

# **User Guide**

## **Greenhouse Gas Emissions Calculator**

**April 2025**

**Version C04/25**

## 1. Background and Objectives

The Hong Kong University of Science and Technology cooperated with the Green and Sustainable Finance Cross-Agency Steering Group to build two greenhouse gases (GHG) emissions tools in bridging the data gap highlighted by the industry.

The GHG emissions calculator aims to facilitate corporates to calculate their Scopes 1 and 2 GHG emissions (as classified in the GHG Protocol Corporate) based on their levels of actual activities and the widely adopted international standards, such as the GHG Protocol Corporate Accounting and Reporting Standard. To cater the needs of local users, this GHG emissions calculator incorporates more parameters in Hong Kong and the Mainland, please refer to section 2.4 for details.

## 2. Introduction to the GHG Emissions Calculator

### 2.1 Standards and Guidelines

The GHG emissions calculator is built with reference to widely adopted international standards as well as local standard to address direct and indirect emissions of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFC and PFC in scopes 1 and 2.

#### International standards:

- WBCSD/WRI<sup>1</sup>: The GHG Protocol Corporate Accounting and Reporting Standard (Revised Edition)
- ISO 14064-1 (2018): Greenhouse Gases – Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals

#### Local standard:

- HKEPD<sup>2</sup> and EMSD<sup>3</sup> Guidelines: Guidelines to Account for and Report on Greenhouse Gas Emissions and Removals for Buildings (Commercial, Residential or Institutional Purposes) in Hong Kong (2010 Edition)

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<sup>1</sup> World Business Council for Sustainable Development and World Resources Institute (WBCSD/WRI)

<sup>2</sup> Hong Kong Environmental Protection Department (HKEPD)

<sup>3</sup> Electrical and Mechanical Services Department (EMSD)

These standards categorize various parameters into 3 different scopes to facilitate the accounting of greenhouse gases.

Scope 1	Scope 2	Scope 3
Direct emissions and removals: <ul style="list-style-type: none"> <li>• Stationary combustion</li> <li>• Mobile combustion</li> <li>• Fugitive emission</li> <li>• Other physical and chemical processing</li> </ul>	Indirect emissions: <ul style="list-style-type: none"> <li>• Imported energy such as purchased electricity and town gas</li> </ul>	Other indirect emissions: <ul style="list-style-type: none"> <li>• Water and sewage</li> <li>• Waste disposal</li> <li>• Air travels</li> <li>• Others</li> </ul>

## 2.2 Boundary Setting

Users are suggested to make reference to “WBCSD/WRI: The GHG Protocol Corporate Accounting and Reporting Standard” and adopts the control approach in the determination of organizational boundary.

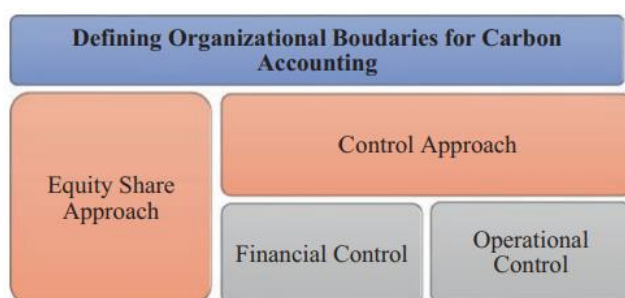


Fig.1 Summary of different approaches to define the organizational boundaries (Zhou, 2020)

## 2.3 Calculation Methodology

The calculation methodology of the GHG emissions calculator is based on the following equations as recommended in the HKEPD and EMSD GHG guidelines for Scopes 1 and 2 GHG emissions.

### 2.3.1 Scope 1 Direct Emissions and Removals

#### (i) GHG Emissions from Stationary Combustion Sources

$$Emission (CO_2) = \sum Fuel\ consumption \times Emission\ factor\ of\ CO_2$$

Where

Emission is measured in tonnes of CO<sub>2</sub>-equivalent;

The amount of fuel used is measured either by its volume, such as liters, or by its mass, such as kilograms; and

CO<sub>2</sub> Emission Factor = Net Calorific Value of Fuel x Carbon Emission Factor of Fuel x Fraction of Carbon Oxidized x (44/12)

This equation calculates the emissions of CH<sub>4</sub> and N<sub>2</sub>O:

$$\begin{aligned} Emission (CH_4/N_2O) \\ = \sum Fuel\ consumption \times Emission\ factor\ of (CH_4/ N_2O) \\ \times Relative\ GWP \end{aligned}$$

where

Emission is measured in tonnes of CO<sub>2</sub>-equivalent;

Amount of fuel consumed is in terms of volume (e.g. litre) or mass (e.g. kg) for particular fuel;

Emission Factor of (CH<sub>4</sub> / N<sub>2</sub>O) = Net Calorific Value of the Fuel x Specific (CH<sub>4</sub> / N<sub>2</sub>O) Conversion Factor; and

Relative GWP refers to the Relative Global Warming Potential of CH<sub>4</sub> or N<sub>2</sub>O

#### Global warming potential (GWP) for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O

GHGs	GWP 100-year time horizon	
	Fifth Assessment Report (AR5) (IPCC, 2014)	Sixth Assessment Report (AR6) (IPCC, 2021)
CO <sub>2</sub>	1	1
CH <sub>4</sub>	28	27
N <sub>2</sub> O	265	273

(Greenhouse Gas Protocol, n.d.)

The GHG emissions calculator uses the latest available GWP values from the IPCC<sup>4</sup> based on the starting date of your reporting period. For example, if your reporting period begins on 1 January 2021 or later, the GWP values from the IPCC AR6 will be applied in the GHG emissions calculator.

<sup>4</sup> The Intergovernmental Panel on Climate Change (IPCC)

Please refer to section 2.4.1(i) for the emission factors for stationary combustion.

