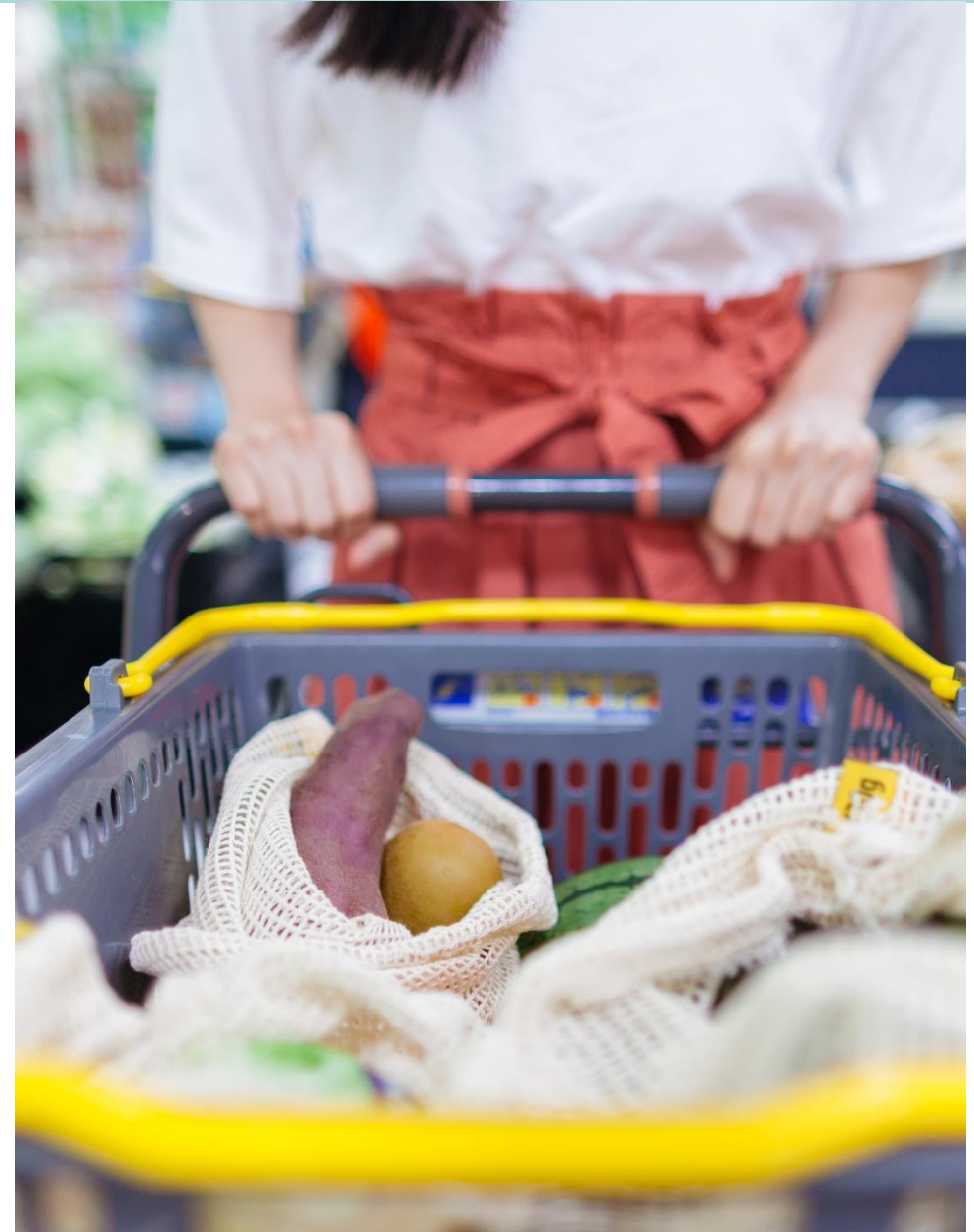


Introduction to GHG Accounting

Content

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2. How to Get Started
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 - Identifying and Calculating GHG Emissions
3. What to Do With Your GHG Inventory
 - Developing and Inventory Management Plan (IMP)
 - Setting Goals and Targets
 - Abatement Planning



