

EMISSIONS TRADING IN PRACTICE

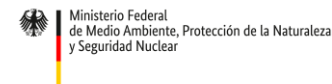
Step 6: Address price predictability and cost containment

William Acworth

Taller de Capacitación en Mecanismos de Emisión
Transables

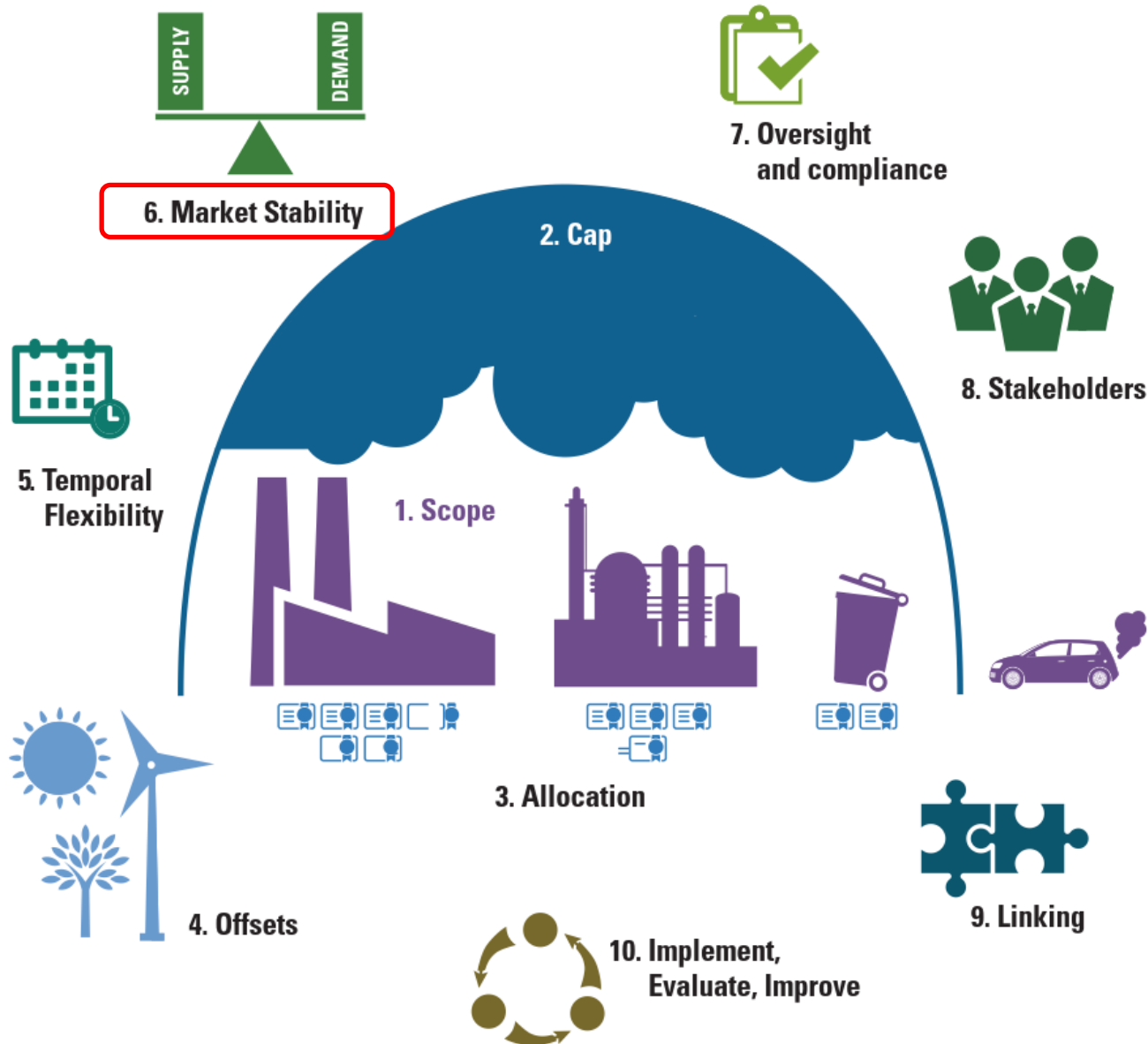


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de la República Federal de Alemania

STEP 6: ADDRESS PRICE PREDICTABILITY AND COST CONTAINMENT

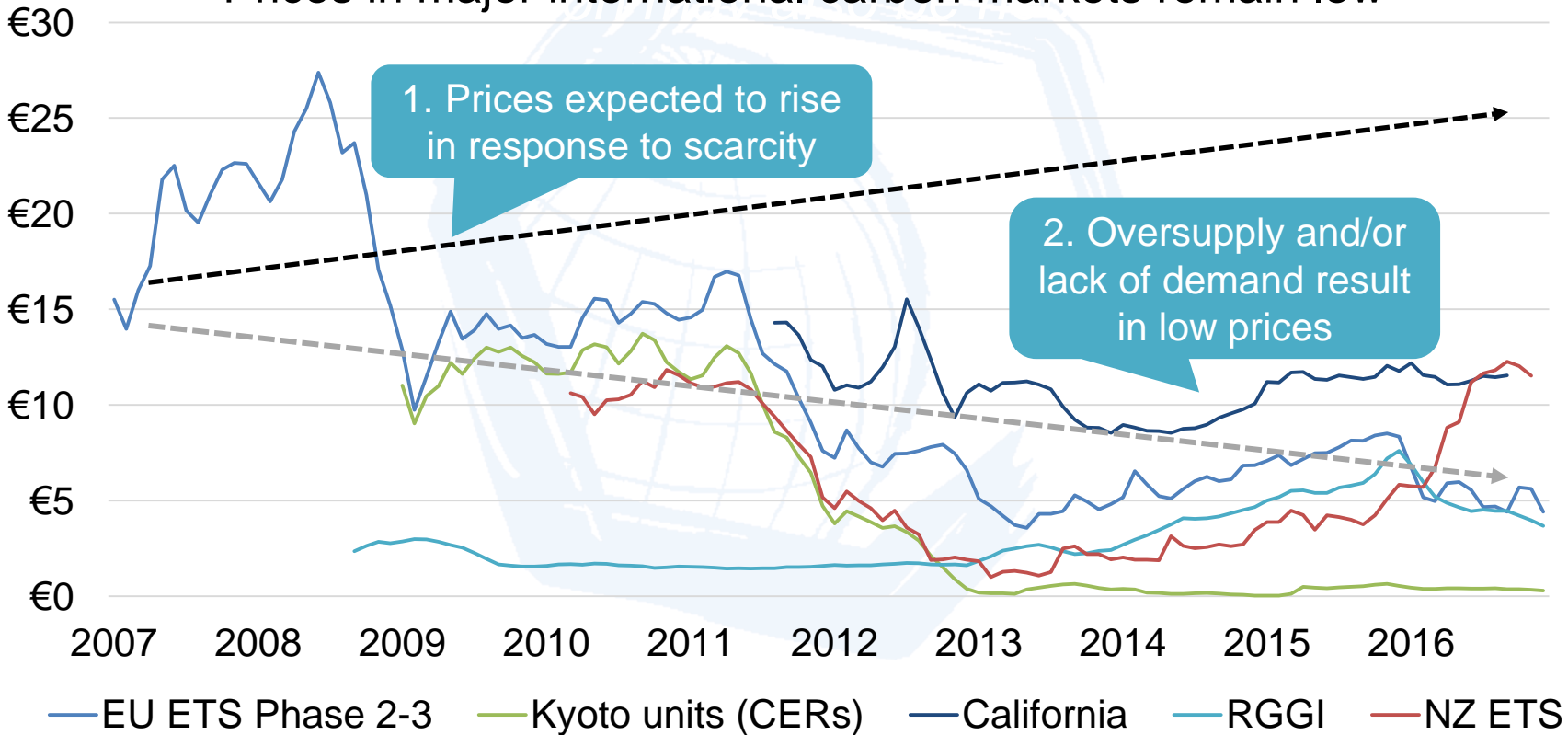


Outline

1. Why does price matter in an ETS?
2. ETS design and price formation
3. Price predictability and cost containment measures

Price fluctuations can be desirable but in case of excessive variability market interventions may be necessary

Prices in major international carbon markets remain low



*USD/EUR exchange rates from OECD, *Monthly Monetary and Financial Statistics*, extracted November 2016

Market efficiency can lead to low carbon prices, but persistent low prices have negative impacts

- carbon prices are often low as they drive low cost abatement
 - UK fuel switching vs renewables
- low prices do not prevent markets from meeting short term targets
- but low prices do reduce investment in the clean technology that reduces costs in the long term
- low prices may also undermine confidence in carbon markets, this:
 - makes reforming markets difficult
 - leads policy makers to adopt other, less efficient, policies

Does price volatility justify intervention?

NO

Increases regulatory uncertainty: this can increase, rather than reduce, price volatility. But this can be limited if measures are transparent, long-term, predictable and with a clear and targeted remit.

Interference may create distortions: jeopardizes self-allocating responsiveness of the market.

YES

Provide a predictable climate for investment: uncertainty generally leads firms to 'wait and see' approach. Market/regulatory failures may also prevent clear carbon price from emerging.

