

Table S1: Emission Factors used in this study

Category		CH₄ Emission Factors / (m³ t⁻¹)				
	Low	3.34	0.739	4.53	2.94	3.42
Underground	High	22.1	11.4	21.8	26.2	22.7
	Outburst	22.1	41.0	21.8	26.2	46.4
Surface		2.5		2.5	2.5	2.5
Default		12.7	5.80	12.7	14.7	12.7
Abandoned	Surface/Low	0.5		0.5	0.5	0.5
	High/Outburst	3		3	3	3
Reference		(Zheng et al., 2005; Sheng et al., 2019)	(Wang et al., 2013)	(Zheng et al., 2005; Huang et al., 2019)	(Zheng et al., 2005; Gao et al., 2021)	(Zheng et al., 2005; Wang et al., 2019)

Table S2: Statistic information of constrained CMM flux in $\text{ug m}^2 \text{s}^{-1}$. For all data, we only show 3 valid digits.

		Low	Low Rank	Low Rank	High Rank	High Rank	High		
		Rank Q1	Q2	Q3	Q1	Q2	Rank Q3		
Percentiles	10	0.12	0.27	0.31	1.75	1.75	1.62		
	20	0.26	0.60	0.69	4.23	4.23	3.94		
	30	0.55	1.29	1.48	9.13	9.13	8.90		
	40	0.95	2.22	2.54	16.5	16.5	16.1		
	50	1.66	3.88	4.44	27.0	27.0	26.2		
	60	2.76	6.48	7.40	46.7	46.7	46.7		
	70	4.87	11.4	13.0	78.8	78.8	77.2		
	80	10.1	23.7	27.1	188	188	174		
	90	21.3	50.0	57.2	333	333	333		

		Outburst	Outburst	Outburst	Default	Default	Default	Flux	Flux
		Rank Q1	Rank Q2	Rank Q3	Rank	Rank	Rank	2021	2022
					Q1	Q2	Q3	Winter	Summer
Percentiles	10	3.06	1.60	2.84	0.85	0.97	0.95	0.83	0.78
	20	5.89	3.09	5.47	2.62	2.97	2.90	1.97	2.70
	30	15.6	8.18	14.5	4.35	4.94	4.83	3.66	5.77
	40	30.0	15.7	27.9	8.19	9.30	9.08	6.05	9.99
	50	44.2	23.1	41.0	12.7	14.4	14.0	10.3	18.3
	60	85.0	44.5	78.9	23.1	26.2	25.6	16.0	29.0
	70	125	65.3	116	35.8	40.6	39.7	27.4	57.6
	80	240	126	223	95.1	108	105	50.2	89.3
	90	567	297	527	158	180	175	140	161

Table S3: detail in EPWP and GPWP.

	EDGAR-R1		EDGAR-R3		EDGAR-R5		EDGAR-R7		EDGAR-R9	
	+	-	+	-	+	-	+	-	+	-
Grid_Number	194	7	161	40	95	106	42	159	12	189
Total_Emissions (Gg d⁻¹)	14.3	0.01	12.0	0.40	9.04	3.61	6.56	18.4	3.36	110.
	GFEI-R1		GFEI-R3		GFEI-R5		GFEI-R7		GFEI-R9	
	+	-	+	-	+	-	+	-	+	-
Grid_Number	169	58	108	119	53	174	30	197	10	217
Total_Emissions (Gg d⁻¹)	7.40	0.13	5.76	1.45	4.03	6.43	2.49	23.8	1.09	126.

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