



POTSDAM INSTITUTE FOR
CLIMATE IMPACT RESEARCH

Increasing the stringency of the EU ETS to achieve more ambitious climate targets

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Outline

- Background & policy problem:
 - The EU ETS and its reform (MSR)
- Methodology:
 - LIMES-EU model
- EU ETS and MSR dynamics
- Impact on cancellation and EUA prices:
 - Intake rate
 - Thresholds
 - Linear reduction factor (LRF)
- Conclusion

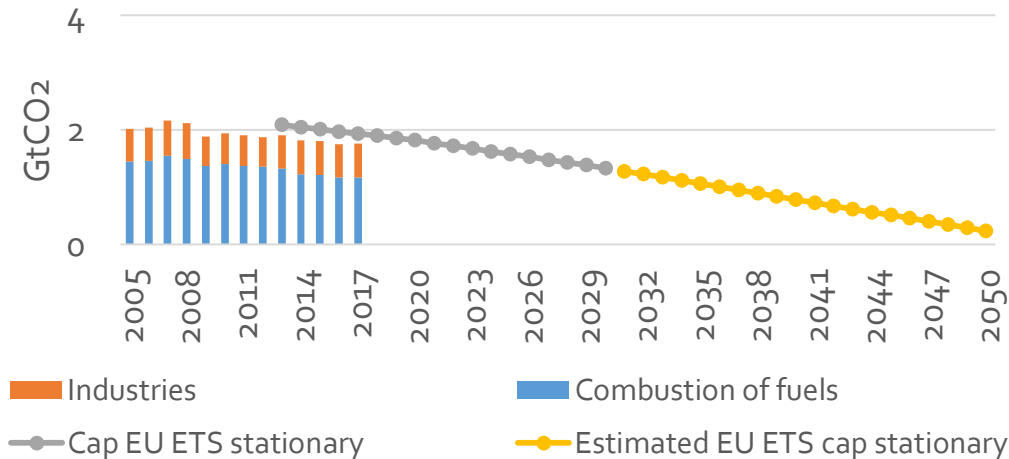
The EU ETS

- Low prices (5-10 eur/tCO₂) until 2018
- Phase IV: stronger reduction factor (2.2%) and implementation of the market stability reserve (MSR)
- EU 2030 emission target to be increased (55%)?
 - New LRF for EU ETS?
 - Review of MSR in 2021



Source: www.eex.com

Emissions and cap



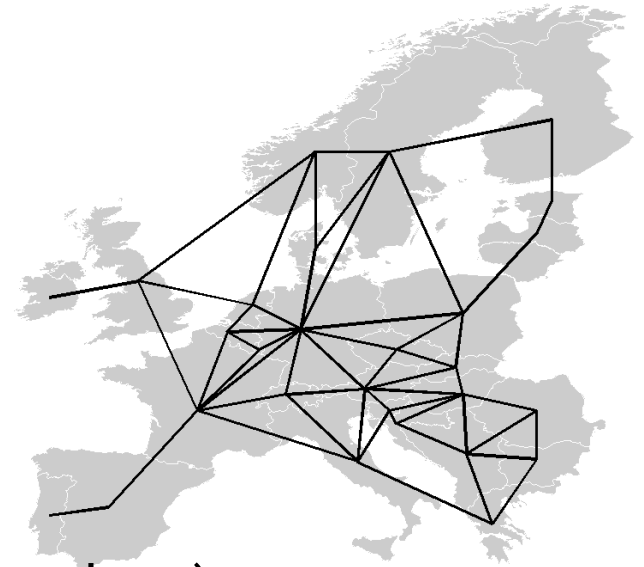
Aim of our research

- How to tweak the MSR to achieve higher stringency?
 - Previous work focused on theoretical mechanisms using simplistic models (Tietjen et al., 2019)
 - MSR is a particularly complex mechanism whose thresholds may lead to discontinuous behaviour (Perino, 2018)
- Inform the MSR revision: **Effect of broad range of relevant parameters on cancellation?**

Levers: **intake** and outtake rate of allowances into the MSR, **thresholds**, auction shares, and the **LRF**

LIMES-EU in a nutshell

- Linear optimization model
- Temporal resolution:
 - From 2010 to 2070 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

