



POTSDAM INSTITUTE FOR
CLIMATE IMPACT RESEARCH

Triggering decarbonisation in the industry: Analysing the sectoral interactions within the EU ETS and the role of the MSR

Sebastian Osorio*, Michael Pahle, Robert Pietzcker

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Member of

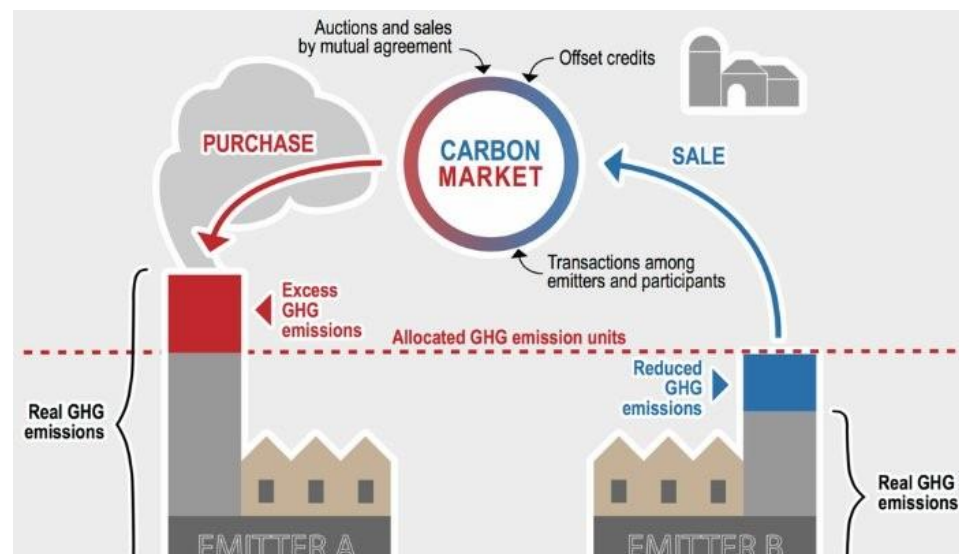
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Outline

- Background & policy problem:
 - The EU ETS and its reform (MSR)
- Model: LIMES in a nutshell
- Results:
 - The German CPO and the waterbed effect
 - Further RES deployment in the EU
 - Sensitivity analysis
- Conclusion
- References

The EU ETS (I)

- Sectors covered: Power and heat generation, energy-intensive industries and civil aviation
- ~43% certificates freely allocated and ~57% auctioned
- Installations in sectors exposed to a significant risk of 'carbon leakage' (majority of industrial installations) receive special treatment



Source: www.imatteryouth.org

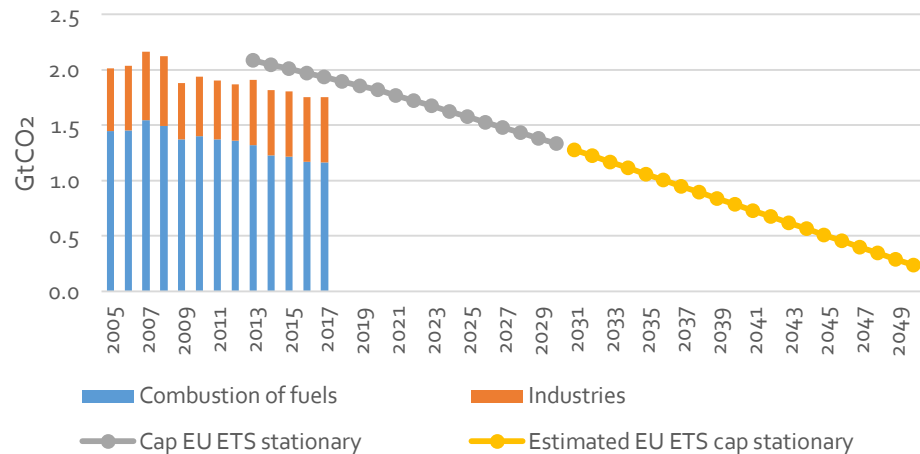
The EU ETS (II)

- Low prices (5-10 eur/tCO₂) until 2018
- Phase IV: stronger reduction factor (2.2%) and implementation of the market stability reserve (MSR)
- Individual actions risk to be offset by the waterbed effect
 - Impact of MSR?