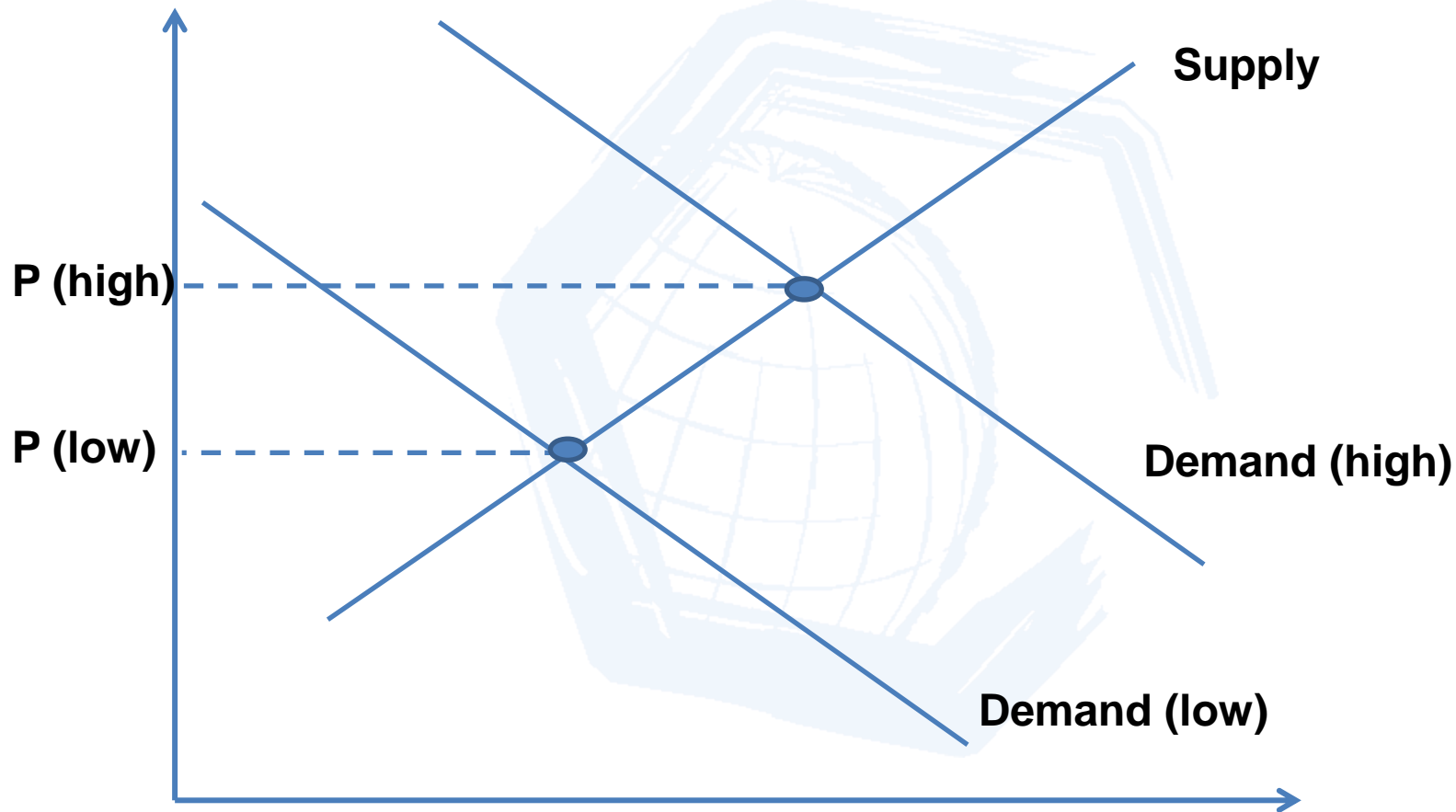
Containing costs: high prices may undermine political viability of ETS, upper bound on price can reassure market participants.

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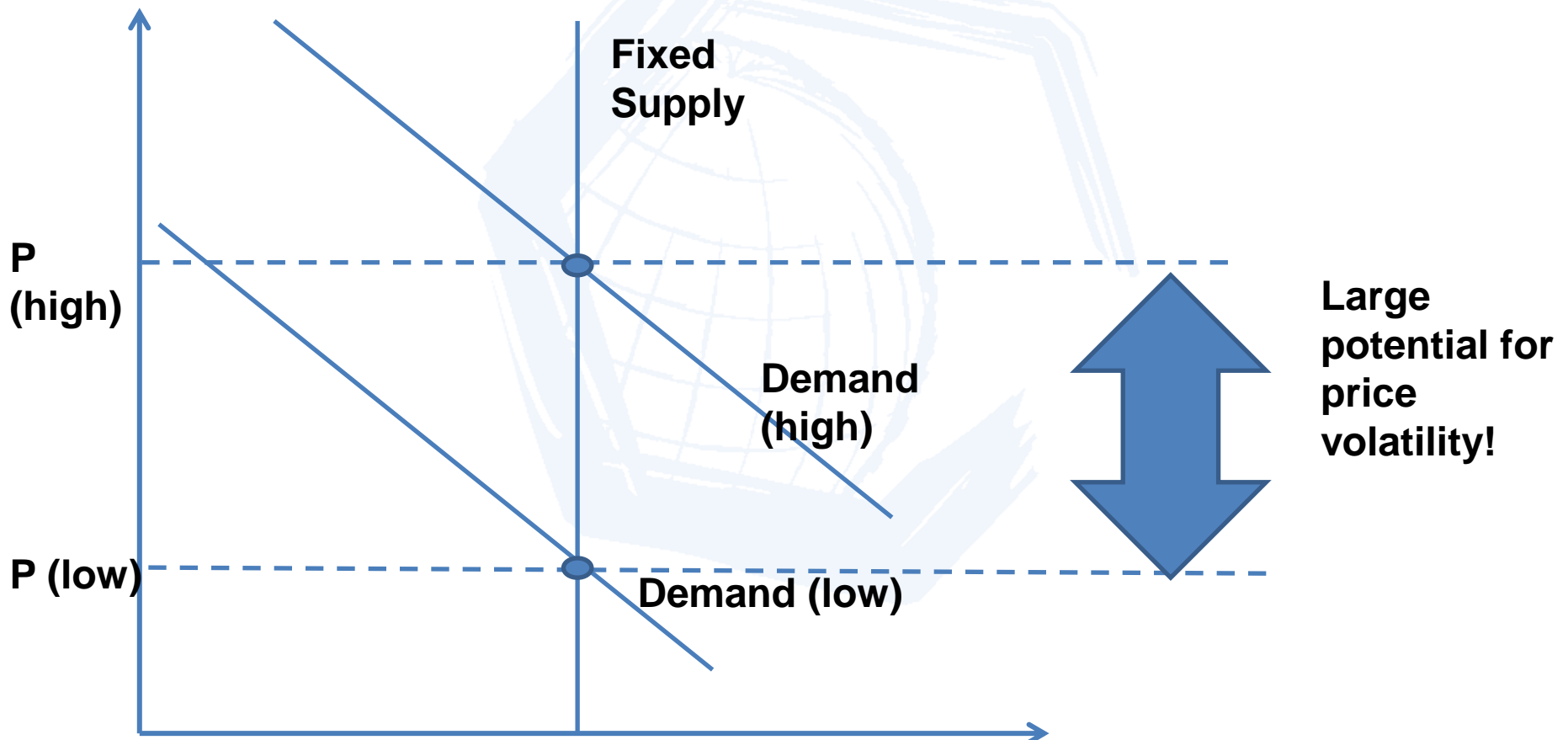
Price formation in commodity markets

Supply responds to demand in clearing the market



Price formation in (classic) emission markets

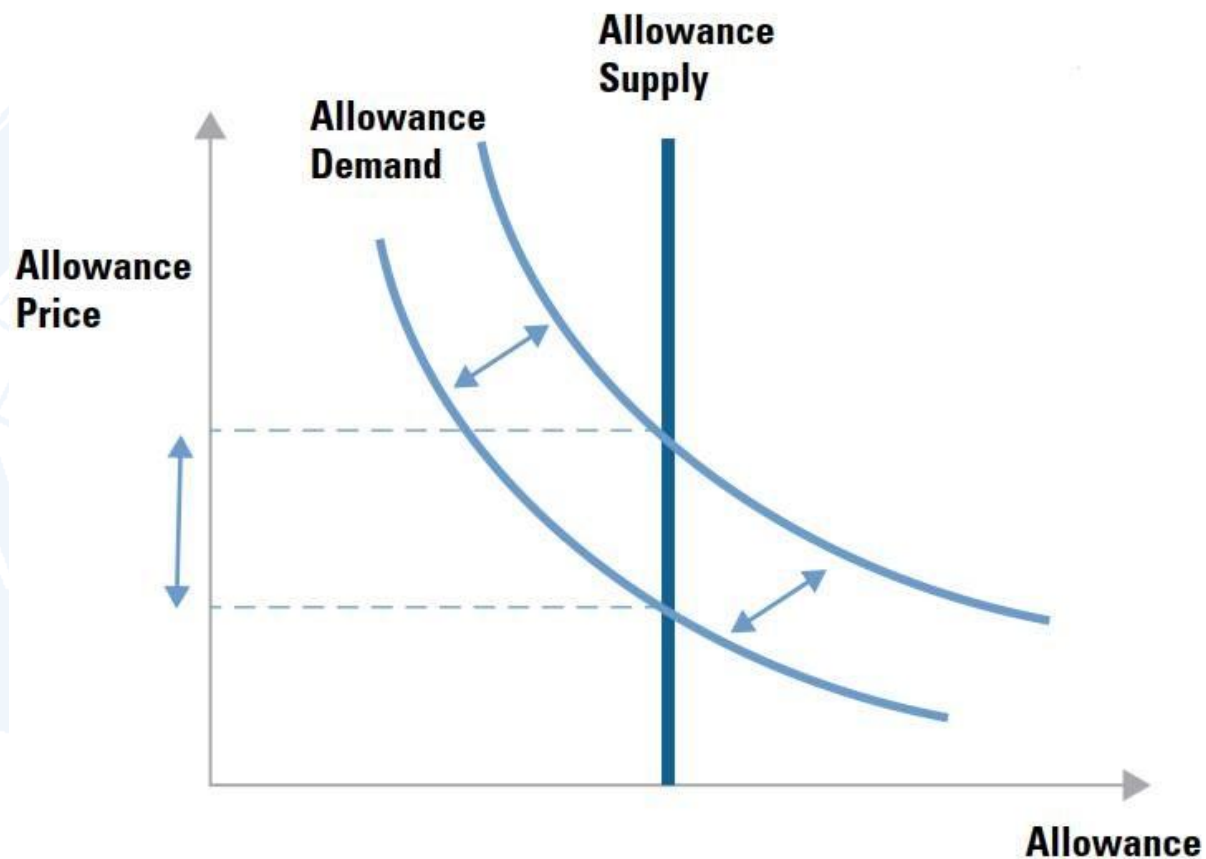
Supply can not respond to demand, resulting in potentially very high or very low prices and volatility in-between.