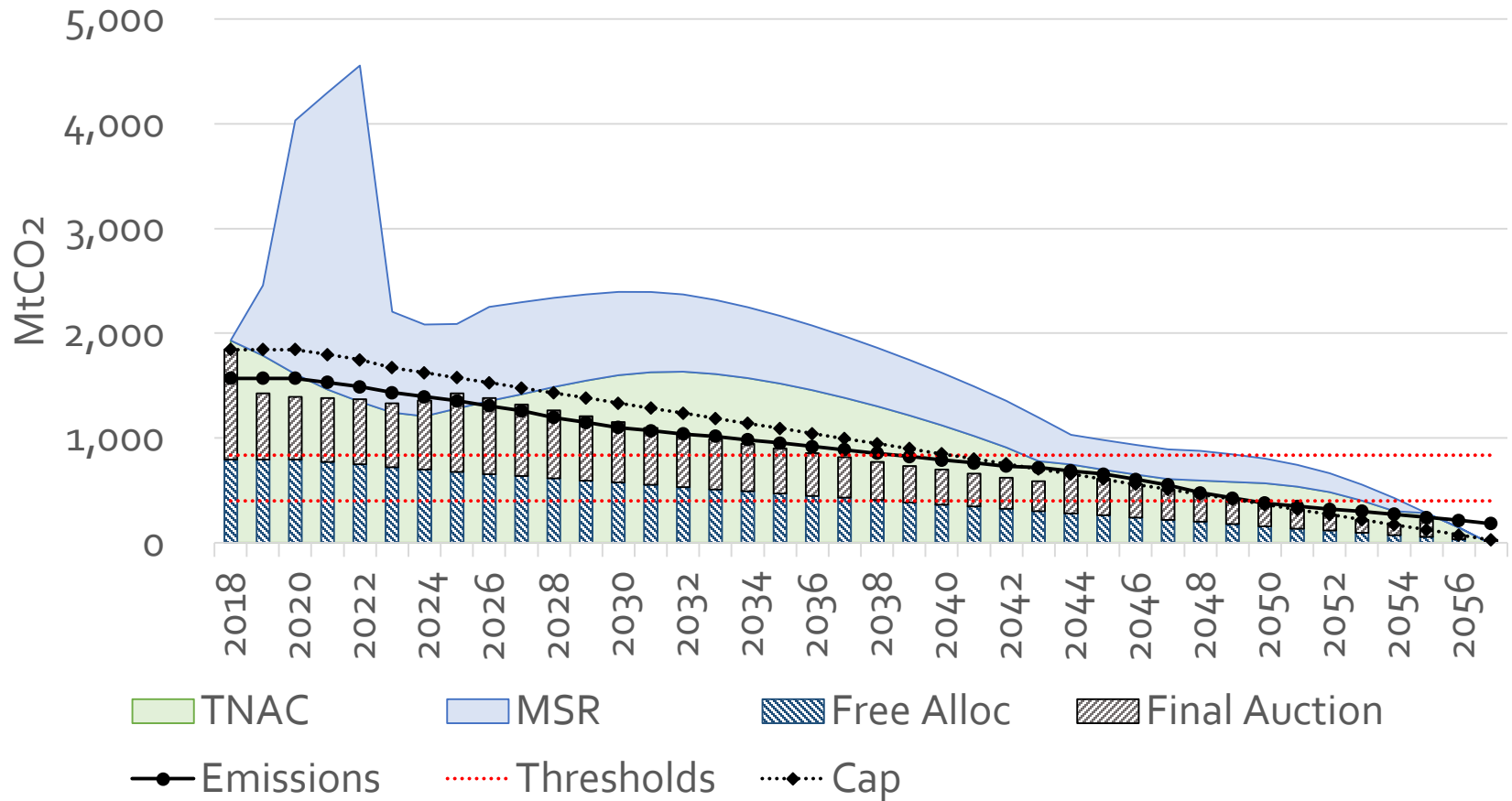


The MSR

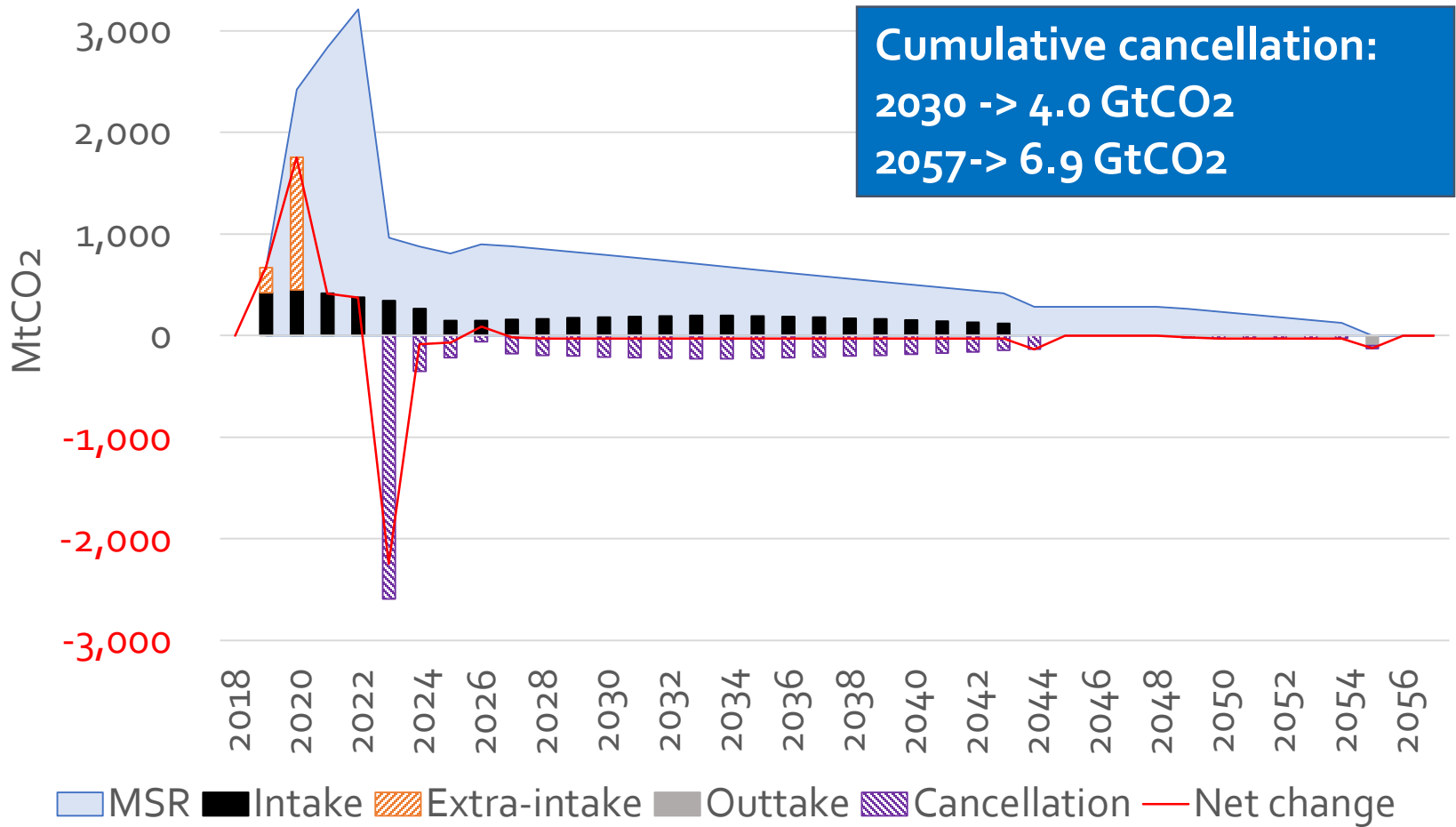
Three main rules:

- If total number of allowances in circulation (TNAC) $> 833 \text{ MtCO}_2$
 - > Intake: transfer from market to MSR (24% of TNAC until 2023, 12% after)
- If TNAC $< 400 \text{ MtCO}_2$
 - > Outtake: transfer from MSR to market (100 MtCO_2)
- If MSR $>$ auction
 - > Cancellation: deletion from the MSR (difference between MSR and auctions) - from 2023 only

