



# Emissions Trading in Practice Setting the Cap

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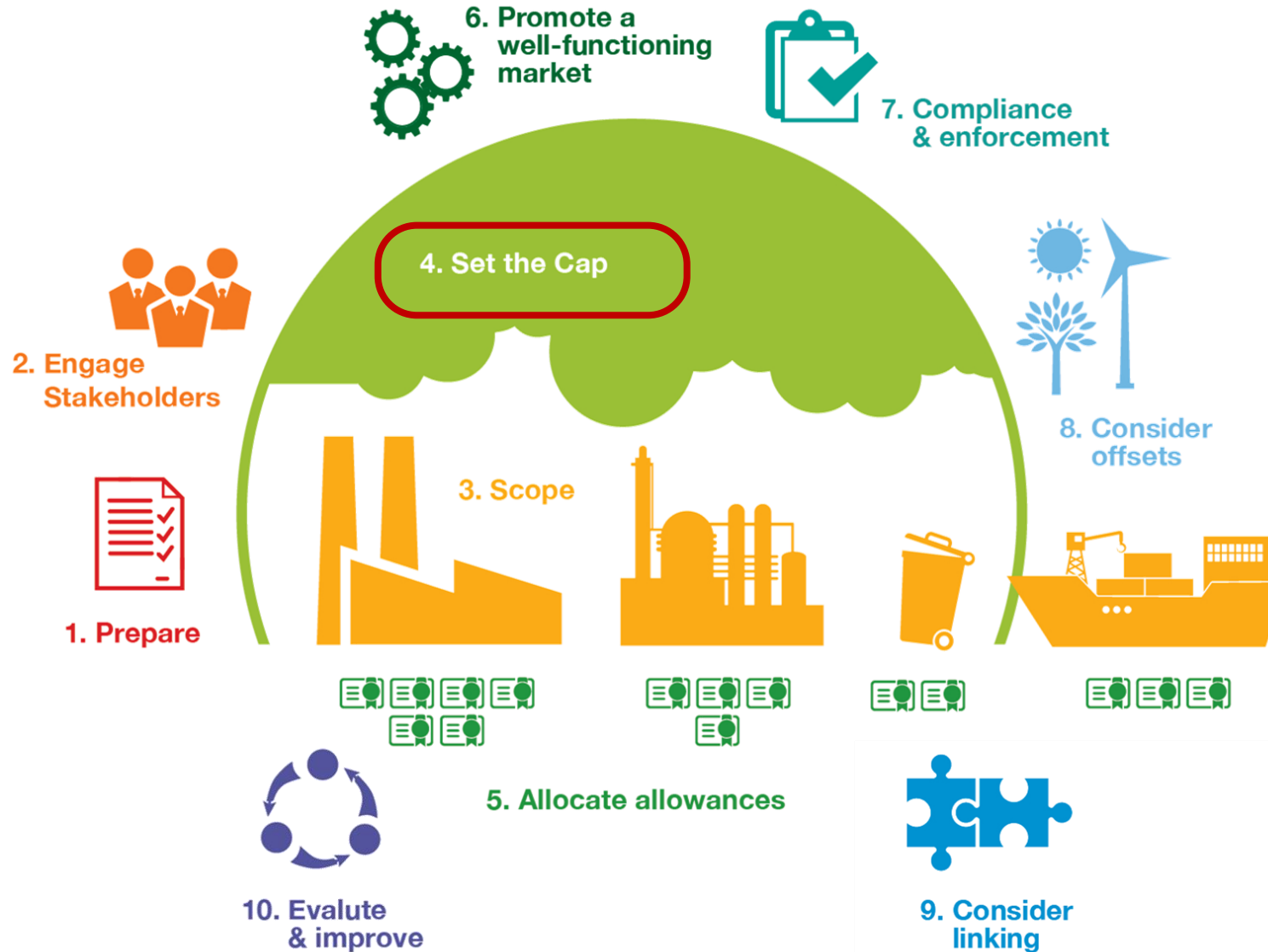
# EMISSIONS TRADING IN PRACTICE:

A Handbook on Design  
and Implementation

SECOND  
EDITION

## ICAP-PMR ETS Handbook





# Learning objectives

- Understand the role of the cap in an ETS
- Understand the difference between an absolute cap and an intensity cap
- Understand the background information which is helpful to set the ETS cap
- Know key considerations for design and management of the Cap



