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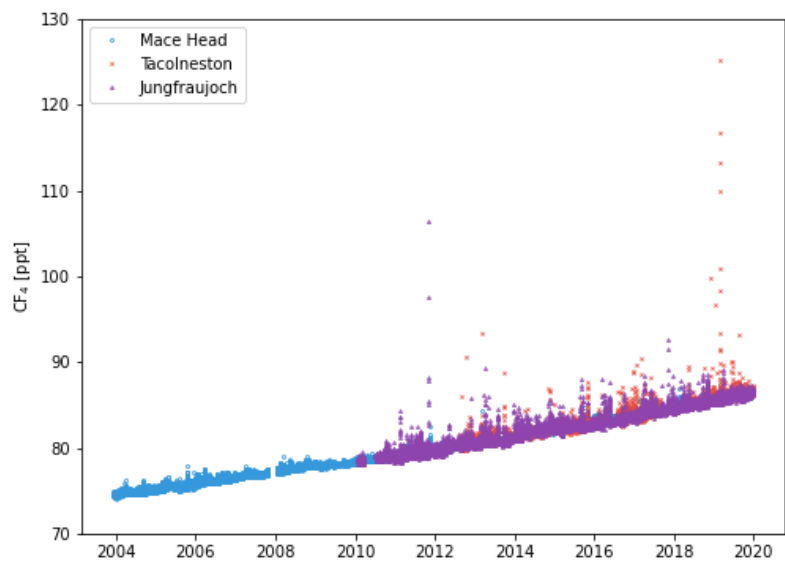
*Supplement of*

## **Global trends and European emissions of tetrafluoromethane (CF<sub>4</sub>), hexafluoroethane (C<sub>2</sub>F<sub>6</sub>) and octafluoropropane (C<sub>3</sub>F<sub>8</sub>)**

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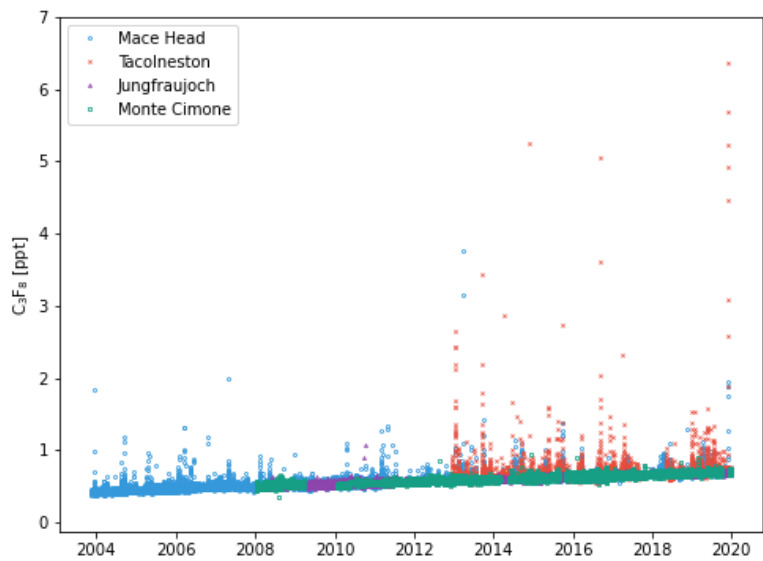
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**Figure S1.** European observations of CF<sub>4</sub> measured at Mace Head (blue circles), Jungfraujoch (purple triangles) and Tacolneston (red crosses) from December 2003 – December 2019 inclusive.



**Figure S2.** European observations of  $C_2F_6$  measured at Mace Head (blue circles), Jungfraujoch (purple triangles) and Tacolneston (red crosses) from December 2003 – December 2019 inclusive.



**Figure S3.** European observations of C<sub>3</sub>F<sub>8</sub> measured at Mace Head (blue circles), Jungfraujoch (purple triangles), Tacolneston (red crosses) and Monte Cimone (turquoise squares) from December 2003 – December 2019 inclusive.