GHG Accounting Overview

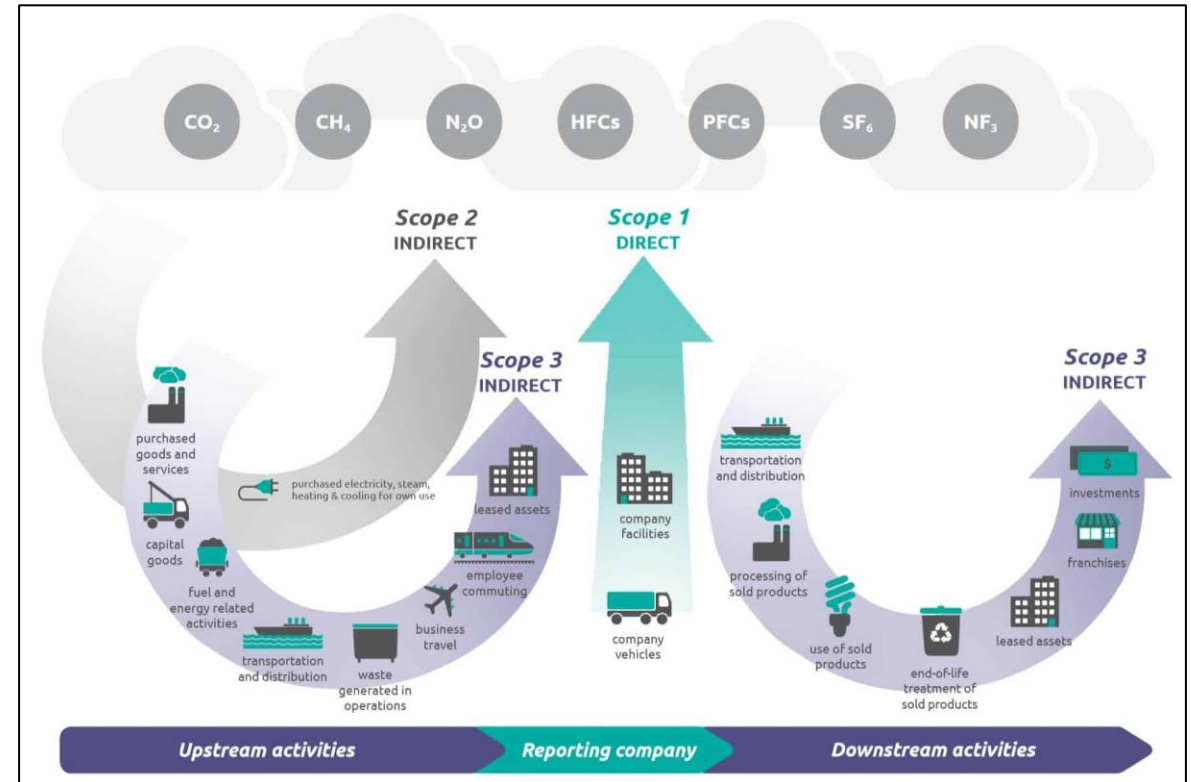
Defining GHG Emissions

The GHG Protocol is a global accounting standard that establishes standardized frameworks to measure greenhouse gas (GHG) emissions. Emissions can be broken down into Scopes 1, 2, and 3.

- **Scope 1** - direct emissions that occur from sources that are controlled or owned by a company.
- **Scope 2 and 3** - indirect emissions that occur due to company operations, but at sources that are controlled or owned by a different organization.

