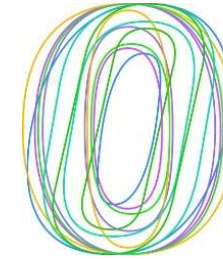




POTSDAM-INSTITUT FÜR
KLIMAFOLGENFORSCHUNG



EUROPEAN
CLIMATE + ENERGY
MODELLING
FORUM

FINDING THE MOST EFFECTIVE INSTRUMENTS: THE EFFECT OF ENABLING POLICIES ON ETS2 PRICES

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based on research done with Johanna Hoppe, Robin Hasse, Gunnar Luderer, Michael Pahle, Matthias Kalkuhl
Potsdam Institute for Climate Impact Research (PIK)

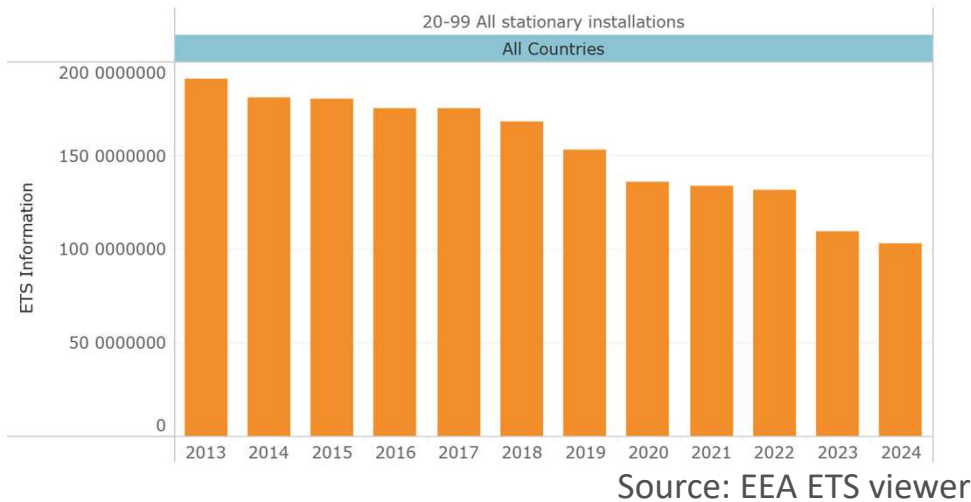


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ETS1 – A SUCCESS STORY!?