Source: www.eex.com

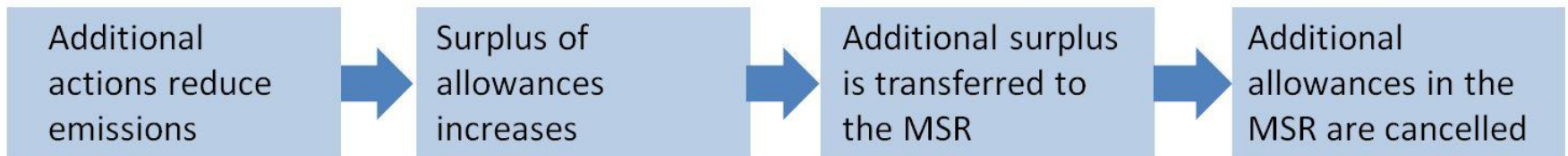
Emissions and cap



The MSR (I)

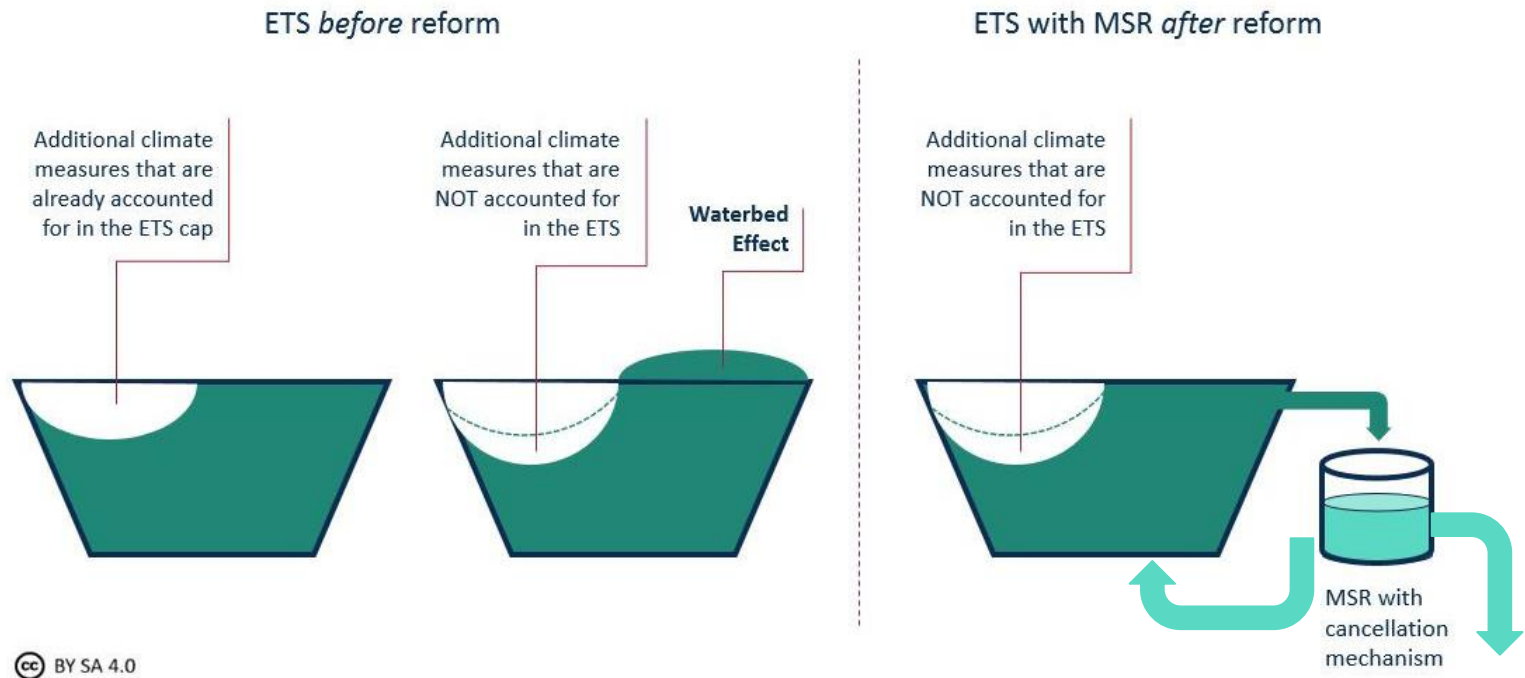
Three main rules:

