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CLIMATE, CLIMATIC CHANGE, AND SOCIETY (CLICCS)

Grischa Perino

The EU ETS is not fit for purpose

Why a new design of the MSR is urgently needed

joint work with:

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KOPERNIKUS Ariadne PROJEKTE
Die Zukunft unserer Energie

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Outline

- The challenges ahead
- Current objectives and design of Market Stability Reserve (MSR)
- Assessment of MSR based on objectives
- Proposal for MSR 3.0

Approach

- Based on the recent literature
  - By the team of authors
  - And others
  - If I've missed one, please let me know

Actual & projected ability to meet goals

The Challenges

- Carbon neutrality by 2050 (European Climate Law, in progress)
- New 2030 target of “cut by at least 55%” (2030 Climate Target Plan, in progress)
- By June 2021 Commission will propose updates to ALL aspects of EU climate policy

Source: European Commission (2020a)

EC's Policy Scenarios

2030 Target Plan Policy Scenarios

	(REG) Policies and measures as main driver for GHG 55% target	(MIX)/ (MIX-50) Policies, measures and carbon pricing combined for GHG 55%/GHG 50% target	(CPRICE) Carbon pricing as main driver for GHG 55% target	(ALLBNK) Inclusion of all bunkers for GHG 55% target
Scope to asses GHG target ambition	All sectors including intra EU bunkers and LULUCF			All sectors including intra and extra EU bunkers and LULUCF
ETS Scope / Carbon Pricing	ETS scope: - Power, Industry, - Intra-EU aviation and navigation*	ETS scope: - Power, Industry, - Intra-EU aviation and navigation*, - Road transport, Buildings		ETS scope: - Power, Industry, - All aviation and navigation, - Road transport, buildings
EE policies	High intensification policies	Medium/low intensification policies	No additional measures compared to Baseline	Medium intensification policies
RES policies	High intensification policies	Medium/low intensification policies	No additional measures compared to Baseline	Medium intensification policies
Transport measures	High intensification policies (CO_2 standards in road transport + RES, aviation and maritime fuel mandates + measures improving transport system efficiency)	Medium/low intensification policies (CO_2 standards in road transport + RES, aviation and maritime fuel mandates + measures improving transport system efficiency)	Low intensification policies (CO_2 standards in road transport + aviation and maritime fuel mandates + measures improving transport system efficiency)	Medium intensification policies (CO_2 standards in road transport + measures improving transport system efficiency) High intensification of RES, aviation and maritime fuel mandates
non-CO_2 policies	Medium intensification policies			High intensification policies
LULUCF policies	Baseline policies			

*Carbon pricing and carbon values are applied on extra EU aviation and navigation to represent ETS or other policy instruments regulating these sector's emissions (which can also stand for other policy instruments like CORSIA for aviation and technical and operational measures for both aviation and maritime).

Source: European Commission (2020b)

EC's Policy Scenarios

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Source: European Commission (2020b)

The Future Role of the EU ETS

- More ambitious abatement targets
- Potential extension to road transport & buildings (MIX, CPRICE, ALLBNK)
- Overlap
  - REG: with high intensification of EE and RES policies
  - MIX/ALLBNK: with Effort Sharing Regulation and intensification of overlapping policies
- CPRICE: carry main weight w.r.t. abatement & investment incentives

We need an EU ETS that's 'fit for purpose'!

Objectives of Market Stability Reserve

- "deliver a credible **investment signal**" (EU 2015, 2018)
- "make more **resilient** to supply-demand imbalances" (EU 2015, 2018)
- "enhance **synergies** with other climate and energy policies" (EU 2015)
- "maximum degree of **predictability**" (EU 2015)

Design of Market Stability Reserve

- Adjusts future cap as a function of number of unused allowances (TNAC)
  - increasing the TNAC by 100 tons reduces cap by 24 tons (12 tons after 2024) in the following year
  - if TNAC is > 833 million allowances
- More details, but the above is sufficient for what follows

