GHG Accounting and Practical Applications for Regulatory Disclosure

17 Apr 2025

01.

Introduction of Climate Change and GHG Emissions

EXECUTIVE SUMMARY – THE GLOBAL RISKS

FIGURE C

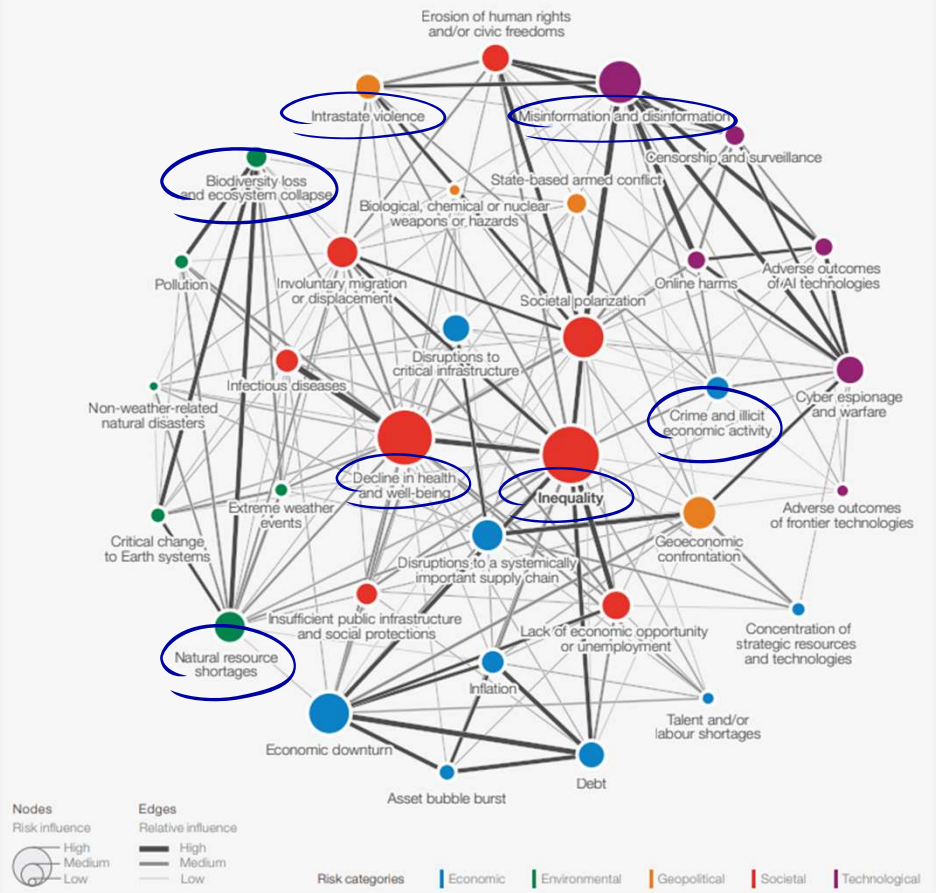
Global risks ranked by severity over the short and long term

"Please estimate the likely impact (severity) of the following risks over a 2-year and 10-year period."

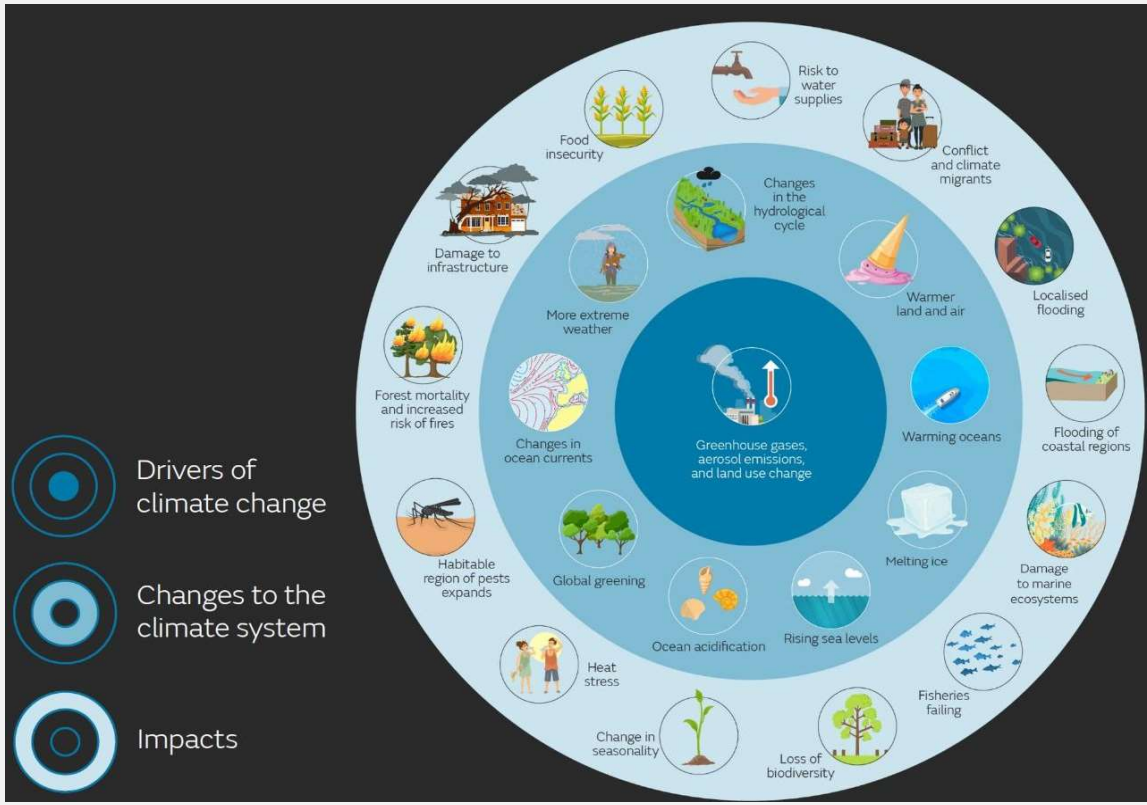
Source: World Economic Forum Global Risks Report 2025

EXECUTIVE SUMMARY – THE LINKAGE BETWEEN EACH OF THE RISKS

FIGURE D | **Global risks landscape: An interconnections map[3]**



Source: [World Economic Forum Global Risks Report 2025]



Source: [Met Office]

HISTORY OF COMBATING CLIMATE CHANGE

1937

《The artificial production of carbon dioxide and its influence on temperature》

《Stockholm Declaration》of the United Nations Conference on the Human Environment

1972

1988

IPCC established

UNFCCC developed an action plan

1992

1997

《Kyoto Protocol》

required only developed countries to reduce emissions

《Copenhagen Accord》

explicit emission pledges by all major economies

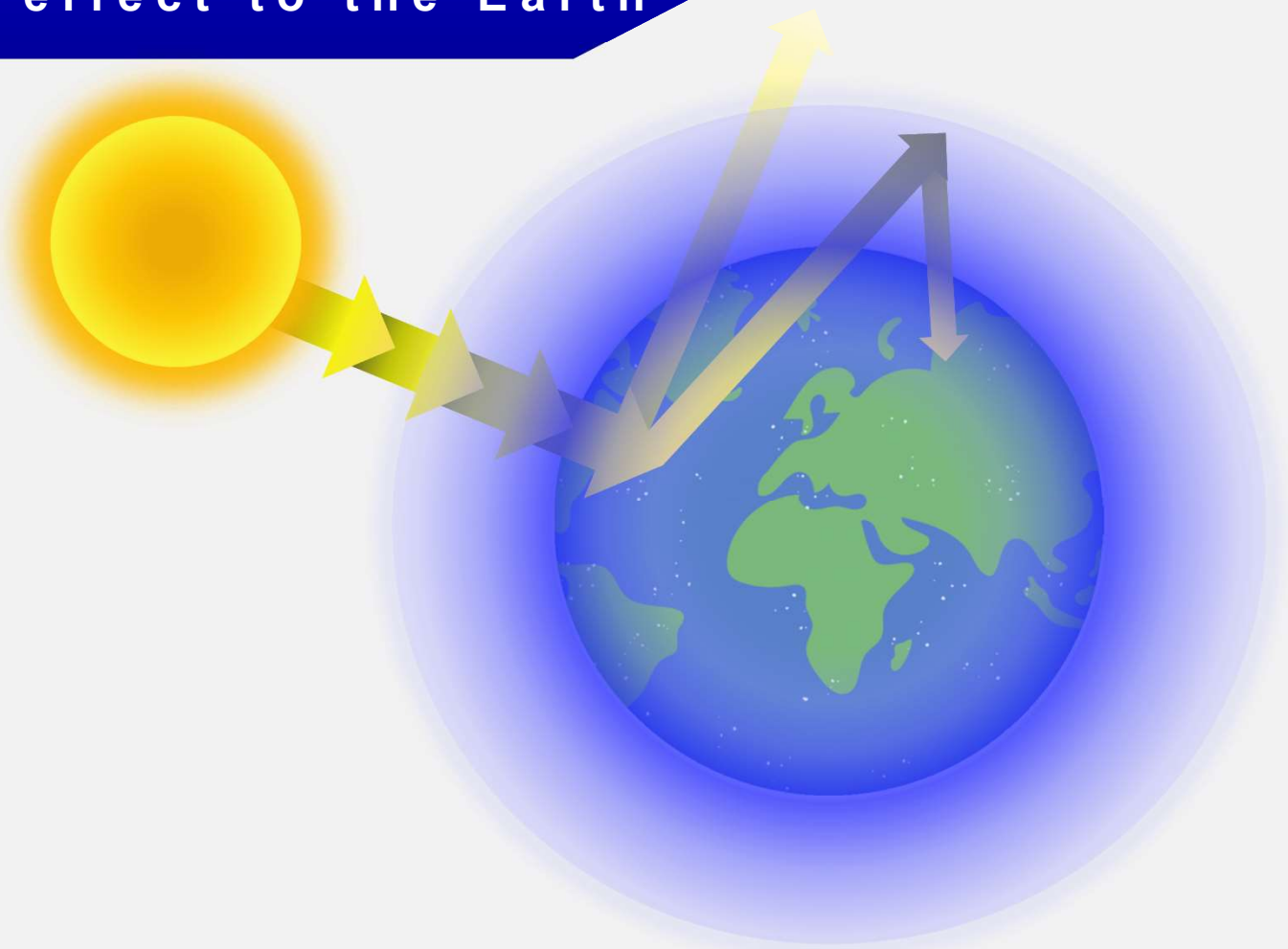
2009

2016

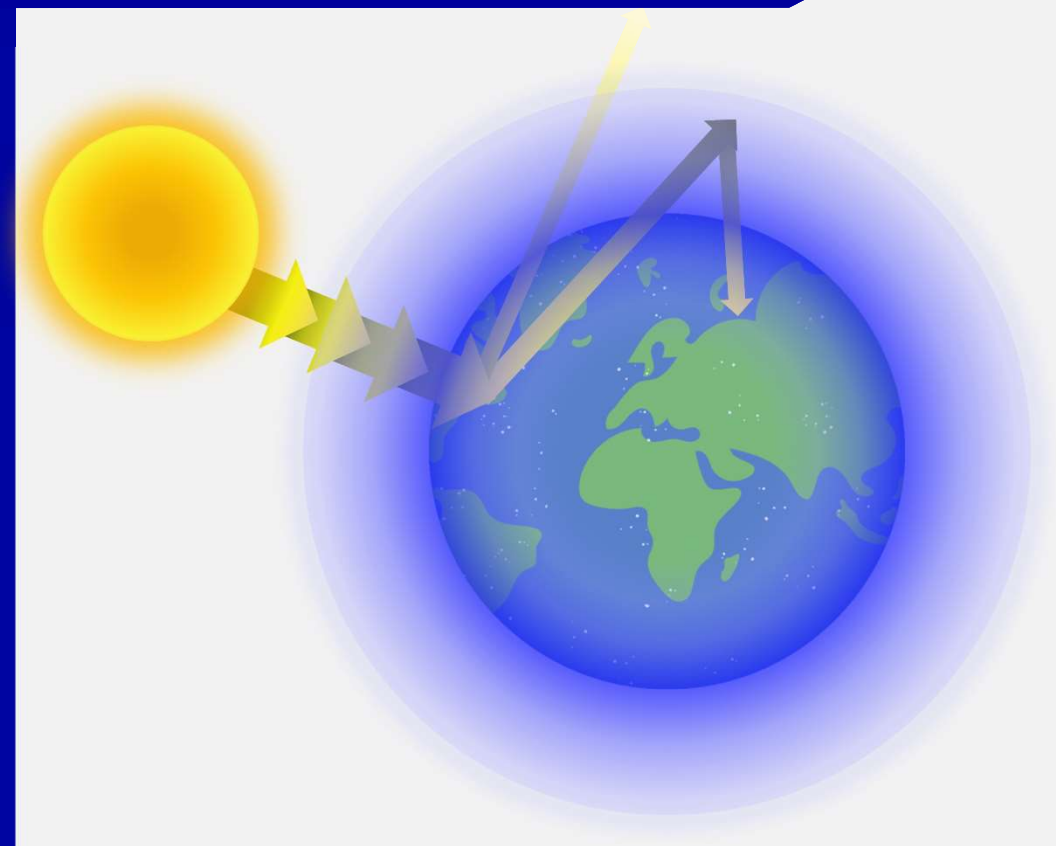
《Paris Agreement》

climate change is a shared problem, all should limit global warming to well below 2°C above pre-industrial levels, ideal 1.5°C

GHG effect to the Earth



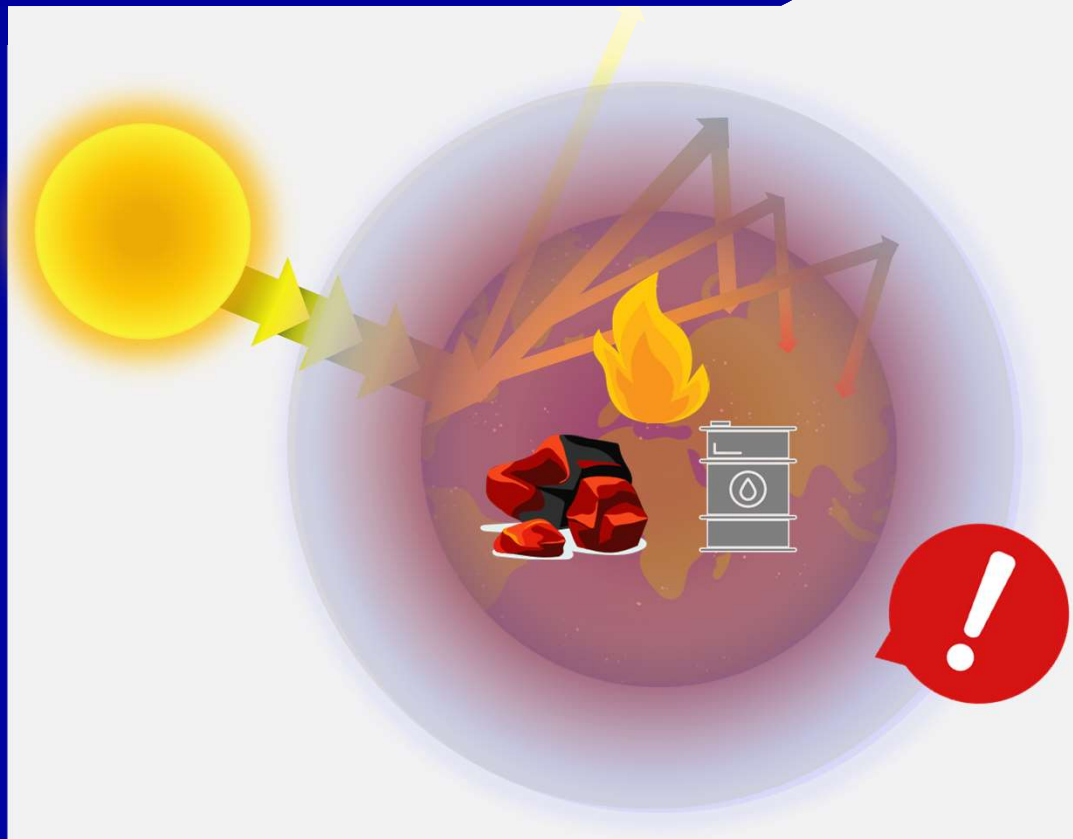
GHG effect to the Earth



Proper greenhouse effect is beneficial to the living things on the Earth as it gives us warmth.

Without GHGs, Earth's average temperature would be below freezing.

GHG effect to the Earth

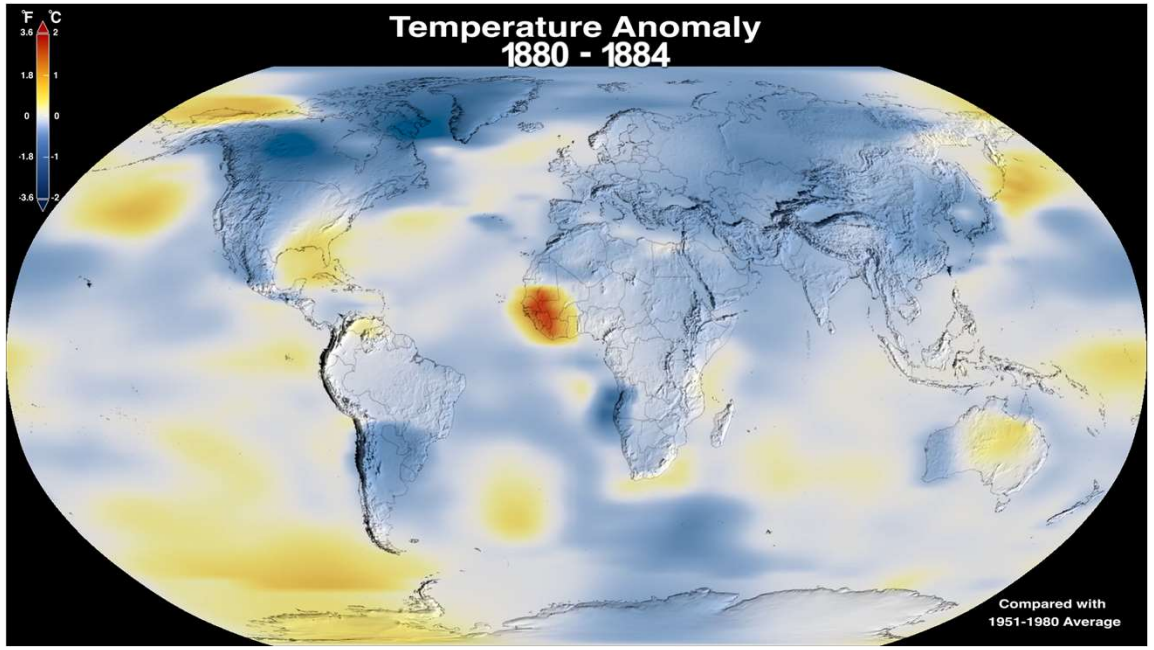


Burning fossil fuels produces GHGs emissions

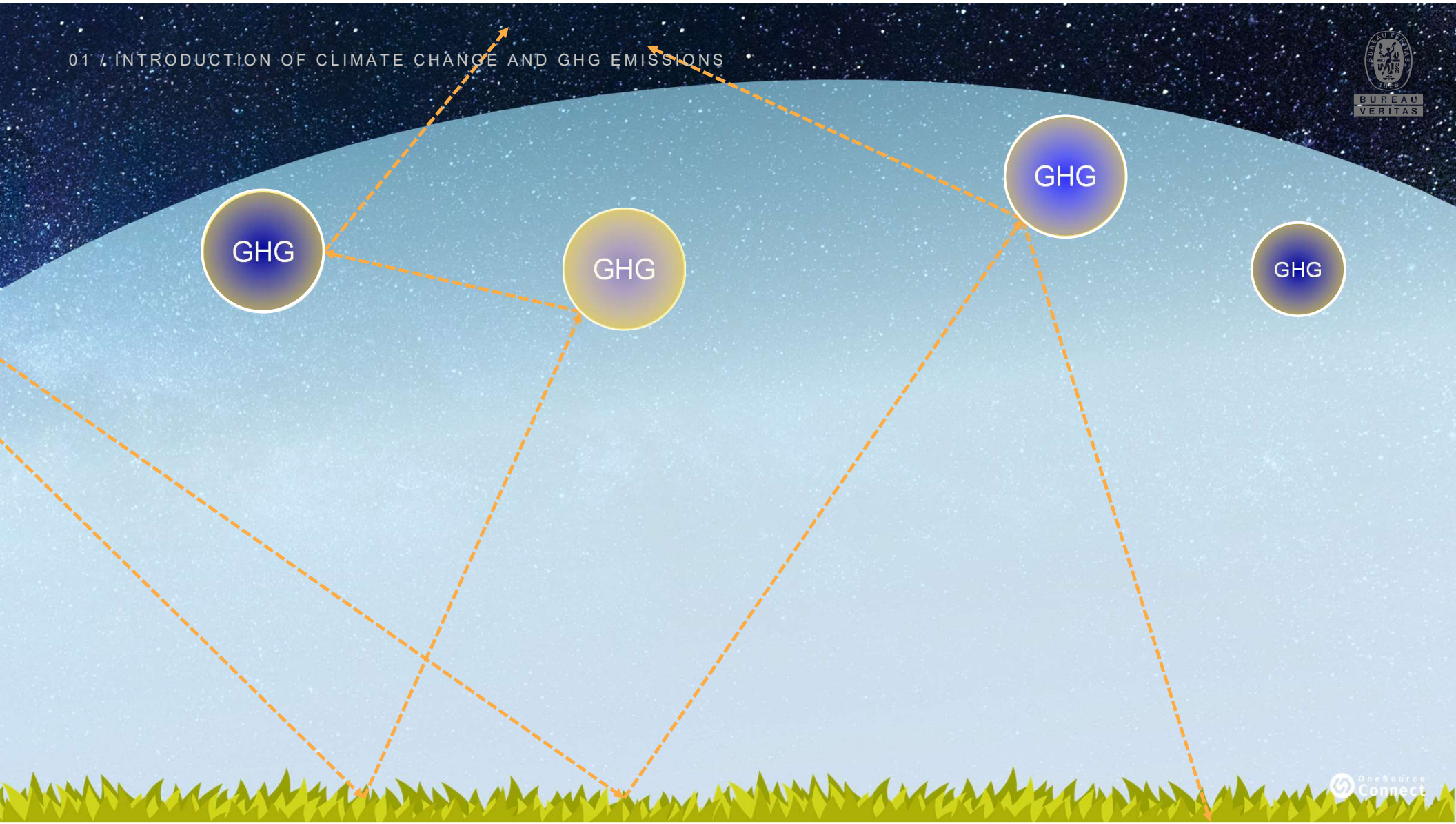
Gas trapped in the atmosphere raise the temperature

GHG effect to the Earth

Temperature Change (1880-2022)



Source: NASA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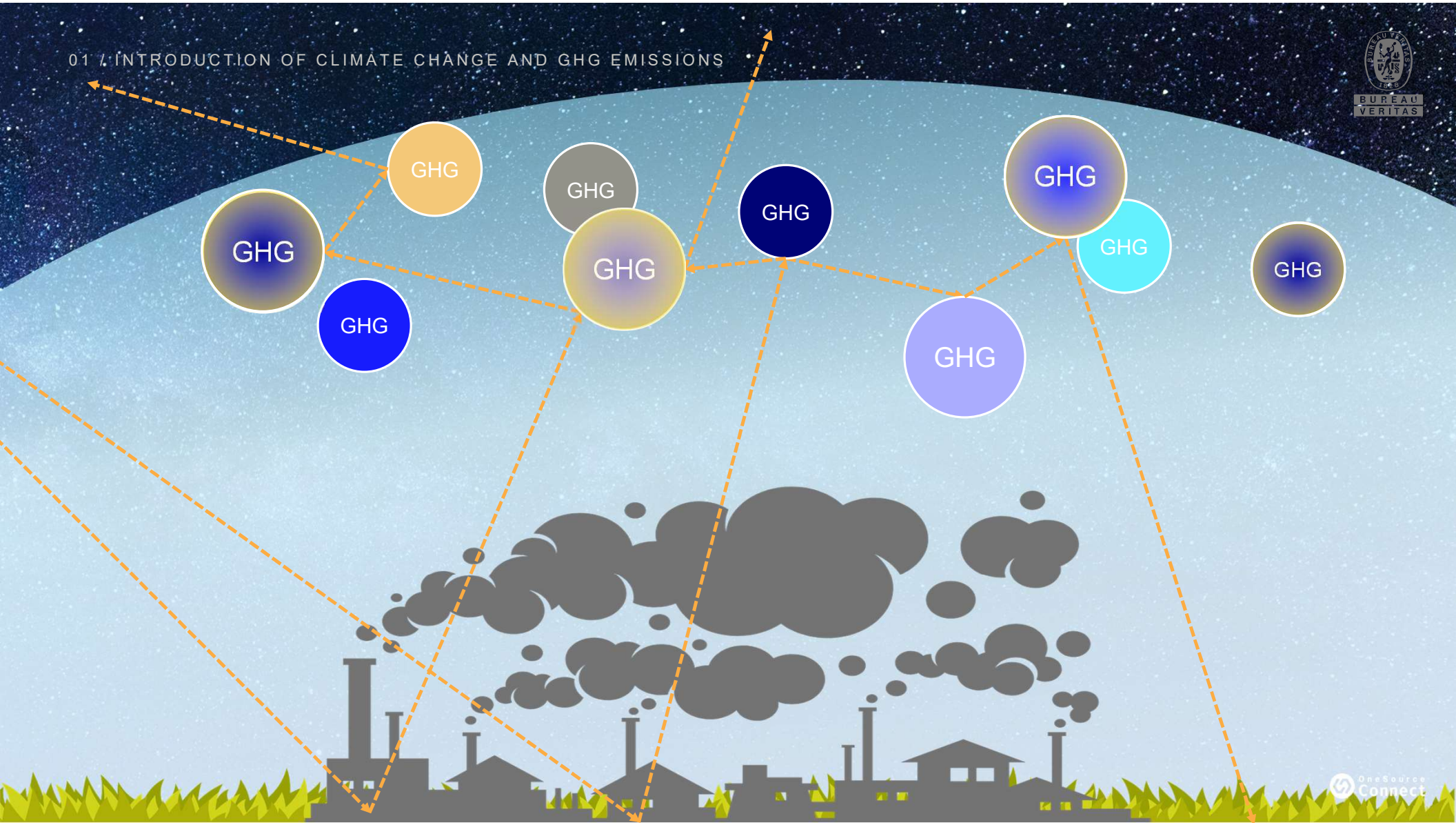
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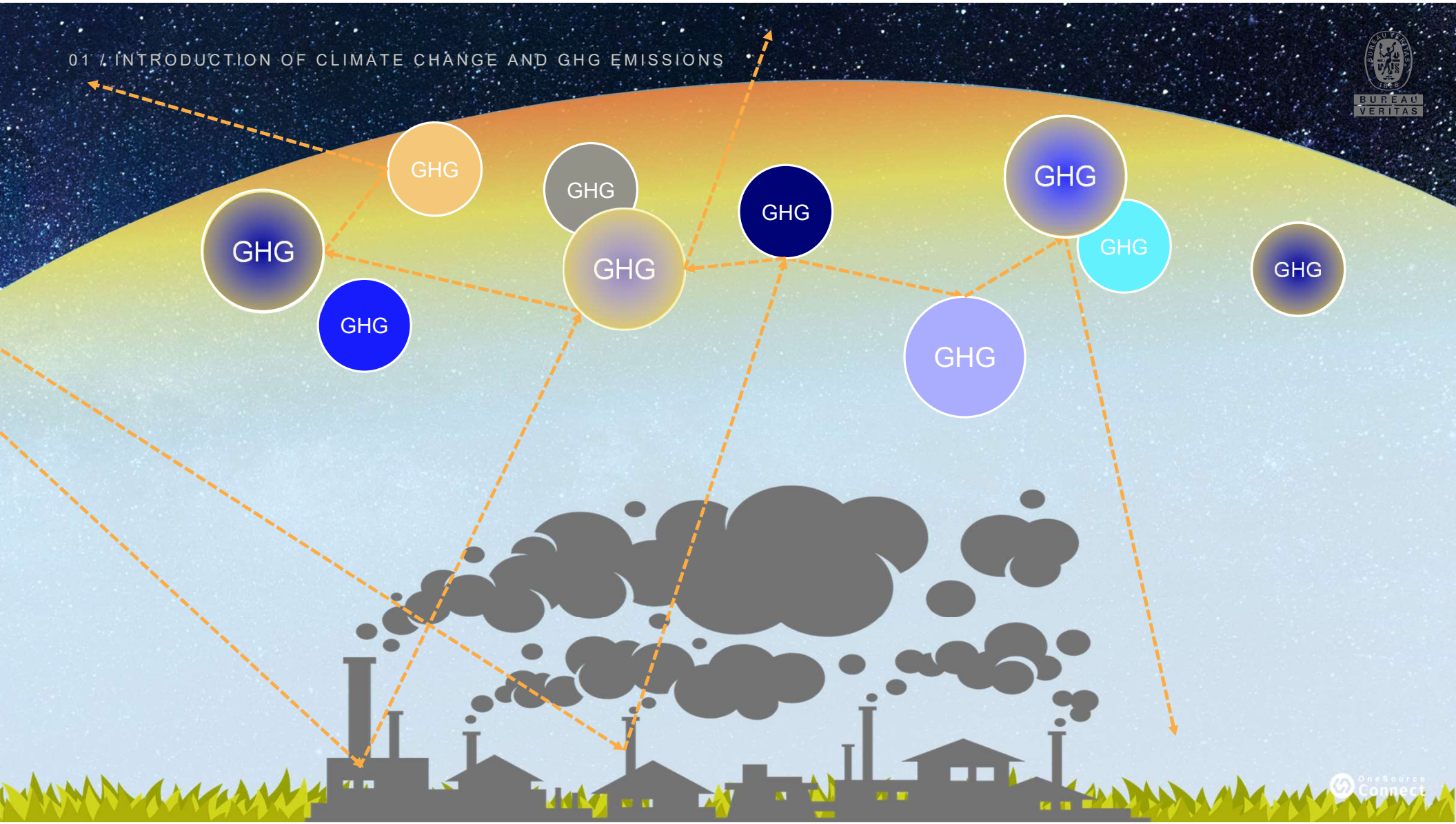
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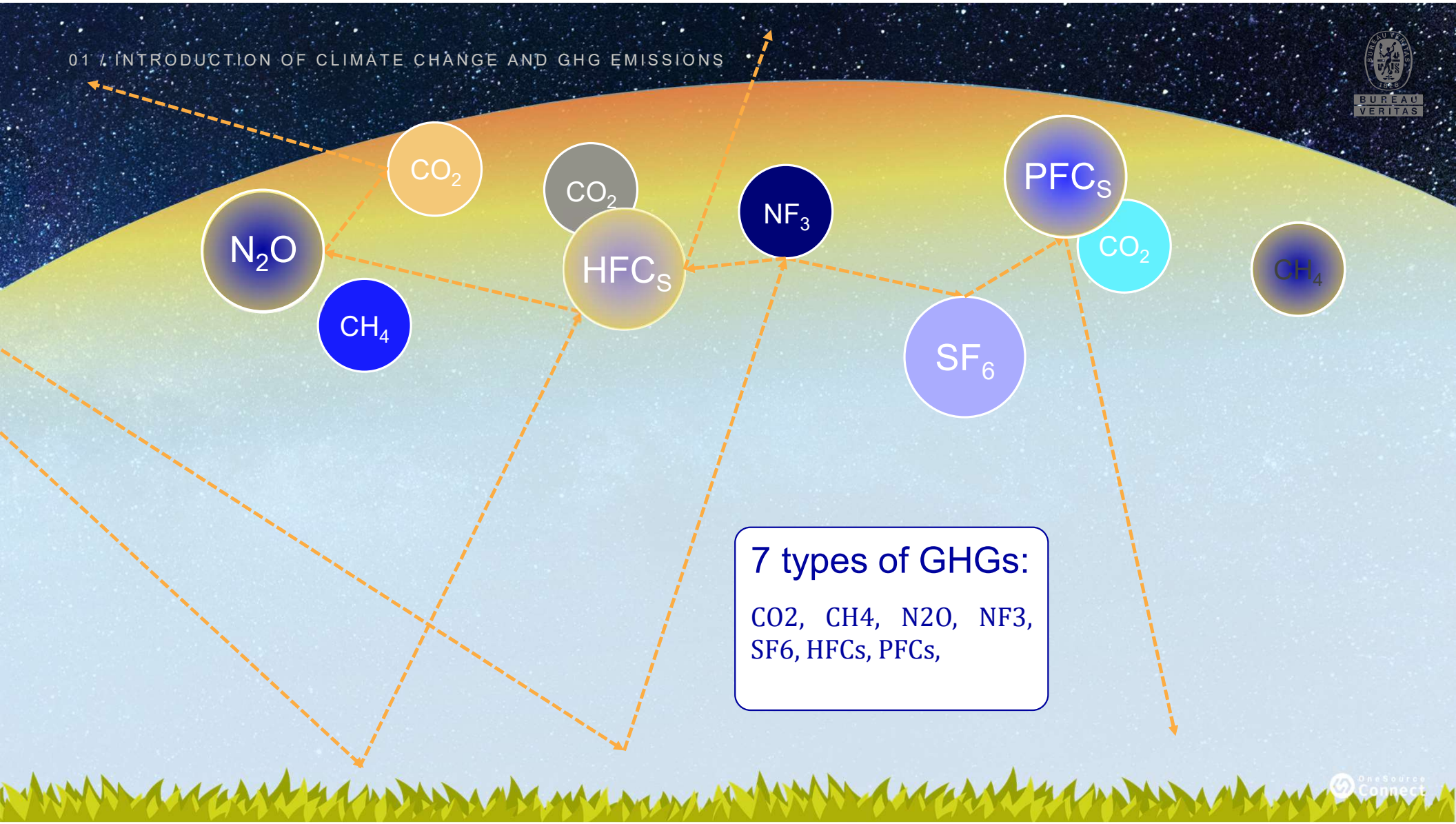
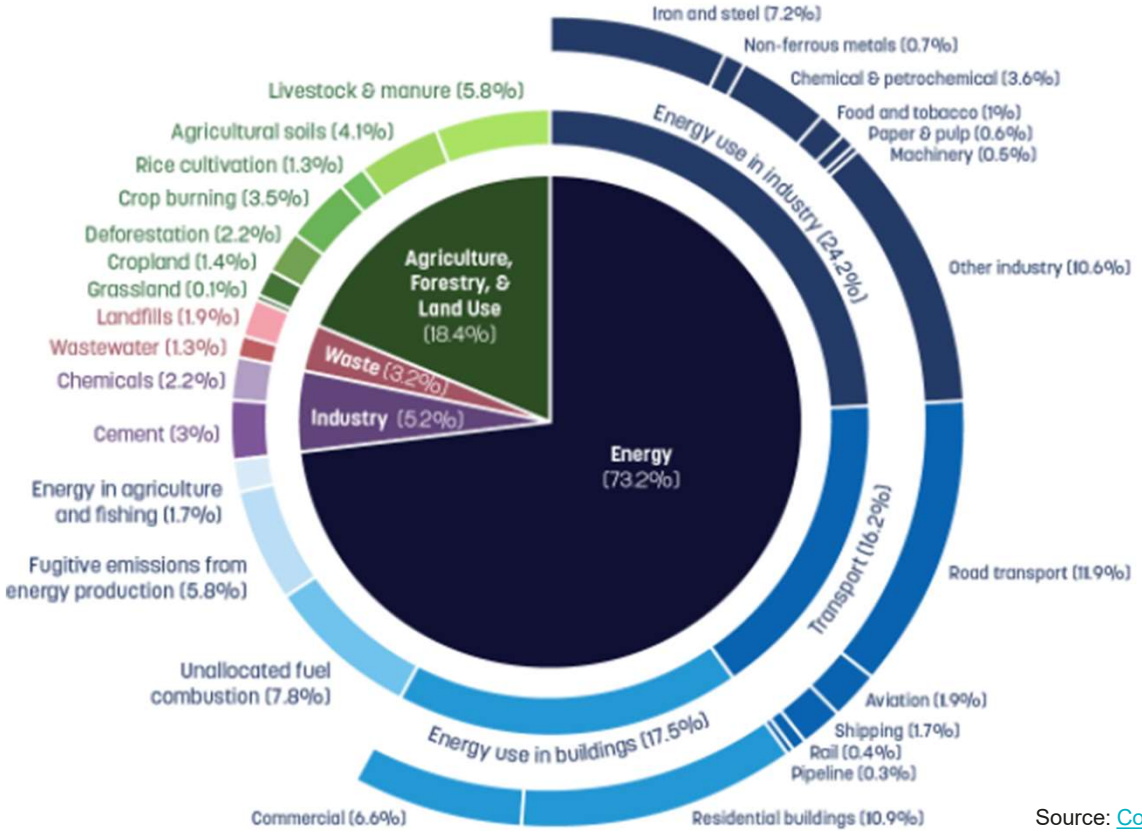


