Supplementary Material

Table S1. Preindustrial (1860) and present (2000) anthropogenic (ANTH) and biomass burning (BB) of NO_x, CO, BC, OC and SO_2 used in this study

	NO_x Tg N year^{-1}		CO Tg year^{-1}		BC Tg C year^{-1}		OC Tg C year^{-1}		SO_2 Tg year^{-1}	
	ANTH	BB	ANTH	BB	ANTH	BB	ANTH	BB	ANTH	BB
1860	0.7	4.8	67.3	322.6	1.3	2.0	5.3	18.0	3.0	2.4
2000	26.5	5.5	608.3	459.1	5.0	2.6	12.6	23.3	92.8	3.8

Table S2. Preindustrial (1860) and present (2000) surface emissions of NO_x, CO, BC, OC and SO_2 used in Anenberg et al. (2010) (denoted as A study) and in this study

	NO_x Tg N year^{-1}		CO Tg year^{-1}		BC Tg C year^{-1}		OC Tg C year^{-1}		SO_2 Tg year^{-1}	
	A study*	This study	A study*	This study	A study*	This study	A study*	This study	A study*	This study
1860	5.5	9.3	306	569	0.9	3.3	9.3	23.2	5.8	5.6
2000	40.5	41.0	1195	1247.7	10.9	7.7	51.5	33.6	147	107.6

* Data from Horowitz (Horowitz, 2006)

Table S3. Premature mortalities in 2000 associated with industrial air pollution driven by individual factors. Values are calculated as in Eq (1), using ACS health impact functions, concentration changes in annual $PM_{2.5}$ and H-O_3 resulting from changes in emissions of short-lived species (EMIS), climate (CLIM) and CH_4 concentrations (TCH4), WHO baseline mortality rate and population in the year 2000. The 95% confidence intervals are shown in brackets.

Regions	$PM_{2.5}$ mortality (Cardiopulmonary)			$PM_{2.5}$ mortality (Lung Cancer)			O_3 mortality (Respiratory)		
	EMIS	CLIM	TCH4	EMIS	CLIM	TCH4	EMIS	CLIM	TCH4
World	1495 (1184, 1788)	91 (71, 110)	0.9 (0.7, 1.1)	92.5 (43.0, 139.8)	5.1 (2.3, 8.0)	1.0 (0.4,1.6	328 (113, 522)	7 (2, 12)	50 (17, 82)
North America	34 (27, 41)	-0.2 (-0.16, 0.25)	1.9 (1.5, 2.3)	3.9 (1.7, 6.0)	-0.07 (-0.03, -0.1)	0.3 (0.1, 0.6)	23 (8, 36)	0.4 (0.1, 0.7)	3.7 (1.2, 6.1)
South America	14 (11, 17)	1.0 (0.8, 1.2)	-0.4 (-0.3, -0.5)	0.7 (0.3, 1.2)	0.05 (0.02, 0.08)	-0.02 (-0.01, -0.03)	3.6 (1.2, 5.8)	-0.1 (-0.2, -0.0)	1.2 (0.4, 2.1)
Europe	117 (92, 141)	18 (14, 21)	-0.5 (-0.4, -0.7)	7.4 (3.4, 11.6)	1.2 (0.5, 1.9)	0.02 (0.01, 0.04)	26 (9, 42)	1.0 (0.3, 1.6)	6 (2, 10)
Africa	74 (58, 89)	6 (4, 7)	-5 (-4, -7)	2.0 (0.9, 3.0)	0.1 (0.06, 0.2)	-0.1 (-0.05, -0.2)	14 (5, 23)	0.3 (0.1, 0.5)	4.7 (1.5, 7.7)
South Asia	408 (323, 487)	31 (24, 37)	-11 (-8, -13)	14.7 (6.8, 22.2)	1.1 (0.5, 1.8)	-0.4 (-0.2, -0.6)	59 (20, 94)	1.2 (0.4, 7.0)	9 (3, 15)
Southeast Asia	108 (85, 129)	1.2 (0.9, 1.4)	0.2 (0.16, 0.25)	6.9 (3.2, 10.4)	0.05 (0.02, 0.08)	0.03 (0.01, 0.05)	24 (8, 38)	0.2 (0.1, 0.3)	3 (1, 5)
East Asia	656 (522, 781)	30 (24, 37)	12 (9, 14)	52.5 (24.6, 78.5)	2.4 (1.1, 3.7)	1.0 (0.4, 1.5)	165 (57,161)	4.3 (1.4, 7.0)	19 (6, 31)
Middle East	51 (40, 62)	4 (3, 5)	1.3 (1.0, 1.5)	2.5 (1.1, 3.9)	0.2 (0.1, 0.3)	0.06 (0.03, 0.09)	6 (2, 10)	0.03 (0.01, 0.05)	1.6 (0.5, 2.6)
Rest of Asia	28 (22, 34)	-0.1 (-0.08, -0.13)	2.8 (2.2, 3.4)	1.4 (0.6, 2.2)	-0.01 (-0.005, -0.02)	0.1 (0.06, 0.2)	4.5 (2.2, 7.3)	0.06 (0.02, 0.1)	1.3 (0.4, 2.1)
Australia	0.6 (0.5, 0.8)	0.08 (0.07, 0.1)	0.02 (0.01, 0.02)	0.1 (0.04, 0.15)	0.01 (0.006, 0.02)	0.003 (0.001, 0.004)	0.2 (0.1, 0.4)	-0.01 (-0.003, -0.015)	0.1 (0.05, 0.15)

Figure S1. Changes in annual mean stratiform (large-scale) precipitation (unit: mm/day) driven by climate change (derived as "2000" – "1860CL2000emis" simulations). Dotted area indicate changes significant at the 90% confidence level assessed by student t test.