# Agenda

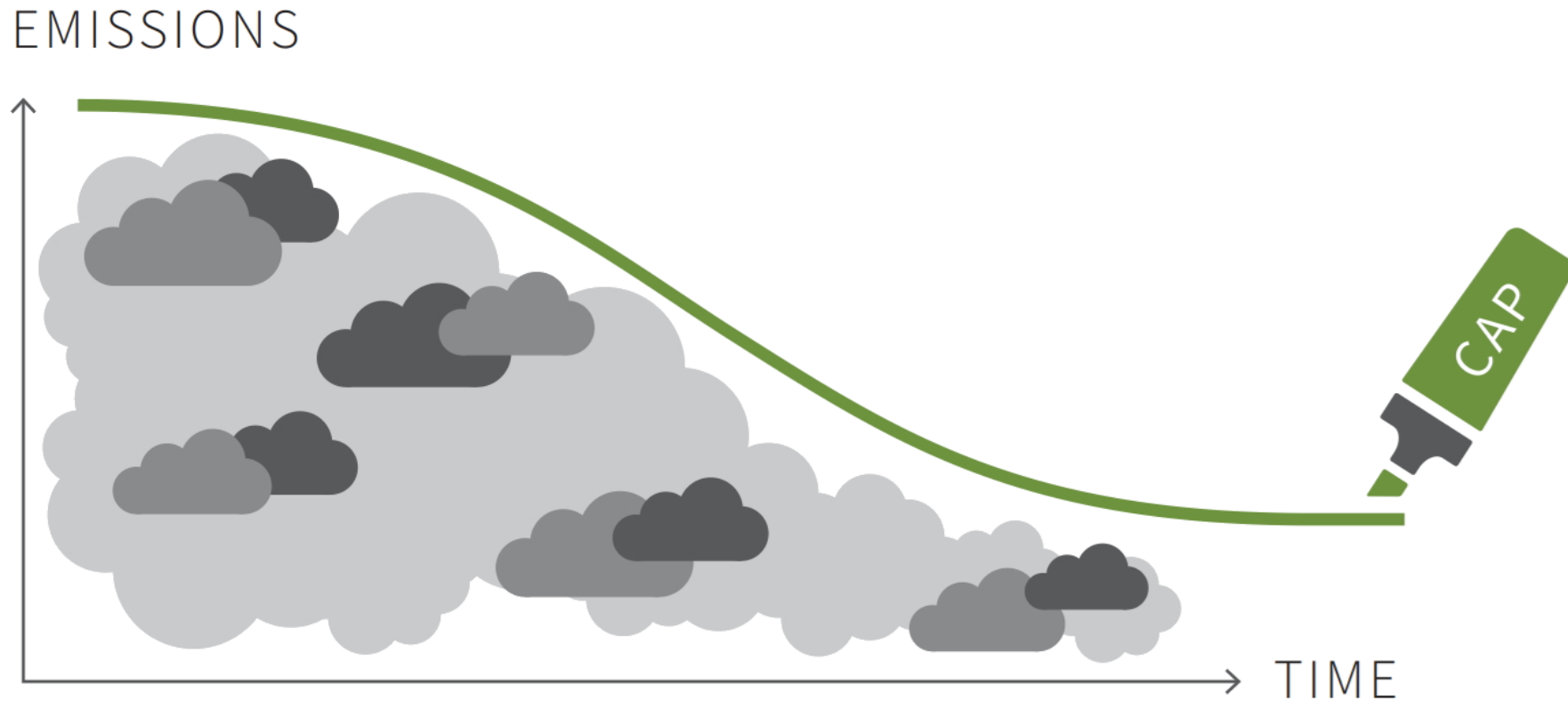
1. What is an ETS cap?
2. Type of cap: absolute or intensity?
3. Data requirements for setting the cap
4. Implementing the cap
5. Managing the cap

# What is an ETS cap?

Types of cap: absolute or intensity?

# What is an ETS cap?

The cap defines the amount of GHGs that can be emitted by covered entities and determines the supply of allowances