7 types of GHGs:

CO2, CH4, N2O, NF3, SF6, HFCs, PFCs,

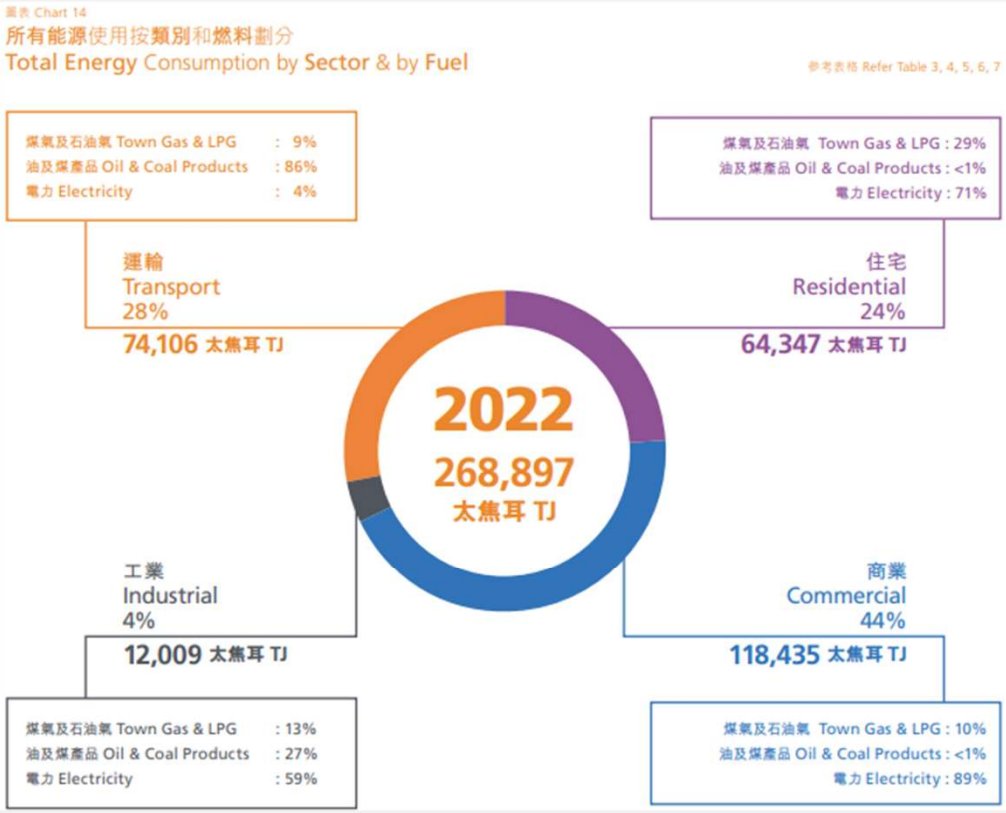
CONTRIBUTING SECTORS:
INDUSTRY
BUILDING
TRANSPORTATION
AGRICULTURE

Where do GHGs used for?



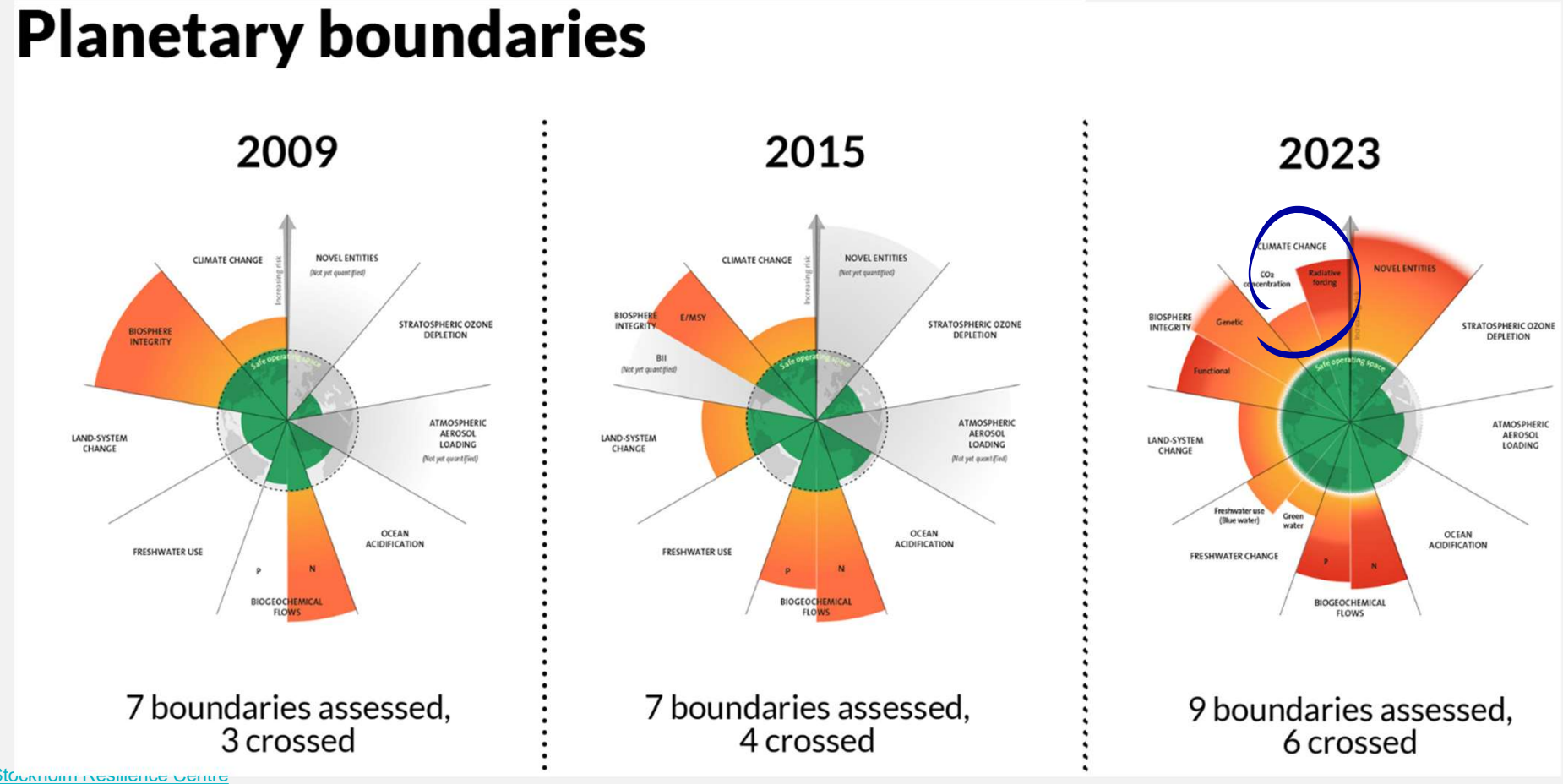
Source: Council of Europe

THE SITUATION IN HONG KONG



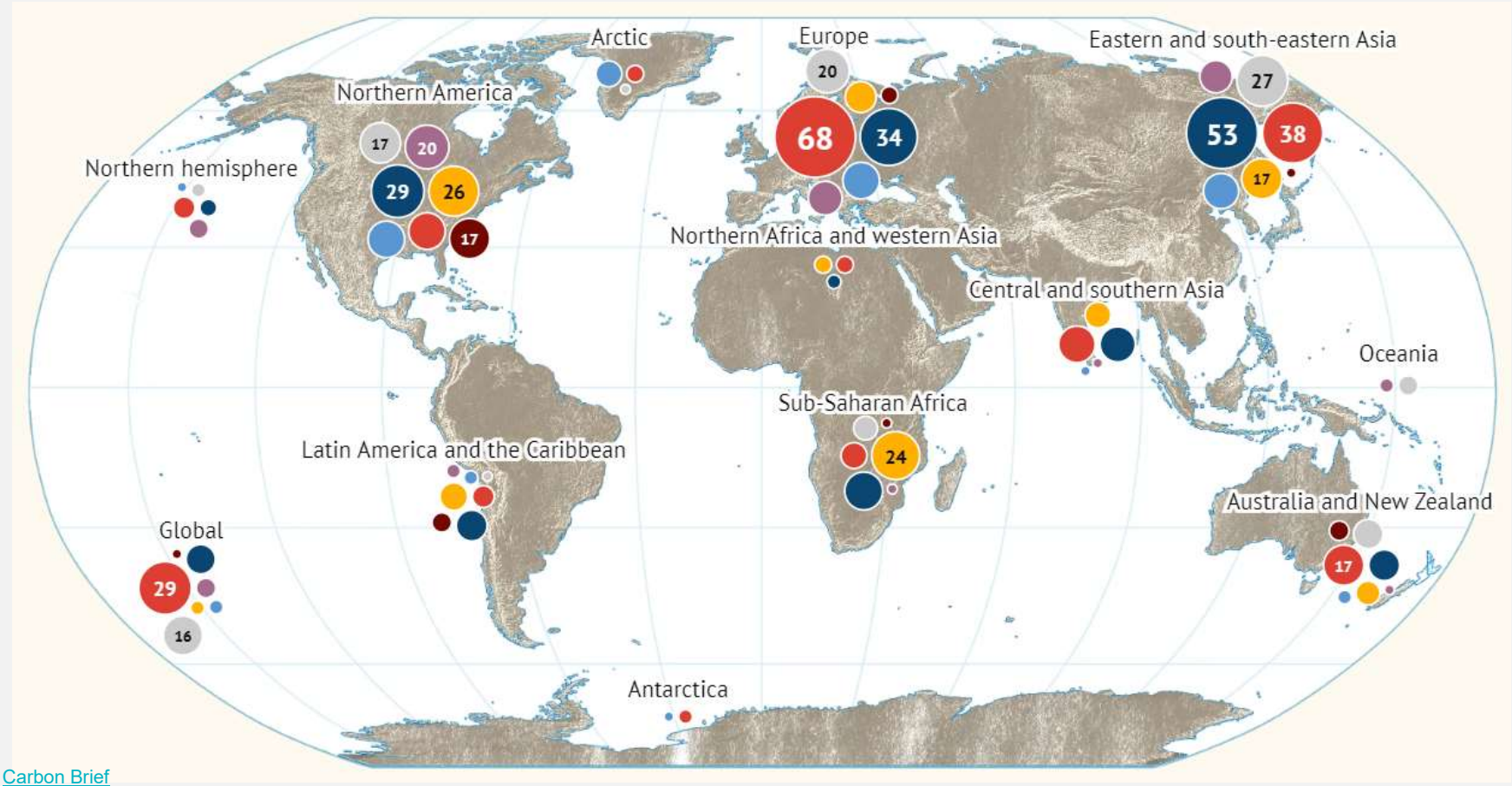
Source: EMSD, HK

EARTH EXCEEDS SAFE LIMITS



Source: Stockholm Resilience Centre

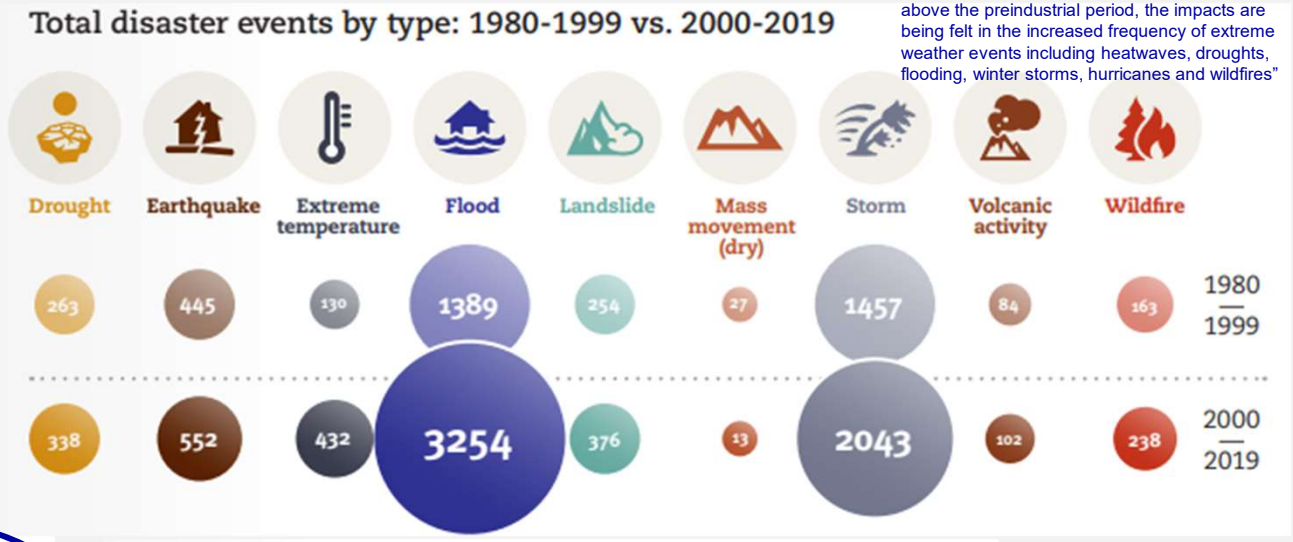
MORE EXTREME WEATHER EVENT IS COMING

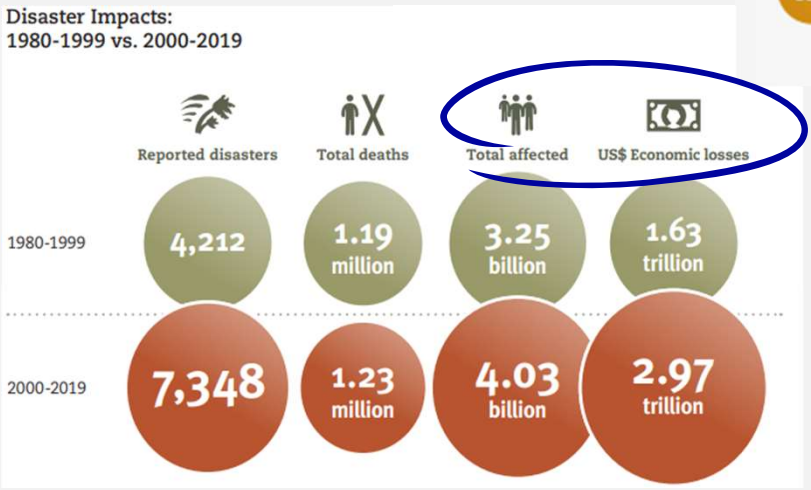


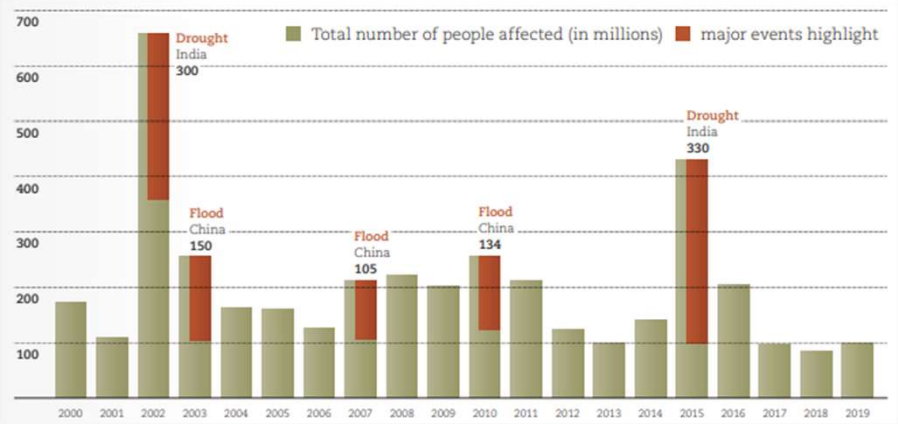
Source: Carbon Brief

The Cost Of Climate Change: A Triple Threat to Human, Economic, And Business

"This is clear evidence that in a world where the global average temperature in 2019 was 1.1˚C above the preindustrial period, the impacts are being felt in the increased frequency of extreme weather events including heatwaves, droughts, flooding, winter storms, hurricanes and wildfires"







Source: UNDRR

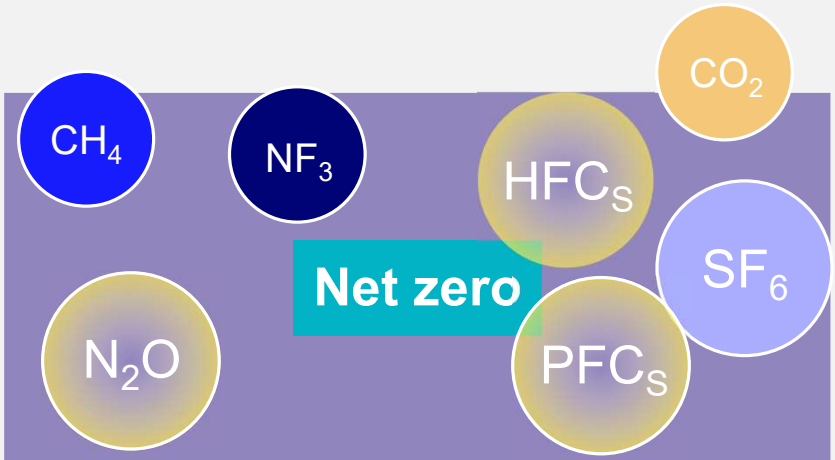
DIFFERENCE BETWEEN

Carbon Neutral and Net Zero

CO_2

Carbon Neutral

Removed **CO2** from the atmosphere being equal to those emitted by human activity



Removed **all GHGs** from the atmosphere being equal to those emitted by human activity

Source: National Grid

CARBON NEUTRAL

VS

NET ZERO

Carbon Neutral and Net Zero are used interchangeably in many context

碳中和及可持續發展
https://cnsd.gov.hk › uploads › 2024/09 › Carbo... XLS

Excel Template for "Paper Approach" Carbon Audit

4 Sept 2024 — Based on the information from the **Hong Kong** and China Gas Company, the **emissions** factors for the past five years were derived as below. This ...

	A	B	C	D	E	F	G	H	I	J	K
1	**Report Table**										
2	**Information on GHG emissions and removals for**						**Sample Venue**				
3	**Reporting Period:**			**From**	**01**	**04**	**2022**	**To**	**31**	**03**	**2023**
4					**(DD)**	**(MM)**	**(YYYY)**		**(DD)**	**(MM)**	**(YYYY)**
5											
6					**GHG Emissions by gas type (in tonnes of CO_2 equivalent)**						
7			**Description(by sources, areas, etc.)**	**Carbon Dioxide (CO_2)**	**Methane (CH_4)**	**Nitrous Oxide (N_2O)**	**Hydrofluoro-carbons (HFCs)**	**Perfluoro-Carbon (PFCs)**	**Total**		
8											
9	**Scope 1 Direct GHG Emissions**										
10	**Stationary Combustion Sources**										
11				**0.00**	**0.0000**	**0.0000**	**N/A**	**N/A**	**0.00**		
12											
13	**Mobile Combustion Sources**										
14				**0.00**	**0.0000**	**0.0000**	**N/A**	**N/A**	**0.00**		
15											
16	**Fugitive Emissions**										
17				**N/A**	**N/A**	**N/A**	**0**	**N/A**	**0.00**		
18											
19	**Others Direct Emissions**										
20				**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**0.00**		

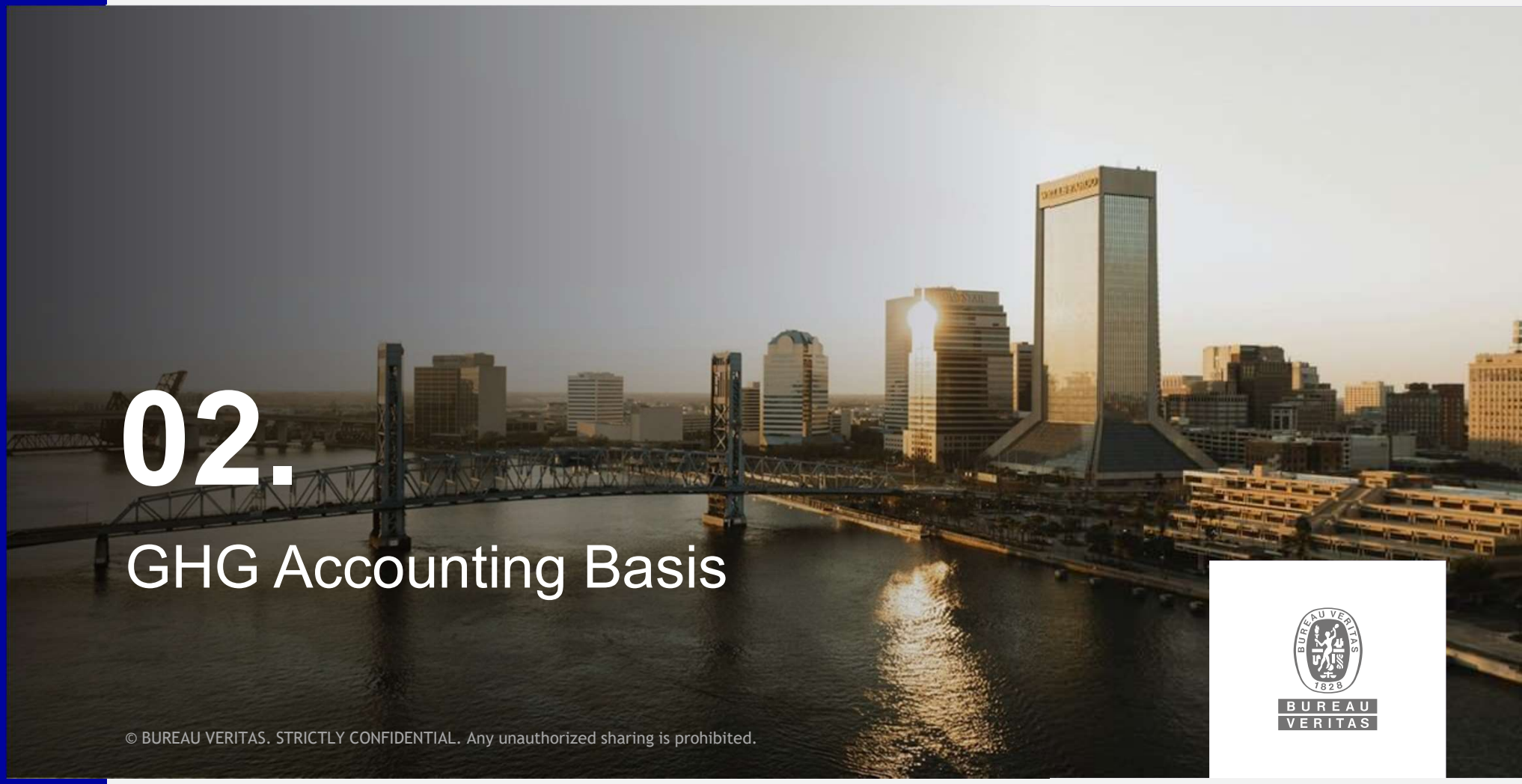
Source: Carbon Neutral and Sustainable Development, HK

HOW TO ACHIEVE CARBON NEUTRAL AND NET ZERO?

From business to individuals, we all can contribute to decarbonisation

Requires abatement of emissions first, offset is the last resort

Source: WRI

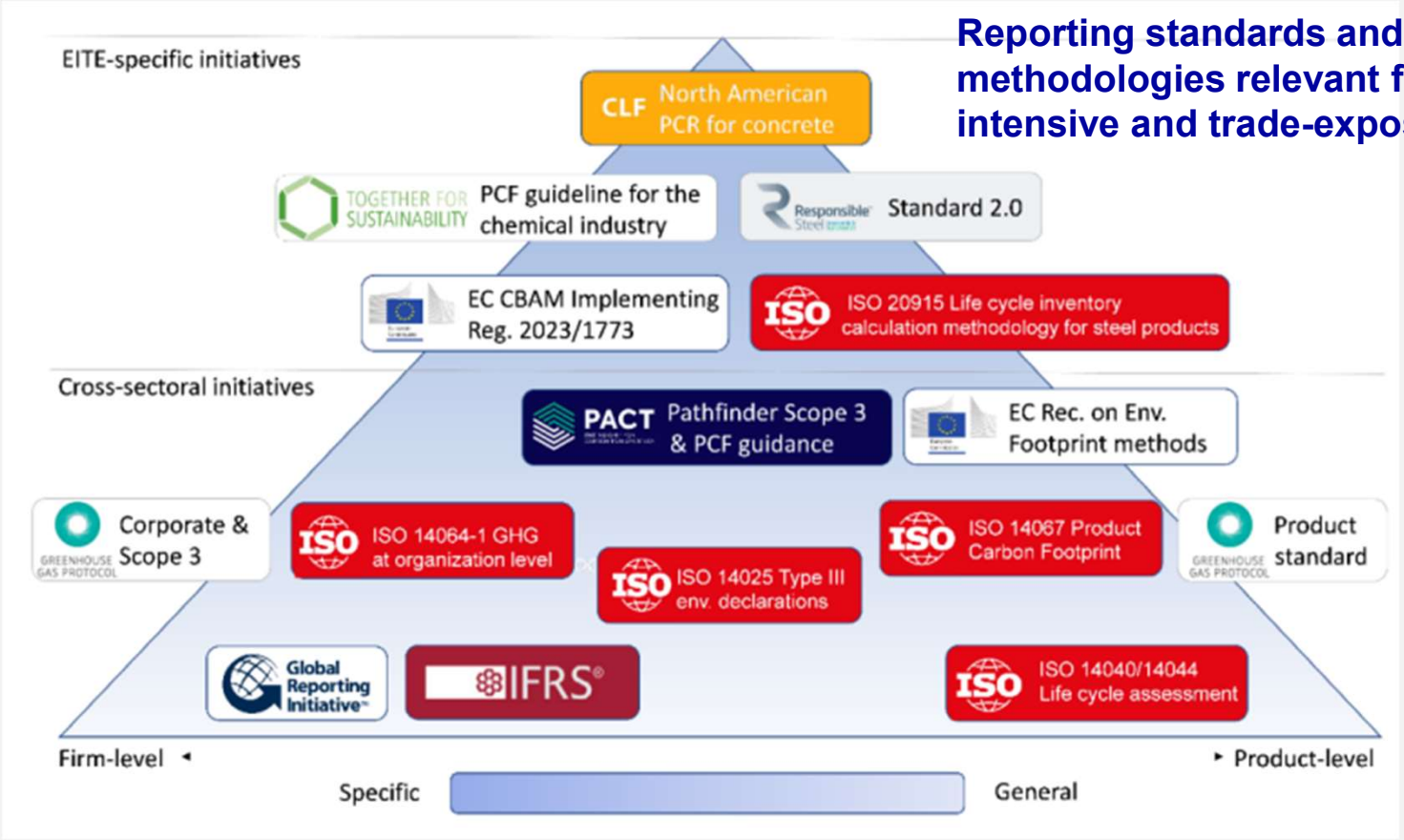


02.

GHG Accounting Basis

CARBON FOOTPRINT (GHG) OF EVERYTHING

Reporting standards and methodologies relevant for Emissions-intensive and trade-exposed industries



Source: OECD

DEFINITION OF

GHG accounting

Organisational Footprint

Source: European Commission

Product Footprint

Source: My climate

GHG INVENTORY STANDARD

Greenhouse Gas Protocol (GHG Protocol) was jointly convened in 1998 by World Business Council for Sustainable Development (WBCSD) and World Resources Institute (WRI).