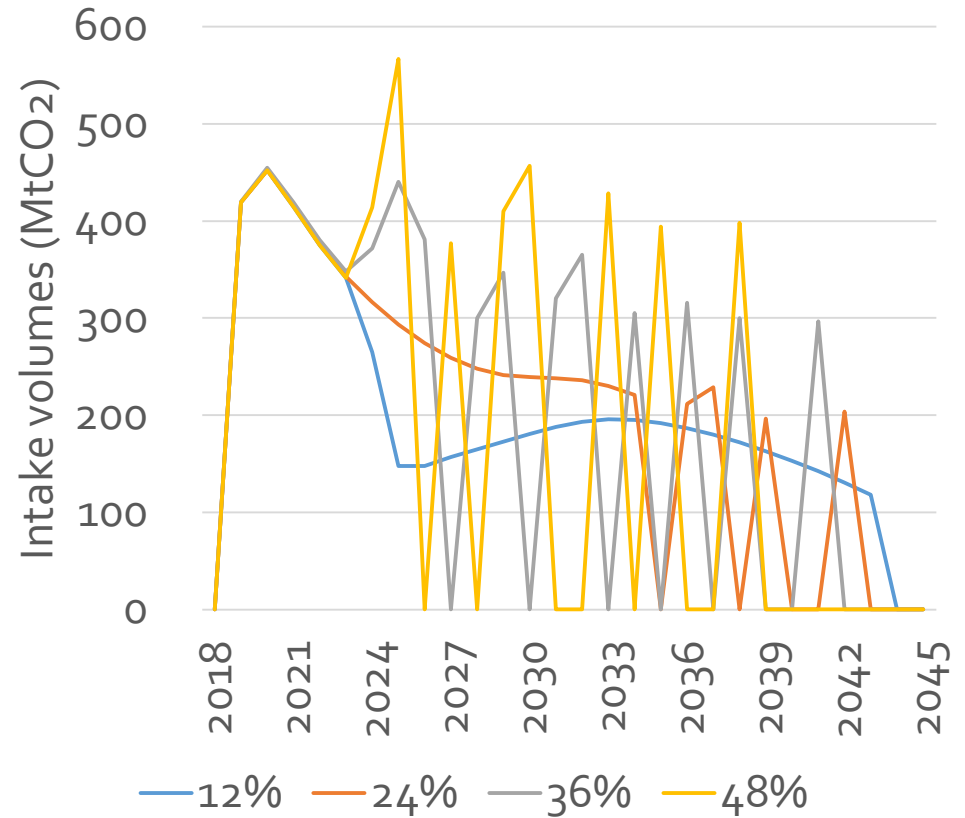
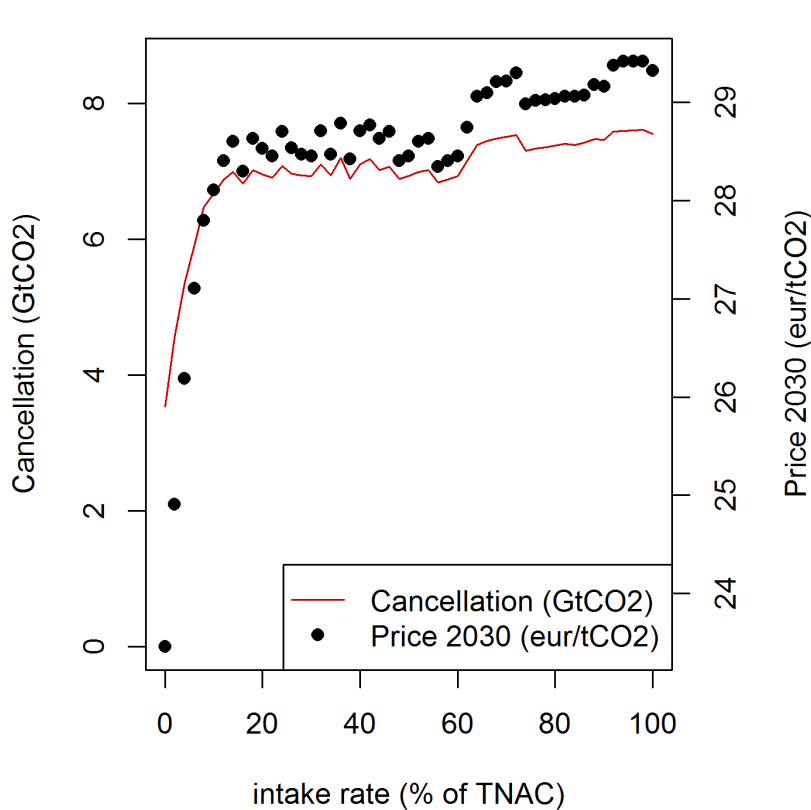
Reference scenario: EU ETS (I)