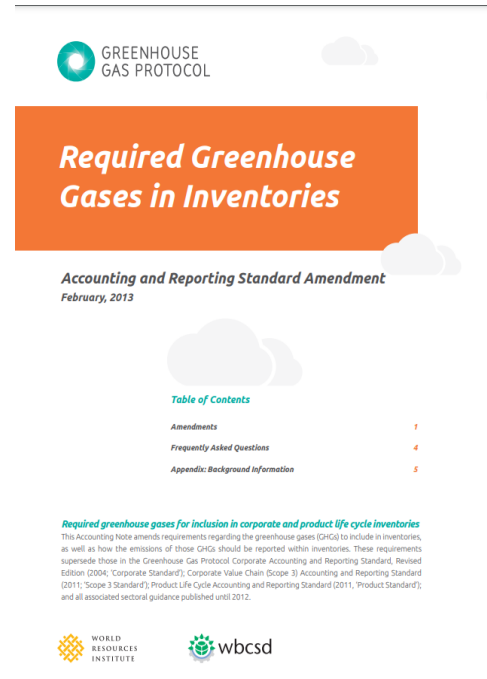
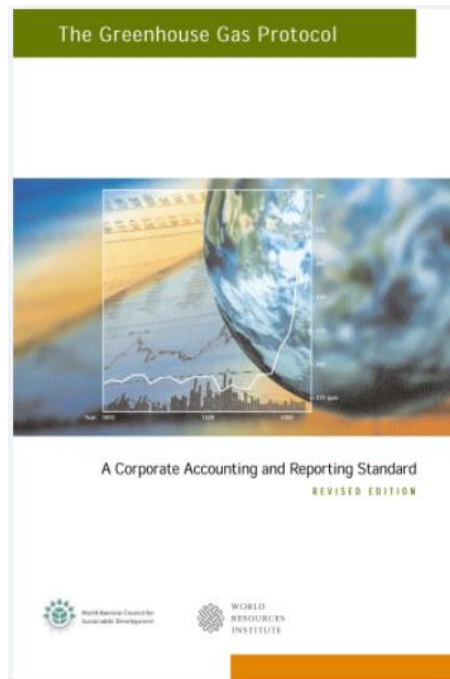
Why measure GHG Emissions?

- Managing GHG risks and identifying reduction opportunities
- Participating in voluntary or mandatory GHG programs
- Participating in GHG markets
- Achieving recognition for early voluntary action

