

ERCST: The EU ETS Market Stability Reserve Coping
with COVID-19 and preparing for the review

Yale

Marten Ovaere

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High-level summary of the following papers:

[1] K. Bruninx, M. Ovaere, and E. Delarue. “**The Long-Term Impact of the Market Stability Reserve on the EU Emission Trading System**” Energy Economics, June 2020.

[2] K. Bruninx, M. Ovaere, K. Gillingham, and E. Delarue. “**The unintended consequences of the EU ETS cancellation policy**”, 2019. KU Leuven Energy Institute Working Paper WP EN2019-11. Available online: https://www.mech.kuleuven.be/en/tme/research/energy_environment/Pdf/wp-en2019-11

[3] K. Bruninx & M. Ovaere, “**Estimating the impact of COVID-19 on emissions and emission allowance prices under EU ETS**”, IAEE Energy Forum / Covid-19 Issue, 2020.

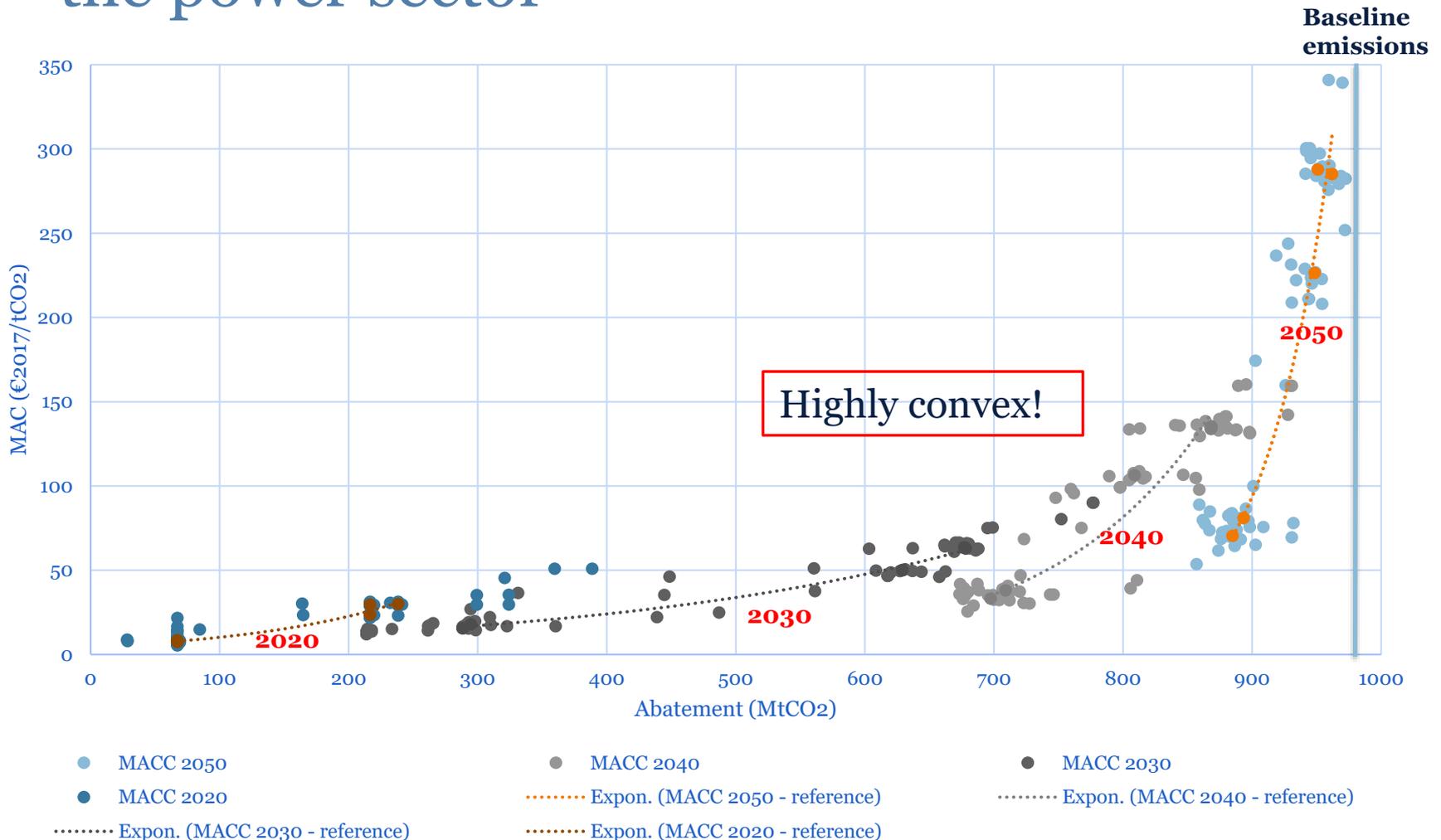
1 Modeling the European-wide long-term abatement cost function of the electricity sector