## **(ii) GHG Emissions from Mobile Combustion Sources**

The calculation covers three categories of mobile sources: road transport, air transport, and water transport.

$$Emission (CO_2) = \sum Fuel\ consumption \times Emission\ factor\ of\ CO_2$$

Where

Emissions, measured in tonnes of CO<sub>2</sub>-equivalent, are calculated by summing up the emissions from all fuel types, transport modes, and vehicle categories; Fuel consumption, measured in volume (e.g. liters), is determined for each specific fuel type, transport mode, and vehicle category; and  
CO<sub>2</sub> Emission Factor = Net Calorific Value of Fuel x Carbon Emission Factor of Fuel x Fraction of Carbon Oxidized x (44/12)

This equation calculates the emissions of CH<sub>4</sub> and N<sub>2</sub>O:

$$\begin{aligned} Emission (CH_4/N_2O) \\ = \sum Fuel\ consumption \times Emission\ factor\ of (CH_4/ N_2O) \\ \times Relative\ GWP \end{aligned}$$

where

Emissions, measured in tonnes of CO<sub>2</sub>-equivalent, are calculated by summing up the emissions from all fuel types, transport modes, and vehicle categories; Fuel consumption, measured in volume (e.g. liters), is determined for each specific fuel type, transport mode, and vehicle category; Emission Factor of (CH<sub>4</sub> / N<sub>2</sub>O) = Net Calorific Value of the Fuel x Specific (CH<sub>4</sub> / N<sub>2</sub>O) Conversion Factor; and  
Relative GWP refers to the Relative Global Warming Potential of CH<sub>4</sub> or N<sub>2</sub>O

Please refer to section 2.4.1(ii) for the emission factors for mobile combustion.

**(iii) HFC and PFC Emissions for Refrigeration / Air-conditioning (Fugitive Emission)**

$$OE = \sum (C_s + C_i - C_d - C_e)_j \times GWP_j$$

Where:

OE = CO<sub>2</sub>-equivalent emissions resulting from the release of refrigerant j during the operation of equipment

C<sub>s</sub> = The inventory of refrigerant in storage (kg) at the beginning of the reporting period

C<sub>i</sub> = The amount of refrigerant added to the inventory during the reporting period (kg)

C<sub>d</sub> = The amount of refrigerant that was disposed of through environmentally responsible means (such as recycling) during the reporting period (kg)

C<sub>e</sub> = The inventory of refrigerant in storage, measured in kilograms, at the end of the reporting period

GWP = The 100-year Global Warming Potential (GWP) of refrigerant j, can be obtained using Table 3.

Please refer to section 2.4.1(iii) for the GWP of refrigerants.

**2.3.2 Scope 2 Energy Indirect Emissions**

**Energy Indirect GHG Emissions due to Electricity and Towngas Purchased**

*GHG Emission*

$$= \text{Quantity of purchased electricity/towngas} \\ \times \text{Emission Factor}$$

Please refer to section 2.4.2 for the emission factors for purchased electricity and towngas.

## 2.4 Emission Factors

The results of the calculations will be expressed in terms of CO<sub>2</sub>-equivalent (CO<sub>2</sub>-e).

### 2.4.1 Scope 1 - Direct Emissions

The tables of emission factors for stationary combustion and mobile combustion presented below are extracted from two sources:

- the EMSD/EPD *Guidelines to Account for and Report on Greenhouse Gas Emissions and Removals for Buildings In Hong Kong (2010)*, and
- the *Guidance for Quantification and Reporting of the Organization's Greenhouse Gas Emissions in Shenzhen (深圳市标准化指导性技术文件 - 组织的温室气体排放量化和报告指南) (2018)*.

#### i) Stationary Combustion Sources in Hong Kong

Table 1-1 CO<sub>2</sub> Emission factor by fuel type

Fuel Type	Emission Factor	Unit
Diesel Oil	2.614	kg/litre
LPG	3.017	kg/kg
Kerosene	2.429	kg/litre
Charcoal	2.970	kg/kg
Towngas	2.549	kg/unit

Table 1-2 CH<sub>4</sub> Emission factor by fuel type

Fuel Type	Emission Factor	Unit
Diesel Oil	0.0239	g/litre
LPG	0.0020	g/kg
Kerosene	0.0241	g/litre
Charcoal	5.5290	g/kg
Towngas	0.0446	g/unit

**Table 1-3 N<sub>2</sub>O Emission factor by fuel type**

Fuel Type	Emission Factor	Unit
Diesel Oil	0.0074	g/litre
LPG	0.0000	g/kg
Kerosene	0.0076	g/litre
Charcoal	0.0276	g/kg
Towngas	0.0099	g/unit

**Stationary Combustion Sources in Mainland****Table 1-4 CO<sub>2</sub> Emission factor by fuel type**

Fuel Type	Fuel Type (Chinese)	Emission Factor	Unit
Anthracite	無煙煤	1.97	kgCO <sub>2</sub> /kg
Bituminous coal	煙煤	1.86	kgCO <sub>2</sub> /kg
Lignite	褐煤	2.06	kgCO <sub>2</sub> /kg
Washed coal	洗精煤	2.45	kgCO <sub>2</sub> /kg
Middling coal	洗中煤	0.78	kgCO <sub>2</sub> /kg
Slime	煤泥	1.17	kgCO <sub>2</sub> /kg
Coke	焦炭	2.85	kgCO <sub>2</sub> /kg
Crude oil	原油	3.02	kgCO <sub>2</sub> /kg
Fuel oil	燃料油	3.17	kgCO <sub>2</sub> /kg
Petrol	汽油	2.92	kgCO <sub>2</sub> /kg
Kerosene	一般煤油	3.03	kgCO <sub>2</sub> /kg
Diesel oil	柴油	3.1	kgCO <sub>2</sub> /kg
LNG	液化天然氣	2.58	kgCO <sub>2</sub> /kg
LPG	液化石油氣	3.1	kgCO <sub>2</sub> /kg
Refinery dry gas	煉廠乾氣	3.04	kgCO <sub>2</sub> /kg
Ethane	乙烷	3.28	kgCO <sub>2</sub> /kg
Bitumen	瀝青	3.26	kgCO <sub>2</sub> /kg
Lubricating oil	潤滑油	3.04	kgCO <sub>2</sub> /kg
Petroleum coke	石油焦	4.14	kgCO <sub>2</sub> /kg



Natural gas	天然氣	0.0022	kgCO <sub>2</sub> /L
Coke oven gas	焦爐煤氣	0.00089	kgCO <sub>2</sub> /L
Blast furnace gas	高爐煤氣	0.00017	kgCO <sub>2</sub> /L
Producer gas fuel	發生爐煤氣	0.00023	kgCO <sub>2</sub> /L
Heavy oil catalytic cracking gas	重油催化裂解煤氣	0.00085	kgCO <sub>2</sub> /L
Heavy oil thermal cracking gas	重油熱裂解煤氣	0.0016	kgCO <sub>2</sub> /L
Coke gas	焦炭製氣	0.00072	kgCO <sub>2</sub> /L
Coalbed methane	壓力水化煤氣	0.00067	kgCO <sub>2</sub> /L
Water gas	水煤氣	0.0046	kgCO <sub>2</sub> /L

