

# Net Zero Carbon

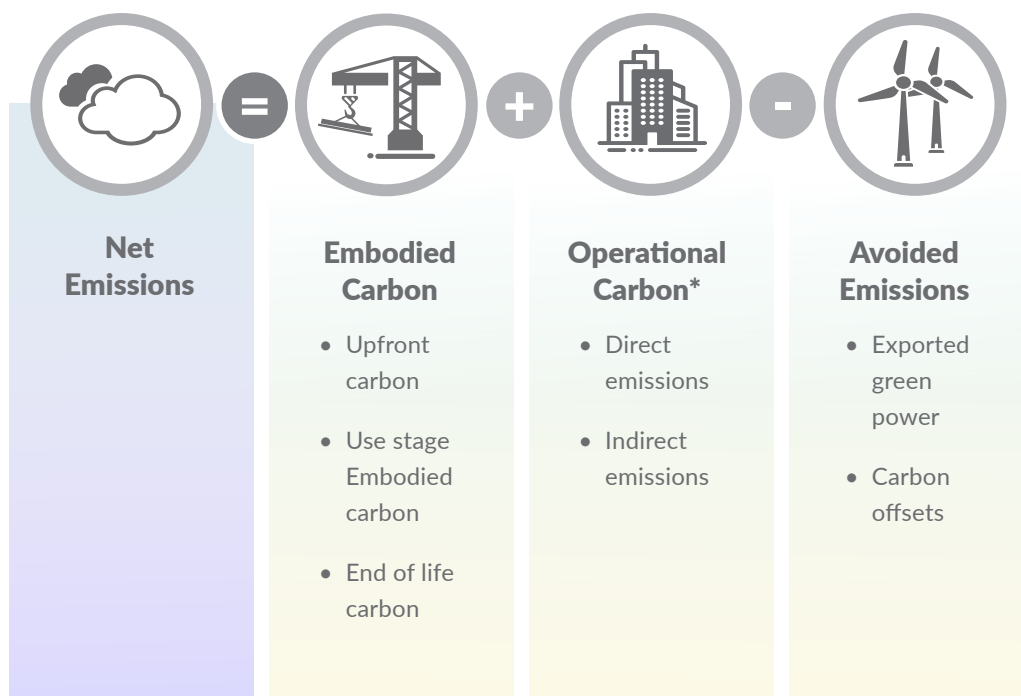
## FUNDAMENTALS

### OVERVIEW

Governments and companies around the world have committed to net zero carbon targets to address climate change. Buildings are the source of approximately a third of GHG emissions globally, and consequently there is growing investor, regulatory, and competitive pressure for the real estate industry to account for, and dramatically reduce these emissions. This Explainer provides an overview of net zero carbon for real estate entities.

### CORE CONCEPT

**Net Zero Carbon** refers to the balance between the amount of carbon emissions produced and avoided by an entity. We reach net zero - in a real estate context - when the GHGs resulting from the development and operation of an asset or portfolio is no more than the avoided emissions.



\*Can be reduced with renewable energy and certain biofuels.  
Source: CAGBC (adapted)

### NET ZERO CARBON DEFINITIONS

**Carbon**  
Unit of consolidated greenhouse gases (CO<sub>2</sub>e or carbon dioxide equivalent) and a more common, simple term for greenhouse gases.

**Embodied Carbon**  
Emissions associated with materials and construction processes throughout the whole life cycle of a building.