Reference scenario: EU ETS (II)



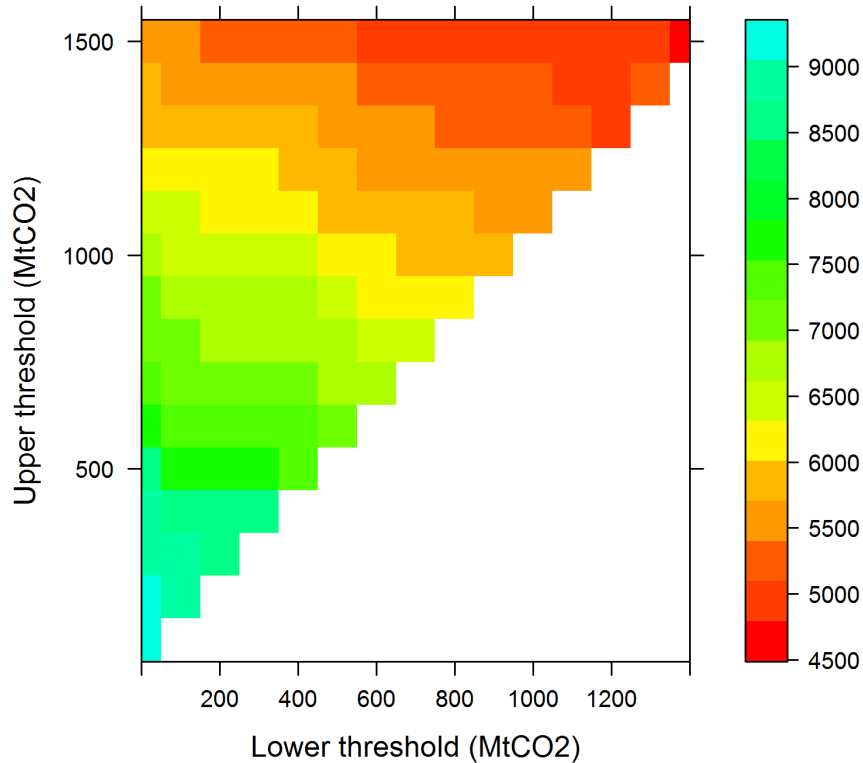
Intake rate



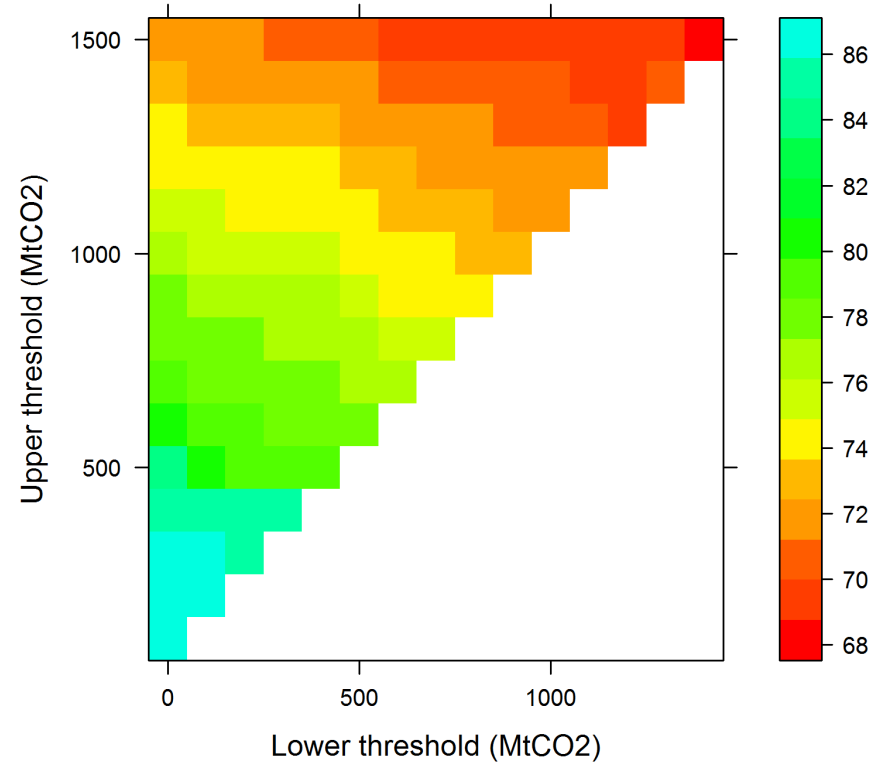
Small variation of cancellation for intake rates above 10%, but higher intake rates induce oscillations to the intake volumes as the TNAC drops faster