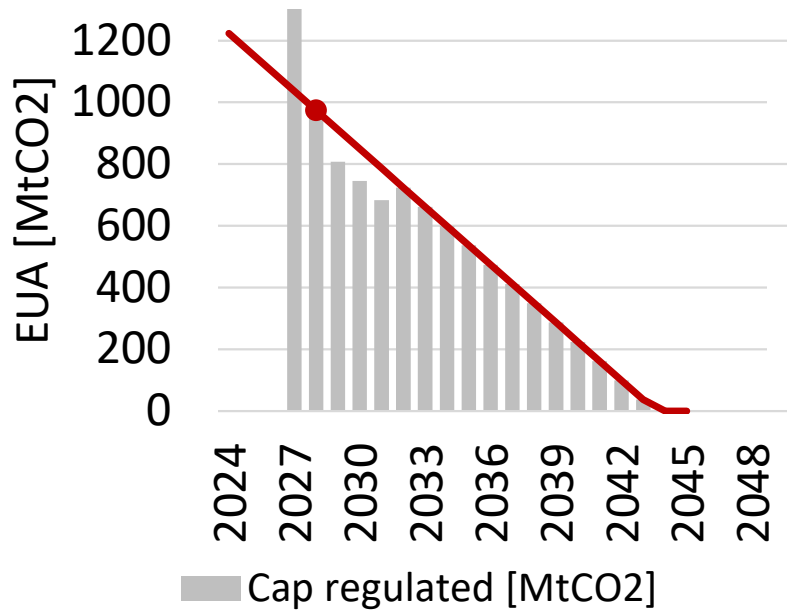
Historical Emissions



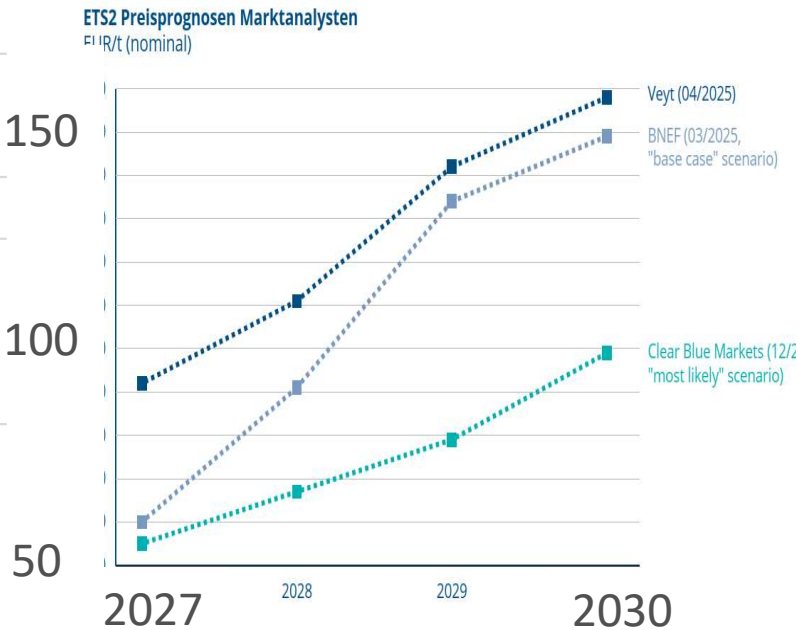
- Impressive reduction of emissions in the ETS1 - ~50% from 2005 to 2024
 - However, prices were (very) low until 2018, and only rose significantly in 2021 (EU Green Deal)
 - By then, renewable energy support policies had already ensured that >80 % of new installations were clean
- ➔ Price increase was manageable because the way out was clear!



WHAT ABOUT THE ETS2?