Issued in 2001，second version in 2004

- Establish a method for calculating and reporting organisational GHGs emissions in accordance with accounting standards
- The purpose is to exchange and integrate knowledge, hoping to serve as a core tool for the GHGs trading market
- In addition to guidelines on principles and procedures, it also provides calculating tools for individual cases for the practitioner

By the International Standards Organization (ISO)

Issued in 2006, second version in 2018

- ISO 14064-1 is one of the ISO 14064 series of standards. It provides clarity and consistency in the quantification, supervision, reporting and verification or verification of greenhouse gas inventories or plans, with a view to benefiting organizations, governments, plan proponents and stakeholders around the world
- In addition to the provisions of this article of ISO 14064-1, the 2018 version also provides appendices A~H as specifications or reference information

Introduction of GHG Protocol

GHG INVENTORY STANDARDS ADOPTED INTERNATIONALLY

Document type：

Standard (標準) 與 Guidance (指引)

Standard (標準)

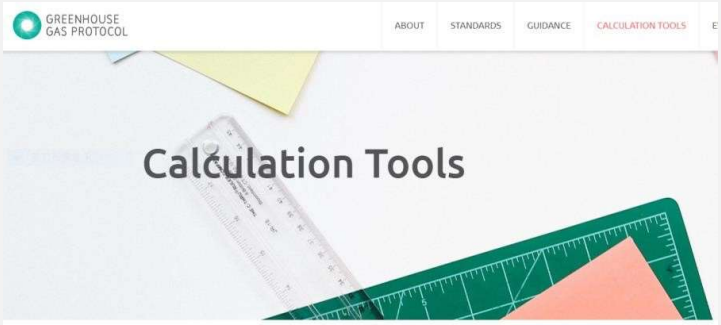
- Corporate Standard
- GHG Protocol for Cities
- Mitigation Goal Standard
- Corporate Value China (Scope 3) Standard
- Policy and Action Standard
- Product Standard
- Project Protocol

Source: GHG protocol

Guidance (指引)

- Scope 2 Guidance
- Scope 3 Guidance
- Agriculture guidance
- Estimating and Reporting Avoided Emissions
- Public Sector Protocol
- Potential Emissions from Fossil Fuel Reserves
- The Global GHG Accounting and Reporting Standard Financial Industry
- Land Sector and Removals
- GPC Supplemental Guidance for Forests and Trees

Source: GHG protocol



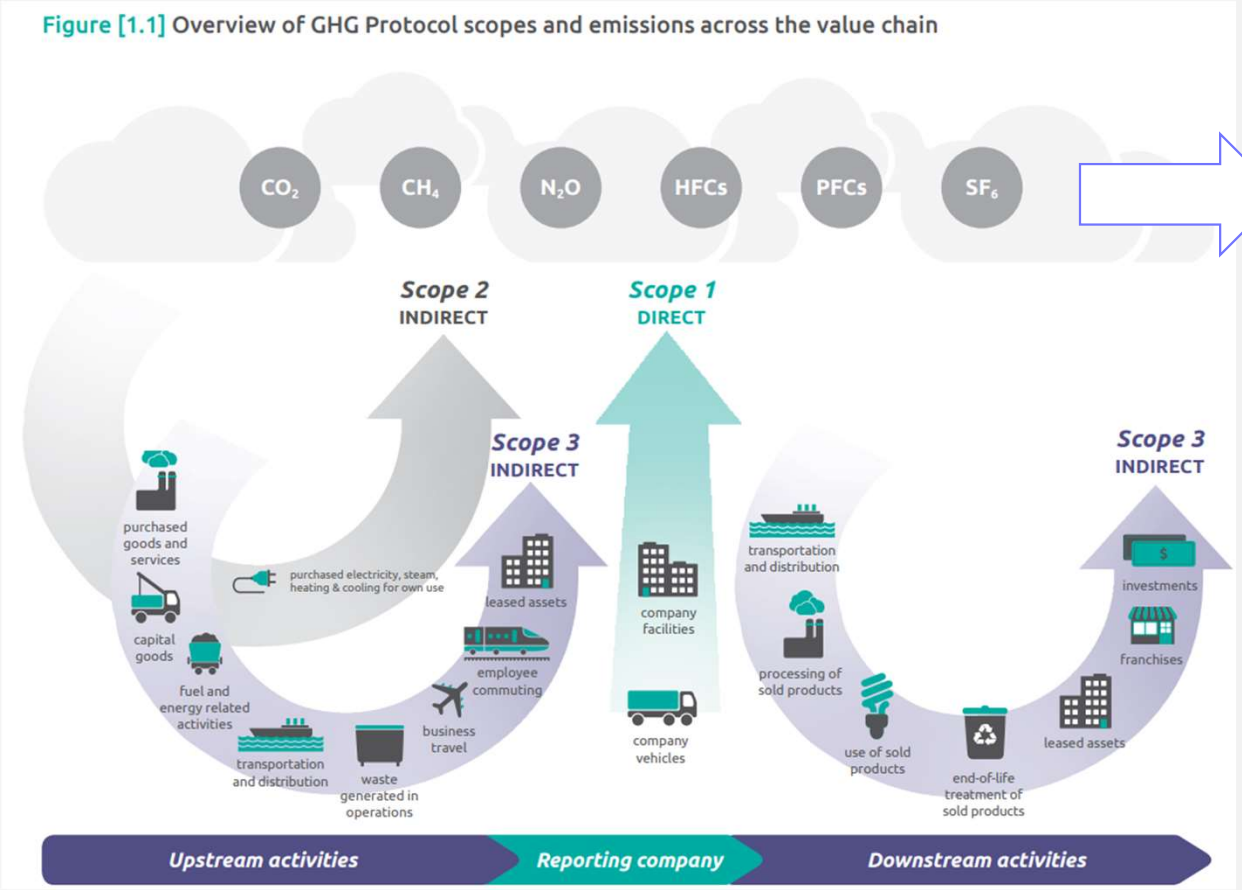
In addition to principle specifications, GHG Protocol also provides quantitative case descriptions and calculation tools, such as:

- Cross-sector tools
- Country-specific tools
- Sector-specific tools
- Tools for countries and cities

Source: GHG protocol

THE WHOLE ORGANISATIONAL FOOTPRINT

Figure [1.1] Overview of GHG Protocol scopes and emissions across the value chain



6 types?

Where is NF_3

Source: GHG Protocol

THE WHOLE ORGANIZATIONAL/PRODUCT FOOTPRINT

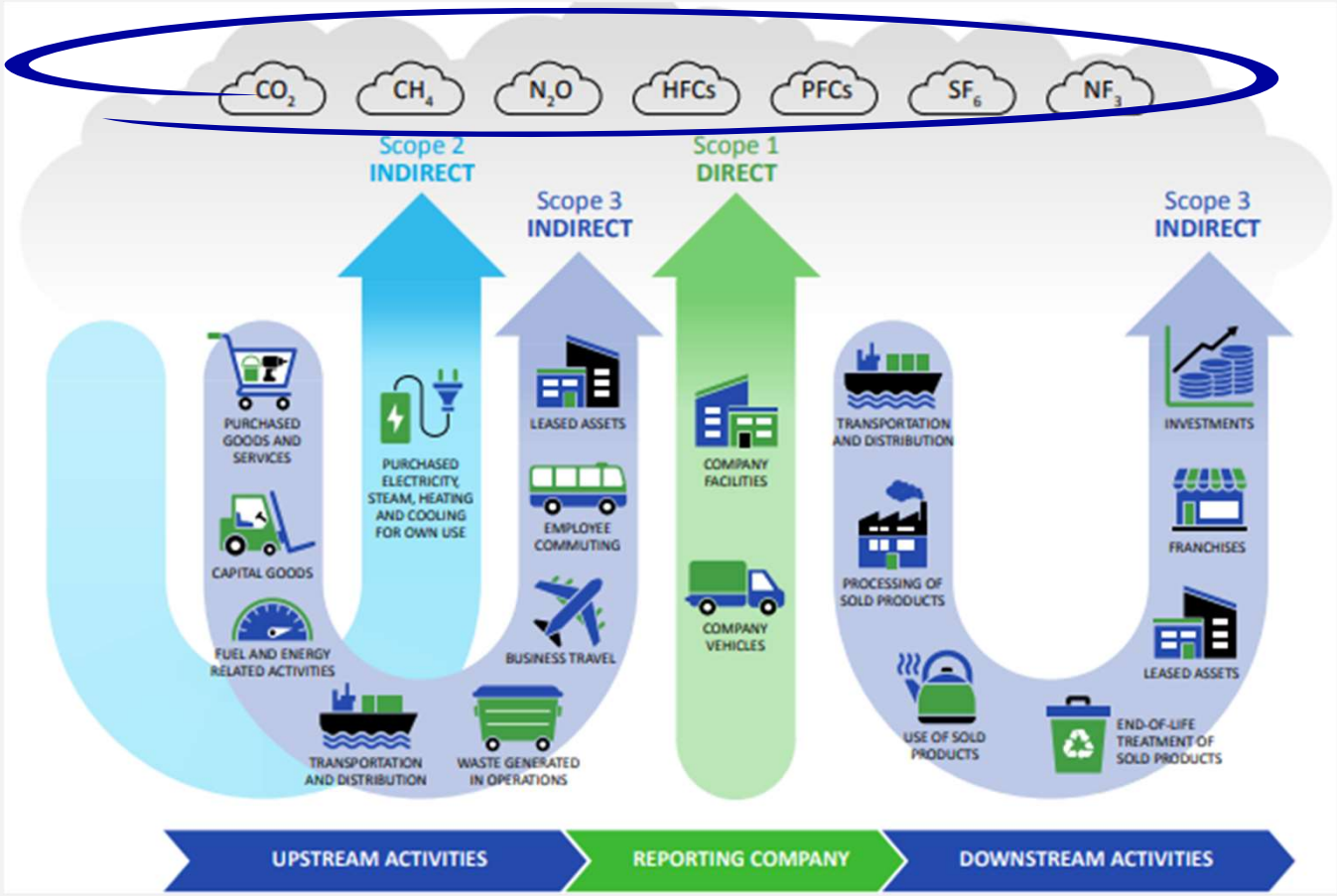
1. *Why is the Greenhouse Gas Protocol issuing this Amendment?*

National reporting guidelines under the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol require that specific GHGs be included in national GHG emissions inventories. To remain consistent with national inventory practices, the Greenhouse Gas Protocol (GHG Protocol) requires that these same GHGs also be reported in corporate and product life cycle GHG emissions inventories. Originally, the requirements of the UNFCCC/Kyoto Protocol, and therefore of the GHG Protocol, were limited to a set of six individual GHGs or classes of GHGs. However, changes to international accounting and reporting rules under the UNFCCC/Kyoto Protocol now also require the reporting of another GHG, NF_3. Existing GHG Protocol Standards need to be updated to reflect this change and to accommodate any further changes that may occur to the UNFCCC/Kyoto Protocol's list of required GHGs. In addition, GHG Protocol Standards have varying specifications on the selection of GWP values. This Amendment has been issued to more closely align corporate accounting practices with national inventory practices and to ensure consistent requirements across all GHG Protocol standards.

Product Standard	p14; Chapter 3 – Summary of Steps and Requirements p27; Chapter 6 – Establishing the Scope of a Product Inventory	Requirements: • Companies shall account for ~~carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs)~~ emissions to, and removals from, the atmosphere **of carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6), and nitrogen triflouride (NF_3)** • Additional GHGs included in the inventory shall be listed in the inventory report.
	p27; Chapter 6 – Establishing the Scope of a Product Inventory	Requirements: Companies shall account for ~~these six~~ **seven** gases in their product GHG inventory if they are emitted during the product's life cycle. Companies should account for any other GHGs whose 100-year GWP values have been identified by the IPCC if they are emitted during the product's life cycle. Any additional GHGs that are accounted for shall be listed in the inventory report to improve transparency.

Source: GHG Protocol

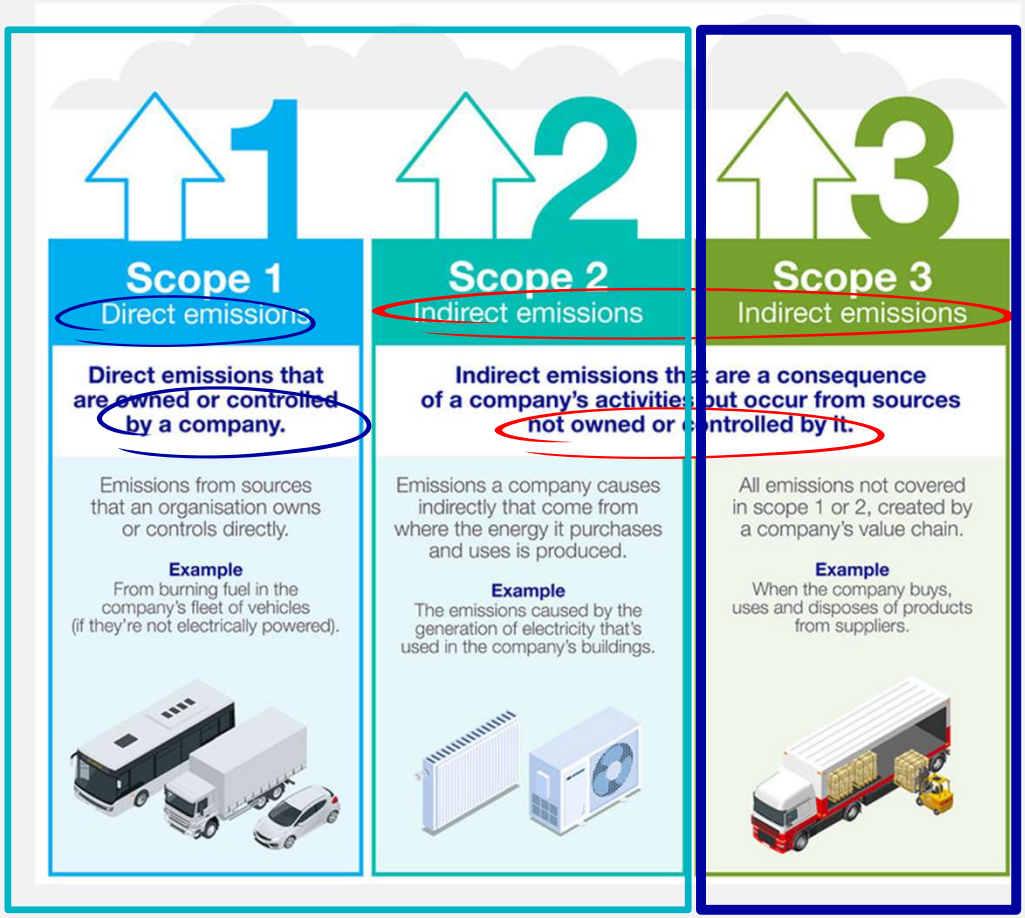
THE WHOLE ORGANISATIONAL FOOTPRINT



Source: EDRA, GHIN

THE WHOLE ORGANISATIONAL FOOTPRINT

Your operation



Your value chain

Source: National Grid

15 CATEGORY OF

Scope 3 Emissions

Upstream category 上游的範圍三排放	Category description 內容描述	Minimum boundary 最低邊界要求
1. Purchased goods and services 商品和服務的採購	Extraction, production, and transportation of goods and services purchased or	All upstream (cradle-to-gate) emissions of purchased goods and services
2. Capital goods 資本貨物	Extraction, production, and transportation of capital goods purchased or acquired	All upstream (cradle-to-gate) emissions of purchased capital goods
3. Fuel-and energy-related activities (not included in scope 1 and scope 2) 燃料和能源相關活動（不包括在範圍1或範圍2中）資本貨物	Extraction, production, and transportation of fuels and energy purchased or acquired by the reporting company in the reporting year, not already accounted for in scope 1 or scope 2：	
	a) Upstream emissions of purchased fuels (extraction, production, and transportation of fuels consumed by the reporting company)	a) For upstream emissions of purchased fuels: All upstream (cradle-to-gate) emissions of purchased fuels (from raw material extraction up to the point of, but excluding combustion)
	b) Upstream emissions of purchased electricity (extraction, production, and transportation of fuels consumed in the generation of electricity, steam, heating, and cooling consumed by the reporting company)	b) For upstream emissions of purchased electricity: All upstream (cradle-to-gate) emissions of purchased fuels (from raw material extraction up to the point of, but excluding, combustion by a power generator)
	c) Transmission and distribution (T&D) losses (generation of electricity, steam, heating and cooling that is consumed (i.e., lost) in a T&D system) – reported by end user	c) For T&D losses: All upstream (cradle-to-gate) emissions of energy consumed in a T&D system, including emissions from combustion
	d) Generation of purchased electricity that is sold to end users (generation of electricity, steam, heating, and cooling that is purchased by the reporting company and sold to end users) – reported by utility company or energy retailer only	d) For generation of purchased electricity that is sold to end users: Emissions from the generation of purchased energy

Source: GHG Protocol Scope 3 Guidance

15 CATEGORY OF

Scope 3 Emissions

Upstream category 上游的範圍三排放	Category description 內容描述	Minimum boundary 最低邊界要求
4. Upstream transportation and distribution 上游運輸和配送 	Transportation and distribution of products purchased by the reporting company in the reporting year between a company's tier 1 suppliers and its own operations (in vehicles and facilities not owned or controlled by the reporting company)	The scope 1 and scope 2 emissions of transportation and distribution providers that occur during use of vehicles and facilities (e.g., from energy use)
	Transportation and distribution services purchased by the reporting company in the reporting year, including inbound logistics, outbound logistics (e.g., of sold products), and transportation and distribution between a company's own facilities (in vehicles and facilities not owned or controlled by the reporting company)	**Optional**：The life cycle emissions associated with manufacturing vehicles, facilities, or infrastructure
5. Waste generated in operations 運營中產生的廢物 	Disposal and treatment of waste generated in the reporting company's operations in the reporting year (in facilities not owned or controlled by the reporting company)	The scope 1 and scope 2 emissions of waste management suppliers that occur during disposal or treatment
		Optional：Emissions from transportation of waste

Source: GHG Protocol Scope 3 Guidance

15 CATEGORY OF

Scope 3 Emissions

Upstream category 上游的範圍三排放	Category description 內容描述	Minimum boundary 最低邊界要求
6. Business Travel 商務差旅 	Transportation of employees for business-related activities during the reporting year (in vehicles not owned or operated by the reporting company)	The scope 1 and scope 2 emissions of transportation carriers that occur during use of vehicles (e.g., from energy use) **Optional**：The life cycle emissions associated with manufacturing vehicles or infrastructure
7. Employee commuting 員工通勤 	Transportation of employees between their homes and their worksites during the reporting year (in vehicles not owned or operated by the reporting company)	The scope 1 and scope 2 emissions of employees and transportation providers that occur during use of vehicles (e.g., from energy use) **Optional**：Emissions from employee teleworking
8. Upstream leased assets 上游租賃資產 	Operation of assets leased by the reporting company (lessee) in the reporting year and not included in scope 1 and scope 2 – reported by lessee	The scope 1 and scope 2 emissions of lessors that occur during the reporting company's operation of leased assets (e.g., from energy use) **Optional**：The life cycle emissions associated with manufacturing or constructing leased assets

Source: GHG Protocol Scope 3 Guidance

15 CATEGORY OF

Scope 3 Emissions

Downstream category 下游的範圍三排放	Category description 內容描述	Minimum boundary 最低邊界要求
9. Downstream transportation and distribution 下游運輸和配送 	Transportation and distribution of products sold by the reporting company in the reporting year between the reporting company's operations and the end consumer (if not paid for by the reporting company), including retail and storage (in vehicles and facilities not owned or controlled by the reporting company)	The scope 1 and scope 2 emissions of transportation providers, distributors, and retailers that occur during use of vehicles and facilities (e.g., from energy use) **Optional**：The life cycle emissions associated with manufacturing vehicles, facilities, or infrastructure
10. Processing of sold products 銷售產品的加工 	Processing of intermediate products sold in the reporting year by downstream companies (e.g., manufacturers)	The scope 1 and scope 2 emissions of downstream companies that occur during processing (e.g., from energy use)
11. Use of sold products 銷售產品的使用 	End use of goods and services sold by the reporting company in the reporting year	The direct use-phase emissions of sold products over their expected lifetime (i.e., the scope 1 and scope 2 emissions of end users that occur from the use of: products that directly consume energy (fuels or electricity) during use; fuels and feedstocks; and GHGs and products that contain or form GHGs that are emitted during use) **Optional**：The indirect use-phase emissions of sold products over their expected lifetime (i.e., emissions from the use of products that indirectly consume energy (fuels or electricity) during use)

Source: GHG Protocol Scope 3 Guidance

15 CATEGORY OF

Scope 3 Emissions

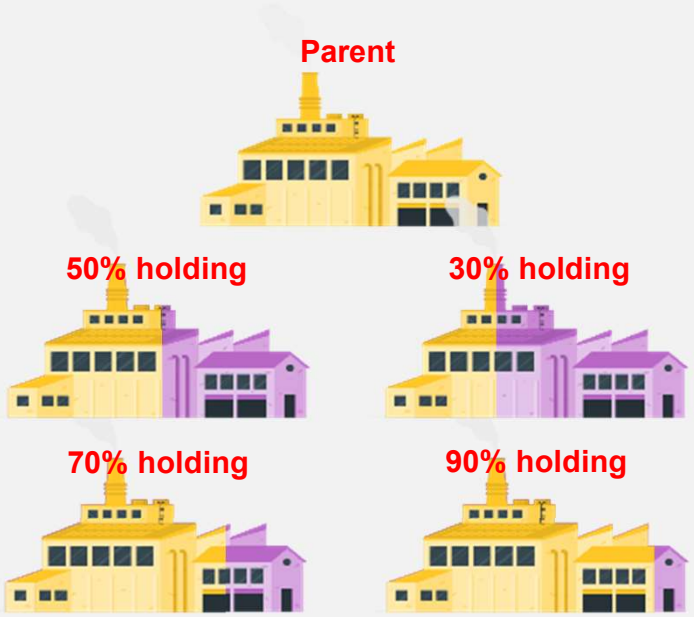
Downstream category 下游的範圍三排放	Category description 內容描述	Minimum boundary 最低邊界要求
12. End-of-life treatment of sold products 已售出產品的報廢處理 	Waste disposal and treatment of products sold by the reporting company (in the reporting year) at the end of their life	The scope 1 and scope 2 emissions of waste management companies that occur during disposal or treatment of sold products
13. Downstream leased assets 下游租賃資產 	Operation of assets owned by the reporting company (lessor) and leased to other entities in the reporting year, not included in scope 1 and scope 2 – reported by lessor	The scope 1 and scope 2 emissions of lessees that occur during operation of leased assets (e.g., from energy use). **Optional**：The life cycle emissions associated with manufacturing or constructing leased assets
14. Franchises 特許經營 	Operation of franchises in the reporting year, not included in scope 1 and scope 2 – reported by franchisor	The scope 1 and scope 2 emissions of franchisees that occur during operation of franchises (e.g., from energy use) **Optional**：The life cycle emissions associated with manufacturing or constructing franchises
15. Investments 投资 	Operation of investments (including equity and debt investments and project finance) in the reporting year, not included in scope 1 or scope 2	See the description of category 15 (Investments) in section 5.5 for the required and optional boundaries

Source: GHG Protocol Scope 3 Guidance

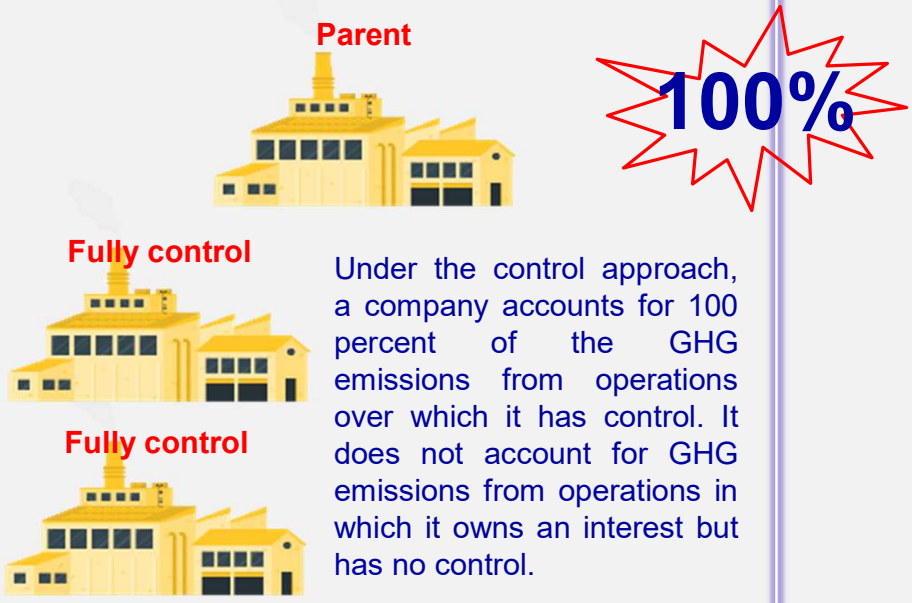
BOUNDARY

of measuring GHG

Based on Shareholding



Based on Control (Financial Control or Operational Control)



Under the control approach, a company accounts for 100 percent of the GHG emissions from operations over which it has control. It does not account for GHG emissions from operations in which it owns an interest but has no control.

Source: GHG protocol

CASE STUDY

Boundary of measuring GHG

Source: Swire Pacific

Boundaries and scoping

Swire Pacific uses the operational control consolidation approach in the reporting of its sustainability performance. ***Appendix I*** contains (I) a list of companies and parts of companies which are covered in the 2024 Swire Pacific Annual Report and Sustainability Report, (ii) a list of companies and parts of companies which have not provided information for the 2024 Swire Pacific Annual Report and Sustainability Report and (iii) changes in scope compared with 2023. For businesses where the Group exercises operational control, performance indicators are reported on a 100% basis and are not adjusted to reflect the proportion of Swire Pacific's shareholdings.

The selected sustainability data in the Group's report for the year ending 31 December 2024 relates to companies and operations listed below:

- Swire Properties Limited
- Hong Kong Aircraft Engineering Company Limited
- Taikoo (Xiamen) Aircraft Engineering Company Limite
- Taikoo (Xiamen) Landing Gear Services Company Limi
- Taikoo Engine Services (Xiamen) Company Limited
- HAECO Composite Structures (Jinjiang) Co. Ltd.
- HAECO Americas
- HAECO Component Overhaul (Xiamen) Limited
- HAECO Component Overhaul (Hong Kong)
- HAECO Global Engine Support
- Swire Coca-Cola Limited[4]
- Swire Resources Group
- Taikoo Motors Group
- Chongqing New Qinyuan Bakery

The scope 3 emissions data in the Group's report for the year ending 31 December 2024 relates to companies listed below:

Cathay Pacific group	Other OPCOs
• AHK Air Hong Kong Limited • Airline Property Limited • Airline Stores Property Limited • Airline Training Property Limited • Asia Miles Limited • Cathay Holidays Limited • Cathay Pacific Aircraft Leasing (H.K.) Limited • Cathay Pacific Aircraft Services Limited • Cathay Pacific Airways Limited • Cathay Pacific Catering Services (H.K.) Limited • Cathay Pacific Finance Limited • Cathay Pacific Finance III Limited • Cathay Pacific MTN Financing (HK) Limited • Cathay Pacific Services Limited • Connaught Network Services Private Limited • Guangzhou Guo Tai Information Processing Company Limited • Hong Kong Airport Services Limited • Hong Kong Aviation and Airport Services Limited • Hong Kong Express Airways Limited • Troon Limited	• Chongqing New Qinyuan Bakery • Hong Kong Aero Engine Services Limited • Hong Kong Aircraft Engineering Company • Swire Coca-Cola Limited • Swire Properties Limited • Swire Resources Limited • Swire Waste Management Limited • Taikoo Motors Group • Taikoo Sugar Limited

Source: Swire Pacific

Overview

This is our 18th annual sustainability report. It was published in April 2025 and covers the financial year from 1st January to 31st December 2024. We aim to provide an accurate and balanced account of the Group's performance and progress in material areas of sustainability.

This report focuses on the five areas of SwireTHRIVE – Climate, Waste, Water, People and Communities – as these are the Group's strategic sustainability priorities. We also deal with matters which are important to stakeholders, required for compliance with regulations or which rating agencies expect us to address (see Other ESG disclosures).

This report deals with the Group as a whole. We also highlight information about individual subsidiaries. Some subsidiaries produce their own sustainability reports. They can be found on our corporate website. The report is available in English and traditional Chinese. It can be viewed online or downloaded as a PDF from the report website. Performance data can be downloaded as a CSV file.

This report has been approved by our Board.

Report boundary

We exclude companies from our report boundary which we do not control. The principal effect of this is to exclude Cathay Pacific, which we do not control because it is an associate. Cathay Pacific has its own board of directors, who are responsible for ESG related matters. Hong Kong Aero Engine Services Limited (HAESL), a joint venture between Rolls-Royce plc (50%) and HAECO (50%) is also excluded, as we do not have sole control. Cathay Pacific and HAESL publish their own sustainability reports, which can be accessed via their corporate websites.

We have restated past data to exclude data relating to Cathay Pacific and HAESL for comparative purposes. As recommended in the GHG Protocol's Corporate Value Chain (scope 3) Accounting & Reporting Standard, we have included a proportion of Cathay Pacific's carbon emissions under the Group's scope 3 (category 15) emissions given their materiality and their interest to readers of this report. The proportion is 44.985%, which is the same as our percentage ordinary shareholding interest in Cathay Pacific.

The report continues to cover subsidiaries of Swire Pacific. Performance data (except as indicated above in respect of Cathay Pacific's carbon emissions) is reported on a 100% basis and has not been proportioned to reflect Swire Pacific's shareholdings in subsidiaries. We do not include newly acquired entities until we have a full calendar year's data from them and a review of their data and internal controls is complete. Swire Properties' commercial buildings are included after each property development has opened and reached a significant level of occupancy.

GHG METRICS – ABSOLUTE AND RELATIVE EMISSIONS

Greenhouse Gas (GHG) Emissions

Year ended December 31,	2021	2022	2023
REDUCE OUR ABSOLUTE EMISSIONS BY 25% BY 2030 AGAINST A 2015 BASELINE (the Coca-Cola system)		6%[1]	**8%**
GHG EMISSIONS (the Coca-Cola system)			
Direct, from manufacturing sites (metric tons) (in millions)	1.61	1.65	**1.61**
Indirect, from electricity purchased and consumed (without energy trading) at manufacturing sites (metric tons) (in millions)	3.88	3.91	**4.01**
Indirect, from electricity purchased and consumed (without energy trading) at manufacturing sites (using GHG Protocol market-based method)[2] (metric tons) (in millions)	3.56	3.33	**3.34**
Total GHG Manufacturing (Scopes 1, 2 and 3), Location-based method (metric tons) (in millions)	5.49	5.56	**5.62**
Total, from manufacturing sites (using GHG Protocol market-based method)[3] (in millions)	5.18	4.97	**4.95**
Emissions Ratio (gCO_2 /L)	33.33	28.85	**28.31**
Reported Manufacturing Emissions in CDP (MT CO_2e)[3, 4] (the Coca-Cola system)			
Scope 1 – Direct Manufacturing per CDP C7.3c	325,833	304,144	**292,106**
Scope 2 – Indirect Manufacturing, Location-based method per CDP C6.3	869,832	890,400	**844,848**
Scope 3 – Franchise Emissions from Manufacturing Energy, Location-based method per CDP C6.5	4,299,247	4,363,071	**4,484,403**
Total GHG Manufacturing (Scopes 1, 2 and 3), Location-based method per CDP	5,494,912	5,557,615[5]	**5,621,357**
Total GHG Manufacturing (Scopes 1, 2 and 3), Location-based method per CDP (in millions)	5.49	5.56	**5.62**
ENERGY USE			
Total Energy Use (megajoules) (in millions) (the Coca-Cola system)	63,735.8	65,389	**66,803**
(The Coca-Cola Company)	12,731.5	10,680	**15,477**
Percentage renewable (electricity) (the Coca-Cola system)	12%	21%	**24%**
Energy Use Ratio (megajoules per liter of product) (the Coca-Cola system)	0.39	0.38	**0.38**
(The Coca-Cola Company)	0.61	0.57	**0.69**
HFC-FREE COOLERS (the Coca-Cola system)			
Number of pieces of HFC-free refrigeration equipment placed	803,602	1,070,739	**1,240,280**
Percentage of all coolers introduced in year that are HFC-free	87%	88%	**97%**

Absolute emissions

Relative emissions >> choose the relevant unit to represent your products and services

1 Improvements in the 2023 data reporting process and calculation methodologies have led to increased accuracy and completeness of GHG emissions across scopes 1, 2 and 3. To maintain meaningful emissions data comparisons over time, we have updated our 2015 base year emissions and 2022 reported emissions in line with these improvements. The 2022 emissions reduction was previously reported as 7% and has been restated as 6%.
2 This metric accounts for renewable electricity use.
3 The GHG emissions reported in the Environmental Update represent the Coca-Cola system's manufacturing emissions, which include emissions from activities which are under the company's operational control and activities that are related to Coca-Cola brands that are under direct control of independent bottlers. Our CDP reporting is aligned with an operational control approach as defined by the GHG Protocol, which includes only emissions from activities within The Coca-Cola Company's operational control as scope 1 and 2 emissions, while manufacturing emissions from independent bottlers are categorized as "scope 3- Franchises".
4 The below emissions figures will be reported in the company's forthcoming 2024 CDP Climate Change response.
5 Erroneously reported in the 2022 Business & Sustainability Report as 5,577,615. The correct 2022 result is 5,557,615.

