Supplementary material to

High resolution seasonal and decadal inventory of anthropic gas-phase and particle emissions for Argentina

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The supplementary material is organized as follows. Figure S1 shows the Summary of total Argentine emissions of different pollutants and sectors for year 2019 within the GEAA-AEIv3.0M inventory. Figure S2 to Figure S17 show the monthly and annual variations for all the sectors analyzed. In all Figures, left vertical axis shows the emissions for each polluting species in Megagrams (Mg), while right vertical axis refers only to CO_{2eq} emissions in Gigagrams (Gg). Table S1 and Table S2 show the comparison of GEAA-AEIv3.0M Vs EDGAR inventories for GHG and other species (NO_x, CO, PM_{10} and $PM_{2.5}$) respectively. All abbreviations and codes shown in this supplementary material correspond to the definitions in Table 1a of the main text of this manuscript. The whole inventory dataset (monthly grilled 1995-2020) for 12 polluting species from 15 sectors is available in a freely accessible repository (http://dx.doi.org/10.17632/d6xrhpmzdp.1). The next table of contents has the list with hyperlinks to reach each figure or table.

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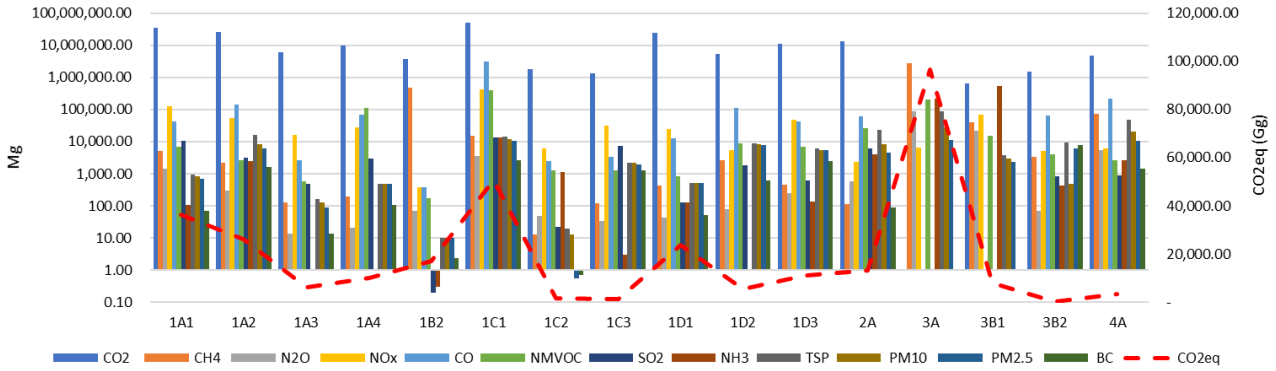

65 **Figure S1. Summary of total Argentine emissions of different pollutants for year 2019 within the GEAA-AEIv3.0M inventory. CO_{2eq} values are in Gg.**

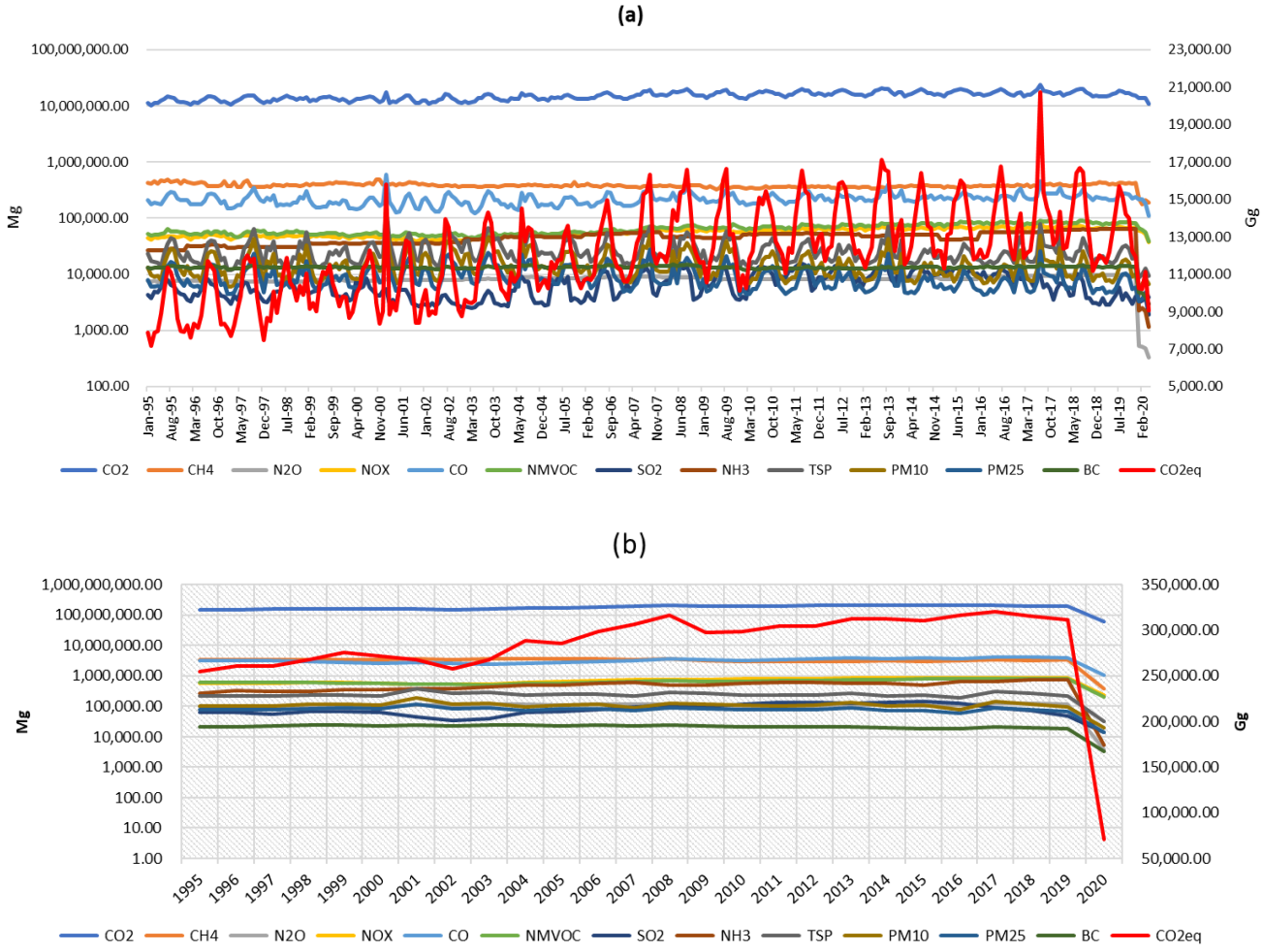

Figure S2 Monthly (a) and annual (b) emissions for all sectors (a). All CO_{2eq} values are in Gg.