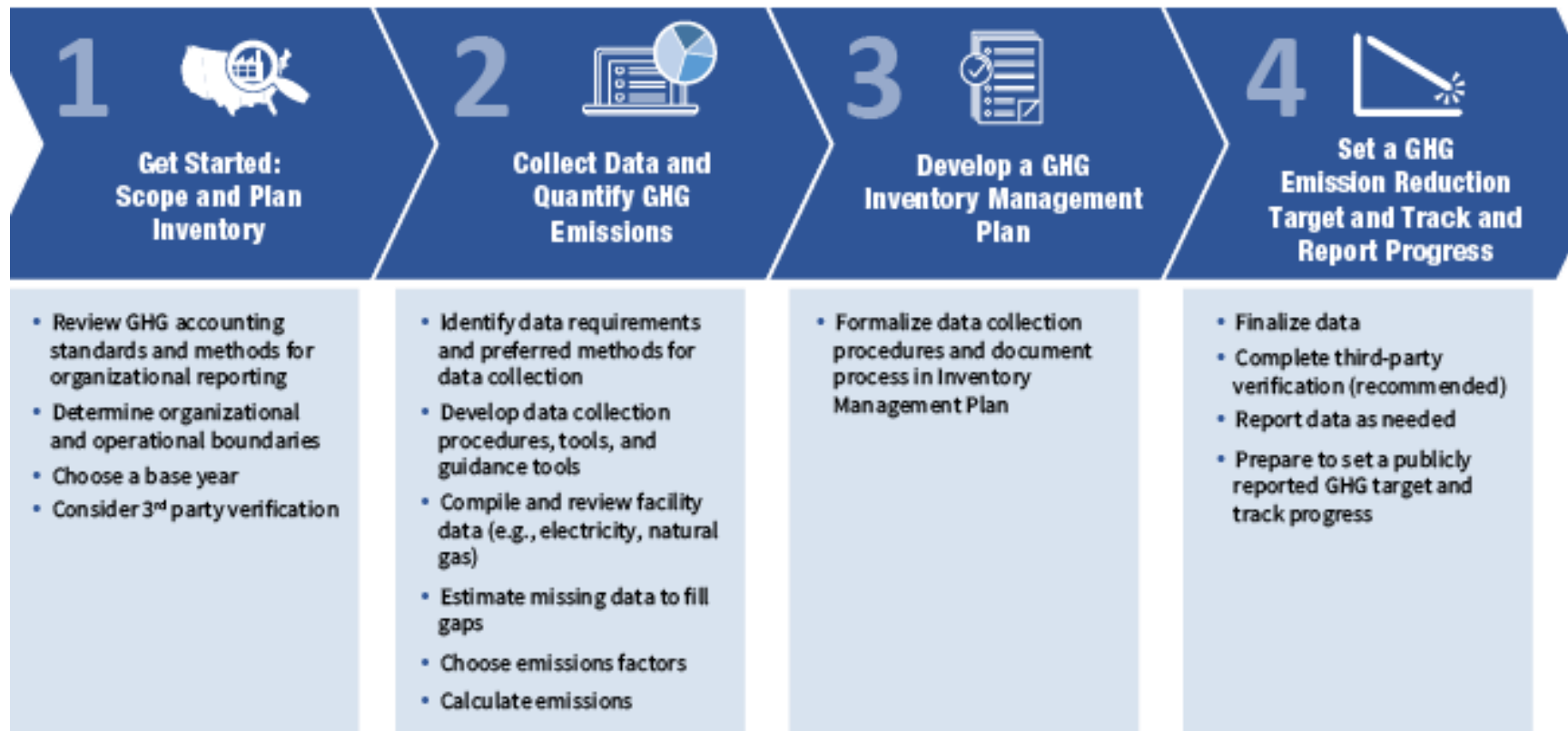


GHG Protocol: Suggested Documents

The Greenhouse Gas Protocol provides the world's most widely used greenhouse gas accounting standards for companies. The protocol is free to [access online](#).



GHG Inventory Process Overview



The full process of conducting a GHG Inventory includes the four steps outlined at the left.

How To Get Started (Steps 1 & 2)

Setting Organizational Boundaries

To accurately report on GHG emissions, a company must first define its organizational boundaries to help determine their direct carbon footprint.

Organizational Boundary Approaches

Equity Share Approach

- Account for GHG emissions from operations according to share of equity in the operation

Control Approach

- Accounts for 100% GHG emissions from operations over which it has control and excludes GHG emissions from operations in which it owns an interest but has no control

Control can be Financial OR Operational

- Financial** – ability to direct the financial and operating policies of the operations with a view to gaining economic benefits from its activities
- Operational** – full authority to introduce and implement its operating policies at the operation

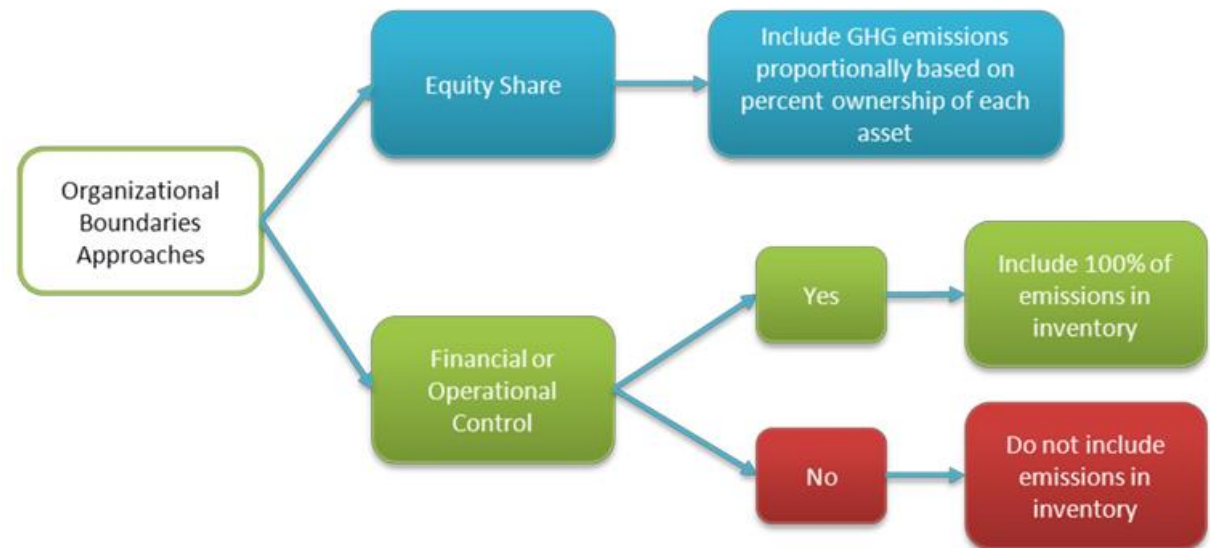


Figure 1 . Determining Organizational Boundaries

Setting Operational Boundaries

To accurately report on GHG emissions, a company must also define its operational boundaries to look at everything where the company or one of its subsidiaries has authority to create and apply operating policies.