Source: Coca Cola

GHG METRICS – ABSOLUTE AND RELATIVE EMISSIONS

Environmental KPIs	Unit	Ports and Related Services			Retail			Infrastructure			Telecommunications			Total		
		2021	2022	2023	2021[1]	2022[1]	2023	2021[2]	2022[2]	2023	2021	2022	2023	2021	2022	2023
GHG emissions																
Total scope 1 + 2 GHG emissions (location-based)	tonne CO_2e	771,365	754,453	**661,702**	588,081	538,731	**573,082**	9,012,393	8,587,495	**8,210,274**	511,675	539,470	**530,833**	10,883,514	10,420,149	**9,975,891**
Total scope 1 + 2 GHG emissions (market-based)	tonne CO_2e	743,631	691,412	**593,160**	536,340	496,578	**485,007**	8,308,058	8,038,737	**7,655,236**	573,503	498,566	**379,103**	10,161,532	9,725,293	**9,112,506**
Scope 1 GHG emissions	tonne CO_2e	415,755	405,829	**363,359**	134,150	122,003	**116,566**	7,488,261	7,327,908	**7,038,127**	16,867	16,482	**16,322**	8,055,033	7,872,222	**7,534,374**
Scope 2 GHG emissions (location-based)	tonne CO_2e	355,610	348,624	**298,343**	453,931	416,728	**456,516**	1,524,132	1,259,587	**1,172,147**	494,808	522,988	**514,511**	2,828,481	2,547,927	**2,441,517**
Scope 2 GHG emissions (market-based)	tonne CO_2e	327,876	285,583	**229,801**	402,190	374,575	**368,441**	819,797	710,829	**617,109**	556,636	482,084	**362,781**	2,106,499	1,853,071	**1,578,132**
Total scope 1 + 2 GHG emissions (location-based) intensity	tonne CO_2e/revenue HK$'000	0.019	0.018	**0.016**	0.005	0.004	**0.004**	0.174	0.173	**0.164**	0.005	0.006	**0.006**	0.034	0.035	**0.032**
Total scope 1 + 2 GHG emissions (market-based) intensity	tonne CO_2e/revenue HK$'000	0.018	0.017	**0.014**	0.004	0.004	**0.004**	0.160	0.162	**0.153**	0.006	0.006	**0.004**	0.032	0.032	**0.029**
Scope 1 GHG emissions intensity	tonne CO_2e/revenue HK$'000	0.010	0.010	**0.009**	0.001	0.001	**0.001**	0.145	0.148	**0.141**	0.000	0.000	**0.000**	0.026	0.026	**0.024**
Scope 2 GHG emissions (location-based) intensity	tonne CO_2e/revenue HK$'000	0.009	0.008	**0.007**	0.003	0.003	**0.003**	0.029	0.025	**0.023**	0.005	0.006	**0.006**	0.009	0.008	**0.008**
Scope 2 GHG emissions (market-based) intensity	tonne CO_2e/revenue HK$'000	0.008	0.007	**0.006**	0.003	0.003	**0.003**	0.016	0.014	**0.012**	0.006	0.006	**0.004**	0.007	0.006	**0.005**
Scope 3 GHG emissions	tonne CO_2e		472,710	**547,316**		9,698,665	**877,133**		776,370	**1,355,741**		1,799,509	**1,624,868**		12,747,254	**4,405,058**

For conglomerate, revenue may be an option

Source: CKH Holdings

THE GHG QUANTIFICATION METHODOLOGIES

Comparison

	Advantages	Tools	Notes
Direct Measurement	• Used for stationary combustion • Provide accurate emissions data without estimates or assumptions	• Gas Analysis Instrument (氣體分析儀器) • Flow Meter (流速計) • Exhaust Pipeline Monitoring Equipment (排氣管道監測設備) • Mass Flow Meter (質量流量計) • Gas Sampler (氣體採樣器)	• High cost and not suitable for all emission sources
Mass Balance Accounting	• Calculated by the transformation pricess of emission sources • Relatively accurate calculation	• Calculate GHG based on chemical formula	• Basic understanding of chemistry is required
Emission Factors & Activity Data	• Simple and fast • Less expensive	• Excel spreadsheet • Emission Factor database	• Emission Factors may be inaccurate • Different emission sources vary greatly • Applicable to those who lack actual monitoring data system

Break

Our decarbonisation solutions

SCAN ME

Link: BVCPS decarbonisation

03.

GHG Regulatory Disclosure

ESG DISCLOSURE

Pathway to ESG disclosure going mainstream

Source: International Finance Corporation

GHG DISCLOSURE – FOR ESG REPORT

IFRS S2
IFRS® Sustainability Disclosure Standard

Climate-related Disclosures

ISSB / TCFD

TCFD

The ISSB's proposed Exposure Draft S2 Climate-related Disclosures, built on the 11 TCFD recommendations. The ISSB requirements fall under the same 4 pillars of the TCFD.

Influences → ISSB

Nov 2021, COP26 announced launch of ISSB
Seeks to establish a global baseline for sustainability reporting. Applies the financial materiality concept.

Complements → GRI

Mar 2022, IFRS and GRI announced MoU
A collaboration agreement to coordinate their work programmes and standard-setting activities. GRI applies the impact materiality concept.

IFRS take over the monitoring responsibility for TCFD in 2024

IFRS

A not-for-profit, public interest organisation established to develop enforceable and globally accepted accounting and sustainability disclosure standards.

Consolidated → CDSB

Established → CDP

A not-for-profit organisation that runs a leading global framework for environmental reporting.

Consolidated → VALUE REPORTING FOUNDATION

Consolidated →
- SASB INSIDE
- IR INTEGRATED REPORTING

Aug 2022, IFRS Foundation assumed responsibility for SASB Standards
ISSB committed to building on the SASB Standards and embedding its industry-based approach to standards development.

Proposed sustainability/climate-related disclosures in sustainability reports

- ISSB is drafting their standards using the 4 pillars outline in TCFD for all sustainability material topics

Figure 2

Core Elements of Recommended Climate-Related Financial Disclosures

Governance
The organization's governance around climate-related risks and opportunities

Strategy
The actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning

Risk Management
The processes used by the organization to identify, assess, and manage climate-related risks

Metrics and Targets
The metrics and targets used to assess and manage relevant climate-related risks and opportunities

The Trustees of the IFRS Foundation announced the formation of ISSB on 3 November 2021 at COP26 in Glasgow, following strong market demand for its establishment.

GHG DISCLOSURE – FOR ESG REPORT (EU SPECIFIC)

Joint statement

Mapping

MoU

General	Environment	Social	Governance
ESRS 1 General Requirements	ESRS E1 Climate change	ESRS S1 Own workforce	ESRS G1 Business conduct
ESRS 2 General disclosures	ESRS E2 Pollution	ESRS S2 Workers in the value chain	
	ESRS E3 Water and marine resources	ESRS S3 Affected communities	
	ESRS E4 Biodiversity and ecosystems	ESRS S4 Consumers and end-users	
	ESRS E5 Resource use and circular economy		

OUR EU PARTNERS ARE INTERESTED

E1-3_03	E1	E1-3	29 b		Achieved GHG emission reductions	ghgEmissions	
E1-3_04	E1	E1-3	29 b		Expected GHG emission reductions	ghgEmissions	
E1-3_05	E1	E1-3	AR21		Explanation of extent to which ability to implement action depends on availability and allocation of resources.	narrative	
E1-3_06	E1	E1-3	29 c i	AR 20	Explanation of relationship of significant CapEx and OpEx required to implement actions taken or planned to relevant line	narrative/monetary	
E1-3_07	E1	E1-3	29 c ii,16 c	AR 22	Explanation of relationship of significant CapEx and OpEx required to implement actions taken or planned to key performan	narrative	
E1-3_08	E1	E1-3	29 c iii,16 c	AR 20	Explanation of relationship of significant CapEx and OpEx required to implement actions taken or planned to CapEx plan re	narrative	Conditional
E1-MDR-A_15-16	ESRS 2		32		Disclosure to be reported if the undertaking has not adopted actions		
E1-MDR-T_10-11	E1	E1-4	32		Tracking effectiveness of policies and actions through targets (see ESRS 2 MDR-T)	MDR-T	
E1-4_01	E1	E1-4	33	AR 27-AR 29	Disclosure of whether and how GHG emissions reduction targets and (or) any other targets have been set to manage mater	narrative	
E1-4_02	E1	E1-4	34 a + 34 b	AR 23-AR 26, AR 27-AR 29, AR31	Tables: Multiple Dimensions (baseline year and targets; GHG Types, Scope 3 Categories, Decarbonisation levers, entity-spe	Table	Conditional
E1-4_03	E1	E1-4	34 a + 34 b		[redacted]	Table/ghgEmissions	Conditional
E1-4_04	E1	E1-4	34 a + 34 b		Percentage of total Greenhouse gas emissions reduct[redacted] of base year)	Table/percent	Conditional
E1-4_05	E1	E1-4	34 a [redacted]		Intensity value of total Greenhouse gas emissions reduction	Table/decimal	Conditional
E1-4_06	E1	E1-4	[redacted]		Absolute value of Scope 1 Greenhouse gas emissions reduction	Table/ghgEmissions	Conditional
E1-4_07	E1	E1-4	34 a + 34 b		Percentage of Scope 1 Greenhouse gas emissions reduction (as of emissions of base year)	Table/percent	Conditional
E1-4_08	E1	E1	34 a + 34 b		Intensity value of Scope 1 Greenhouse gas emissions reduction	Table/decimal	Conditional
E1-4_09	E1		34 a + 34 b		Absolute value of location-based Scope 2 Greenhouse gas emissions reduction	Table/ghgEmissions	Conditional
E1-4_10	E1	E1-4	34 a + 34 b		Percentage of location-based Scope 2 Greenhouse gas emissions reduction (as of emissions of base year)	Table/percent	Conditional
E1-4_11	E1	E1-4	34 a + 34 b		Intensity value of location-based Scope 2 Greenhouse gas emissions reduction	Table/decimal	Conditional
E1-4_12	E1	E1-4	34 a + 34 b		Absolute value of market-based Scope 2 Greenhouse gas emissions reduction	Table/ghgEmissions	Conditional
E1-4_13	E1	E1-4	34 a + 34 b		Percentage of market-based Scope 2 Greenhouse gas emissions reduction (as of emissions of base year)	Table/percent	Conditional
E1-4_14	E1	E1-4	[redacted]		Intensity value of market-based Scope 2 Greenhouse gas emissions reduction	Table/decimal	Conditional
E1-4_15	E1	E1-4	34 a + 34 b		Absolute value of Scope 3 Greenhouse gas emissions reduction	Table/ghgEmissions	Conditional
E1-4_16	E1	E1-4	34 a + 34 b		Percentage of Scope 3 Greenhouse gas emissions reduction (as of emissions of base year)	Table/percent	Conditional
E1-4_17	E1	E1-4	34 a + 34 b		Intensity value of Scope 3 Greenhouse gas emissions reduction	Table/decimal	Conditional
E1-4_18	E1	E1-4	[redacted]		Explanation of how consistency of GHG emission reduction t[redacted]atory boundaries has been ensured.	narrative	
E1-4_19	E1	E1-4	34 c		Disclosure of base [redacted] and base year.	narrative	
E1-4_20	E1	E1-4	AR 25 a		Description of how it has been ensured that baseline value is representative in terms of activities covered and influences	narrative	
E1-4_21	E1	E1-4	AR 25 b		Description of how new baseline value affects new target, its achievement and presentation of progress over time.	narrative	
E1-4_22	E1	E1-4	34 e, 16 a	AR 26	GHG emission reduction target is science based and compatible with limiting global warming to one and half degrees Cels	semi-narrative	
E1-4_23	E1	E1-4	34 f, 16 b	AR 30	Description of expected decarbonisation levers and their overall quantitative contributions to achieve GHG emission reduc	narrative	
E1-4_24	E1	E1-4	AR 30 c		Diverse range of climate scenarios have been considered to detect relevant environmental, societal, technology, market an	narrative	

There are 12 topical ESRS in total:

ENVIRONMENT

E1: “Climate”

E2: “Pollution”

E3: “Water and marine resources”

E4: “Biodiversity and ecosystems”

E5: “Resource use and circular economy”

SOCIAL

S1: “Own workforce”

S2: “Workers in the value chain”

S3: “Affected communities”

S4: “Consumers and end users”

GOVERNANCE

S5: “Business conduct”

The topical ESRS have been released, in draft form, by EFRAG earlier in 2023. Even though they are to be subject to materiality assessments,

Source: EFRAG

ESG DISCLOSURE COMPARISON

Comparing US SEC, ESRS, and ISSB Climate Disclosures

Comparison Matrix	SEC Climate Disclosure	ESRS	IFRS S1 & S2
Jurisdiction	All publicly reporting companies under the SEC's jurisdiction in the United States except for Canadian issuers filing annual reports on Form 40-F, and asset-backed issuers.	All large companies in the EU subject to CSRD; listed companies on EU regulated markets except listed micro-enterprises.	ISSB Standards will be considered for adoption on a voluntary basis by individual jurisdictions.
Likely date of the first report	FY24 to FY26	First reports expected by 2025 FY24 to FY28	On or after 1 January 2024
Materiality	Investors	All stakeholders	Investors
Where to disclose	Financial statements and Annual report	Management report	Annual report
Scope	Climate only	2 Cross-cutting core principles and 10 thematic ESG areas (5 on ENV, 4 on SOC and 1 GOV)	Currently – 1 standard on General sustainability and 1 on climate-related disclosure. Broader coverage is anticipated in the future.
GHG Reporting	Scope 1 &2. Scope 3 if material or included in targets	Scope 1 &2. Scope 3 with a phased-in period	Scope 1, 2 and3. Scope 3 with possible 1 year relief period and guidance
Assurance Requirements	~~Accelerated Filers and Large~~ Accelerated Filers required to include attestation report for Scopes 1 and 2 emissions, phased in with limited assurance in the second and third years after the initial compliance. Beginning in the fourth year, attestation must be at a reasonable assurance level.	~~Limited assurance requirements~~ are expected within three years after implementation and reasonable assurance after six years.	Not required. It is however recommended, given that information is to be disclosed in a company's annual report.

Adapted from: WB and IFC, 2023, and The Evolution of Sustainability Disclosure: Comparing the 2022 SEC, ESRS, and ISSB

Note: **CSRD** = Corporate Sustainability Reporting Directive; **EFRAG** = European Financial Reporting Advisory Group; **ESG** = environmental, social, and governance; **ESRS** = European Sustainability Reporting Standards; **EU** = European Union; **FY** = Fiscal Year; **ISSB** = International Sustainability Standards Board; **SEC** = Security and Exchange Commission.

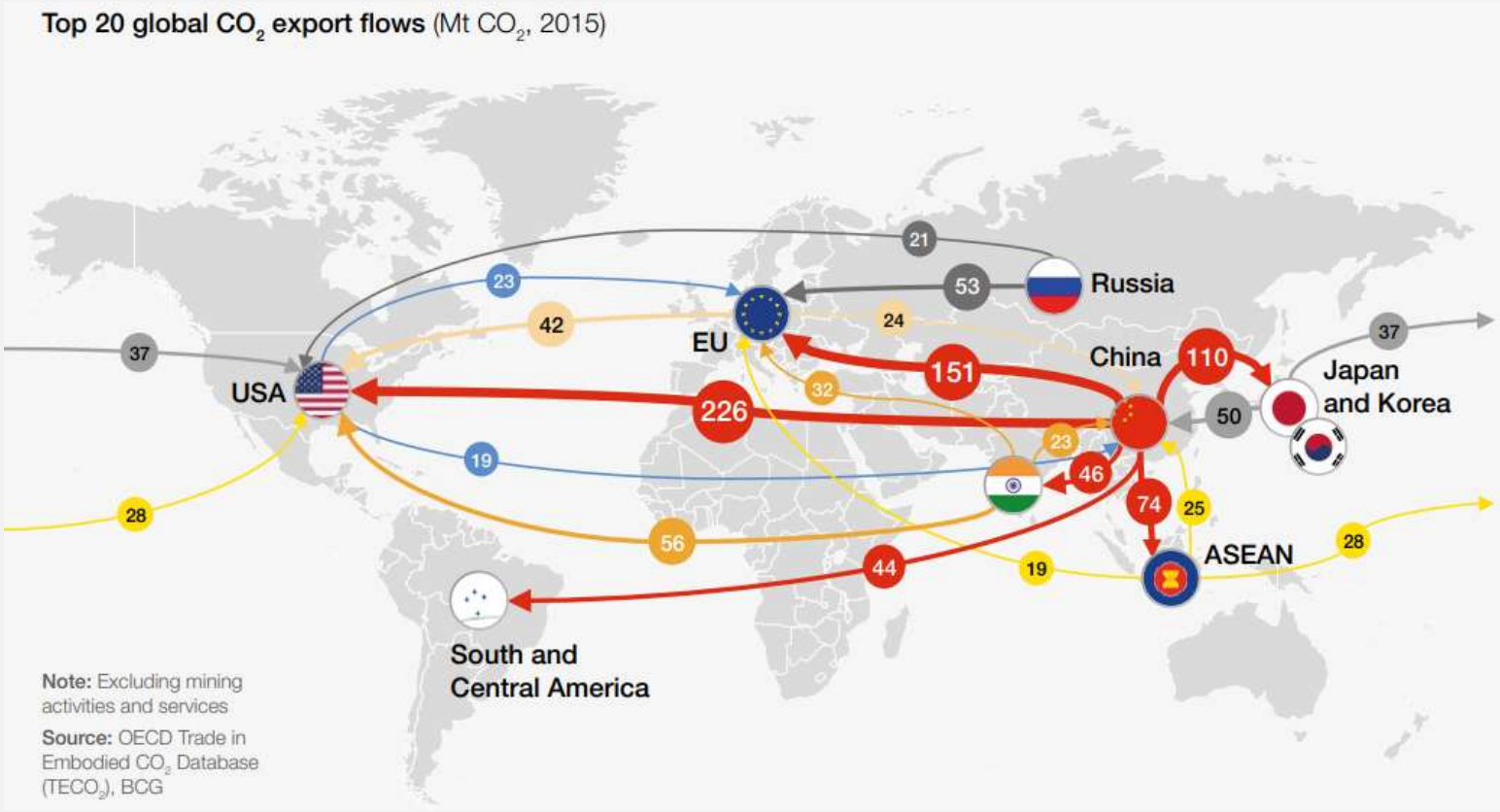
Comparison of Main Sustainability Disclosure Frameworks and Standards

	GRI	ESRS	ISSB	Consolidated into ISSB		
				Integrated Reporting Framework	SASB Standards	TCFD
Type of Guidance	Standards	Standards	Standards	Framework	Standards	Guidelines
Application	Voluntary	Mandatory for large companies and listed SMEs	Subject to national jurisdiction adoption	Voluntary	Voluntary	Voluntary
Coverage	Global	European Union (third countries in the future)	Global	Global	U.S., to be applicable globally	Global
Topics	Economic, environmental, and social activities and impacts	Environmental, social and governance	General Sustainability; Climate, Other topics to be added	Six capitals: financial, manufactured, intellectual, human, social, natural	Environment, social capital, human capital, business model & innovation, leadership & governance	Climate-related risks, opportunities, financial impacts, and scenario analysis
Sector Specific	No	Yes (forthcoming)	Yes	No	Yes	Yes
Target Audience	All stakeholders	All stakeholders	Investors	Providers of financial capital	Investors	Investors
Building Blocks		TCFD, GRI, CDP	TCFD, SASB, CDSB			
Materiality type	Impact materiality	Double-materiality (financial + impact materiality)	Single materiality (financial materiality)	Single materiality (financial materiality)	Single materiality (financial materiality)	Single materiality (financial materiality)
Materiality definition	Aspects that reflect the organization's significant economic, environmental, and social impacts; or that substantively influence the assessments and decisions of stakeholders	Impact on people or the environment and financial effects on undertaking over the short-, medium- and long-term time horizons.	Information is material if omitting, misstating or obscuring that information could reasonably be expected to influence decisions that the primary users of general-purpose financial reporting.	Matter that could substantively affect the organization's ability to create value in the short, medium, or long term.	A fact is material if there is a substantial likelihood that a reasonable investor would view its omission or misstatement as having significantly altered the total mix of information.	Public companies' legal obligation to disclose information in their financial filings—including material climate-related information.

Source: IFC, 2023.

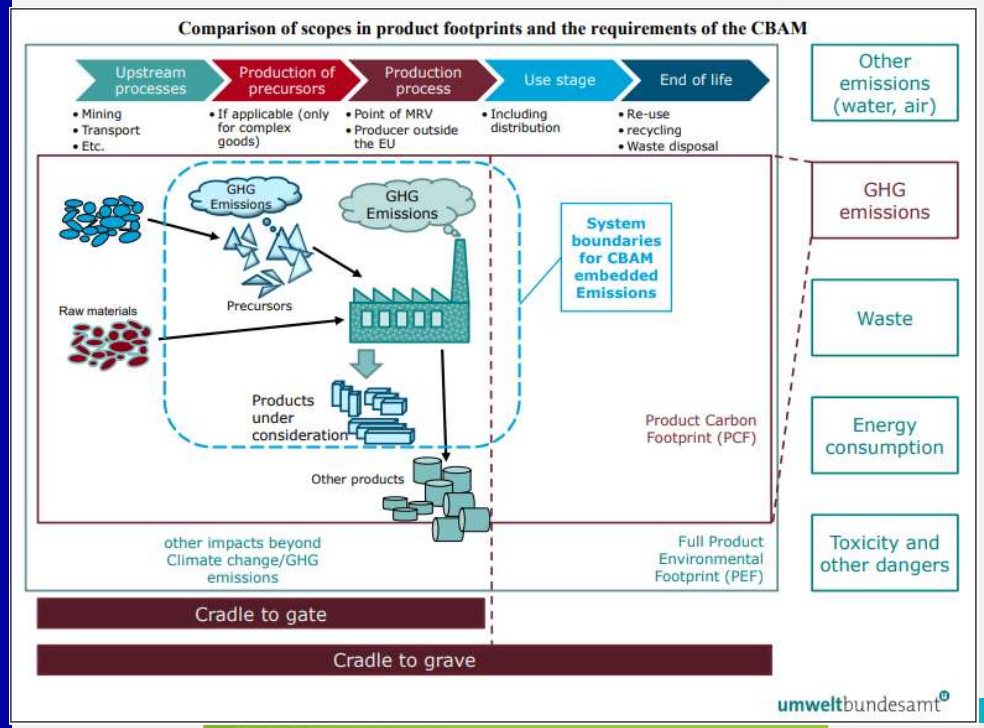
Source: International Finance Corporation

EMBODIED CO2 IN TRADE

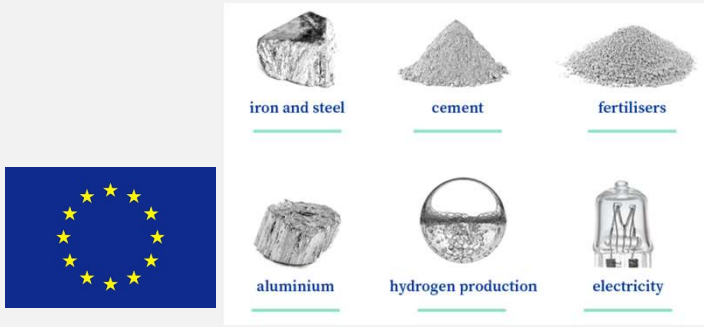


Source: World Economic Forum, Boston Consulting Group

THE EUROPEAN LAW - CBAM



Source: European Commission

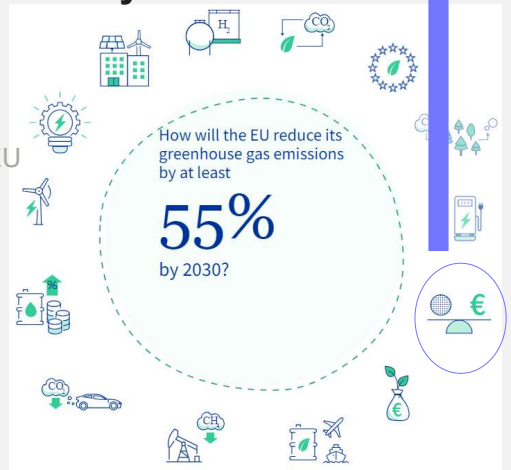


Gradually phasing out of free allowance in ETS for certain sectors in parallel with the introduction of CBAM

EU climate-neutral by 2050

To prevent carbon leakage

Carbon leakage – companies within the EU shift carbon-intensive production to countries with less stringent climate policies



2015
Paris Agreement

2019
European Green Deal

FIT FOR 55
EU's target of reducing net greenhouse gas emissions by at least 55% by 2030 compared to 1990

THE EUROPEAN LAW - CBAM

C. Sheet "C_Emissions&Energy" - Installation-level GHG emissions and energy consumption

1 Fuel balance

Please enter in the table below the amount of energy consumed for each use type:

- Fuel input to all CBAM production processes (including precursors produced within the installation), either directly or via the production of measurable heat (e.g. steam) with the exception of fuel for electricity.
- Fuel input for electricity production
- Fuel input to all non-CBAM production processes, either directly or via the production of measurable heat (e.g. steam).

	Fuel balance:	Unit	Total fuel input	Direct fuel for CBAM goods	Fuel for electricity	Direct fuel for non-CBAM goods	Rest
i.	from sheet "B_EmInst"	TJ	0.00				
ii.	manual entries	TJ					
iii.	**Results:**	TJ	**0.00**				**0.00**

2 Greenhouse gas emissions balance & information on data quality

(a) GHG balance by type of GHG

Values below are taken automatically from entries in sheet "B_EmInst". If entries made in that sheet are incomplete, please enter the total emissions figures manually under ii. to override automatic results displayed under i.

	Installation level data:	Unit	Total CO2 emissions	Biomass emissions	Total N2O emissions	Total PFC emissions	Total direct emissions	Total indirect emissions	Total emissions
i.	from sheet "B_EmInst"	tCO2e	7,387,178	28,069	0	0	7,387,178		
ii.	manual entries	tCO2e						977,059	
iii.	**Results:**	tCO2e	**7,387,178**	**28,069**	**0**	**0**	**7,387,178**	**977,059**	**8,364,237**

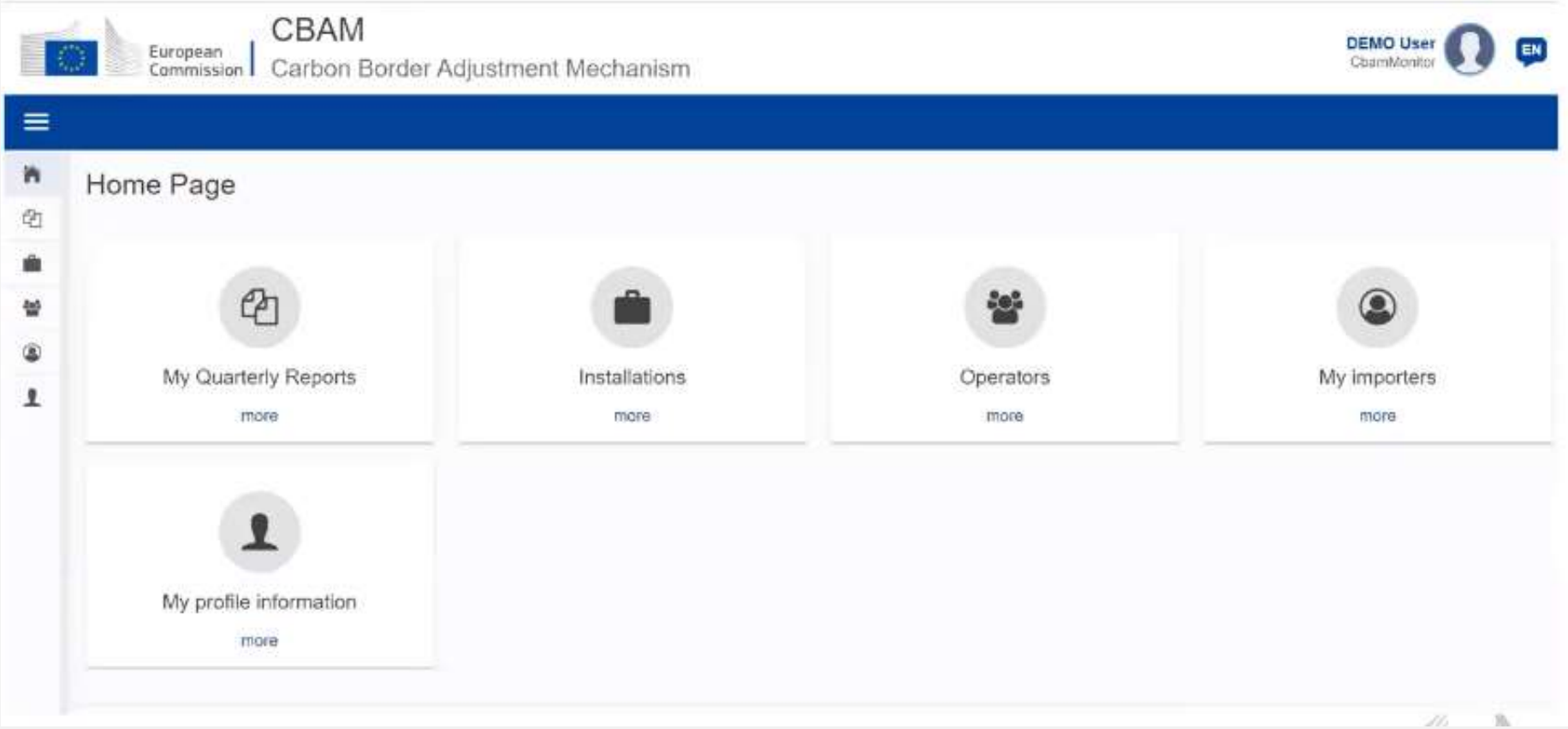
(b) GHG balance by type of monitoring methodology

Values below are taken automatically from entries in sheet "B_EmInst" and point (a) above.

	Unit	Calculation - based (excl. PFC	Total PFC emissions	Measurement - based	Other
Emissions	tCO2e	**7,387,178**	**0**	**0**	**0**

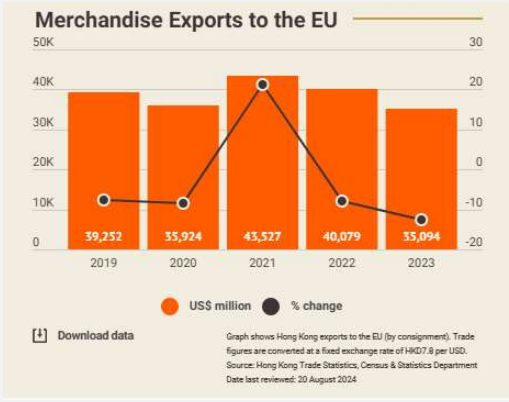
Source: CBAM Communication Template

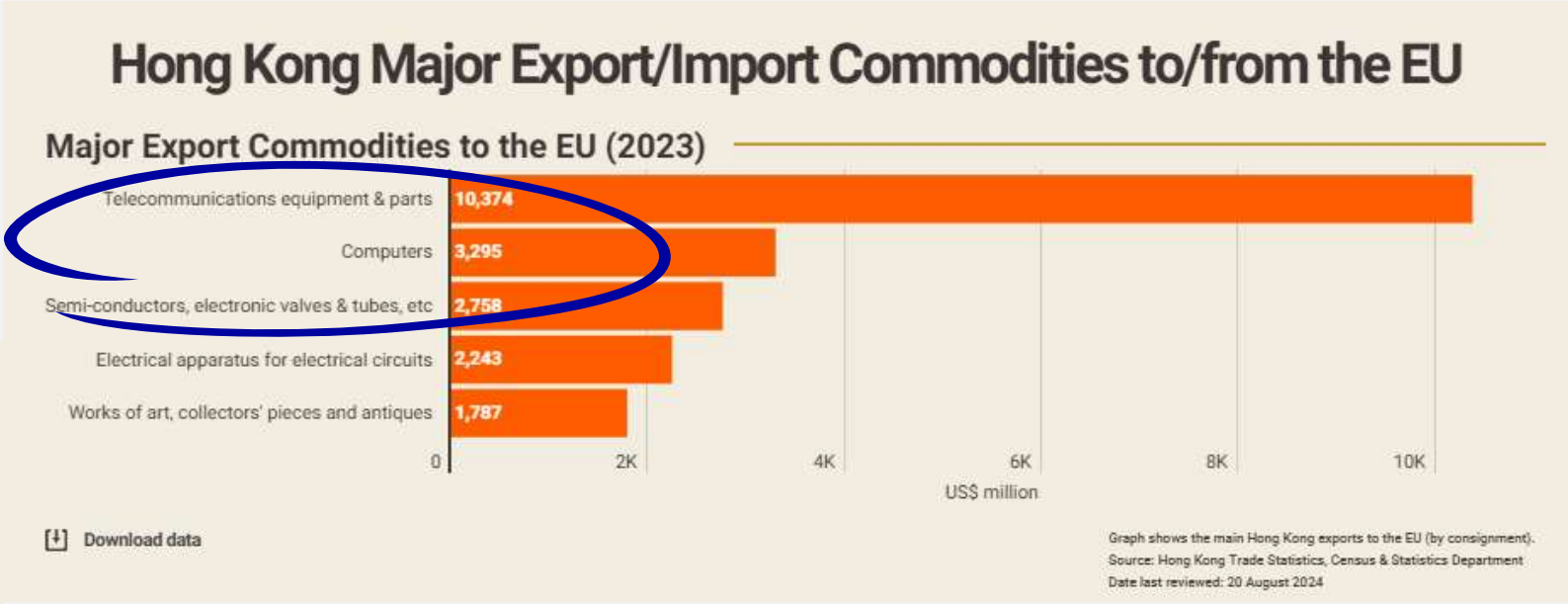
THE EUROPEAN LAW - CBAM



Source: European Commission

EU CBAM - HONG KONG SITUATION





Source: HKTDC

THE LOCAL LAW - TURKEY

Regulation on "Monitoring of Greenhouse Gases Emissions" went into force on May 17, 2014 with the publication of 29003 numbered official gazette. Following some amendments on several articles, the regulation has been revised and republished on May 31, 2017 on 30082 numbered official gazette.