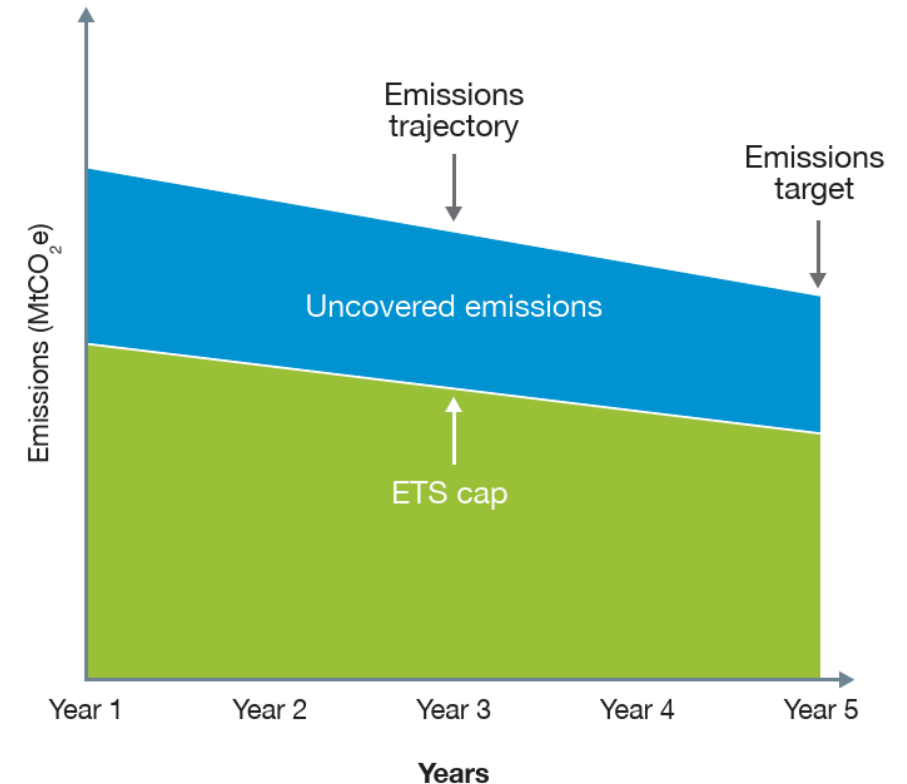


# Mitigation ambition of the cap

*How far and how quickly should GHG emissions be reduced?*

1. **Align cap ambition and target ambition:**  
Make sure ETS cap trajectory is compatible with the jurisdiction's overall climate target
  
2. **Balance mitigation ambition vs. costs:**  
Avoid harming domestic competitiveness and welfare

