



# GHG Emission Reporting Practical Guide -1



#### Danushka Prabhad

Net Zero | LCA | EPD | ESG | Carbon Footprint | Ecovadis | GHG Protocol | ISO 14064 | GRI | SASB | SBTi | TCFD | CSR



#### Pre-Industrial Era vs. Now

Before the industrial revolution, Earth's climate was largely regulated by natural cycles. But with rapid industrialization, human activities started emitting large amounts of greenhouse gases (GHGs), leading to rising global temperatures.

#### Then





#### Now



#### **Greenhouse Effect?**

The greenhouse effect refers to the trapping of heat by transparent surfaces, promoting warmth and temperature elevation inside.







## Greenhouse Gases (GHGs)

Certain gases in the atmosphere, act as greenhouse gases, not allowing heat radiation to leave.

Examples -

- Carbon Dioxide
- Methane
- Nitrous Oxide
- Chlorofluorocarbons
- Hydrofluorocarbons
- Perfluorocarbons





#### Human-induced emissions

These are human-made emissions resulting from burning fossil fuels, deforestation, and industrial processes. Unlike natural emissions (like volcanoes), these are accelerating climate change at an unprecedented rate.



The average global temperature has increased by **1.4°C** since pre-industrial times.



### Global Warming Potentials (GWPs)

Not all GHGs have the same impact. Some gases are more effective than others at making the planet warmer

Gas	GWPs
Carbon dioxide (CO <sub>2</sub> )	1
Methane (CH <sub>4</sub> )	28
Nitrous Oxide (N <sub>2</sub> 0)	265
HFC -23	12,400
HFC -134a	1,300
SF <sub>6</sub>	23500

Ref - IPCC 5th assessment report

#### Example:-

1Kg Of Methane (CH <sub>4</sub> )	= 28 Kg CO <sub>2</sub> e
1Kg Of Nitrous Oxide (N <sub>2</sub> O)	= 265 Kg CO <sub>2</sub> e
1Kg Of HFC -23	= 12 400 Kg CO <sub>2</sub> e
1Kg Of HFC -134a	= 1300 Kg CO <sub>2</sub> e
1Kg Of SF <sub>6</sub>	= 23 500Kg CO <sub>2</sub> e



#### **Global Warming & Its Effects**



**Climate Change** 





**Glacier melting** 







#### **Corporate GHG Reporting Standards**







WORLD Resources Institute



By



#### **GHG Protocol Standard** Emission Scopes

GHG Protocol Standard is the most widely used GHG accounting and reporting Standard.

- 1. Scope 1: Direct emissions from company-controlled sources.
- 2. Scope 2: Indirect emissions from purchased Energy
- 3. Scope 3: Indirect emissions from value chain activities





### **Scope 1 Emission**

Direct GHG emissions from sources that are owned or controlled by the organization.

These emissions occur from activities directly within the operational boundary of the company.

Eg-

- Stationary Combustion: Fuel burned in boilers, furnaces, or generators at company facilities.
- **Mobile Combustion**: Emissions from company-owned or controlled vehicles (e.g., delivery trucks, fleet cars).
- **Process Emissions:** Emissions from chemical or industrial processes (e.g., cement manufacturing, steel production).
- Fugitive Emissions: Leaks from refrigeration systems, air conditioning units, or industrial gases.





### **Scope 2 Emission**

Indirect GHG emissions from the generation of purchased energy that is consumed by the organization. These emissions occur at the source of energy production, not within the organization's operational boundaries.

Eg:-

- **Purchased Electricity**: Emissions from electricity used to power office buildings, factories, or operations.
- **Purchased Steam**: Emissions from steam acquired for heating or industrial processes.





### **Scope 3 Emission**

Indirect GHG emissions resulting from activities in the organization's value chain, both upstream and downstream, which are not **owned** or **controlled** by the organization.

Scope 3 emissions often represent the largest portion of an organization's total carbon footprint.