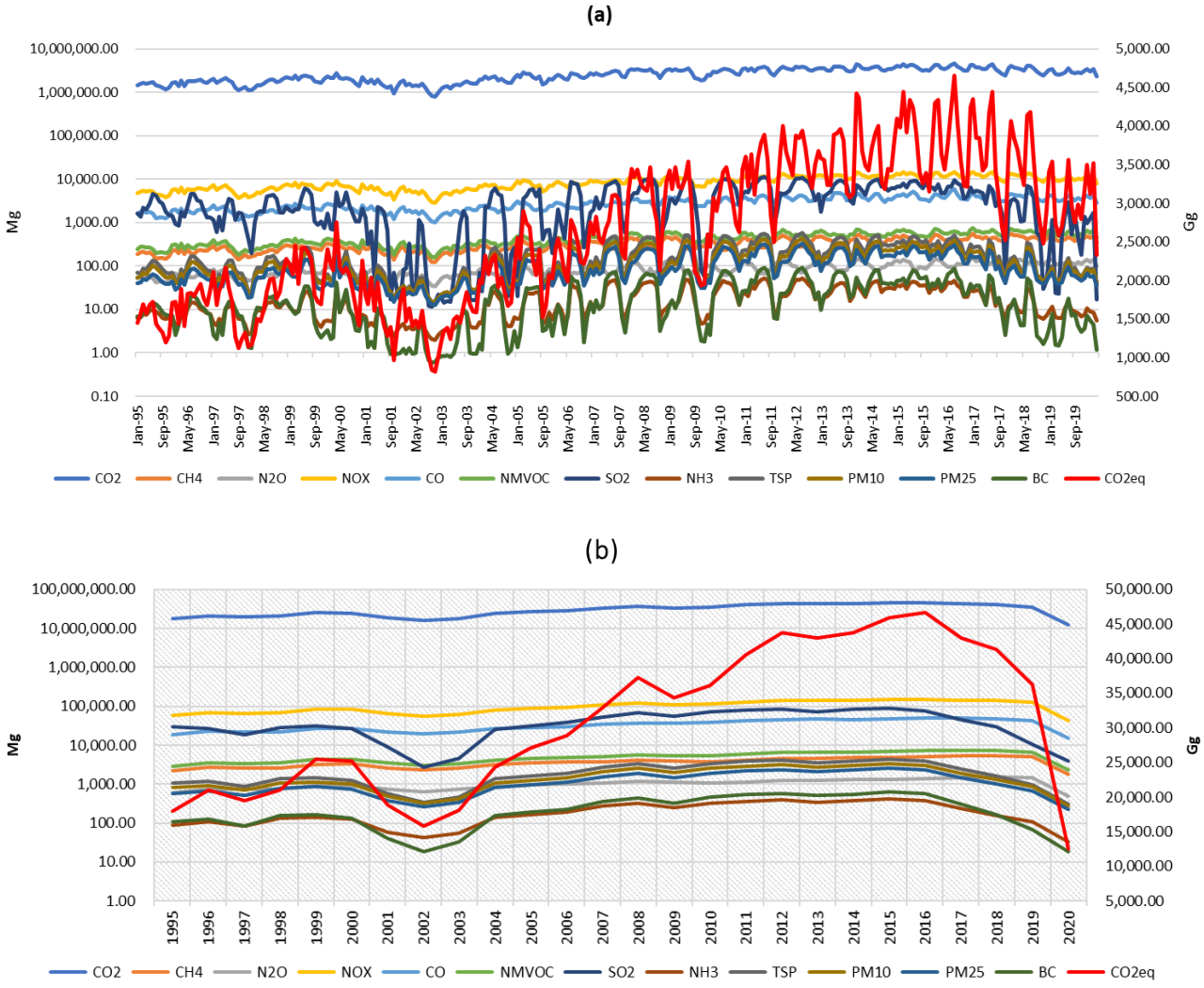

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Figure S3. Monthly (a) and annual (b) emissions from electricity production at thermal power plants (TPP: 1A1a). All CO_{2eq} values are in Gg.

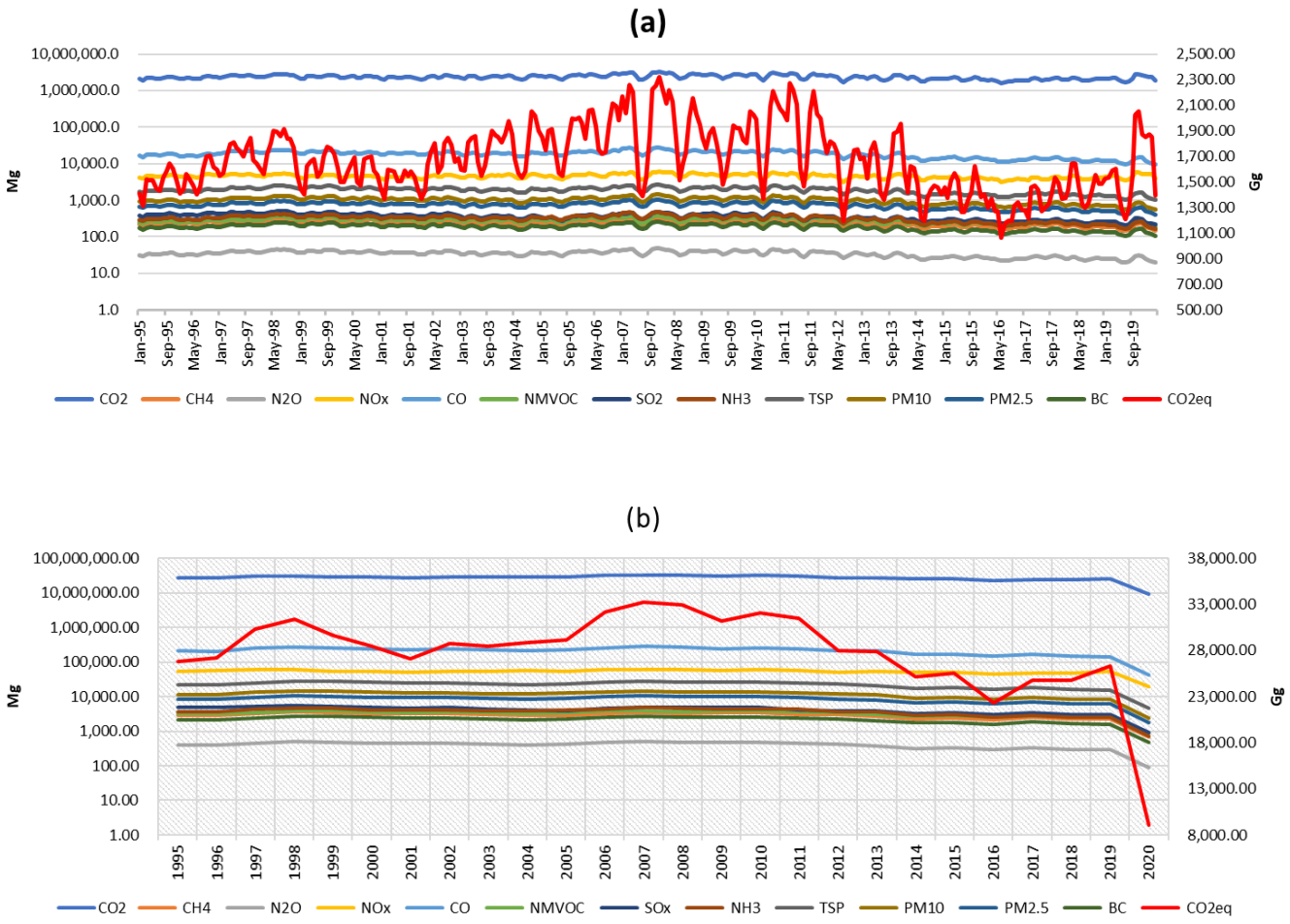
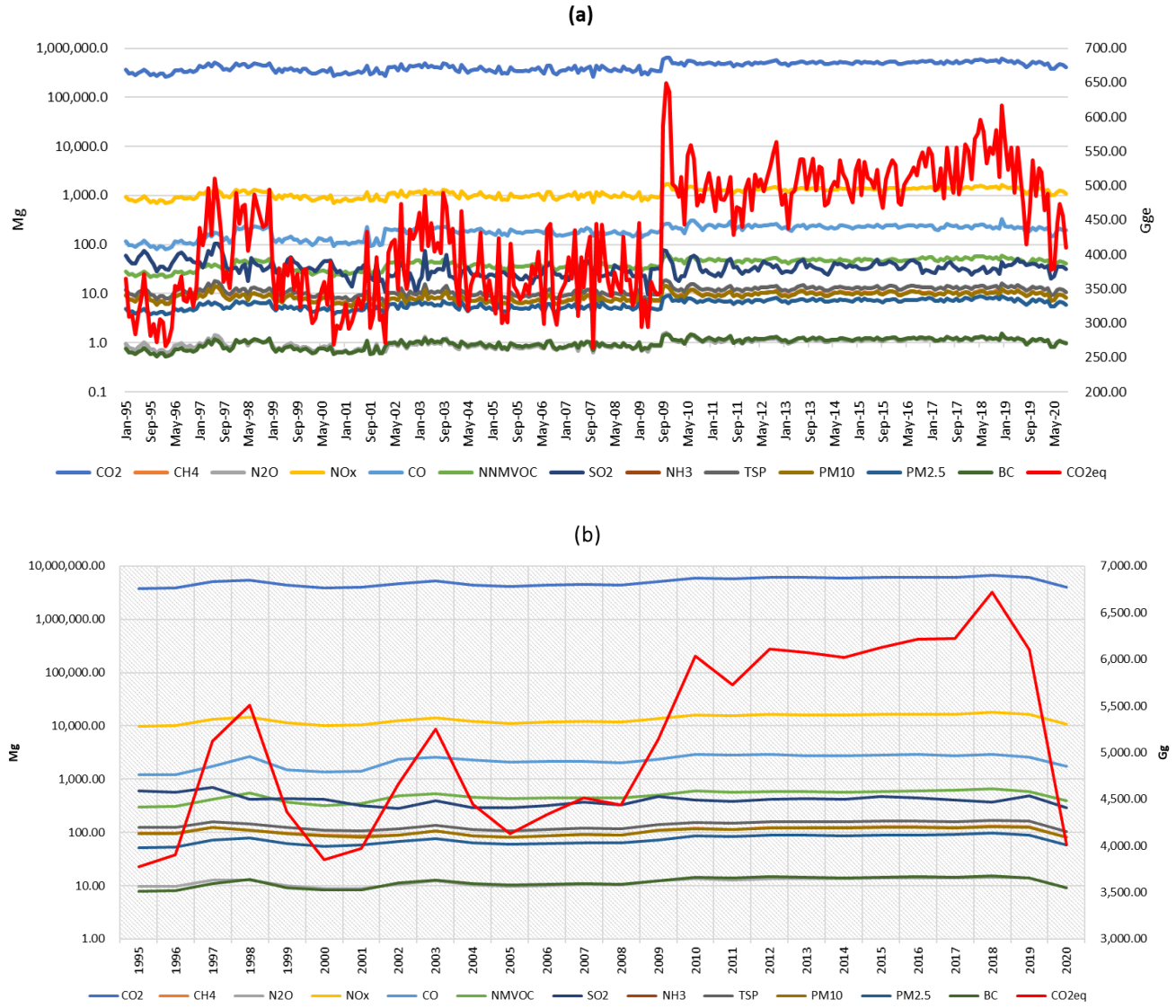