*Aligning the ETS cap with overarching emissions target*

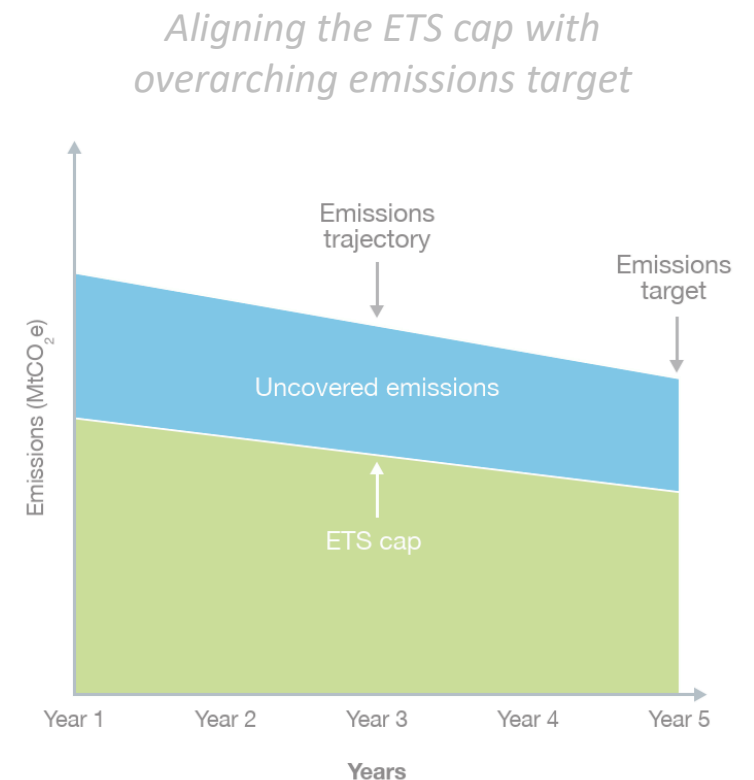




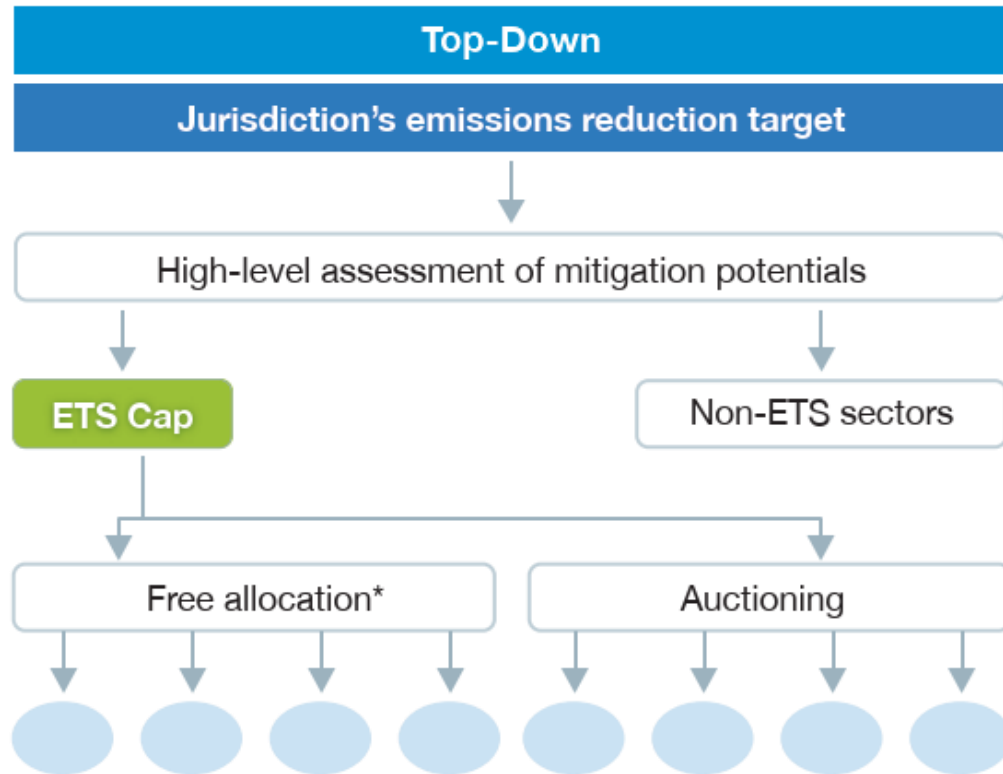
# Mitigation ambition of the cap

*How can other decarbonization policies and instruments influence the ETS mitigation outcomes?*

- 3. **Burden sharing between capped and uncapped sectors:** What share of mitigation effort should be borne by ETS sectors vis-à-vis other sectors to reach overall target?
- 4. **Share of domestic emissions abatement efforts:** What share of emission reductions may be achieved outside the jurisdiction?