Operational Boundary Categories

Scope 1 – Direct: Fuel consumption and Company-owned vehicles

Scope 2 – Indirect: Purchased electricity for own use

Scope 3 – Indirect: Production of purchased materials, Product use, Outsourced activity, Contractor-owned vehicles, Employee business travel

Identifying and Calculating GHG Emissions

Many free GHG Protocol
tools to use

Lots of GHG emissions
calculation and accounting
software

1. Identify sources
2. Select calculation approach
3. Collect data and choose emission factors
4. Apply calculation tools
5. Roll-up GHG emissions data to corporate level
6. Quality check

What to Do With Your GHG Inventory (Steps 3 & 4)

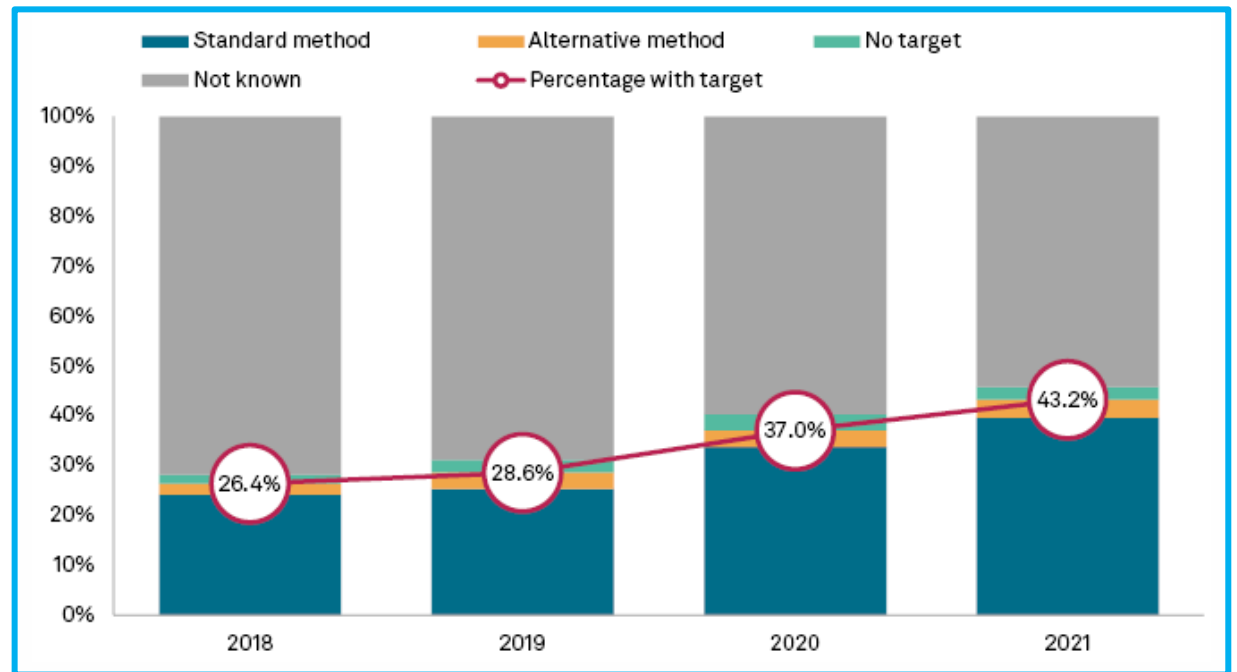
Setting GHG Reduction Targets

After calculating emissions, it is best practice to set and disclose reduction targets. Below are some key things to consider when setting a target and a view of current practices in the real estate sector.