Determinants of supply in an ETS

Drivers of supply:

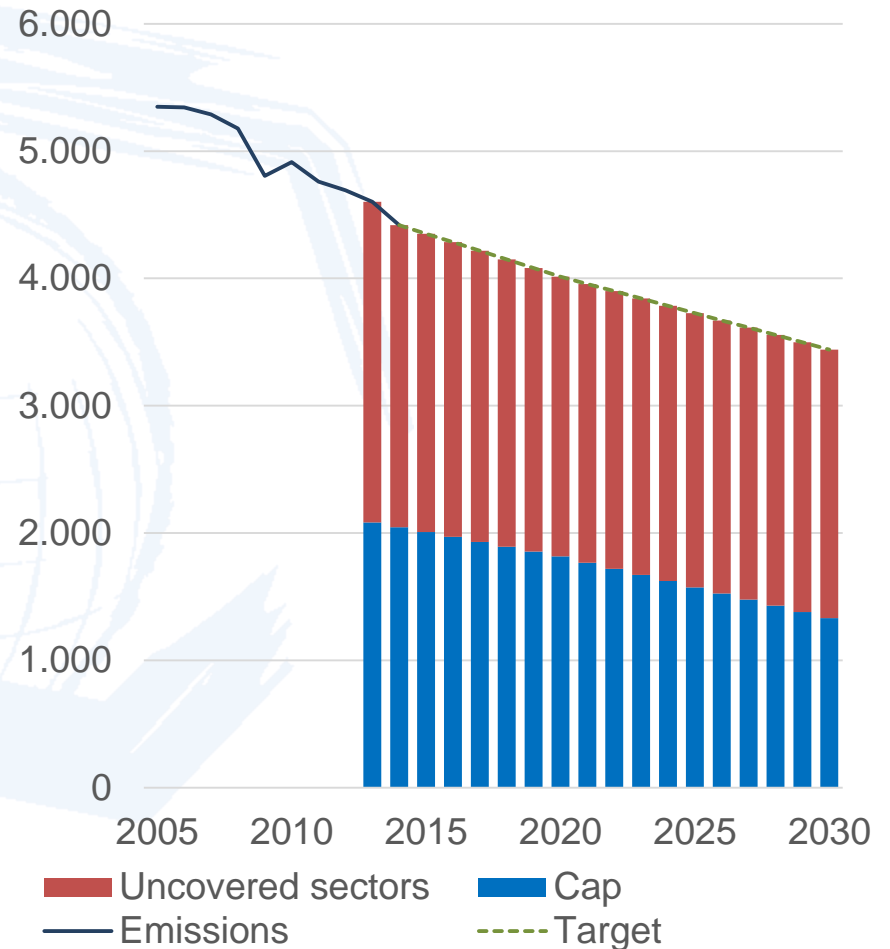
- Targets (long term supply)
- Cap (number of allowances)
- Availability/cost of offsets
- Supply of banked/borrowed allowances
- Availability of units from linked system(s)



Source: ICAP 2016

Targets and coverage (largely) determine caps

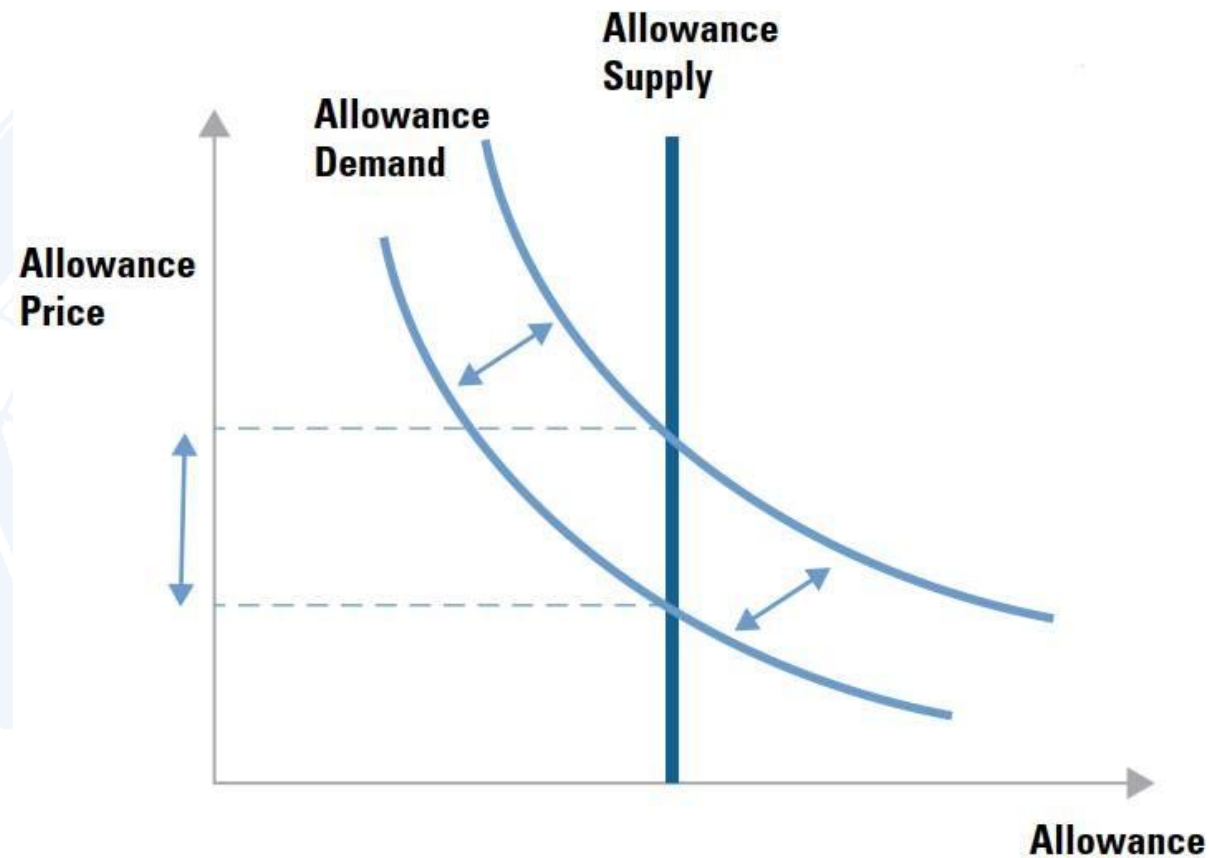
- supply is determined by caps, targets and coverage
- targets give long term supply
- caps give medium term supply
- coverage determines the upper limit of the cap, as space is needed for uncovered sectors
- regulatory interventions change the supply profile in the medium term
- e.g. EU ETS Market Stability Reserve



Determinants of demand in an ETS

Drivers of demand:

- BAU emissions (relative to the cap)
- Marginal abatement costs
- Future price expectations
- Weather
- Commodity prices
- Technological change
- Demand from linked systems