### **Biomass Combustion Sources in Mainland**

**Table 1-5 CO<sub>2</sub> Emission factor**

Fuel Type	Fuel Type (Chinese)	Emission Factor	Unit
Timber/ waste wood	木材/廢木材	2.21	kgCO <sub>2</sub> /kg
Other solid biomass	其他固體生物量	2.7	kgCO <sub>2</sub> /kg

### **ii) Mobile Combustion Sources in Hong Kong**

**Table 2-1 CO<sub>2</sub> Emission factor**

Fuel Type	Emission Factor	Unit
Diesel Oil (DO)	2.614	kg/litre
Unleaded Petrol (ULP)	2.360	kg/litre
Liquefied Petroleum Gas (LPG)	1.679	kg/litre
	3.017	kg/kg
Gas Oil (For Ships only)	2.645	kg/litre
Kerosene (Including Jet Kerosene)	2.429	kg/litre

**Table 2-2 CH<sub>4</sub> Emission factor**

Vehicle Type	Fuel Type	Emission Factor	Unit
Motorcycle	ULP	1.422	g/litre
Passenger Car	ULP	0.253	g/litre
	DO	0.072	g/litre
Private Van	ULP	0.203	g/litre
	DO	0.072	g/litre
	LPG	0.248	g/litre
Public Light Bus	DO	0.072	g/litre
	LPG	0.248	g/litre
Light Goods Vehicle	ULP	0.203	g/litre
	DO	0.072	g/litre
Heavy Goods Vehicle	DO	0.145	g/litre
Medium Goods Vehicle	DO	0.145	g/litre
Ships	Gas Oil	0.146	g/litre
Aviation	Jet Kerosene	0.069	g/litre
Other Mobile Machinery	DO	0.0239	g/litre
	LPG	0.0036	g/litre
		0.006	g/kg
	Kerosene	0.0241	g/litre

**Table 2-3 N<sub>2</sub>O Emission factor**

Vehicle Type	Fuel Type	Emission Factor	Unit
Motorcycle	ULP	0.046	g/litre
Passenger Car	ULP	1.105	g/litre
	DO	0.110	g/litre
Private Van	ULP	1.140	g/litre
	DO	0.506	g/litre
	LPG	0.000	g/litre
Public Light Bus	DO	0.506	g/litre

	LPG	0.000	g/litre
Light Goods Vehicle	ULP	1.105	g/litre
	DO	0.506	g/litre
Heavy Goods Vehicle	DO	0.072	g/litre
Medium Goods Vehicle	DO	0.072	g/litre
Ships	Gas Oil	1.095	g/litre
Aviation	Jet Kerosene	0.000	g/litre
Other Mobile Machinery	DO	0.007	g/litre
	LPG	0.000	g/litre or g/kg
	Kerosene	0.0076	g/litre

### **Mobile Combustion Sources in Mainland**

**Table 2-4 CO<sub>2</sub> Emission factor**

Transport	Fuel Type	Fuel Type (Chinese)	Emission Factor	Unit
Road transport	Petrol	汽油	2.92	kgCO <sub>2</sub> /kg
	Kerosene	噴氣煤油	3.02	kgCO <sub>2</sub> /kg
	Diesel oil	柴油	3.1	kgCO <sub>2</sub> /kg
	LPG	液化石油氣	3.1	kgCO <sub>2</sub> /kg
	LNG	液化天然氣	2.68	kgCO <sub>2</sub> /kg
Non-road transport	Petrol	汽油	2.92	kgCO <sub>2</sub> /kg
	Diesel oil	柴油	3.1	kgCO <sub>2</sub> /kg

### **iii) Fugitive emission**

This GHG emissions calculator include the refrigerants by making reference to the EMSD/EPD Guidelines to Account for and Report on Greenhouse Gas Emissions and Removals for Buildings in Hong Kong, the Greenhouse Gas Protocol (n.d.) and the California Air Resources Board (n.d.). The global warming potential (GWP) of these refrigerants are updated to reflect the most recent data available from the IPCC AR5 and AR6.

Table 3 GWP of Refrigerants

Refrigerant Type	AR5	AR6 <sup>5</sup>
HCFC-21	148	160
HCFC-22	1,760	1,960
HCFC-123	79	90
HCFC-124	527	597
HCFC-141b	782	860
HCFC-142b	1,980	2,300
HCFC-225ca	127	137
HCFC-225cb	525	568
HFC-23	12,400	14,600
HFC-32	677	771
HFC-41	116	135
HFC-43-10mee	1,650	1,600
HFC-125	3,170	3,740
HFC-134	1,120	1,260
HFC-134a	1,300	1,530
HFC-143	328	364
HFC-143a	4,800	5,810
HFC-152	16	22
HFC-152a	138	164
HFC-161	4	5
HFC-227ea	3,350	3,600
HFC-236cb	1,210	1,350
HFC-236ea	1,330	1,500
HFC-236fa	8,060	8,690
HFC-245ca	716	787
HFC-245fa	858	962
HFC-365mfc	804	914
PFC-14	6,630	7,380
PFC-116	11,100	12,400
PFC-218	8,900	9,290
PFC-318	9,540	10,200
PFC-31-10	9,200	10,000

Refrigerant Type	AR5	AR6 <sup>5</sup>
PFC-41-12	8,550	9,220
PFC-51-14	7,910	8,620
R-401A	1,130	1,263
R-401B	1,236	1,381
R-401C	876	982
R-402A	2,571	2,989
R-402B	2,261	2,597
R-403B	4,457	4,721
R-404A	3,943	4,728
R-406A	1,780	2,021
R-407A	1,923	2,262
R-407B	2,547	3,001
R-407C	1,624	1,908
R-407D	1,487	1,748
R-407F	1,674	1,965
R-407H	1,378	1,615
R-408A	3,257	3,856
R-409A	1,485	1,670
R-410A	1,924	2,256
R-410B	2,048	2,404
R-411A	1,555	1,733
R-411B	1,659	1,847
R-414B	1,274	1,431
R-416A	975	1,139
R-417A	2,127	2,508
R-417C	1,643	1,935
R-420A	1,382	1,622
R-500	7,564	9,268
R-502	4,786	5,872
R-503	13,300	15,560
R-507	3,985	4,775
R-508B	11,698	13,412

<sup>5</sup> For refrigerant types R, their GWP under AR 6 are projected by referencing to the GWP of their constituent refrigerants proportionally as describe by the California Air Resources Board (n.d.).

