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GHG PROTOCOL MITIGATION GOAL STANDARD

AN ACCOUNTING AND REPORTING STANDARD FOR NATIONAL AND SUBNATIONAL GREENHOUSE GAS REDUCTION GOALS

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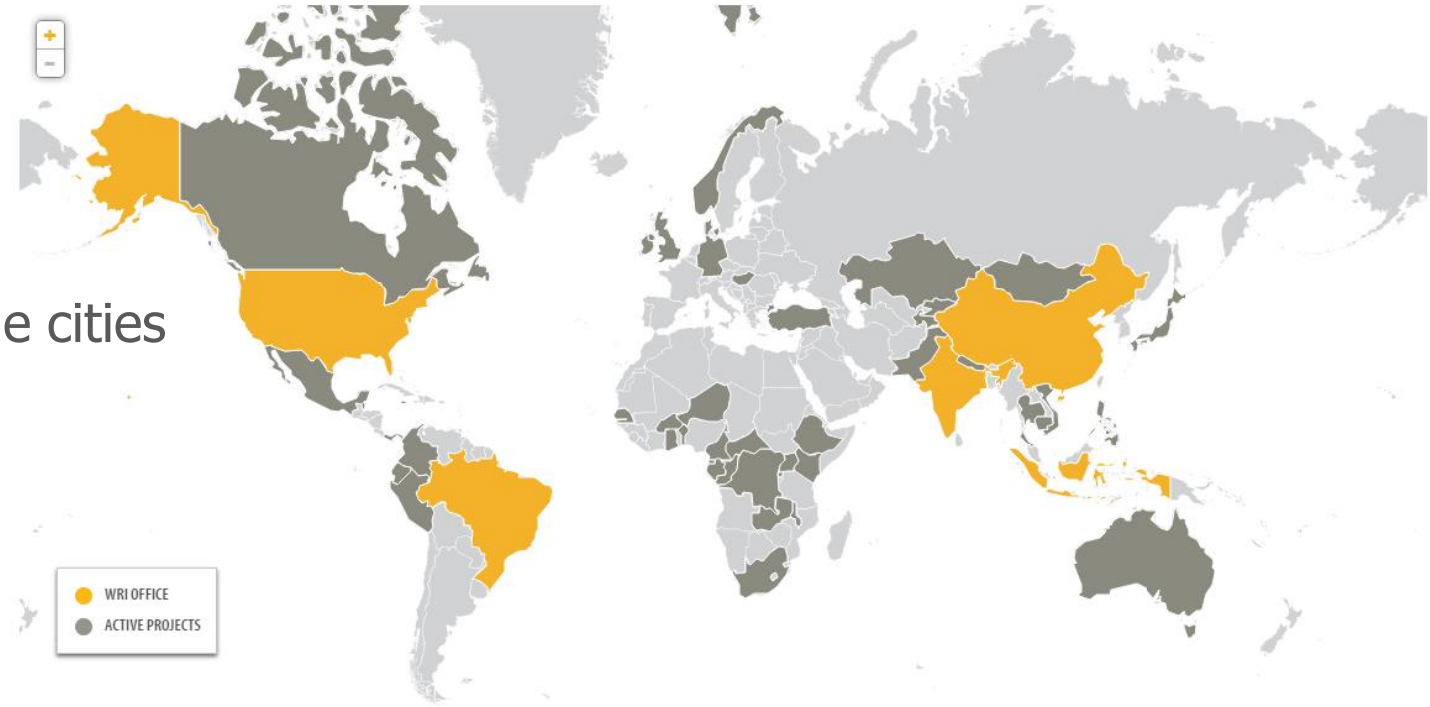
About WRI

- 450+ staff
- Issue areas:
  - Climate
  - Energy
  - Food
  - Forests
  - Water
  - Sustainable cities



About the Greenhouse Gas Protocol

- The GHG Protocol sets the global standard for how to measure, manage, and report greenhouse gas emissions
- Convened in 1998 by WRI and WBCSD
- Provides:
  - Greenhouse gas accounting and reporting standards
  - Sector guidance
  - Calculation tools
  - Trainings (webinar, e-learning and in-person training)
- Standards and tools available free of charge at www.ghgprotocol.org

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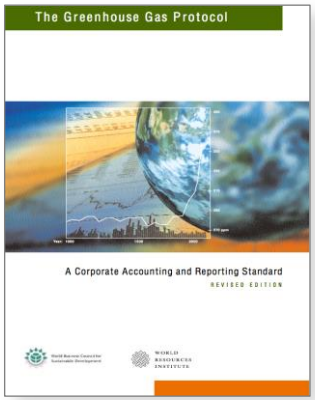
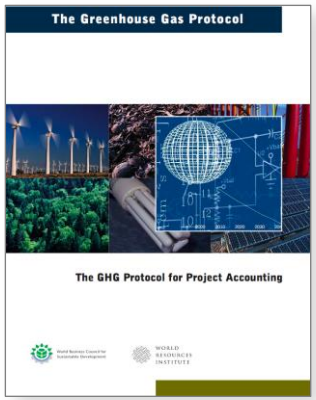
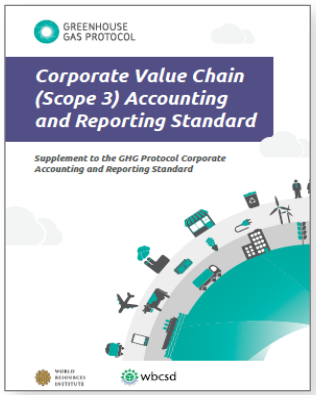
Greenhouse Gas Protocol standards



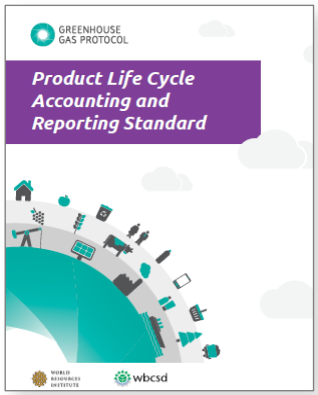
Corporate Standard



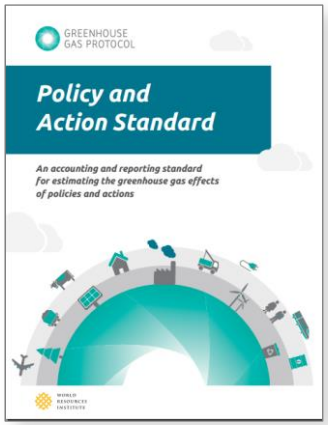
Project Protocol



Corporate Value Chain (Scope 3) Standard

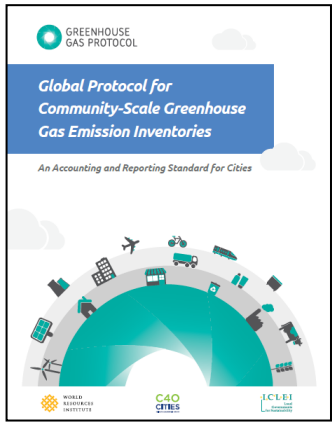


Product Standard



Policy and Action Standard

Mitigation Goal Standard



Global Protocol for Cities (GPC)

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Relationship of different standards

Type of GHG measurement	Countries	Cities and subnational jurisdictions	Companies/ organizations
GHG emissions inventory	IPCC *Guidelines for National Greenhouse Gas Inventories*	WRI/C40/ICLEI *Global Protocol for Community-Scale Greenhouse Gas Emission Inventories*	GHG Protocol *Corporate Standard*
GHG reductions	GHG Protocol *Policy and Action Standard* (for policies and actions) *GHG Protocol for Project Accounting* (for projects)		
Goal progress	GHG Protocol *Mitigation Goals Standard*		GHG Protocol *Corporate Standard*

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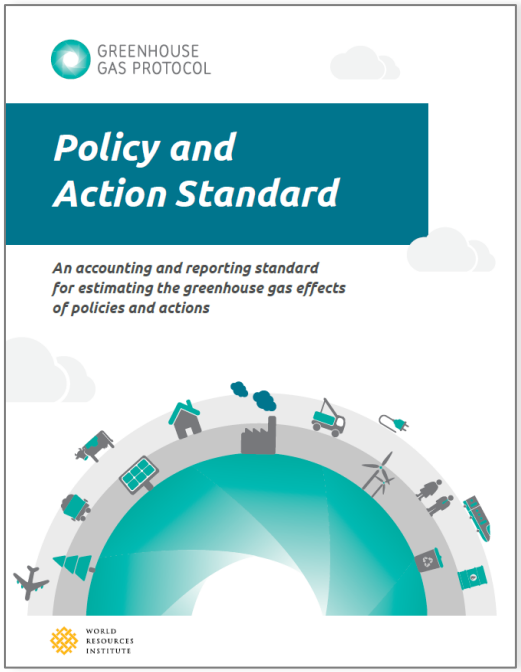
New standards



How to estimate the greenhouse gas effects of policies and actions

How to assess progress toward national or subnational GHG emissions reduction goals

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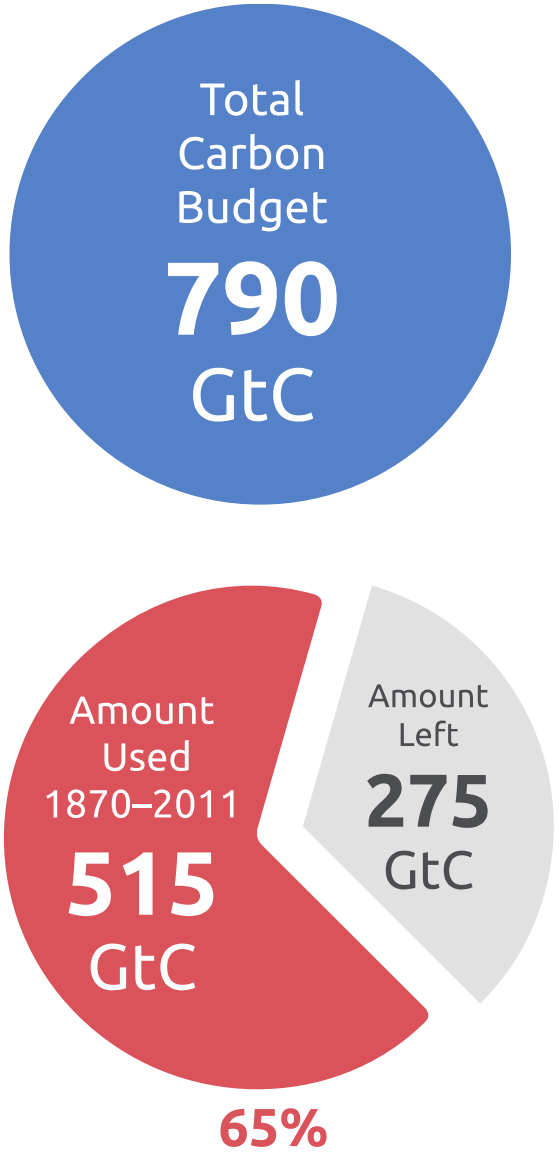
New standards can help answer:

- Are countries on track to meet their climate commitments?
- How effective are local or national policies to drive emissions reductions?
- Will countries' actions add up to limit warming to under 2 degrees Celsius?



Source for carbon budget: IPCC AR5 Synthesis Report

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Need for new standards

- New diversity of national and subnational GHG reduction goals (e.g., INDCs)
- New needs for estimating GHG effects of policies and actions (e.g., NAMAs)
- Lack of consistency and transparency in current approaches
- Lack of capacity
- No international guidelines until now

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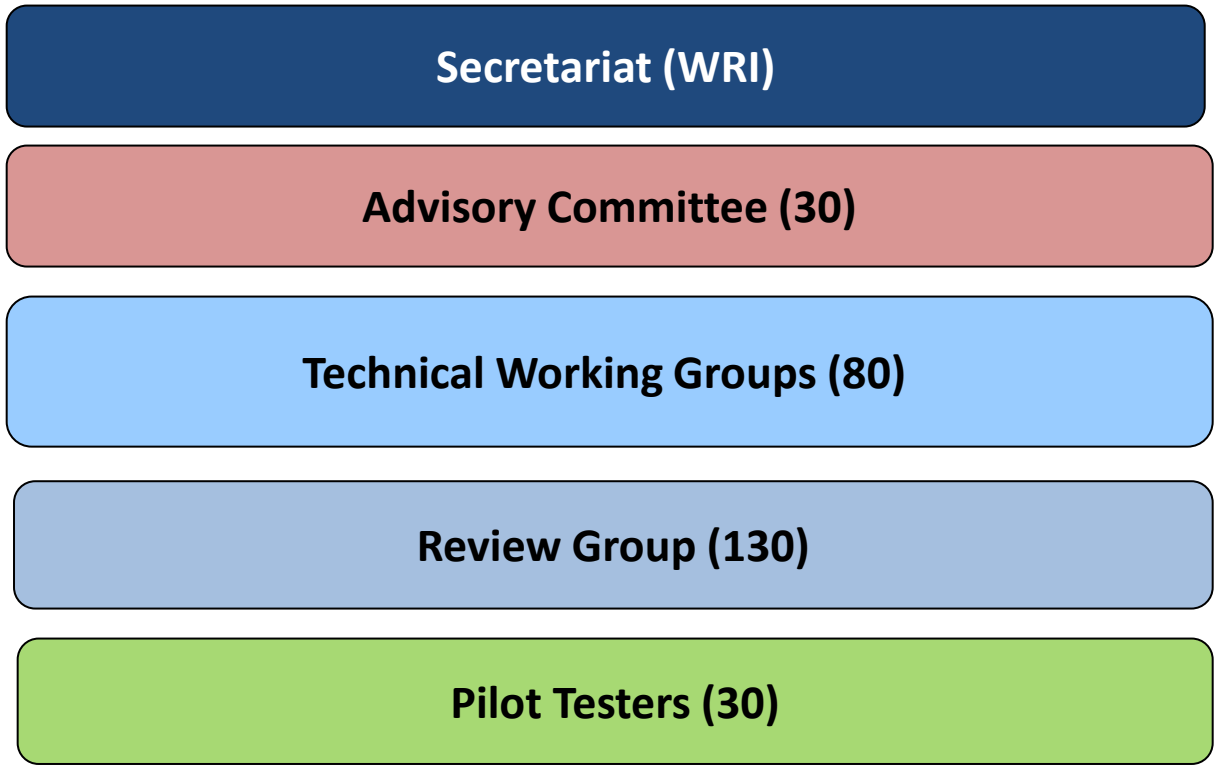
Standard development process

- 270 participants in 40 countries; three year process



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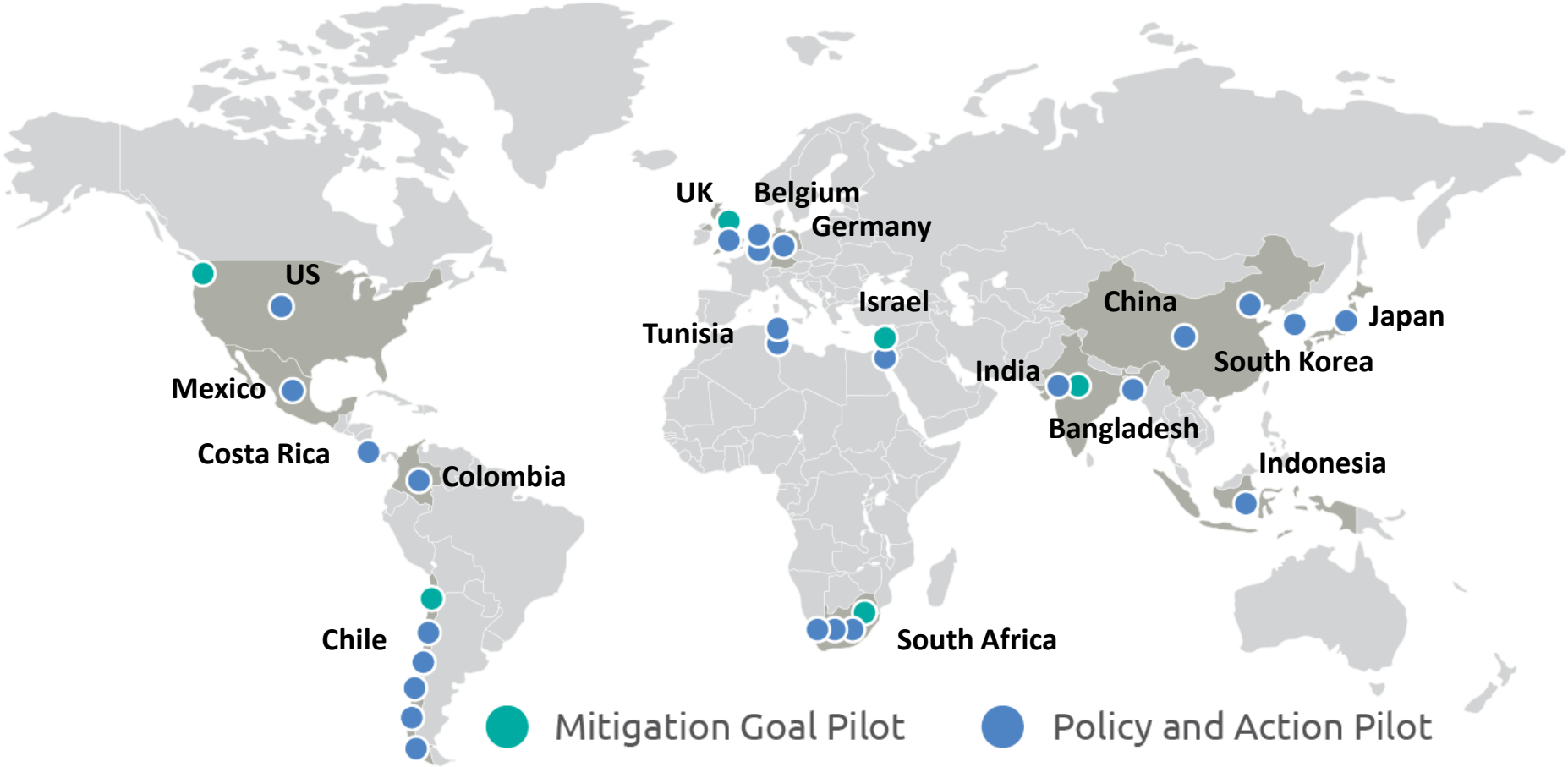
Pilot testing: 32 policies/goals in 20 countries/cities



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Overarching steps	Detailed steps	Chapter
Define goal/methods	Design a mitigation goal	4
	Estimate base year or baseline scenario emissions	5
	Account for the land sector	6
Calculate allowable emissions	Calculate allowable emissions in the target year(s)	7
Assess progress/ achievement	Assess progress during the goal period	8
	Assess goal achievement at the end of the goal period	9
Verify	Verify results (optional)	10
Report	Report results and methodology used	11

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Chapter 1 Introduction

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Why use this standard?

