CLIMATE CHANGE 1995

The Science of Climate Change

WMO

UNEP

Contribution of Working Group I
to the Second Assessment Report of the
Intergovernmental Panel on Climate Change

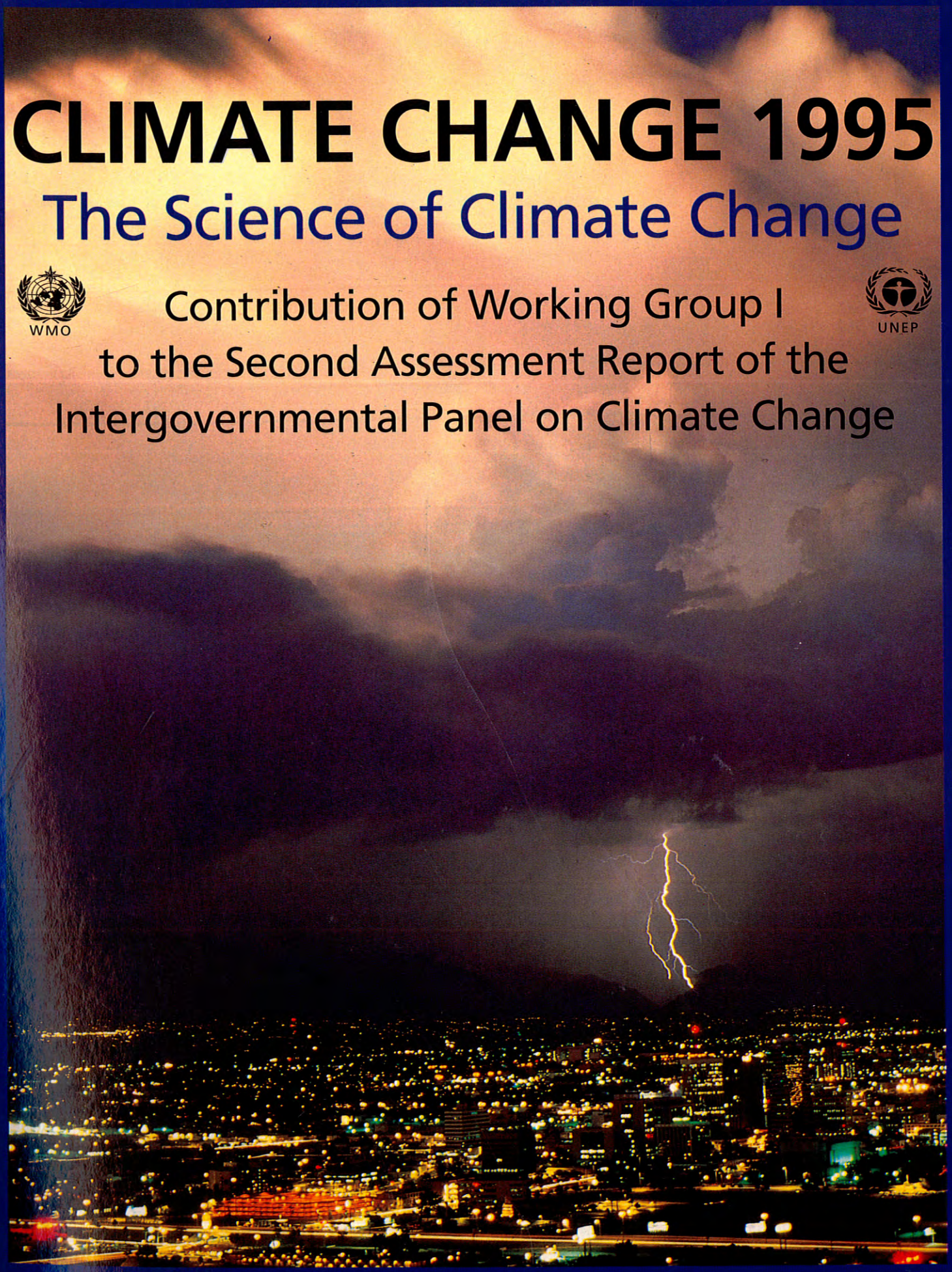

Table 4: *Global Warming Potential referenced to the updated decay response for the Bern carbon cycle model and future CO_2 atmospheric concentrations held constant at current levels.*

Species	Chemical Formula	Lifetime (years)	Global Warming Potential (Time Horizon) 20 years	100 years	500 years
CO_2	CO_2	variable§	1	1	1
Methane*	CH_4	12±3	56	21	6.5
Nitrous oxide	N_2O	120	280	310	170
HFC-23	CHF_3	264	9,100	11,700	9,800
HFC-32	CH_2F_2	5.6	2,100	650	200
HFC-41	CH_3F	3.7	490	150	45
HFC-43-10mee	$C_5H_2F_{10}$	17.1	3,000	1,300	400
HFC-125	C_2HF_5	32.6	4,600	2,800	920
HFC-134	$C_2H_2F_4$	10.6	2,900	1,000	310
HFC-134a	CH_2FCF_3	14.6	3,400	1,300	420
HFC-152a	C_2H4F_2	1.5	460	140	42
HFC-143	$C_2H_3F_3$	3.8	1,000	300	94
HFC-143a	$C_2H_3F_3$	48.3	5,000	3,800	1,400
HFC-227ea	C_3HF_7	36.5	4,300	2,900	950
HFC-236fa	$C_3H_2F_6$	209	5,100	6,300	4,700
HFC-245ca	$C_3H_3F_5$	6.6	1,800	560	170
Sulphur hexafluoride	SF_6	3,200	16,300	23,900	34,900
Perfluoromethane	CF_4	50,000	4,400	6,500	10,000
Perfluoroethane	C_2F_6	10,000	6,200	9,200	14,000
Perfluoropropane	C_3F_8	2,600	4,800	7,000	10,100
Perfluorobutane	C_4F_{10}	2,600	4,800	7,000	10,100
Perfluorocyclobutane	c–C_4F_8	3,200	6,000	8,700	12,700
Perfluoropentane	C_5F_{12}	4,100	5,100	7,500	11,000
Perfluorohexane	C_6F_{14}	3,200	5,000	7,400	10,700
Ozone-depleting substances†	e.g., CFCs and HCFCS				

§ Derived from the Bern carbon cycle model.

* The GWP for methane includes indirect effects of tropospheric ozone production and stratospheric water vapour production, as in IPCC (1994). The updated adjustment time for methane is discussed in Section B.2.

† The Global Warming Potentials for ozone-depleting substances (including all CFCs, HCFCs and halons, whose direct GWPs have been given in previous reports) are a sum of a direct (positive) component and an indirect (negative) component which depends strongly upon the effectiveness of each substance for ozone destruction. Generally, the halons are likely to have negative net GWPs, while those of the CFCs are likely to be positive over both 20- and 100-year time horizons (see Chapter 2, Table 2.8).