Figure S4. Monthly (a) and annual (b) emissions from fuel burning at manufacturing industries (MFC: 1A1b). All CO_{2eq} values are in Gg. Residue crops, wood and other primaries used in as industrial fuel do not include CO2 emissions for their calculation in CO2eq.



85 **Figure S5. Monthly (a) and annual (b) emissions from refineries by own consumption (ROC: 1A1c). All CO_{2eq} values are in Gg.**

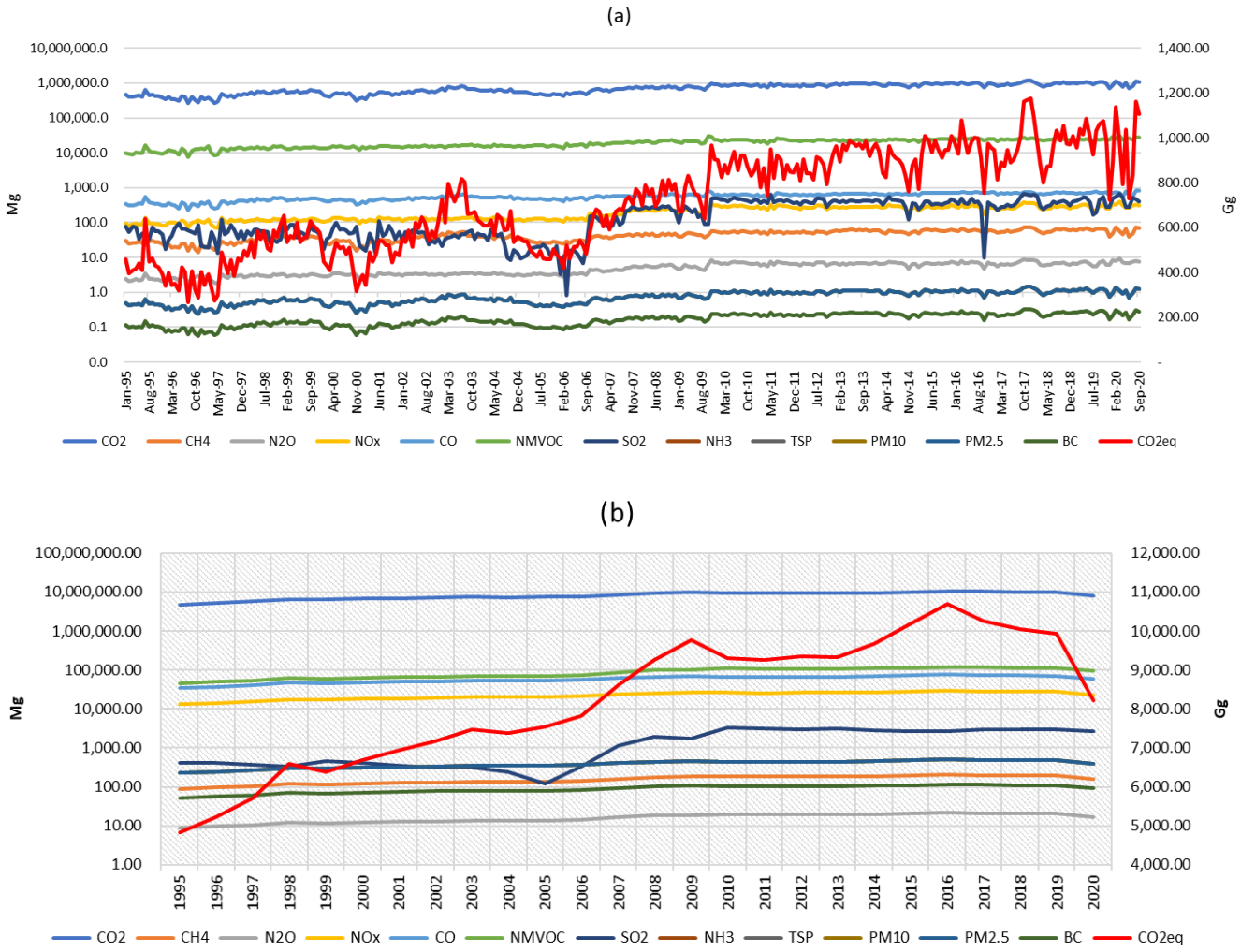
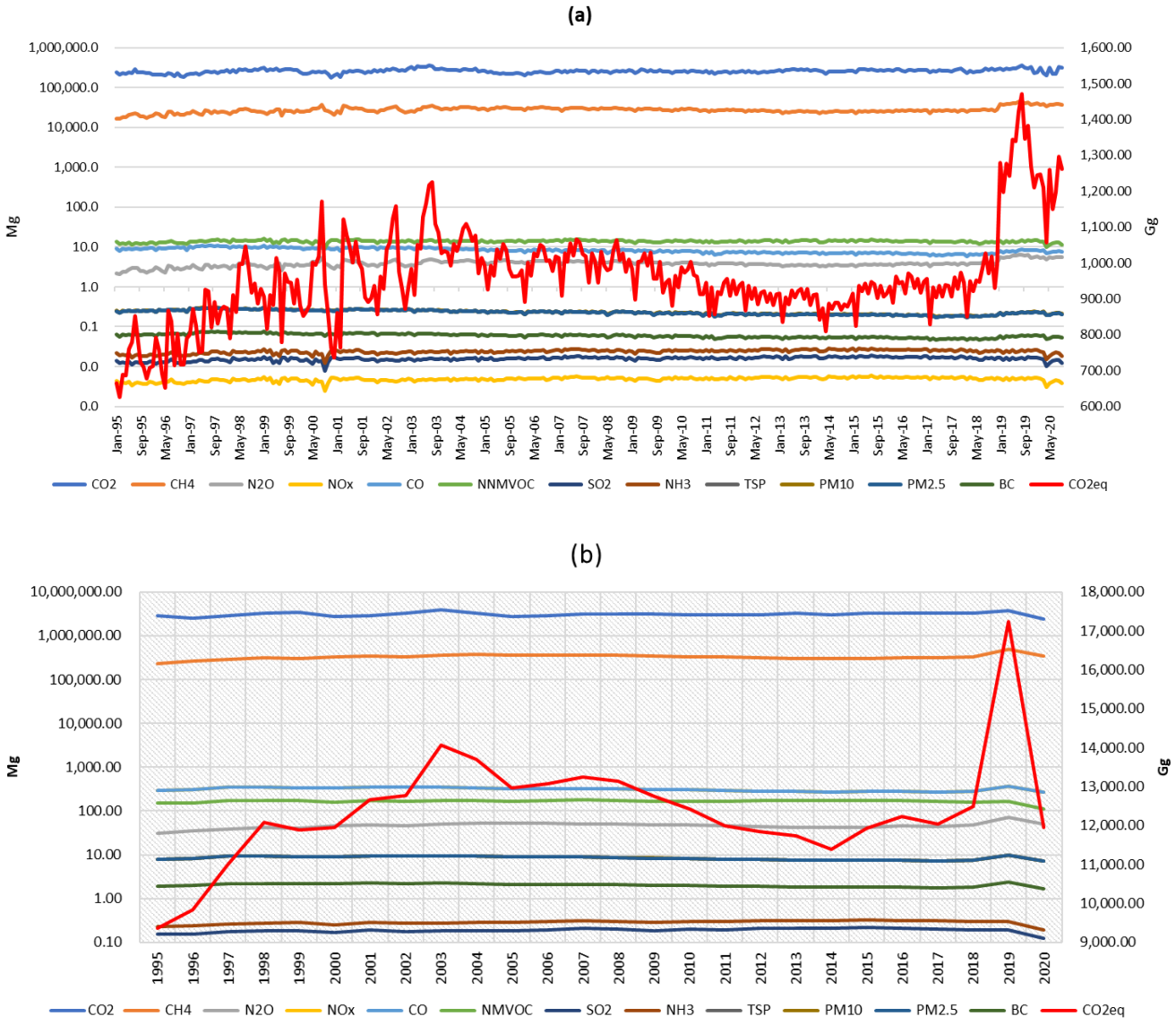
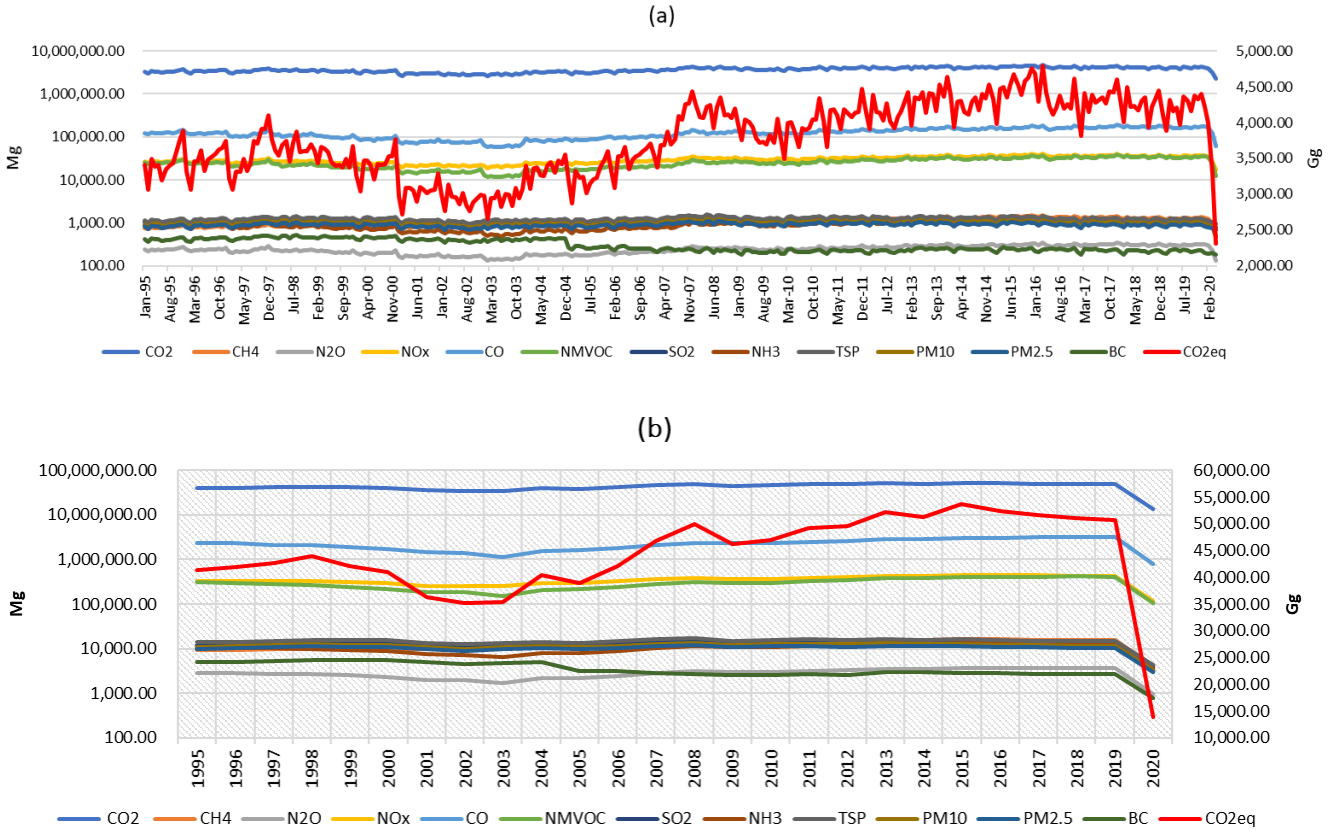