**Operational Carbon**  
Emissions associated with the energy and equipment used to operate the building.

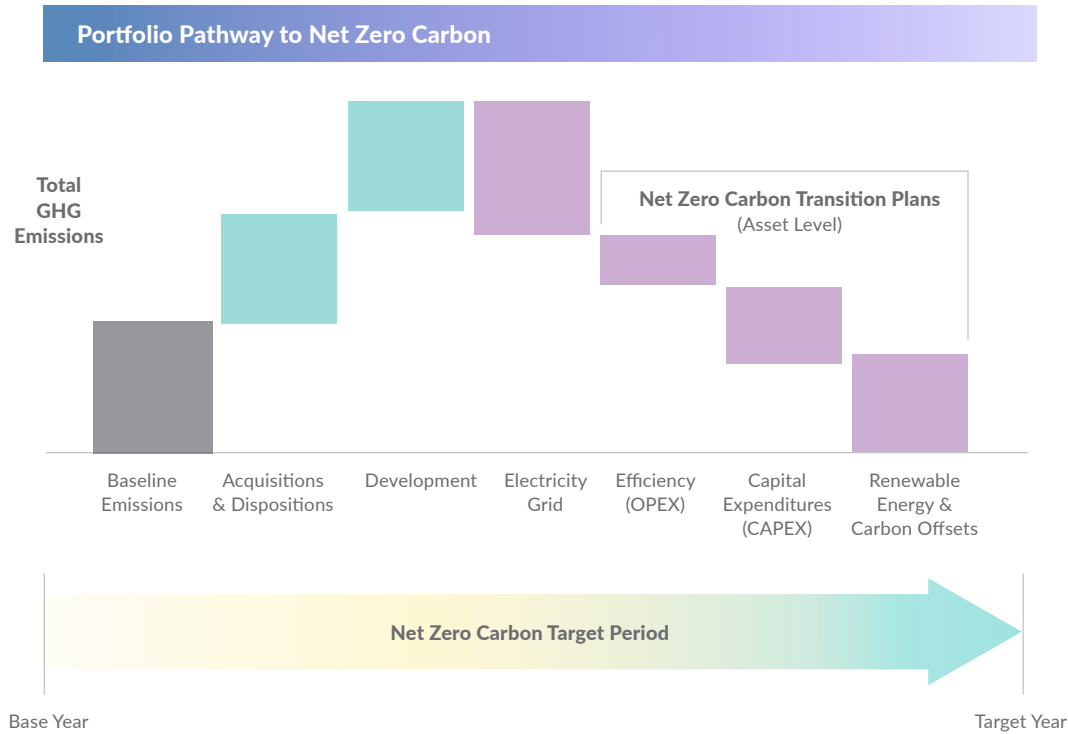
**GHG Inventory**  
A quantified list of an entity's greenhouse gas emissions and sources.

**Greenhouse Gases (GHGs)**  
Six gases listed in the Kyoto Protocol responsible for global warming & climate change.

## NET ZERO CARBON PORTFOLIO EMISSIONS

Real estate owners, investors and asset managers can chart their path to net zero by considering the scope of their activities and GHG emissions over a specified time period.

The focus of portfolio carbon reduction efforts is on whole building emissions and includes both operational and embodied carbon.



### Additional Guidance:

- (1) General – chart is illustrative only; the applicability and magnitude of each component will depend on the entity’s business & activities.
- (2) Baseline Emissions – includes Scope 1, 2 and 3 emissions – as determined by the boundaries set by the entity.
- (3) Acquisitions & Dispositions – net effect of both acquisitions and dispositions on emissions that results in resetting the entity’s baseline emissions.
- (4) Development – net effect of both business as usual and zero carbon development projects; inclusive of embodied and operational carbon – as determined by the boundaries set by the entity.
- (5) Grids – includes reductions in emissions from the trend towards cleaner grids in most jurisdictions (but also considers the impact from grids that get temporarily dirtier as well).
- (6) Efficiency (OPEX) – includes reductions in emissions from recurring, operational energy efficiency projects.
- (7) Capital Expenditures (CAPEX) – includes both typical end of life equipment replacement and strategic low carbon renewal capex investments; represent high impact actions that can drive meaningful carbon reductions.
- (8) Renewable Energy & Carbon Offsets – includes generation of onsite renewable energy, virtually net-metered offsite renewable energy, and annual procurement of zero emission biofuel, offsite renewable energy, and carbon offsets.

## NET ZERO CARBON DEFINITIONS (CONT'D)

### Renewable Energy

A source of energy that is replenished through natural processes or sustainable management policies. Includes solar, wind, geothermal, zero emissions biofuels, and low-impact hydro resources.

### Net Zero Carbon Transition Plan

How a building will adapt over time to reduce operational emissions from building operations in a cost effective manner (\$/kg carbon).

### Renewable Energy Certificates

An authorized electronic or paper representation of the environmental attributes associated with the generation of one MWh of renewable energy.

### Carbon Offsets

A credit for reductions in GHG emissions that occur somewhere else and that can be purchased to compensate for the emissions of a company or project.

## NET ZERO CARBON PORTFOLIO EMISSIONS (cont'd)

<b>STEP 1</b>	Baseline Emissions	Starting operational carbon for your portfolio.
<b>STEP 2</b>	Acquisitions & Dispositions	Determine operational carbon from your acquisitions and dispositions across your portfolio.
<b>STEP 3</b>	Development	Determine operational & embodied carbon from development projects across your portfolio.
<b>STEP 4</b>	Electricity Grids	Determine operational carbon reductions (or increases) from future electricity grid factors.

### Net Zero Carbon – Transition Plans (Asset Level)

<b>STEP 5</b>	Efficiency (OPEX)	Determine operational carbon reductions from annual energy efficiency actions across your portfolio.
<b>STEP 6</b>	Capital Expenditures (CAPEX)	Determine operational carbon reductions from periodic low carbon capital investments across your portfolio (e.g. fuel switching).
<b>STEP 7</b>	Renewable Energy & Carbon Offsets	Determine emission reductions from onsite renewable energy generation, virtually net-metered renewable energy, and/or the annual procurement of zero emission biofuels, offsite renewable energy, and carbon offsets.

