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Co-existence of carbon emissions trading exemplars

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Overview

1. Focus & Limits of lecture
2. Main components of ETS
3. Assembling components
4. Concluding considerations

Focus & Limits of lecture

Focus on Design of ETS:

> 4 main components:

- **[i] Policy goals**
- **[ii] Costs of compliance**
- **[iii] Carbon emissions prices**
- **[iv] Allocations of tradable emissions permits**

- **every component = range of options**
- **assemblage of particular options = ETS exemplar**

Limits

> no survey of the vast literature

> mainly descriptive, using graphics

> no evaluation of ETS

Component [i]
Two major policy goals for EU ETS

A-goal

= Atmospheric stability and cleanness

> emitting (industrial) activities

> carbon emissions down 80-95%

> by the nearest date (before 2050)

+ induce disruptive innovations

++ higher carbon emissions prices as inducing force

Π-goal

= maintain/expand EU's industrial activities

> businesses, employment

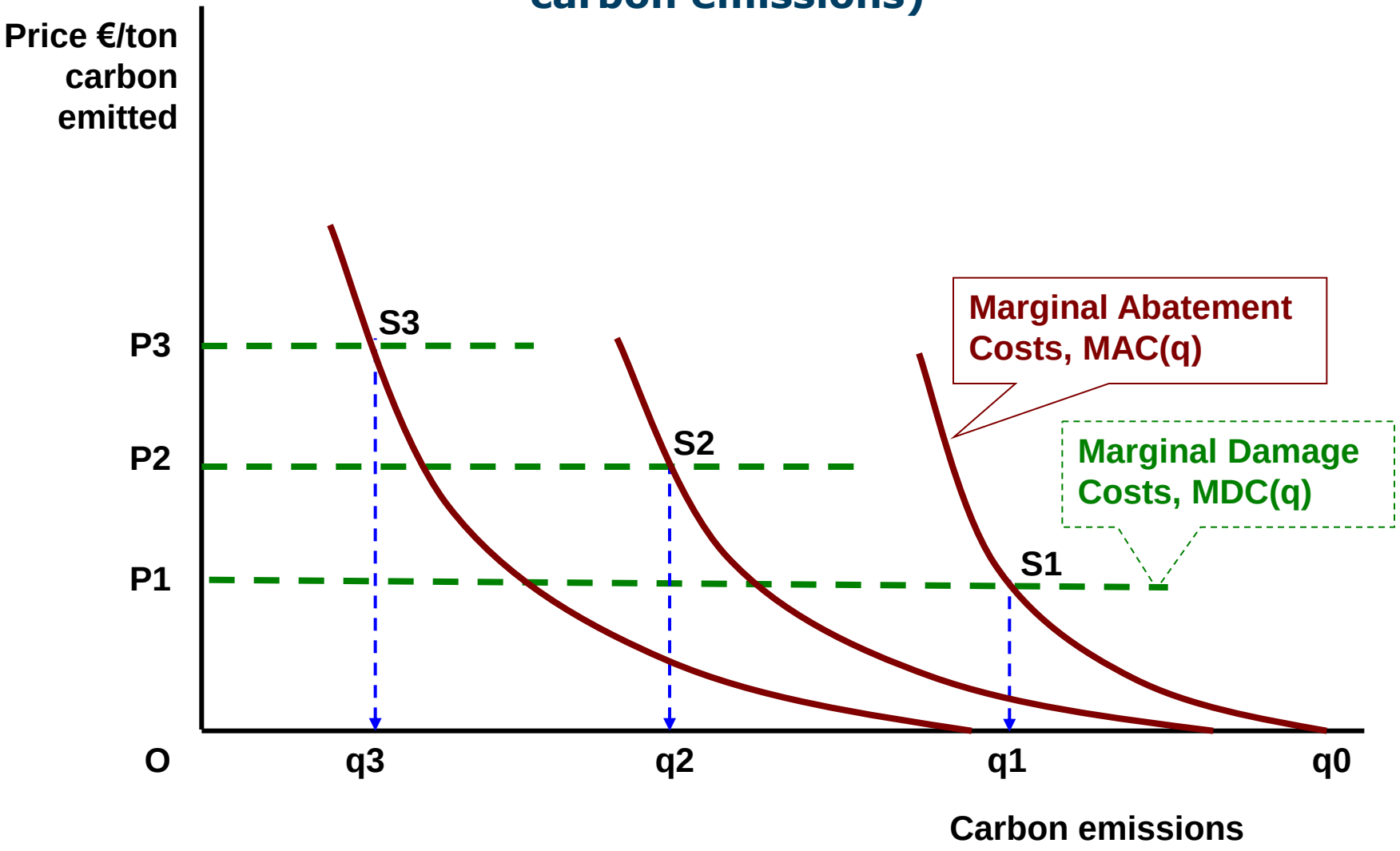
>> profits

+ avoid 'carbon leakage'

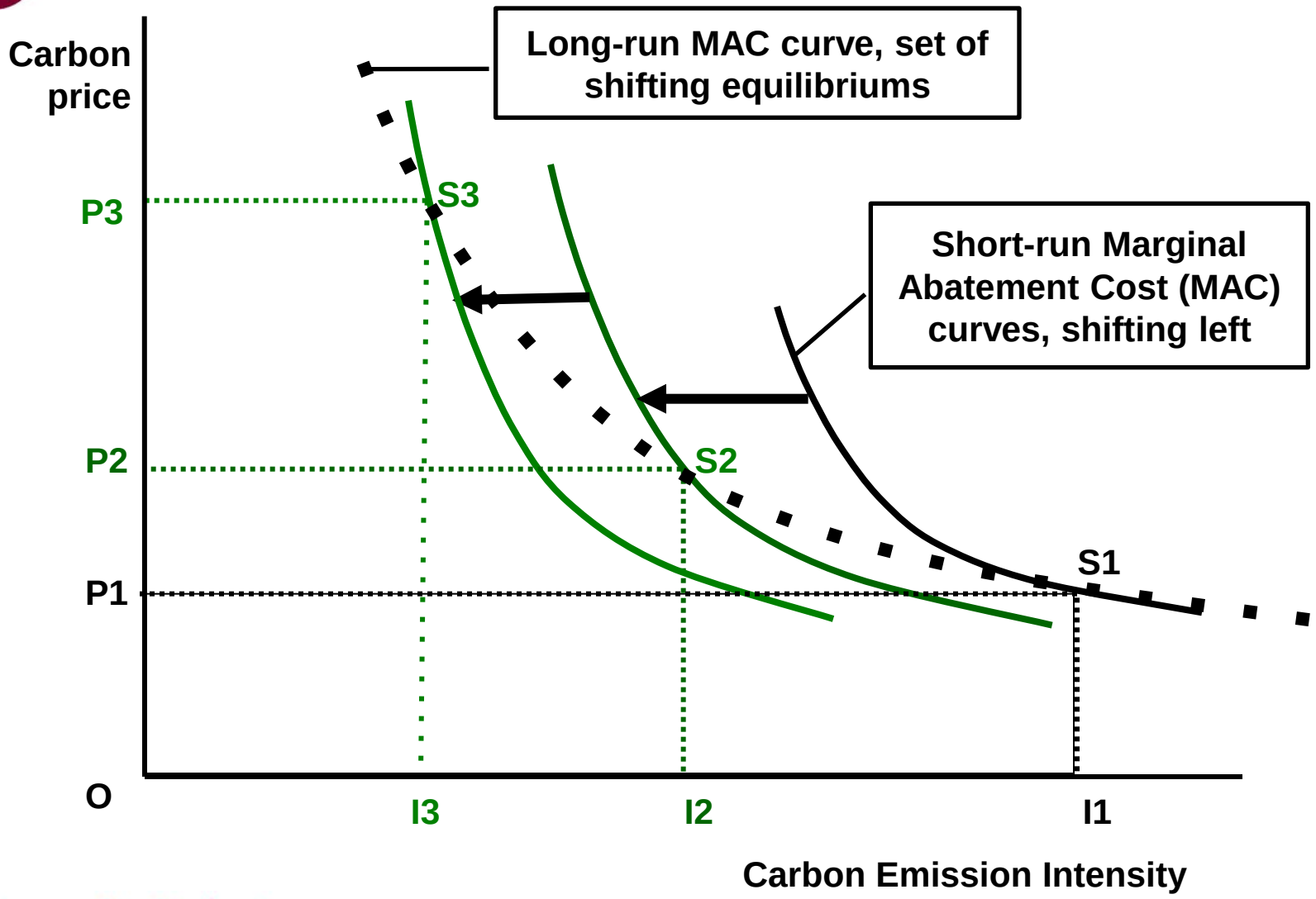
++ no € burdens on Energy-Intensive Trade-Exposed (EITE) industries