Figure S6. Monthly (a) and annual (b) emissions from oil and natural gas production at well (FPR: 1Ab2). All CO_{2eq} values are in Gg.



95 **Figure S7. Monthly (a) and annual (b) emissions from refineries, and gas and oil production (venting and flare) (FUG: 1B2). All CO_{2eq} values are in Gg.**



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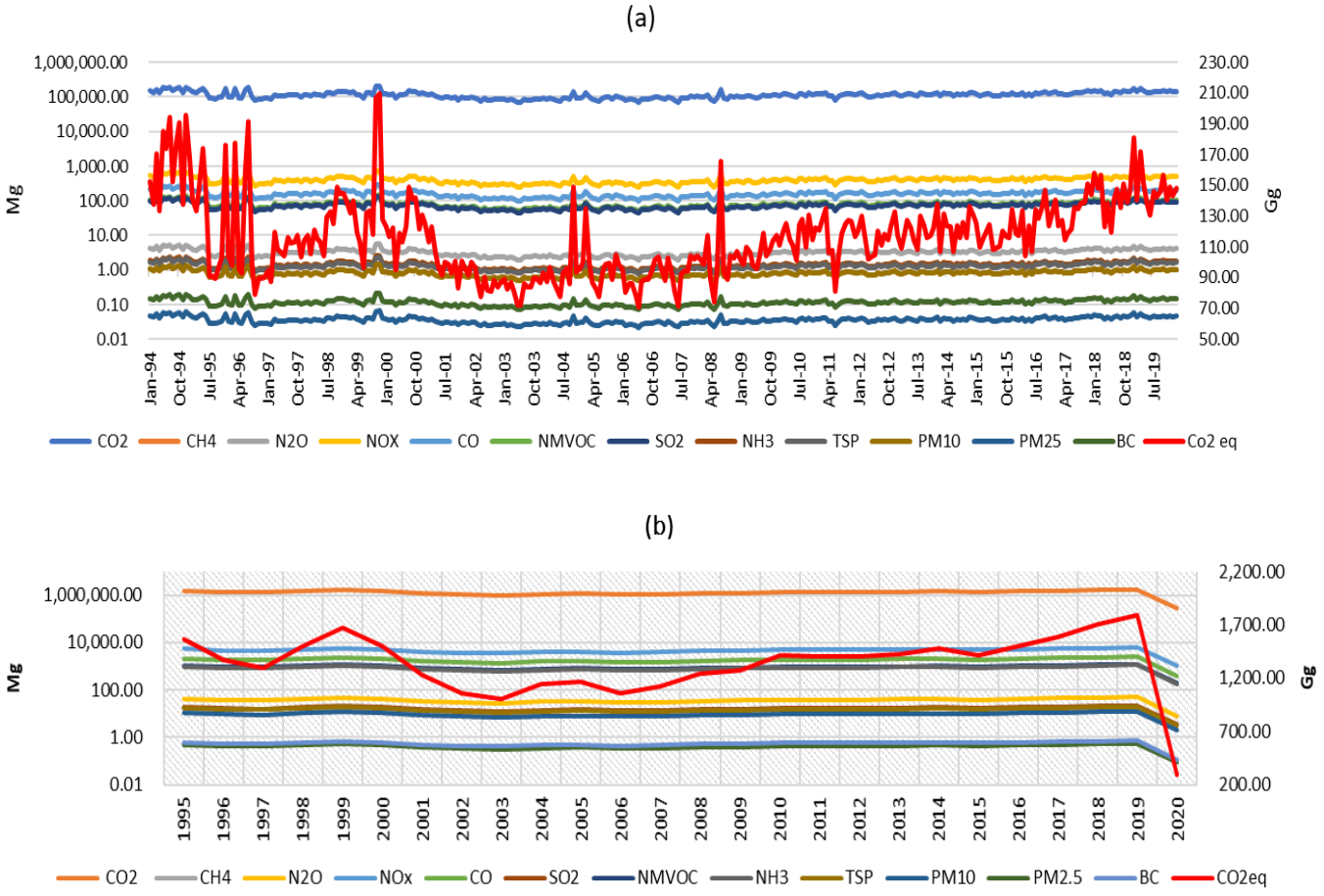
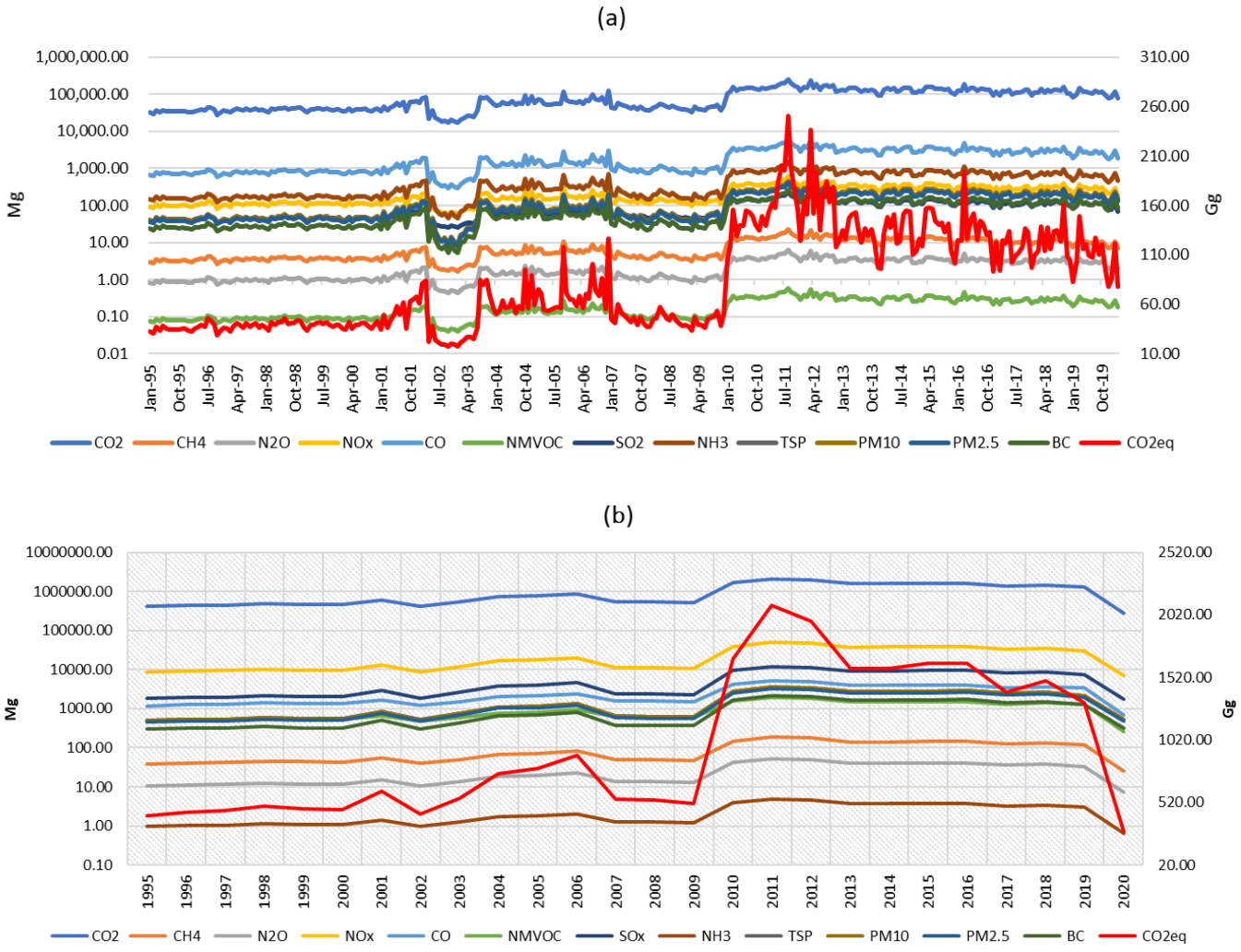


Figure S9. Monthly (a) and annual (b) emissions from aviation fuel consumption (DOA: 1A3a). All CO_{2eq} values are in Gg.



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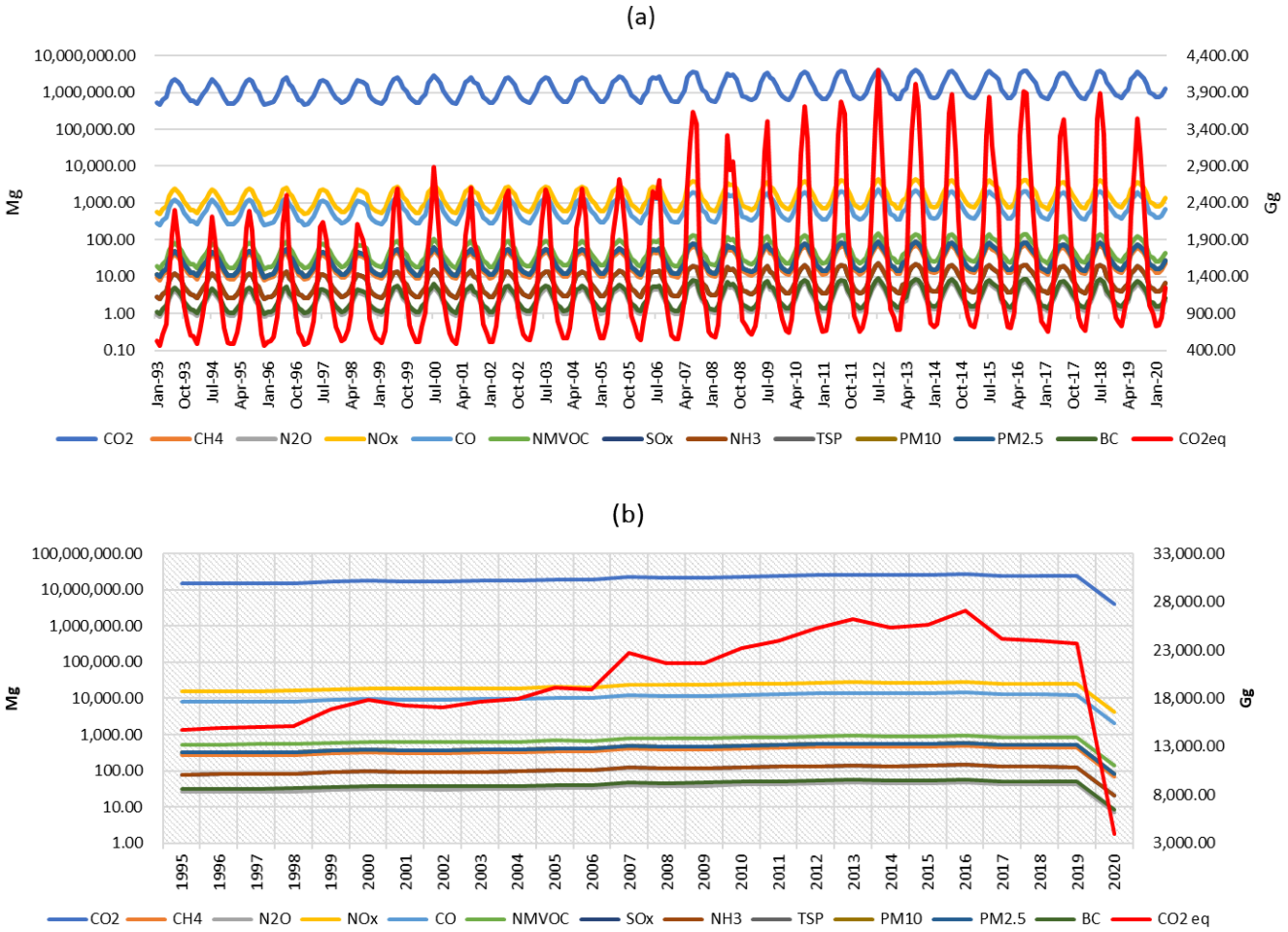