#### **2.4.2 Scope 2 – Indirect emissions: Purchased Electricity and Towngas**

The emission factors for purchased electricity from HKE and CLP are sourced from their annual sustainability reports, while the territory-wide default value for Hong Kong is suggested by the EMSD/EPD Guidelines to Account for and Report on Greenhouse Gas Emissions and Removals for Buildings in Hong Kong (2010).

The electricity emission factors for Mainland are sourced from the 2019 Emissions Reduction Project Baseline Emission Factor for the Chinese Regional Power Grid (2019 年度減排專案中國區域電網基準線排放因數) and 2021 Electricity Carbon Dioxide Emission Factor (2021 年電力二氧化碳排放因數). In addition, the 2022 country-wide emission factor for Mainland that published by The Ministry of Ecology and Environment of People's Republic of China in February 2023 is also included in the data set.

The towngas emission factor is from the annual Environmental, Social and Governance Report of Towngas.

It is important to note that the GHG emissions calculator will use the latest available emission factors based on the starting date of your reporting period. For example, if your reporting period begins between 1 January 2022 and 31 December 2022, the emission factors for the year 2022 will be used. In cases where emission factors are updated less frequently, such as the emission factors of purchased electricity in Mainland, the emission factors for the year 2021 will be used, as they are the latest emission factors available based on the reporting period's starting date.

**Table 4-1 Emission factor of purchased electricity in Hong Kong and Mainland**

Location	Electricity Company/ Power Grid	Unit	Emission Factor <sup>6</sup>			
			2020	2021	2022	2023
Hong Kong	HKE	kg/kWh	0.71	0.71	0.68	0.66
Hong Kong	CLP	kg/kWh	0.37	0.39	0.39	0.39
Hong Kong	Territory-wide	kg/kWh	0.7			
Mainland	Northern China Grid	kg/kWh	0.9419	0.712		
Mainland	Northeast China Grid	kg/kWh	1.0826	0.6012		
Mainland	Eastern China Grid	kg/kWh	0.7921	0.5992		
Mainland	Central China Grid	kg/kWh	0.8587	0.5354		
Mainland	Northwest China Grid	kg/kWh	0.8922	0.5951		
Mainland	Southern China Power Grid	kg/kWh	0.8042	0.4326		
Mainland	Southwest China Power Grid <sup>7</sup>	kg/kWh	0.8587	0.2113		
Mainland	Country-wide	kg/kWh		0.5568	0.5703	

<sup>6</sup> Cells that are left blank indicate that no latest emission factors are available for the corresponding years.

<sup>7</sup> In the 2021 Electricity Carbon Dioxide Emission Factor Calculation Guideline (2021 年電力二氧化碳排放因數計算說明), Sichuan province and Chongqing city, which were previously categorized under the Central China Grid, have been reclassified to the Southwest China Power Grid. As there is no publicly available information on the emission factor of these two places prior to 2021, the emission factor of Central China Grid was hence applied retrospectively as the emission factor of the Southwest China Power Grid for the year 2020.

**Table 4-2 Geographical area covered in the regional power grid of Mainland<sup>8</sup>**


Power Grid	Covering Provinces and Cities
North China Grid 華北區域電網	Beijing city, Tianjin city, Hebei province, Shanxi province, Shandong province, Inner Mongolia autonomous region (except for Chifeng city, Tongliao city, HulunBuir city and Hinggan League) 北京市、天津市、河北省、山西省、山東省、蒙西（除赤峰市、通遼市、呼倫貝爾市和興安盟外的內蒙古其他地區）
Northeast China Grid 東北區域電網	Liaoning province, Jilin province, Heilongjiang province, Inner Mongolia autonomous region (Chifeng city, Tongliao city, HulunBuir city and Hinggan League) 遼寧省、吉林省、黑龍江省、蒙東（赤峰市、通遼市、呼倫貝爾市和興安盟）
East China Grid 華東區域電網	Shanghai city, Jiangsu province, Zhejiang province, Anhui province, Fujian province 上海市、江蘇省、浙江省、安徽省、福建省
Central China Grid 華中區域電網	Henan province, Hubei province, Hunan province, Jiangxi province 河南省、湖北省、湖南省、江西省
Northwest China Grid 西北區域電網	Shaanxi province, Gansu province, Qinghai province, Ningxia autonomous region, Xinjiang autonomous region 陝西省、甘肅省、青海省、寧夏自治區、新疆自治區
China Southern Power Grid 南方區域電網	Guangdong province, Guangxi autonomous region, Yunnan province, Guizhou province, Hainan province 廣東省、廣西自治區、雲南省、貴州省、海南省
China Southwest Power Grid 西南區域電網	Sichuan province, Chongqing city 四川省、重慶市

**Table 5 Emission factor of purchased towngas**

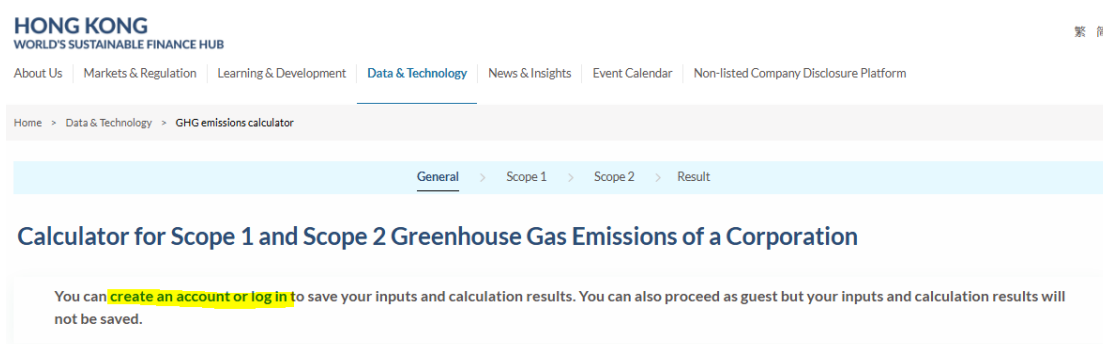
Location	Towngas Company	Unit	Emission Factor			
			2020	2021	2022	2023
Hong Kong	Towngas	kg/kWh	0.592	0.588	0.576	0.549

<sup>8</sup> The distribution of geographical area within the regional power grid of Mainland is based on the latest 2021 Electricity Carbon Dioxide Emission Factor Guideline (2021 年電力二氧化碳排放因數計算說明) published by The Ministry of Ecology and Environment of People's Republic of China in April 2024.