- If total number of allowances in circulation (TNAC) > 833 MtCO₂
 - > Intake: transfer from market to MSR (24% of TNAC until 2023, 12% after)
- If TNAC < 400 MtCO₂
 - > Outtake: transfer from MSR to market (100 MtCO₂)
- If MSR > auction
 - > Cancellation: deletion from the MSR (difference between MSR and auctions) - from 2023 only



Source: sandbag.org.uk (2017)

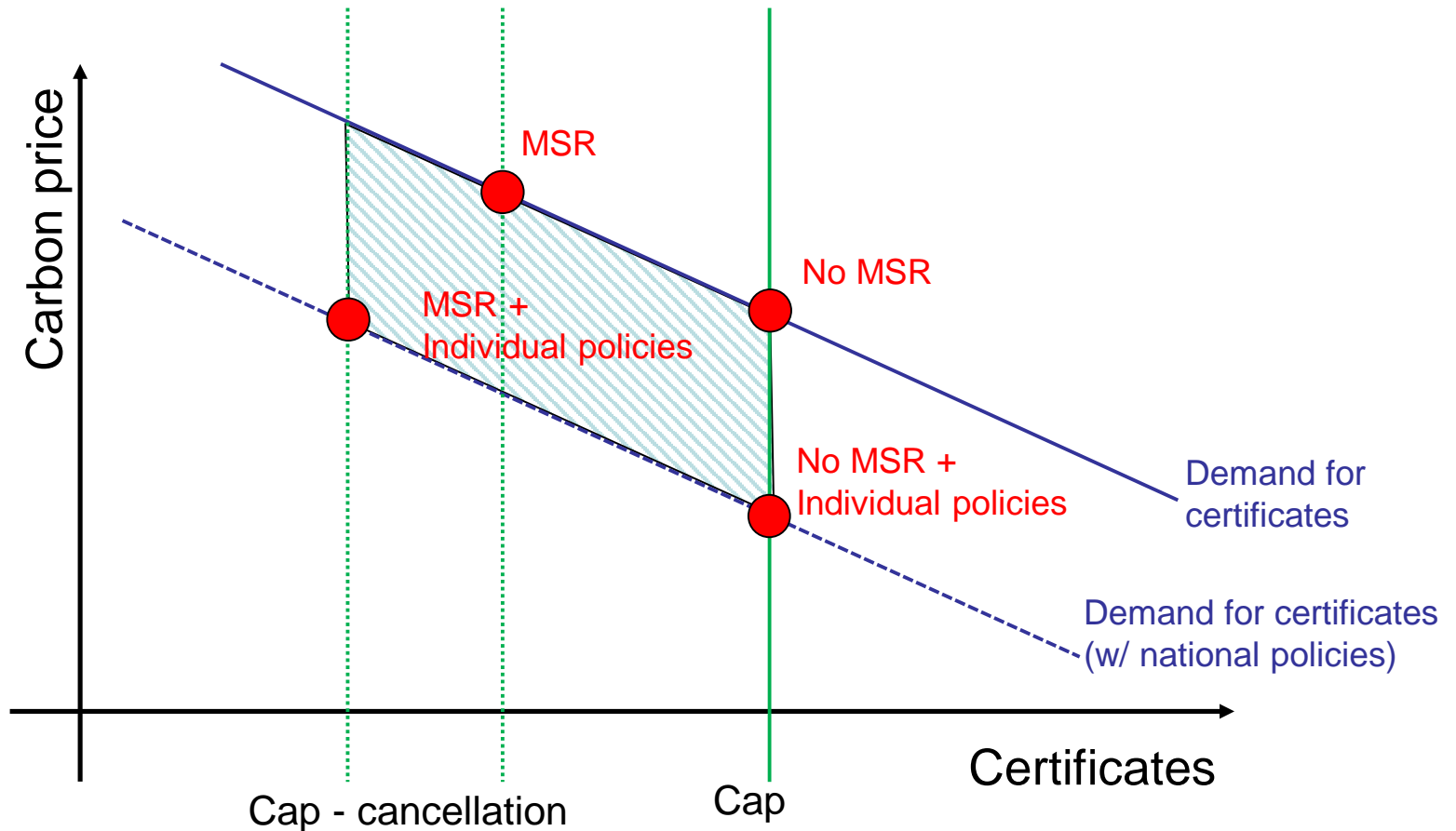
The MSR (II)