- Guide users in answering the following questions:
  - For jurisdictions that do not have a mitigation goal: Which factors to consider when designing a mitigation goal
  - Before the goal period: How to calculate allowable emissions in the target year or period
  - During the goal period: How to assess and report progress
  - After the goal period: How to assess and report goal achievement

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How this standard may be useful

- To help national and subnational governments **design and implement mitigation goals** that make a transparent and meaningful contribution to effective global GHG mitigation
- To help users **assess progress** toward mitigation goals
- To help policymakers and other decision makers **develop effective strategies** for managing and reducing GHG emissions

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How this standard may be useful (cont.)

- To support **consistent and transparent public reporting** of mitigation goal design choices and progress toward goal achievement

- To support national governments in **meeting international reporting obligations**

- To **create more international consistency and transparency** in the way jurisdictions design and assess progress toward mitigation goals

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Who may want to use the standard?

- Governments (subnational, national)
- Research institutions
- NGOs
- Companies

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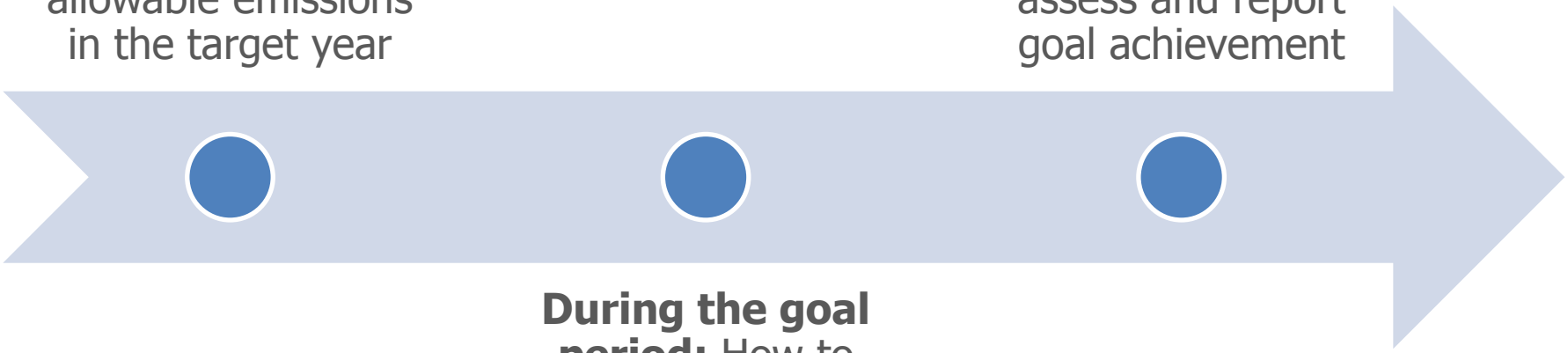
When the standard can be used

Before the goal period: What factors to consider when designing a goal and how to calculate allowable emissions in the target year



During the goal period: How to assess and report progress

After the goal period: How to assess and report goal achievement

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What does the standard apply to?

- Voluntary
- All countries and regions
- Economy-wide mitigation goals and sectoral goals
- Variety of goal types

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Chapter 4 Designing a mitigation goal

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Preparation: Developing a GHG inventory

- To identify mitigation opportunities
- To track changes during the goal period
- Methodologies to use:
  - National jurisdictions: most up-to-date IPCC guidance and guidelines agreed under the UNFCCC
  - Subnational jurisdictions: internationally accepted methods, e.g. Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC), in addition to relevant IPCC methods
- Global Warming Potentials (GWP):
  - IPCC values based on a 100-year horizon
    - As agreed under the UNFCCC, or
    - The most recent values published by the IPCC

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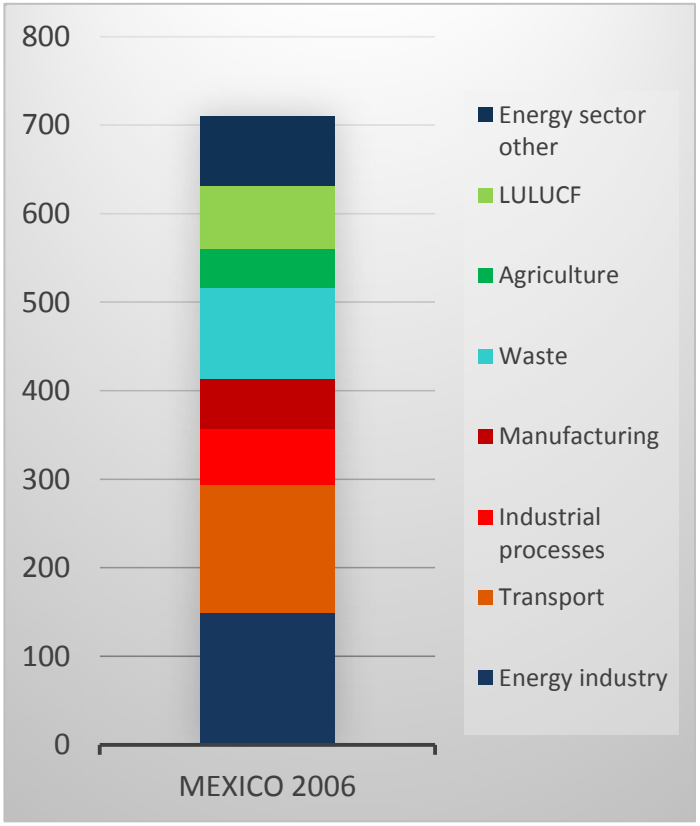
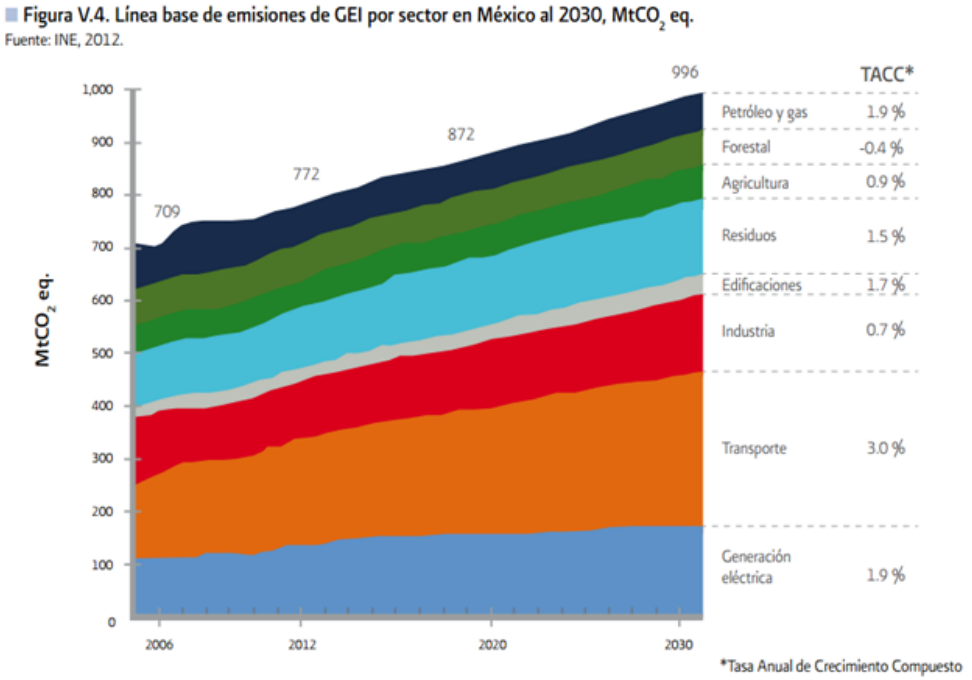
Example Mexico: understanding future trends



Largest source of emissions is the energy sector



Largest growth of emissions is expected in the transport sector

Sources: Mexico's GHG inventory 2006 (left), UNFCCC GHG data by Party; Projected BAU emissions per sector, Mexico's fifth National Communication, page 253

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Preparation: Assess mitigation needs

- To inform the design of the goal, users should consider global mitigation needs

- Recent findings from climate science, such as IPCC reports, can help understand the magnitude of emission reductions needed

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Preparation: Assess mitigation opportunities

- Starts with understanding the GHG inventory and the contribution of each sector and gas
- Needs to take into account expected future development
- Assessment methods should provide an indication of:
  - The magnitude of available reduction opportunities
  - Potential cost of each opportunity
  - Potential benefits of each opportunity

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Choose geographic coverage

- Define which geographic area the mitigation goal covers:
  - At the national level
  - At a regional level
  - For one or more cities

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Choose and define sectors to be included

- The most comprehensive approach is to include all IPCC sectors in the goal boundary
- High emitting sectors should be included to increase mitigation opportunities
- Sector definition for the goal should be consistent with the GHG inventory
- Sectoral goals may be adopted as a way to focus mitigation efforts and resources on a high emitting sector

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Choose treatment of the land sector

The land sector is treated separately because of the significance of natural-disturbance-related emissions and legacy effects.

Four options:

- **Include in the goal boundary**: The land sector is included in the goal boundary, like other sectors.
- **Sectoral goal**: A sectoral goal for the land sector is separately designed and assessed, apart from any other mitigation goals a jurisdiction may have.
- **Offset**: The land sector is not included in the goal boundary. Instead, net land sector emissions added to emissions from sectors included in the goal boundary.
- **Do not account for the land sector**: The land sector is not included in the goal boundary.

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Choose coverage of in-jurisdiction and out-of jurisdiction

Definition

- **In-jurisdiction** emissions are emissions from sources located within a jurisdiction's boundary.
- **Out-of-jurisdiction** emissions are emissions from sources located outside of a jurisdiction's boundary that occur as a consequence of activities within that boundary.

Treatment

- Users in national jurisdictions that choose to set a goal for out-of-jurisdiction emissions shall define **separate goals** for in-jurisdiction and out-of-jurisdiction emissions.
- Users in subnational jurisdictions shall report whether the goal covers out-of-jurisdiction emissions and, if so, which out-of-jurisdiction emissions are included and excluded.

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Select GHGs covered

- Recommended comprehensive coverage of 7 Kyoto greenhouse gases
  - Carbon dioxide (CO_2)
  - Methane (CH_4)
  - Nitrous oxide (N_2O)
  - Hydrofluorocarbons (HFCs)
  - Perfluorocarbons (PFCs)
  - Sulfur hexafluoride (SF_6)
  - Nitrogen triflouride (NF_3)
- Users may include fewer greenhouse gases depending on objectives, data quality, mitigation opportunities, and capacity.

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Choose mitigation goal type

Goal Type	Description	Reductions in what?	Reductions relative to what?
Base year emissions goal	Reduce, or control the increase of, emissions by a specified quantity relative to a base year. For example, a 25% reduction from 1990 levels by 2020.	Emissions	Historical base year emissions
Fixed-level goal	Reduce, or control the increase of, emissions to an absolute emissions level in a target year. One type of fixed-level goal is a carbon neutrality goal, which is designed to reach zero net emissions by a certain date.	Emissions	No reference level
Base year intensity goal	Reduce emissions intensity (emissions per unit of another variable, typically GDP) by a specified quantity relative to a base year. For example, a 40% reduction from 1990 base year intensity by 2020.	Emissions intensity	Historical base year emissions
Baseline scenario goal	Reduce emissions by a specified quantity relative to a projected emissions baseline scenario. A baseline scenario is a reference case that represents future events or conditions most likely to occur in the absence of activities taken to meet the mitigation goal. For example, a 30% reduction from baseline scenario emissions in 2020.	Emissions	Projected baseline scenario emissions

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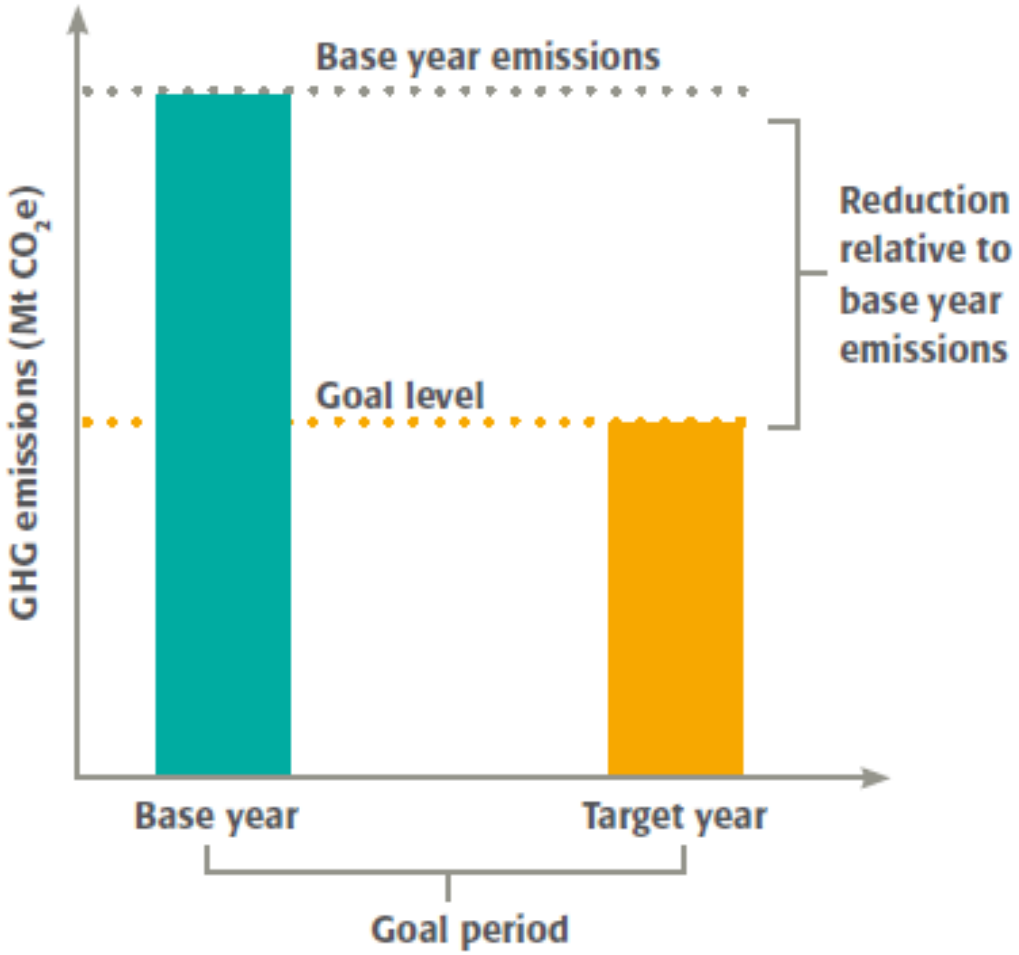
Example of a base year emissions goal