### 3. How to use the GHG Emissions Calculator

The GHG emissions calculator is an online tool with clear guidance, the  icons in the tool also provide simple guidance for respective input field. Please read below for details on using the GHG emissions calculator.

You can create an account or log in to save your inputs and calculation results, please refer to section 3.5 for the functions of the account platform. You can also proceed as guest but your inputs and the calculation results will not be saved.



**HONG KONG**  
WORLD'S SUSTAINABLE FINANCE HUB

About Us | Markets & Regulation | Learning & Development | **Data & Technology** | News & Insights | Event Calendar | Non-listed Company Disclosure Platform

Home > Data & Technology > GHG emissions calculator

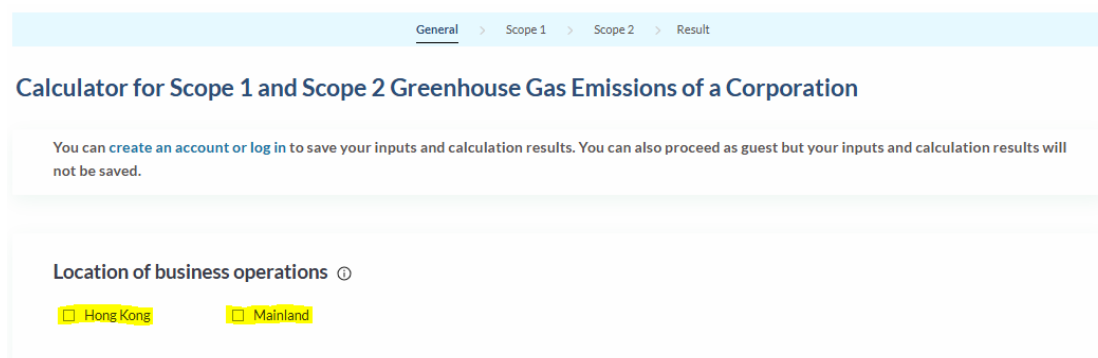
General > Scope 1 > Scope 2 > Result

#### Calculator for Scope 1 and Scope 2 Greenhouse Gas Emissions of a Corporation

You can [create an account or log in](#) to save your inputs and calculation results. You can also proceed as guest but your inputs and calculation results will not be saved.

#### 3.1 Selecting the location of business operations and reporting period

On the front page of the GHG emissions calculator, select the applicable location(s) of business operations of the company. You can select more than 1 location.



General > Scope 1 > Scope 2 > Result

#### Calculator for Scope 1 and Scope 2 Greenhouse Gas Emissions of a Corporation

You can [create an account or log in](#) to save your inputs and calculation results. You can also proceed as guest but your inputs and calculation results will not be saved.

Location of business operations ⓘ

☒ Hong Kong ☐ Mainland

Then, you can enter the reporting period which can be up to 12 months. The GHG emissions calculator is designed to quantify GHG emissions of a company by integrating emission factors from the year 2020 onwards, therefore, please enter a starting date that is on or after 1 January 2020.



General
>
Scope 1
>
Scope 2
>
Result

### Calculator for Scope 1 and Scope 2 Greenhouse Gas Emissions of a Corporation

You can [create an account](#) or [log in](#) to save your inputs and calculation results. You can also proceed as guest but your inputs and calculation results will not be saved.

**Location of business operations** ⓘ

☒ Hong Kong
☒ Mainland

**Reporting Period** ⓘ

(DD/MM/YYYY)

To

(DD/MM/YYYY)

It is important to note that the GHG emissions calculator will use the latest available emission factors based on the starting date of your reporting period. For example, if your reporting period begins between 1 January 2022 and 31 December 2022, the emission factors for the year 2022 will be used, provided that these emission factors are update annually. If the emission factors are updated less frequently, the latest available data based on the starting date of the reporting period will be used. For example, for purchased electricity in Mainland, the emission factors for the year 2021 will be used, as no emission factors for year 2022 have been published.

If you do not specify the reporting period, the calculator will use the most recent emission factors for the calculation by default.

### 3.2 Inputting Scope 1 data

On the Scope 1 page, you can input fuel consumptions by i) stationary combustion, ii) mobile combustion and iii) fugitive emission, where applicable. If Scope 1 emission is not applicable to the company, you can press “Next” to proceed to Scope 2 inputs.

#### i) Stationary combustion

You can enter the fuel consumption by each station or by aggregating the consumption of all stations by each fuel type.





The name of the “station” field is defaulted as Station 1, you can change the name of the station to label a designated station and its corresponding fuel consumption for easy reference.

General > **Scope 1** > Scope 2 > Result


### Calculator for Scope 1 and Scope 2 Greenhouse Gas Emissions of a Corporation

**Hong Kong** ⓘ

Stationary combustion ⓘ

Station	Fuel Type	Consumption	
Station 1	Please select ▼		 
<b>HK Station A</b>	Please select ▼		 

Then you can select a fuel type in the drop-down menu and input the fuel consumption. The GHG emissions calculator does not cover all possible

measurement units, you may refer to  icon for a unit conversion table which may be helpful for performing unit conversion.



General > **Scope 1** > Scope 2 > Result



### Calculator for Scope 1 and Scope 2 Greenhouse Gas Emissions of a Corporation

**Hong Kong** ⓘ

Stationary combustion ⓘ

Station	Fuel Type	Consumption	
Station 1	<b>Diesel Oil</b> ▼	<b>10000</b>	Litre
HK Station A	<b>Charcoal</b> ▼	<b>2000</b>	kg

[+ Add more station](#)

To add more stations, you can press the “add more station”. To remove any

additional station, click the  icon.



General > **Scope 1** > Scope 2 > Result



### Calculator for Scope 1 and Scope 2 Greenhouse Gas Emissions of a Corporation

**Hong Kong** ⓘ

Stationary combustion ⓘ

Station	Fuel Type	Consumption	
Station 1	Diesel Oil ▼	10000	Litre
HK Station A	Charcoal ▼	2000	kg

[+ Add more station](#)

## ii) Mobile combustion

Similar with stationary combustion, you can enter the fuel consumption by each vehicle or by aggregating the consumption of the same type of vehicles by each fuel type.