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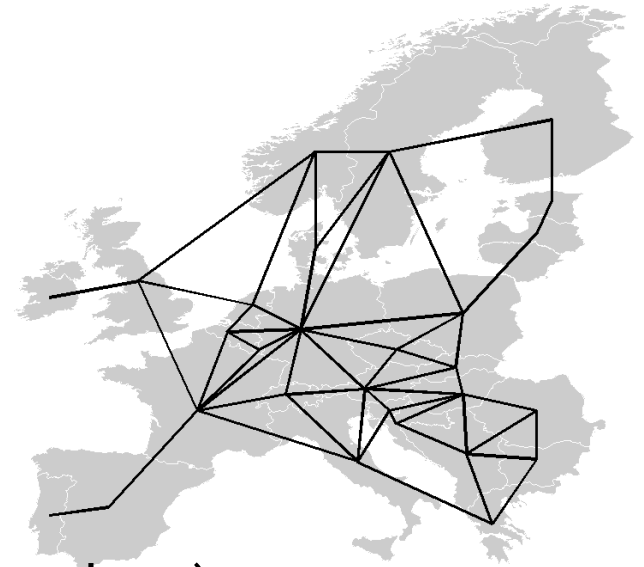
Source: www.cleanenergywire.org (2019); own work

Policies interaction: EU ETS + MSR + national policies (CPO, RES)

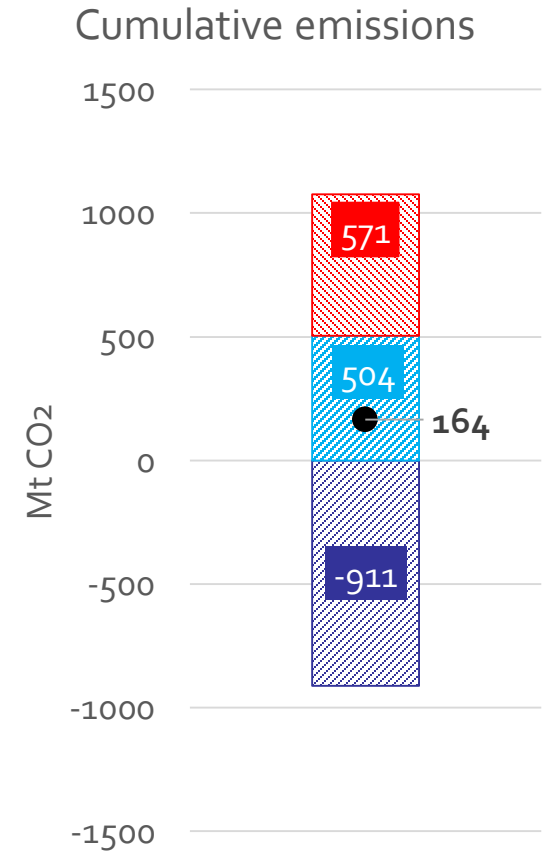
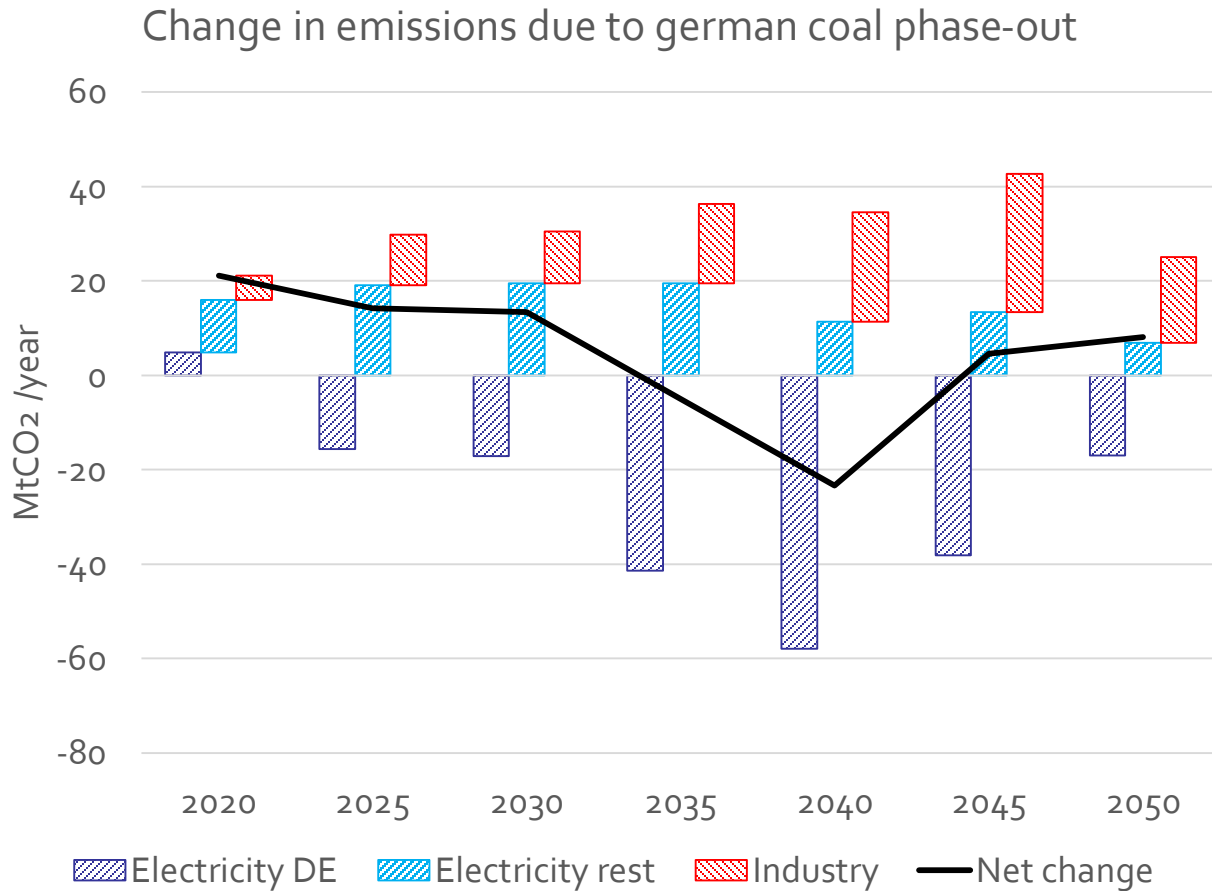