#### **Scope 3 Emission - 15 Categories**

Category	Description	Example
1. Purchased Goods and Services	Emissions from producing goods and services acquired by the organization.	Emissions from manufacturing raw materials used in production.
2. Capital Goods	Emissions from producing long-term assets like buildings and machinery.	Emissions from constructing a new manufacturing facility.
3. Fuel- and Energy-Related Activities	Emissions related to fuel and energy production not included in Scope 1 or 2.	Emissions from extracting and refining fuels consumed by the organization.
4. Upstream Transportation and Distribution	Emissions from transporting and distributing products purchased by the organization.	Emissions from shipping raw materials to the organization's facilities.
5. Waste Generated in Operations	Emissions from disposing of waste produced during operations.	Emissions from treating and disposing of manufacturing waste.
6. Business Travel	Emissions from employee travel for business purposes.	Emissions from flights, car rentals, and hotel stays during business trips.
7. Employee Commuting	Emissions from employees traveling to and from work.	Emissions from employees driving personal vehicles to the office.



Category	Description	Example
8. Upstream Leased Assets	Emissions from operating leased assets not included in Scope 1 and 2.	Emissions from operating leased office spaces.
9. Downstream Transportation and Distribution	Emissions from transporting and distributing sold products.	Emissions from delivering products to customers.
10. Processing of Sold Products	Emissions from processing products sold by the organization.	Emissions from a customer processing purchased raw materials.
11. Use of Sold Products	Emissions from using products sold by the organization.	Emissions from fuel combustion in vehicles sold by the company.
12. End-of-Life Treatment of Sold Products	Emissions from disposing of products sold by the organization at the end of their life cycle.	Emissions from landfill disposal of packaging materials.
13. Downstream Leased Assets	Emissions from operating assets owned by the organization and leased to others.	Emissions from energy use in buildings leased to tenants.
14. Franchises	Emissions from franchise operations not directly controlled by the organization.	Emissions from energy consumption in franchised retail stores.
15. Investments	Emissions from investments made by the organization.	Emissions from projects financed by the company's investments.



#### Test your knowledge

Identify the appropriate emission scopes (Scope 1, 2, 3) for the following emission sources. (Answers are provided on the next page.)

- 1. Natural gas used to operate a boiler in a chemical plant
- 2. Electricity purchased to power machinery in an automotive manufacturing plant
- 3. Emissions from transporting raw materials to a cement factory by a third-party logistics provider
- 4. Leakages of refrigerant gases from air conditioning systems in a retail store
- 5. Diesel fuel consumption by company-owned excavators on a construction site
- 6. Business travel by employees of a consultancy firm via commercial airlines
- 7. Waste generated from a food processing plant that is sent to an incineration facility
- 8. Emissions from forklifts operating inside a warehouse
- 9. Energy consumption from district heating purchased by a pharmaceutical company
- 10. Fuel used by subcontractors to deliver finished goods to customers



#### Test your knowledge

Identify the appropriate emission scopes (Scope 1, 2, or 3) for the following emission sources. (Answers are provided on the next page.)

- Natural gas used to operate a boiler in a chemical plant - Scope 1
- 2. Electricity purchased to power machinery in an automotive manufacturing plant- Scope 2
- 3. Emissions from transporting raw materials to a cement factory by a third-party logistics provider - Scope 3
- 4. Leakages of refrigerant gases from air conditioning systems in a retail store Scope 1
- 5. Diesel fuel consumption by company-owned excavators on a construction site Scope 1
- 6. Business travel by employees of a consultancy firm via commercial airlines Scope 3
- 7. Waste generated from a food processing plant that is sent to an incineration facility Scope 3
- 8. Emissions from forklifts operating inside a warehouse Scope 1
- 9. Energy consumption from district heating purchased by a pharmaceutical company -Scope 2
- 10. Fuel used by subcontractors to deliver finished goods to customers Scope 3



## **Please wait for**



To learn how to perform real-life GHG emission calculations with practical example.



#### Follow for More Insights



#### Need expert help with sustainability?



## dan@vestingrow.ae

## www.vestingrow.com

#### Danushka **Prabhad**

Net Zero Advisory and EPD Expert

dan@vestingrow.ae
+971 50 253 5594



#### VestinGrow Rethink . Grow . Sustain

Strategic ESG Partner Transforming environmental, social, and governance challenges into triple bottom line advantages through collaborative innovation, expert guidance and implementation. Enabling organizations across MENA to build a more sustainable, equitable future through measurable impact

Dubai World Trade Centre, UAE WWW.Vestingrow.com