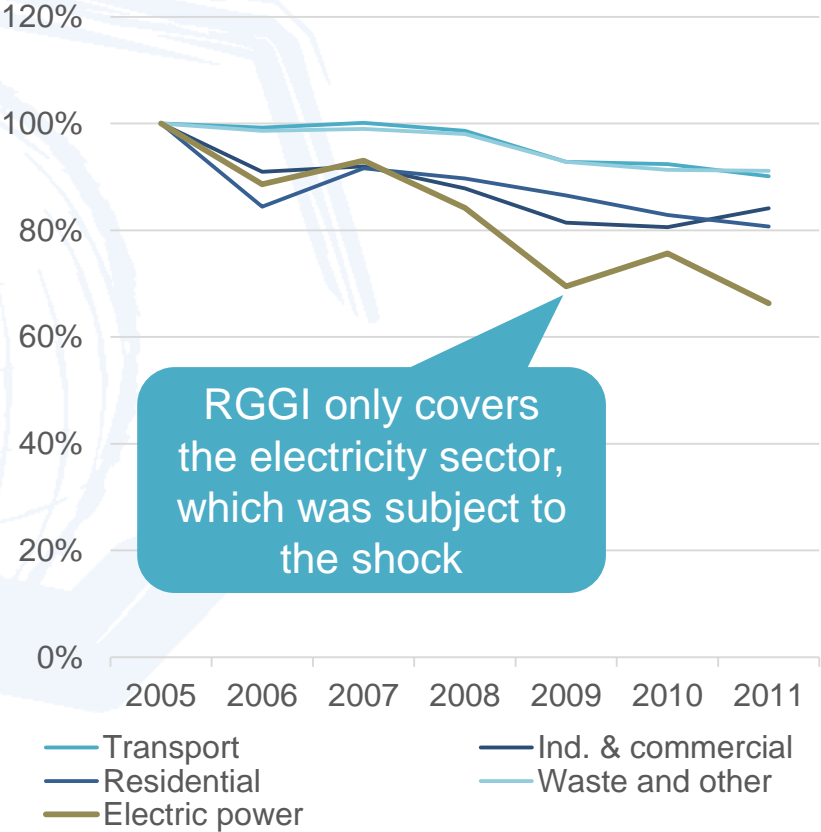


Source: ICAP 2016

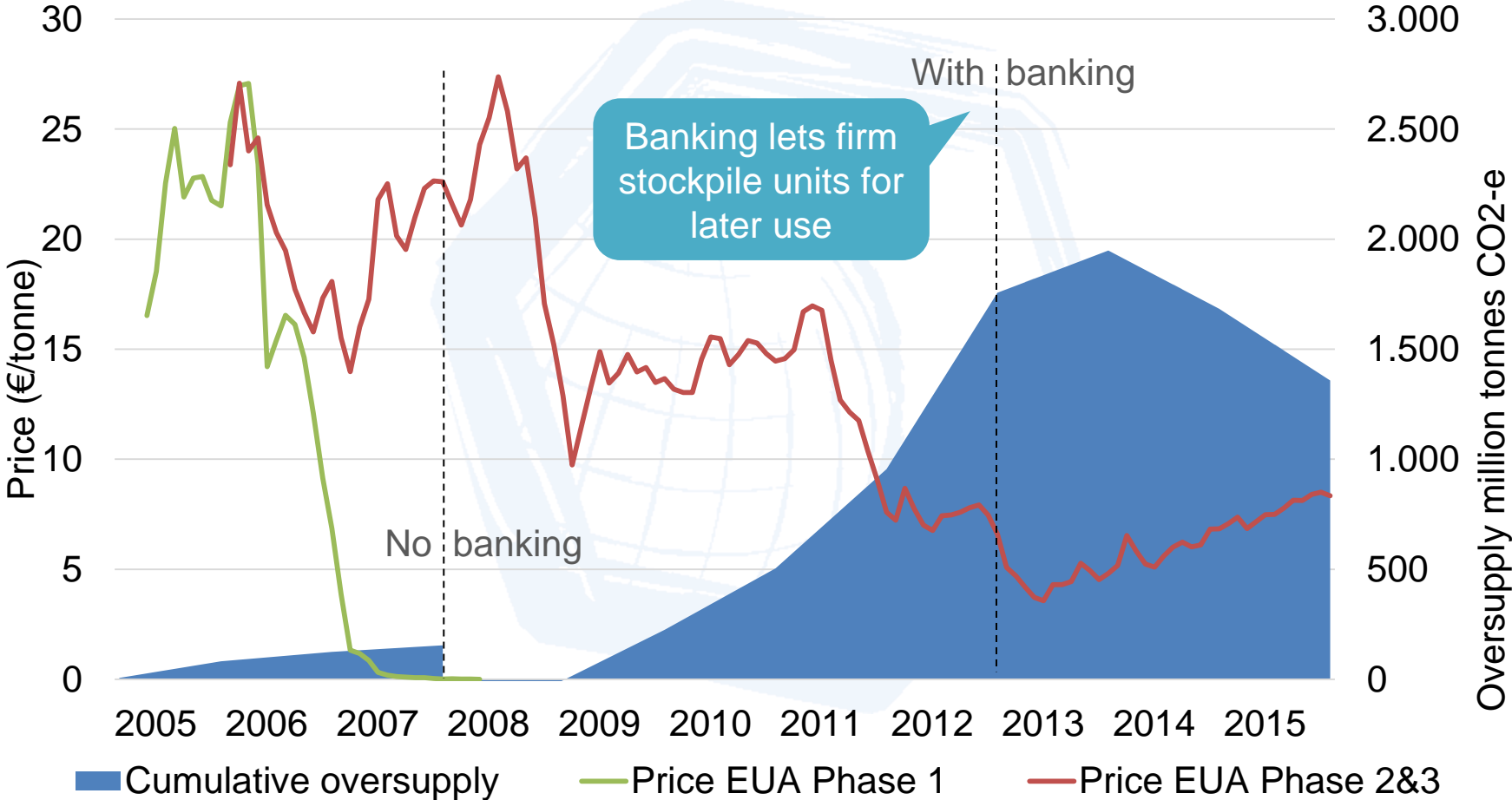
Coverage effects level and shape of demand

- design choices and market characteristics determine demand
- coverage choices determine domestic market characteristics
- different sectors and end users will respond to changed economic conditions in different ways
- narrow sectoral coverage exposes markets to shocks



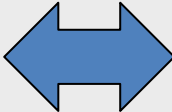



RGGI's coverage exacerbated impacts of gas technology shock



Banking helped support prices despite oversupply in the EU ETS



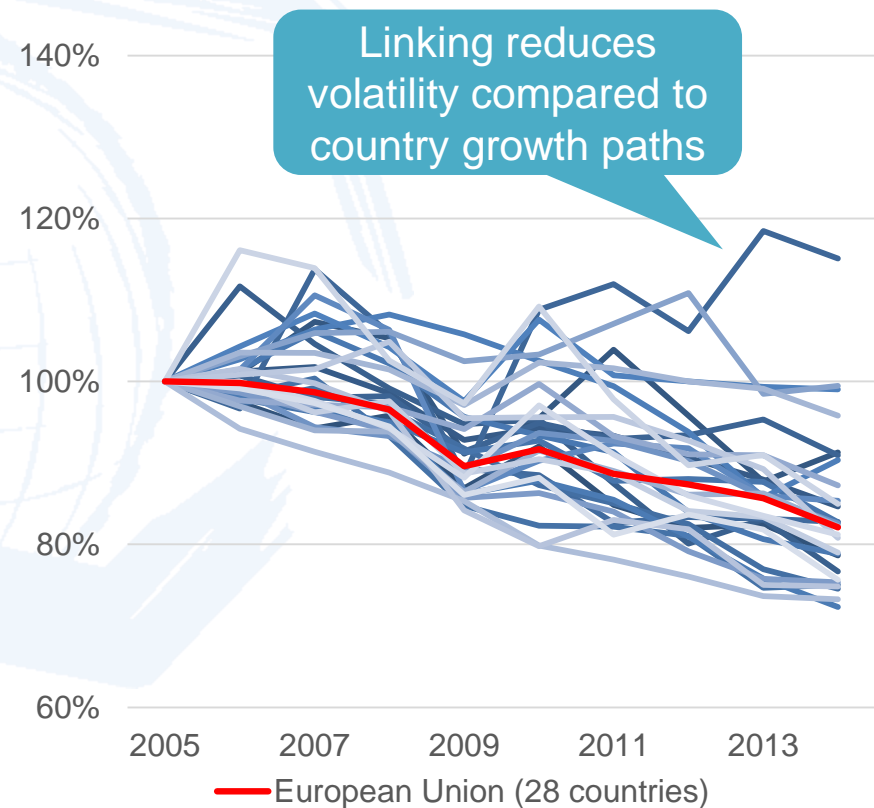
Companion policies can have a major impact on allowance prices.