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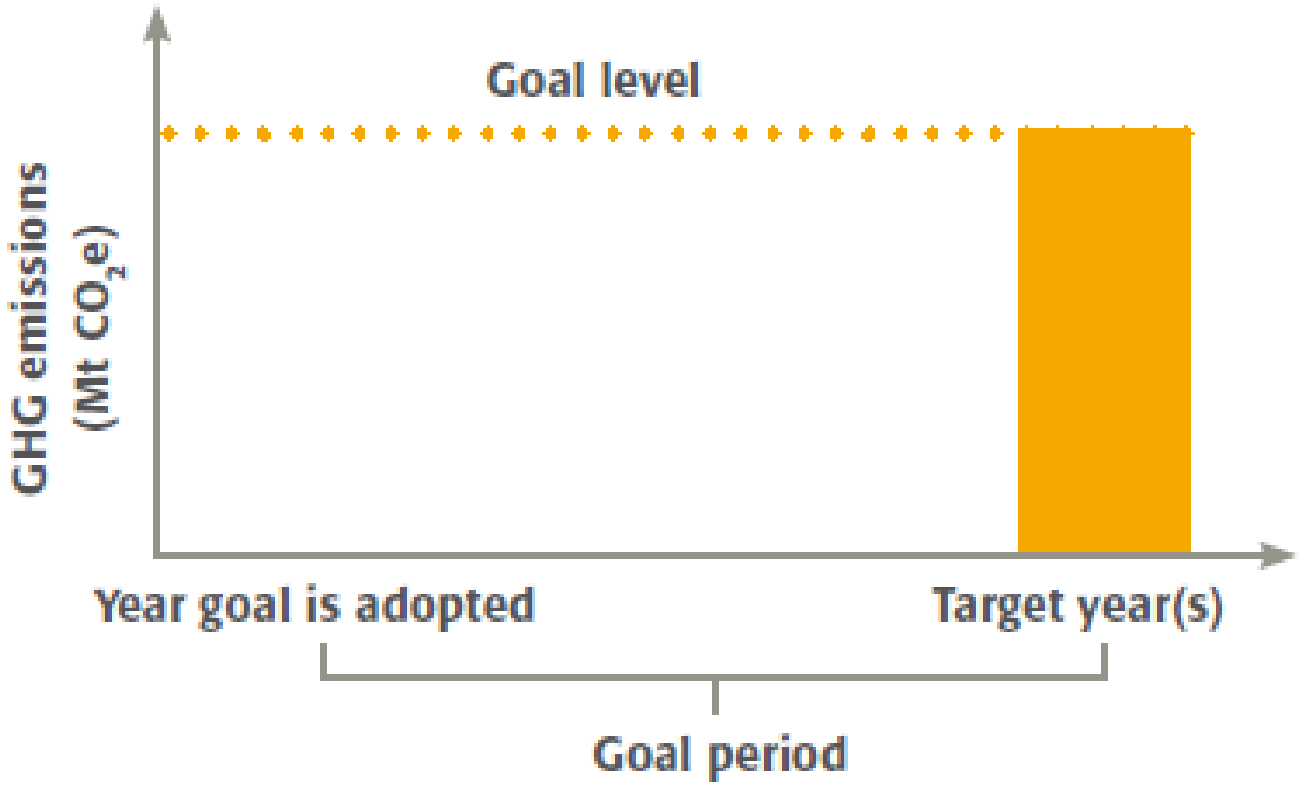
Example of a fixed-level goal



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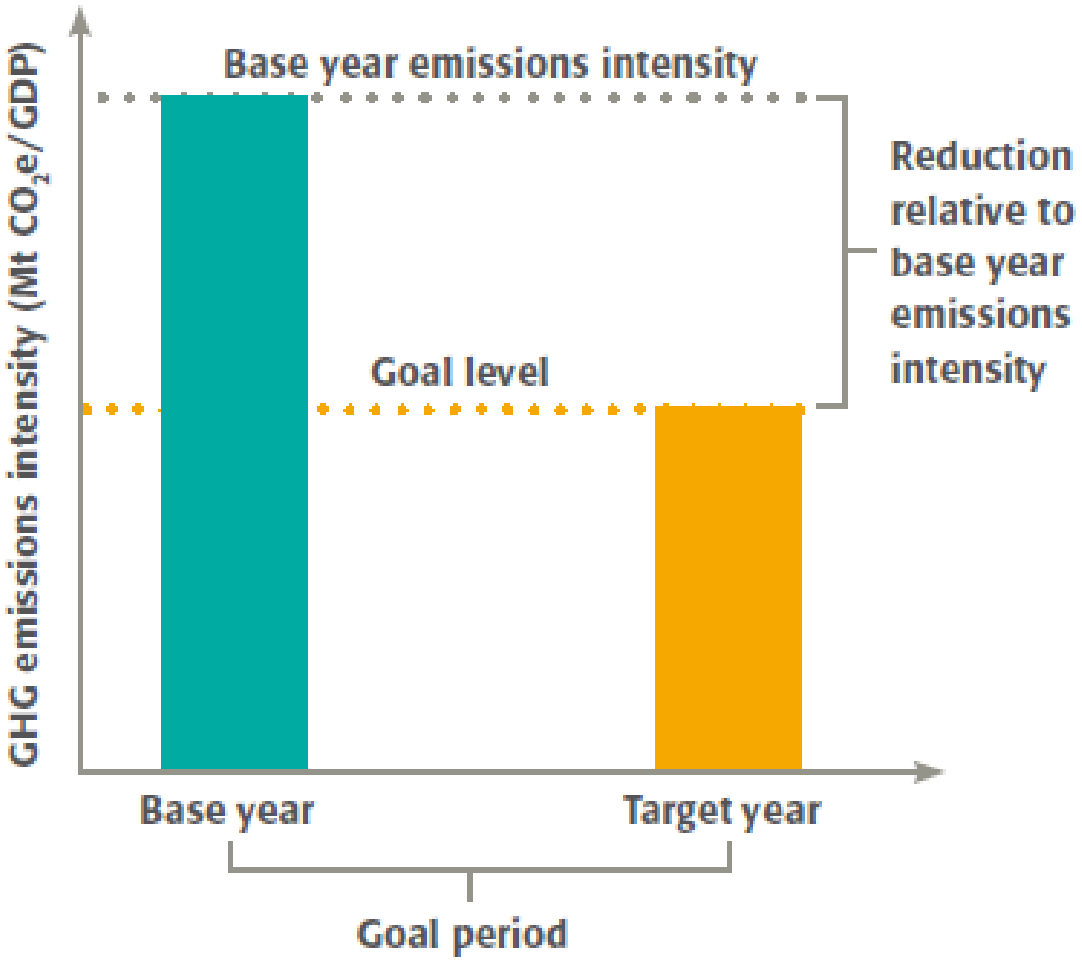
Example of a base year intensity goal



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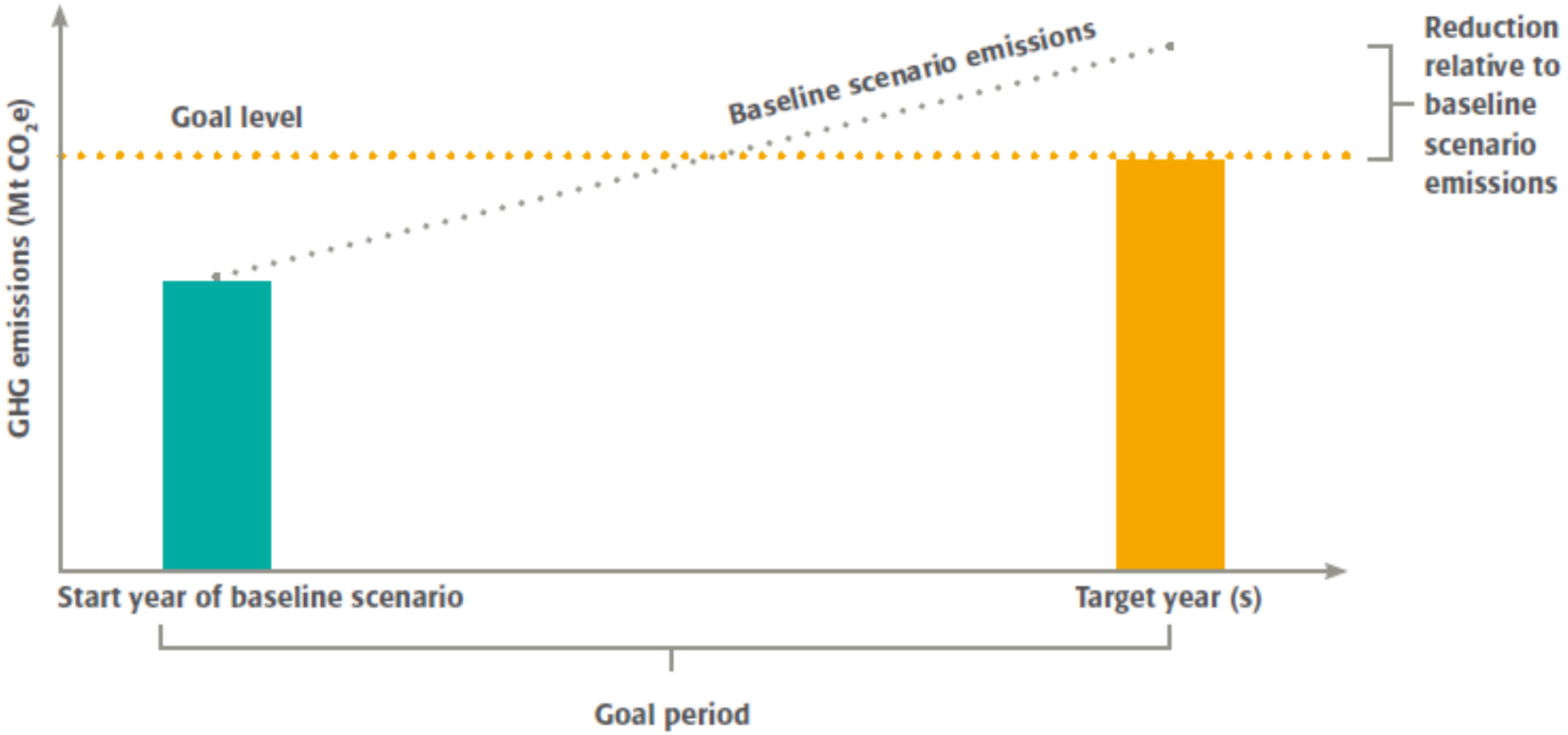
Example of a baseline scenario goal



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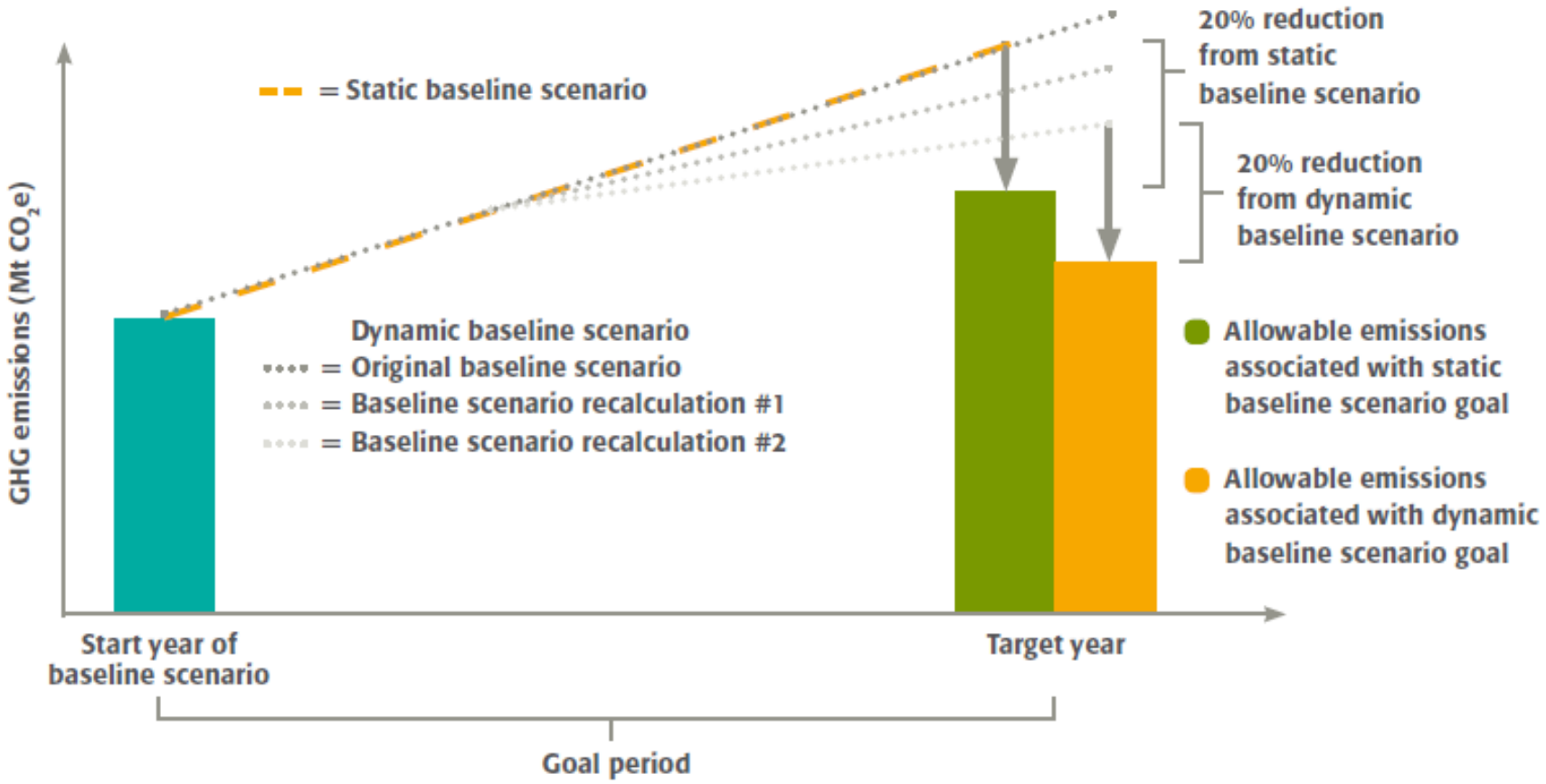
Example of static versus dynamic baseline scenarios



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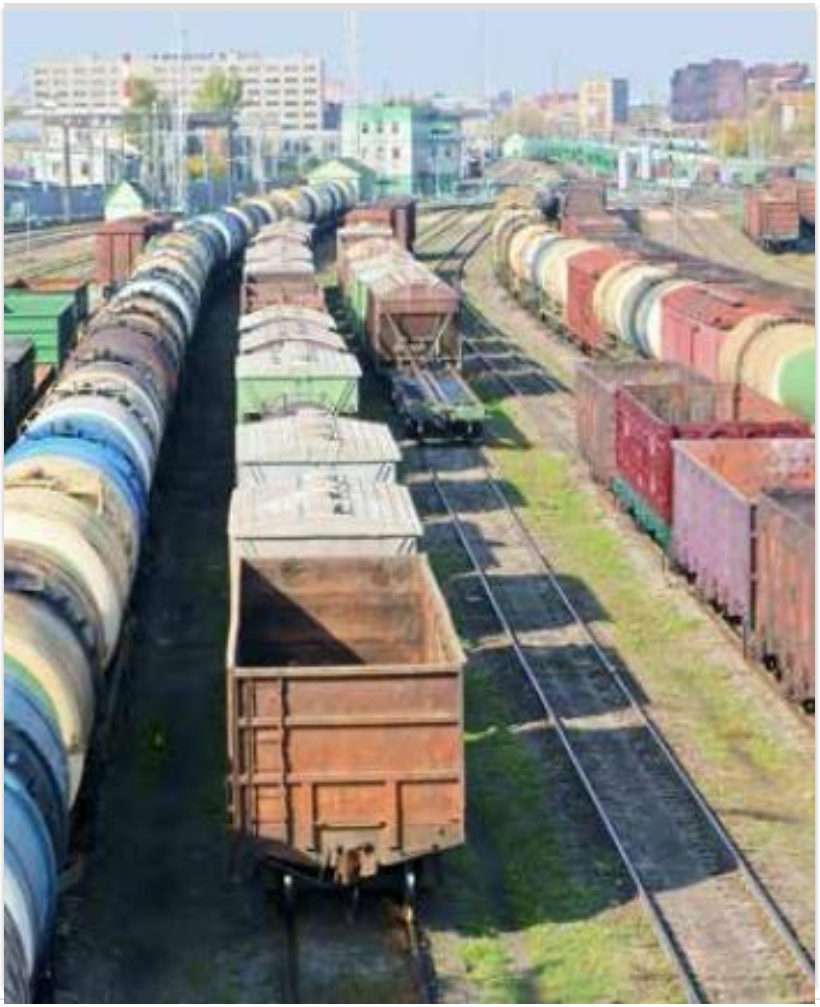
Other goal types



- Emission reductions to be achieved by policies, actions, or projects
- Baseline scenario goals framed in terms of emission reductions to be achieved by policies, actions or projects
- Non-GHG goals

Some parts of the Mitigation Goal Standard are useful. Also see the Policy and Action Standard for further guidance.