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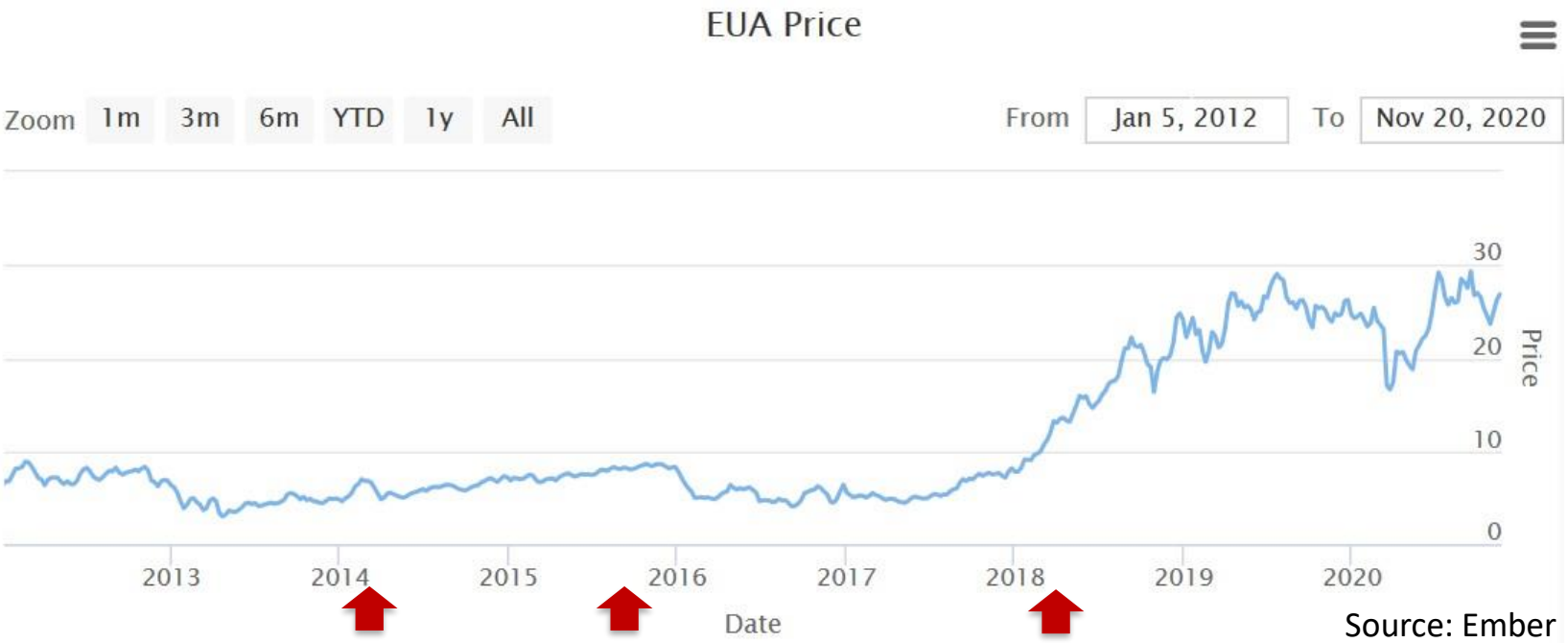
Objective 1

Credible Investment Signal

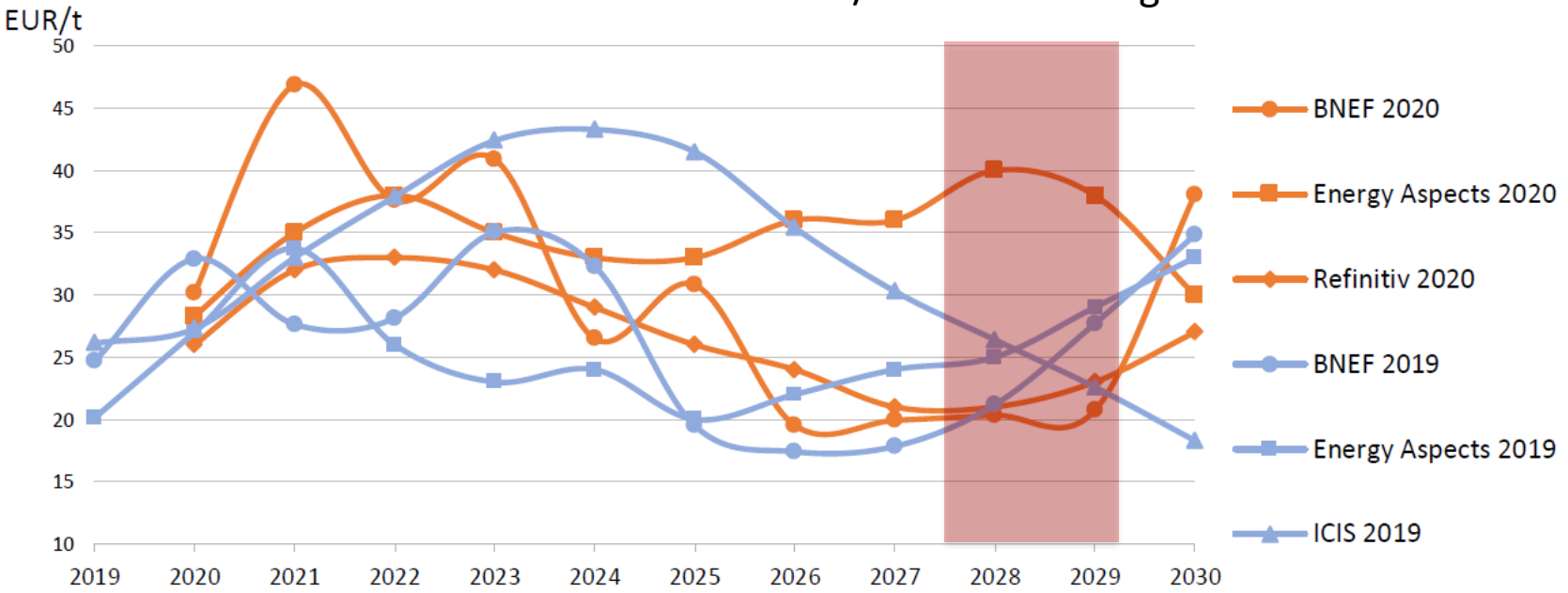
EUA Price Development (Phase 3) – The Good News