	Examples	Efficiency of climate policy	Likely impact on demand and price
Complementary improve functioning of carbon markets	<ul style="list-style-type: none"> - energy market reform (facilitating cost pass through) - transmission infrastructure - energy efficiency labelling - pollution/emissions measurement 		
Overlapping duplicate incentives in carbon markets	<ul style="list-style-type: none"> - feed in tariffs - energy efficiency standards - vehicle fuel efficiency standards - (some) carbon price floors 		
Countervailing oppose incentives in carbon markets	<ul style="list-style-type: none"> - fossil fuel subsidies - industry tax-breaks and special treatment 		

Linking with other markets can effect supply and/or demand

- demand varies across markets
- linking can both stabilise demand fluctuations and transmit volatility across markets
- linking can increase supply and/or demand in a carbon market:
 - **supply only**, CERS and ERUs in EU ETS and NZ ETS
 - **demand only**, Australia one-way link with EU ETS
 - **supply and demand**, RGGI and California-Quebec

GHG growth paths of EU28 member states (2005=1)

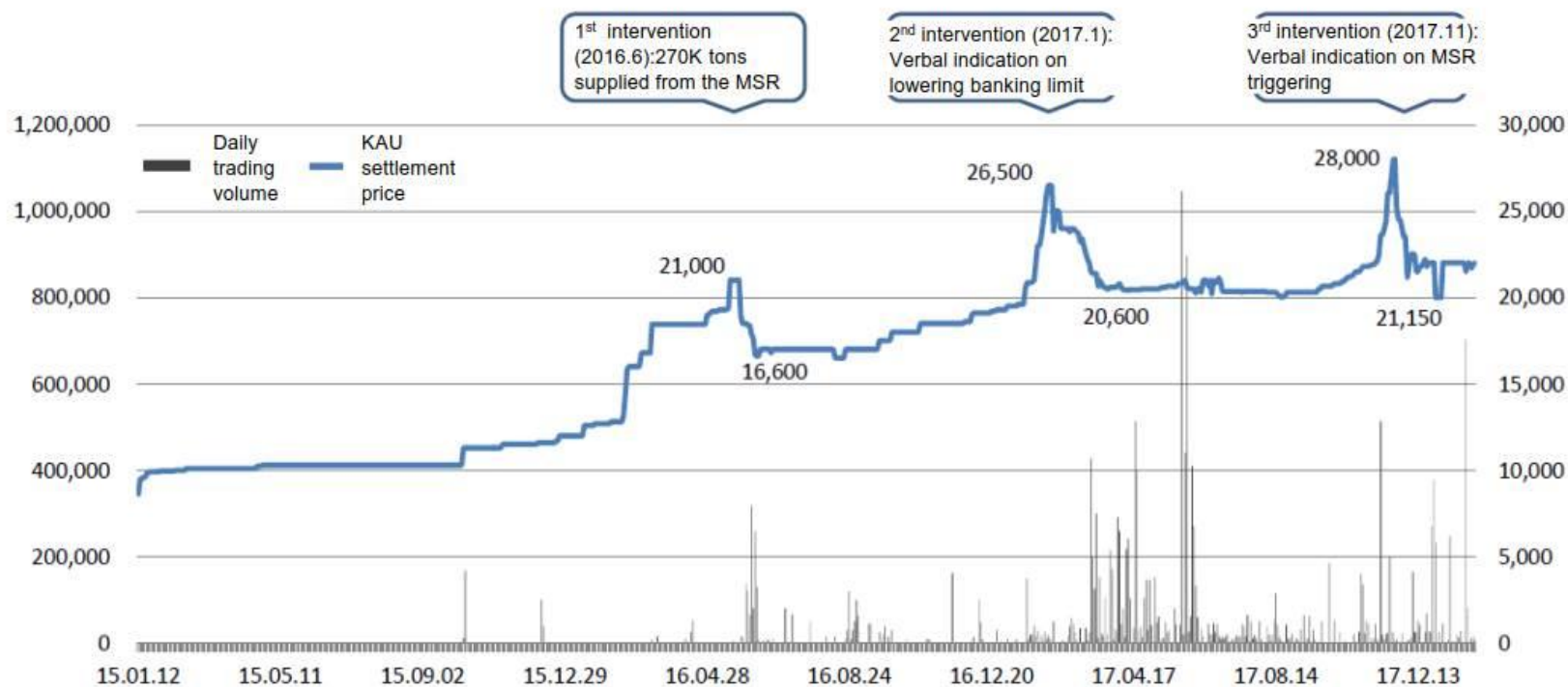


Policy making under constraints

- policy makers face legitimate political, social and economic constraints, balancing these constraints leads to imperfect design:
 - **limited coverage** (EU less than 50% coverage, RGGI power sector only)
 - **widespread use of overlapping and countervailing policies** (feed in tariffs, energy efficiency standards, fossil fuel subsidies)
 - **limited supply flexibility** (EU caps set >10 years in advance)
- market responses are uncertain
- demand can be estimated but it is only observed as the market operates
- this means other mechanisms can play an important role in achieving price certainty, which supports investment in the technology and assets needed to lower long term costs

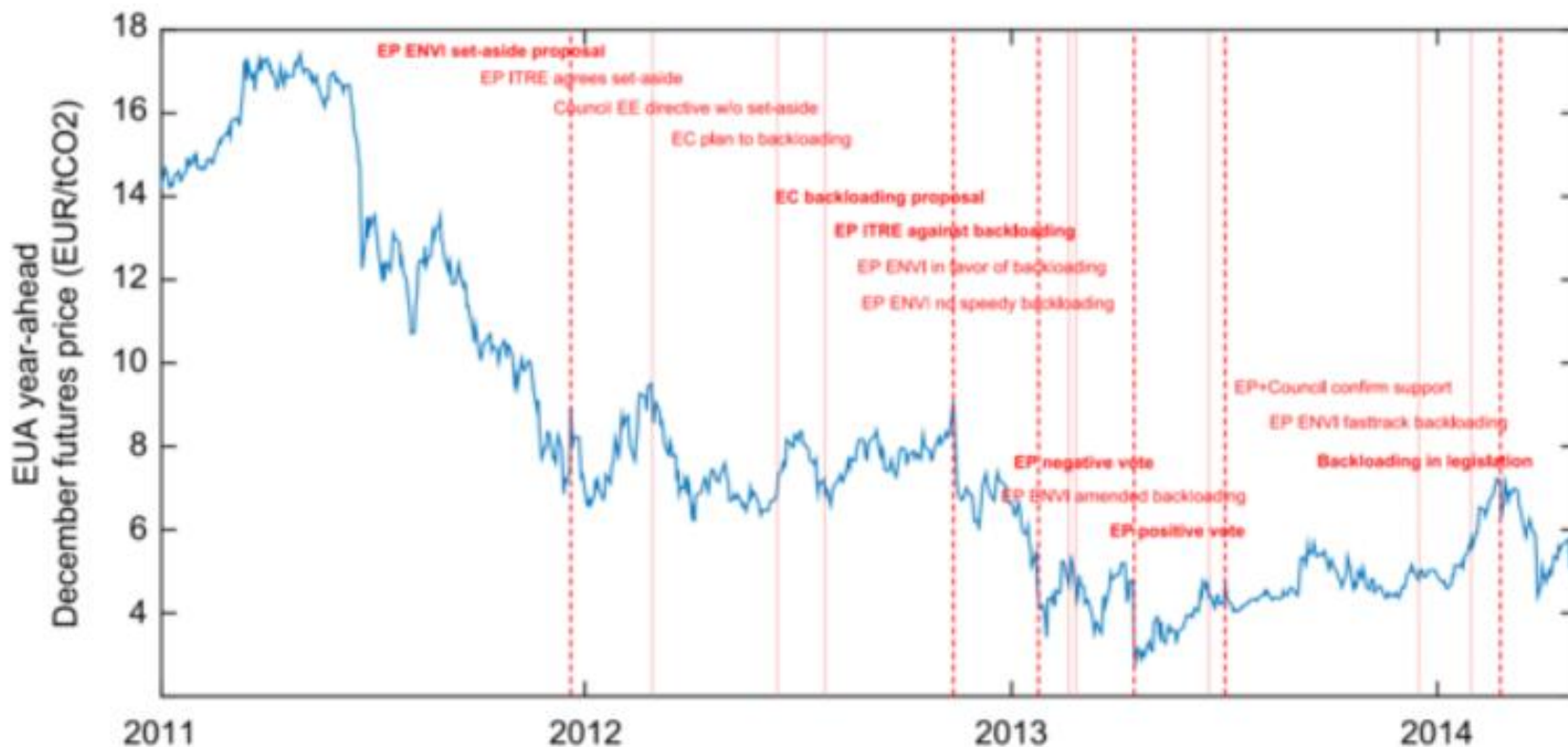
Allowance price development in KETS in Phase One (2015-17)

- The Korean government intervened in the market three times during the phase 1 (2015-17) | verbal intervention, lowering banking limit, and volume supply
- Impacts of the intervention: 1st intervention: price drop by -21%, 2nd intervention: -22.3%, 3rd intervention: -24.5% > Average: -22.6%



Source: Ecosian carbon market research center, KRX

Allowance price development in EU ETS 2011 - 15



Source: Koch et al. Politics matters: Regulatory events as catalysts for price formation under cap-and-trade, in: *Journal of Environmental Economics and Management*, Volume 78, July 2016, Pages 121–139,