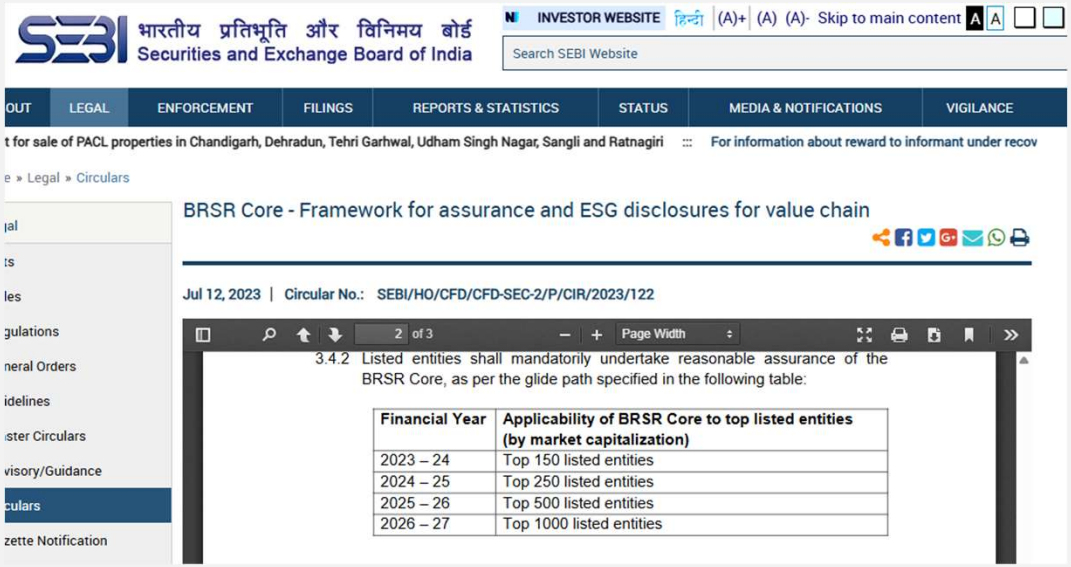
Obligations on monitoring and reporting of the regulation on "Communique of Monitoring and Reporting Greenhouse Gas Emissions" came into force on July 22, 2014 and has been published with 29068 numbered official gazette. This communiqué was revised and published in the Official Gazette dated February 5, 2021 and numbered 31386.

Energy and industrial sectors are subject to annual monitoring, reporting and **verification** processes.

Source: Carbon Turkey

After this legislation, "Communique on Verification of Greenhouse Gas Emission Reports and Authorization of Verifiers" also came into force on April 02, 2015 with the publication of 29314 numbered official gazette. This Communique from 02.04.2015 was repealed on 02.12.2017 and instead, the "Communique on Verification of Greenhouse Gas Emissions and Accreditation of Verifiers" went into force with 30258 numbered official gazette. This communiqué was revised and published in the Official Gazette dated June 21, 2022 and numbered 31873. The same communiqué was revised again on 12.09.2024 and the revision was published in the Official Gazette numbered 32660.

THE LOCAL LAW - INDIA



Source: Securities and Exchange Board India

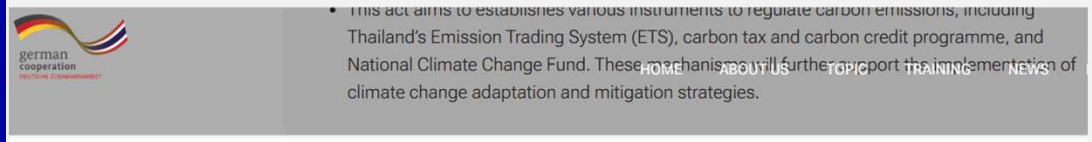
Top 1,000 listed Indian companies to provide and highlight quantitative metrics on **sustainability-related factors including emissions, energy, and waste**

Annexure I - Format of BRSR Core

Sr. No.	Attribute	Parameter	Measurement	Data & Assurance Approach	Cross – reference to the BRSR
1	Green-house gas (GHG) footprint *Greenhouse gas emissions may be measured in accordance with the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard*	Total Scope 1 emissions (Break-up of the GHG into CO2, CH4, N2O, HFCs, PFCs, SF6, NF3, if available)	GHG (CO_2e) Emission in Mn MT / KT / MT Direct emissions from organization's owned- or controlled sources	1. Absolute Fossil Fuel (Coal, Natural Gas, Diesel, FO etc.) Consumption (Mn MT / KT / MT / MM BTU etc.) 2. Emission Factor (GHG in CO_2e / Unit of Measure) - IPCC or Actual Testing from Accredited Test Lab 3. Quantity of Carbon Capture (Mn MT / KT / MT) 4. GHG emissions in CO2 equivalent by process (Non-Fuel Source) (Mn MT / KT / MT / MM BTU) 5. Fugitive emissions 6. Total Scope 1 GHG Emissions: Point 2 x Point 1 - Point 3 + Point 4 + Point 5	Principle 6, Question 7 of Essential Indicators
		Total Scope 2 emissions (Break-up of the GHG (CO_2e) into CO2, CH4, N2O, HFCs, PFCs, SF6, NF3, if available)	GHG (CO_2e) Emission in Mn MT / KT / MT Indirect emissions from the generation of energy that is purchased from a utility provider	1. Total Consumption of Purchased Energy (MW), Steam (MT), Refrigeration (MMBTU) 2. GHG (CO_2e) Emission Factor across all purchased energy sources - IPCC or actual from the supplier (audited certificates) 3. Total Scope 2 GHG Emissions: Total Consumption x Emission Factor	Principle 6, Question 7 of Essential Indicators

Source: Securities and Exchange Board India

THE LOCAL LAW - THAILAND



- This act aims to establishes various instruments to regulate carbon emissions, including Thailand's Emission Trading System (ETS), carbon tax and carbon credit programme, and National Climate Change Fund. These mechanisms will further support the implementation of climate change adaptation and mitigation strategies.

10 April 2024 – The Department of Climate Change and Environment (DCCE) with support from the Climate, Coastal and Marine Biodiversity (CCMB) project implemented by GIZ Thailand, is in the process of drafting Thailand's first climate legislation, namely the Climate Change Act. The draft Climate Change Act, consisting of 14 chapters, establishes various carbon pricing instruments, including Thailand's Emission Trading System (ETS), carbon tax and carbon credit, as well as the National Climate Change Fund. The draft Act also establishes mandates on climate adaptation, Green Taxonomy and mandatory greenhouse gas reporting, along with other components.

Source: GIZ Thailand

Require businesses and legal entities to **disclose their GHG emission data** in a standardised format

Chapter 6: GHG Information (Articles 43—65)

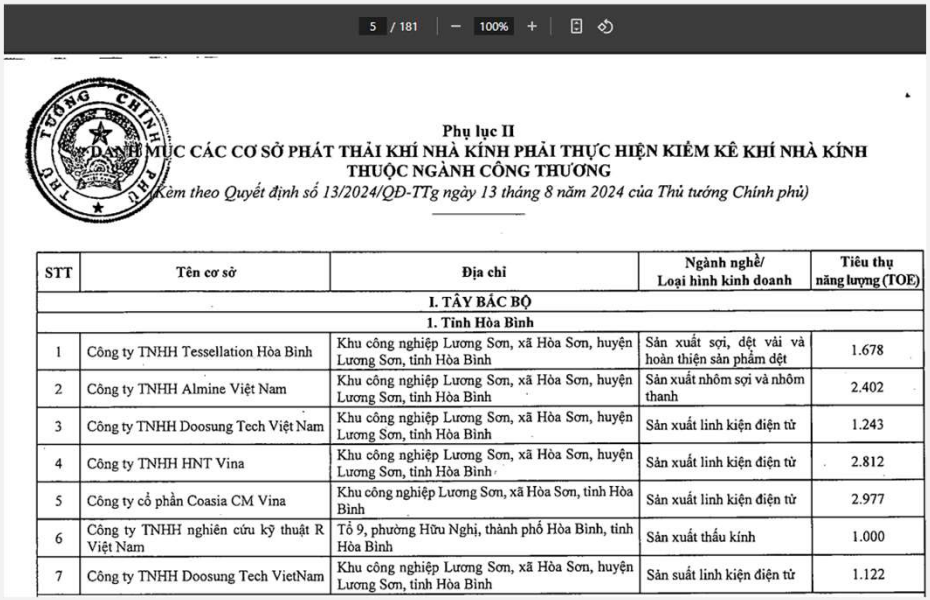
- **Part II: Corporate GHG Emissions Reporting**
  To inform GHG reduction measures, emissions trading schemes, and the promotion of GHG reductions, a mandatory corporate GHG emissions reporting scheme will be implemented. The bill stipulates the following:

Chapter 10: Carbon Tax (Articles 118—147)

A carbon tax is a **mandatory mechanism** to control GHG emissions which impose a fee on GHG emissions as a tax, which will be collected from industrial emitters and importers.

Source: Enviliance Asia

THE LOCAL LAW - VIETNAM



5 / 181 — 100%

Phụ lục II

DANH MỤC CÁC CƠ SỞ PHÁT THẢI KHÍ NHÀ KÍNH PHẢI THỰC HIỆN KIỂM KÊ KHÍ NHÀ KÍNH THUỘC NGÀNH CÔNG THƯƠNG

(Kèm theo Quyết định số 13/2024/QĐ-TTg ngày 13 tháng 8 năm 2024 của Thủ tướng Chính phủ)

STT	Tên cơ sở	Địa chỉ	Ngành nghề/ Loại hình kinh doanh	Tiêu thụ năng lượng (TOE)
	I. TÂY BẮC BỘ			
	1. Tỉnh Hòa Bình			
1	Công ty TNHH Tessellation Hòa Bình	Khu công nghiệp Lương Sơn, xã Hòa Sơn, huyện Lương Sơn, tỉnh Hòa Bình	Sản xuất sợi, dệt vải và hoàn thiện sản phẩm dệt	1.678
2	Công ty TNHH Almine Việt Nam	Khu công nghiệp Lương Sơn, xã Hòa Sơn, huyện Lương Sơn, tỉnh Hòa Bình	Sản xuất nhôm sợi và nhôm thanh	2.402
3	Công ty TNHH Doosung Tech Việt Nam	Khu công nghiệp Lương Sơn, xã Hòa Sơn, huyện Lương Sơn, tỉnh Hòa Bình	Sản xuất linh kiện điện tử	1.243
4	Công ty TNHH HNT Vina	Khu công nghiệp Lương Sơn, xã Hòa Sơn, huyện Lương Sơn, tỉnh Hòa Bình	Sản xuất linh kiện điện tử	2.812
5	Công ty cổ phần Coasia CM Vina	Khu công nghiệp Lương Sơn, xã Hòa Sơn, tỉnh Hòa Bình	Sản xuất linh kiện điện tử	2.977
6	Công ty TNHH nghiên cứu kỹ thuật R Việt Nam	Tổ 9, phường Hữu Nghị, thành phố Hòa Bình, tỉnh Hòa Bình	Sản xuất thấu kính	1.000
7	Công ty TNHH Doosung Tech VietNam	Khu công nghiệp Lương Sơn, xã Hòa Sơn, huyện Lương Sơn, tỉnh Hòa Bình	Sản suất linh kiện điện tử	1.122

Source: Vietnam Government

Relevant entities with greenhouse gas emissions of up to 3,000 metric tons of carbon dioxide equivalent per year are required to conduct **GHG inventory verified by the governmental authority** and prepare **reduction plans with 3rd party validation**

Article 5. Entities subject to mitigation of greenhouse gas emissions

1. Establishments on the Prime Minister-issued list of sectors or establishments emitting greenhouse gases subject to greenhouse gas inventory.

2. Ministries managing the sectors of energy, agriculture, land use and forestry, wastes, and industrial processes, namely the Ministries of Industry and Trade; Transport; Agriculture and Rural Development; Natural Resources and Environment; and Construction.

Source: DAZPRO

THE LOCAL LAW - THE CHINESE MAINLAND

关于做好2023—2025年部分重点行业企业温室气体排放报告与核查工作的通知

各省、自治区、直辖市生态环境厅（局），新疆生产建设兵团生态环境局：

为加快全国碳排放权交易市场（以下简称全国碳市场）建设，规范重点行业企业温室气体排放数据管理，现将2023—2025年石化、化工、建材、钢铁、有色、造纸、民航等重点行业企业温室气体排放报告与核查有关重点工作要求通知如下。

一、工作任务

各省级生态环境部门根据本通知有关要求，组织开展重点行业企业温室气体排放报告与核查有关工作。

（一）确定报告与核查工作范围

石化、化工、建材、钢铁、有色、造纸、民航等重点行业，年度温室气体排放量达2.6万吨二氧化碳当量（综合能源消费量约1万吨标准煤）及以上的重点企业（具体行业子类见附件1）纳入本通知年度温室气体排放报告与核查工作范围。

Source: Ministry of Ecology and Environment of the People's Republic of China

Relevant entities are required to conduct **GHG inventory verified by the governmental authority**

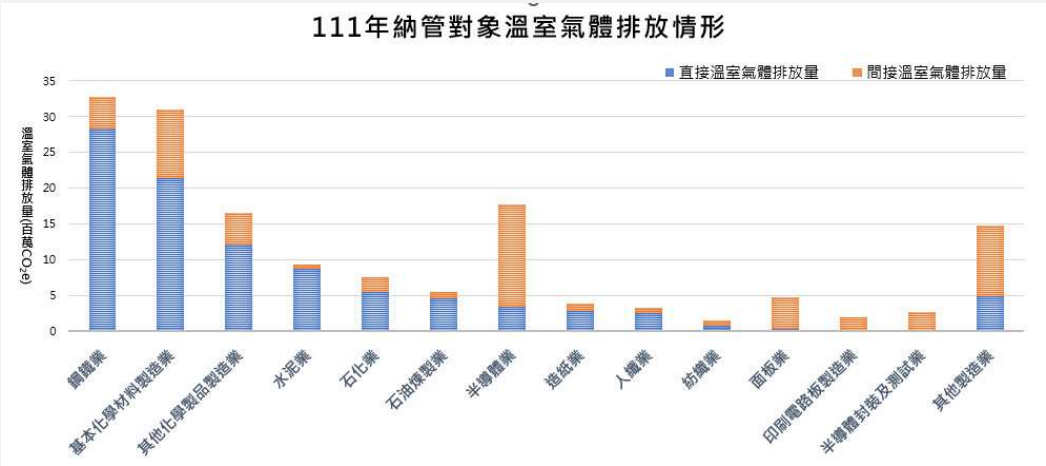
附件 1

覆盖行业及代码

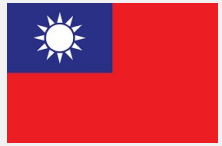
行业	国民经济行业分类代码（GB/T 4754-2017）	类别名称	主营产品统计代码	行业子类
建材	30	非金属矿物制品业	31	非金属矿物制品
	3011	水泥制造	310101	水泥熟料
	3041	平板玻璃制造	311101	平板玻璃
钢铁	31	黑色金属冶炼和压延加工业	32	黑色金属冶炼及压延产品
	3110	炼铁	3201	生铁
	3120	炼钢	3206	粗钢
	3130	钢压延加工	3207 3208	轧制、锻造钢坯 钢材
	32	有色金属冶炼和压延加工业	33	有色金属冶炼和压延加工产品

Source: Ministry of Ecology and Environment of the People's Republic of China

THE LOCAL LAW - TAIWAN



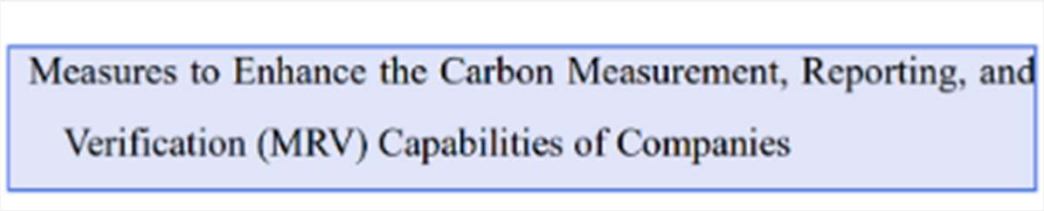
Source: Ministry of Environment, Taiwan



Specific industries or Manufacturing industries with greenhouse gas emissions of up to 25,000 metric tons of carbon dioxide equivalent per year should **submit 3rd party verified GHG report**

Source: Ministry of Environment, Taiwan

THE LOCAL LAW - KOREA


Measures to Enhance the Carbon Measurement, Reporting, and Verification (MRV) Capabilities of Companies

Source: Ministry of Environment, Korea

Source: KIM & CHANG

listed companies with total assets of KRW 2 trillion or more on a consolidated basis are required to **disclose their greenhouse gas emissions** (Scope 1 and Scope 2), renewable energy consumption, use/recycling rate of plastic renewable materials, and the amount of water usage in water-stressed areas.

In response, the Ministry of Environment and other related departments plan to establish a foundation for utilizing carbon MRV to alleviate the burden on South Korean companies related to international carbon trade regulations and to enhance their capabilities for measuring emissions.

By operationalizing a cross-departmental system for building a database, reforming the methods for calculating product carbon footprints*, establishing a regulation-adapted emissions MRV system for climate disclosures, and creating a carbon data collection and management platform, the plan aims to enhance the foundation for responding to carbon regulations.

Source: Ministry of Environment, Korea

* The amount of carbon emissions generated throughout the life cycle of a product or service (including material procurement, preprocessing, production, distribution, disposal, etc.).

There are plans to implement various support programs, including training and consulting, to enhance the carbon emission measurement capabilities of domestic small and medium-sized enterprises.

THE LOCAL LAW - JAPAN

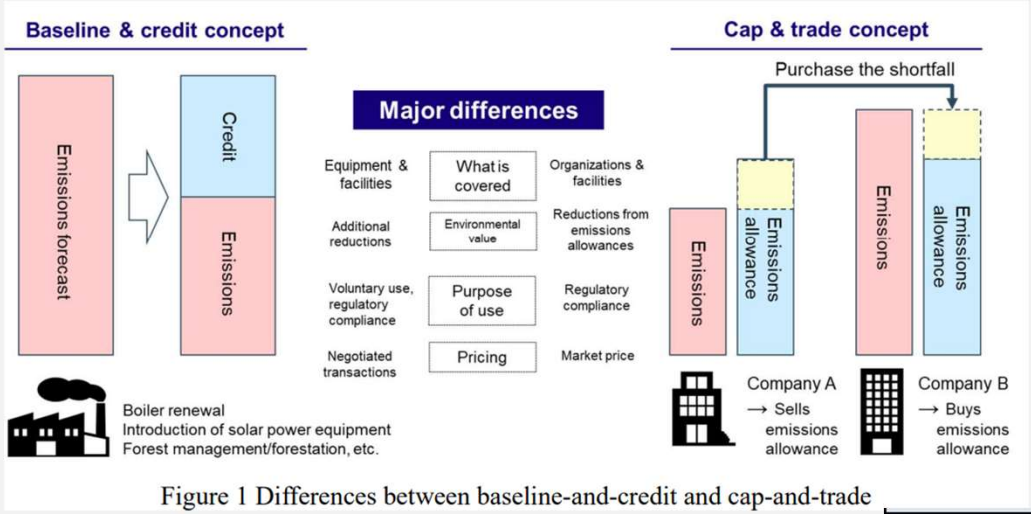


Figure 1 Differences between baseline-and-credit and cap-and-trade

Source: 経済産業省

Source: Baker McKenzie

Specified Emitters are required to report "unadjusted greenhouse gas emissions (actual emissions)" as well as "adjusted greenhouse gas emissions" after deducting "certified domestic emission reductions under the SHK scheme, and **verified by a 3rd party**

Independently verified	All emission reductions and removals shall be verified to a reasonable level of assurance by an independent and accredited third-party verifier. MRV should be conducted at the specified intervals.

Source: 経済産業省

[ISO14065]

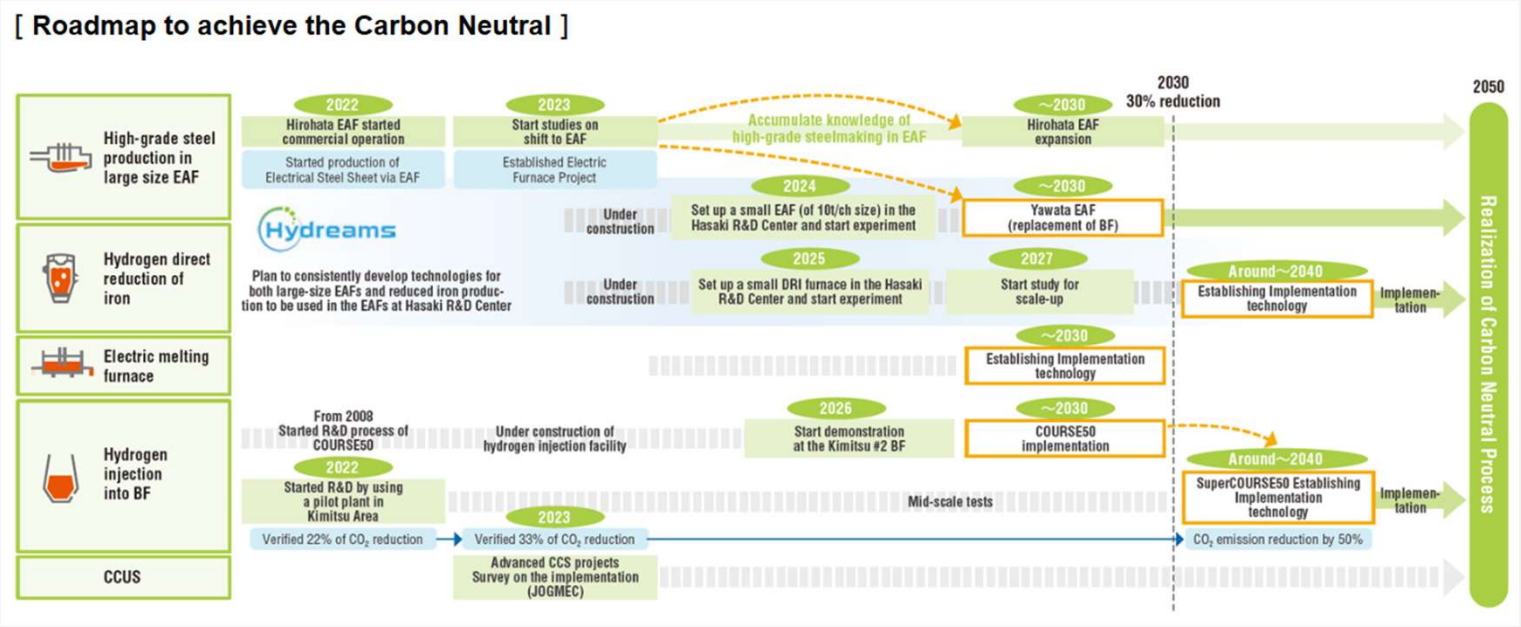
- An international standard that outlines requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition.
- Referenced as a requirement to register as a verification body under the J-Credit Scheme, etc.

CASE STUDY: COMPANY OPERATING IN MULTIPLE REGIONS

Nippon Steal (TYO:5401) exports steel products to the EU, bringing it within the scope of CBAM

- Listed in Tokyo, which the Stock Exchange is actively aligning its sustainability disclosure standards with ISSB
- Together with their Carbon Neutral Vision 2050, they are having their decarbonisation plan which also comply with multiple regulatory frameworks.

Source: Nippon Steel



CASE STUDY: COMPANY OPERATING IN MULTIPLE REGIONS

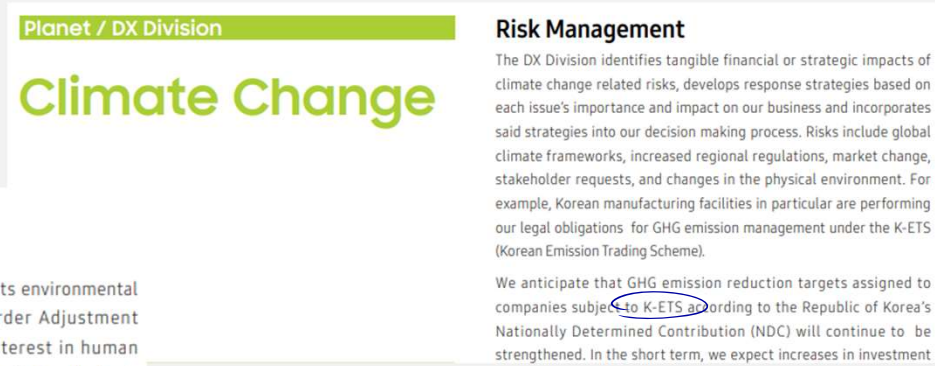
Samsung (KRX:005930) exports electronic equipment and products to the EU, bringing it within the scope of CBAM

- HQ in Busan, which needed to disclose GHGs
- Expect ETS will become prominent

Our Company

Message from Our CEO

In addition, the EU is consistently strengthening its environmental regulation through means like the Carbon Border Adjustment Mechanism (CBAM) and Battery Regulation. Interest in human rights continue to grow as well as, seen by Germany's Supply Chain Due Diligence Act, mandating supply chain human rights and work environment management, coming into effect in 2023, and the EU Corporate Sustainability Due Diligence Directive (CSDDD) being approved in May 2024 by member states.



Planet / DX Division

Climate Change

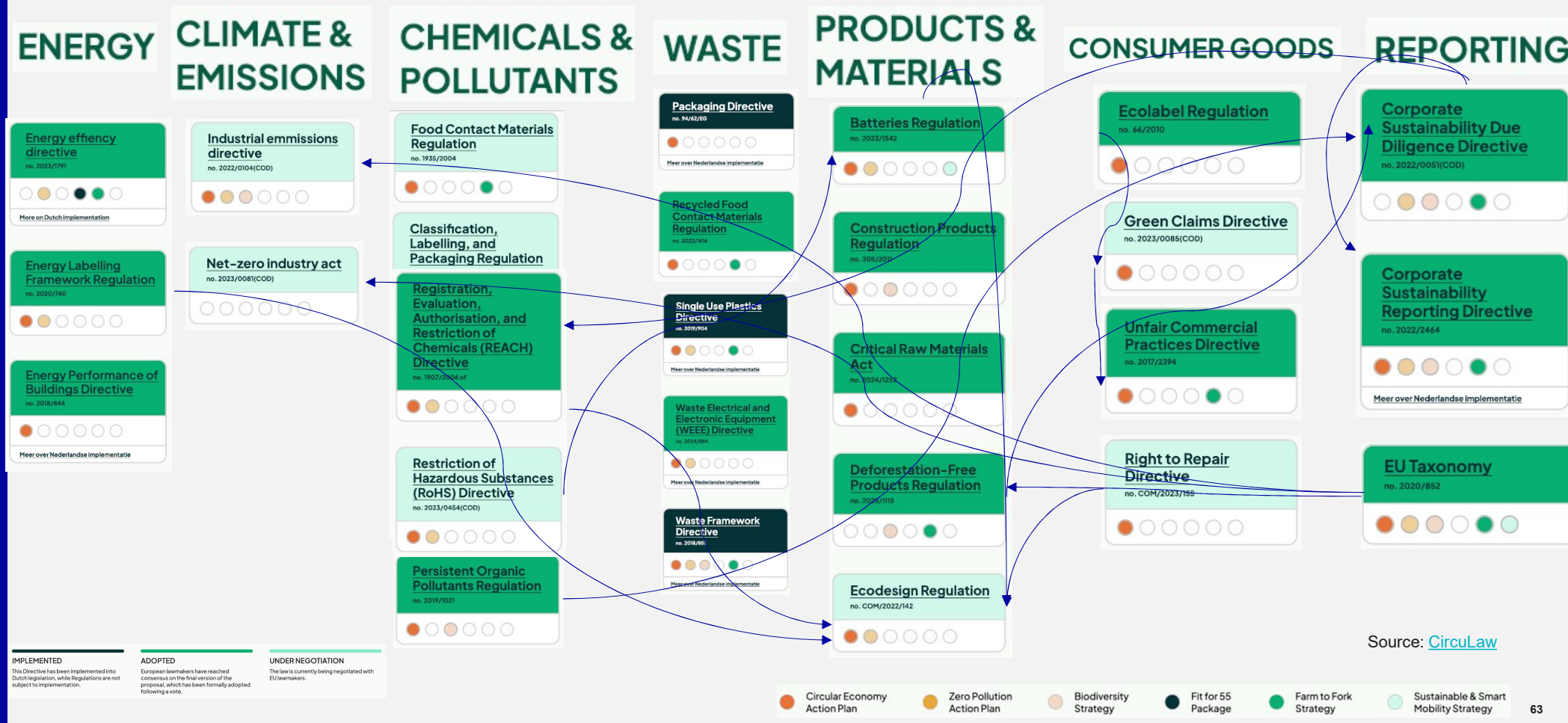
Risk Management

The DX Division identifies tangible financial or strategic impacts of climate change related risks, develops response strategies based on each issue's importance and impact on our business and incorporates said strategies into our decision making process. Risks include global climate frameworks, increased regional regulations, market change, stakeholder requests, and changes in the physical environment. For example, Korean manufacturing facilities in particular are performing our legal obligations for GHG emission management under the K-ETS (Korean Emission Trading Scheme).

We anticipate that GHG emission reduction targets assigned to companies subject to K-ETS according to the Republic of Korea's Nationally Determined Contribution (NDC) will continue to be strengthened. In the short term, we expect increases in investment

Source: Samsung

EVERYTHING'S CONNECTED



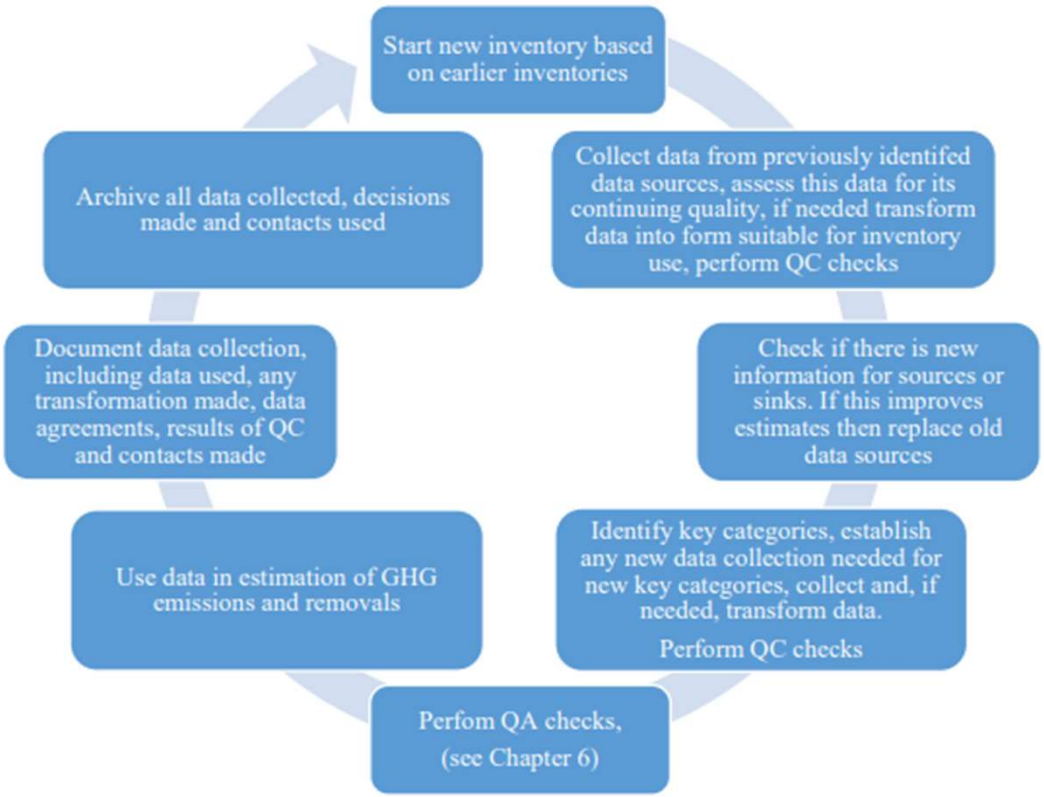
Source: CircuLaw

04.

GHG Data Collection and Management

DATA COLLECTION PROCEDURE

Figure 2.0a (New) Steps in data collection



Note: This diagram outlines the steps in collecting and using data. In practice, some of the steps may be done in a different order or at differen times for different sectors to suit national needs and circumstances. For example, documentation may be completed earlier than shown here.

Source: IPCC

HOW TO COLLECT AND MANAGE GHG DATA

Step-by-Step Process

Define Scope
(Scope 1, 2, 3* emissions)

Identify Data Sources
(utilities, fuel use, supplier data*, business travel* etc.)