LIMES-EU in a nutshell

- Linear optimization model
- Temporal resolution:
 - From 2010 to 2050 in 5-year steps
 - 6 representative days per year
 - 8 time slices per day
 - Perfect foresight
- Geographical scope: Europe (29 model regions)
 - EU (w/o MT and CY) + CH + NO + aggregated Balkan
- 33 generation and storage technologies
- EU ETS energy-intensive industry: MACC
- Policy focus: EU ETS and MSR



German coal phase-out: does the MSR limit the waterbed effect?

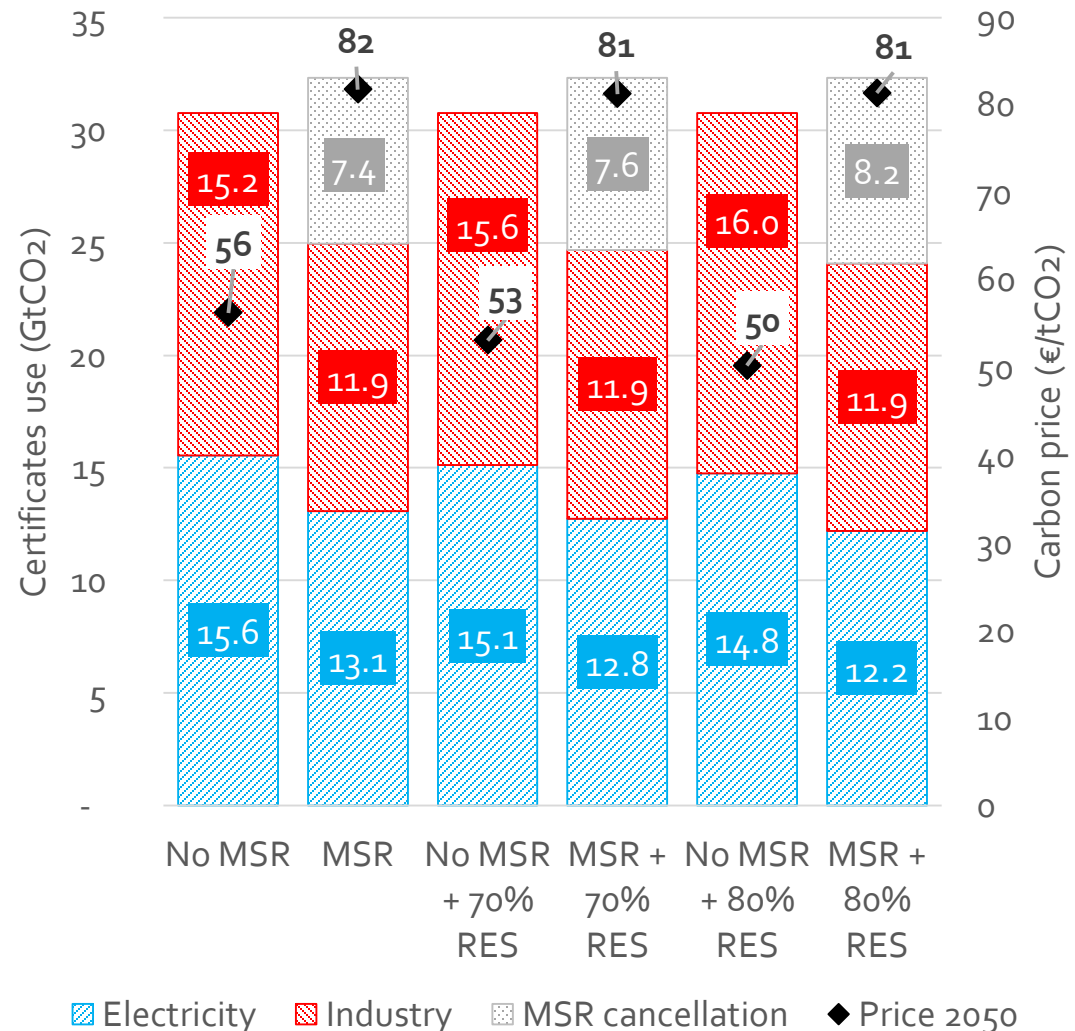


Source: Pahle et al. (2019)