You can change the name of the vehicle to label a designated vehicle and its corresponding fuel consumption. Then you can select a fuel type in the drop-down menu and input the fuel consumption.

Mobile combustion ⓘ

Vehicle	Vehicle Type	Fuel Type	Consumption	
<input type="text" value="Toyota AP 1234"/>	<input type="text" value="Passenger Car"/>	<input type="text" value="Unleaded petrol"/>	<input type="text" value="500"/>	Litre
<input type="text" value="Honda KE 5678"/>	<input type="text" value="Heavy Goods Vehicle"/>	<input type="text" value="Diesel Oil"/>	<input type="text" value="300"/>	Litre

[+ Add more vehicle](#)

## iii) Fugitive emission

If you want to include fugitive emissions in the calculation, you can check the box of “include fugitive emission in the calculation”.

While the calculator uses the latest GWP values available (i.e. AR6) for the selected reporting period, you could select AR5 from the drop-down menu and use the corresponding GWP values to calculate fugitive emissions for inventory and reporting purposes.

Fugitive Emission (optional)

☒ Include fugitive emission in the calculation

GWP value source ⓘ

Refrigerant Type	Beginning inventory balance (kg)	Purchase (kg)	Disposal (kg)	Ending inventory balance (kg)
<input type="text" value="Please select"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Refrigerants used during the period

=  kg

[+ Add more fugitive emission](#)

Then you can select the refrigerant type and input the inventory balances, purchase and disposal during the reporting period. The usage of the refrigerants during the period will be automatically calculated based on your input. Please note that any refrigerant used during the period should not be less than zero.

#### Fugitive Emission (optional)

☒ Include fugitive emission in the calculation

GWP value source ⓘ

IPCC Sixth Assessment Report (AR6) ▼

Refrigerant Type	Beginning inventory balance (kg)	Purchase (kg)	Disposal (kg)	Ending inventory balance (kg)
HCFC-21 ▼	110	20	5	100

Refrigerants used during the period

= 25 kg

[+ Add more fugitive emission](#)

If the company also has business operations in Mainland, repeat the steps for inputting fuel consumption for stationary combustion, mobile combustion, and fugitive emission, where applicable.

#### Mainland ⓘ

##### Stationary combustion ⓘ

Station	Fuel Type	Consumption
Station 1	Diesel oil ▼	500

kg

[+ Add more station](#)

##### Mobile combustion ⓘ

Vehicle	Vehicle Type	Fuel Type	Consumption
Vehicle1	Road transport ▼	Diesel Oil ▼	200

kg

[+ Add more vehicle](#)

#### Fugitive Emission (optional)

☒ Include fugitive emission in the calculation

GWP value source ⓘ

IPCC Sixth Assessment Report (AR6) ▼

Refrigerant Type	Beginning inventory balance (kg)	Purchase (kg)	Disposal (kg)	Ending inventory balance (kg)
HFC-23 ▼	20	0	5	10

Refrigerants used during the period

= 5 kg

[+ Add more fugitive emission](#)

[< Previous](#)

[Next >](#)

After inputting all applicable Scope 1 fields, press “Next” to proceed to Scope 2 section.

### 3.3 Inputting Scope 2 data

On the Scope 2 page, you can input fuel consumptions for i) purchased electricity and ii) purchased town gas (for Hong Kong only), where applicable.

#### i) Purchased electricity

You can select the source of electricity in the drop-down menu and input the corresponding electricity consumption in kWh.

The screenshot shows the 'Purchased electricity' section of the calculator. At the top, a navigation bar includes 'General', 'Scope 1', 'Scope 2' (which is active), and 'Result'. Below this is the title 'Calculator for Scope 1 and Scope 2 Greenhouse Gas Emissions of a Corporation'. The 'Purchased electricity' section has a title with a help icon. It contains two rows of input fields. The first row has a 'Source of electricity' dropdown menu set to 'HKE' and a 'Consumption' text box with '120000', followed by the unit 'kWh'. The second row has a 'Source of electricity' dropdown menu set to 'North China Grid' and a 'Consumption' text box with '50000', followed by the unit 'kWh'. To the right of each row are two icons: a link icon and a trash icon. At the bottom of the section is a link that says '+ Add more purchased electricity'.

#### ii) Purchased town gas (Hong Kong only)

You can input the town gas consumption in Hong Kong during the year, if applicable.

In general, this figure should be the sum of town gas consumption of all stations under Scope 1 emission. It is because the consumption of town gas involves both types of emissions – (i) direct emissions (Scope 1) arising from the combustion of town gas of the station and (ii) indirect emissions (Scope 2) arising from the generation and transportation of town gas from the production plant to the station concerned.

The screenshot shows the 'Purchased Towngas (Hong Kong only)' section of the calculator. It has a title with a help icon. Below the title is a text box containing '1200' and the unit 'unit'. At the bottom right of the section are two buttons: '< Previous' and 'Next >'. The 'Next >' button is highlighted in blue.

After inputting all applicable Scope 2 fields, press “Next” to proceed to the calculation results.

### 3.4 Reviewing results and generating reports

On the results page, you can see a summary of your inputs and the calculation results.

General > Scope 1 > Scope 2 > **Result**

Calculator for Scope 1 and Scope 2 Greenhouse Gas Emissions of a Corporation

Input Summary Collapse all

— Location of business operations

Hong Kong & Mainland

— Reporting Period

01/01/2024 To 31/12/2024

— Hong Kong

Stationary combustion

Station	Fuel Type	Consumption	
Station 1	Diesel Oil	10000	Litre
Station A	Charcoal	2000	kg

Mobile combustion

Vehicle	Vehicle Type	Fuel Type	Consumption	
Toyota AP 1234	Passenger Car	Unleaded petrol	500	Litre
Honda KE 5678	Heavy Goods Vehicle	Diesel Oil	300	Litre

Fugitive Emission (optional)

Include fugitive emission in the calculation

GWP value source

IPCC Sixth Assessment Report (AR6)

Refrigerant Type	Beginning inventory balance (kg)	Purchase (kg)	Disposal (kg)	Ending inventory balance (kg)
HCFC-21	110	20	5	100

Refrigerants used during the period

- 25 kg

Results

Hong Kong

Scope 1 GHG emissions

38.55 metric tonnes CO<sub>2</sub>e

Scope 2 GHG emissions

79.86 metric tonnes CO<sub>2</sub>e

Scope 1 and 2 GHG emissions

118.41 metric tonnes CO<sub>2</sub>e

Please refer to the [User Guide](#) for details of source data used in the calculation.

