

Grid Emission Factor (GEF) in Malaysia, 2022-2024 (Provisional)

GEF is the generation weighted-average greenhouse gas (GHG) emission per unit of electricity generation of all generating power plants serving the electricity grid (GHG intensity of the grid electricity), including RE power plants that may generate Renewable Energy Certificate (REC).

Year	Grid Emission factor (Gg CO ₂ e/GWh) (Provisional)		
	Peninsular	Sabah	Sarawak
2024	0.740	0.539	0.199
2023	0.760	0.545	0.206
2022	0.769	0.531	0.199

Sources:

1. Grid Emission Factor for Peninsular and Sabah are calculated by the Energy Commission.
2. Data for Sarawak's Grid Emission Factor is from Sarawak Energy Berhad (SEB) Annual and Sustainability Reports.

Notes:

1. The GHG emission and Net Electricity Generation values used is inclusive of those from electricity generators connected to the grid that may produce REC. As such, the GEF may not reflect the GHG intensity of electricity unclaimed via REC or other contractual instruments.
2. Net Electricity Generation = Gross Electricity Generation – Electricity Own Use
3. Data for Peninsular and Sabah's Fuel Consumption, Electricity Generation and Electricity Own Use are sourced from the National Energy Balance (NEB).
4. For this calculation, fuel consumption and electricity generation from Main Activity Producer only is considered.
5. GHG Emission is calculated using Tier 1 Emission Factor.
6. Grid Emission Factors (2022) for Peninsular and Sabah were recalculated to reflect the latest updated data.
7. The GEF values presented herein are released as provisional statistics, in line with international statistical practices. These estimates are compiled using the most recent and complete data available and have undergone technical validation and review by the Technical Committee.
8. While the figures are considered fit for use and are not expected to undergo material changes, they remain subject to final endorsement by the Government of Malaysia. Any subsequent revisions, if required, are expected to be minimal and will be communicated transparently in accordance with established revision practices. Users are therefore advised that these provisional GEF values may be updated upon official confirmation, after which the provisional status will be removed.

Year: 2024

Peninsular Malaysia

Fuel Type	Fuel consumption (TJ)	GHG Emission (kg CO ₂ e)	GHG Emission (Gg CO ₂ e)	Net Electricity Generation (GWh)	GEF (Gg CO ₂ e/GWh)
Coal	900,941	86,598,553,028	86,599	149,301	0.740
Natural Gas	424,258	23,823,973,399	23,824		
Diesel	1,213	90,204,822	90		
Fuel Oil	544	42,231,581	42		
Total RE	-	-	-		
TOTAL	1,326,956	110,554,962,831	110,555		

Sabah

Fuel Type	Fuel consumption (TJ)	GHG Emission (kg CO ₂ e)	GHG Emission (Gg CO ₂ e)	Net Electricity Generation (GWh)	GEF (Gg CO ₂ e/GWh)
Natural Gas	59,873	3,362,140,625	3,362	7,593	0.539
Diesel	7,489	556,781,490	557		
Fuel Oil	2,259	175,423,488	175		
Total RE	-	-	-		
TOTAL	69,622	4,094,345,604	4,094		

Year: 2023

Peninsular Malaysia

Fuel Type	Fuel consumption (TJ)	GHG Emission (kg CO ₂ e)	GHG Emission (Gg CO ₂ e)	Net Electricity Generation (GWh)	GEF (Gg CO ₂ e/GWh)
Coal	876,297	84,196,643,332	84,197	141,091	0.760
Natural Gas	407,187	22,865,375,653	22,865		
Diesel	1,590	118,199,423	118		
Fuel Oil	753	58,474,496	58		
Total RE	-	-	-		
TOTAL	1,285,827	107,238,692,904	107,239		

Sabah

Fuel Type	Fuel consumption (TJ)	GHG Emission (kg CO ₂ e)	GHG Emission (Gg CO ₂ e)	Net Electricity Generation (GWh)	GEF (Gg CO ₂ e/GWh)
Natural Gas	58,409	3,279,907,975	3,280	7,307	0.545
Diesel	7,071	525,676,379	526		
Fuel Oil	2,259	175,423,488	175		
Total RE	-	-	-		
TOTAL	67,739	3,981,007,843	3,981		

Year: 2022

Peninsular Malaysia

Fuel Type	Fuel consumption (TJ)	GHG Emission (kg CO ₂ e)	GHG Emission (Gg CO ₂ e)	Net Electricity Generation (GWh)	GEF (Gg CO ₂ e/GWh)
Coal	843,327	81,006,297,560	81,006	136,447	0.769
Natural Gas	415,597	23,337,626,013	23,338		
Diesel	5,690	423,029,512	423		
Fuel Oil	2,552	198,163,570	198		
Total RE	-	-	-		
TOTAL	1,267,166	104,965,116,655	104,965		

Sabah

Fuel Type	Fuel consumption (TJ)	GHG Emission (kg CO ₂ e)	GHG Emission (Gg CO ₂ e)	Net Electricity Generation (GWh)	GEF (Gg CO ₂ e/GWh)
Natural Gas	54,727	3,073,151,598	3,073	6,923	0.531
Diesel	6,485	482,129,224	482		
Fuel Oil	1,590	123,446,159	123		
Total RE	-	-	-		
TOTAL	62,802	3,678,726,980	3,679		