Source: Ember

Price Forecasts 2019/2020 – The Bad News

5 out of 6 forecasts see prices in 2028/29 in same range as 2020



Source: BloombergNEF, Energy Aspects, ICIS, Refinitiv

Source: ERCST, Wegener Center, BloombergNEF and Ecoact (2020)

MSR and Investment Signal

- Impacts of postponing / cancelling allowances
  - Postponing allowance supply reduces investment incentives for transformative technologies. (Perino & Willner 2019)
  - Cancellations increase investment incentives (Perino & Willner 2019)
  - Investment in coal drops, gas largely unaffected (Tietjen et al. 2020)
  - Conflicting results of relative importance of postponement/cancellations (Tietjen et al. 2020, Maurer et al. 2020)
  - For myopic firms both mechanisms increase abatement (Quemin & Trotignon 2019, Quemin 2020)
- Assessments highly sensitive to modelling approach.

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Objective 2

Resilience to Supply-Demand Imbalances

TNAC and MSR's Impact

	2016	2017	2018	2019	2020	Sum
TNAC on 31st Dec. (in billion)	1.69	1.65	1.65	1.39		
MSR intake (in million)	0	0	0	397	375	772
Estimated abatement due to price increase (in million)	0	0	130 - 160	270 – 340	270 – 340	670 - 840

Sources: European Commission (2017, 2018, 2019, 2020), own calculations

MSR intake roughly equivalent to abatement induced by price increase.

Literature on Resilience to Shocks

- Total compliance costs can be reduced by a symmetric adjustment rate conditioned on bank (Kollenberg & Taschini 2016)
- Conditioning future cap on past banking/emissions can come close to first best in multi-period ETS (Gerlagh & Heijmans 2018, Gerlagh et al. 2019)
- Optimal updating rule depends on marginal damages and marginal benefits of emissions (Gerlagh & Heijmans 2018, Gerlagh et al. 2019)

MSR and COVID-19

- MSR performance depends on length of shock (Bruninx & Ovaere 2020, Gerlagh et al. 2020):
  - MSR performs well in case of short shock
  - MSR almost irrelevant in case of slow recovery
- Good MSR performance irrespective of duration of shock in main specification but sensitive to assumptions (Azarova & Mier 2020)
- Key difference: Impact of persistent shock on TNAC