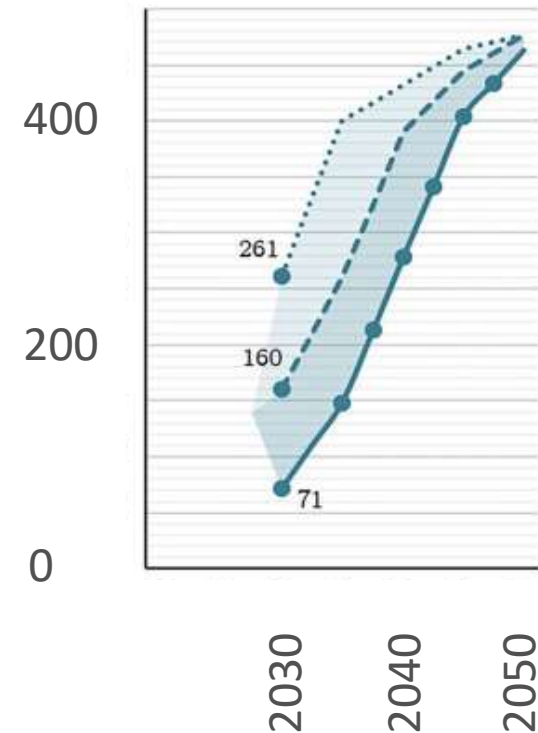


Graichen and Ludig (2024): Supply and demand in the ETS 2



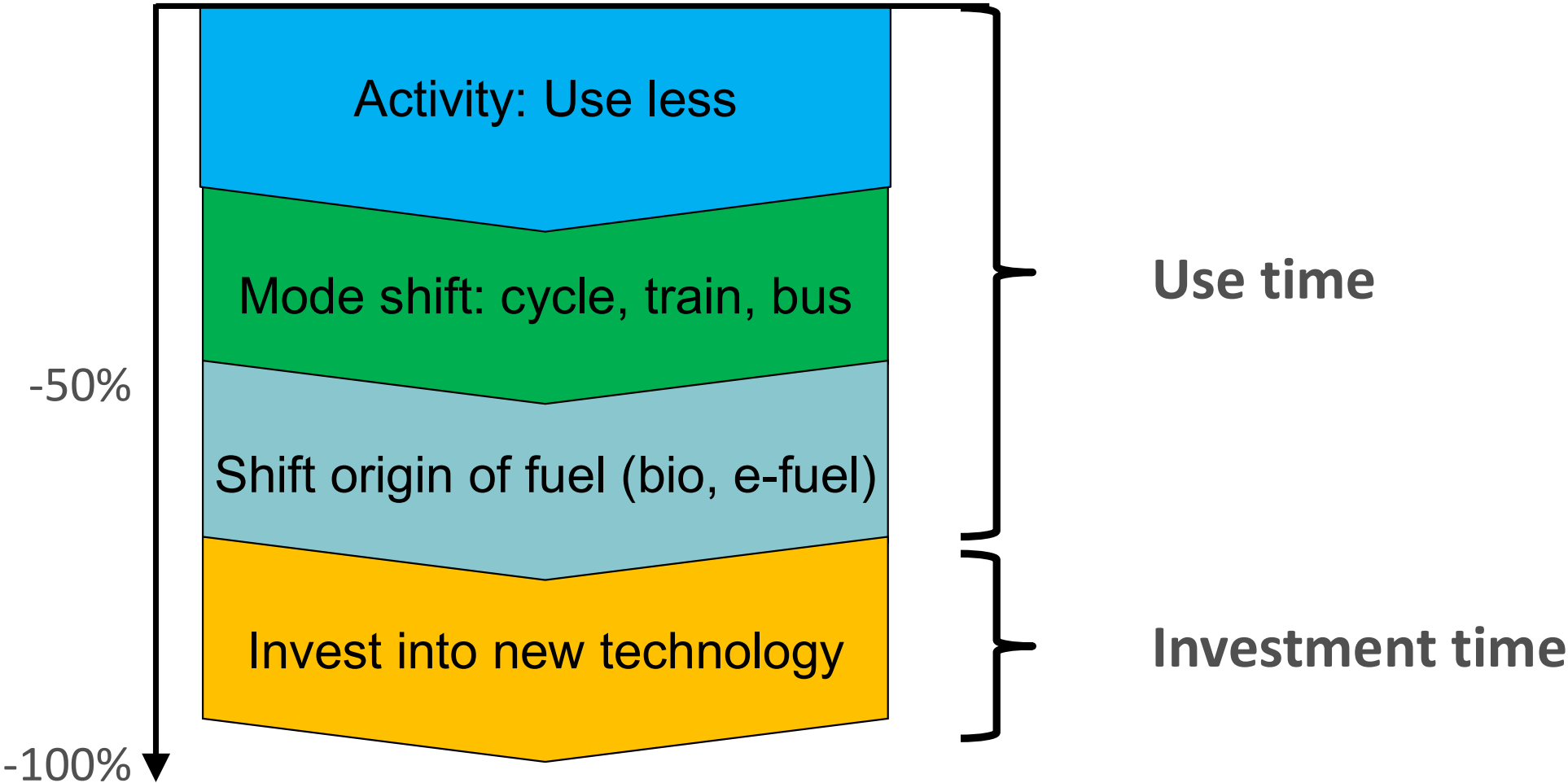
Pahle et al (2025): Wie weiter mit dem ETS2? Vorschläge und Erwägungen zur Stärkung der Glaubwürdigkeit

Günther et al (2025): Carbon prices on the rise? Shedding light on the emerging second EU Emissions Trading System (EU ETS 2)