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Choose base year

- Choose a single year of historical data (**base year**) or an average of historical data over multiple years (**base period**)

- Choose a base year or base period for which **representative**, **reliable**, and **verifiable** emissions data are available to enable comprehensive and consistent tracking of emissions over time

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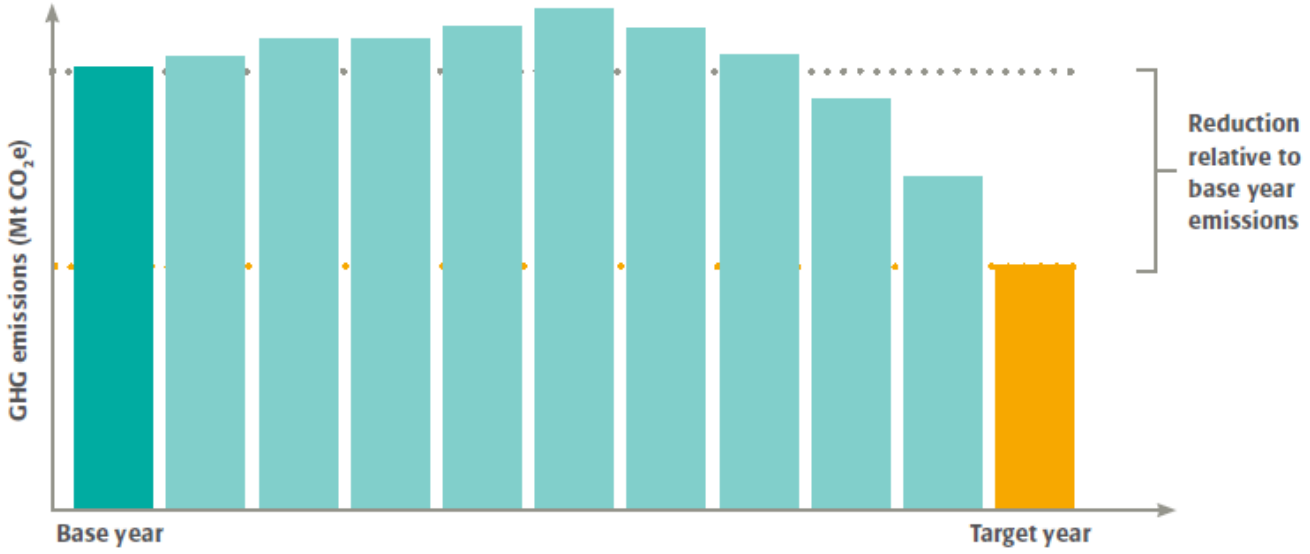
Single year goals

- Single-year targets are more vulnerable to inter-annual fluctuations
- Emissions can increase during the goal period and then be reduced only shortly before the target year ⇨ larger amount of cumulative emissions
- Fluctuations in emissions can pose challenges to meeting a single-year goal



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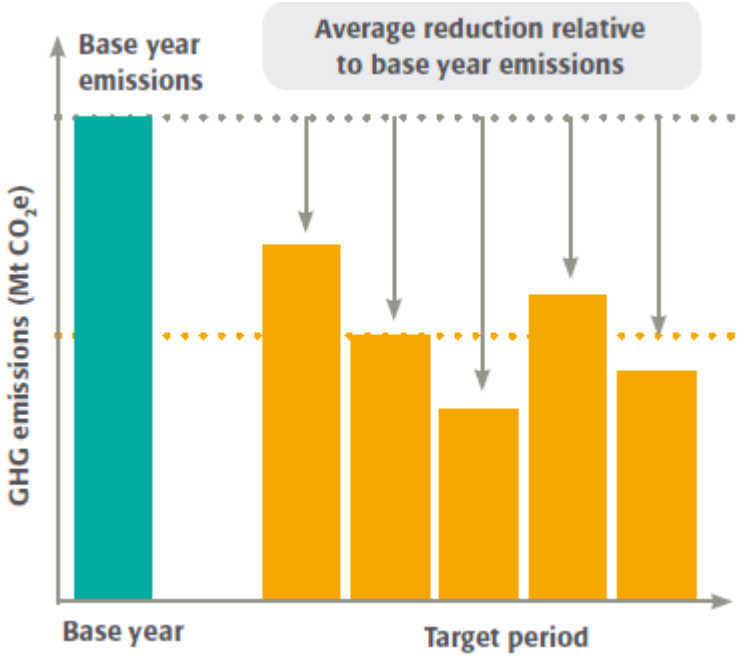
Average multi-year goals

- Commitment to reduce, or control the increase of, annual emissions (or emissions intensity) by an average amount over a target period
- Adopting multi-year goals will have a better chance of limiting cumulative emissions over the goal period



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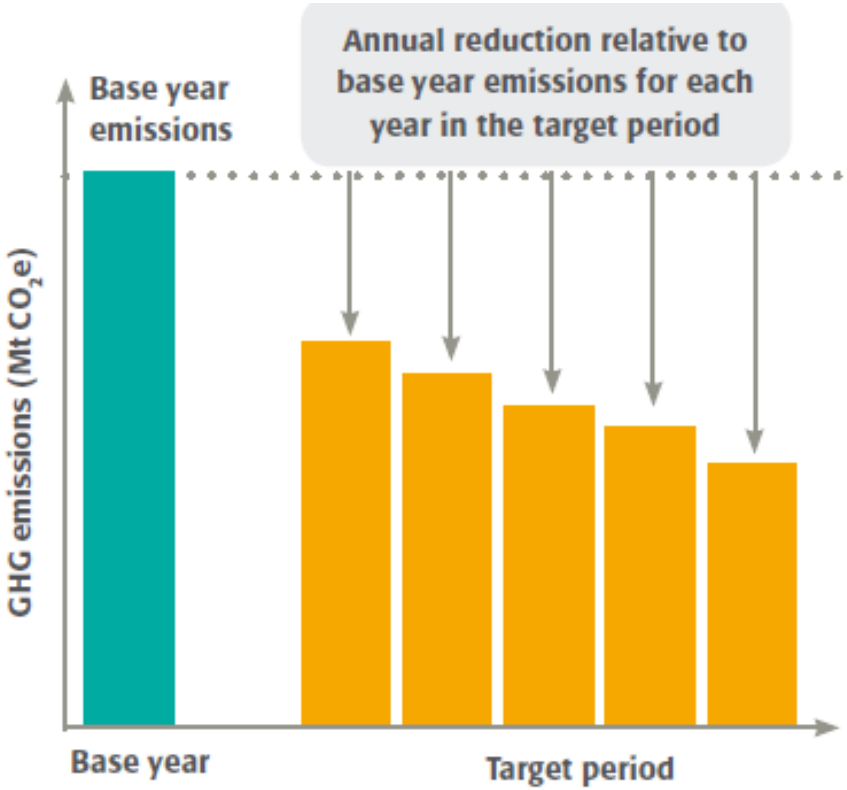
Annual multi-year goals

- Commitment to reduce, or control the increase of, annual emissions (or emissions intensity) by a specific amount each year over a target period

- It is likely that multi-year goals will lead to transformed emissions pathways in which emissions continue to be reduced after the goal period



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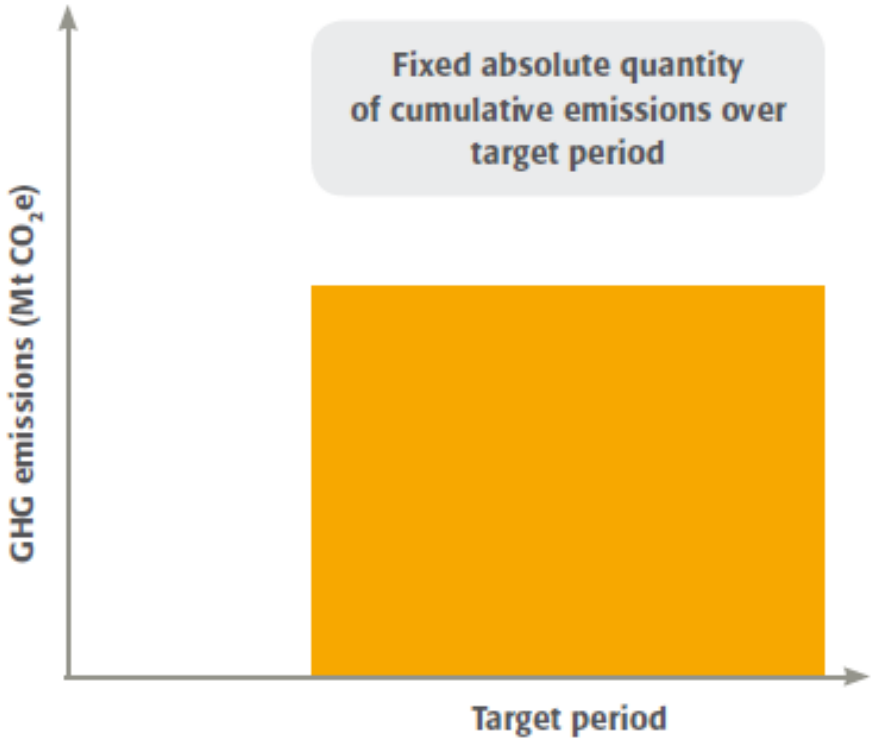
Cumulative multi-year goals

- Commitment to reduce, or control the increase of, cumulative emissions over a target period to a fixed absolute quantity
- Cumulative multi-year goals are often referred to as "carbon budgets."
- Annual or average multi-year goals can also be converted to cumulative multi-year goals
- Average and cumulative multi-year goals offer more flexibility



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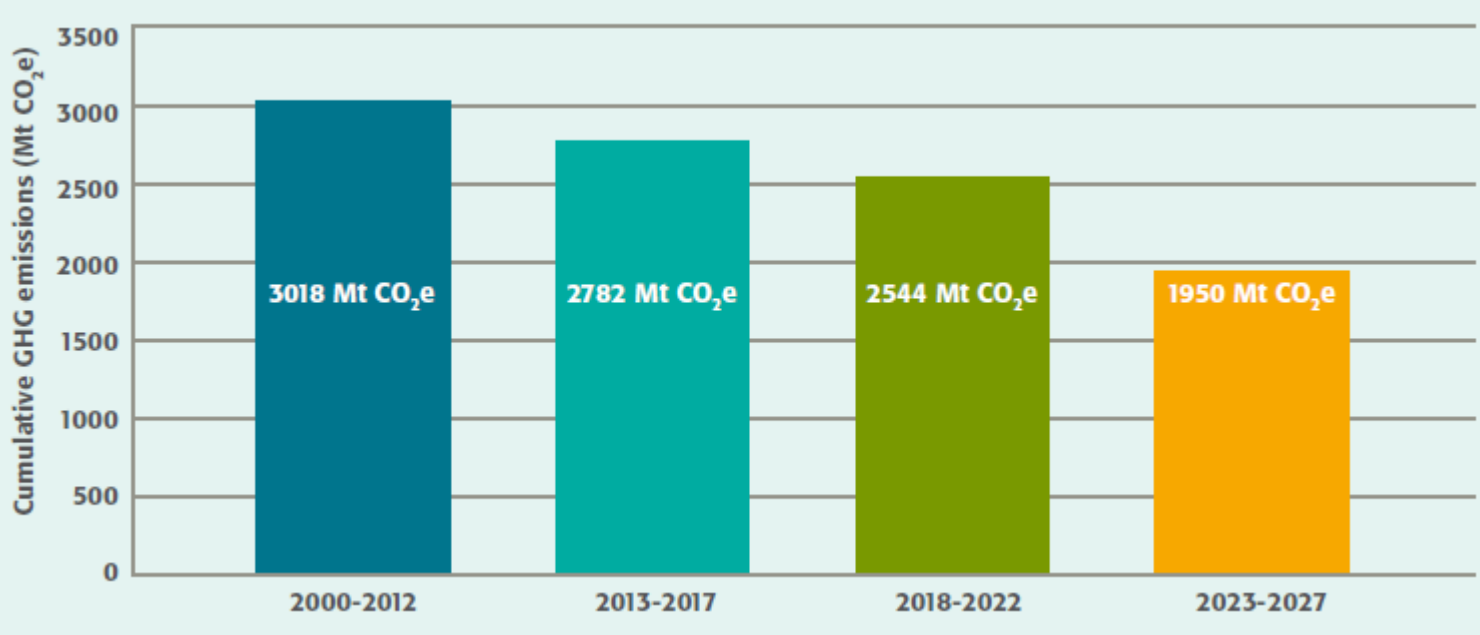
Example: UK's fixed-level, cumulative multi-year goals

- Long-term goal of reducing emissions by at least 80 percent below 1990 levels by 2050
- Individual carbon budgets for intermediate periods with growing stringency



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Choose target year or target period

- Choose a single year (**target year**) or a multi-year period (**target period**) for the goal
- Choose:
  - Short-term goals
  - Long-term goals
  - A combination of both
- The most robust approach is to set a combination of short- and long-term goals that are consistent with an emissions trajectory that phases out greenhouse gas emissions in the long-term
- In particular, users that choose a single-year goal should consider adopting a series of single-year goals for different timeframes

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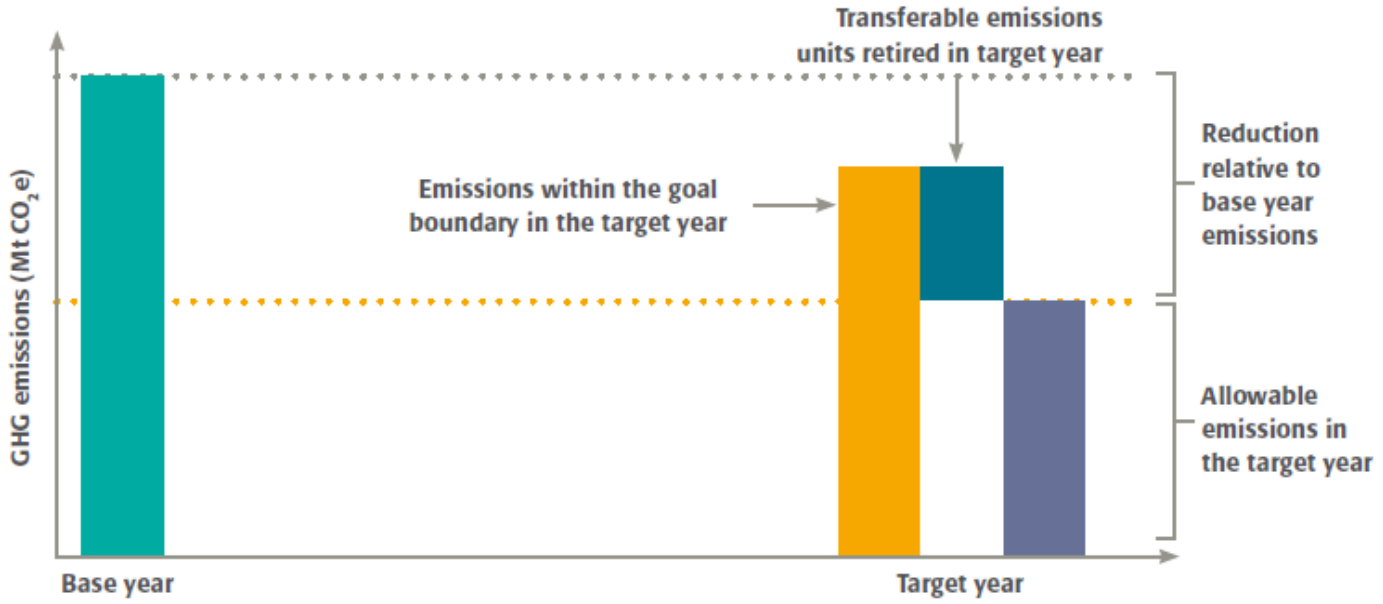
Decide on use of transferable emissions units

- A goal may be achieved using any combination of emission reductions from within the goal boundary (domestic reductions) and transferable emissions units generated outside of the goal boundary
  - Emissions allowances from emissions trading programs
  - Offset credits generated from outside of the goal boundary



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If selling units

- if a jurisdiction is expected to be a net seller of emissions units in the target year or period, the jurisdiction will need to plan for greater domestic emission reductions to achieve the goal.

