

## Supplementary Information for:

# The return to 1980 stratospheric halogen levels: A moving target in ozone assessments from 2006 to 2022

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**Table S1:** Sources of incremental changes (in yrs) to EESC 1980 return date using Engel et al. (2018)

	CFC-11	CFC-12	Halon-1301	CCl <sub>4</sub>	Other 12	Total Change	EESC 1980 Return Date
2006 Assessment Initial Return Date							
2006 Assessment Initial Return Date Engel et al.							2053.5
Lifetime Update	+2.2	+0.1	+0.3	+0.9		+3.4	
Observed mole fractions since 2006	-0.6	+0.3	+0.3	+1.0		+1.0	
Bank update	+1.8	+0.8	+1.4			+3.9	
Feedstock emissions				+3.1		+3.1	
Remaining gases					+1.2	+1.2	
Total updates by gas	+3.4	+1.2	+1.9	+5.0	+1.2	+12.6	2066.1
2010 Assessment Initial Return Date							2056.9
Lifetime Update	+1.8	+0.1	+0.2	+0.3		+2.6	
Observed mole fractions since 2010	-0.5	+0.3	+0.2	+2.2		+2.2	
Bank update	+2.0	+0.8	+0.9			+3.7	
Feedstock emissions				+1.3		+1.3	
Remaining gases					-0.5	-0.5	
Total updates by gas	+3.3	+1.2	+1.3	+3.8	-0.5	+9.2	2066.1
2014 Assessment Initial Return Date							2059.4
Lifetime Update	0	0	0	+0.5		+0.5	
Observed mole fractions since 2014	-0.1	+0.2	0	+1.3		+1.3	
Bank update	+2.2	+0.7	+0.7			+3.5	
Feedstock emissions				+1.2		+1.2	
Remaining gases					+0.1	+0.1	
Remaining Updates	+2.1	+0.8	+0.7	+2.9	+0.1	+6.7	2066.1
2018 Assessment Initial Return Date							2061.9
Lifetime Update	0	0	0	-0.1		-0.1	
Observed mole fractions since 2014	0	+0.1	0	+1.0		+1.1	
Bank update	+2.3	+0.7	+0.7			+3.7	
Feedstock emissions				-1.7		-1.7	
Remaining gases					+1.2	+1.2	
Remaining Updates	+2.3	+0.8	+0.7	-0.8	+1.2	+4.2	2066.1

**Table S2: Atmospheric lifetimes (units of yr) for the 16 principal ODSs, given in each SAOD report**

	WMO 2006	WMO 2010	WMO 2014	WMO 2018	WMO 2022
CFC-11	45	45	52	52	52
CCl <sub>4</sub>	26	26	26	32	30
halon-1301	65	65	72	72	72
CFC-12	100	100	102	102	102
CH <sub>3</sub> Br	0.7	0.8	0.8	0.8	0.8
CFC-113	85	85	93	93	93
halon-2402	20	20	20	28	28
HCFC-142b	17.9	17.2	18	18	17.1
CH <sub>3</sub> CCl <sub>3</sub>	5.0	5	5	5	5
CFC-114	300	190	189	189	189
CFC-115	1700	1020	540	540	540
halon-1202	2.9	2.9	2.9	2.5	2.5
halon-1211	16	16	16	16	16
HCFC-141b	9.3	9.2	9.4	9.4	8.81
CH <sub>3</sub> Cl	1.0	1.0	0.9	0.9	0.9
HCFC-22	12.0	11.9	11.9	11.9	11.6