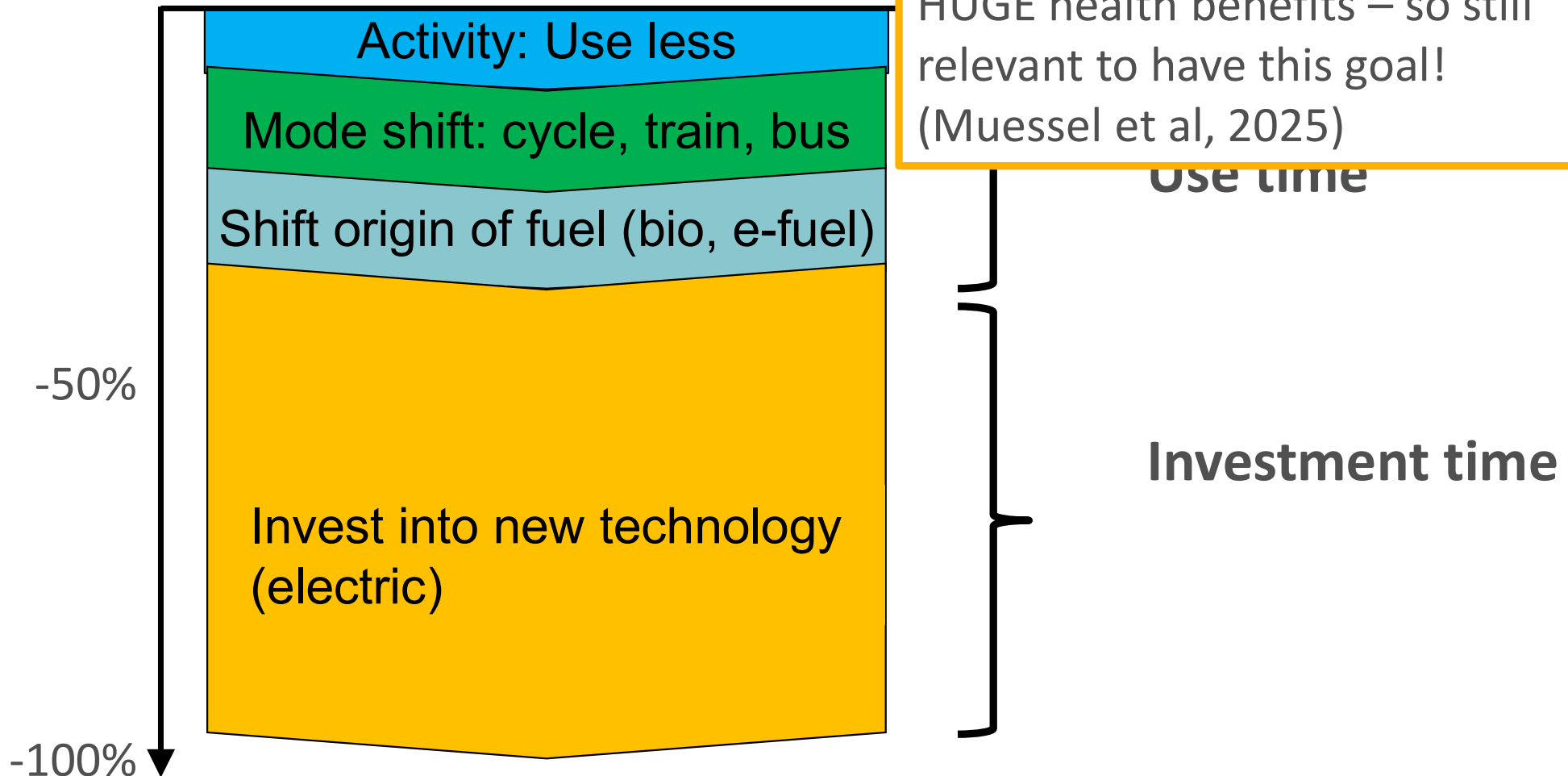


- Very steep yearly emission reductions (5% per year)
- Substantial uncertainty:
2030: 70-260EUR/tCO₂, 2035: 150 – 400 EUR/tCO₂ (~40-120 ct/liter gasoline)

HOW TO REDUCE EMISSIONS?



HOW TO REDUCE EMISSIONS?