- Considered horizon: 2018-2061
- Nash equilibrium between utilities & energy-intensive industry, casted as a large-scale *mixed complementary problem*, incl. discrete triggers MSR.
- Starting from existing installed electricity generation capacity, every year utilities make decisions on capacity investments (coal, gas, nuclear, solar, onshore wind, offshore wind, oil) considering the expected profits from economic dispatch over their technical lifetime.
- EU ETS allowance price determined as the equilibrium of supply and demand over the full considered horizon.
 - Supply: emission cap, corrected for actions MSR & cancellation
 - Demand: carbon emissions from electricity generation & industry

1 Main results

- EUA prices quadruple from € 7 to around €28 per ton.
- Cumulative CO₂ emissions decrease with 21.3 GtCO₂.
 - Around 40% of this decrease (8.3GtCO₂) is due to the increased linear reduction factor.
 - 60% due to the cancellation policy (**13 GtCO₂**).
- Results depend on complementary policies (e.g. renewable energy targets, coal/nuclear phase-outs) and cost evolutions (e.g., investment cost reductions for wind and solar power)
 - Effective cancellation uncertain: between **5.6 and 17.8 GtCO₂**
- Marginal abatement cost curve is highly nonlinear.

1 Simulated marginal abatement cost curve of the power sector



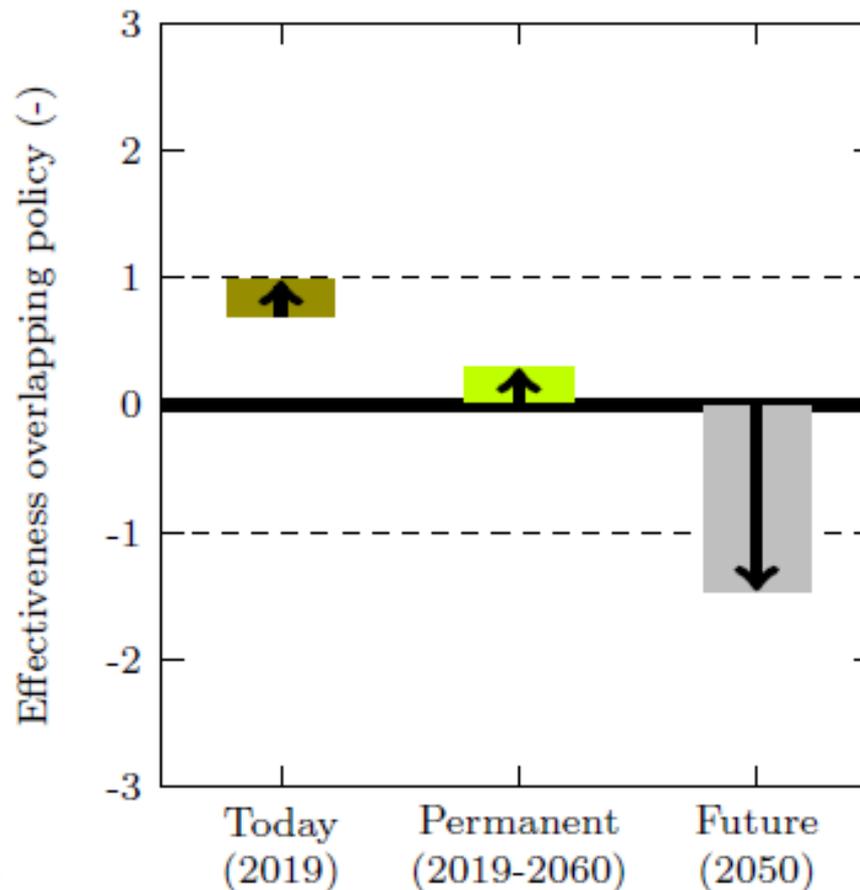
2 Unintended consequence [1]: Reinforcing effect