**Notes:** (1) Steps are illustrative only and not sequential; (2) Actions would typically occur in parallel by different teams across entities; (3) Applicability of steps depends on an entity’s business and activities.

## METRICS & REPORTING

There are two core GHG emissions performance metrics as follows:

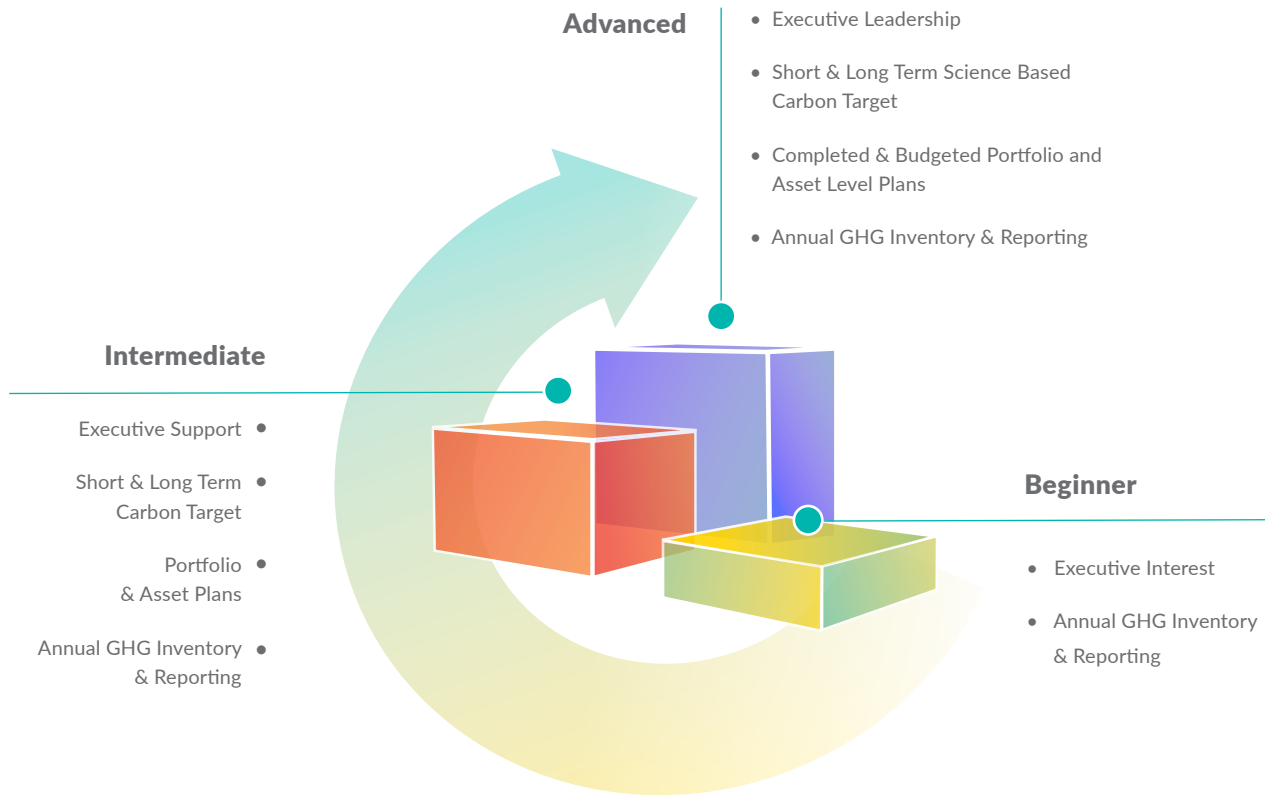
<b>Absolute</b>	Total GHG emissions, in kg/tons of carbon dioxide equivalent (CO <sub>2</sub> e).
<b>Intensity</b>	Absolute GHG emissions divided by square footage (CO <sub>2</sub> e/sqf.)

Real estate entities typically report on their portfolio GHG emissions performance in one or more of the following ways:



## PERFORMANCE SPECTRUM

A credible Net Zero Carbon approach requires executive support, targets, plans, and disciplined reporting. “Beginner”, “Intermediate” and “Advanced” performance levels are summarized below.



## KEY REFERENCES



A legally binding international treaty on climate change with a goal to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels.



The Science Based Targets initiative (SBTi) provides a framework for the private sector to set emissions reduction targets that are aligned with the Paris Agreement.



The CAGBC ZCB-Performance Standard is used to demonstrate that a building has achieved net zero carbon operations.

The CAGBC ZCB – Design Standard guides the design of new buildings and the retrofit of existing ones so they can achieve net zero carbon operations.



The Carbon Risk Real Estate Monitor (CRREM) initiative has derived decarbonization pathways that translate the ambitions of the Paris Agreement into regionally- and property-type-specific trajectories against which real estate assets and portfolios can benchmark themselves.