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Objective 3

Synergies with Climate & Energy Policies

Waterbed Effect

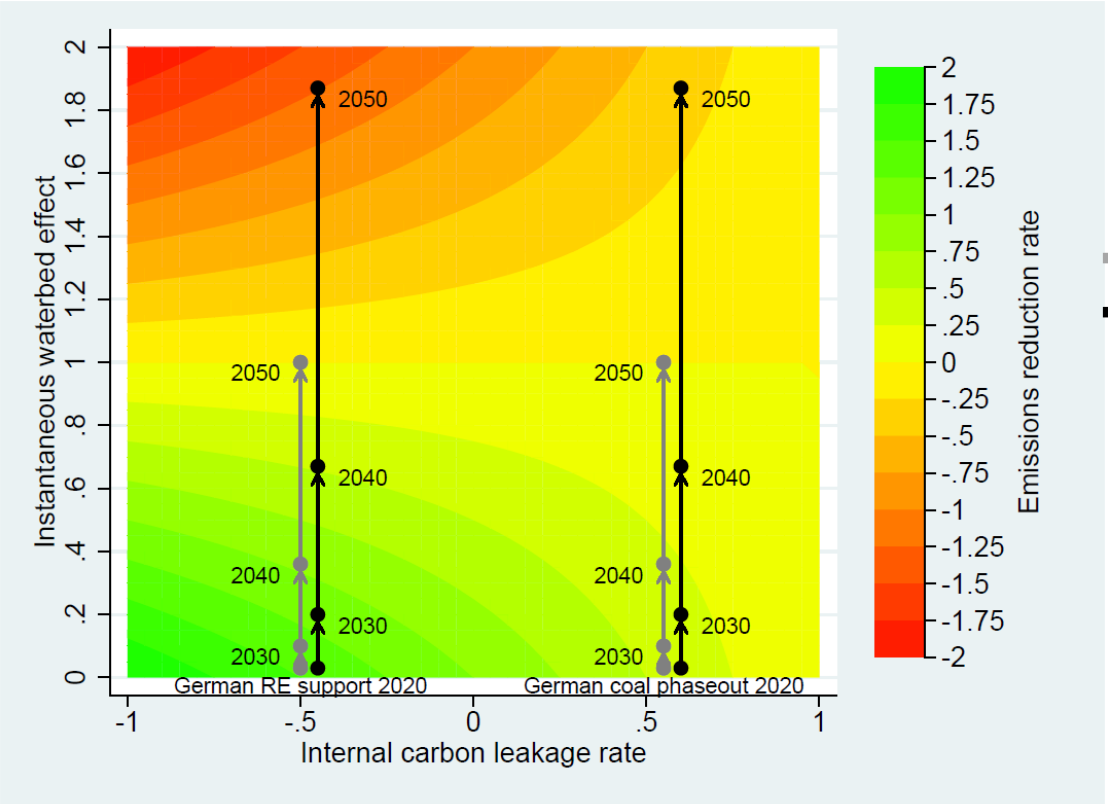
- Before the 2018 reform
  - EU ETS had a fixed cap => no direct climate benefit of overlapping policies (100% waterbed effect)

- Punctured waterbed (Perino 2018)
  - MSR renders cap endogenous
  - Current abatement increases TNAC => reduces cap
  - Size of effect only known ex-post
  - Puncture vanishes over time

Waterbed Effect

- ‚Rosendahl effect' / Green paradox (Rosendahl 2019)
  - Flexibility of cap can backfire
  - Anticipated future abatement (e.g. coal phase-out) reduces TNAC => cap increases (ceteris paribus)
  - Waterbed effect > 100%

Climate Benefit of Abating 1ton at Different Points in Time



(c) $t_{B=833} = 2048$; with Rosendahl effect

Source: Perino et al. (2020)

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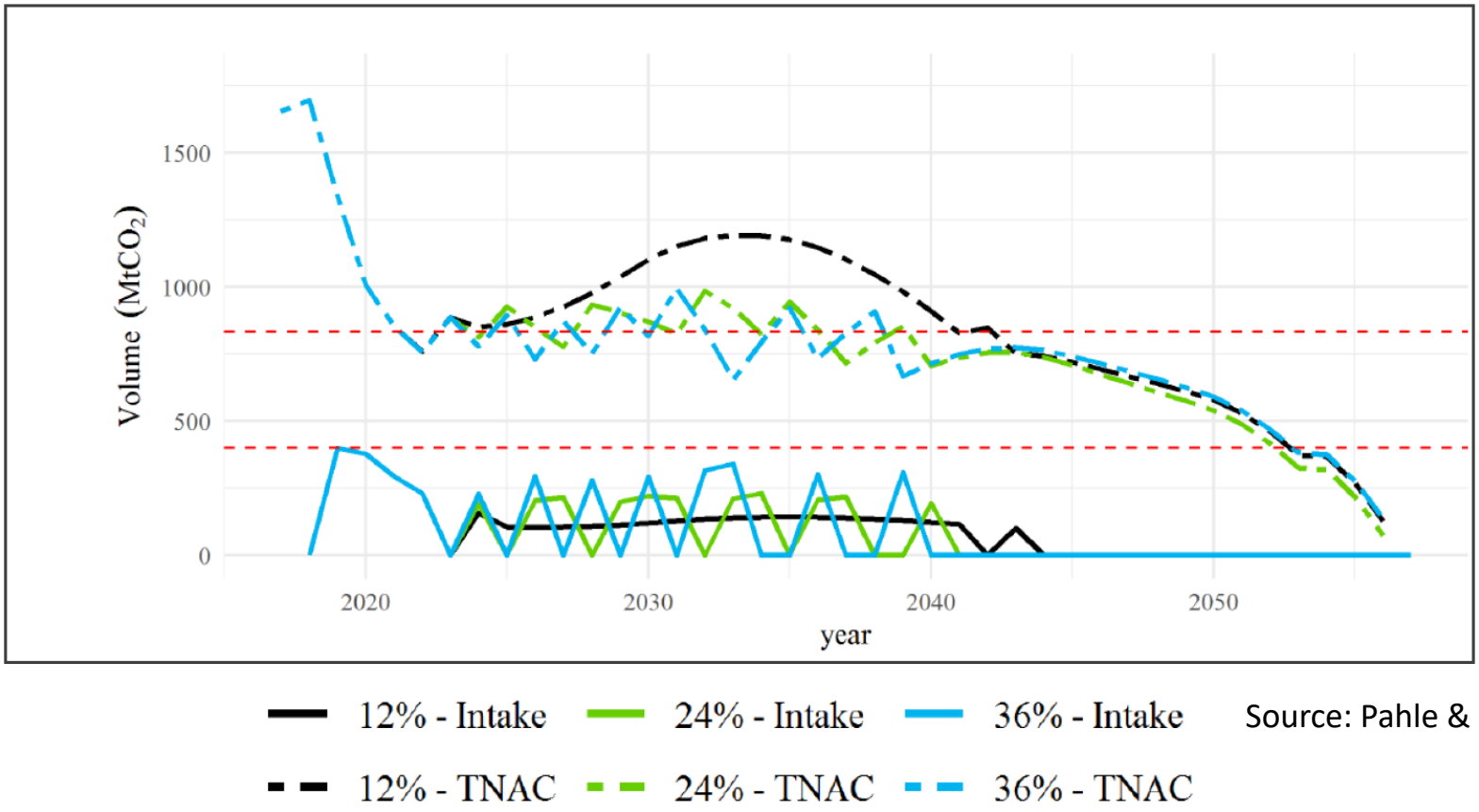
Objective 4