Are the two goals reconcilable?

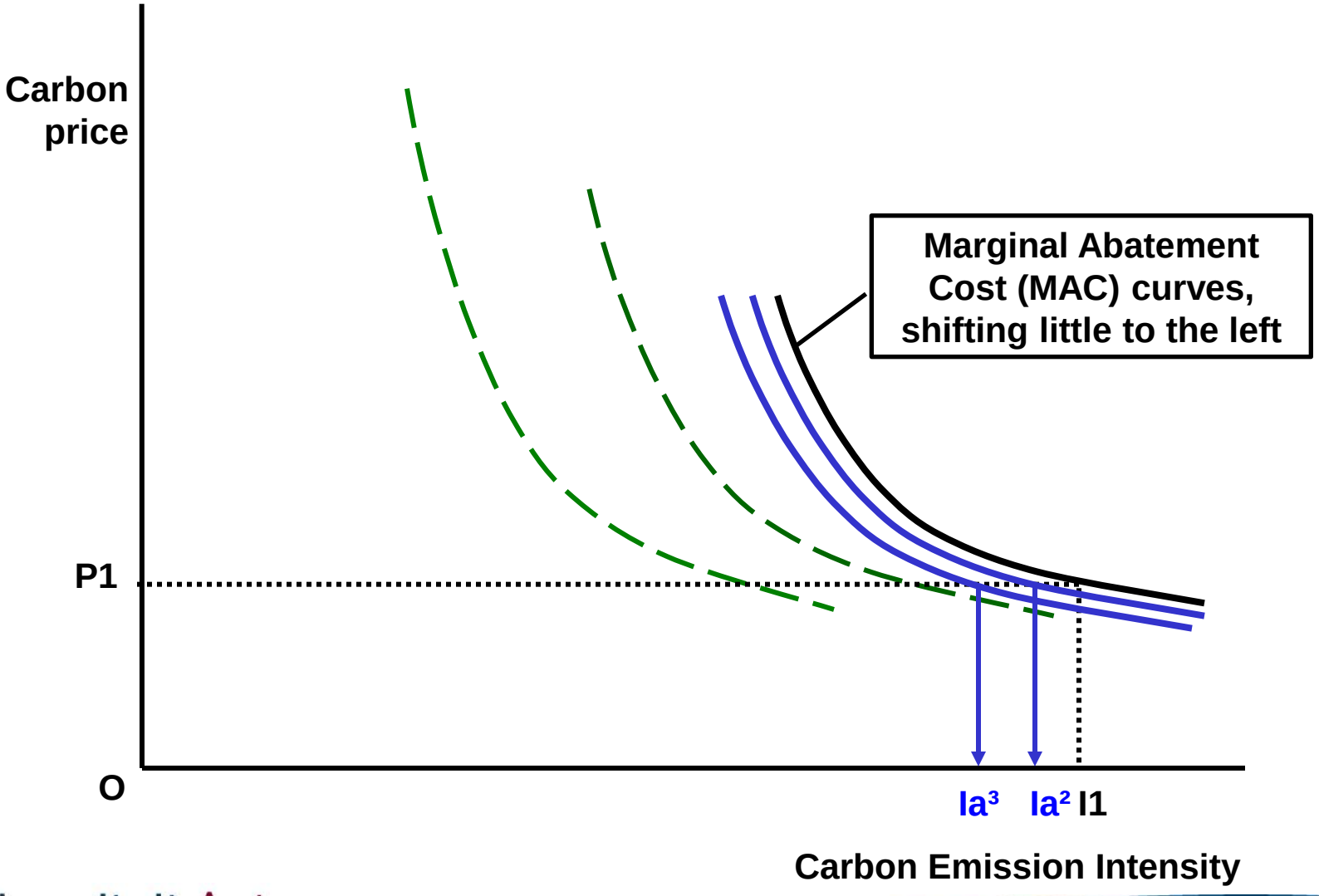
Component [ii]
Costs of compliance (abatement, mitigation of carbon emissions)