Outline

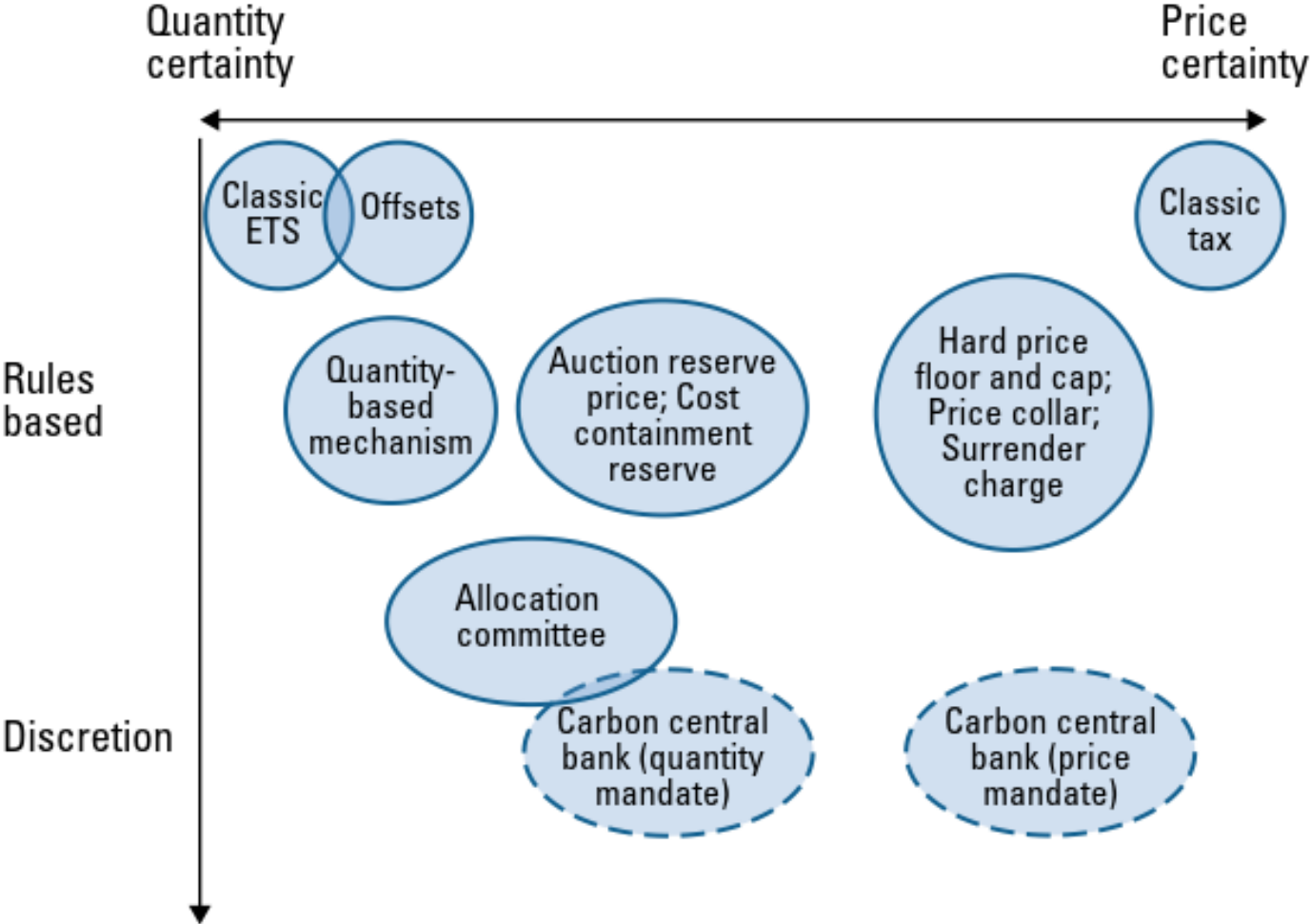
1. ETS price formation
2. Rationale and risk for market intervention
3. Price predictability and cost containment

measures

What different types of methods for price predictability and cost containment are there?

How do different ETS around the world manage the allowance market?

Different policy options are available



Note: A circle with a solid line denotes a policy already implemented, a dashed circle denotes one that has been proposed but not yet implemented

Source: ICAP 2016 based on Grosjean et al. 2014

Responding to high and low prices

If prices are too high...

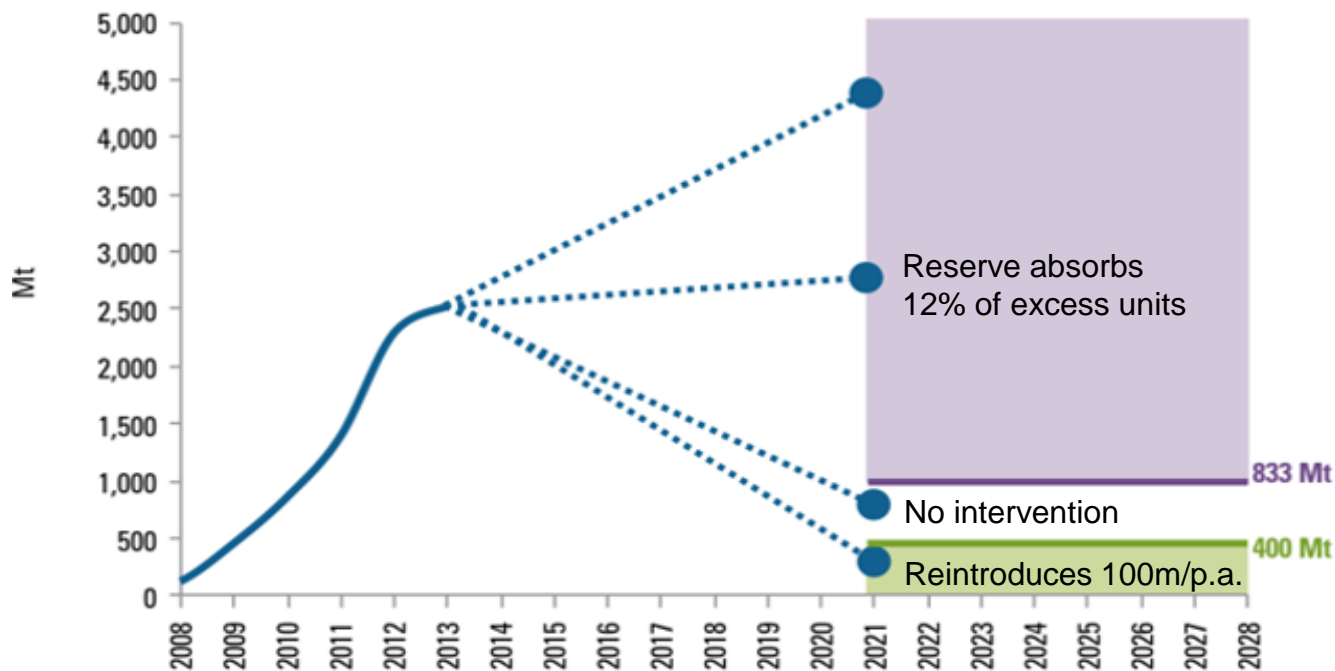
- Price ceiling
- Cost containment reserve
- Relaxing limits on offsets

If prices are too low...

- Price floor
- Surrender charges
- Tightening offset limits
- Government purchases or cancelation of allowances

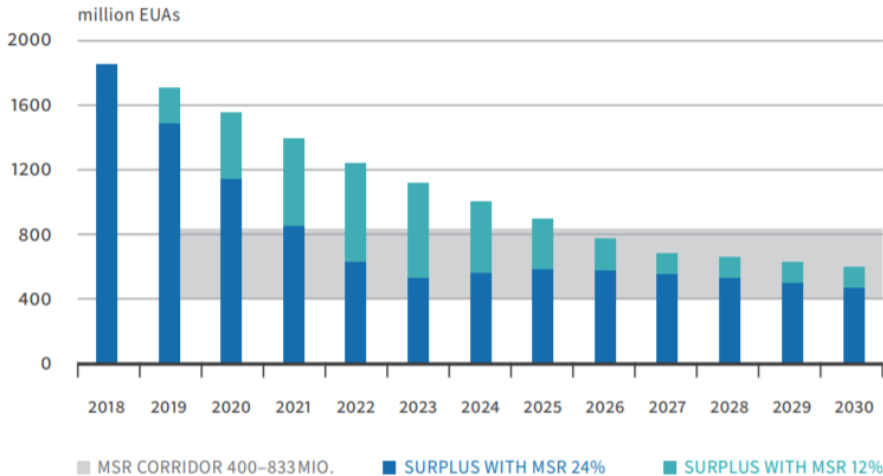
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The Market Stability Reserve in the EU ETS

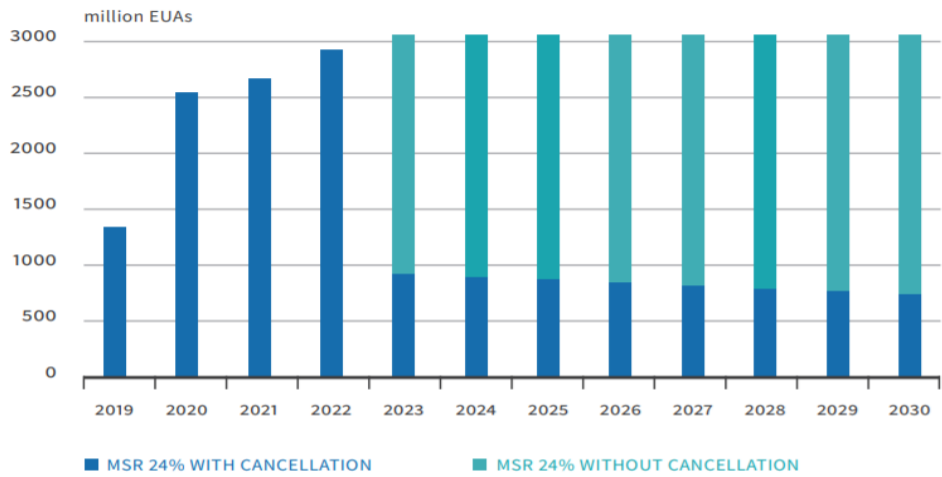


- alters supply based on the quantity of units in the market
 - if quantity of units is high supply is reduced, if quantity of units is low supply is increased
- withdraws supply gradually, so best suited to temporary imbalances rather than structural oversupply