Thresholds

Cumulative cancellation 2018-2057 (MtCO₂)

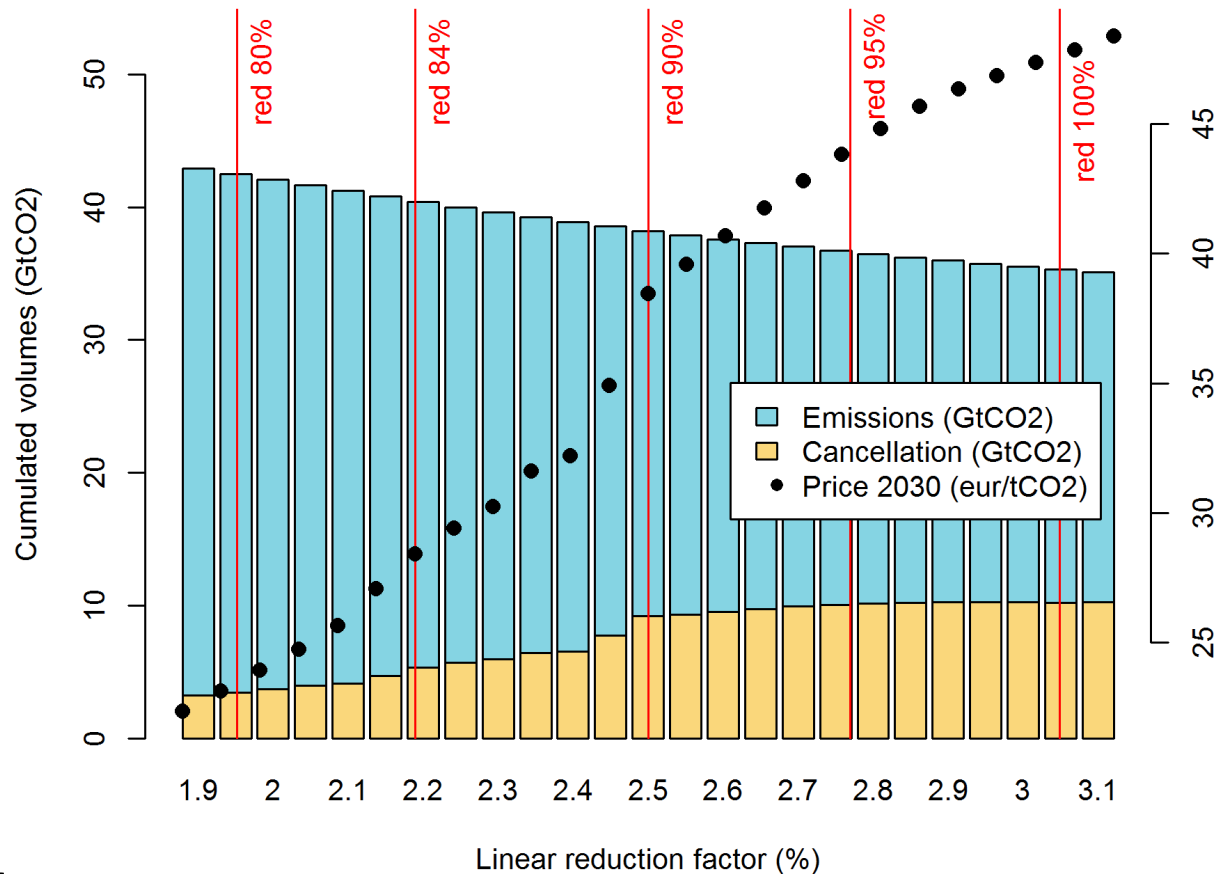


Price 2050 (eur/tCO₂)



Highest cancellation for low values of the lower and upper thresholds:
-> not only more transfers to the MSR, but also less outtake from it

Linear reduction factor (LRF)



Feedback effect:

