0.02		1	1	<<1
Chloroform	$CHCl_3$	0.51	0.11	4	108	31	9.3
Methylene chloride	CH_2Cl_2	0.38	0.03	9	31	8.7	2.7
Methyl chloride	CH_3Cl	1.0	0.01		45	13	4
	CH_2Br_2	0.41	0.01		5.4	1.54	0.47
Halon-1201	$CHBrF_2$	5.8	0.14		1,380	404	123
Trifluoroiodomethane	CF_3I	0.005	0.23	<1	1	0.4	0.1

Notes:

[a] The CO_2 response function used in this report is based on the revised version of the Bern Carbon cycle model used in Chapter 10 of this report (Bern2.5CC; Joos et al. 2001) using a background CO_2 concentration value of 378 ppm. The decay of a pulse of CO_2 with time t is given by

$$a_0 + \sum_{i=1}^{3} a_i \cdot e^{-t/\tau_i}$$

Where $a_0 = 0.217$, $a_1 = 0.259$, $a_2 = 0.338$, $a_3 = 0.186$, $\tau_1 = 172.9$ years, $\tau_2 = 18.51$ years, and $\tau_3 = 1.186$ years.

[b] The radiative efficiency of CO_2 is calculated using the IPCC (1990) simplified expression as revised in the TAR, with an updated background concentration value of 378 ppm and a perturbation of +1 ppm (see Section 2.10.2).

[c] The perturbation lifetime for methane is 12 years as in the TAR (see also Section 7.4). The GWP for methane includes indirect effects from enhancements of ozone and stratospheric water vapour (see Section 2.10.3.1).

[d] Robson et al. (2006)

[e] Hurley et al. (2005)

[f] Shine et al. (2005c), updated by the revised AGWP for CO_2. The assumed lifetime of 1,000 years is a lower limit.

‡ Second Assessment Report (IPCC, 1996)

* Compound in SAR (Table 2.8) was erroneously listed as CH_3Cl_3.