Key considerations

- What kind of targets are peers setting?
- What kind of targets are corporate customers setting?
- What is material to operations?
- Where does reducing emissions mitigate risk?
- What is impactful to wider industry or global initiatives?
- What is viewed favorably by stakeholders?
- What is generally accepted as best practice?

Real Estate Emission Reduction Targets, by year



Source: "More real estate firms are embracing climate targets," S&P Global, 8/16/22

Note: Standard method = absolute or intensity target

Alternative method = other methods (e.g. energy productivity, land use, supplier engagement)

Understanding Science-Based Targets (SBTs)

The Science Based Target initiative (SBTi) provides a standardized way of setting targets aligned with the Paris Agreement. SBTs require a reduction of GHG emissions to an organization’s scientifically calculated share of gross emissions under the 1.5°C or 2°C scenario by 2050.

Steps in the SBTi Process



SBTi target-setting methods



TARGET SETTING APPROACH	SCOPE 1 AND 2	SCOPE 3
Absolute reduction	X	X
Physical intensity reduction	X	X
Economic intensity reduction		X
Supplier engagement		X

Stakeholders' View of Different Carbon Targets

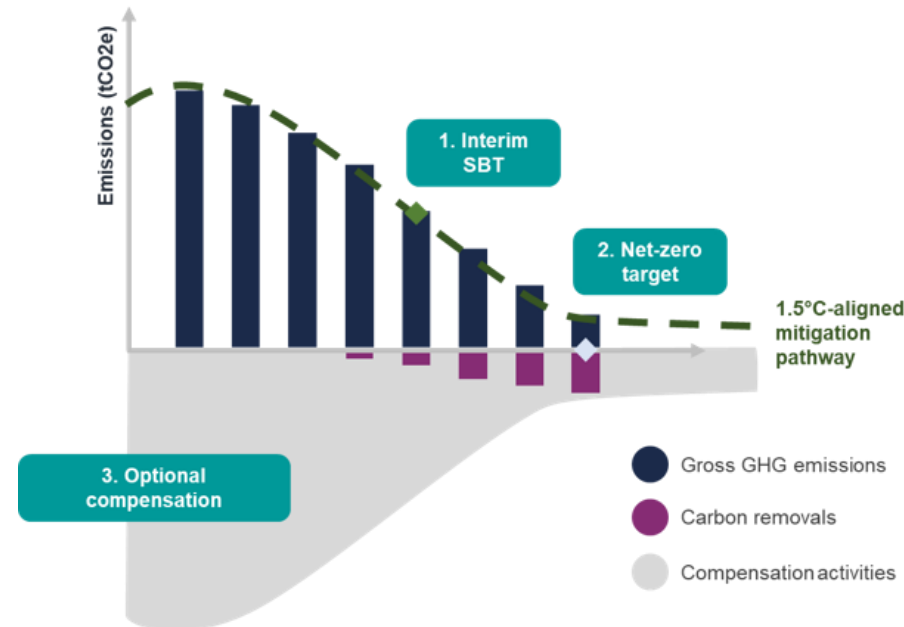
GHG reduction targets vary widely in quality and ambition. Stakeholders will expect targets to progress over time.

	No Activity	Entry-Level	Intermediate	Advanced
Scopes 1 & 2	Does not have a GHG emission reductions target for full scope 1 and 2 emissions	<p>Target that covers all scope 1 and 2 emissions</p> <p>Target can be absolute or intensity-based reduction</p>	<p>Absolute science-based reduction target or intensity-based target that covers all scope 1 and 2 emissions (2°C scenario)</p>	<p>Absolute science-based reduction target or intensity-based target that covers all scope 1 and 2 emissions (well below 2°C or 1.5°C scenario)</p> <p>OR Exceeds this ambition (e.g. Net Zero)</p>
Scope 3	Does not have a scope 3 target	<p>Reduction target and/or supplier engagement target for at least one relevant scope 3 category</p>	<p>Reduction target and/or supplier engagement target for more than two relevant scope 3 categories</p>	<p>Reduction science-based target and/or supplier engagement target covers at least two-thirds of its total scope 3 emissions (2°C scenario)</p>