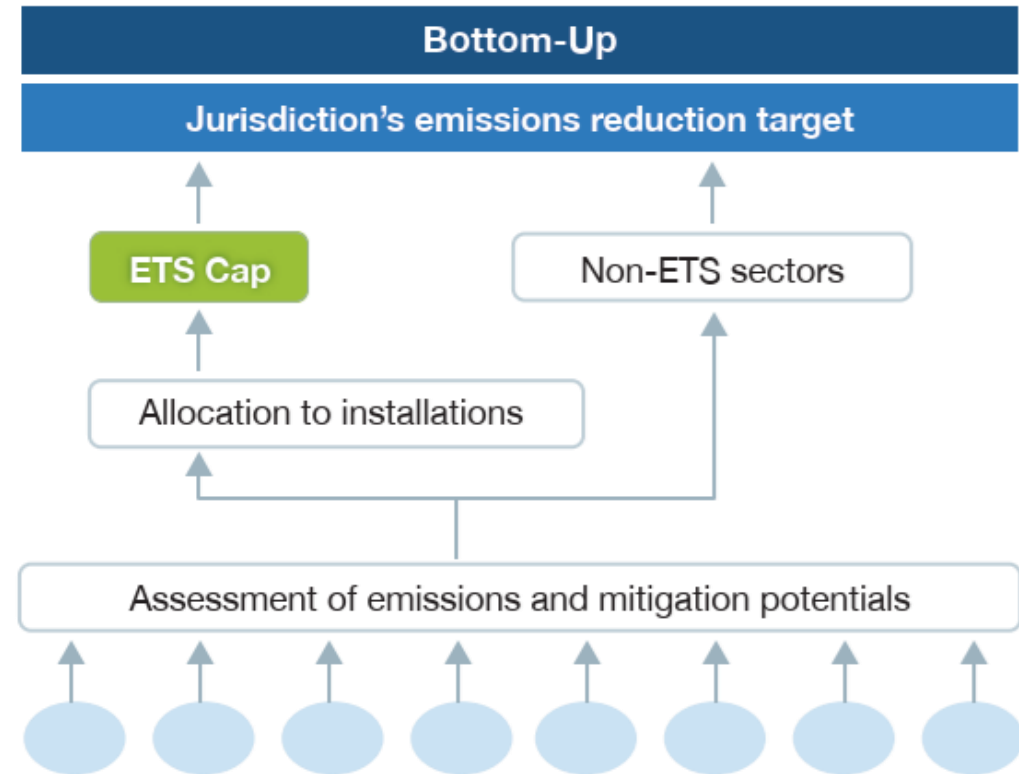


# Approaches to cap-setting: top-down vs bottom-up



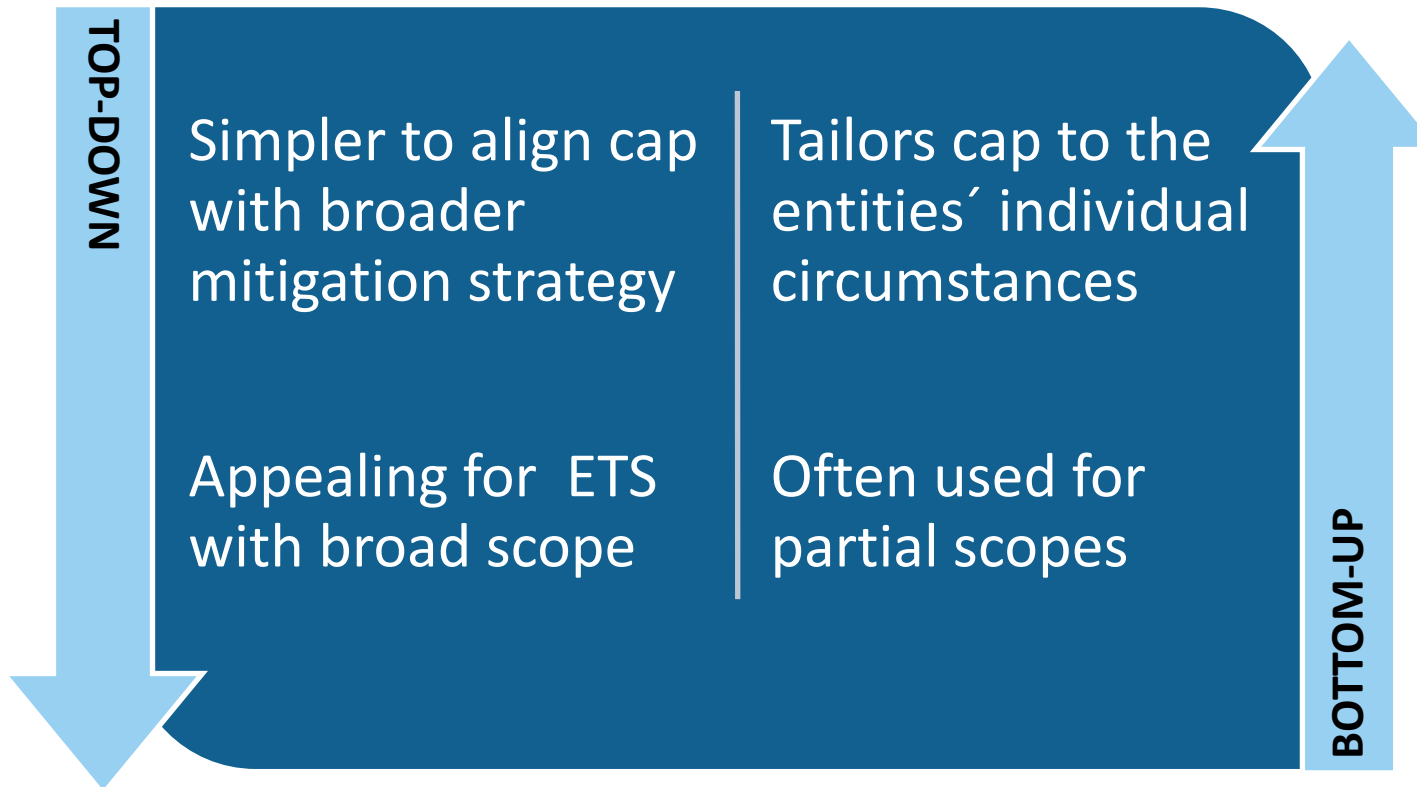
\*Potentially aligned to the ETS cap with an adjustment factor

Government sets the cap based on its overall emission reduction objectives and a high-level assessment of mitigation potential and costs across covered sectors.



Government bases the cap on a more granular assessment of emissions, mitigation potential, and costs for each sector, subsector, or participant, and determines an appropriate emission reduction potential for each.

# Approaches to cap-setting: top-down vs bottom-up



A **hybrid approach** takes elements from both bottom-up/top-down:

- **Bottom-up data** helps policy makers determine the cap
- Many ETSs with a more limited scope **use hybrid approaches**

# Type of cap: Absolute or intensity?

## Absolute

1. **Carbon budget approach:** **absolute limit** on emissions over some fixed point in time
2. Normally expressed as a **reduction compared to a base year**
3. Constant absolute reductions set a **reduction pathway**