Innovations in compliance, induced by high Carbon prices, shift cost curves and reduce optimal Intensities



Without inducing carbon prices: autonomous innovations (ceteris paribus, other innovation drivers excluded)



Component [iii] Carbon emissions pricing

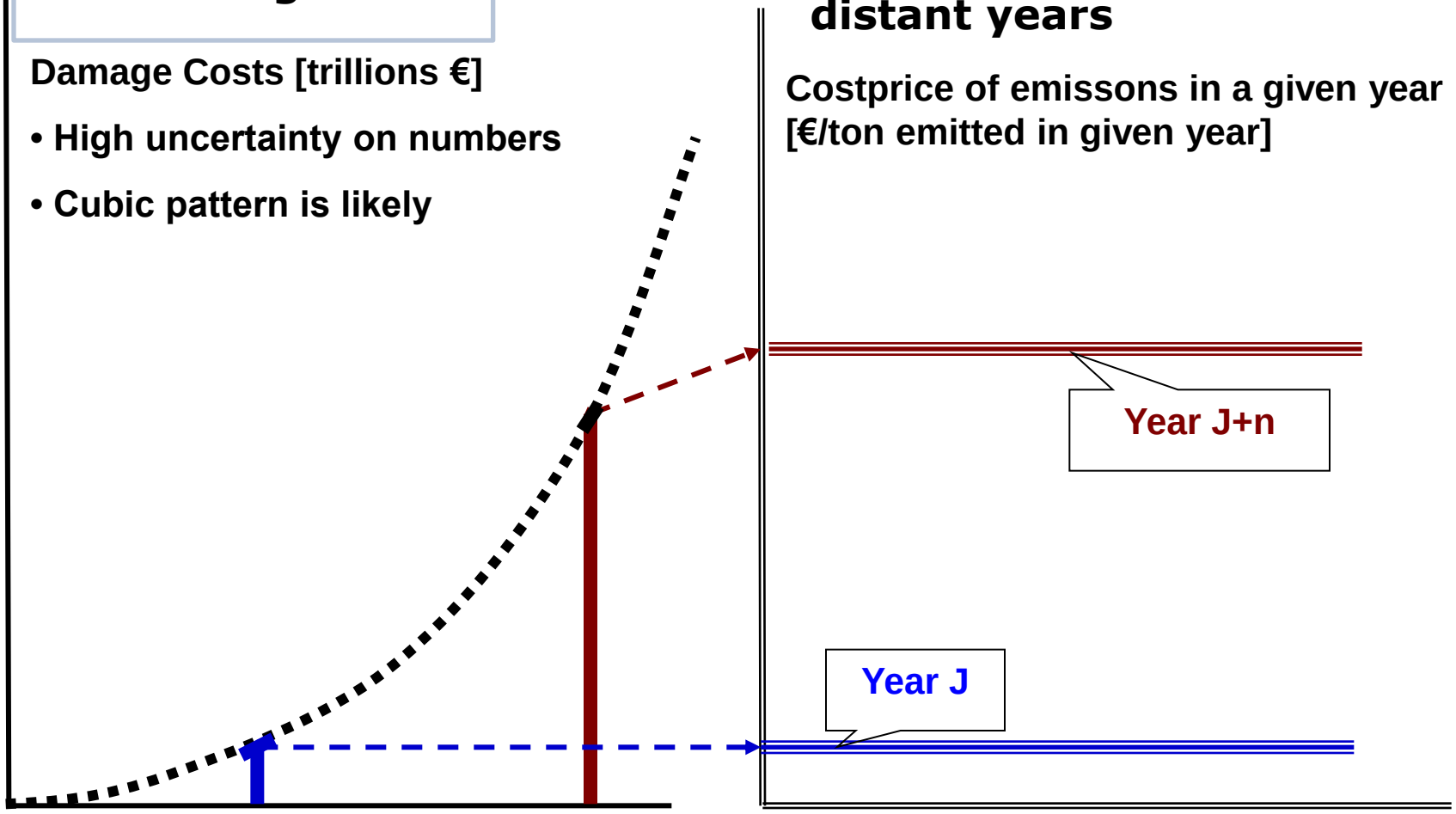
Total damage costs

Damage Costs [trillions €]