Beyond Targets – Setting the Stage for Emissions Abatement

An extension of climate neutral requires all emissions as close to zero as possible across the entire supply chain

- GHG emissions are balanced or offset resulting in a Net Zero emissions
- General practice: Scope 1 & 2 emissions are included in the net with Scope 3 optional
- Companies have flexibility to develop Net Zero or Carbon Neutral targets appropriate to the business
- Voluntary, independent 3rd party certifications can validate targets to earn greater credibility



CARBON Neutral – Balancing CO₂ emissions released with those removed; eg, finding an equivalent amount of carbon savings elsewhere

CLIMATE Neutral – Neutral across **CARBON** + *all other GHG emissions*

Emissions of the Real Estate and Retail Industries

The real estate sector produces 40% of global emissions, the main sources being building energy and water use. The landlord-tenant relationship is critical to finding collaborative ways to implement reductions.

Main sources of emissions include:

- Energy used for heating, cooling, and lighting
- Water consumption and wastewater treatment
- Production of waste and plastics
- Air conditioning and refrigeration
- Land Use

Ways to reduce emissions:

- Green building techniques including energy efficiency improvements and building retrofits
- Energy efficient retrofits and water management programs
- Recycling and waste reduction programs, landfill methane capture programs
- Upgrade air conditioning and refrigeration systems to reduce refrigerant charges
- Minimize conversion of forest land to other land uses, improve management of existing land-use types

Carbon Credits or Offsets

Decarbonizing and reaching reduction targets can be difficult, especially for the real estate industry, where emissions are often out of the control of property owners. Aside from renewable energy and efficiency measures, companies can also purchase carbon credits to offset hard to abate emissions.

Carbon Offsets are:

- Generated by sequestering carbon in the ground by planting trees and improved land management OR by generating electricity from renewable sources
- 1 carbon credit = 1 metric ton of carbon dioxide equivalent removed
- A high-quality carbon offset is **Real, Verifiable, Enforceable, Permanent, Additional**

Google became the first major company to eliminate its carbon legacy “...we have eliminated Google’s entire carbon legacy (covering all our operational emissions before we became carbon neutral in 2007) through the purchase of high-quality carbon offsets. This means that Google's lifetime net carbon footprint is now zero...” (Sept 2020)

Appendix

Terms and Definitions

Terms	Definition
GHG Accounting	A formal system to inventory and audit greenhouse gas (GHG) emissions.
Scope 1 Emissions	GHG emissions that a company is directly responsible for, such as emissions from on-site burning of fossil fuels or emissions from fleet vehicles.
Scope 2 Emissions	GHG emissions from sources that a company owns or controls, such as the generation of electricity, heat, or steam purchased from a utility provider.
Scope 3 Emissions	GHG emissions from sources a company doesn't own or control but are related to your operations, such as employee commuting or contracted solid waste and wastewater disposal.
Net-Zero	Achieving a state in which the activities within the value chain of a company result in no net impact on the climate from greenhouse gas emissions.
Science-based Targets	Science-based targets provide a roadmap for companies to future-proof growth by determining how much to reduce carbon emissions and how quickly the reduction needs to happen.
Decarbonization	The process of reducing 'carbon intensity' and/or eliminating carbon dioxide (and CO2 equivalent) emissions from business processes or other activities.

Greenhouse Gases (GHG)

GHG	Common sources/uses	Global Warming Potential (GWP) over 100 years	Lifetime in Atmosphere in years
Carbon dioxide (CO₂)	burning of fossil fuels for transport or power and chemical reactions like cement manufacturing	1	300-1000
Methane (CH₄)	coal and natural gas production, livestock, landfills	28–36	10
Nitrous oxide (N₂O)	agriculture	265–298	114
Hydrofluorocarbons (HFCs)	refrigerants	high-GWP	270
Perfluorocarbons (PFCs)	aluminum production and semiconductor manufacture	high-GWP	2600-50000
Sulphur hexafluoride (SF₆)	electrical insulator	high-GWP	3200
Nitrogen trifluoride (NF₃)	manufacture of semiconductors, thin film solar cells and flat-panel displays	high-GWP 16800 - 17000	550-740