Data Collection
(Automated tools, spreadsheets, supplier questionnaires*)

Data Validation
(internal audits)

Emission Calculation
(GHG Protocol tools, emission factors)

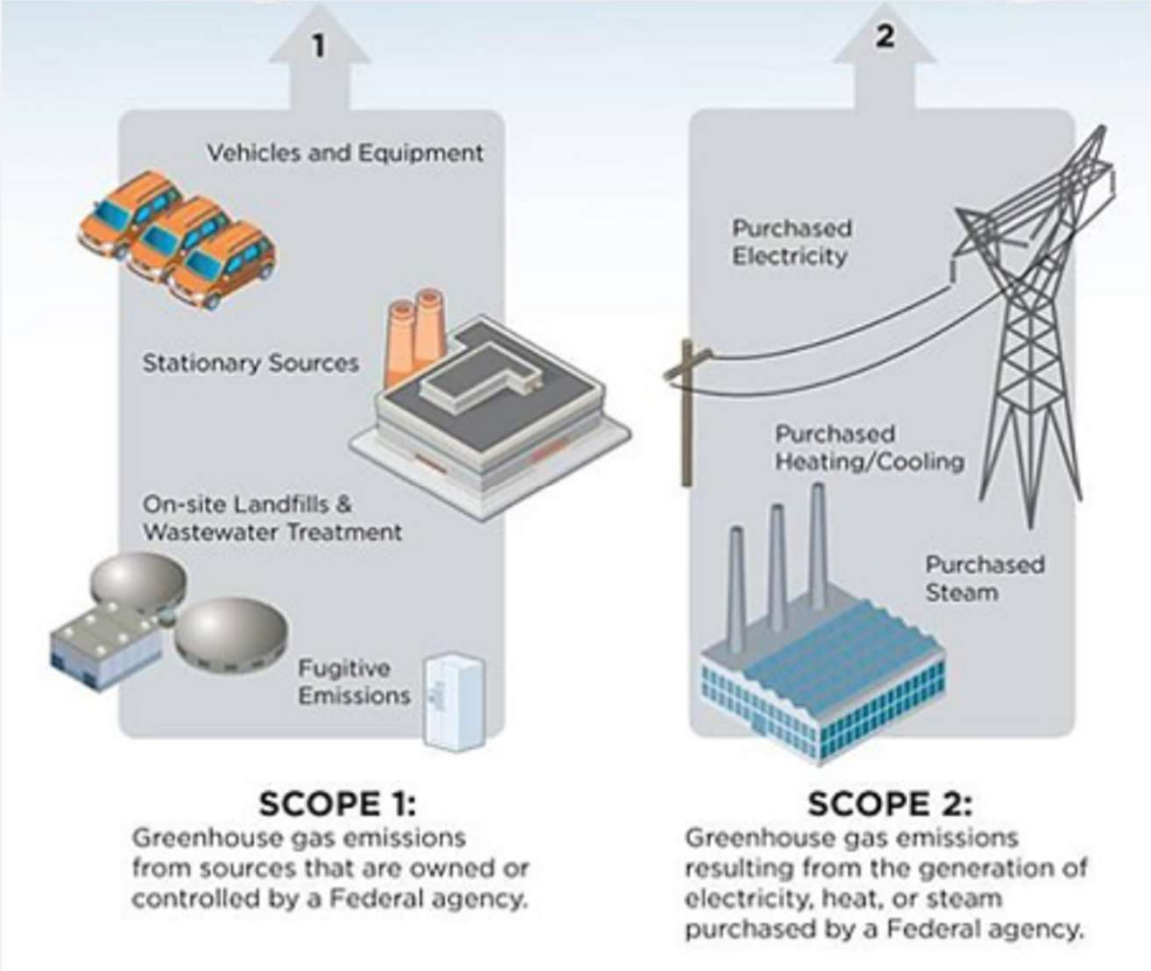
Reporting & Disclosure
(CDP, TCFD, regulatory filings)

** Specifically for scope 3 only*

STEP 1: IDENTIFYING EMISSION SOURCES

Find out the energy sources that you use (examples)

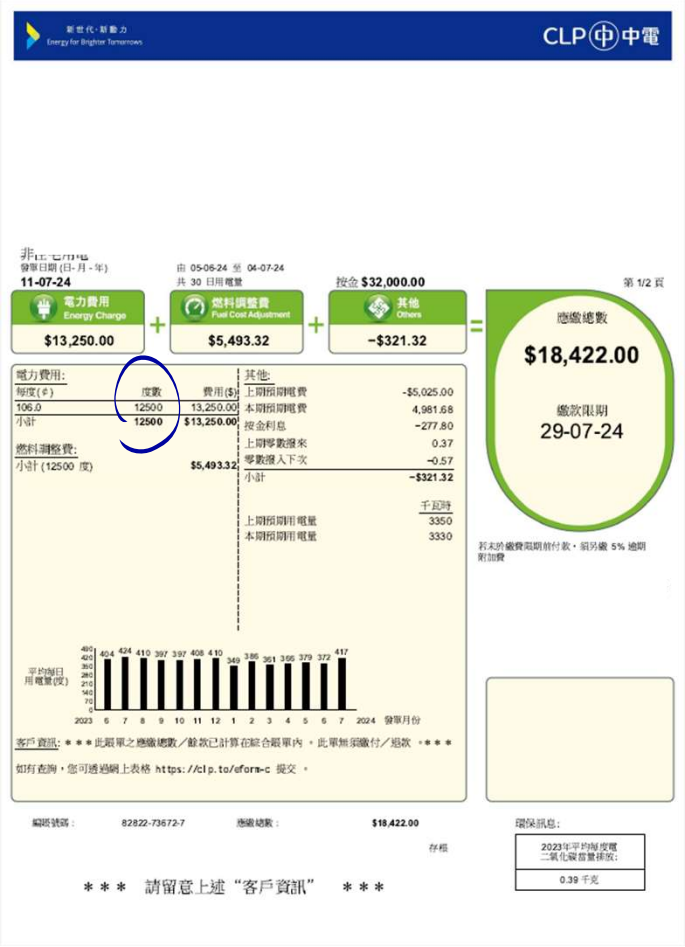
Diesel Oil
LPG
Refrigerant
Towngas
Electricity



STEP 2: GATHERING ACTIVITY DATA

Activity Data

(example)
Electricity Bills from utility company

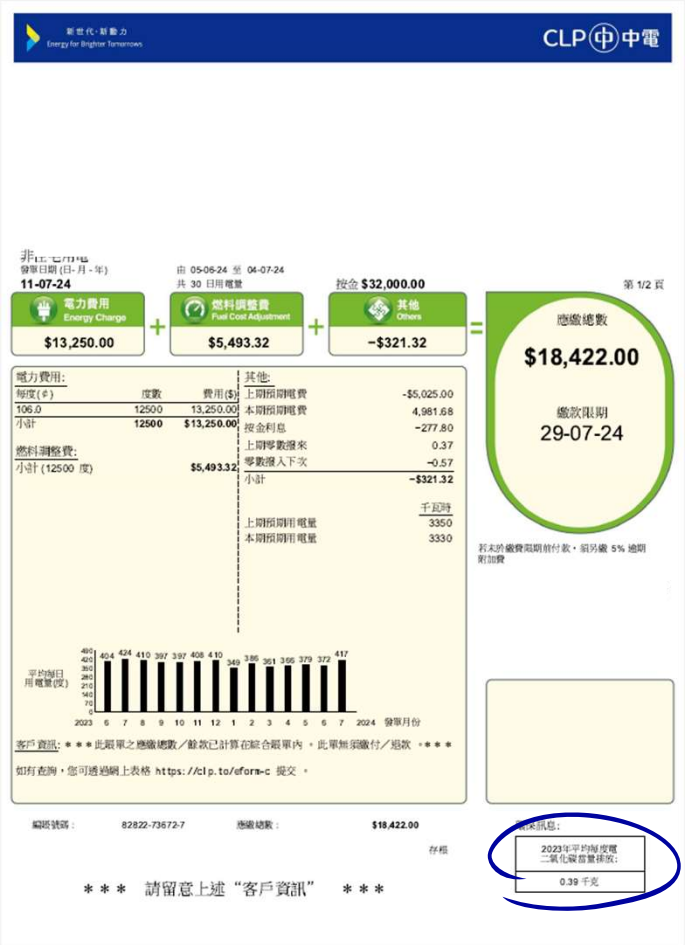


12,500 Kwh

STEP 3: FINDING OUT THE EMISSION FACTORS

Emission Factor

(example)
Electricity Bills from utility company



0.39 kg CO2e/kWh

STEP 4: APPLYING EMISSION FACTORS TO CALCULATE EMISSIONS

Activity Data	x	Emission Factor	=	CO2e
12,500 Kwh	x	0.39 kg CO2e/kWh	=	4,875 kg CO2e

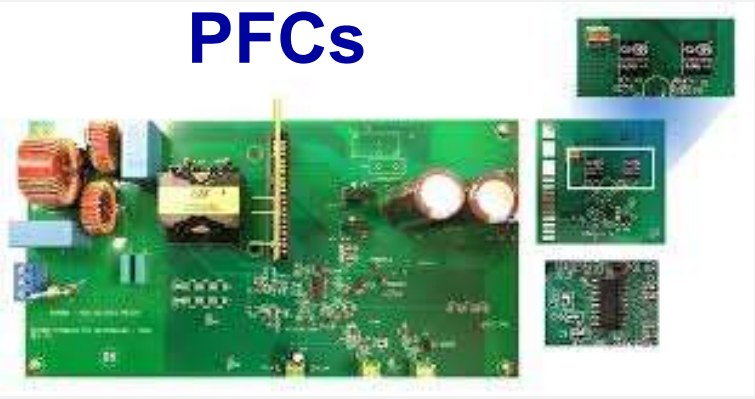
STEP 5: REITERATE THE CALCULATION PROCESS

Activity Data x Emission Factor = CO2e

GWP

Global Warming Potential

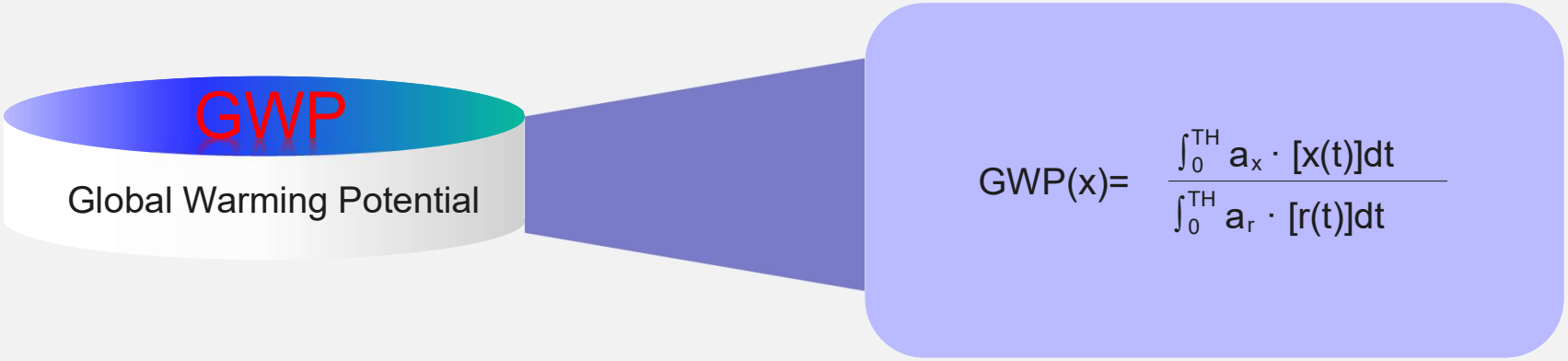
PFCs



HFCs

STEP 5: REITERATE THE CALCULATION PROCESS

Activity Data x Emission Factor = CO2e

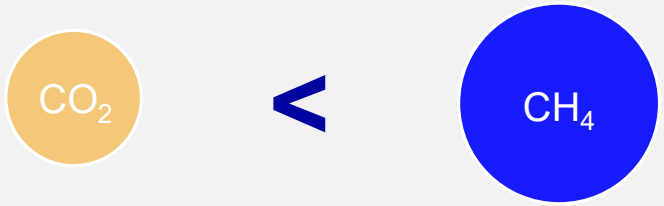


The GWP is a measure of how much energy the emission of 1 ton of a gas will absorb over a given period of time, relative to the emission of 1 ton of carbon dioxide (CO_2). The larger the GWP, the more that a given gas warms the Earth compared to CO_2 over that time period. The time period usually used for GWPs is 100 years.

Source: EPA, US

STEP 5: REITERATE THE CALCULATION PROCESS

Activity Data x Emission Factor = CO2e



GWP = 28x

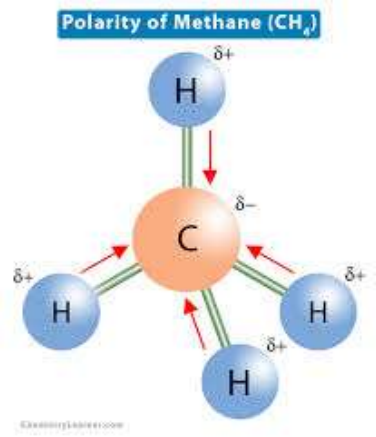
The GWP is a measure of how much energy the emission of 1 ton of a gas will absorb over a given period of time, relative to the emission of 1 ton of carbon dioxide (CO_2). The larger the GWP, the more that a given gas warms the Earth compared to CO_2 over that time period. The time period usually used for GWPs is 100 years.

Source: EPA, US

STEP 5: REITERATE THE CALCULATION PROCESS

Activity Data x Emission Factor = CO2e

12,000 kg of CH_4 x 0.037 CH_4 / kg x 28 = 12,432 kg



Source: GHG Protocol

Global warming potential (GWP) values relative to CO_2

Industrial designation or common name	Chemical formula	GWP values for 100-year time horizon		
		Second Assessment Report (SAR)	Fourth Assessment Report (AR4)	Fifth Assessment Report (AR5)
Carbon dioxide	CO_2	1	1	1
Methane	CH_4	21	25	28
Nitrous oxide	N_2O	310	298	265

SUMMARY

Activity Data	x	Emission Factor With GWP	=	CO2e
Find out the energy sources that you use Diesel Oil LPG Kerosene Charcoal Towngas Electricity		Search from Database Energy Bills Utilities Company Country-Specific Sector-Specific Global		Add up all GHGs CO_2 CH_4 N_2O HFCs PFCs SF_6 NF_3

Normally expressed in in Tons or Kg

MORE YOU WANT TO KNOW

Country

Data Year	Emission Factor, kgCO2e / kWh												% Net Elec Imports
	For electricity GENERATED (supplied to the grid, plus imports)				Due to grid transmission/distribution LOSSES				For electricity CONSUMED (includes grid losses)				
	CO_2	CH_4	N_2O	Total	CO_2	CH_4	N_2O	Total	CO_2	CH_4	N_2O	Total	Total
2007	0.49054	0.00024	0.00303	0.49381	0.03884	0.00002	0.00024	0.0391	0.52939	0.00025	0.00327	0.53291	1.37%
2008	0.48219	0.00026	0.00286	0.48531	0.03883	0.00002	0.00023	0.03908	0.52102	0.00028	0.00309	0.52439	2.91%
2009	0.44917	0.00027	0.00261	0.45205	0.03838	0.00002	0.00022	0.03863	0.48755	0.00029	0.00284	0.49068	0.80%
2010	0.45706	0.00028	0.00267	0.46002	0.03611	0.00002	0.00021	0.03634	0.49317	0.0003	0.00289	0.49636	0.73%
2011	0.44238	0.00029	0.00281	0.44548	0.03783	0.00002	0.00024	0.03809	0.4802	0.00031	0.00305	0.48357	1.76%
2012	0.49023	0.00033	0.00369	0.49426	0.04287	0.00003	0.00032	0.04322	0.5331	0.00036	0.00402	0.53748	3.40%
2013	0.4585	0.00035	0.00334	0.46219	0.03786	0.00003	0.00028	0.03816	0.49636	0.00038	0.00362	0.50035	4.10%
2014	0.40957	0.00039	0.00209	0.41205	0.03705	0.00003	0.00019	0.03727	0.44662	0.00042	0.00228	0.44932	6.44%
2015	0.34885	0.00062	0.00209	0.35156	0.03261	0.00006	0.0002	0.03287	0.38146	0.00068	0.00229	0.38443	6.59%
2016	0.28088	0.00066	0.00153	0.28307	0.02394	0.00006	0.00013	0.02413	0.30482	0.00072	0.00166	0.3072	5.57%
2017	0.25358	0.00065	0.00137	0.2556	0.02153	0.00005	0.00012	0.0217	0.27511	0.0007	0.00149	0.2773	4.78%
2018	0.23104	0.00072	0.00138	0.23314	0.01987	0.00006	0.00012	0.02005	0.25091	0.00078	0.0015	0.25319	6.20%
2019	0.21016	0.00080	0.00137	0.21233	0.01860	0.00007	0.00012	0.01879	0.22876	0.00087	0.00149	0.23112	6.98%
2020**	0.19121	0.00080	0.00137	0.19338	0.01750	0.00007	0.00012	0.017690	0.20871	0.00087	0.00149	0.21107	6.22%
2021**	0.20496	0.00090	0.00122	0.20707	0.01773	0.00008	0.00011	0.01792	0.22269	0.00098	0.00133	0.22500	8.36%
2022**	0.20493	0.00090	0.00122	0.20705	0.01811	0.00008	0.00011	0.01830	0.22304	0.00097	0.00133	0.22535	0.00%

Source: Department for Energy Security & Net Zero, UK

Sector

特此通知。

附件：1、《中国发电企业温室气体排放核算方法与报告指南（试行）》

2、《中国电网企业温室气体排放核算方法与报告指南（试行）》

3、《中国钢铁生产企业温室气体排放核算方法与报告指南（试行）》

4、《中国化工生产企业温室气体排放核算方法与报告指南（试行）》

5、《中国电解铝生产企业温室气体排放核算方法与报告指南（试行）》

6、《中国镁冶炼企业温室气体排放核算方法与报告指南（试行）》

7、《中国平板玻璃生产企业温室气体排放核算方法与报告指南（试行）》

8、《中国水泥生产企业温室气体排放核算方法与报告指南（试行）》

9、《中国陶瓷生产企业温室气体排放核算方法与报告指南（试行）》

10、《中国民航企业温室气体排放核算方法与报告格式指南（试行）》

Source: 国家发展改革委

Global

TABLE 3.2.1
ROAD TRANSPORT DEFAULT CO_2 EMISSION FACTORS AND UNCERTAINTY RANGES [a]

Fuel Type	Default (kg/TJ)	Lower	Upper
Motor Gasoline	69 300	67 500	73 000
Gas/ Diesel Oil	74 100	72 600	74 800
Liquefied Petroleum Gases	63 100	61 600	65 600
Kerosene	71 900	70 800	73 700
Lubricants [b]	73 300	71 900	75 200
Compressed Natural Gas	56 100	54 300	58 300
Liquefied Natural Gas	56 100	54 300	58 300

Source: Table 1.4 in the Introduction chapter of the Energy Volume.

Notes:
[a] Values represent 100 percent oxidation of fuel carbon content.
[b] See Box 3.2.4 Lubricants in Mobile Combustion for guidance for uses of lubricants.

Source: IPCC

CASE STUDY

The choice of emission factor by different sector

Sector

Scope 1 emissions

Sources of Scope 1 gross emissions include fuel, refrigerant and Towngas usage from ground-based activities (including biodiesel) in Hong Kong covering Cathay Pacific and the Subsidiaries. Canteens operated by third parties within Cathay Pacific's buildings are excluded. Net Scope 1 emissions refer to the Scope 1 gross emissions minus the removal of emissions contributed by the use of sustainable aviation fuel and carbon offsets financed by Cathay Group.

In Hong Kong, the CO_2 emissions factors follow the guidelines published by the Environmental Protection Department of the Hong Kong Special Administrative Region Government in February 2010[1]. The emissions factor for biodiesel follows guidance from the UK's Department for Business, Energy & Industrial Strategy (Greenhouse gas reporting: conversion factors 2023)[2].

In respect of Cathay Pacific's GHG emissions from aircraft fuel consumption, the scope includes all flight activities, including testing, training flights, dry lease and wet lease. As fuel density varies according to a number of factors, Cathay Pacific uses the Joint Inspection Group's[3] recommended specific gravity of 0.80 kg/L to calculate the weight of fuel. Cathay Pacific uses an emissions factor of 3.15[4] to determine its CO_2 emissions from the combustion of aircraft fuel.

[3] Formed by international oil companies, the Joint Inspection Group performs regular inspections of their airport facilities to ensure that these are operated in accordance with their procedures for handling aviation fuel at airports and upstream aviation fuel facilities.

[4] IPCC. (1999). Aviation and the Global Atmosphere. Cambridge: Cambridge University Press.

Source: Cathay Pacific

Country

6.8 Appendix H – Grid Factor ($kgCO_2e/kWh$) Improvement by Market (Scope 2)

All regions have demonstrated improvement in their grid factors.

Market	Source of Grid Factor in 2023	2018	2019	2020	2021	2022	2023	% Change to 2018
HKSAR	CLP (2024)[10]	0.510	0.510	0.500	0.370	0.390	0.390	-24%
Chinese Mainland (East)	Baseline Emission Factors for Regional Power Grids in China (2019 Edition)[11]	0.811	0.811	0.805	0.792	0.792	0.792	-2%
Chinese Mainland (South)		0.896	0.896	0.837	0.804	0.804	0.804	-10%
Chinese Mainland (Central)		0.952	0.952	0.901	0.859	0.859	0.859	-10%
Chinese Mainland (Weighted average)		0.858	0.856	0.829	0.806	0.806	0.806	-6%
Chinese Mainland (MEE)	Ministry of Ecology and Environment (2023)[12]	–	–	–	–	–	0.573	–
Taiwan	Bureau of Energy Ministry of Economic Affairs (Taiwan) – 2022 Annual Carbon Emission Coefficient	0.590	0.590	0.509	0.502	0.509	0.495	-16%
United States (WECC Northwest)	US EPA eGRID – eGRID 2023 (2021 data)[14]	0.298	0.298	0.292	0.326	0.274	0.290	-3%
United States (WECC Southwest)		0.476	0.476	0.466	0.434	0.386	0.374	-21%
United States (WECC Rockies)		0.625	0.625	0.581	0.567	0.522	0.530	-15%
United States (Weighted average)		0.409	0.409	0.394	0.398	0.347	0.353	-14%

Source: Swire Coca Cola

Carbon emissions[2]		
Direct carbon emissions (Scope 1)	Tonnes of CO_2e	88
Indirect carbon emissions (Scope 2) - market-based method		
Total carbon emissions (Scopes 1 & 2) - market-based method		
Consolidated accounting group		
Other investees		
Indirect carbon emissions (Scope 2) - location-based method		
Total carbon emissions (Scopes 1 & 2) - location-based method		
Biogenic carbon emissions		

Source: Swire Properties

Global

(2) Calculation standards and methodologies for carbon emissions:

(i) Carbon emissions are calculated using:

(a) "Guidelines to Account for and Report on Greenhouse Gas Emissions and Removals for Buildings (Commercial, Residential or Institutional Purposes) in Hong Kong" published by the Environmental Protection Department (EPD) and the Electrical and Mechanical Services Department (EMSD) of the Hong Kong Government.

(b) GHG Protocol published by the WBCSD and the World Resources Institute.

(ii) Carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and hydrofluorocarbons (HFCs) are included in greenhouse gas (GHG) calculations. Perfluorocarbons (PFCs), sulphur hexafluoride (SF_6) and nitrogen trifluoride (NF_3) are not applicable.

(iii) Direct carbon emissions included industrial diesel, ULSD, biodiesel (for CH_4 and N_2O emissions), petrol, town gas, natural gas and refrigerant containing HFCs refilled.

(iv) Indirect carbon emissions included non-renewable electricity purchased, off-site renewable electricity purchased (via power purchase agreement), on-site renewable electricity generated, district heating and cooling (energy purchased from local utility companies) and town gas.

(v) Market-based method for indirect carbon emissions (as defined by GHG Protocol Scope 2 Guidance) refers to a method to quantify scope 2 emissions based on GHG emissions emitted by the generators from which the reporter contractually purchases electricity bundled with instruments, or unbundled instruments on their own.

(vi) Location-based method for indirect carbon emissions (as defined by GHG Protocol Scope 2 Guidance) refers to a method to quantify scope 2 emissions based on average energy generation emission factors for defined locations, including local, subnational, or national boundaries.

(vii) Biogenic carbon emissions (as defined by GHG Protocol Scope 2 Guidance) refer to CO_2 emissions from the combustion or biodegradation of biomass.

(viii) The sources of emission factors for the reporting of carbon emissions are:

(a) Sustainability reports of the local utility companies (for electricity and town gas in Hong Kong).

(b) "Guidelines to Account for and Report on Greenhouse Gas Emissions and Removals for Buildings (Commercial, Residential or Institutional Purposes) in Hong Kong" published by the EPD and the EMSD of the Hong Kong Government.

(c) "Guidelines to Defra's Greenhouse Gas Conversion Factors for Company Reporting" by the Department for Environment, Food and Rural Affairs (Defra) of the UK.

(d) "IEA Emission Factors" published by International Energy Agency.

(e) For market-based indirect carbon emissions calculation (for the Chinese Mainland since 2020): "Methodology for Carbon Emissions Reduction in Commercial Complex Buildings" (by Tsinghua University) published in Journal of Building Energy Efficiency (Nov 2020 Edition), and references from the Chinese Mainland government and industry associations including China Renewable Energy Development Assessment Report by National Energy Administration, China Energy Statistical Yearbook by National Bureau of Statistics and China Electricity Market Annual Report by China Electricity Council.

(f) For market-based indirect carbon emission calculation (for U.S.A. portfolio since 2024): "The Emissions & Generation Resource Integrated Database (eGRID)" by U.S. Environmental Protection Agency.

(ix) Where the utility (e.g. diesel, electricity, natural gas and town gas) bills and refrigerant refill records are pending from utility companies and maintenance contractors at the time of preparation of this report, the utilities and fuel consumption is estimated by making reference to the same period last year.

(x) The emissions reported in the table do not take into account the utilisation of carbon credits.

MORE YOU WANT TO KNOW

CH_4	N_2O	HFCs	PFCs	SF_6	NF_3
Oil & gas	Agriculture and Fertiliser manufacturing	Aerosols	Aluminium production	Electric power industry	Semiconductor
Coal Mining	Chemical production	Automotive	Metal and mining	Semiconductor	Photovoltaics
		Refrigeration	Semiconductor		

HOW TO COLLECT AND MANAGE GHG DATA

Step-by-Step Process

Define Scope
(Scope 1, 2, 3* emissions)

Identify Data Sources
(utilities, fuel use, supplier data*, business travel* etc.)

Data Collection
(Automated tools, spreadsheets, supplier questionnaires*)

Data Validation
(internal audits)

Emission Calculation
(GHG Protocol tools, emission factors)

Reporting & Disclosure
(CDP, TCFD, regulatory filings)

Challenges

- Inconsistent data formats across departments/suppliers*
- Lack of data for Scope 3 emissions*
- Manual data collection = time-intensive, error-prone
- Misalignment with reporting frameworks

Good Practices

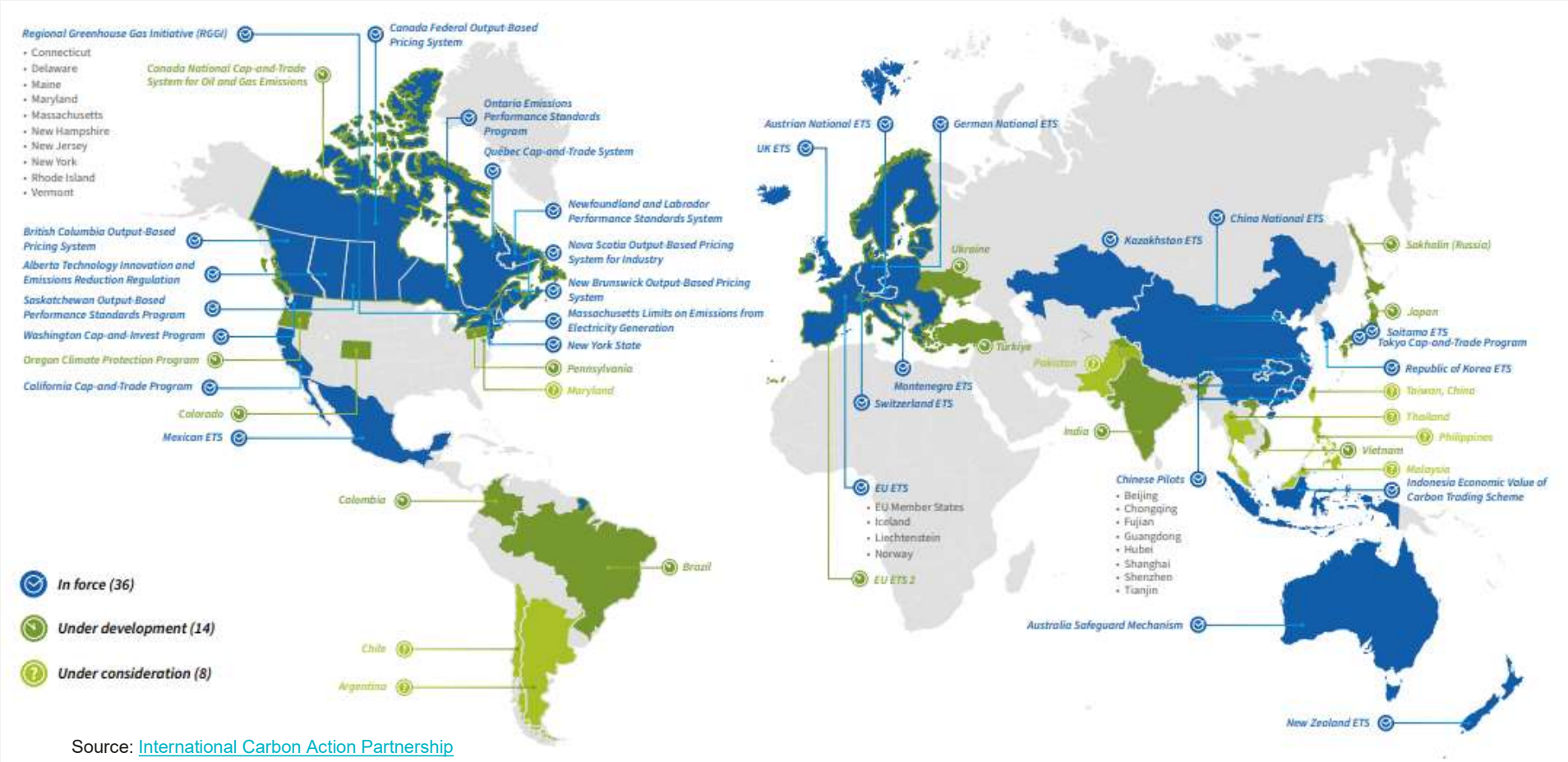
- Centralised digital platforms for GHG tracking
- Training staff on GHG data protocol
- Collaborating with suppliers for better Scope 3 data*

** Specifically for scope 3 only*

05.

Introduction to GHG Reporting

THE PURPOSE OF GHG DISCLOSURE



Source: International Carbon Action Partnership

Globally……

140%

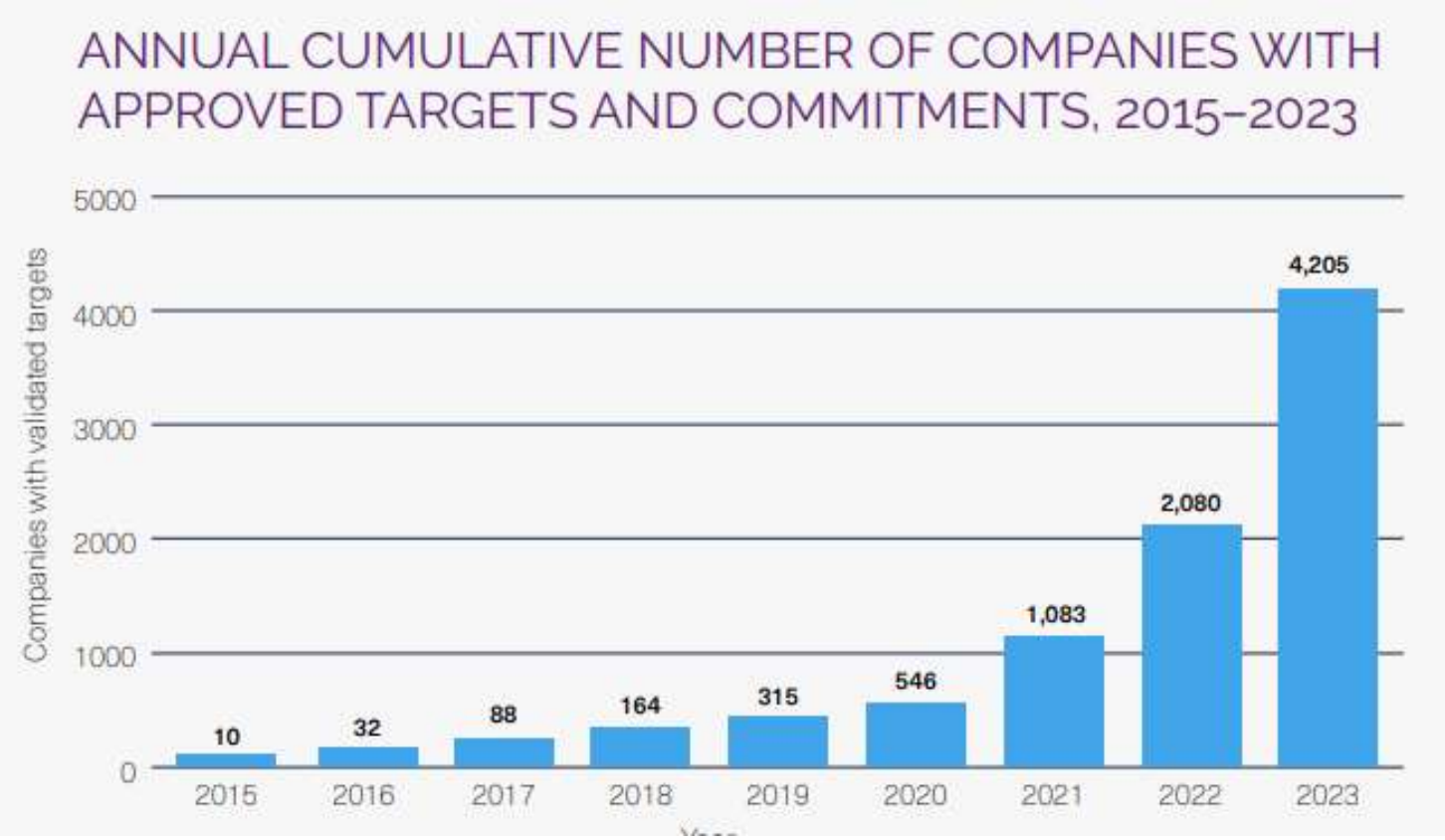
There was a 140% increase in the number of Asian companies setting a science-based target compared to 2022.