EU ETS market developments under the MSR



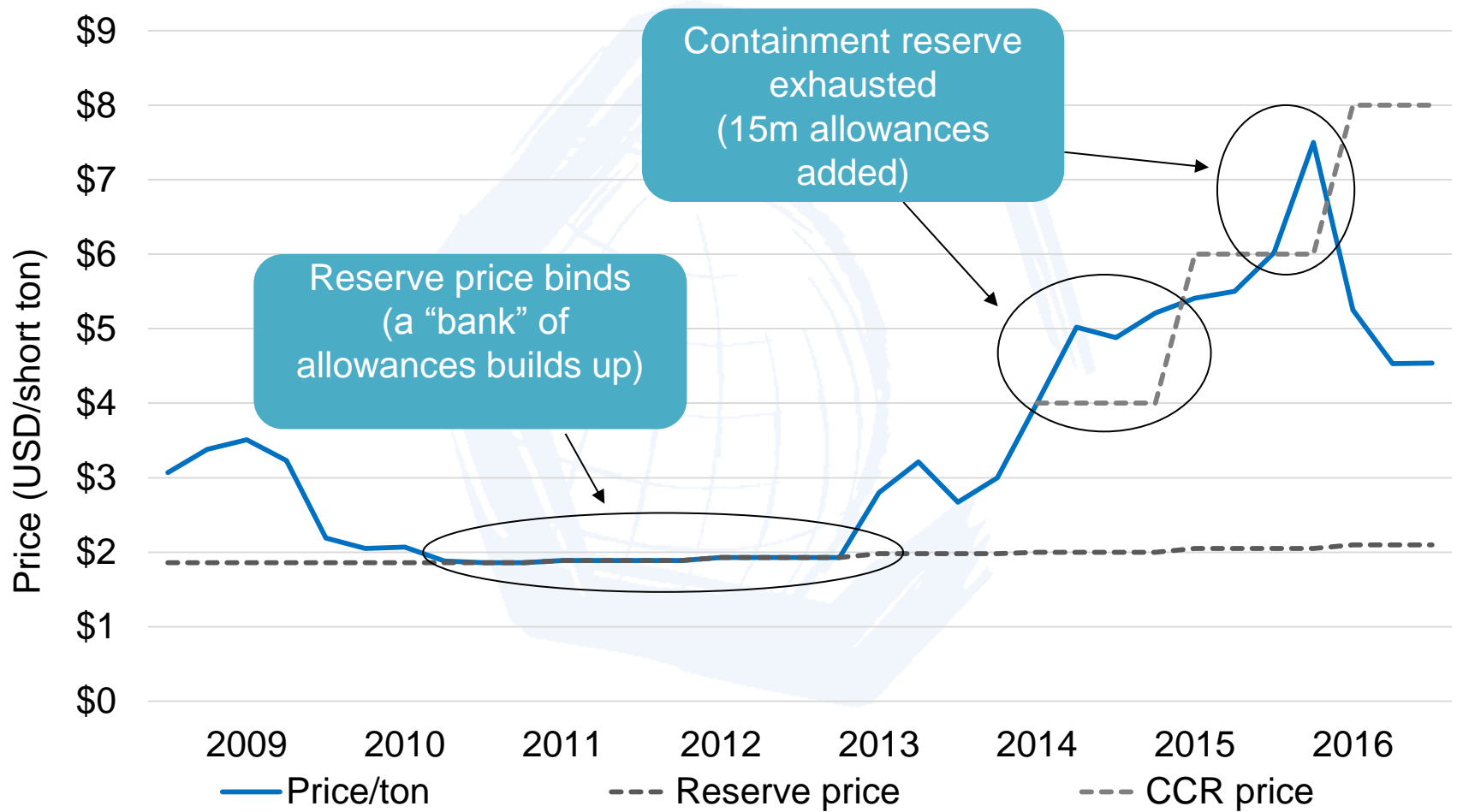
The effect of doubling the MSR intake rate on the projected surplus development indicating the timeframe for dropping below the upper threshold.



Amount of allowances in the MSR with and without cancellation

Market management in RGGI

Both the upper and lower bounds have been triggered in the past.



RGGI's Second Program Review: the introduction of an Emissions Containment Reserve (ECR)

RGGI will introduce an Emissions Containment Reserve from 2021.

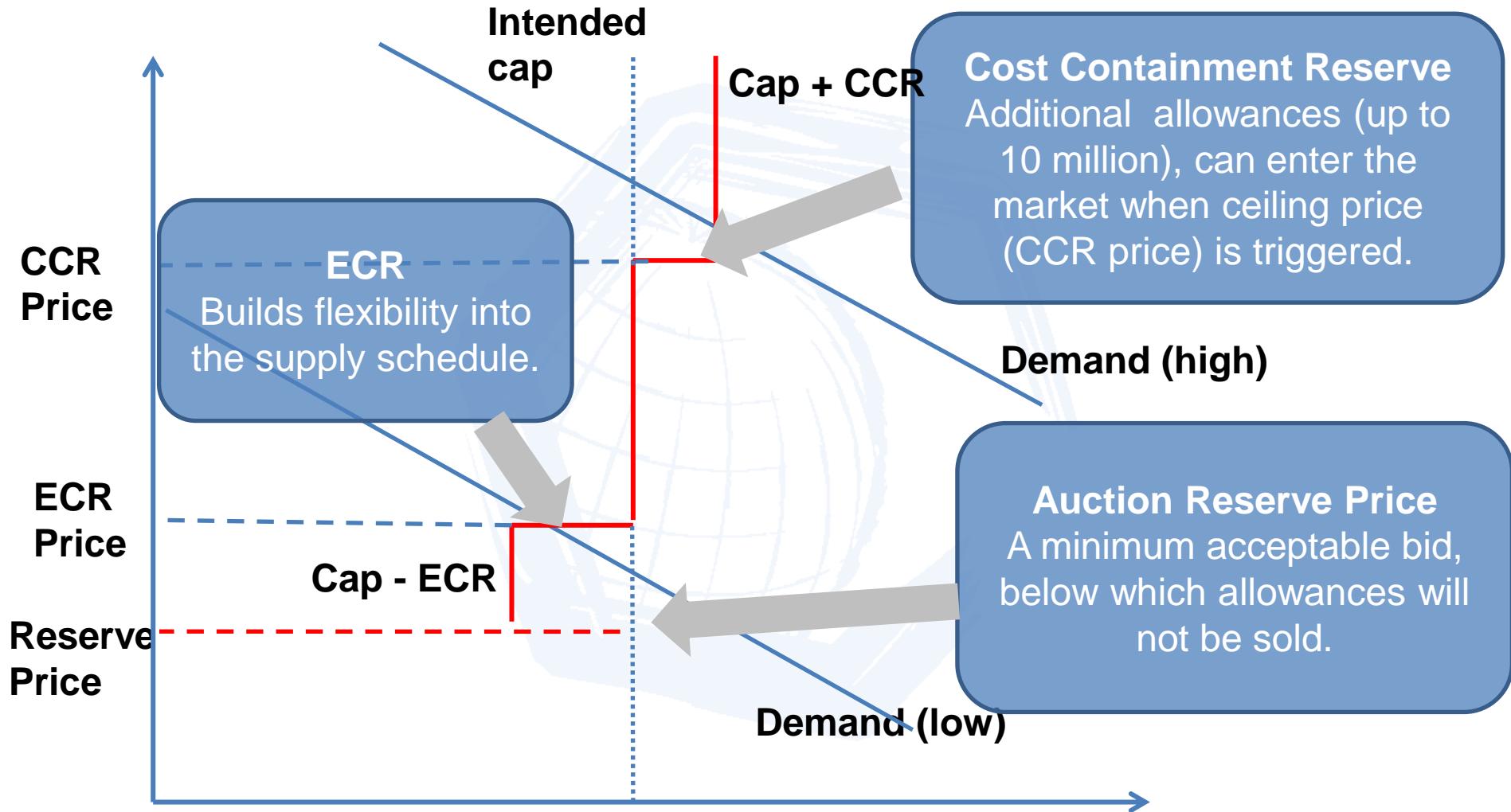
- **What:** introduces “steps” to the price floor. When the auction price fall below a certain threshold, a fixed number of allowances are withheld from the market.
- **When:** to be implemented in 2021.
- **How:** the trigger price will start at \$6.00/tCO₂e in 2021 and rise 7% annually to \$11.03/tCO₂e in 2030.
- **Why:** allows RGGI to undertake more emissions reductions, when costs turn out to be lower than expected (tech change, companion policies in member states, etc).

RGGI's Second Program Review: the introduction of an Emissions Containment Reserve (ECR)

Why was a new tool considered necessary?