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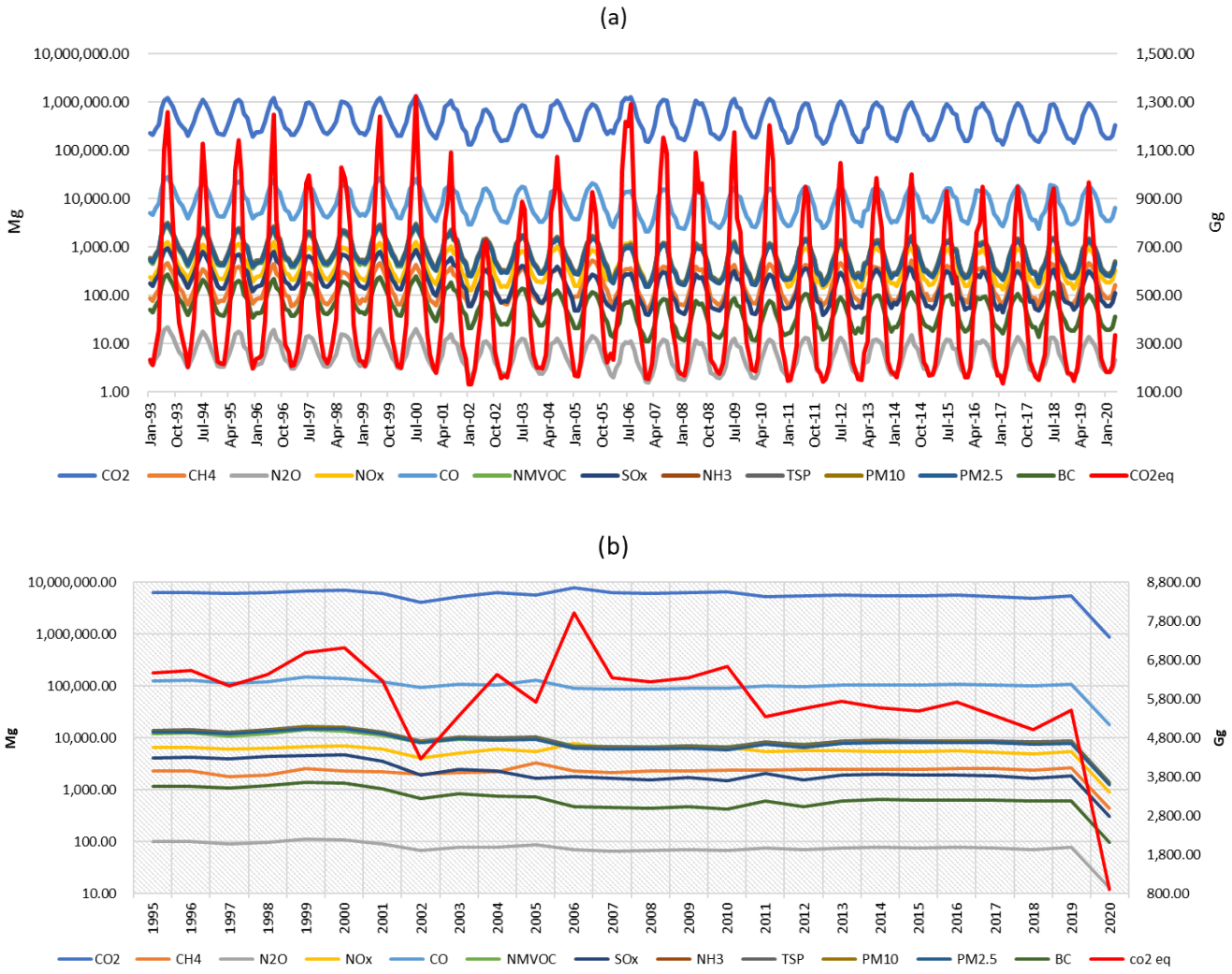

150 **Figure S12. Monthly (a) and annual (b) emissions from Residential (coal/wood). All CO_{2eq} values are in Gg.**