IN ASIA

520%

The increase in the number of organizations in India setting targets in 2023 compared to 2022.

For the second year running, Japan led as the country with the highest number of companies setting science-based targets.



Source: SBTI Monitoring Report 2023

THE GLOBAL NET ZERO

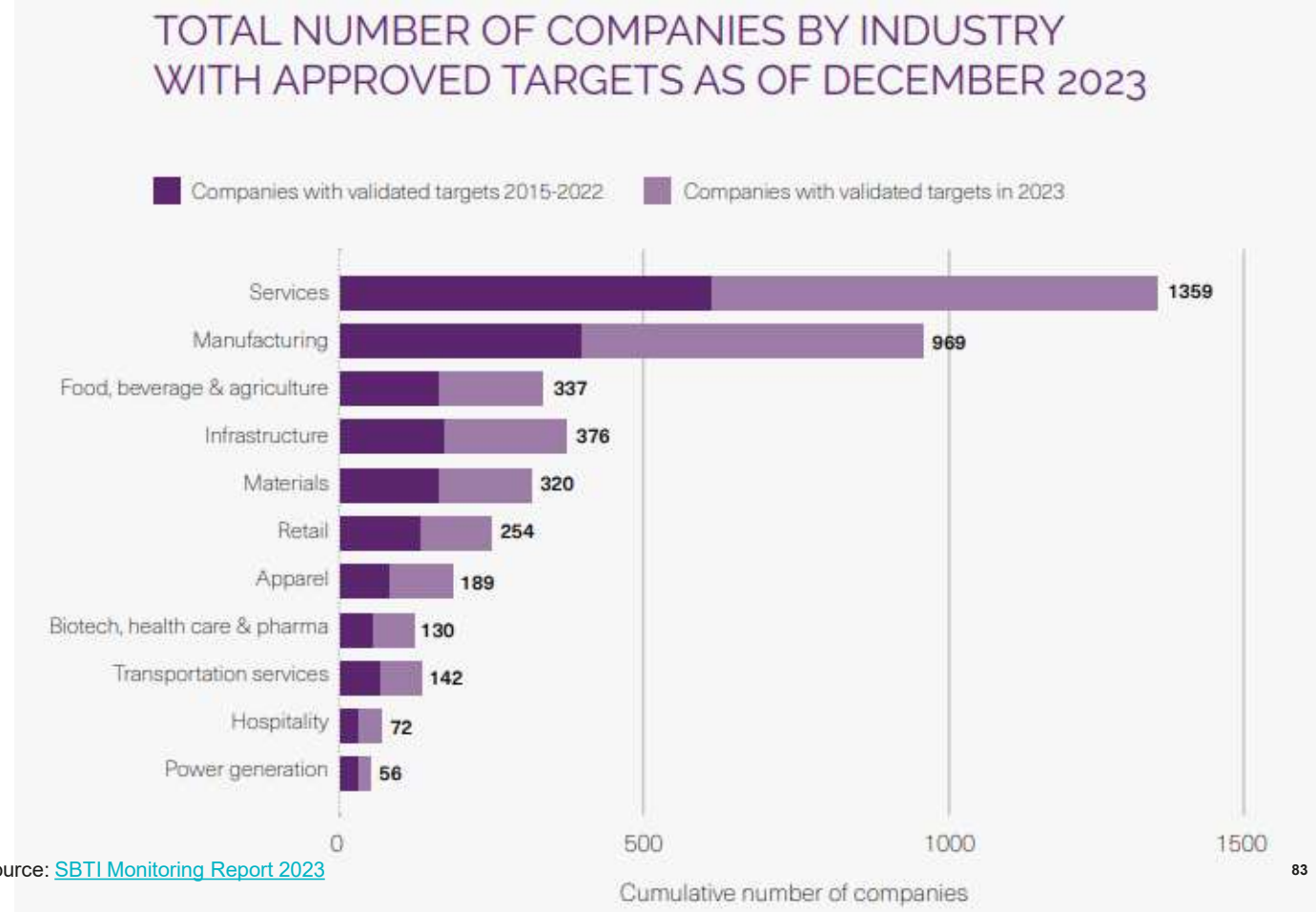
449

A total of 449 organizations set net-zero targets in 2023, of which 230, or 51%, were classed as corporations and the remaining 49% as SMEs.

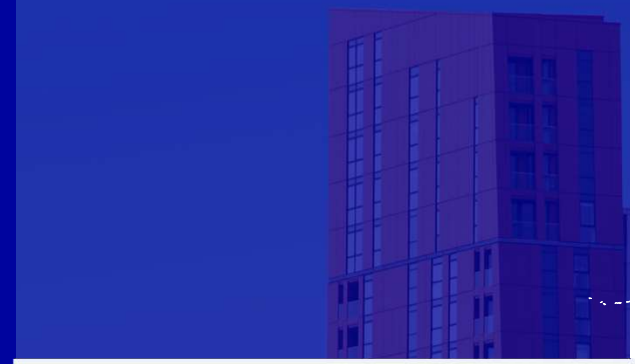
20%

20% of companies setting science-based targets in 2023 set net-zero targets.

The market force keeps going…



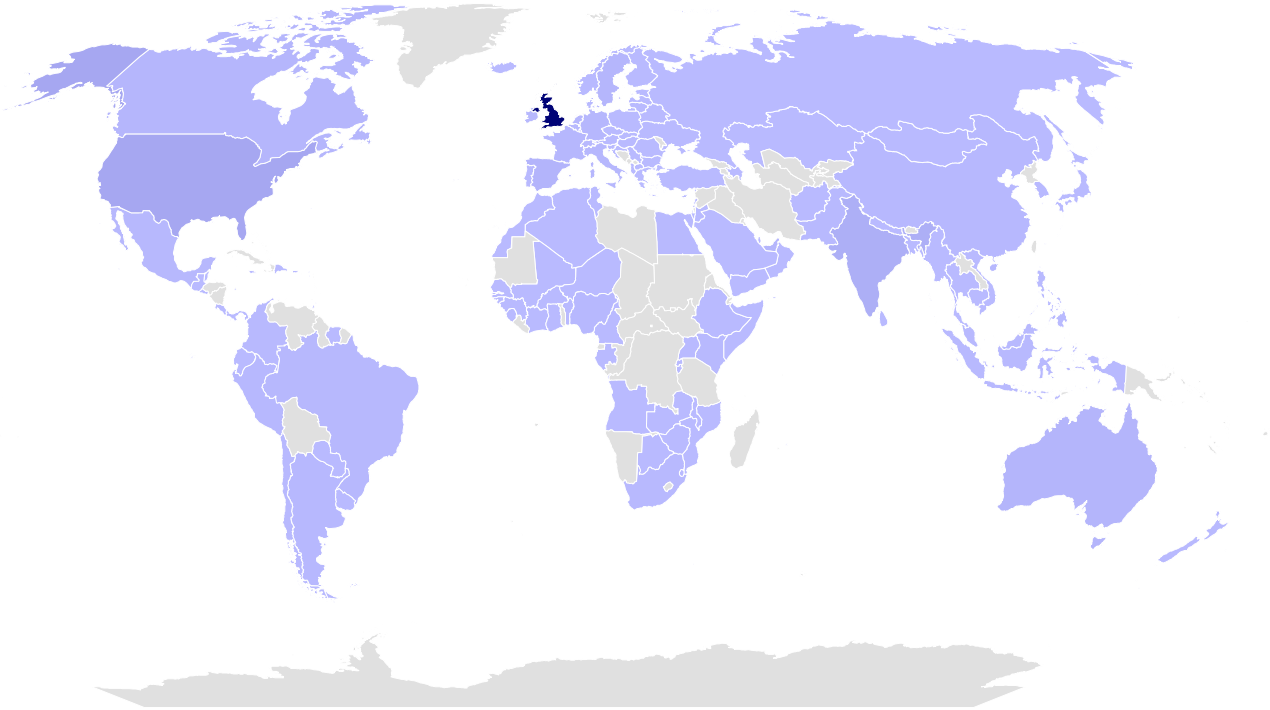
Source: SBTI Monitoring Report 2023



9072 Businesses have already made the commitment

More SMEs are taking climate actions

Country/Region of commitment



Source: SME Climate Hub

INVESTORS WANT TO KNOW

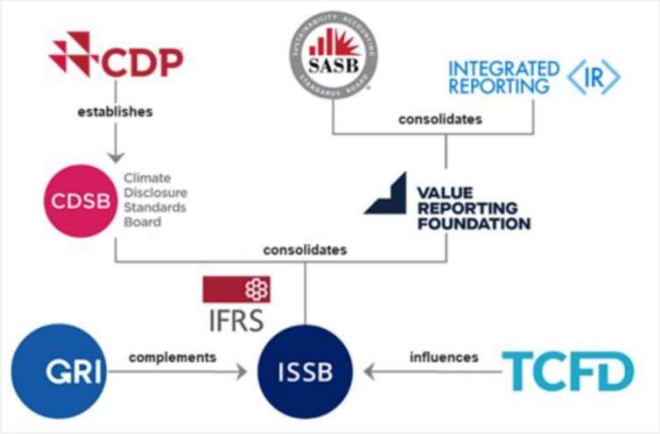
Industry: Apparel, Accessories & Footwear | Prev | 1 of 5 | Next

General Issue Category: Product Quality & Safety | Prev | 1 of 3 | Next

Disclosure Topic: Management of Chemicals in Products

Accounting Metric(s)

- CG-AA-250a.1: Discussion of processes to maintain compliance with restricted substances regulations
- CG-AA-250a.2: Discussion of processes to assess and manage risks and/or hazards associated with chemicals in products



Environmental Impacts in the Supply Chain | Labor Conditions in the Supply Chain

Accounting Metric(s)

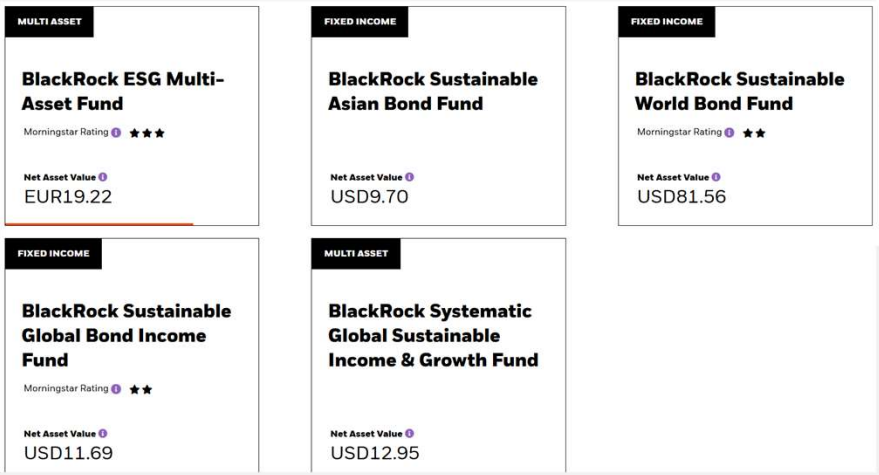
- CG-AA-430a.1: Percentage of (1) Tier 1 supplier facilities and (2) supplier facilities beyond Tier 1 in compliance with wastewater discharge permits and/or contractual agreements
- CG-AA-430a.2: Percentage of (1) Tier 1 supplier facilities and (2) supplier facilities beyond Tier 1 that have completed the Sustainable Apparel Coalition's Higg Facility

Source: SASB

OBLIGATIONS FOR MONEY MANAGERS

Soft commodities	
Palm oil	Companies must be members of the Roundtable on Sustainable Palm Oil (the RSPO) and not subject to any unresolved public criticism from the RSPO. Production companies must further have some level of mill or plantation certification and be publicly committed to achieving full certification (evidence must be available). Companies must also be committed to "No Deforestation, No Peat and No Exploitation."
Soy	Companies producing soy in markets at high risk of tropical deforestation must be members of the Round Table on Responsible Soy (the RTRS) or similar standards such as Proterra, ISCC, CRS, and not be subject to any unresolved public criticism from these standards. When a company is not certified, it must credibly commit to the RTRS or a similar standard, providing a robust time-bound plan or demonstrate a credible commitment toward an equivalent standard, to be independently verified.
Forestry	The producing company must seek to achieve full certification of its production according to the Forest Stewardship Council (FSC) or a national scheme endorsed against the Programme for the Endorsement of Forest Certification (PEFC) within a robust time-bound plan. The producing company must also have fire prevention, monitoring and suppression measures in place.
Fish and seafood	Companies producing, processing or trading fish and seafood must provide credible evidence of no illegal, unreported and/or unregulated fishing in their own production and supply chain.
Power generation	
Coal-fired power plants (CFPP)	We do not provide project-level finance for new CFPP globally and only support financing transactions of existing coal-fired operators (>20% coal reliance) if they have a transition strategy that aligns with the goals of the Paris Agreement or if the transaction is related to renewable energy or clean technology.
Large dams	Transactions directly related to large dams include an assessment against the recommendations made by the International Hydropower Sustainability Assessment Protocol.

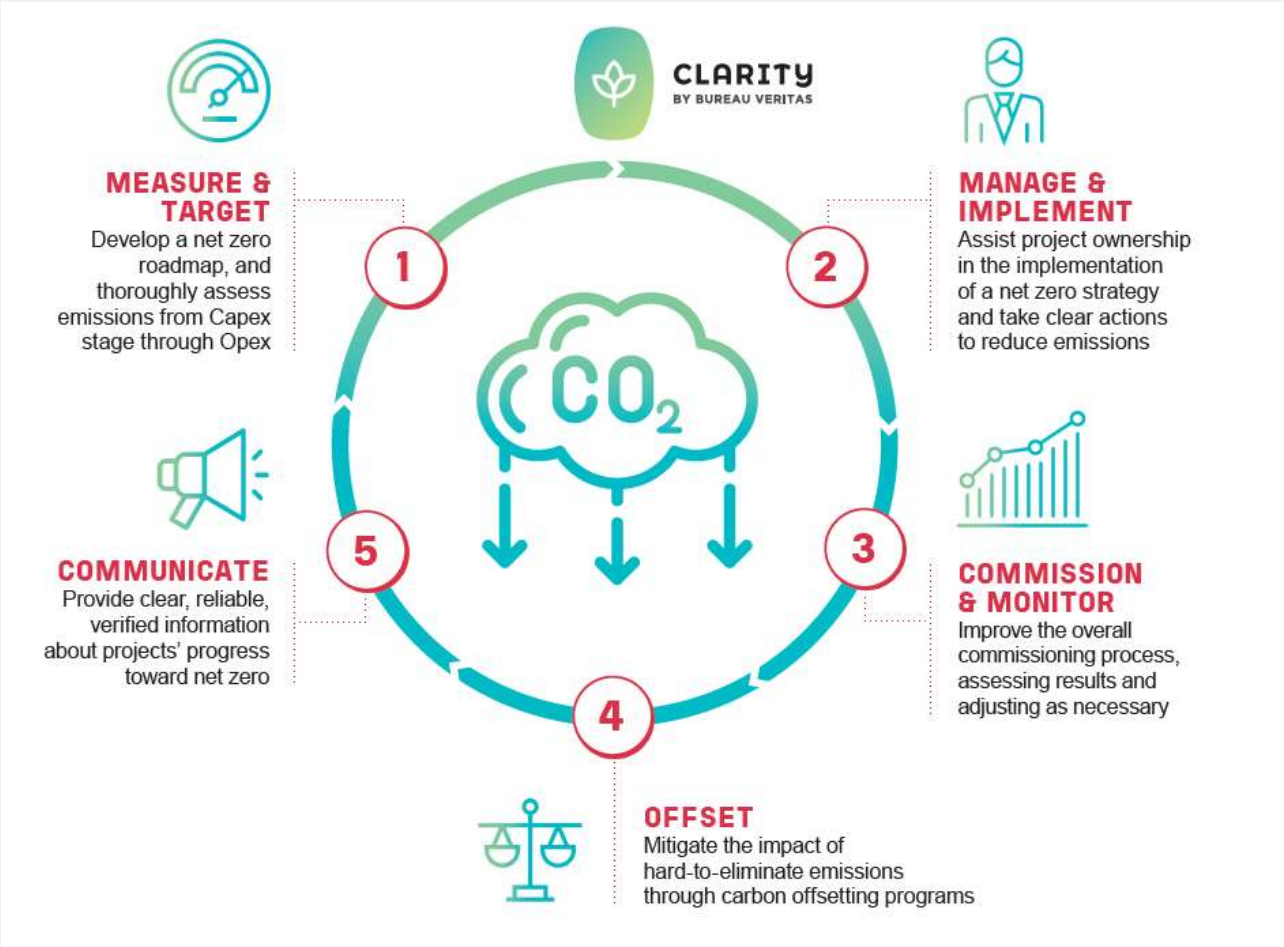
Source: UBS



Source: Blackrock

Source: CDP

THE PURPOSE OF DISCLOSURE



THE BENEFITS OF DISCLOSURE

- Companies that focus on climate change through measuring, managing and reporting GHG emissions experience benefits in terms of cost savings, brand building and stakeholder communications.

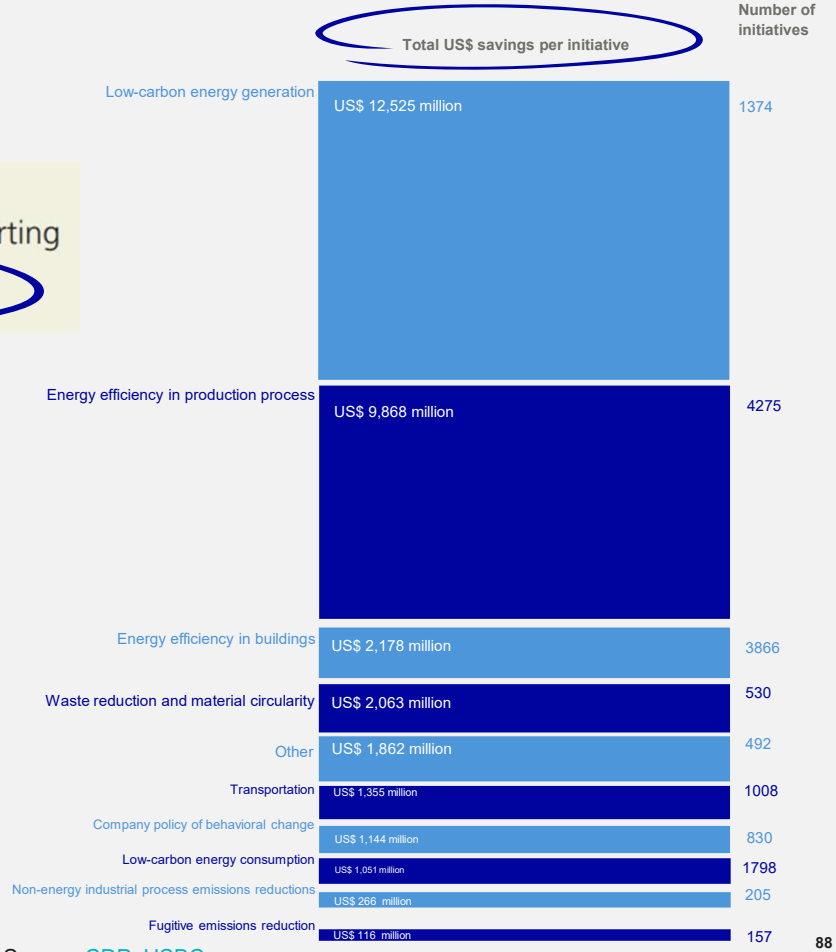
Source: defra, UK

Learn About the Greenhouse Gas Reporting Program (GHGRP)

The GHGRP (codified at 40 CFR Part 98) requires reporting of greenhouse gas (GHG) data and other relevant information from large GHG emission sources, fuel and industrial gas suppliers, and CO_2 injection sites in the United States. This data can be used by businesses and others to track and compare facilities' greenhouse gas emissions, identify opportunities to cut pollution, minimize wasted energy, and save money. States, cities, and other communities can use EPA's greenhouse gas data to find high-emitting facilities in their area, compare emissions between similar facilities, and develop common-sense climate policies.

Source: EPA, US

Total US$ savings per initiative, CDP Supply Chain Report 2024



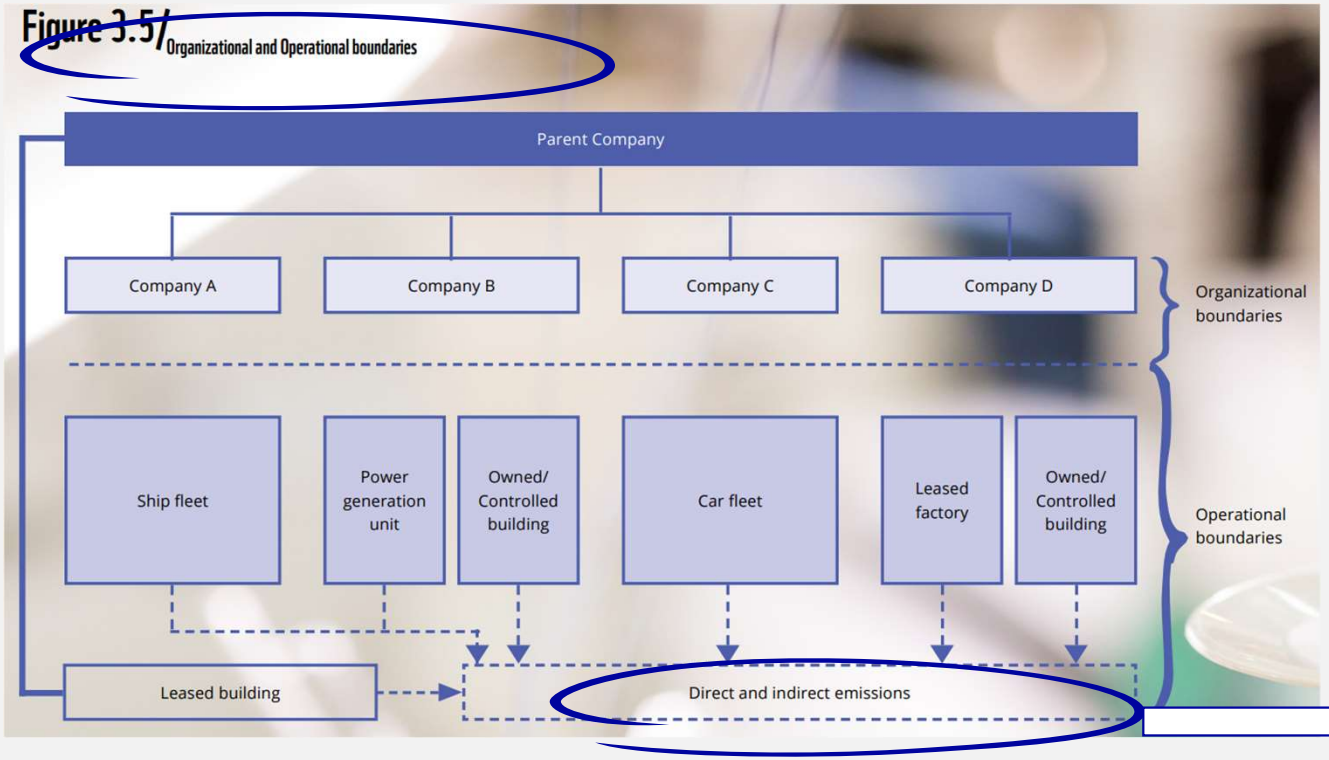
Source: CDP, HSBC

GHG REPORTING BOUNDARIES AND METRICS

Three approached:

Shareholding
Financial Control
Operational Control

(Boundary)



(Metrics) **CO2e**

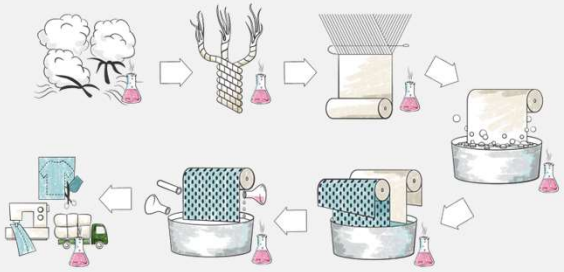
Add up all GHGs

CO_2
CH_4
N_2O
HFCs
PFCs
SF_6
NF_3

Source: WWF, HSBC

REPORT QUALITY CHECKING

Understanding the production process and emission sources



most common missing points: refrigerant, septic tanks, coal-fired boiler and wastewater treatment emissions

Specific questions: whether the factory have coal-fired boiler, solar roof top, etc

Unintentional missing info

Check any big differences in terms of energy used. If the two factories are similar, check the factory has counted combustion processes or not

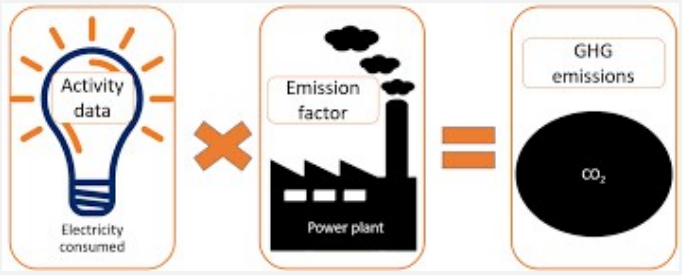
The flexibility allowable in SBTI

Intentional missing info

Emissions coverage

*C5 – Scope 1, 2 and 3 allowable exclusions: Companies shall not exclude more than 5% of total combined scope 1 and scope 2 emissions from either the boundary of the GHG inventory or the target boundary.[7, 8] Companies shall not exclude more than 5% of emissions from their total scope 3 GHG inventory.[9] Scope 3 target boundary requirements are outlined in C6.

referencing the emission factors



Lacking representable EF

Check the references for the emission factor to see if it is representable

- Country (the best)
- Industry
- Global
- Build it in LCA by the report provider (the least)

EXAMPLE REPORT

Statistics and measurement of Scope 1 and 2 data

Classification of Emission Sources		Emission sources	Corresponding Material or Energy Type	Types of GHGs Emitted	Activity Data	Unit	Data source
SCOPE 1	Stationery Emissions	Back-up generator, boiler	Diesel oil	CO_2, CH_4, N_2O	82,922.00	Liter	Purchase Invoice
		Forklift	Diesel oil	CO_2, CH_4, N_2O	2,338.00	Liter	Purchase Invoice
		Cooking area	LPG	CO_2, CH_4, N_2O	26,024.00	Kg	Purchase Invoice
	Mobile Emissions	Company cars, 7 seats, model 2005 onward (03 cars), petrol-engine	Petrol	CO_2, CH_4, N_2O	2,895.70	Liter	Purchase Invoice
		Company cars, 7 seats, model 2008 (01 cars), diesel-engine	Diesel oil	CO_2, CH_4, N_2O	936.06	Liter	Purchase Invoice
	Fugitive emissions	Refrigeration and air-conditioning equipment	R22	HCFC-22	720.80	Kg	Maintenance record from service provider
		Fire extinguisher	CO_2	CO_2	617.00	Kg	Maintenance record from service provider
		Wastewater treatment facility	CH_4	CH_4	2,601,054	Man-day	Calculation based on number of employees and working days from HR record
SCOPE 2	Purchased Power	Purchased electricity	Electricity	CO_2	28,284,020	kWh	Purchase Invoice

5.2 Emission and conversion factors

a) GHG emission factors

Fuel type	Net calorific value (TJ/Gg) [1]	Emission factor [2] CO_2	CH_4	N_2O	CO_2e	Unit	Source
Emission factors for stationary combustion in manufacturing industries and construction							
Gas/Diesel Oil	43	74,100	3	0.6		Kg/TJ	[1] IPCC 2006, Vol 2, Chapter 1, table 1.2 [2] IPCC 2006, Vol 2, Chapter 2, Table 2.3
LPG	47.3	63,100	1	0.1		Kg/TJ	[2] Vietnam Government 2022, Decision 2626/QĐ-BTNMT dated 10/10/2022
Emission factors for off-road mobile sources and machinery							
Diesel	43	74,100	4.15	28.6		Kg/TJ	[1] IPCC 2006, Vol 2, Chapter 1, table 1.2 [2] IPCC 2006, Vol 2, Chapter 3, Table 3.3.1
Emission factors for road transport							
Diesel (Road)	43	74,100	3.9	3.9		Kg/TJ	[1] IPCC 2006, Vol 2, Chapter 1, table 1.2 [2] IPCC 2006, Vol 2, Chapter 3, Table 3.2.1 and 3.2.2
Gasoline (Road)	44.3	69,300	33	3.2		Kg/TJ	[2] Vietnam Government 2022, Decision 2626/QĐ-BTNMT dated 10/10/2022
Emission factor of Vietnam							
Electricity							

c) Physical Units Conversion factor

Unit	Symbol	Equivalent unit	Symbol
1 tonne of oil equivalent (toe)	1 toe	1 x 10^{10} calories	10^{10} cal
1 ktoe	1 ktoe	41.868 terajoules	41.868 TJ
1 short ton	1 sh t	0.9072 tonne	0.9072 t
1 tonne	1 t	1.1023 short tons	1.1023 sh t
1 tonne	1 t	1 megagram	1 Mg
1 kilotonne	1 kt	1 gigagram	1 Gg
1 megatonne	1 Mt	1 teragram	1 Tg
1 gigatonne	1 Gt	1 petagram	1 Pg
1 kilogram	1 kg	2.2046 pounds	2.2046 lb
1 hectare	1 ha	10^4 square meters	10^4 m^2
1 calorie	1 cal	4.1868 Joules	4.1868 J
1 terajoule	1 TJ	2.78 x 10^5 kilowatt hour	2.78 x 10^5 kWh

b) GWP values

Industrial designation or common name	Chemical formula	GWP values for 100- year time horizon	Source
Carbon dioxide	CO_2	1	IPCC Sixth Assessment Report, 2021 (AR6), Chapter 7 Supplementary Material, The Earth's Energy Budget, Climate Feedbacks and Climate Sensitivity Supplementary Material
Methane	CH_4	27.9	
Nitrous oxide	N_2O	273	
Sulfur hexafluoride	SF_6	24,300	
Nitrogen trifluoride	NF_3	17,400	
HCFC-22 (R-22)	$CHClF_2$	1,960	

3.2 Exclusion of GHG sources

Scope 3 emissions were excluded from the inventory or have no emissions in the following categories:

Scope	Category	Description	Justification
Categories were excluded			

Gas, diesel, light fuel oil	1 litre	0.84 kg

THE SUGGESTED CONTENTS AND STRUCTURE

Allow offsets to be reported separately, but not used to lower reported emissions

01
General information

Description of the reporting organization, purpose of the report, and reporting period.

02
Organizational and operational boundaries

Explain which business entities and activities are being included (and excluded) within your GHG inventory.

03
Base year

Define the base year (or mean of years) that you are using as a reference from which emission reduction targets (e.g., 30% reduction by 2030) are being benchmarked.

04
Methodology

Describe and explain the standards and methods used to prepare the GHG inventory report.

05
Calculation of GHG emissions and removals

This chapter includes quantified results by each category (e.g., Scope 1 transport emissions, Scope 2 electricity emissions), describes the activity data used, references and/or explains emission factors, uncertainty and imprecision effects on results, and an action plan to reduce uncertainty for future inventories.

06 (optional)
Carbon offset

Report on any carbon offsetting activities (if any) during the reporting period.

07 (optional)
Proposed action plans

List any emission reduction targets and strategies (e.g., install 100kW of solar capacity; upgrade to motion sensor lights, improve insulation) that are planned for the upcoming years. Plans should include a timeline, be measurable, and be suitable to achieve the aims of the reduction targets.