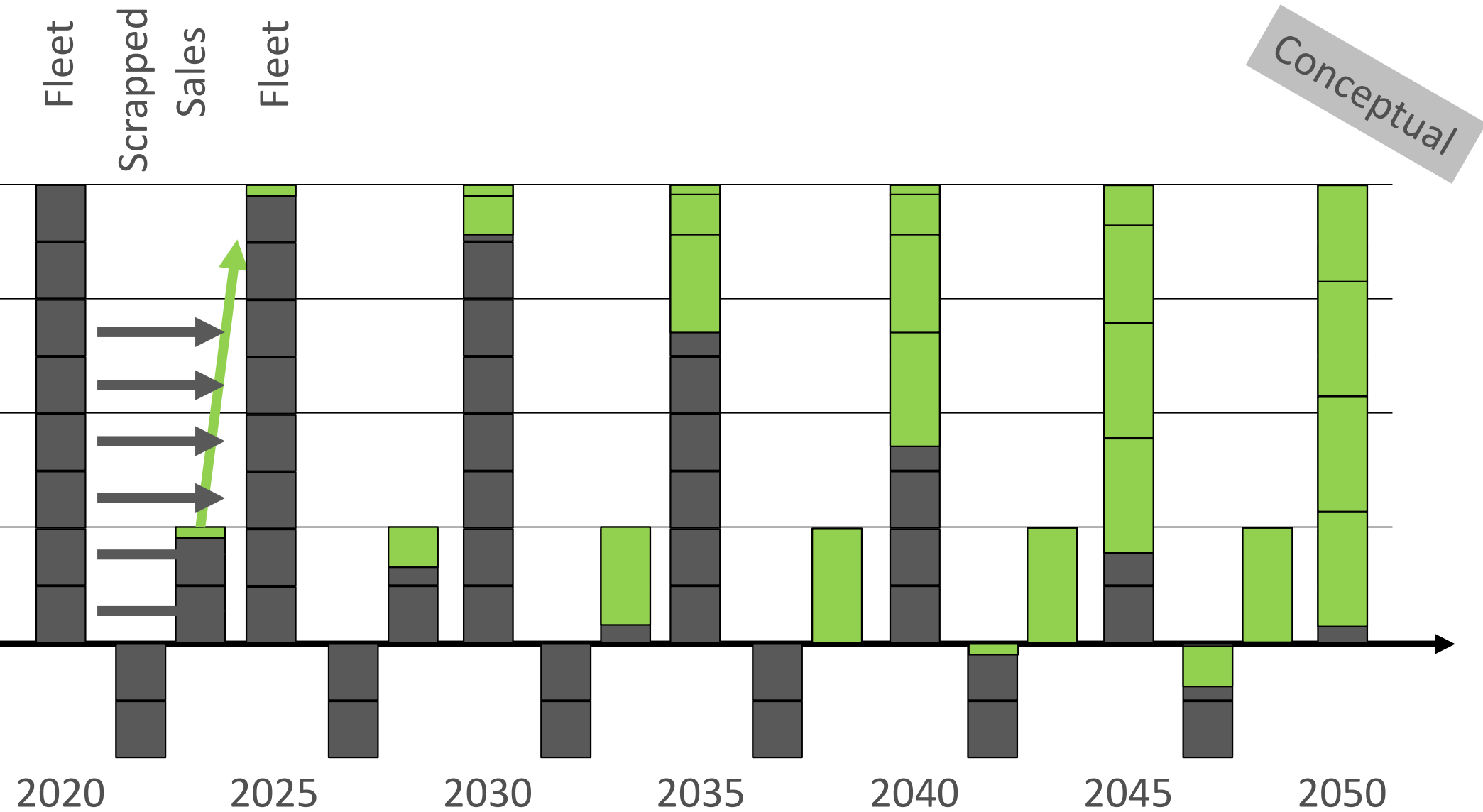
[Muessel et al \(2025\): An integrated modeling perspective on climate change mitigation and co-benefits in the transport sector](#)

AIM: ANALYZE THE INTERACTION OF EU ETS2 AND OTHER POLICY INSTRUMENTS

Work in Progress

1. We need stock-flow models of buildings and transport
 - EDGE-Transport
 - BRICK
 - (at the moment: rough estimation)
2. Combine with representation of price-elastic demand reduction