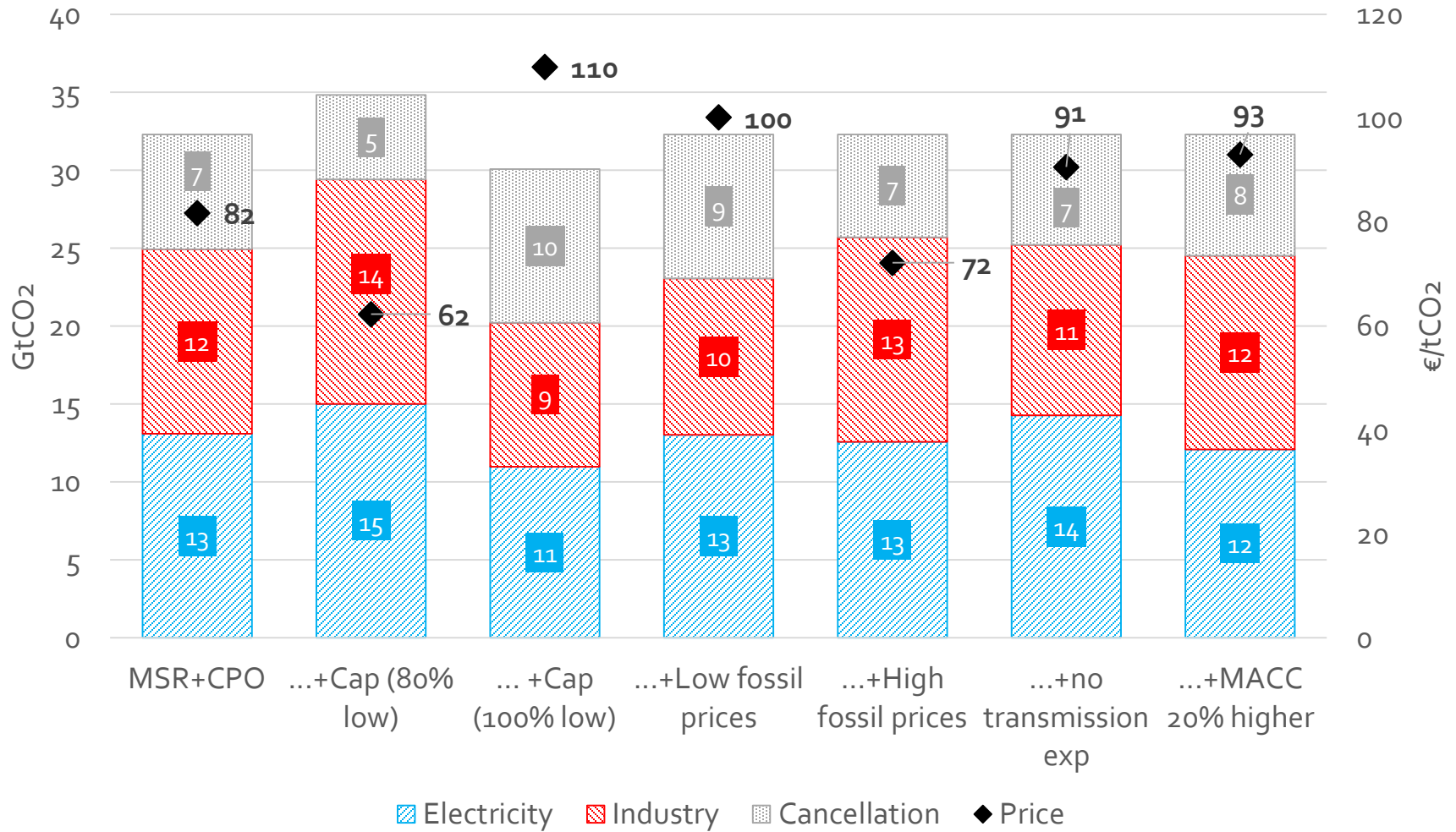
Waterbed effect = 118%

Could electricity decarbonisation help decarbonising industry?

- Cancellation from MSR increases with more RES
- MSR limits increase in industry emissions
- Additional abatement in electricity preserved by cancellations through the MSR