Source: WWF, HSBC

ASSESS, CHOSE, AND RECALCULATE THE BASE YEAR

17. In what scenarios would I need to recalculate base year emissions?

For consistent tracking of emissions over time, base year emissions may need to be recalculated as companies undergo significant structural changes, methodology changes, or discovery of errors.

Structural changes

- Mergers, acquisitions, and divestment
- Outsourcing and insourcing of emitting activities

Methodology changes

- Changes in calculation methodology or improvements in the accuracy of emission factors or activity data that result in a significant impact on the base year emissions data

Discovery of errors

- Discovery of significant errors, or a number of cumulative errors, that are collectively significant

Source: GHG Protocol

EXAMPLE OF BASE YEAR CHANGE POLICY

GHG Emissions Recalculation Policy

Guidelines for Base Year Adjustments

Linde has used 2018 as the base year for our greenhouse gas (GHG) emission calculations related to SD2028 targets and 2021 as the base year for our greenhouse gas (GHG) emission calculations related to the 2035 target and 2050 climate neutrality ambition. GHG emissions for scope 1 and 2 are per the audited values, as published in its 2021 SD Report, and this inventory is annually presented in each SD Report. In order to accurately track progress towards our GHG intensity targets, we will adjust our base year emissions inventory to account for significant changes, described below, if the changes drive an increase/decrease in emissions of greater than 5%, in accordance with the GHG Protocol guidance Tracking Emissions Over Time. We may also choose to recalculate our baseline for changes less than 5%, especially when structural changes occur.

Structural Changes

Structural changes that significantly impact our base year GHG emissions and may trigger the adjustment of the baseline include acquisitions, divestitures or mergers. When significant structural changes occur in the middle of a year, the current and baseline year will be recalculated for the entire year. In the event of an acquisition, in order to ensure that full and accurate data are available, recalculation may be carried out up to one year after the structural change has occurred.

Calculation Methodology Changes

Methodology changes that significantly impact our base year GHG emissions and may trigger the adjustment of the baseline include updated emission factors, improved data access or updated calculation methods or protocols.

Data Errors or Other Changes

We will recalculate our emissions in the event of discovery of a significant error, or a number of cumulative errors that together are significant. Significant change in our organizational or operations boundaries may likewise result in the adjustment of the baseline.

Timeline

Baseline adjustments will occur at the end of each fiscal year if we identify any changes described above that have occurred in the reporting period which may require us to recalculate our base year. We publicly restate our baseline when we report the latest carbon footprint, typically the next annual sustainability report, which covers the previous financial year. on specific collaborations is included in the annual community engagement brochure and annual sustainable development report.

Source: Linde

CASE STUDIES FOR STEP-BY-STEP GHG REPORT

Step 01: General Information

About this Report

This Report is the BlackRock, Inc. (together, with its subsidiaries, "BlackRock" or the "Company") 2023 Greenhouse Gas ("GHG") Emissions Report ("GHG Emissions Report" or this "Report"). All information in this report is provided for the year-ended December 31, 2023, unless otherwise noted.

GHG Protocol

The GHG Protocol: A Corporate Accounting and Reporting Standard (Revised Edition) ("GHG Protocol") was established through a partnership of non-governmental organizations, governments, and other stakeholders that was convened by the World Resources Institute and the World Business Council for Sustainable Development. The GHG Protocol provides a consistent standard and guidance for the measurement and reporting of GHG emissions by companies. BlackRock has adopted this standard for measuring and reporting on the GHG emissions that arise from BlackRock's corporate operations[1].

Source: BlackRock

CASE STUDIES FOR STEP-BY-STEP GHG REPORT

Step 02: Organisational and operational boundaries

Approach to Measuring GHG Emissions

This section provides a description of BlackRock's approach to measuring GHG emissions that arise from its corporate operations.

Organizational Boundary

BlackRock is a leading publicly traded investment management firm with $10.0 trillion of assets under management ("AUM") as of December 31, 2023. As of December 31, 2023, BlackRock had approximately 19,800 employees in more than 30 countries who serve clients in over 100 countries across the globe.

BlackRock leases office space throughout the world, including but not limited to locations such as Atlanta, Belgrade, Budapest, Edinburgh, Gurgaon, Hong Kong, London, Mumbai, Princeton, New York City, San Francisco, and Singapore. The Company also owns an 84,500 square foot office building in Wilmington, Delaware and a 43,000 square foot data center in Amherst, New York.

BlackRock utilizes an operational control boundary for the purposes of GHG emissions reporting. GHG emissions associated with the facilities over which BlackRock has determined it has operational control are included in this GHG Emissions Report. This includes owned and leased facilities and company-owned vehicles globally.

Source: BlackRock

CASE STUDIES FOR STEP-BY-STEP GHG REPORT

Step 03: Base year

Base Year

BlackRock's base year, for emissions reporting, is 2019, which is consistent with BlackRock's emissions reduction goals. As subsequent years' emissions are measured relative to the 2019 baseline, there are certain circumstances under which BlackRock may recalculate the baseline or subsequent year's disclosures including but not limited to mergers, acquisitions, divestitures, or clarifications or changes to methodologies. BlackRock has established an internal recalculation policy to determine when recalculations are appropriate based on significance thresholds, and in each instance of recalculation, BlackRock will disclose the trigger event(s) that drove the recalculation, the original emissions and the recalculated emissions.

Source: BlackRock

CASE STUDIES FOR STEP-BY-STEP GHG REPORT

Step 04: Methodology

Methodology

The following describes the methodology used for each emission Scope in the current reporting year and any methodology changes made ~~from the~~ prior year. Emissions factor sources are summarized in the Appendix.

Scope 1

Scope 1 emissions include direct emissions arising from stationary combustion of fuels, mobile combustion of fuels, and refrigerants.

Direct fuel consumption data is used to calculate GHG emissions associated with stationary and mobile combustion of fuels. For refrigerants, BlackRock uses a square footage based refrigerant leakage assumption to estimate fugitive emissions. BlackRock references the *United States ("U.S.") Environmental Protection Agency's ("EPA") Accounting to Support Federal Reporting of Hydrofluorocarbon Emissions*, which estimates the average refrigerant leakage per square foot of a specific facility type (e.g., office) and the refrigerant types used to cool offices and data centers (HFC134a and HFC410a refrigerants for offices and HFC404a refrigerants for data centers).

Previously, BlackRock assumed facilities were cooled using HFC134a refrigerants only. For 2023 reporting, this assumption has been updated and due to the materiality of the impact, prior year emissions have been recalculated and a relevant disclosure has been made for this methodology change.

Scope 2

Scope 2 emissions include indirect emissions arising from purchased electricity and purchased heat.

BlackRock reports Scope 2 emissions from purchased electricity using the GHG Protocol dual-reporting methodology, stating figures to reflect both:

- A location-based method that reflects the average emissions intensity of the national electricity grids from which consumption occurs; and
- A market-based method that reflects emissions from electricity specific to each supply / contract.

Scope 3

This Report includes upstream Scope 3 emissions as detailed in Exhibit B. Several different approaches are used to calculate Scope 3 emissions for these categories as discussed below. Due to the nature of BlackRock's operations, downstream Scope 3 emissions are not relevant apart from S3C15 discussed in the earlier Exclusions section.

- ***3.1 Purchased Goods and Services, 3.2 Capital Goods, 3.4 Upstream Transportation and Distribution:*** BlackRock utilizes a spend-based approach with emissions being estimated using spend multiplied by either industry- and commodity-level emissions factors or a supplier-specific emissions factor if available. The addition of supplier-specific emissions factors was applied from 2022. BlackRock has not updated prior year emissions for supplier-specific emissions factors as these are not easily available within our emissions measurement application pre-2022.

  In 2023, a reassessment was performed on the spend sources used for data capture which has resulted in some immaterial changes to input data and resulting emissions. No recalculation of prior years has been performed as the change is below the significance threshold per BlackRock's recalculation policy.

Source: BlackRock

CASE STUDIES FOR STEP-BY-STEP GHG REPORT

Step 05: Calculation of GHG emissions and removal

Exhibit A: Scope 1 and 2 GHG Emissions[1]
in metric tons of CO_2 equivalents

	2019	2020	2021	2022	2023	% Change from 2019
Scope 1[2]	6,386	4,090	5,308	6,401	6,689	5%
Scope 2 (Location-based)[3,4]	21,419	18,753	18,041	21,514	23,500	10%
Scope 2 (Market-based)[3,5,6,7]	2,747	1,646	1,611	2,382	1,568	-43%
Total Scope 1 and 2 emissions (Location-based)	27,805	22,843	23,349	27,915	30,189	9%
Total Scope 1 and 2 emissions (Market-based)[5,6]	9,133	5,736	6,919	8,783	8,257	-10%

Exhibit B: Scope 3 GHG Emissions[1]
in metric tons of CO_2 equivalents

	2019	2020	2021	2022	2023	% Change from 2019
1. Purchased Goods & Services	249,356	214,957	241,526	250,345	234,645	-6%
2. Capital Goods[2]	8,015	2,337	29,410	49,097	34,620	332%
3. Fuel- and Energy-Related Activities (Location-Based)[3,4]	7,981	6,760	9,281	11,068	11,109	39%
Fuel- and Energy-Related Activities (Market-Based)[3,4]	3,209	2,400	2,904	4,418	4,262	33%
4. Upstream Transportation & Distribution[5]	1,709	973	1,313	1,450	1,046	-39%
5. Waste Generated in Operations[6]	1,162	379	146	396	556	-52%
6. Business Travel[7,8]	47,246	7,879	3,737	22,194	46,720	-1%
7. Employee Commuting (employee shuttles in India)[9]	1,161	26	30	65	1,619	39%
8. Upstream Leased Assets (Location-Based)[10]	777	928	937	1,223	1,697	118%
Upstream Leased Assets (Market-Based)[11]	0	0	334	647	359	-

Source: BlackRock

5 PRINCIPLES FOR
Accounting and Reporting GHG Emissions

RELEVANCE	Ensure the GHG inventory appropriately reflects the GHG emissions of the company and serves the decision-making needs of users – both internal and external to the company.
COMPLETENESS	Account for and report on all GHG emission sources and activities within the chosen inventory boundary. Disclose and justify any specific exclusions.
CONSISTENCY	Use consistent methodologies to allow for meaningful comparisons of emissions over time. Transparently document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series.
TRANSPARENCY	Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.
ACCURACY	Ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the integrity of the reported information.

Source: WWF, HSBC

Understand the production process and all the emission sources

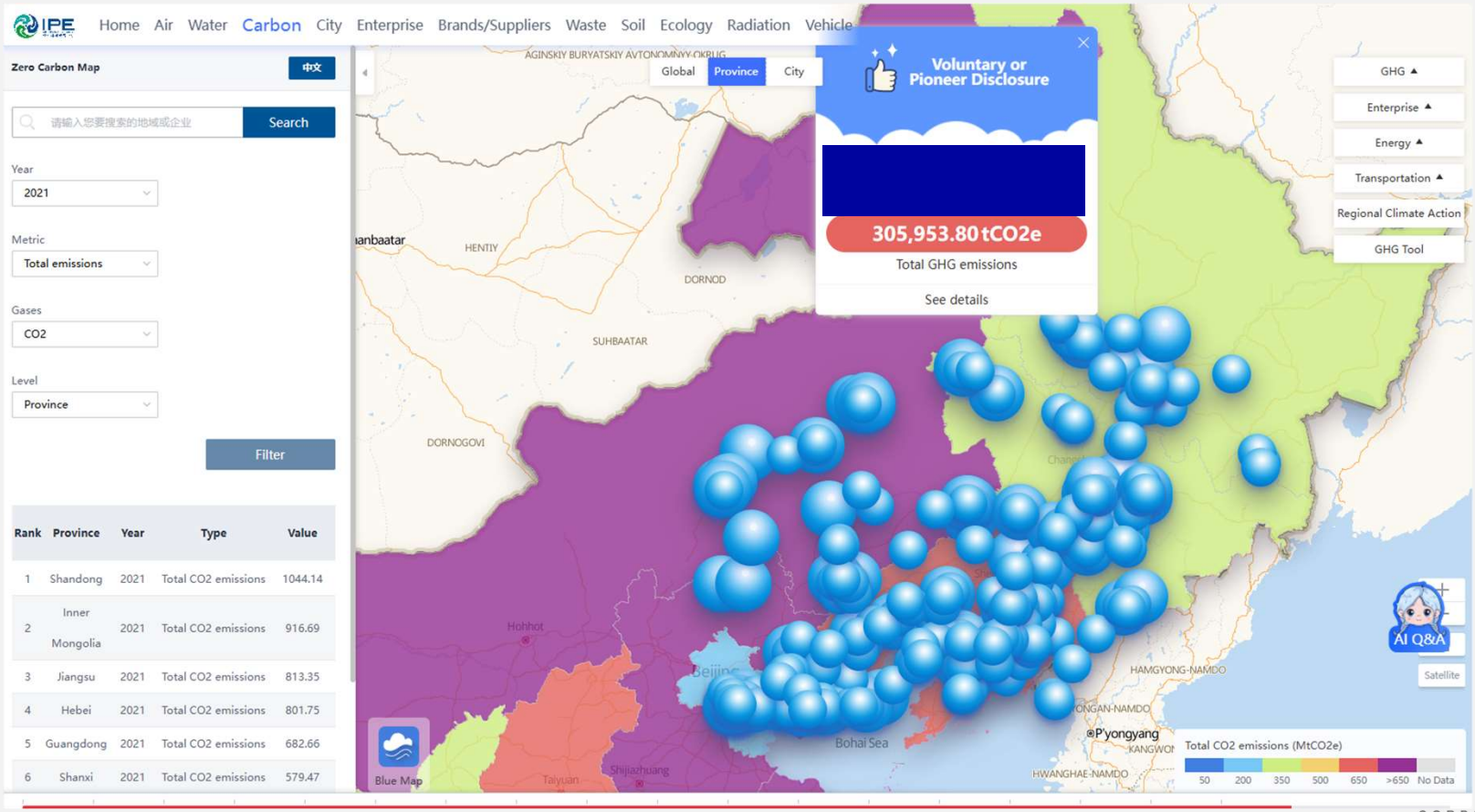
State the scope and organisational boundary

Changes of scope and omission of data should be clearly mentioned with reasons

Assumptions behind and methodologies needed to be disclosed

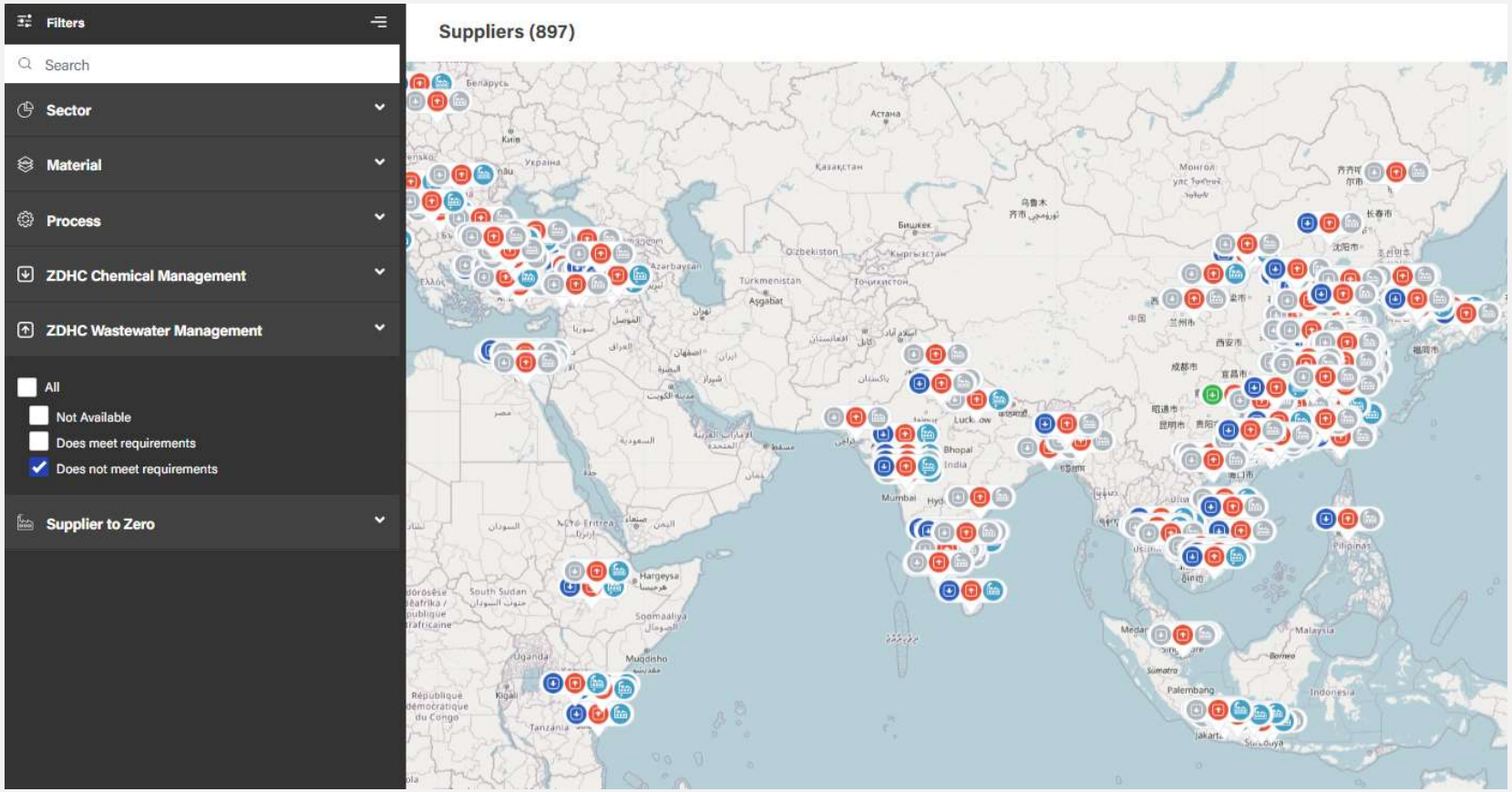
Consider accredited 3rd party verifier

TRANSPARENCY BOOST



Source: IPE

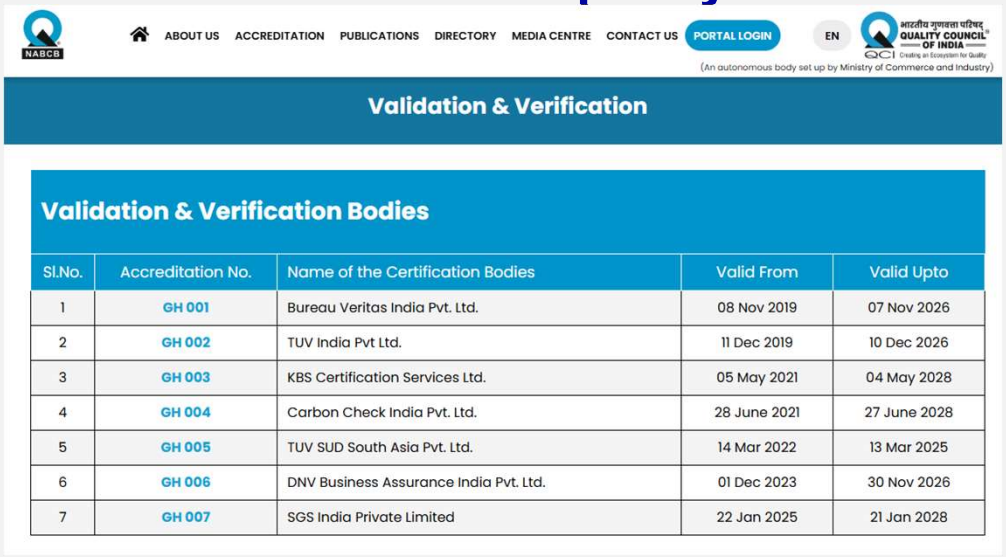
TRANSPARENCY BOOST



Source: ZDHC

OPPORTUNITIES TO TIC INDUSTRY

To ensure the data quality



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भारतीय गुणवत्ता परिषद् QUALITY COUNCIL OF INDIA

(An autonomous body set up by Ministry of Commerce and Industry)

Validation & Verification

Validation & Verification Bodies

Sl.No.	Accreditation No.	Name of the Certification Bodies	Valid From	Valid Upto
1	GH 001	Bureau Veritas India Pvt. Ltd.	08 Nov 2019	07 Nov 2026
2	GH 002	TUV India Pvt Ltd.	11 Dec 2019	10 Dec 2026
3	GH 003	KBS Certification Services Ltd.	05 May 2021	04 May 2028
4	GH 004	Carbon Check India Pvt. Ltd.	28 June 2021	27 June 2028
5	GH 005	TUV SUD South Asia Pvt. Ltd.	14 Mar 2022	13 Mar 2025
6	GH 006	DNV Business Assurance India Pvt. Ltd.	01 Dec 2023	30 Nov 2026
7	GH 007	SGS India Private Limited	22 Jan 2025	21 Jan 2028

Source: NABCB, India

Find the List of Governmental Accreditation 3rd party

Qualified Verification Bodies

A. Approved verification items by the Ministry of Environment of the Executive Yuan

According to the Greenhouse Gas Accreditation and Verification Bodies Management Regulations promulgated on January 7, 2016, the qualifications of greenhouse gas verification projects are divided into two categories: organizational verification (Category A verification) and project-type verification (Category B verification). The organizational verification is applicable to voluntary and mandatory greenhouse gas emissions measurements or greenhouse gas reduction data verification while the project-type verification is applicable to the verification of project plans, greenhouse gas reduction data verification or important evaluations for offset projects.

Currently, seven verification bodies have obtained permits approved by the Ministry of Environment of the Executive Yuan for the verification of a total of 26 greenhouse gas verification items (20 organizational and 6 project-type verifications).

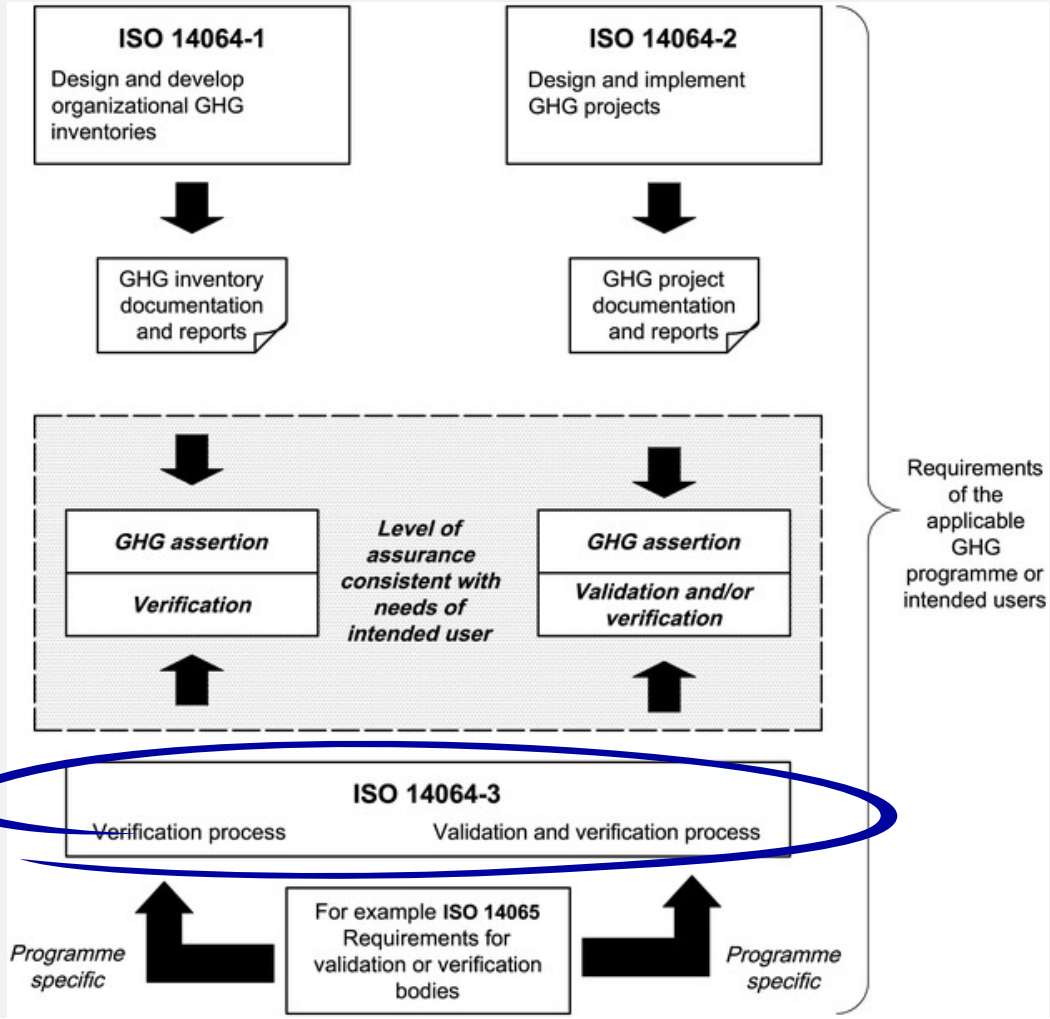
B. Basic information of verification bodies

Name and abbreviation of the accreditation body	Contact information
Bureau Veritas Taiwan BV	Website : Taiwan - Bureau Veritas
DNV Business Assurance Co., Ltd. DNV	Website : DNV
Hong Kong BSI Pacific Limited Taiwan Branch BSI	Website : Hong Kong BSI Pacific Limited Taiwan Branch
Lloyd's Register Quality Assurance LRQA	Website : LRQA
SGS Taiwan Ltd SGS	Website : SGS Taiwan Ltd
AFNOR Asia Ltd AFNOR	Website : AFNOR Asia Ltd
TUV Rheinland TUVRh	Website : TUV Rheinland

Source: Ministry of Environment, Taiwan

OPPORTUNITIES TO TIC INDUSTRY

Verification standard



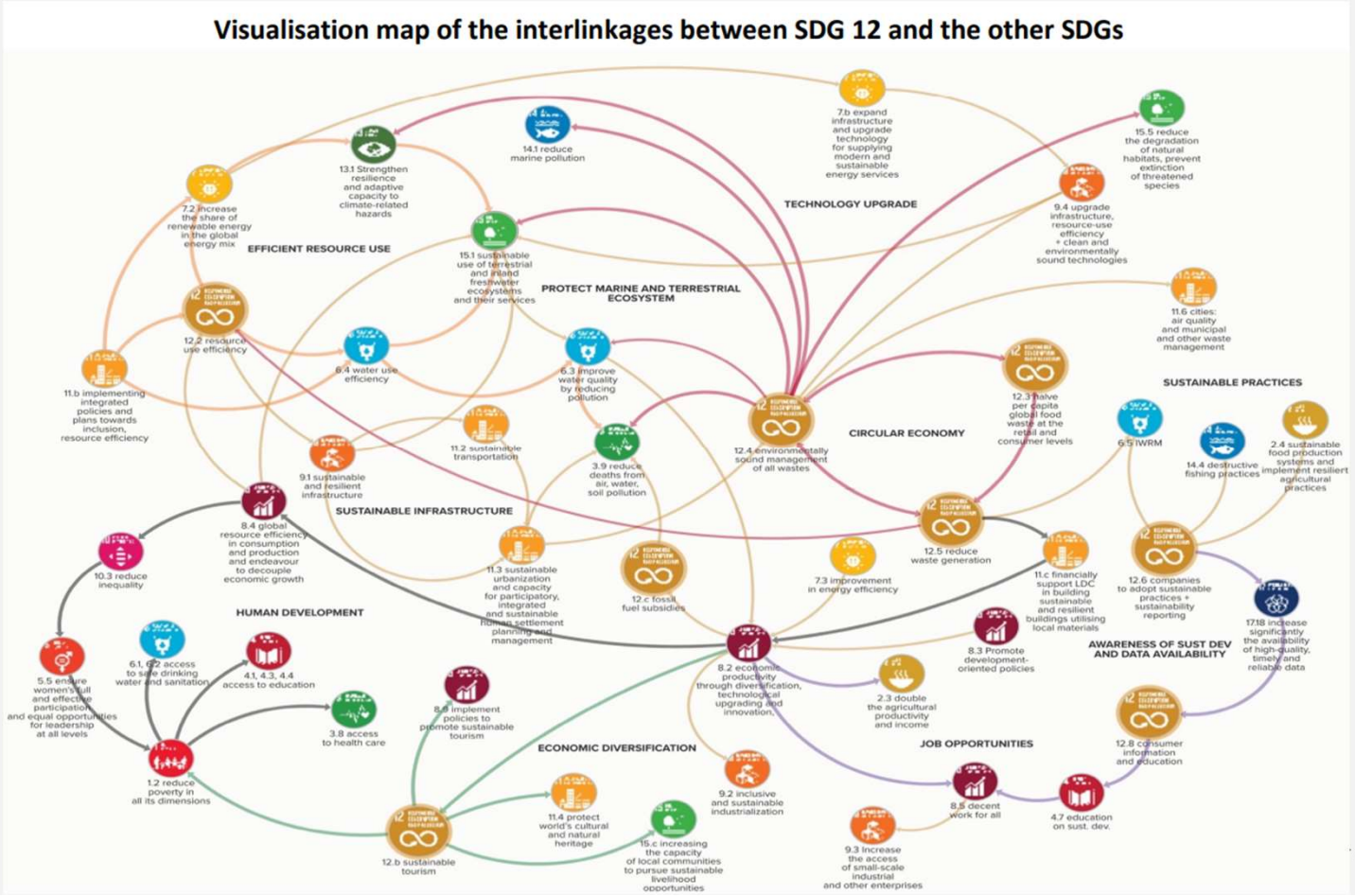
Source: ISO

PRACTICAL USE CASES

Everything is based on a robust GHG

Use cases	Description	Examples
Scenario Analysis	Banks modeling impacts of 2°C Vs 4°C world on loan books	HSBC (LON:HSBA) modelling credit losses from climate risks have been modelled under different scenario Source: HSBC
Target Setting	Brands using SBTi to guide their decarbonization plans	Adidas (FRA:ADS) set out key initiatives (e.g. powering up renewable, material innovation, phase out coal, etc) Source: Adidas
Carbon Markets	Companies Selling/buying offsets aligned with GHG Protocol	Tesla (NAS:TSLA) earns tradable credits in the operation of business under various regulations related to zero-emission vehicles (“ZEVs”), greenhouse gas, fuel economy and clean fuel Source: Tesla
Strategy Planning	Utilities modelling emissions and diversify different fuel mixes	CLP (HKG:2) is working towards adopting a greener mix of greater amount of nuclear power, as well as renewable energy and zero-carbon hydrogen Source: CLP

WIN FOR EVERYONE



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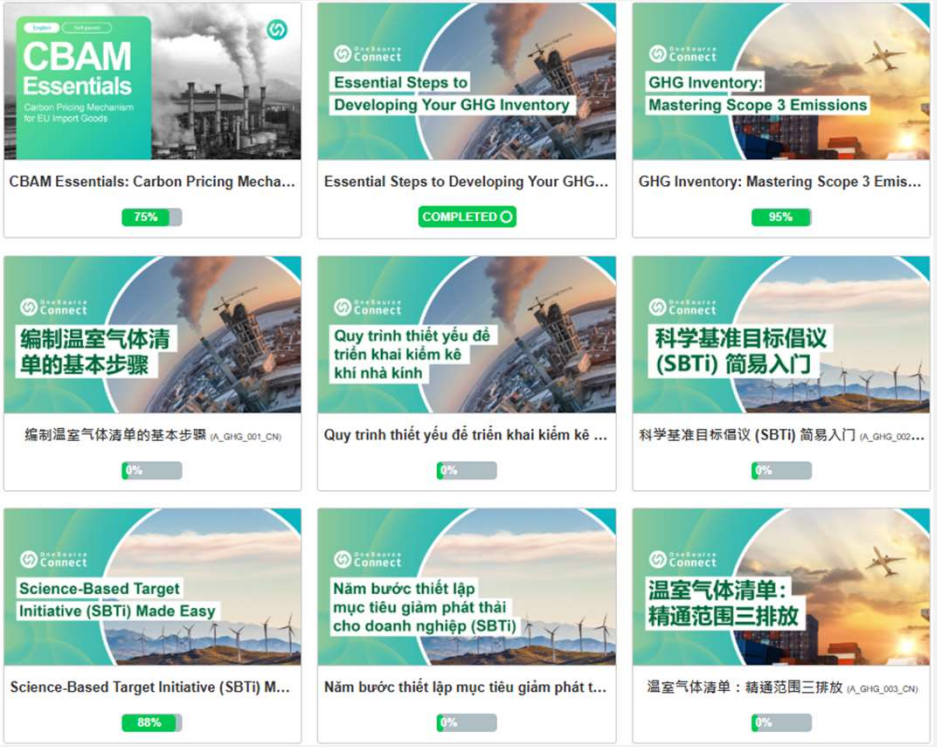
SCAN ME

BV Academy courses



Link: BV Academy

BUREAU
VERITAS

Shaping a World of Trust