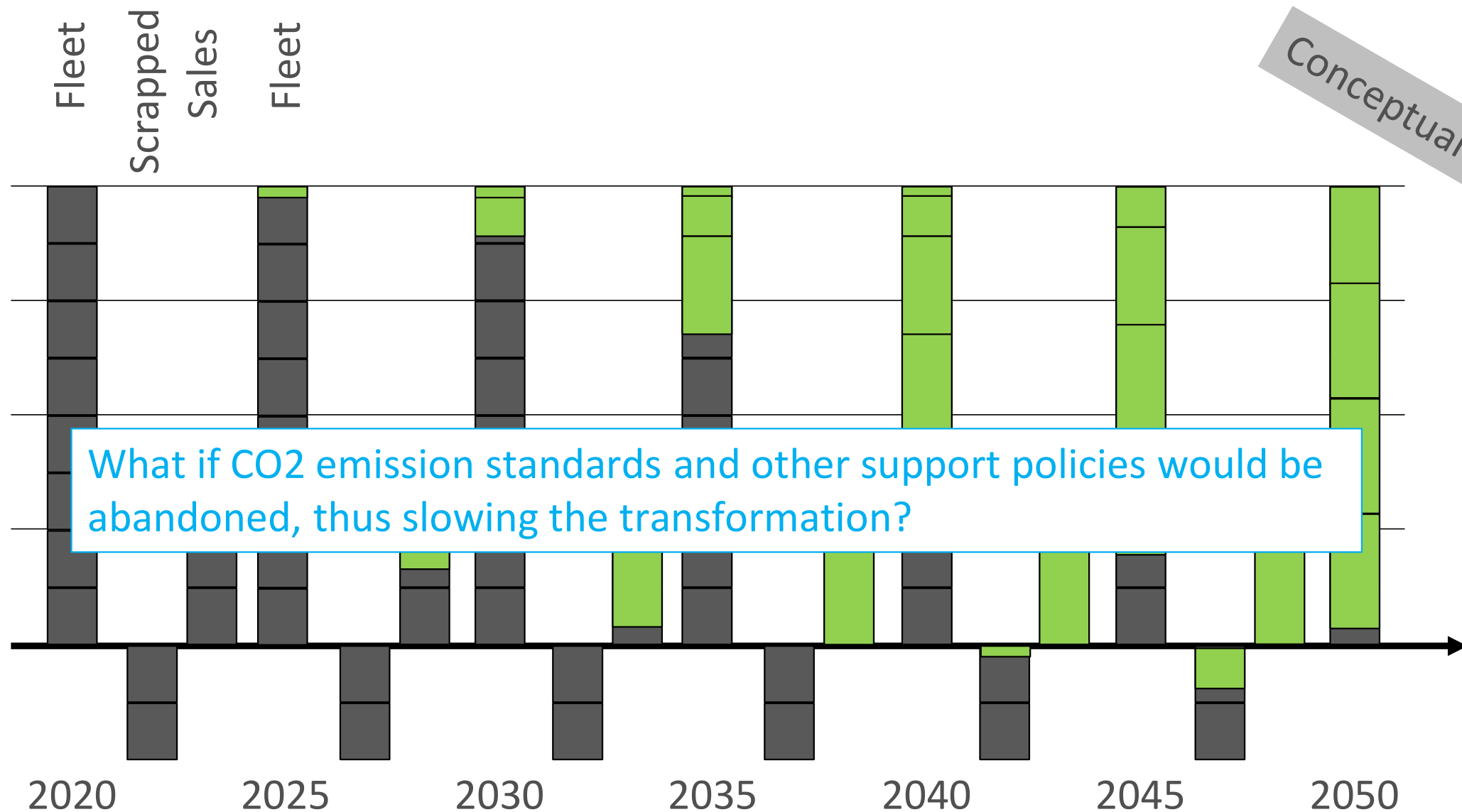
“CURRENT SITUATION” (UNCHANGED CO2 EMISSION STANDARDS, EXISTING CAR LIFETIME OF ~20 YEARS)