Predictability

For Regulated Firms

- Long-run scarcity highly sensitive to future market dynamics (Bruninx et al. 2020)
- Reduction in TNAC increases price responses to shocks (Perino & Willner 2016, Kollenberg & Taschini 2019)
- MSR increases size of risk premium and price variability (Tietjen et al. 2020)
- Erratic price behaviour
  - Due to multiple equilibria (Gerlagh et al. 2019, Perino et al. 2020)
  - Due to speculation against long-term price impact & thresholds (Friedrich et al. 2020, Osorio et al. 2020, Quemin 2020, Pahle & Quemin 2020)

Speculation Induced Oscillation



Source: Pahle & Quemin (2020)

For Additional Efforts / Overlapping Policies

- Climate benefits of additional efforts by EU, member states, sub-jurisdictions, NGOs and households are highly uncertain
  - Sign and size crucially depend on their timing (Bruninx et al. 2019, Gerlagh et al. 2019, Perino et al. 2020, Rosendahl 2019)
  - Early announcement of policies (predictability) reduces or even reverses their climate benefits under MSR
  - Voluntary cancellations currently almost ineffective unless they use 'buy, bank, burn'-strategy (Gerlagh & Heijmans 2019)

- While rules of MSR are transparent, their impacts are highly complex and counter-intuitive

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MSR 1.0 (2015)

MSR 2.0 (2018)

MSR 3.0 (2021)

Why the MSR is not fit for purpose

- works well for unexpected short-term demand reductions
- weak to counterproductive for anticipated future demand reductions (e.g. depressions, coal phase-outs)
  - Esp. problematic in scenarios REG, MIX & ALLBNK or if COVID-19 has long-term impacts
- impacts excessively complex and counter-intuitive
  - Mid to long-term price projections difficult
  - Climate benefit of overlapping policies essentially coincidental

How to fix the MSR?

- Most issues the MSR tries to address are related to scarcity
  - Response to shocks
  - Synergies with other climate policies
  - Hedging
- TNAC is an ill-suited measure of changes in scarcity
- There is a much better one: the price of allowances

Price Stability Reserve

- Allows EU direct control of
  - Waterbed effect
  - Response to unexpected shocks
  - Trade-off between abatement target and cost containment
- Re-establishes predictability
  - Regulators and firms have a life-time of experience with upward-sloping supply curves
- Wide range of specific design feasible
  - Price bounds
  - Step-ladder
  - Any weakly increasing function…

Summary

- MSR was important step forward in EU ETS design
- Reliance on TNAC substantial shortcoming
- 2021 window of opportunity to make MSR (i.e. EU ETS) fit for purpose
- The challenges ahead are enormous – we need the best EU ETS we can get