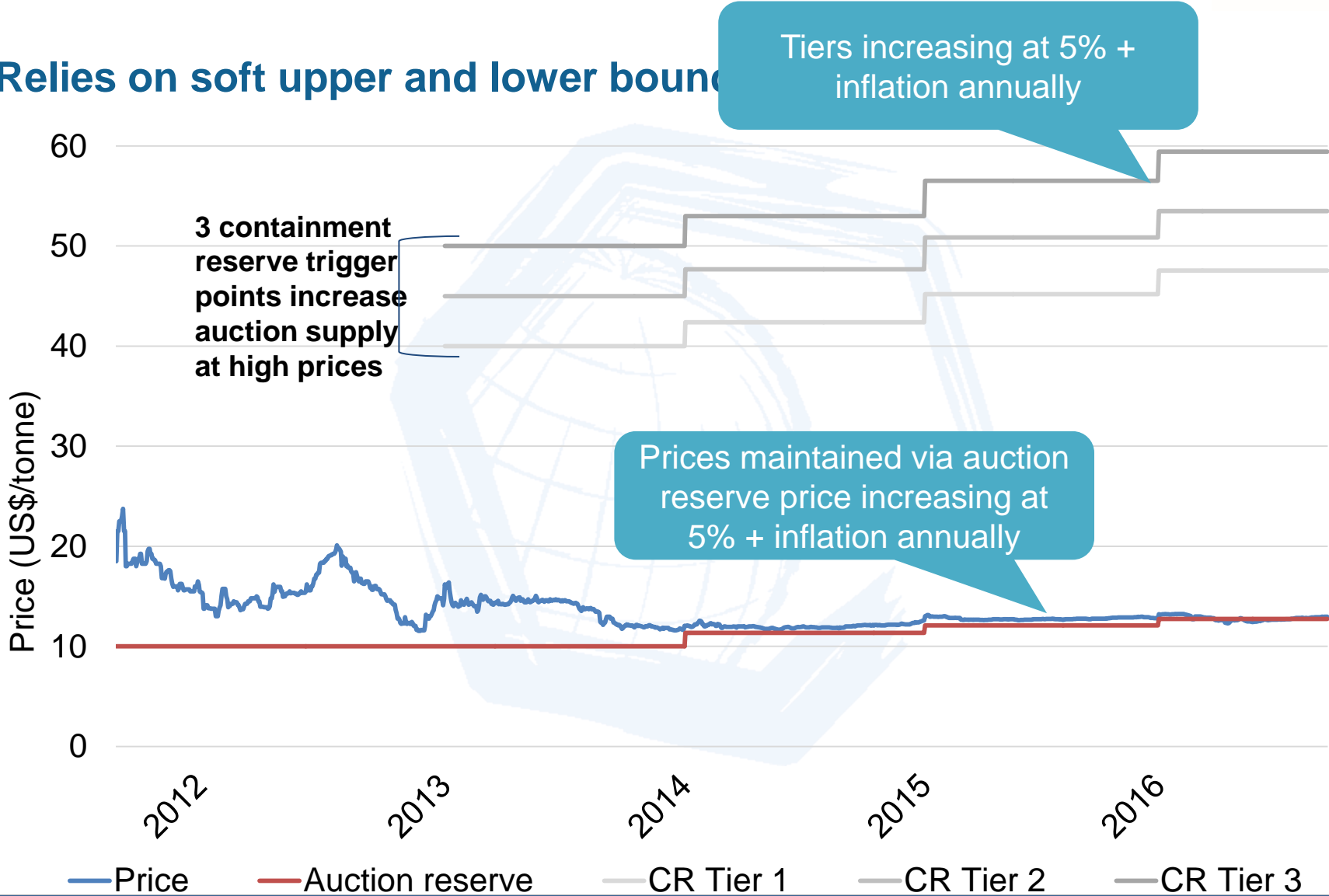
- **Reserve price worked** – maintained a positive allowance price, guaranteeing minimum return on low carbon investment and generated over a billion in fiscal revenue, during a time when otherwise the price would have fallen (close) to zero.
- **But** - it resulted in a large public bank and emissions continued to trend below the cap.
- **Emissions Containment Reserve** – offers a rule based mechanism to remove allowances from the system where costs turn out to be lower than expected.

Price formation in RGGI: Post 2021



Market management in California: pre 2021.

Relies on soft upper and lower bounds



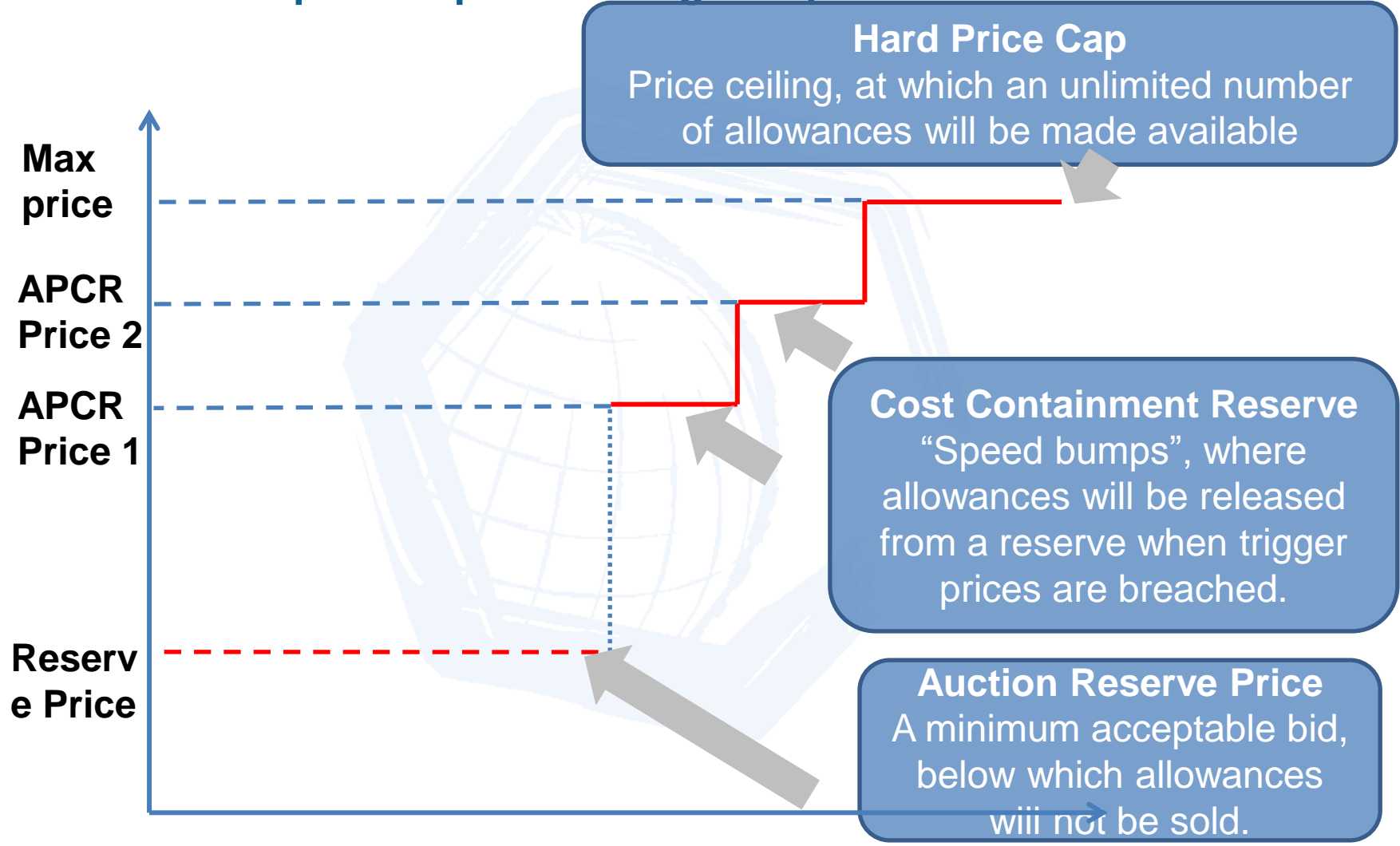
California passed law to change their ETS post 2020 (AB – 398)

An ambitious cap combined with concessions to industry.

- **Ambitious Cap** - will decline by about 4% annually from 2021-2030, yielding a 40% cap reduction by 2030 compared to 1990 levels.
- **Reduced offset limits** – from 8% to 4% between 2021-25 and 6% thereafter.
- **Changes to free allocation** – 100% assistance factor for industry.
- **Hard price ceiling** – a maximum price at which an unlimited number of allowances will be offered at auction. Revenues will be reinvested into emission reduction activities.

Market management in California: post 2021

Will add a “hard” price cap to existing soft price controls



Allocation Committee in the Republic of Korea

Delegates some market intervention to an independent body.

The Allocation committee may intervene in the market if **certain conditions** are met:

1. The market allowance price of six consecutive months is at least three times higher than the average price of the two previous years.
2. The market allowance price of the last month is at least twice the average price of two previous years and the average trading volume of the last month is at least twice the volume of the same month of the two previous years.
3. The average market allowance price of a given month is smaller than 40% of the average price of the two previous years. In 2015 and 2016, the price threshold is KRW 10,000 (EUR 7).
4. **When it is difficult to trade allowances due to the imbalance of supply or demand. (added for phase 2)**

Allocation Committee in the Republic of Korea

- The Allocation Committee is may:
 - Allocate additional allowances from a reserve
 - Set limits on allowance retention
 - Increase or decrease limits on borrowing or offsets
 - Temporarily set a price ceiling or floor
- **In 2016** an additional 900,000 allowances were offered from the Allowance Reserve at a floor price of around EUR 12. Only a third of allowances were sold, despite the auction price being higher than the market price??
- **In 2018** a “Market Maker” will be introduced

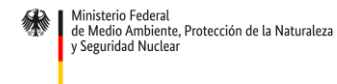
Thank you for your attention

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