- Understanding the quantity of units that are expected to be sold can help policymakers design mitigation strategies for any additional emission reductions needed to achieve the goal.

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Criteria for use of offset units

- **Real**: Emission reductions or removals represent actual emission reductions and are not artifacts of inaccurate or incomplete accounting.
- **Additional**: Emission reductions or removals are beyond what would have happened in the absence of the incentive provided by the offset credit program or project.
- **Permanent**: Emission reductions or removals are irreversible or if sourced from projects subject to potential reversal have guarantees to ensure that any losses are compensated for.
- **Transparent:** Offset credits are publicly and transparently registered with unique serial numbers to clearly document offset credit generation, transfer, retirement, cancellation, and ownership.

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Criteria for use of offset units (cont'd)

- **Verified**: Offset credits have been appropriately validated and verified to a standard that ensures reproducible results by an independent third party that is subject to a viable and trustworthy accreditation system.
- **Owned unambiguously:** Ownership of GHG reductions or removals is clear by contractual assignment and/or government recognition of ownership rights. Transfer of ownership of offset credits must be unambiguous and documented.
- **Addresses leakage**: Emission reductions or removals are generated so as to address leakage.

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Criteria for use of allowances from emissions trading

- **Rigorous monitoring and verification protocols**: Allowances are generated based on robust methods for measuring emissions that ensure the quality and comparability of underlying emissions data.
- **Transparent tracking and reporting of units**: Allowances are publicly and transparently registered to clearly document their generation, transfer, and ownership. Emissions trading programs are transparent regarding rules and procedures for monitoring, reporting, and verification, as well as compliance and enforcement.
- **Stringent caps**: Emissions trading programs have stringent caps that limit the amount of emissions in a given time period to a level lower than would be expected in a business-as-usual scenario.

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Types of double counting

- **Double claiming** occurs when a single transferable emissions unit is claimed by two different jurisdictions and applied toward the mitigation goal of both

- **Double selling** occurs when a single unit is sold twice

- **Double issuance** occurs when more than one transferable emissions unit is generated for one unit of emission reduction

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Mechanisms to prevent double counting

- A **registry** that lists the quantity, status (canceled, retired, or banked), ownership, location and origin of transferable emissions units held by a jurisdiction
- A **transaction log** that records the details of each transaction between registry accounts, including the issuance, holding, transfer, and acquisition of transferable emissions units
- **Agreements** between buyers and sellers that specify which party has the exclusive right to claim each unit and specifies what percentage, if any, is shared
- **Legal mandates** that disallow double counting and employ penalty and enforcement systems
- **Information sharing** to identify units that are already registered in other programs

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Define the goal level

Users should define an ambitious goal level that:

- Substantially reduces emissions below the jurisdiction's business-as-usual emissions trajectory
- Corresponds to an emissions trajectory that is in line with the level of emissions reductions necessary to avoid dangerous climate change impacts, as determined by the most recent climate science.

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Key considerations for goal design

- **Choice of goal type**:

  Base year emissions goals and fixed-level goals are

  - simpler to account for,
  - more certain, and
  - more transparent

  ➡ Users seeking to accommodate short-term emissions increases should consider adopting base year emissions goals or fixed-level goals that are framed as a controlled increase in emissions from a base year.

  ➡ Static baseline scenario goals provide more certainty and transparency regarding intended future emissions levels than dynamic baseline scenario goals.

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Key considerations for robust goals (cont'd)

- **Choice of goal timeframe**:
  - Multi-year goals have a better chance of limiting cumulative emissions over the goal period than single-year goals
  - Adopting a combination of short-term and long-term goals provides more clarity for long-term planning and better ensures a decreasing emissions pathway.

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Key considerations for robust goals (cont'd)

- **Use of transferable emissions units**: Ensuring that any transferable emissions units applied toward a goal
  - Meet the highest quality principles
  - Are generated in the target year or period
  - Include mechanisms for tracking units to double counting
- **Choice of goal level**: The goal level should
  - Significantly reduce emissions below the jurisdiction's business-as-usual emissions trajectory
  - Correspond to an emissions trajectory that is in line with emissions reductions necessary to avoid dangerous climate change, as determined by the most recent climate science.

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Chapter 5 Estimating base year / baseline scenario emissions

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Calculate base year / base period emissions

- Develop and report a complete inventory for the base year or base period
- Aggregate emissions from the GHG inventory for all gases and sectors that are included in the goal boundary, including out-of-jurisdiction emissions, if relevant
- For base periods: calculate the average annual emissions level over the base period

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Calculating base year emissions intensity

- Divide base year emissions by the level of output in the base year

$$\text{Base year emissions intensity} = \frac{\text{Base year emissions (Mt } CO_2e)}{\text{Level of output (or relevant variable) in the base year}}$$

- Data for the level of output should be reliable, verifiable, and gathered from official sources
- Report the level of output in the base year, and data sources used

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Estimating baseline scenario emissions: Choose emissions projection model

- The choice of model typically reflects a tradeoff among several factors, including:
  - available resources, including financial resources and technical expertise;
  - data availability;
  - model performance, including level of sophistication and suitability for jurisdiction;
  - software costs;
  - alignment with other models being used by the jurisdiction;
  - the expected use of the model outputs

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Identify emissions drivers

- Economic activity (for example, GDP and sectoral composition of GDP)
- Structural changes in economic sectors (e.g., shifts from manufacturing to service sector jobs, shifts of industrial production between countries)
- Energy prices by fuel type
- Energy supply and demand by fuel type
- Emissions intensity by fuel type
- Population and degree of urbanization
- Technological development
- Land-use practices

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Defining assumptions using published data

- Existing data sources of sufficient quality may be available to define assumptions for emissions drivers:
  - peer-reviewed scientific literature,
  - government statistics,
  - reports published by international institutions (such as IEA, IPCC, IMF, World Bank, UN, etc.),
  - national, regional, state, city, or sector-level sources specific to the jurisdiction, and
  - economic and engineering analyses and models

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Identify policies and actions to include

- Emissions will be affected by policies and actions implemented in the jurisdiction
- This includes policies and actions designed to reduce emissions as well as those designed to meet other objectives
- Which policies are included in the baseline scenario and the assumptions made about their likely effects on emissions can have a significant effect on resulting baseline scenario emissions
- Users should include all policies and actions that:

  (1) have a significant effect on GHG emissions, either increasing or decreasing them, and

  (2) are implemented or adopted in the year the baseline scenario is developed

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Example: Chile's national baseline emissions

Sector	Policies and actions included
Power generation and electricity transmission	• Current regulations associated with Short Law I and Short Law II of the sector. These laws require the private sector to cover a percentage of power generation through renewable energy.
Mining and other industries	• Compliance measures in the "Decontamination Plans" for different cities and resolutions related to air pollution, water, and soil.
Transportation	• None included.
Agriculture and land-use change	• None included.
Forestry and land-use change	• Regulations associated with the DL 701 of the Ministry of Agriculture until 2012. This law regulates deforestation and encourages afforestation.
Commercial, public, and residential	• Program Regulators Thermal Conditioning. • The Country Energy Efficiency Program to label bulbs and refrigerators.
Waste	• None included.

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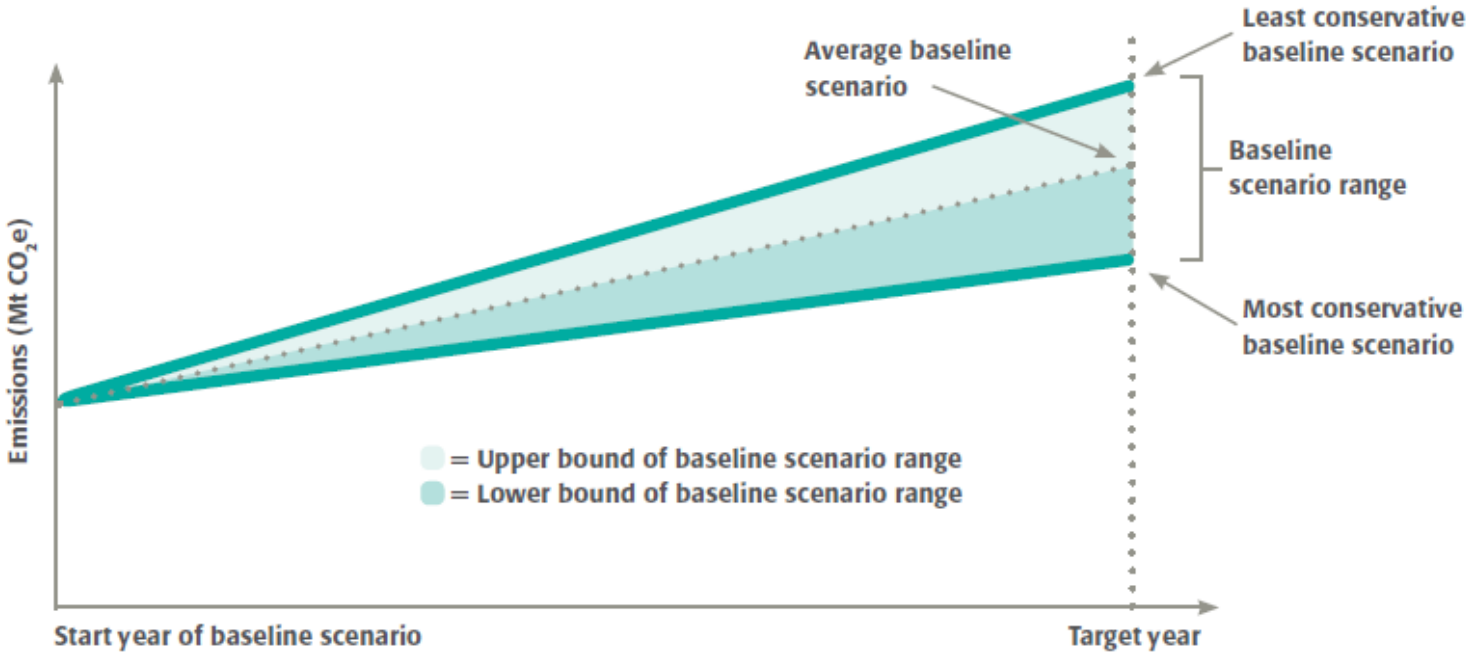
Develop a range of plausible scenarios

- A range of baseline scenarios reflects the upper and lower bounds of plausible emissions trajectories associated with a range of assumptions
- Out of the range choose and report a single baseline scenario against which to set the goal and track progress



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Example: Chile's national baseline emissions

Figure 5.6 Baseline scenario emissions levels in 2020 under various GDP growth rates

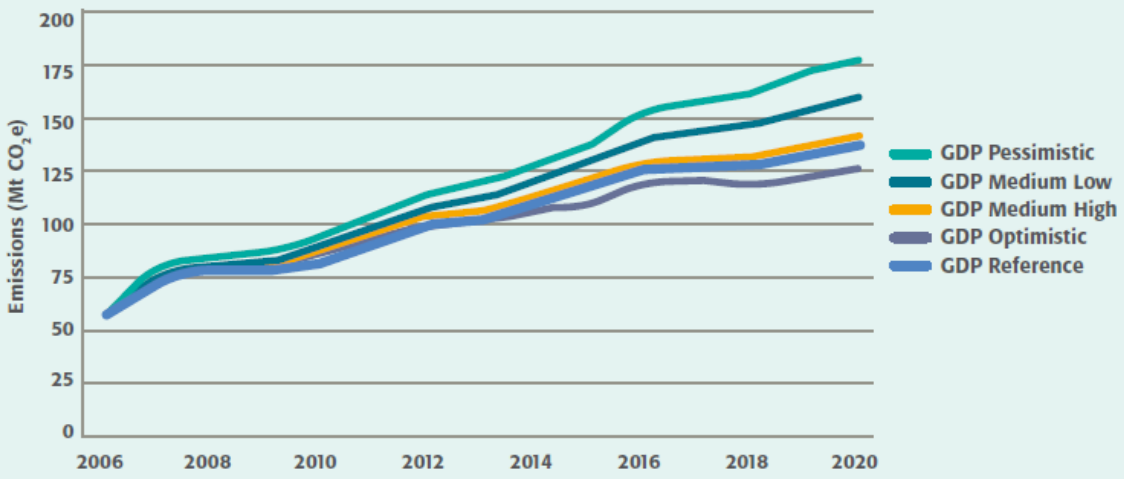

Table 5.13 Baseline scenario emissions levels in 2020 based on various GDP growth rate assumptions

Scenario	Emissions (Mt CO_2e)	Average GDP growth rate assumption (%)
GDP pessimistic	124.3	3.0
GDP medium low	139.9	3.7
GDP medium high	158.6	4.2
GDP optimistic	177.9	4.8
GDP reference**	136.2	3.4
Minimum	124.3	3.0
Maximum	177.9	4.8

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Chapter 6 Accounting for the land sector

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Selecting and reporting the accounting method

- Choose accounting method:
  - **Land-based** accounting assesses net emissions (emissions + removals) of select land-use categories,
  - **Activity-based** accounting assesses net emissions of select land-use activities

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Land-based accounting

- Determines the scope of accounting based on six land-use categories:
  - Forestland
  - Cropland
  - Grassland
  - Wetland
  - Settlement
  - Other
- Accounting should cover all lands within the category of interest

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Activity-based accounting

- Bases the accounting on a predetermined set of land-use practices
- The aim is to limit accounting to those lands subject to direct human influence and thereby exclude non-anthropogenic fluxes
- All anthropogenic activities that result in changes in carbon pools or fluxes and emissions resulting from land-use change activities should be included

Select activity categories	Select activity sub-categories
Forest management	Afforestation/reforestation, deforestation, community forestry, sustainable forest management, enhancement of forest carbon stocks, protected area management
Cropland management	Soil carbon management, cropland fertilizer/manure application, agroforestry, controlled burning, vegetation management
Grassland management	Soil carbon management, controlled burning, vegetation management, protected area management
Wetland management	Wetland drainage, wetland rewetting, vegetation management, protected area management

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Choose the accounting method

- Land sector accounting methods are used to assess changes in net emissions (emissions + removals) within each land-use category or activity
- There are three land sector accounting methods:

  (1) relative to a base year/period emissions (also known as net-net),

  (2) without reference to base year/period or baseline scenario emissions (also known as gross-net);

  (3) forward-looking baseline

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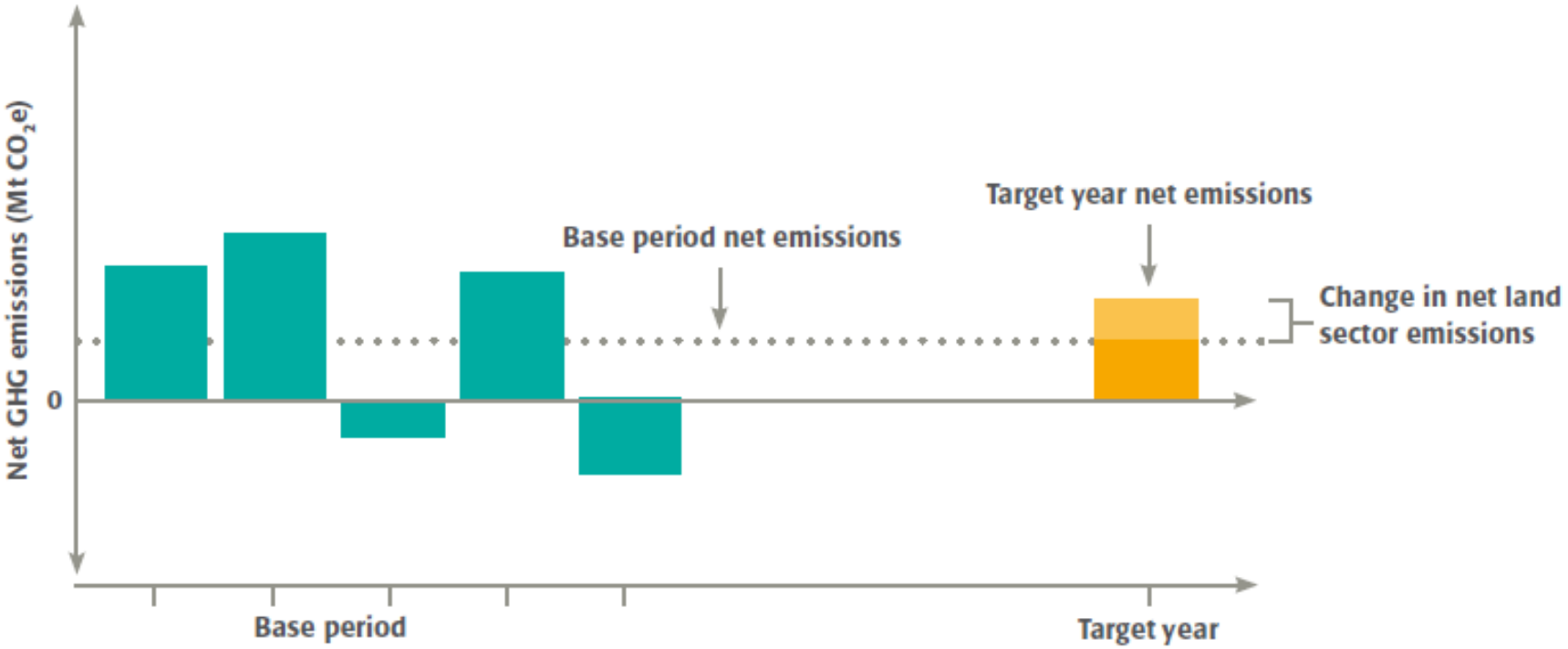
Accounting relative to base period emissions