Thank you for your attention

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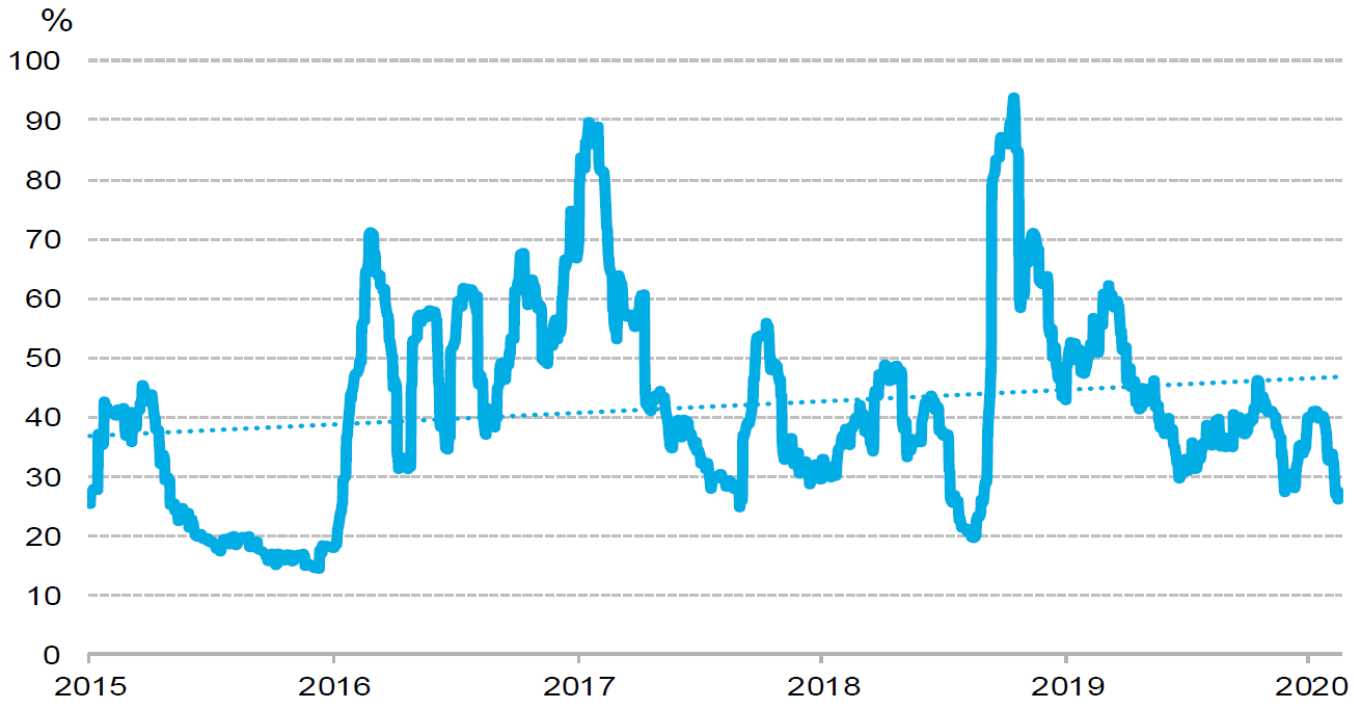
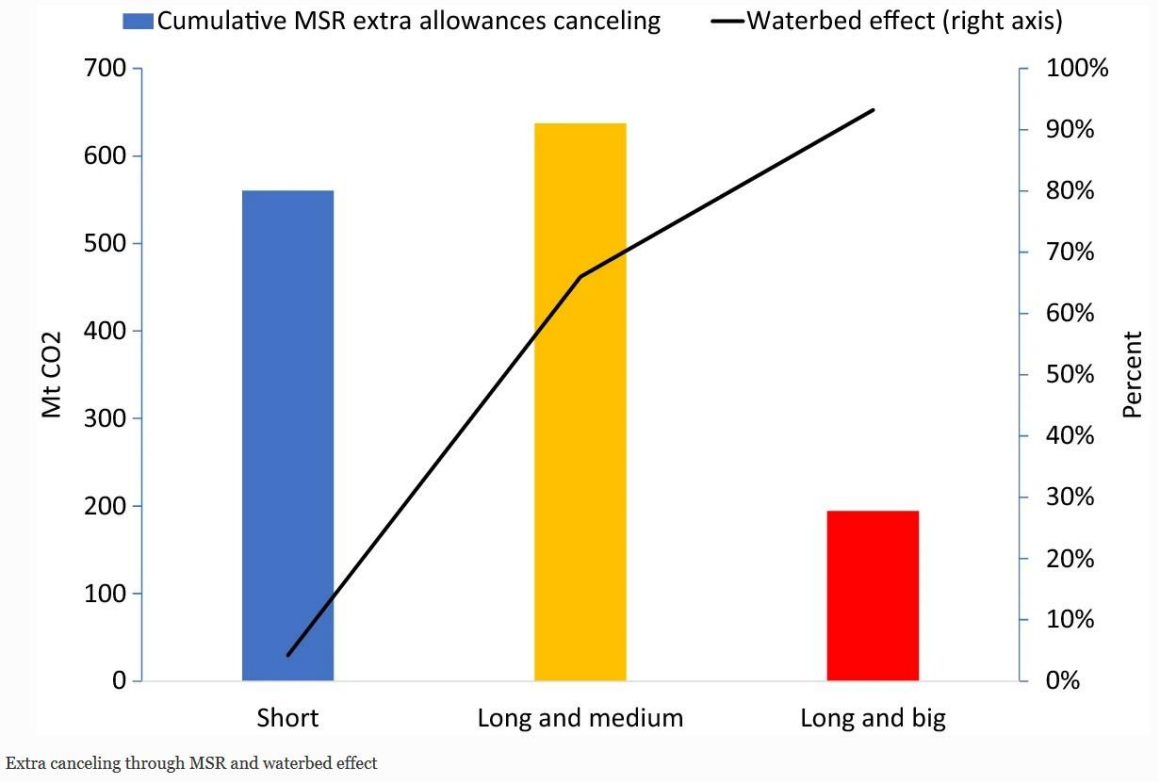
Price Volatility