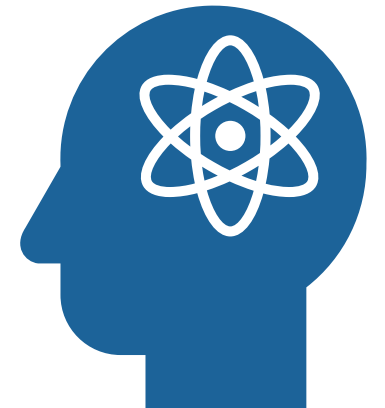
## Intensity

1. **Targets set relative to the carbon intensity** of an underlying metric (per GDP, capita, output)
2. **Absolute emissions level not fixed** – emissions increase under a growing economy
3. Could take a **slow, stop, reverse growth** approach

# Type of Cap: intensity or absolute?

## Key considerations

- **Alignment of cap type with national target type**
  - Structural alignment helps stakeholders understand how much the ETS contributes to achieving the target
- **Data considerations**
  - Absolute cap often requires economic modelling
  - Intensity based cap requires appropriate intensity metrics (economy wide such as GDP, or sector specific product benchmarks)
- **Future linking**
  - Linking easier with partners that have equivalent cap structures





# Type of Cap: intensity or absolute?

## Cap structure under uncertainty

Absolute and intensity-based caps have different mitigation and cost implications when emissions deviate from expectations.

Emissions	Absolute Cap	Intensity Cap
<b>Higher than expected</b>	<ul style="list-style-type: none"><li>• More mitigation</li><li>• Higher cost</li><li>• Equivalent emissions</li></ul>	<ul style="list-style-type: none"><li>• Less mitigation</li><li>• Lower costs</li><li>• Higher emissions</li></ul>
<b>Lower than expected</b>	<ul style="list-style-type: none"><li>• Less mitigation</li><li>• Lower cost</li><li>• Equivalent emissions</li></ul>	<ul style="list-style-type: none"><li>• More mitigation</li><li>• Higher cost</li><li>• Lower emissions</li></ul>

# Type of Cap: intensity or absolute?

- Both types can accommodate for emissions growth
- Intensity based caps are more difficult to translate into sector- or installation-specific allocation
- Almost all ETSs to date have an absolute caps
- Absolute and intensity targets can be combined



# Data requirements for cap-setting

# Data requirements

## Collecting data to set the cap

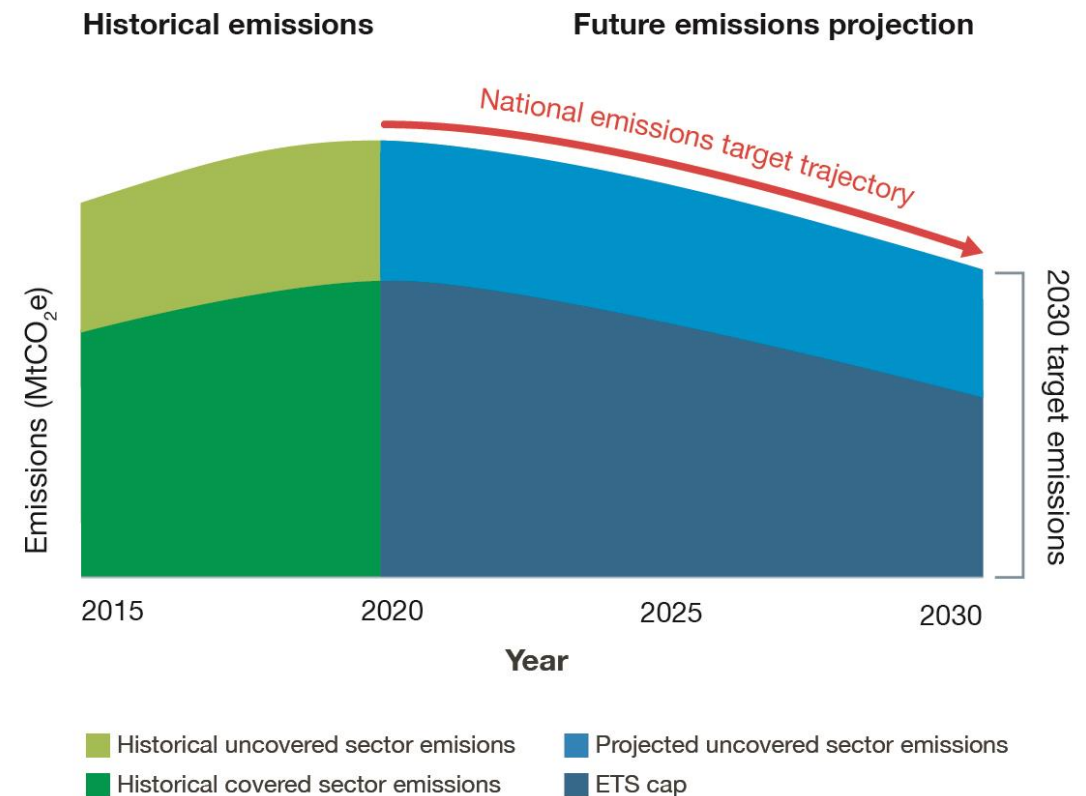
- **Historical emissions** and economic data
- **Projections for emissions** in a baseline scenario
  - E.g., BAU trajectory
- **Technical and economic potential** to reduce emissions in covered sectors
- Roles of existing and new companion policies and barriers to mitigation