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Accounting without reference

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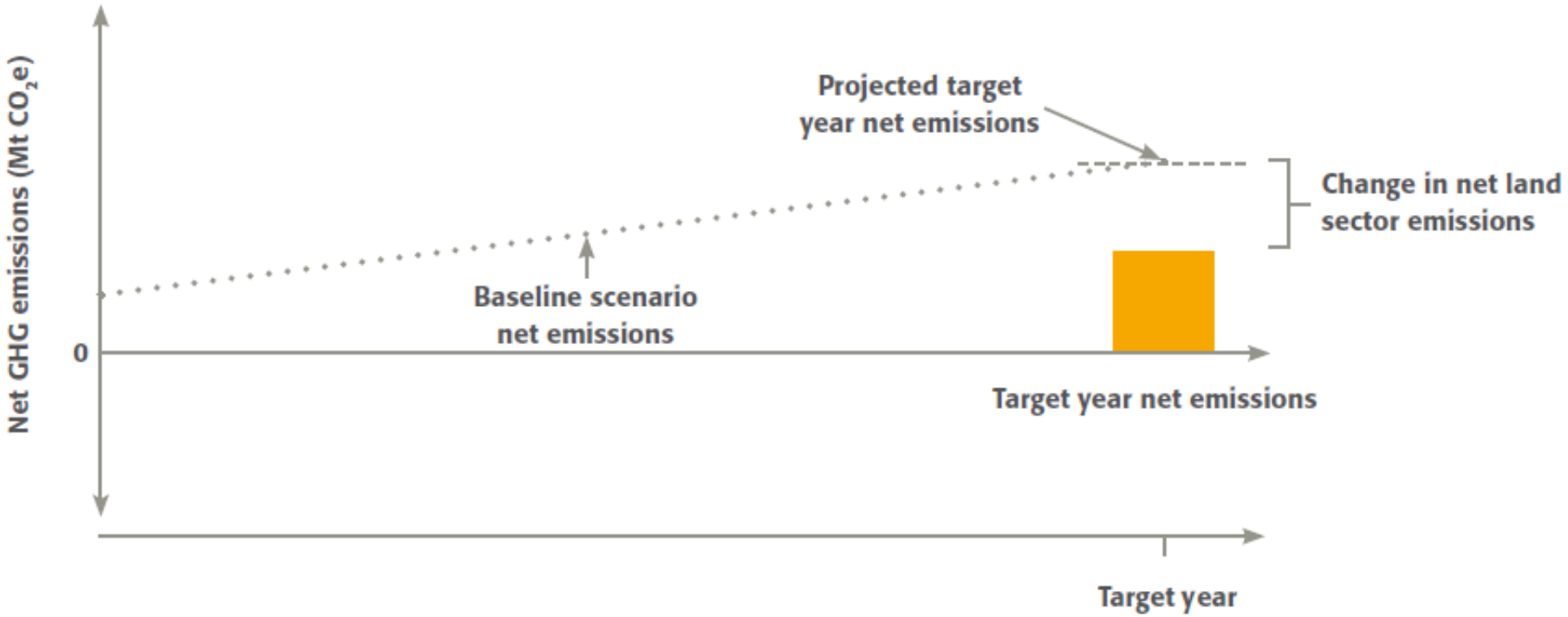
Forward-looking baseline accounting



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Recommended approach

- Base year emissions goal: Account relative to base year/period emissions (also known as net-net accounting)
- Fixed-level goal: Account in the target year/period, without reference to base year/period or baseline scenario emissions (also known as gross-net accounting)
- Base year intensity goal: Account for emissions intensity relative to a base year/period (also known as net-net accounting)
- Baseline scenario goal: Use forward-looking baseline accounting method

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Chapter 7 Calculate allowable emissions

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Calculating allowable emissions

- **Allowable emissions** represent the maximum quantity of emissions that may be emitted in the target year or target period that is consistent with achieving the mitigation goal

- **Calculating** allowable emissions provides users with critical information for
  - Decision making,
  - Designing mitigation strategies,
  - Assessing progress during the goal period, and
  - Assessing goal achievement

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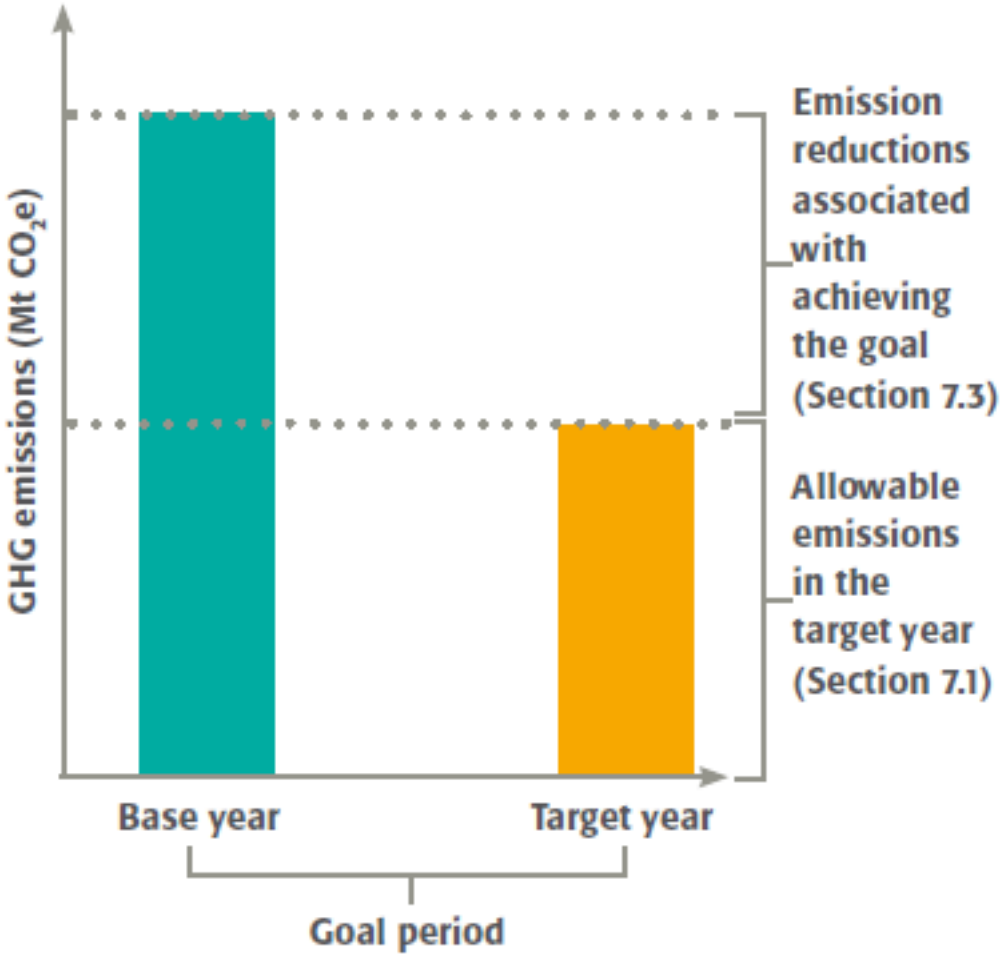
Example of allowable emissions for a base year goal



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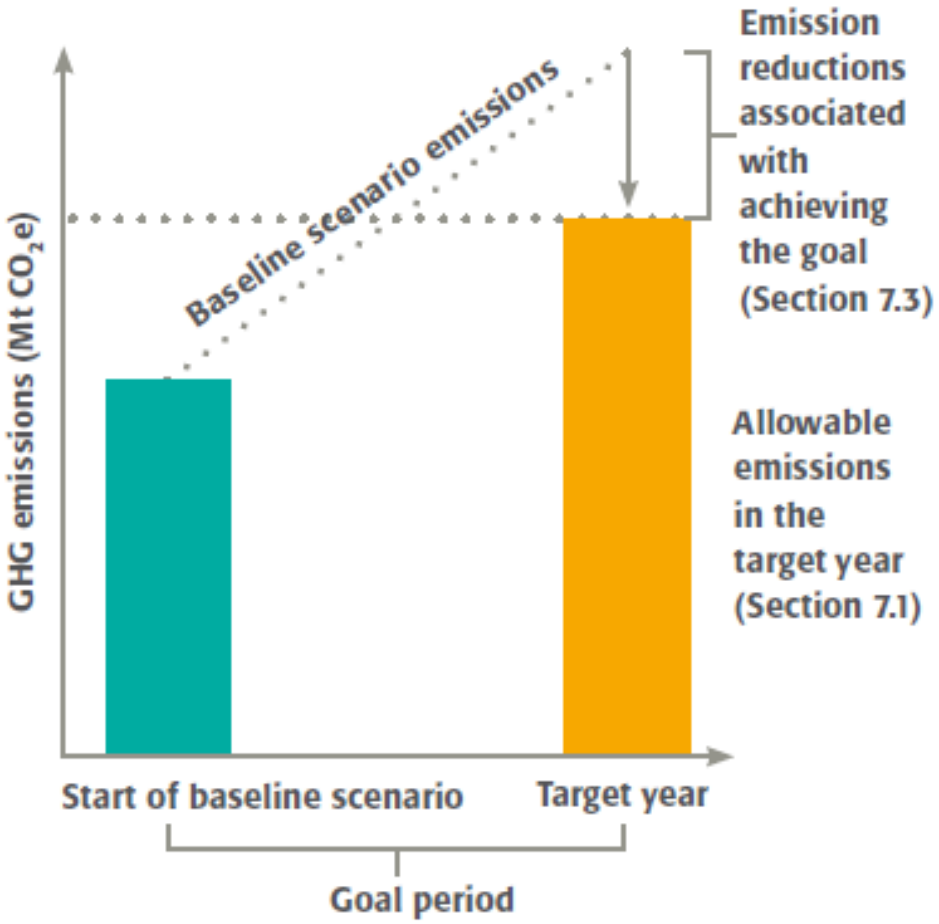
Example of allowable emissions for a baseline goal



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Equations for calculating allowable emissions

Goal type*	Calculation method
Base year emissions goal	**Allowable emissions in the target year (Mt CO_2e) =** Base year emissions (Mt CO_2e) – [Base year emissions (Mt CO_2e) x Percent reduction]
Fixed-level goal	**Allowable emissions in the target year (Mt CO_2e) =** Absolute quantity of emissions specified by the goal level (Mt CO_2e)
Base year intensity goal	**Estimated allowable emissions in the target year (Mt CO_2e) =** [Base year emissions intensity (Mt CO_2e/level of output) – Base year emissions intensity (Mt CO_2e/level of output) x Percent reduction] x Projected level of output in the target year
Baseline scenario goal**	**Allowable emissions in the target year (Mt CO_2e) =** Projected baseline scenario emissions in the target year (Mt CO_2e) – [Projected baseline scenario emissions in the target year (Mt CO_2e) x Percent reduction]

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Equation for calculating allowable emission intensity

Allowable emissions intensity in the target year (t CO_2e/level of output) =
Base year emissions intensity (t CO_2e/level of output) –
[Base year emissions intensity (t CO_2e/level of output) × Percent reduction]

Note: Section 5.1 provides guidance on whether to include land sector emissions in base year emissions intensity.

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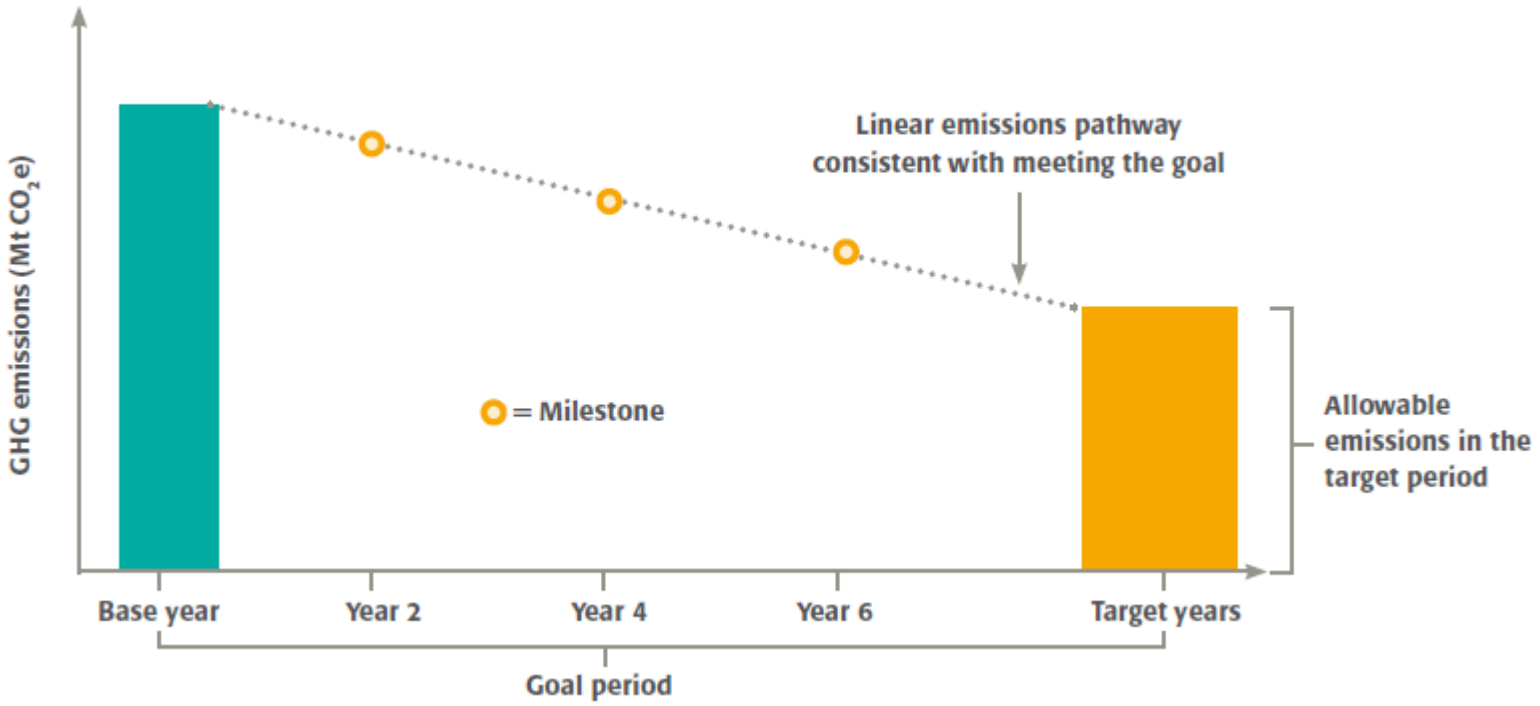
Setting milestones: Example along a linear emissions path



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Chapter 8 Assessing progress

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Choose frequency of assessment

- The frequency of assessment depends on:
  - stated objectives,
  - policy-making needs,
  - data availability,
  - cost, capacity, and
  - stakeholder demand
- If feasible, progress should be reported on an annual basis
- The same frequency should be used throughout the goal period