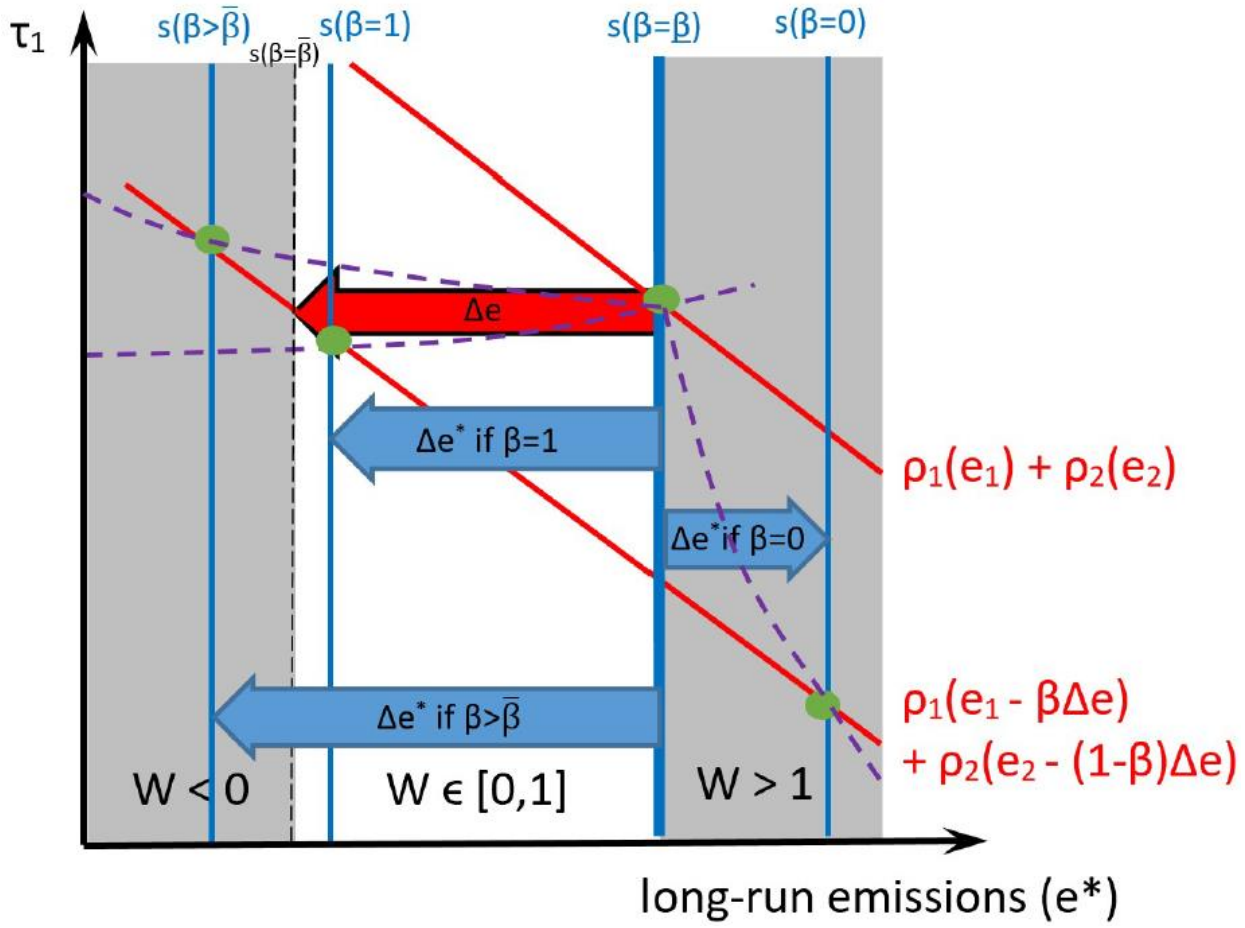
Source: ERCST, Wegener Center, BloombergNEF and Ecoact (2020)