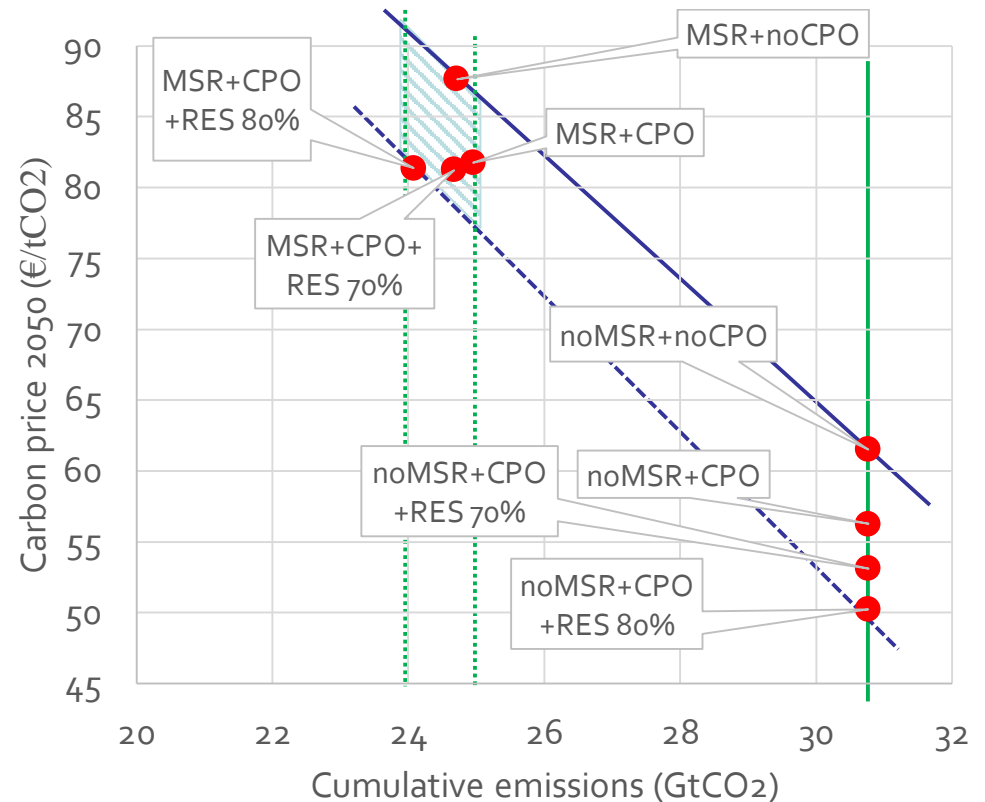


Sensitivity analysis



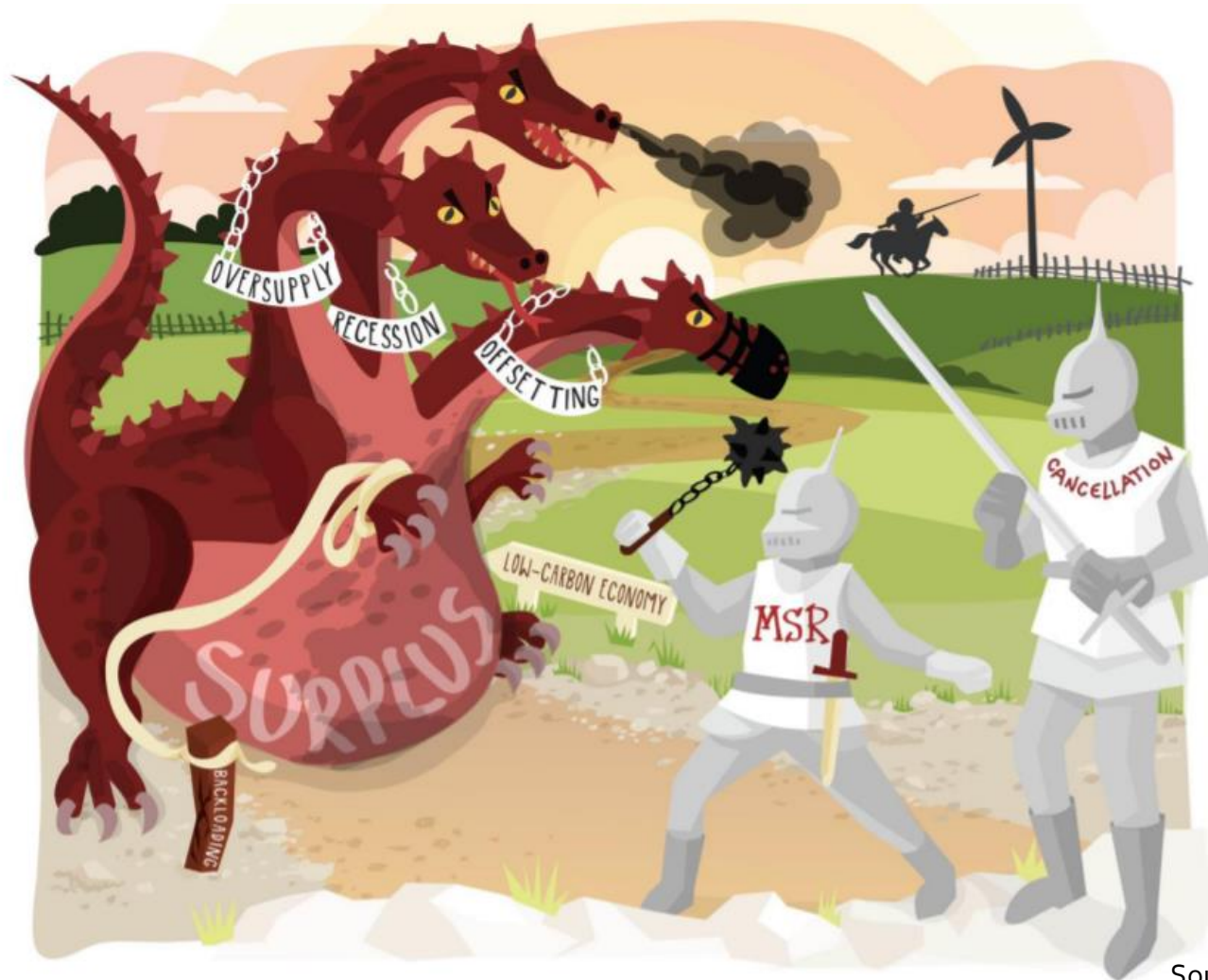
Conclusion

- MSR induces decarbonisation in both industry and electricity
- Impact of electricity-focused policies and MSR?
 - CPO: more emissions
 - RES support: decarbonisation in electricity... But waterbed effect is limited
- Timing and “wideness” of policies are key to avoid inter-sectoral waterbed



Questions?

Sebastian.osorio@pik-potsdam.de



Source: Sandbag, 2014

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