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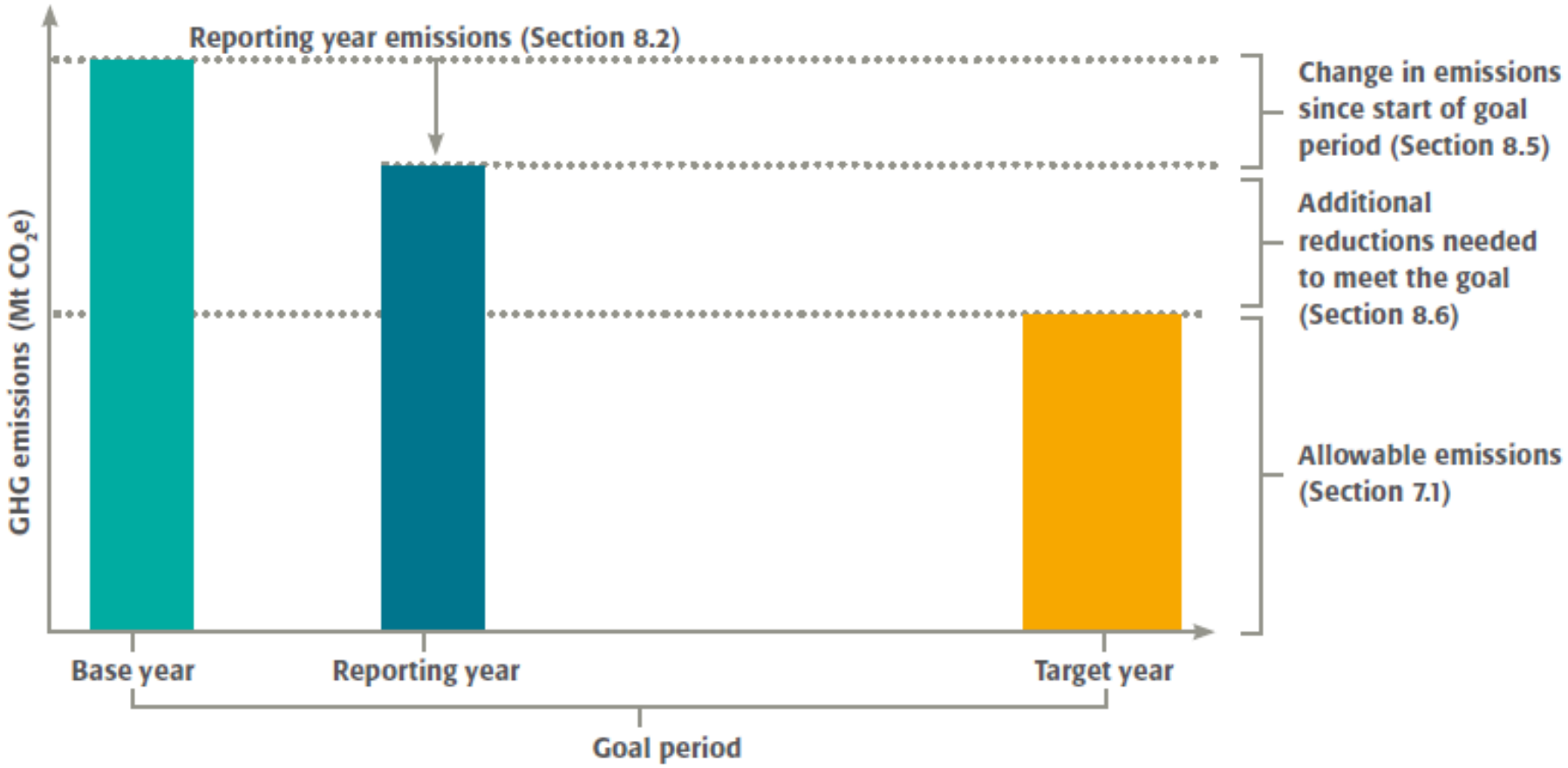
Assessing progress



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Develop GHG inventory for reporting year

- There may be a time lag between the GHG inventory year and the year in which the inventory is actually published
- Official statistics for the unit of output may not be immediately available

➡ A complete assessment will need to be based on a published inventory and official statistics

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Calculate reporting year emission intensity

$$\text{Reporting year emissions intensity} = \frac{\text{Reporting year emissions (Mt } CO_2e)}{\text{Level of output (or relevant variable) in the reporting year}}$$

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Recalculate emissions (if relevant)

- What to recalculate:
  1. Base year emissions, base year emissions intensity, or baseline scenario emissions;
  2. Allowable emissions or emissions intensity; and/or
  3. Reporting year emissions
- Why:
  1. Due to methodological changes
  2. Due to changes in emissions drivers (dynamic baseline scenarios)
  3. Due to changes to the goal itself

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Calculate change in emissions

Change in emissions since the start of the goal period (Mt CO_2e) =
Reporting year emissions (Mt CO_2e) – Emissions in the first year of the goal period (Mt CO_2e)

* For users that do not treat the land sector as an offset.

Calculate additional reductions needed to achieve the goal

Additional emission reductions needed to achieve the goal (Mt CO_2e) =
Reporting year emissions (Mt CO_2e) – Allowable emissions (Mt CO_2e)

* For users that do not treat the land sector as an offset.

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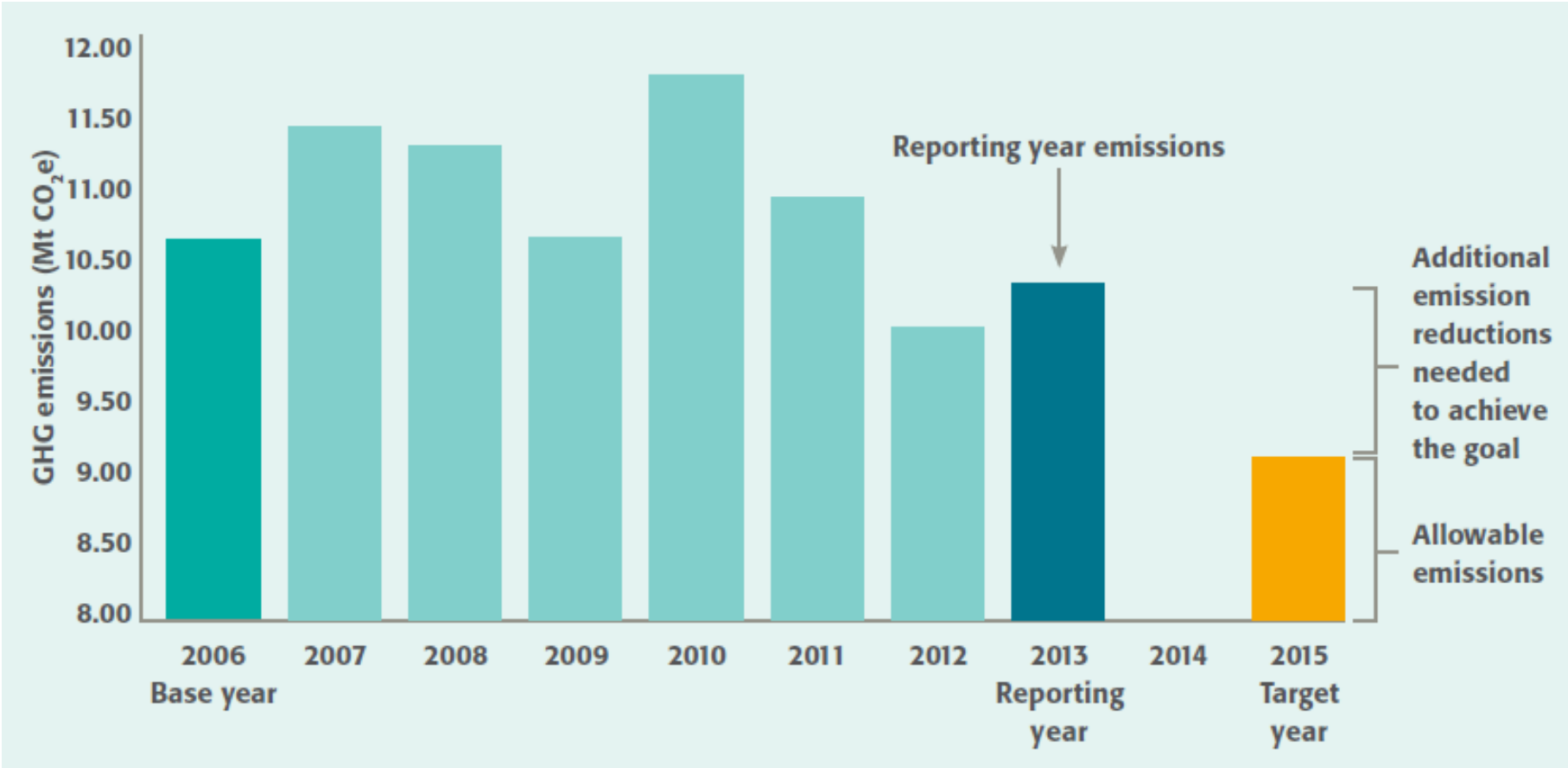
Example: Assessing progress toward South Africa's mining sector goal



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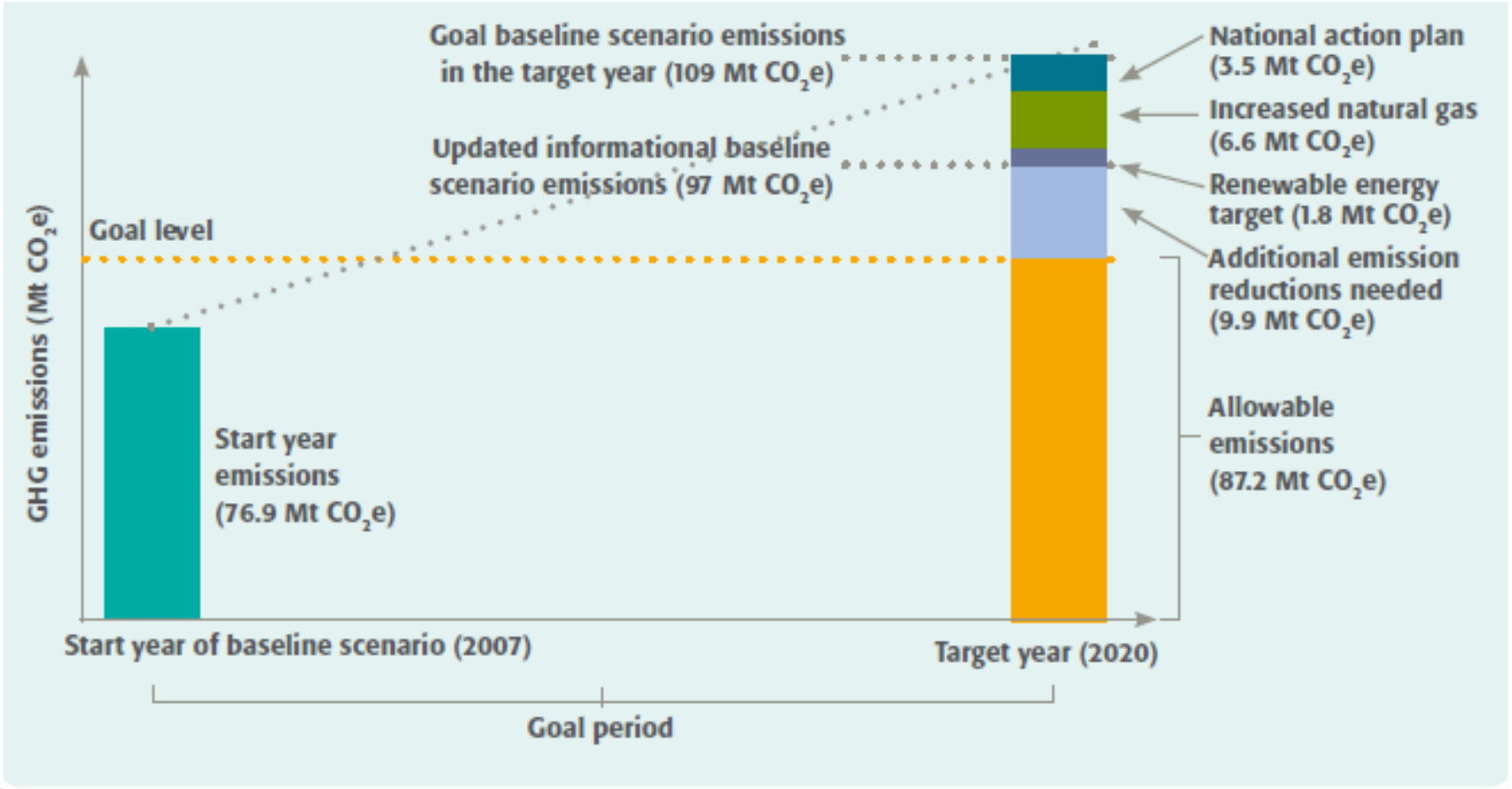
Example: Tracking progress towards Israel's goal



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Assess whether the jurisdiction is on track to achieve the goal

- Develop an informational baseline scenario that includes all implemented and adopted policies and uses the reporting year as the start year
- Compare baseline scenario emissions in the target year(s) to allowable emissions

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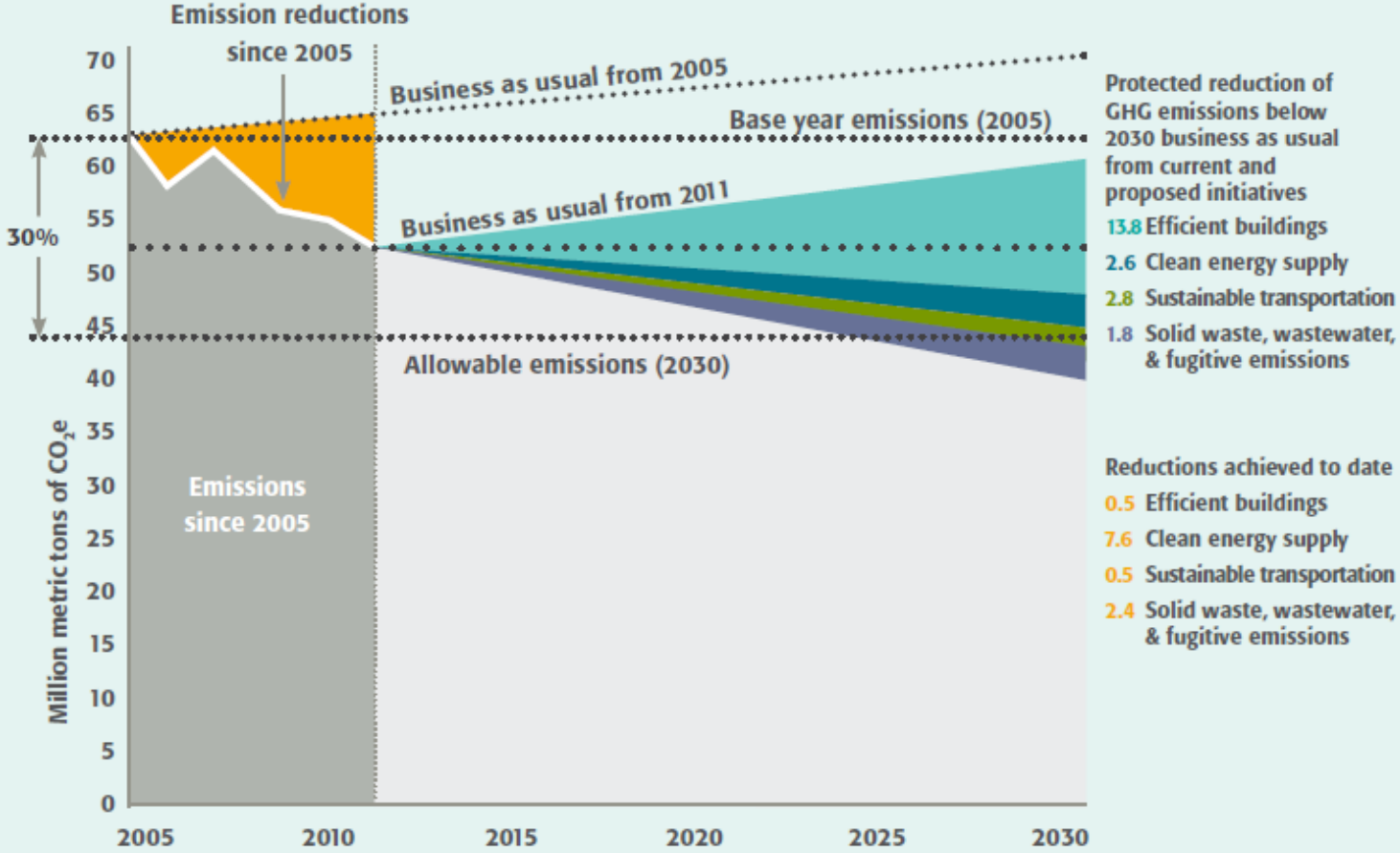
Example: New York City's progress toward meeting its goal



Source: New York City 2013.