Mainland

Scope 1 GHG emissions

75.17 metric tonnes CO<sub>2</sub>e

Scope 2 GHG emissions

35.6 metric tonnes CO<sub>2</sub>e

Scope 1 and 2 GHG emissions

110.77 metric tonnes CO<sub>2</sub>e

Please refer to the [User Guide](#) for details of source data used in the calculation.

Note: The calculation output will be auto-saved for filling in the SME Questionnaire.

Go to Questionnaire

Edit

Export to Excel

Generate a report

You can click the “Export to Excel” to download an excel report which includes your inputs, emission factors applied, data sources, and calculation results for your records.

In addition, you can click the “Generate a report” to download a GHG emissions report in PDF format which shows details of the calculation methodologies, emission factors applied, and the calculation results. The PDF report aims to aid companies’ sustainability reporting processes. It is designed to provide a clear and transparent calculation of GHG emissions, thereby facilitating the audit and assurance of the calculation on the reported GHG emissions by any third party agencies.

For generation of the PDF report, you need to enter the company name and select the industry that is most applicable to the company. This information will be shown in the PDF report for identification purposes. It is important to note that by using the GHG emissions report function, you consent to the CASG and HKUST to use the data and/or information provided on the “GHG Emissions Calculator” for research and analysis purposes. Individual data will be used solely for the development and enhancement of the GHG Emissions Calculator and GHG Emissions Estimator, and will not be shared with any third parties except as required by law.

The screenshot displays a web form titled "Company Name" with a close button (X) in the top right corner. Below the title is a text input field containing "ABC Limited". Underneath is the "Industry" section, which includes a detailed instruction: "(Select the industry that is most applicable to your organization. You can follow CDP's Activity Classification System (CDP-ACS) in determining the industry sector. The system categorizes companies by focusing on the activities from which they derive revenue and associate these activities with the company's climate change impact.)". There are two columns of radio button options. The first column lists: Apparel, Food, beverage & agriculture, Hospitality, International bodies, Materials, Retail, and Transportation Services. The second column lists: Biotech, health care & pharma, Fossil fuels, Infrastructure, Manufacturing, Power generation, and Services. The "Services" option is selected, indicated by a blue dot. At the bottom of the form is a "Disclaimer" paragraph and a blue "Confirm" button. The text "Scope 2 GHG emissions" is visible at the bottom left of the page.

Company Name

ABC Limited

Industry

(Select the industry that is most applicable to your organization. You can follow CDP's Activity Classification System (CDP-ACS) in determining the industry sector. The system categorizes companies by focusing on the activities from which they derive revenue and associate these activities with the company's climate change impact.)

☐ Apparel

☐ Food, beverage & agriculture

☐ Hospitality

☐ International bodies

☐ Materials

☐ Retail

☐ Transportation Services

☐ Biotech, health care & pharma

☐ Fossil fuels

☐ Infrastructure

☐ Manufacturing

☐ Power generation

☒ Services

Disclaimer: The GHG emissions report aims to aid companies' sustainability reporting processes. By using the GHG emissions report function, you hereby consent to the CASG and HKUST to use the data and/or information provided through the calculator on the "GHG Emissions Calculator". The data will be used solely for the development and enhancement of the GHG Emissions Calculator and GHG Emissions Estimator, and will not be shared with any third parties except as required by law.

Confirm

Scope 2 GHG emissions

Greenhouse Gases Emissions Report

Company Name  
Sector  
For the period from  
Location of business operations  
Hong Kong and Mainland

ABC Limited  
Services  
01/01/2024 To 31/12/2024

2025-03-21 11:32:54  
Ref: 20250321-002

Greenhouse gases (GHG) emissions results (metric tonnes CO<sub>2</sub>e)

Hong Kong	
Scope 1	38.55
Scope 2	79.86
Scope 1 and 2	118.41

Mainland	
Scope 1	75.17
Scope 2	35.6
Scope 1 and 2	110.77

Total	229.18
-------	--------

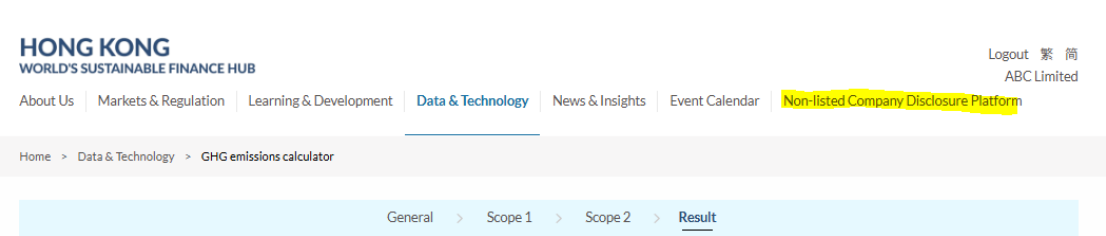
**Sources of Emissions and Calculation**  
The calculation of GHG emissions mainly covers carbon dioxide (CO<sub>2</sub>). Scope 1 GHG emissions in Hong Kong are calculated based on the emission factors published by the relevant authorities, taking into account the emissions of methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O). Please refer to the table below for details of the calculation, including the respective emission factors and global warming potential (GWP) applied in deriving the total GHG emissions of the captioned entity.