- High uncertainty on numbers
- Cubic pattern is likely

Damage cost prices for two distant years

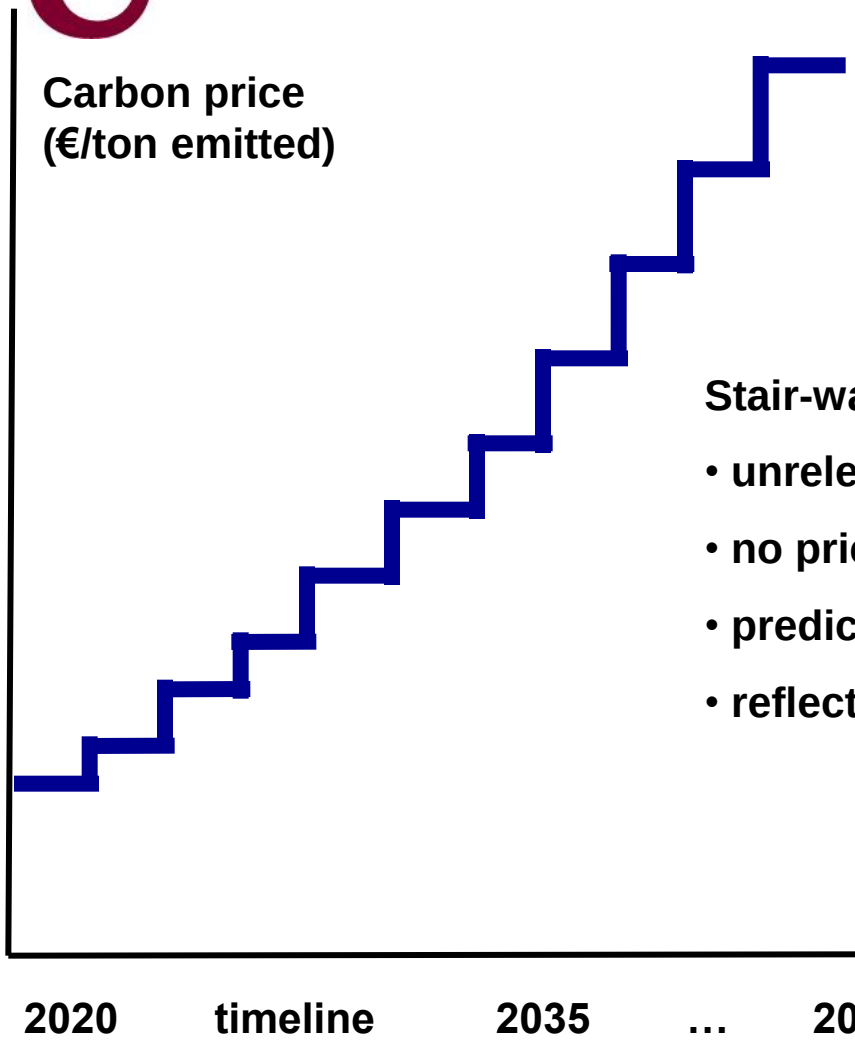
Costprice of emissons in a given year [€/ton emitted in given year]



GHG Concentration in the atmosphere, every year adding a few ppm, due to the yearly GHG emissions

GHG Emissions (ton)