**Table S1.** Annual top-down CF<sub>4</sub> emissions for northwest European countries, in megagrams (Mg).

	UK	Ireland	France	Benelux	Germany	Northwest Europe
2005	58.0 (28.1 – 87.9)	9.3 (1.2 – 17.4)	–	28.1 (0.0 – 88.3)	–	–
2006	52.0 (21.6 – 82.4)	8.0 (0.7 – 15.3)	–	12.5 (0.0 – 77.3)	–	–
2007	47.2 (20.3 – 74.1)	5.4 (0.0 – 11.1)	–	19.6 (0.0 – 82.4)	–	–
2008	43.7 (20.8 – 66.6)	5.2 (0.0 – 10.8)	–	25.3 (0.0 – 76.7)	–	–
2009	34.6 (13.7 – 55.5)	4.7 (0.0 – 10.3)	–	16.7 (0.0 – 62.7)	–	–
2010	33.6 (14.1 – 53.1)	4.6 (0.0 – 9.4)	94.0 (0.0 – 192.1)	8.4 (0.0 – 52.4)	70.5 (0.0 – 157.5)	211.1 (86.4 – 335.8)
2011	27.6 (9.8 – 45.4)	3.7 (0.0 – 7.7)	107.6 (30.1 – 185.1)	9.2 (0.0 – 56.0)	43.7 (0.0 – 136.0)	191.7 (79.3 – 304.1)
2012	17.9 (4.1 – 31.7)	2.2 (0.0 – 5.7)	74.8 (17.6 – 132.0)	15.5 (0.0 – 47.7)	44.9 (0.0 – 116.9)	155.3 (69.9 – 240.7)
2013	20.5 (5.7 – 35.3)	2.3 (0.0 – 7.6)	46.2 (0.0 – 95.5)	17.5 (2.3 – 32.7)	52.4 (4.8 – 100.0)	138.9 (72.1 – 205.7)
2014	21.9 (3.4 – 40.4)	2.9 (0.0 – 10.7)	50.1 (0.0 – 104.1)	17.5 (2.0 – 33.0)	36.4 (0.0 – 91.6)	128.7 (51.5 – 205.9)
2015	24.8 (2.1 – 47.5)	2.6 (0.0 – 11.5)	64.4 (1.7 – 127.1)	18.9 (0.0 – 39.1)	37.4 (0.0 – 106.4)	148.2 (54.7 – 241.7)
2016	22.0 (0.0 – 49.5)	1.2 (0.0 – 10.6)	46.5 (0.0 – 120.3)	23.8 (0.0 – 50.8)	36.8 (0.0 – 111.5)	130.3 (26.1 – 234.5)
2017	14.4 (0.0 – 40.6)	2.2 (0.0 – 10.5)	27.4 (0.0 – 107.2)	27.3 (0.0 – 58.7)	19.7 (0.0 – 105.8)	91.0 (0.0 – 204.6)
2018	12.8 (0.0 – 32.6)	6.8 (0.5 – 13.1)	35.7 (0.0 – 101.6)	24.4 (0.0 – 52.3)	23.3 (0.0 – 102.6)	103.1 (5.7 – 200.5)
2019	12.1 (0.0 – 29.5)	10.6 (4.3 – 16.9)	52.4 (0.0 – 108.0)	14.2 (0.0 – 37.2)	48.9 (0.0 – 117.0)	138.2 (55.0 – 193.2)

**Table S2.** Annual top-down C<sub>2</sub>F<sub>6</sub> emissions for northwest European countries, in megagrams (Mg).

	UK	Ireland	France	Benelux	Germany	Northwest Europe
2005	11.1 (0.0 – 23.6)	11.7 (7.2 – 16.2)	–	3.8 (0.0 – 27.7)	–	–
2006	14.8 (1.8 – 27.8)	11.6 (7.4 – 15.8)	–	0.7 (0.0 – 24.7)	–	–
2007	17.4 (3.9 – 30.9)	10.3 (6.8 – 13.8)	–	6.4 (0.0 – 33.3)	–	–
2008	16.0 (2.9 – 29.1)	8.5 (5.0 – 12.0)	8.0 (0.0 – 34.8)	6.4 (0.0 – 29.8)	14.5 (0.0 – 63.5)	53.4 (4.4 – 102.4)
2009	13.6 (1.0 – 26.2)	6.3 (2.6 – 10.0)	9.3 (0.0 – 27.4)	3.7 (0.0 – 21.5)	20.9 (0.0 – 49.6)	53.8 (23.5 – 84.1)
2010	8.2 (0.0 – 20.0)	5.7 (2.3 – 9.1)	14.8 (0.0 – 33.0)	4.7 (0.0 – 19.4)	19.0 (0.0 – 43.5)	52.4 (23.5 – 81.3)
2011	6.7 (0.0 – 16.2)	4.3 (1.7 – 6.9)	13.9 (0.0 – 31.2)	3.5 (0.0 – 17.9)	15.3 (0.0 – 40.5)	43.6 (15.0 – 72.2)
2012	8.1 (1.9 – 14.3)	2.4 (0.6 – 4.2)	10.9 (0.0 – 23.7)	5.0 (0.0 – 15.1)	9.9 (0.0 – 29.3)	36.2 (14.6 – 57.8)
2013	7.7 (2.6 – 12.8)	2.7 (0.6 – 4.8)	12.2 (2.0 – 22.4)	6.5 (1.6 – 11.4)	8.6 (0.0 – 22.4)	37.7 (20.9 – 54.5)
2014	6.9 (1.6 – 12.2)	2.6 (0.1 – 5.1)	14.6 (4.3 – 24.9)	6.6 (2.5 – 10.7)	12.0 (0.0 – 26.1)	42.6 (25.0 – 60.2)
2015	5.5 (0.0 – 11.4)	1.9 (0.0 – 4.3)	15.4 (3.3 – 27.5)	8.1 (2.9 – 13.3)	9.4 (0.0 – 25.7)	40.2 (19.8 – 60.6)
2016	5.9 (0.0 – 13.3)	1.7 (0.0 – 4.3)	10.7 (0.0 – 25.6)	9.6 (2.2 – 17.0)	4.4 (0.0 – 22.5)	32.3 (9.1 – 55.5)
2017	6.4 (0.0 – 14.2)	2.3 (0.0 – 5.0)	7.0 (0.0 – 22.6)	5.7 (0.0 – 13.8)	10.2 (0.0 – 30.9)	31.6 (6.3 – 56.9)
2018	5.5 (0.0 – 11.6)	2.6 (0.4 – 4.8)	6.9 (0.0 – 19.9)	2.4 (0.0 – 8.9)	17.2 (0.0 – 37.7)	34.5 (11.2 – 57.8)
2019	4.9 (0.0 – 10.0)	2.4 (0.4 – 4.4)	7.3 (0.0 – 19.3)	2.6 (0.0 – 7.5)	21.6 (3.0 – 40.2)	38.7 (17.1 – 60.3)