MSR and COVID-19



Extra canceling through MSR and waterbed effect

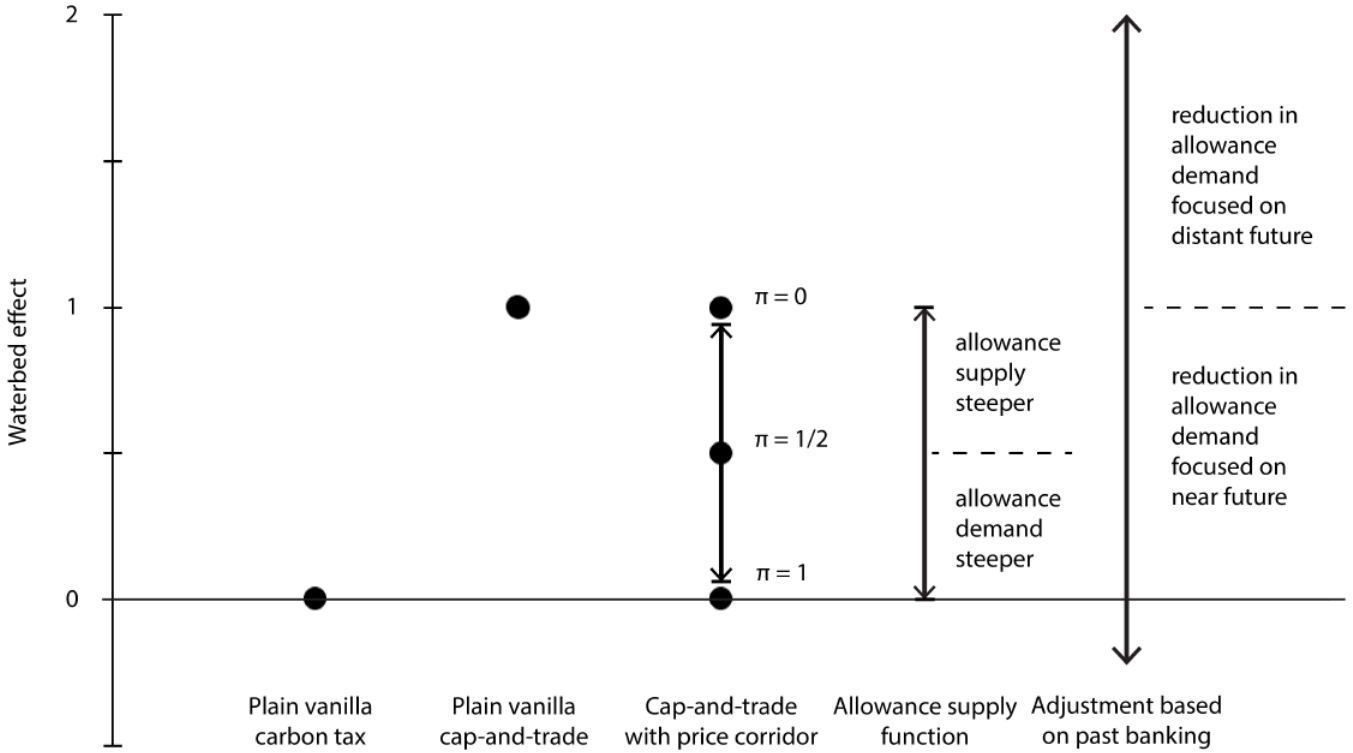
Source: Gerlagh et al. (2020)



Notes: Shift in total allowance demand (Δe, red) induced by overlapping policy; supply response (blue); temporal distribution of the impact (β); response to continuum of demand shifts (dotted purple) with β fixed.

Source: Perino et al. (2020)

Waterbed effects of Different Carbon Pricing Policies



Notes: The expected (but not the ex-post) waterbed effect of a marginal overlapping policy in a cap-and-trade scheme with a price corridor depends on the probability that price bounds are binding (π).

Source: Perino et al. (2020)