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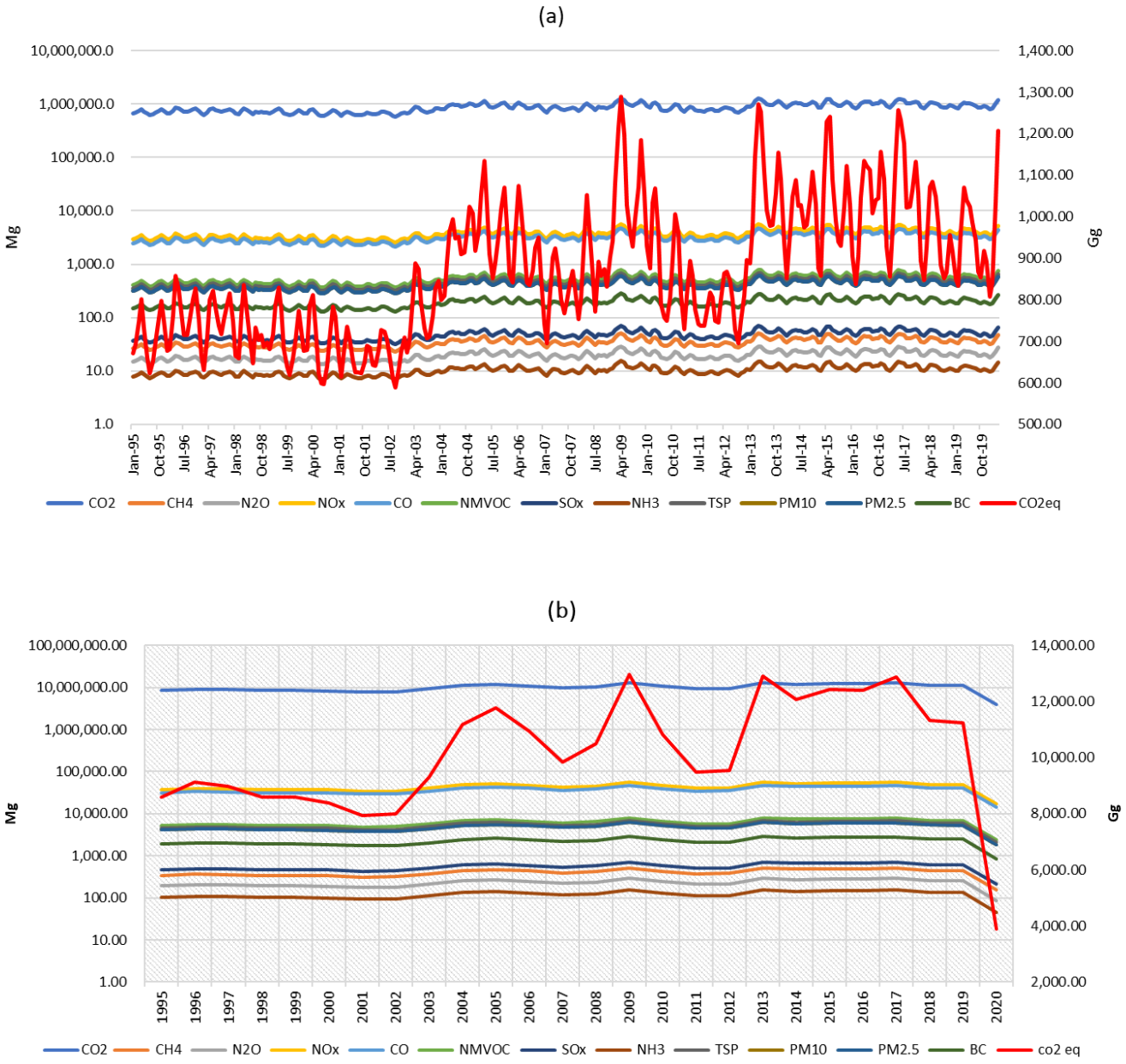
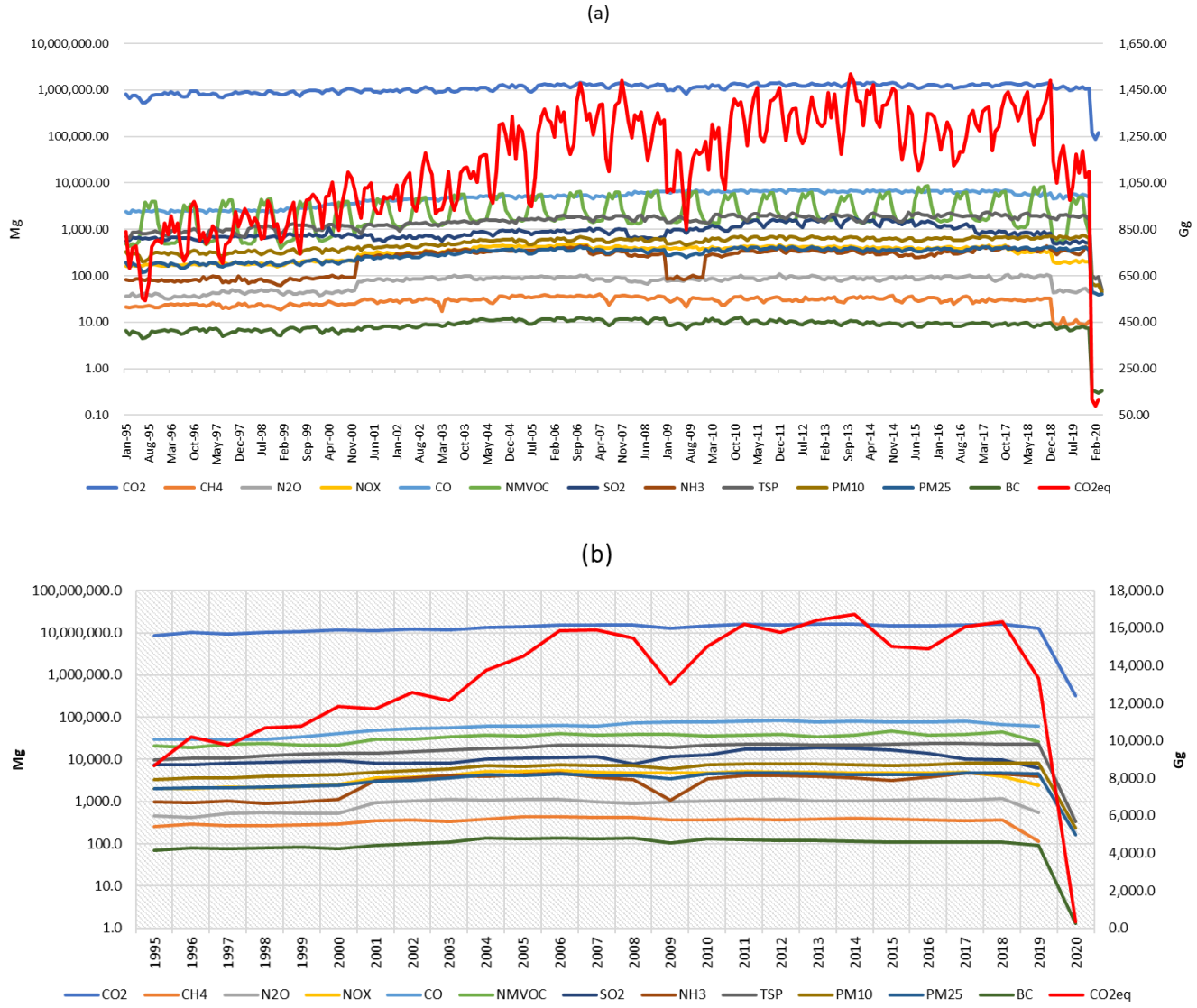


Figure S13. Monthly (a) and annual (b) emissions from agriculture and other sectors. All CO_{2eq} values are in Gg.