# Data requirements

## Historical emissions data & baseline emissions projections

- Historical data can be a good starting point to project future emissions and set the cap
- Projecting BAU emissions
  - Dealing with uncertainty – Stress test assumptions and run multiple scenarios
  - Understand your data sources – Industrial or company data may be overly optimistic in terms of growth projections



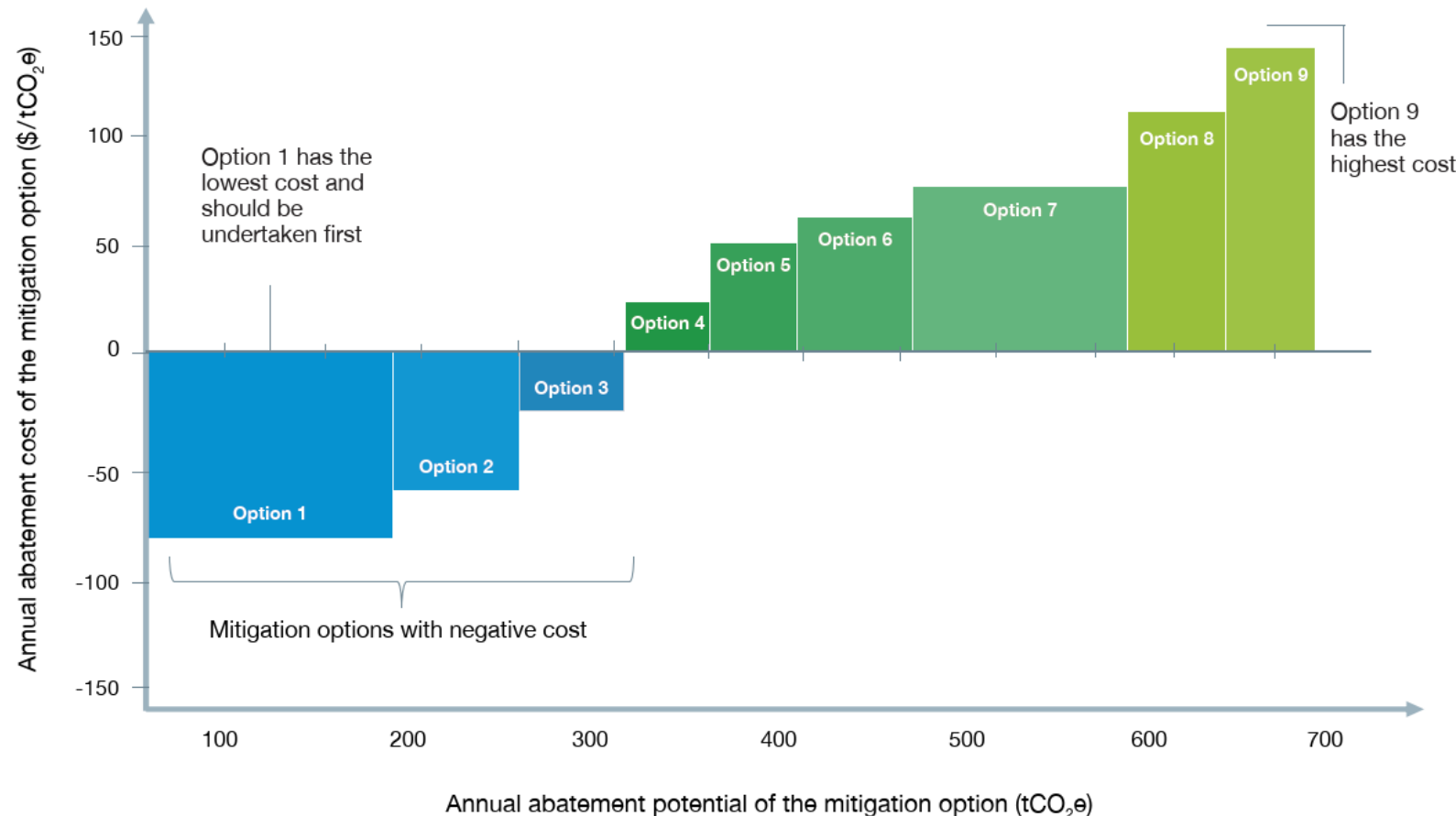


## Projections for emissions under BAU

### Four key options for emissions projections

- 1. Trend extrapolation:** Observed historical trends in output (e.g., GDP, kWh of electricity use) and emissions intensity as a function of output are extended into the future to define an emission pathway
- 2. Extended extrapolation:** Extrapolation of historical trends is refined by accounting for potential changes in output and/or emissions intensity.
- 3. Decomposition projection:** Trends in a small number of key emission drivers (for example, population, economic growth, energy intensity, and structural change) are assessed to define an emission pathway.
- 4. Detailed bottom-up analysis:** Drivers of production and emission intensity are analyzed in detail at the (sub)sector level in the context of broader economic projections. Results aggregated to define an emission pathway.

## Technical and economic potential to reduce emissions



Marginal Abatement Cost (MAC) Curves for different sectors can help assess mitigation potentials incited by the ETS Cap

# Implementing the cap

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## Cap governance

*Who administers the cap? How is the cap represented in legislation?*

Agreeing upon the formal legal and administrative governance arrangements.

- **Administration:**
  - Authorities can be either **regulatory, legislative or administrative** bodies.
  - Given importance (and lobbying) consider role of independent body
- **Legislation:**
  - Most commonly, the *process* for establishing the cap is in legislation with the actual caps in secondary (or other form of subordinate legislation)

## Cap governance

### California

- Target set by state legislation
- California Air Resource Board entrusted with strategy, implementation and administration



### Republic of Korea

- ETS cap was set outside of legislation
- Legal basis provided in a 2010 Framework Act
- Ministry of the Environment entrusted with first allocation plan