**Table S3.** Annual top-down C<sub>3</sub>F<sub>8</sub> emissions for northwest European countries, in megagrams (Mg).

	UK	Ireland	France	Benelux	Germany	Northwest Europe
2005	24.0 (15.5 – 32.5)	1.2 (0.0 – 3.2)	–	3.8 (0.0 – 21.6)	–	–
2006	23.4 (16.0 – 30.8)	0.8 (0.0 – 2.6)	–	5.4 (0.0 – 21.4)	–	–
2007	19.0 (12.4 – 25.6)	1.1 (0.0 – 2.7)	–	9.1 (0.0 – 22.1)	–	–
2008	14.2 (7.4 – 21.0)	1.4 (0.0 – 3.2)	7.1 (0.0 – 17.0)	8.2 (0.0 – 19.1)	2.1 (0.0 – 20.2)	33.0 (15.6 – 50.4)
2009	14.1 (6.5 – 21.7)	1.7 (0.0 – 3.8)	4.9 (0.0 – 14.6)	2.9 (0.0 – 12.6)	4.6 (0.0 – 19.2)	28.3 (12.5 – 44.1)
2010	13.9 (6.5 – 21.3)	2.3 (0.2 – 4.4)	6.1 (0.0 – 14.9)	0.0 (0.0 – 8.0)	6.6 (0.0 – 19.9)	28.9 (13.5 – 44.3)
2011	15.3 (9.4 – 21.2)	1.7 (0.2 – 3.2)	5.8 (0.0 – 13.1)	1.2 (0.0 – 9.3)	5.0 (0.0 – 18.2)	29.0 (15.0 – 43.0)
2012	15.6 (11.5 – 19.7)	0.6 (0.0 – 1.6)	4.6 (0.0 – 10.4)	4.2 (0.0 – 10.4)	3.8 (0.0 – 15.3)	28.7 (17.0 – 40.4)
2013	15.0 (11.0 – 19.0)	0.8 (0.0 – 2.2)	3.3 (0.0 – 8.1)	6.2 (3.0 – 9.4)	2.8 (0.0 – 11.7)	28.0 (17.9 – 38.1)
2014	16.1 (11.5 – 20.7)	1.1 (0.0 – 3.0)	3.8 (0.0 – 8.9)	5.8 (2.8 – 8.8)	1.4 (0.0 – 10.2)	28.2 (17.6 – 38.8)
2015	14.7 (9.5 – 19.9)	1.0 (0.0 – 3.0)	5.0 (0.0 – 11.1)	5.3 (1.3 – 9.3)	1.1 (0.0 – 11.5)	27.0 (14.7 – 39.3)
2016	12.1 (6.3 – 17.9)	0.8 (0.0 – 2.8)	3.2 (0.0 – 9.9)	6.1 (1.1 – 11.1)	1.6 (0.0 – 12.7)	23.8 (10.9 – 36.7)
2017	13.8 (8.2 – 19.4)	1.0 (0.0 – 2.8)	2.3 (0.0 – 8.8)	6.4 (1.2 – 11.6)	1.5 (0.0 – 12.4)	25.1 (12.7 – 37.5)
2018	16.6 (11.8 – 21.4)	1.0 (0.0 – 2.5)	2.5 (0.0 – 8.4)	4.6 (0.9 – 9.3)	3.1 (0.0 – 13.5)	27.8 (16.3 – 39.3)
2019	16.4 (11.7 – 21.1)	0.6 (0.0 – 2.4)	2.0 (0.0 – 8.1)	3.5 (0.0 – 7.9)	6.3 (0.0 – 17.7)	28.9 (16.4 – 41.4)