- The costlier future abatement, the more allowances will be canceled.
- Underlying mechanism:
If the cost of meeting the cap in the future increases:
 - Abatement more today
 - More banking and higher surplus today
 - More EUAs absorbed & cancelled by the MSR
 - Lower cumulative emissions
- Policy more stringent when it is more expensive to abate

2 Unintended consequence [2]: Overlapping policies affect cumulative emissions in unexpected ways

Policies reducing CO₂ emissions

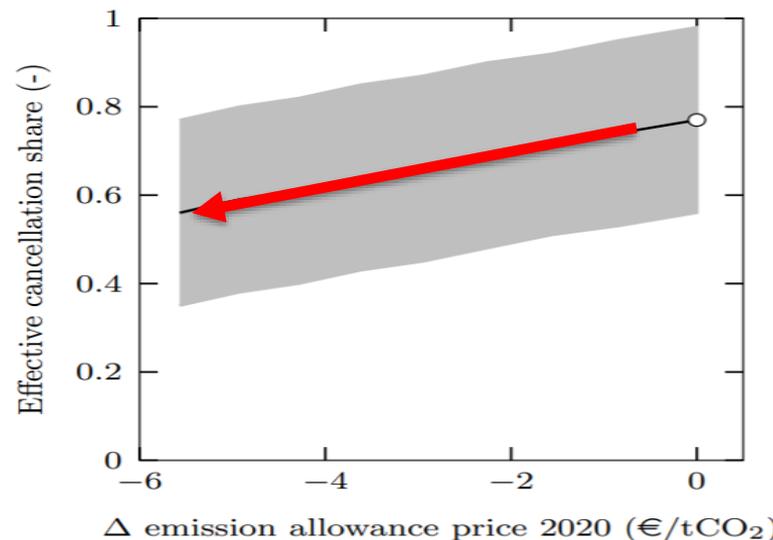
E.g., Energy efficiency targets, RES targets, Coal phase-out



See paper for effect of policies increasing emissions, increasing supply or decreasing supply

3 COVID-19 & EU ETS

- Estimation: -38 MtCO₂ EU ETS emissions per month of lockdown.
- We find in our model that a **negative demand shock by itself** has a negligible effect on prices and emissions (under different scenarios, see paper).
 - However, a **negative demand shock in combination with a temporary increase in discount rates** ('future is less important'), we find the kind of price decreases observed in the market.
 - When the allowance price decreases, effectiveness also decreases, because negative demand shock is partly canceled by lower abatement.



4 Conclusions

- Introduction of MSR & increase in LRF has significant impact on EUA prices and climate/energy policy in Europe
 - 2018 jump in prices may be result of introduction MSR & increased LRF
 - Significant reduction in allowed cumulative emissions
 - The effect of COVID-19 should be limited when market actors are perfectly optimizing (because negative demand shock is small compared to supply over the full ETS horizon), but actors clearly are not optimizing perfectly.
- Some gaps in regulation (e.g., aviation), but more fundamental design flaws related to feedback effect & overlapping policies:
 - If it becomes more costly to meet the cap, we strengthen the cap!
 - National (overlapping) policies may affect cumulative emissions in unexpected and counterintuitive ways!

Thank you for your attention!

Questions or comments?

marten.ovaere@yale.edu

martenovaere.eu

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