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Chapter 9 Assessing goal achievement

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Calculate target year/period emissions

- Develop a complete GHG inventory for the target year(s) or period
- Aggregate emissions from the GHG inventory for all gases and sectors that are included in the goal boundary, including out-of-jurisdiction emissions, if relevant

➡ A complete assessment will need to be based on a published inventory and official statistics

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Determine quantity of transferable emissions

- Report the
  - type,
  - vintage, and
  - quantity (in terms of Mt CO_2e)

  of transferable emissions units retired and sold in the target year, relevant year of the target period, or over the target period
- Units that have been applied toward the goal are retired permanently and cannot be used again by the retiring jurisdiction or any other jurisdiction
- Use sample GHG balance sheet to report and track units

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Sample GHG balance sheet

GHG balance sheet for mitigation goals accounting			1	2	3	4	5	6
			2010 (Base year)	Target Period				Cumulative emissions= (2) + (3) + (4) + (5)
				2014	2015	2016	2017	
Emissions and removals within the goal boundary (Mt CO_2e)								
A	**Total emissions (excluding the land sector)**		**1,000**	**900**				
	In-jurisdiction emissions (scope 1)		800	700				
	Out-of-jurisdiction emissions (scope 2 and/or 3)		200	200				
B	**Net land sector emissions**		**-100**	**-150**				
	Total land sector emissions		50	50				
	In-jurisdiction emissions (scope 1)		50	50				
	Out-of-jurisdiction emissions (scope 2 and/or 3)		0	0				
	Total land sector removals		-150	-200				
	In-jurisdiction removals (scope 1)		-150	-200				
	Out-of-jurisdiction removals (scope 2 and/or 3)		0	0				
Transferable emissions units (Mt CO_2e)								
C	**Total credits retired**		**0**	**50**				
	Credits retired by type	Type A (e.g., CDM)	0	30				
		Type B	0	20				
D	**Total credits sold**		**0**	**10**				
	Credits sold by type	Type A (e.g., CDM)	0	5				
		Type B	0	5				
E	**Total allowances retired**		**0**	**10**				
	Allowances retired by type	Type A (e.g., EUA)	0	5				
		Type B	0	5				
F	**Total allowances sold**		**0**	**5**				
	Allowances sold by type	Type A (e.g., EUA)	0	3				
		Type B	0	2				
Change in net land sector emissions (Mt CO_2e) (For users that treat the land sector as an offset and accounting relative to base year/period emissions)								
G	(B) reporting year – (B) base year		**N/A***	**-50**				
Accountable emissions (Mt CO_2e) (For all users except those treating the land sector as an offset)								
H	(A) + (B) – (C) + (D) – (E) + (F)		**N/A***	**705**				
Accountable emissions (Mt CO_2e) (For users that treat the land sector as an offset)								
I	(A) – (C) + (D) – (E) + (F) + (G)		**N/A***	**805**				

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Calculate accountable emissions

- Accountable emissions are the quantity of emissions and removals that users apply toward achieving the goal, and may take into account sales and retirement of transferable emissions units and change in net land sector emissions, depending on goal design.

Accountable emissions ($MtCO_2e$) =
Target year emissions ($MtCO_2e$) + Transferable emissions units sold in the target year ($MtCO_2e$)
– Transferable emissions units retired in the target year ($MtCO_2e$)

* For users that do not treat the land sector as an offset.

$$\textbf{Accountable emissions intensity} = \frac{\text{Accountable emissions } (MtCO_2e)}{\text{Level of output (or relevant variable) in the target year}}$$

* For users that do not treat the land sector as an offset.

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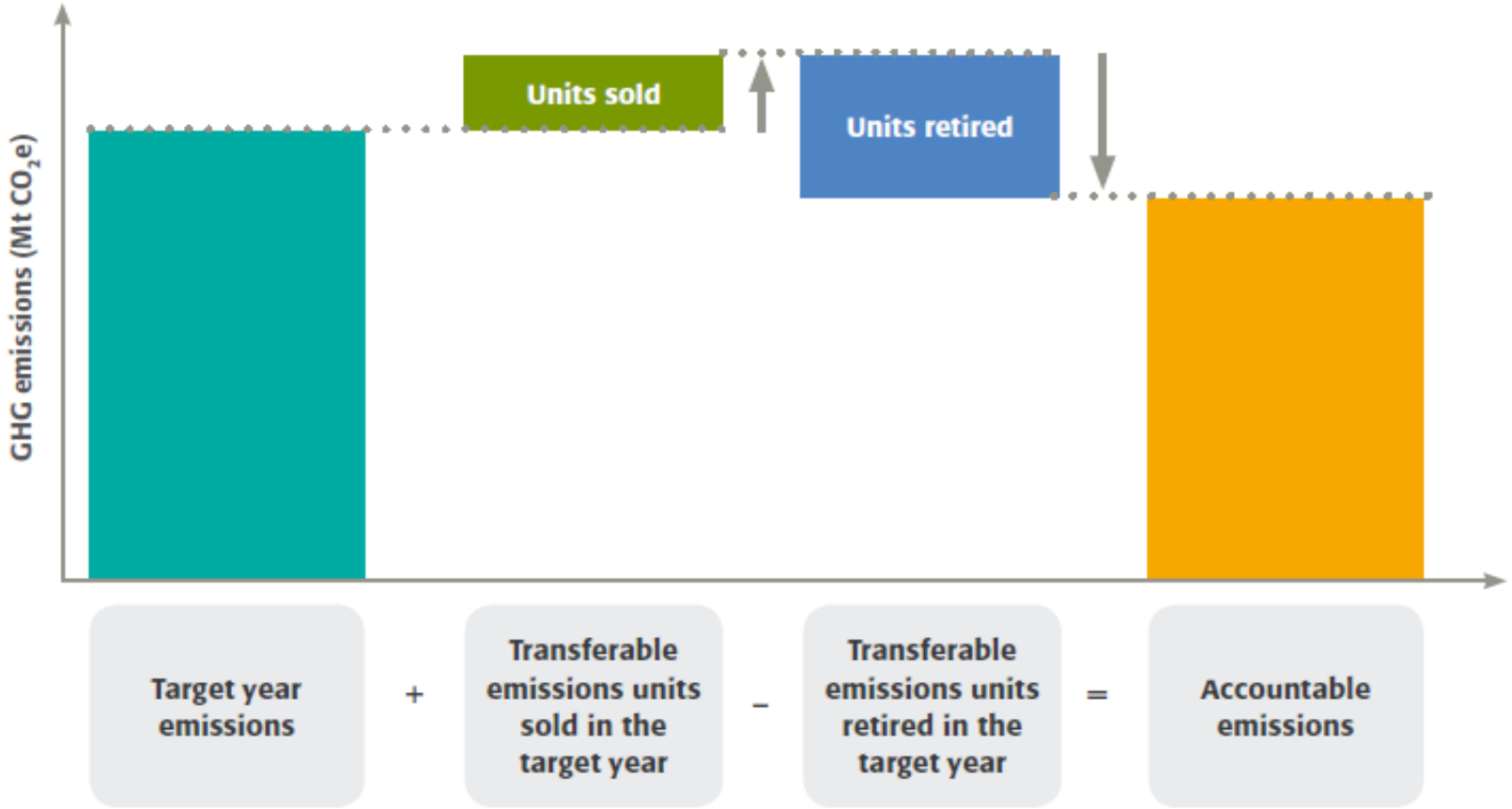
Calculate accountable emissions (no land use offsets)



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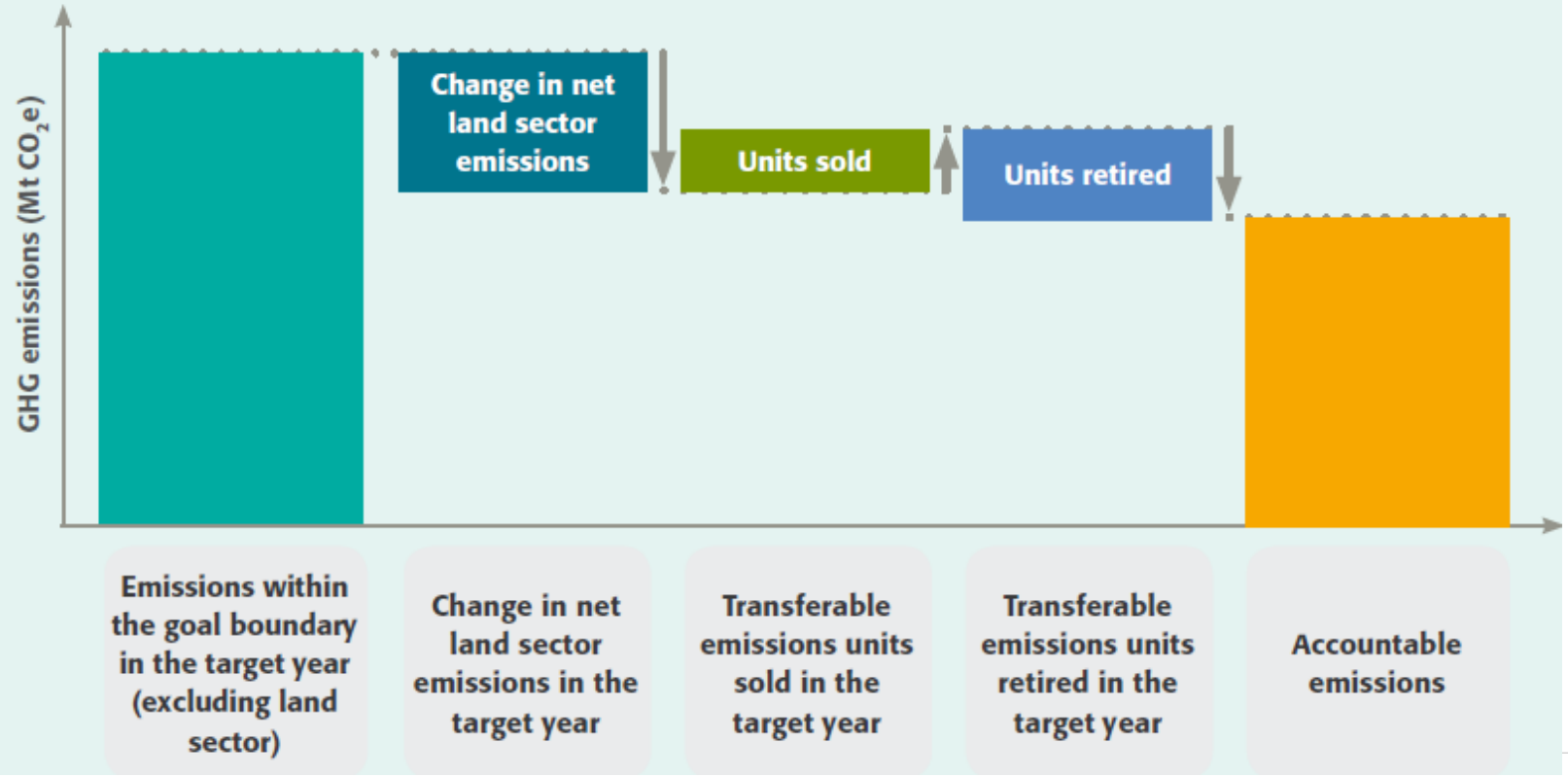
With treatment of the land sector as an offset

Accountable emissions (Mt CO_2e) =

Target year emissions* (Mt CO_2e) + Transferable emissions units sold in the target year (Mt CO_2e) – Transferable emissions units retired in the target year (Mt CO_2e) + Change in net land sector emissions (Mt CO_2e)

* Excluding the land sector.



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Recalculate emissions

- To maintain the consistency of time-series data and enable meaningful comparisons of emissions at the end of the goal period, emissions and other values may need to be recalculated:
  - Due to methodological changes
  - Due to changes in emission drivers (for dynamic baselines)
- Report any emissions recalculations, including recalculations of base year emissions, base year emissions intensity, baseline scenario emissions, and allowable emissions or emissions intensity, and the recalculated values alongside the original values

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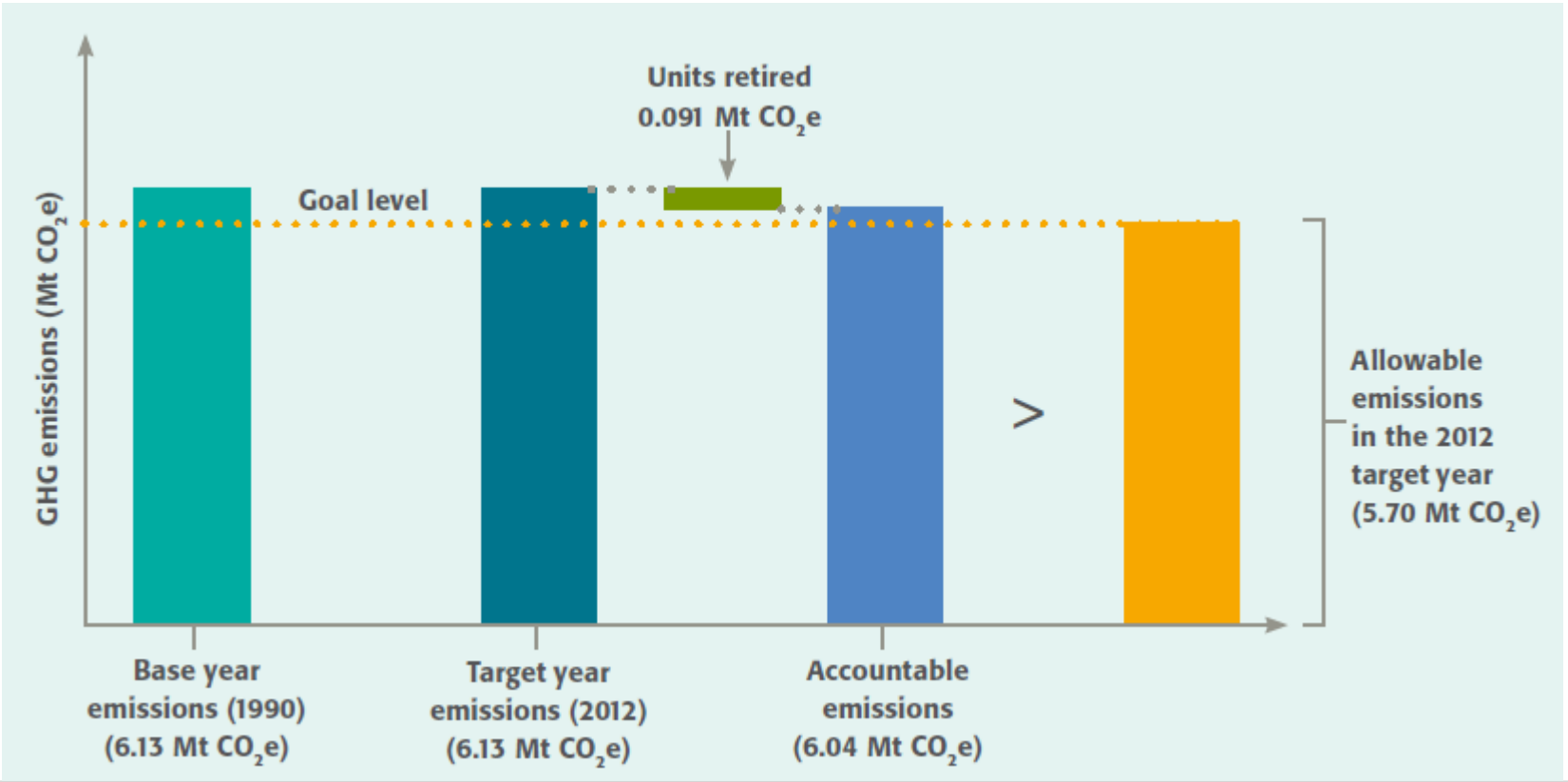
Example: the City of Seattle

- Accountable emissions exceeded allowable emissions by 0.34 Mt CO_2e, and, thus Seattle's goal was not achieved.



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Chapter 11 Reporting

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Reporting

- Report the results of the assessment according to a standardized set of reporting requirements

- Optional reporting information can further enhance transparency

- Four parts to the reporting requirements/template:
  1. Design of the goal
  2. Calculation of allowable emissions in the target year or period
  3. Assessing progress during the goal period
  4. Assessing goal achievement

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For more information

Kelly Levin
klevin@wri.org
1-202-729-7910

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Federal Ministry
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