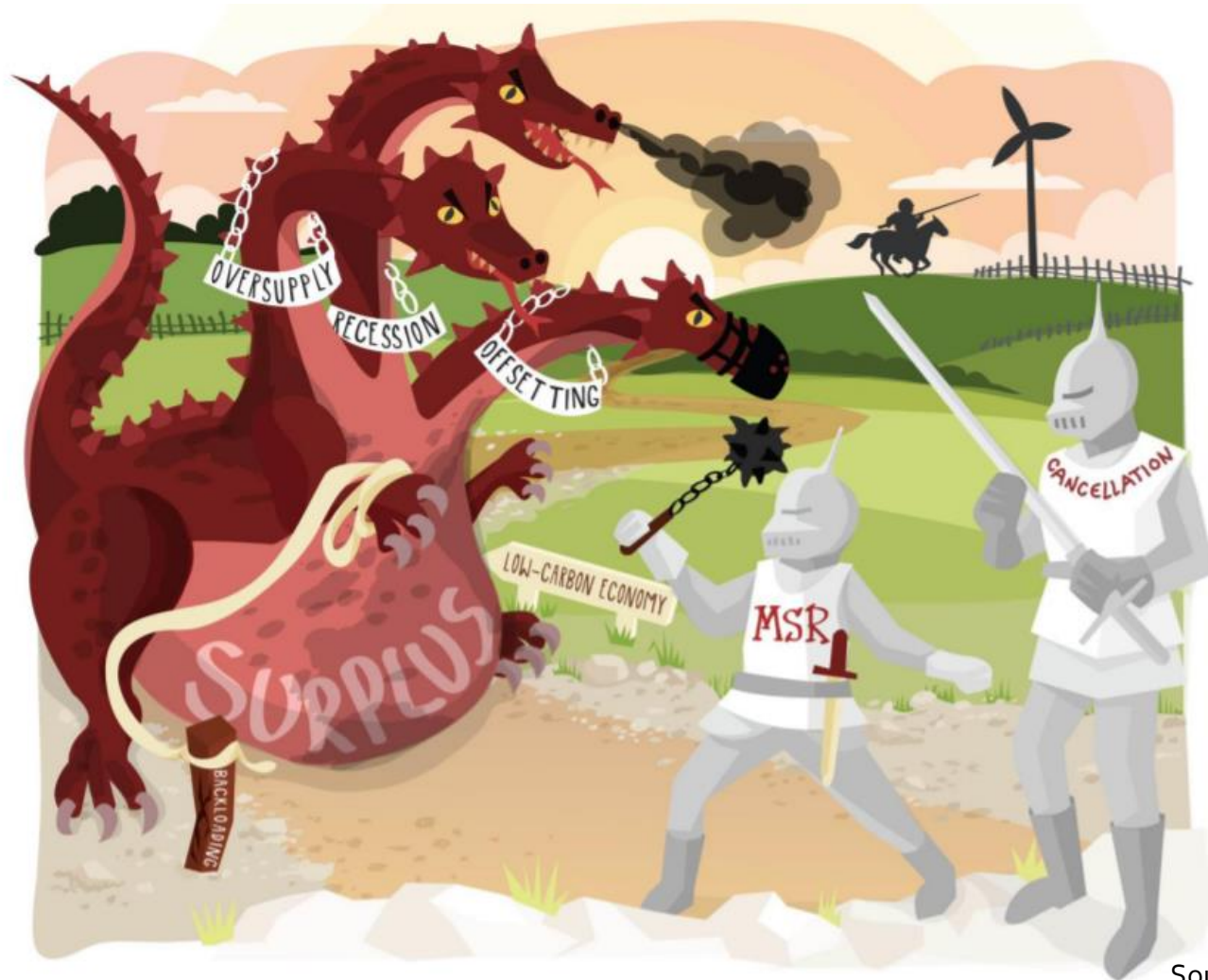
Higher LRF leads to strong long-term scarcity of allowances -> higher short term prices (due to banking) -> higher TNAC -> higher intake into the MSR

Conclusion

- Allowance intake and cancellation until around the mid 2040s
- Impact of levers on cancellation:
 - Sensitive to the intake rate for values smaller than 10% (beware of oscillatory behaviour induced by high intake rates)
 - Stronger impact from upper than lower one threshold
 - Feedback from allowance prices on cancellations -> effect when abatement costs are low

Questions?

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Source: Sandbag, 2014

References

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