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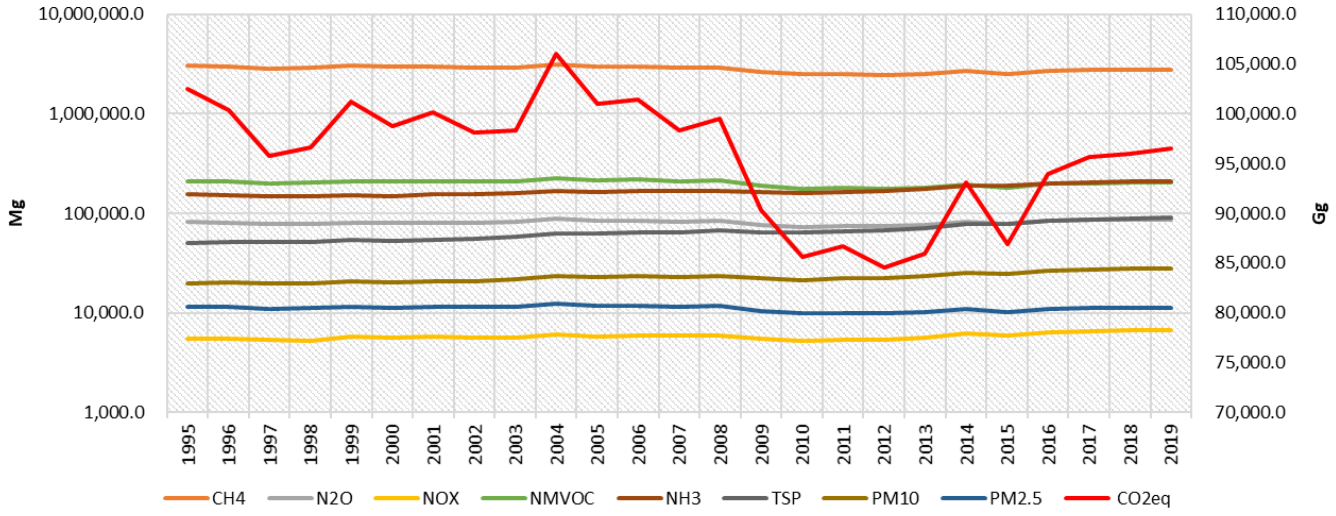

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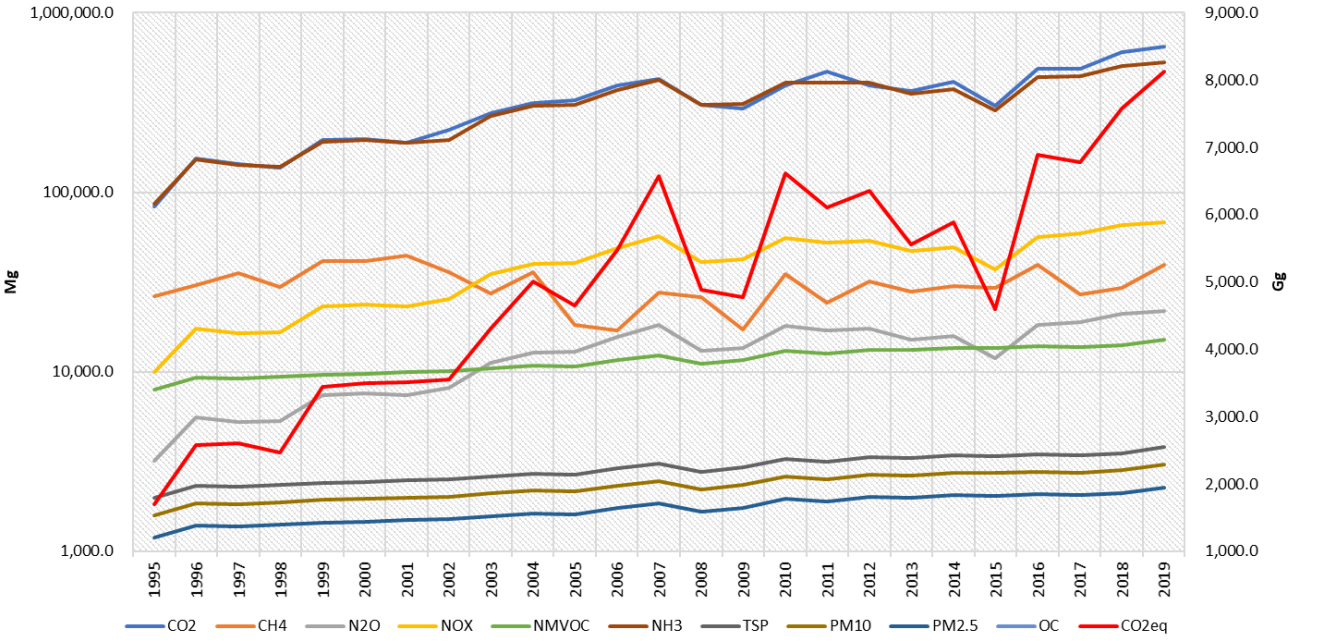