	Consumption [A]	Unit	CO <sub>2</sub> emission ([A]*EF) (in kg CO <sub>2</sub> e)	CH <sub>4</sub> emission ([A]*EF*GWP) (in kg CO <sub>2</sub> e)	N <sub>2</sub> O emission ([A]*EF*GWP) (in kg CO <sub>2</sub> e)	GHG emissions (in kg CO <sub>2</sub> e)	GHG emissions (in metric tonnes CO <sub>2</sub> e)	Data source
Hong Kong								
Scope 1								
Stationary Combustion								
Diesel Oil (Station 1)	10000	Litre	10000*2.614	10000*2.39E-5 *27	10000*7.4E-6 *273	26,166.66	26.17	EF is from EPD https://www.epd.gov.hk/epd/sites/default/files/epd/gn_pd f/GN2014P097-2014c-e.pdf; GWP is from IPCC Sixth Assessment Report: Climate Change 2021 (AR6)
Charcoal (Station A)	2000	kg	2000*2.97	2000*0.005529*27	2000*2.76E-5 *273	6,253.64	6.25	EF is from EPD https://www.epd.gov.hk/epd/sites/default/files/epd/gn_pd f/GN2014P097-2014c-e.pdf; GWP is from IPCC Sixth Assessment Report: Climate Change 2021 (AR6)
Mobile Combustion								
Unleaded petrol (Toyota AP 1234 - Passenger Car)	500	Litre	500*2.36	500*0.000253 *27	500*0.001105 *273	1,334.25	1.33	EF is from EPD https://www.epd.gov.hk/epd/sites/default/files/epd/gn_pd f/GN2014P097-2014c-e.pdf; GWP is from IPCC Sixth Assessment Report: Climate Change 2021 (AR6)
Diesel Oil (Honda KE 5678 - Heavy Goods Vehicle)	300	Litre	300*2.614	300*0.000145 *27	300*7.2E-5 *273	791.27	0.79	EF is from EPD https://www.epd.gov.hk/epd/sites/default/files/epd/gn_pd f/GN2014P097-2014c-e.pdf; GWP is from IPCC Sixth Assessment Report: Climate Change 2021 (AR6)
Fugitive Emission								

3.5 Retrieving calculation results (only for users who created an account)

If you create an account and log in, your inputs and calculation results, as well as the reports are automatically saved in the account platform.


To access your user profile and retrieve your calculation history, press “Non-listed Company Disclosure Platform”.



Then click “History of Emissions Calculation” on the menu, your calculation history will be shown. You can review the information online, or click the





icon and the  icon to download the excel report and the PDF report respectively.

Hong Kong's Green and Sustainable Finance Cross-Agency Steering Group













> Leadership



Strategy and Priorities

> Key Policy Work and the Centre for Green and Sustainable Finance















Non-listed Company Questionnaire Background Submission of Response(s) Option of Sharing GHG Emissions History of Emissions Calculation History of Emissions Estimation	Submission Date	Location	Scope 1 (metric tonnes CO2e)	Scope 2 (metric tonnes CO2e)	Scope 1 and 2 (metric tonnes CO2e)	
	2025-03-21 11:52:24	Mainland	75.17	35.6	110.77	  
		Hong Kong	38.55	79.86	118.41	
	2025-03-21 11:32:54	Mainland	75.17	35.6	110.77	  
		Hong Kong	38.55	79.86	118.41	
	2025-03-19 09:57:09	Mainland	0.2	0.11	0.31	  
		Hong Kong	0	0	0	
	2025-01-13 15:10:22	Mainland	146.39	0.59	146.98	  
		Hong Kong	147.43	0.14	147.57	

1 to 4 of 4 Items



To remove a calculation history, click the icon and confirm to delete.

## History of Emissions Calculation

Submission Date	Location	Scope 1 (metric tonnes CO2e)	Scope 2 (metric tonnes CO2e)	Scope 1 and 2 (metric tonnes CO2e)	
2025-03-21 11:52:24	Mainland	75.17	35.6	110.77	  
	Hong Kong	38.55	79.86	118.41	
2025-03-21 11:32:54	Mainland	75.17	35.6	110.77	  
	Hong Kong	38.55	79.86	118.41	
2025-03-19 09:57:09	Mainland	0.2	0.11	0.31	  
	Hong Kong	0	0	0	
2025-01-13 15:10:22	Mainland	146.39	0.59	146.98	  
	Hong Kong	147.43	0.14	147.57	

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- 2021: [https://www.clp.com.cn/wp-content/uploads/2022/03/Sustainability\\_Report\\_2021\\_en.pdf](https://www.clp.com.cn/wp-content/uploads/2022/03/Sustainability_Report_2021_en.pdf)
- 2022: [https://www.clpgroup.com/content/dam/clp-group/channels/sustainability/document/sustainability-report/2022/CLP\\_Sustainability\\_Report\\_2022\\_en.pdf.coredownload.pdf](https://www.clpgroup.com/content/dam/clp-group/channels/sustainability/document/sustainability-report/2022/CLP_Sustainability_Report_2022_en.pdf.coredownload.pdf)
- 2023: [https://www.clpgroup.com/content/dam/clp-group/channels/sustainability/document/sustainability-report/2023/CLP\\_Sustainability\\_Report\\_2023\\_en.pdf](https://www.clpgroup.com/content/dam/clp-group/channels/sustainability/document/sustainability-report/2023/CLP_Sustainability_Report_2023_en.pdf)
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- 2020: [https://www.hkelectric.com/documents/en/CorporateSocialResponsibility/CorporateSocialResponsibility\\_CDD/Documents/SR2020E.pdf](https://www.hkelectric.com/documents/en/CorporateSocialResponsibility/CorporateSocialResponsibility_CDD/Documents/SR2020E.pdf)
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[porateSocialResponsibility\\_CDD/Documents/SR2021E.pdf](#)

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2023: [https://www.hkelectric.com/documents/en/InvestorRelations/InvestorRelations\\_GLNCS/Documents/2024/ESR2023%20full%20version.pdf](https://www.hkelectric.com/documents/en/InvestorRelations/InvestorRelations_GLNCS/Documents/2024/ESR2023%20full%20version.pdf)

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2021: [https://www.towngas.com/getmedia/606f4b03-f911-4efc-b184-9c5937736e84/Towngas\\_ESG2021\\_EN.aspx](https://www.towngas.com/getmedia/606f4b03-f911-4efc-b184-9c5937736e84/Towngas_ESG2021_EN.aspx)

2022: [https://www.towngas.com/getmedia/c6da701c-519b-4e04-ae9-7557b1d509f4/Towngas\\_ESG2022\\_EN.pdf.aspx](https://www.towngas.com/getmedia/c6da701c-519b-4e04-ae9-7557b1d509f4/Towngas_ESG2022_EN.pdf.aspx)

2023: [https://www.towngas.com/getmedia/6b774b8d-c94b-4e39-8fda-0e505cf6d10f/Towngas-ESG-Report-2023\\_EN.pdf.aspx?ext=.pdf](https://www.towngas.com/getmedia/6b774b8d-c94b-4e39-8fda-0e505cf6d10f/Towngas-ESG-Report-2023_EN.pdf.aspx?ext=.pdf)

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