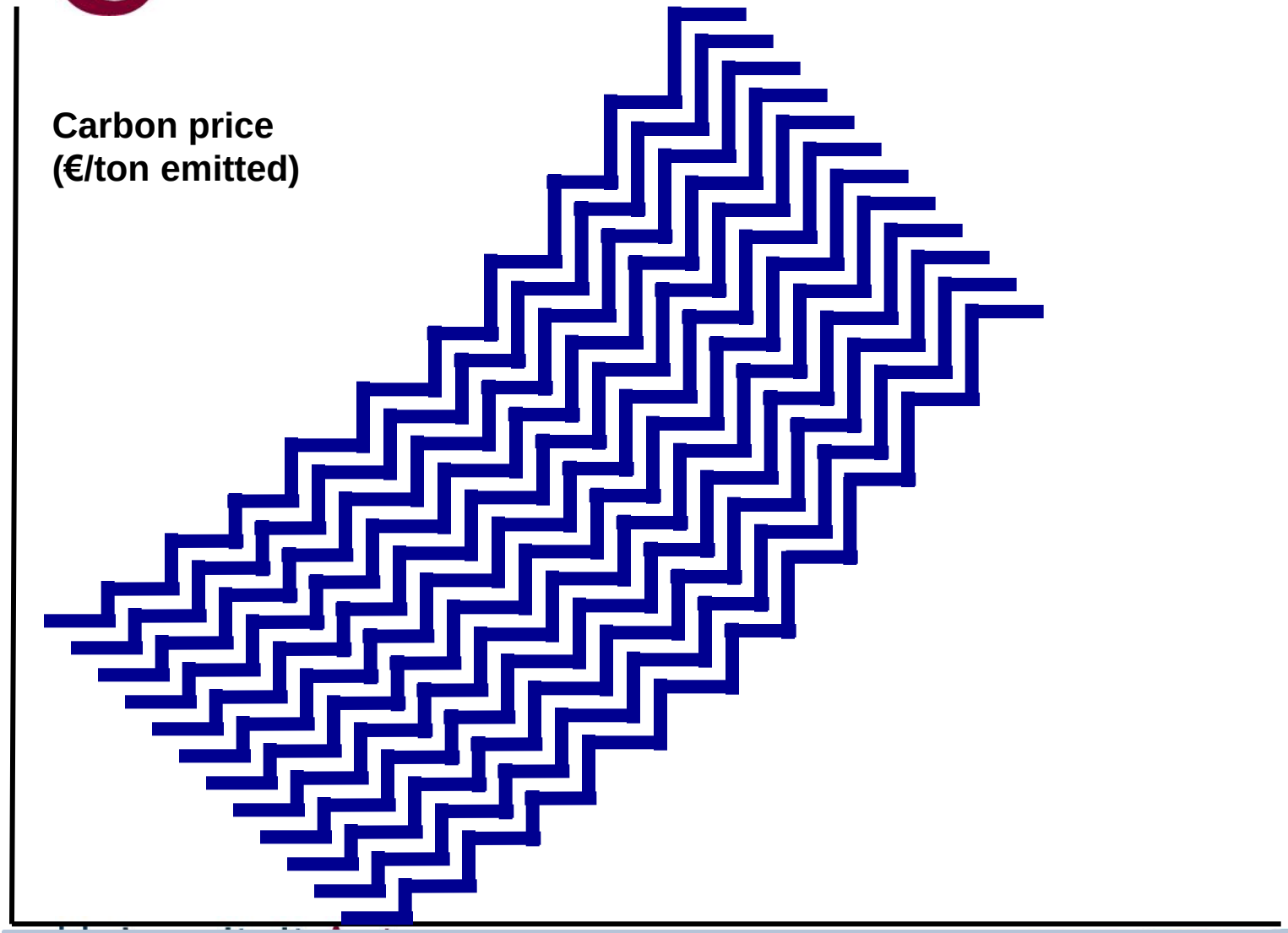
Carbon price 'optimal' path = stair-way



Stair-way:

- **unrelenting price increase**
- **no price volatility**
- **predictable**
- **reflects mounting damage costs**

Carbon price stairs evolving over time
(specific outcomes depend on start year, height & gradient)