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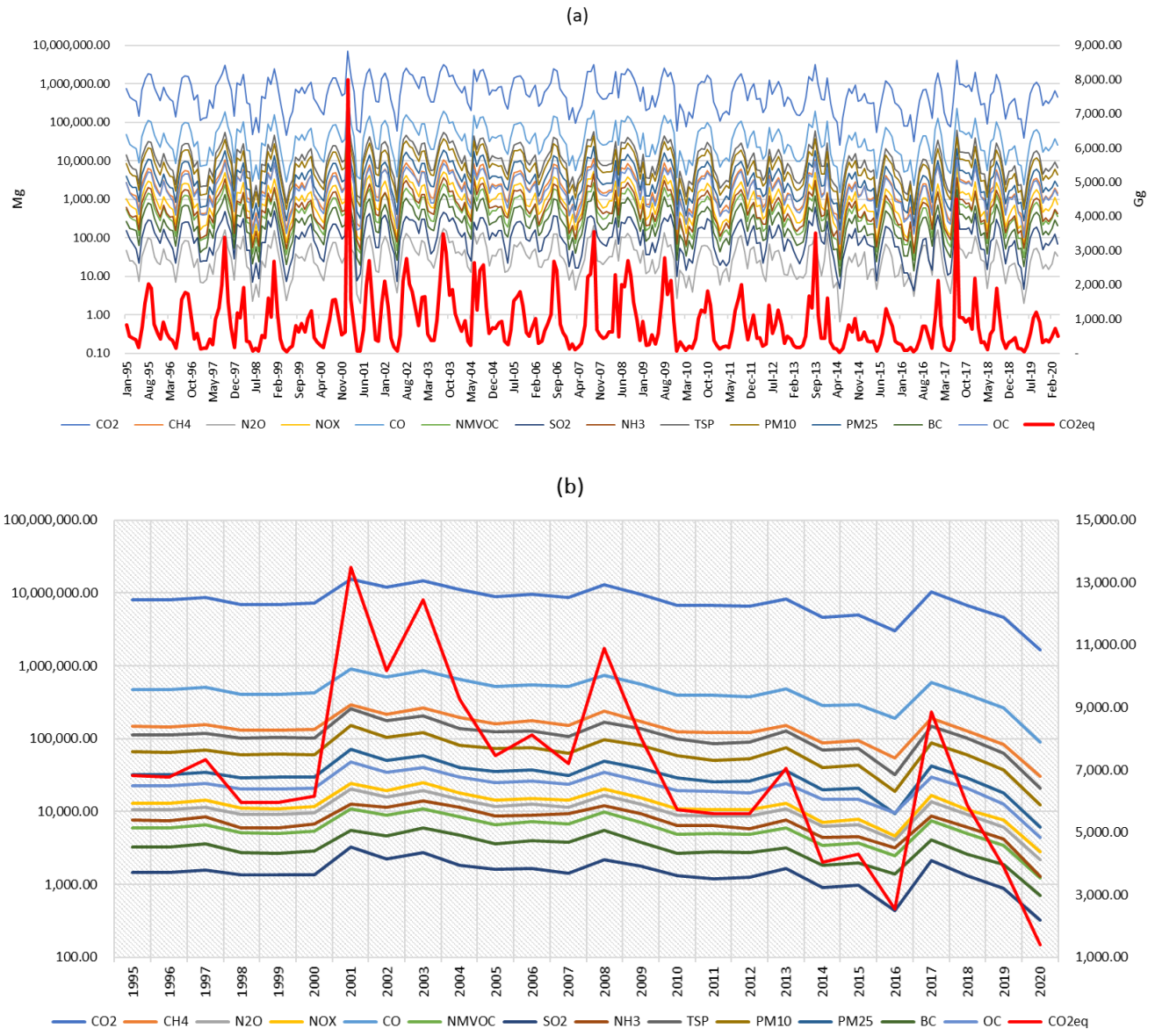

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Table S1. GEAA-AEIv3.0M Vs EDGAR inventories differences (1995-2015) for GHG in Argentina. Values expressed in %.

Gas	Statistics	Power Plants	Industry fuel	Refinery	Fuel prod	Fugitive	Road transport	Aviation	RR + Nav	Residential	Subtotal	Industry process	Agriculture	Total
CO_2	Mean	-22.1	-1.7	-102.5	127.7	-62.2	14.7	3.7	39.5	-28.2	-16.4	44.7	-145.9	-33.5
	Std. Dev.	4.6	12.7	8.8	20.4	56.7	5.7	10.1	33.4	5.6	4.2	12.1	72.0	17.1
CH_4	Mean	78.7	11.0	-152.7	-197.9	-92.9	1.8	4.5	40.2	-83.7	-92.3	-87.0	21.3	-69.9
	Std. Dev.	14.9	19.9	12.9	0.5	15.3	3.8	9.4	33.5	9.8	14.9	34.1	31.5	14.5
N_2O	Mean	139.9	-5.8	-103.7	-74.7	174.9	96.4	4.5	36.6	-165.1	-14.7	43.1	-118.3	-6.2
	Std. Dev.	15.4	16.8	11.4	19.4	5.0	8.1	9.4	33.8	3.1	11.5	14.0	20.6	5.6
CO_{2eq}	Mean	-22.1	-1.7	-102.5	127.7	-62.2	14.7	3.7	39.5	-28.2	-16.4	44.7	-145.9	-33.5
	Std. Dev.	4.6	12.7	8.8	20.4	56.7	5.7	10.1	33.4	5.6	4.2	12.1	72.0	17.1

Table S2. GEAA-AEIv3.0M Vs EDGAR inventories differences (1995-2015) for NOx, CO, PM_{10} and $PM_{2.5}$ in Argentina. Values expressed in %.

Gas/particles	Statistics	Power Plants	Industr. fuel	Refinery	Fuel prod	Fugitive	Road transport	Aviation	RR+Nav	Residential	Subtotal	Industry process	Livestock	Agriculture	Open Fire	Total
NOx	Mean	14.2	-81.6	22.5		-84.3	1.6	7.1	26.3	39.7	-3.0	88.7	89.4	-30.4	-136.1	-9.5
	Std. Dev.	10.2	9.4	28.5		40.3	12.6	9.4	35.4	4.3	8.5	9.1	8.4	35.3	23.5	7.4
CO	Mean	5.3	41.3	-148.0	-80.6	-152.5	-12.6	25.8	-45.1	11.2	-10.4	-82.8				-54.2
	Std. Dev.	7.2	30.4	15.6	22.6	40.8	11.2	8.8	50.1	20.0	10.5	19.6				9.2
PM_{10}	Mean	-102.5	-100.0	-106.3	-191.0	-28.4	-5.8	-157.6	-77.6	-35.2	-81.5	-68.9	102.4	126.0	-95.3	-69.3
	Std. Dev.	27.6	17.2	20.4	1.8	58.0	9.3	3.8	31.1	35.0	6.1	16.9	5.4	9.5	40.4	18.9
$PM_{2.5}$	Mean	-72.9	-94.2	-120.5	-154.2	-22.2	-16.3	-197.9	-46.4	8.9	-52.1	-48.7	161.0	-193.9	-134.5	-112.8
	Std. Dev.	29.5	17.3	20.0	7.7	59.0	9.2	0.2	107.1	35.0	8.6	17.7	4.2	0.9	27.5	16.5