

Corrigendum to “It is premature to include non-CO₂ effects of aviation in emission trading schemes” by P.M.de F. Forster, K.P.Shine and N.Stuber (Atmospheric Environment 40 (2006) 1117-1121

Table 1 of the above paper contains two errors and a corrected version is shown below. First, for the Absolute Global Warming Potential (AGWP) for Contrails, we had failed to convert emissions in TgC to TgCO₂. This error gave an over-estimate of the climate impact of contrails, compared to carbon dioxide emissions. Second, a *much* smaller error has been noted in our values for the AGWP of CH₄ and O₃ as we had not retained sufficient precision in our calculations. The revised values are given in the Table. Note, though, that given the uncertainties in the chemical transport models used to calculate the perturbations in ozone and methane following NO_x emissions by aviation, the effects of this second error are in the “noise”. Had we used the methane lifetime corrected values from Wild et al. (2001), as quoted in Stevenson et al. (2004), rather than Stevenson et al.’s own values, the corresponding AGWPs would (in the same units as Table 1) be 3.1, 1.2, 0.75 and 0.75 for the time horizons of 1, 20, 100 and 500 years respectively. This indicates that the magnitude and sign of the NO_x effect is uncertain at the longer timescales.

Table 1
CO₂ and approximate non-CO₂ aviation AGWPs at different time horizons

Time horizon (2000 start) (year)	CO ₂ AGWP	CH ₄ and O ₃ NET AGWP	Contrail AGWP	CO ₂ EWF
1	0.25	1.94	1.8	16
20	2.65	0.34	1.8	1.8
100	9.15	-0.038	1.8	1.2
500	29.9	-0.038	1.8	1.1

Units of AGWP are 10⁻¹⁴ Wm⁻² kgCO₂⁻¹ year. The appropriate CO₂ Emission-Weighting Factor (EWF) for the total aviation effect at the given time horizon is given in the last column. This is the sum of the middle three columns divided by the CO₂ AGWP.

References

Stevenson, D.S., Doherty, R.M., Sanderson, M.G., Collins, W.J., Johnson, C.E., Derwent, R.G., 2004. Radiative forcing from aircraft NO_x emissions: mechanisms and seasonal dependence. Journal of Geophysical Research 109, D17307

Wild, O., Prather, M.J., Akimoto, H., 2001. Indirect long-term global radiative cooling from NO_x emissions. Geophysical Research Letters 28, 1719-1722