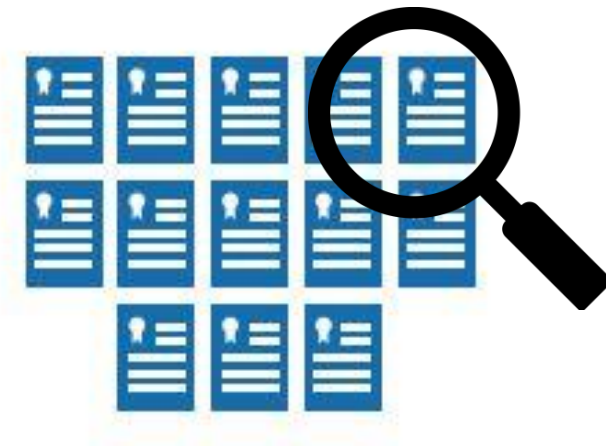




# Implementing the cap

## Designating allowances to be allocated under the cap

- All existing ETSs issue their own domestic allowances
- Often issued in tonnes
- Should external units be recognized? (e.g., offsets)
- Unique serial numbers enable allowance tracking



# Implementing the cap

## Choosing time periods for setting the cap

- **Cap period:** number of years that the cap is set in advance
  - Balance flexibility and certainty for investors
  - Cap period should be aligned to broader climate targets, also to allow for ratcheting ambition in the Paris context
- **Transition between cap periods:** where major changes to the ETS are introduced (expanded sectoral coverage, new targets, reviews, etc.)
- Typically, caps have been set 3-10 years in advance



# Managing the cap

# Managing the cap

## Why make changes between cap phases?

- **Changes in scope:** sectors entering/exiting an ETS or change in participation thresholds
- **Interactions with allocation,** especially the level of free allocation
- **Manage market shocks** (e.g., changes in fuel prices)
- **Interactions with offsets** (if appropriate qual/quant restrictions are not applied)

# Managing the cap

*Why make changes between cap phases?*

- **Linking with other ETSs** is easier if caps are similar
- **Ratcheting ambition**
- Improved data collection reveals **emissions factors** need to be recalculated
- Adjusting supply can help **maintain ‘appropriate’ price** but will affect emissions outcome of ETS. Does jurisdiction have to compensate mitigation shortfall?



# Discussion questions

1. What is the role of the cap in an ETS?
2. What background information is helpful to set the ETS cap?
3. What is the difference between an absolute cap and an intensity cap?
4. How much should the ETS contribute toward meeting the overall emission reduction targets?
5. What considerations should be made at the design stage if planning to link to another ETS in the near or longer term?

## Checklist for Step 4: Set the cap

- ✓ Determine the ambition of the cap, type of cap, and approach to cap setting
- ✓ Create a robust foundation of data to determine the cap
- ✓ Choose time periods for cap setting
- ✓ Agree upon formal legal and administrative governance arrangements
- ✓ Agree on a long-term cap trajectory and strategy for providing a consistent price signal



Thank you