Component [iv] Allocation of tradable emissions permits

ETS is a levies-permits hybrid ≠ permits allocation

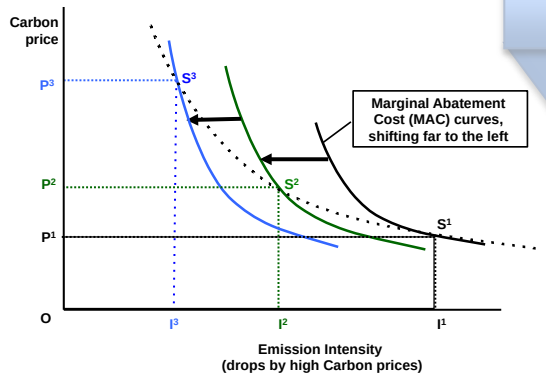
LEVIES

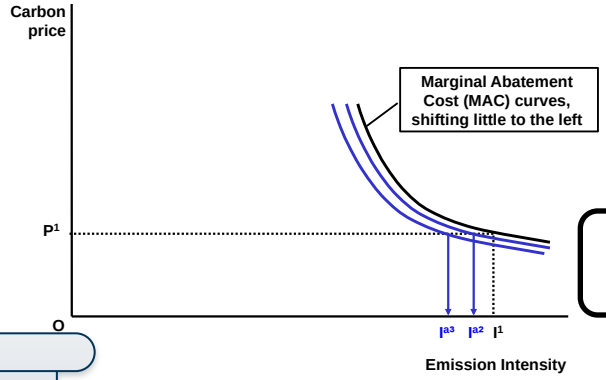
- Yearly auctioning of shrinking year quota
- Auctioning of quota for a trade period of a few years
- Auctions spread over years, following the demand for permits
- Partial auctioning, partial free gifts
- Assign permits to the principle MACi = λ
- Assigning expected BAT emissions
- Grandfathering

PERMITS

[i] Goals of EU policy	[ii] Costs of Compliance	[iii] Carbon emissions Prices	[iv] Allocations of tradable emissions permits
Atmosphere A-goal: all industrial activities without carbon emissions (by 2050?)	Innovation of products, services, technologies	Carbon emissions price stair	Levies-permits hybrid ⌥ permit allocation

Induced Innovation





Autonomous Innovation

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PERMITS

Profit π-goal: maintain, expand EU's industrial activities, business, employment

Antwe

No leakage by carbon price

carbon price stair is not climbed

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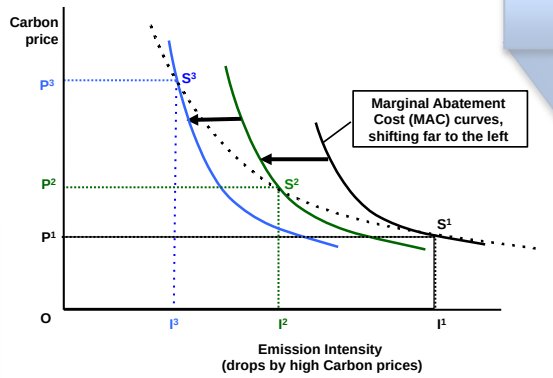

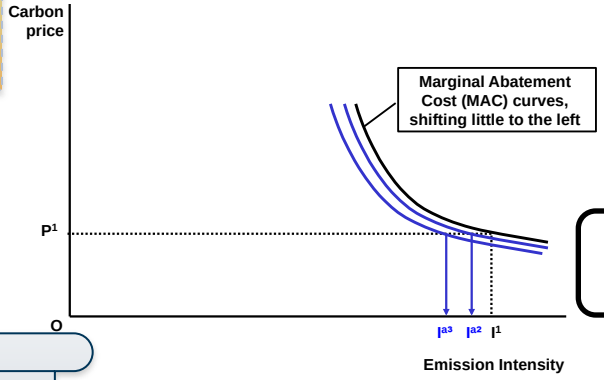

Autonomous Innovation

Conflicting goals.
Not attainable both with one instrument

Profit π-goal: maintain, expand EU's industrial activities, business, employment

Antw

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carbon price stair is not climbed

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PERMITS

Concluding Considerations

. **ETS exemplars depend on assembled selection of component options**

. **Conflicting goals require different exemplars**

. **EU ETS successful in protecting (serving) EU's large industries interests**

. **High-price [*with high-cost for industry*] EU ETS exemplar is unlikely [*the more sticky MACs are*]**