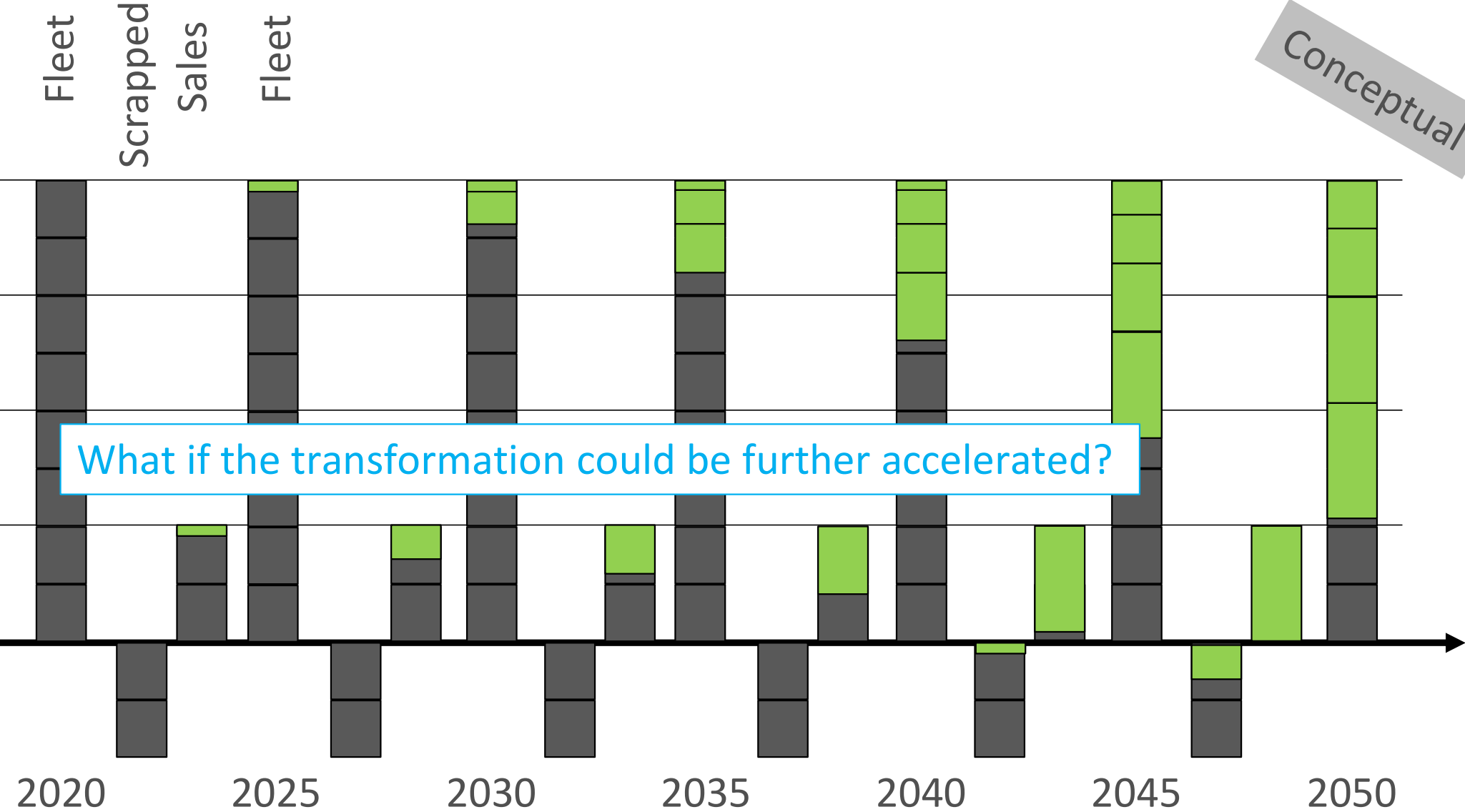
“CURRENT SITUATION” (UNCHANGED CO₂ EMISSION STANDARDS, EXISTING CAR LIFETIME OF ~20 YEARS)

(UNCHANGED CO2 EMISSION STANDARDS, EXISTING CAR LIFETIME OF ~20 YEARS)

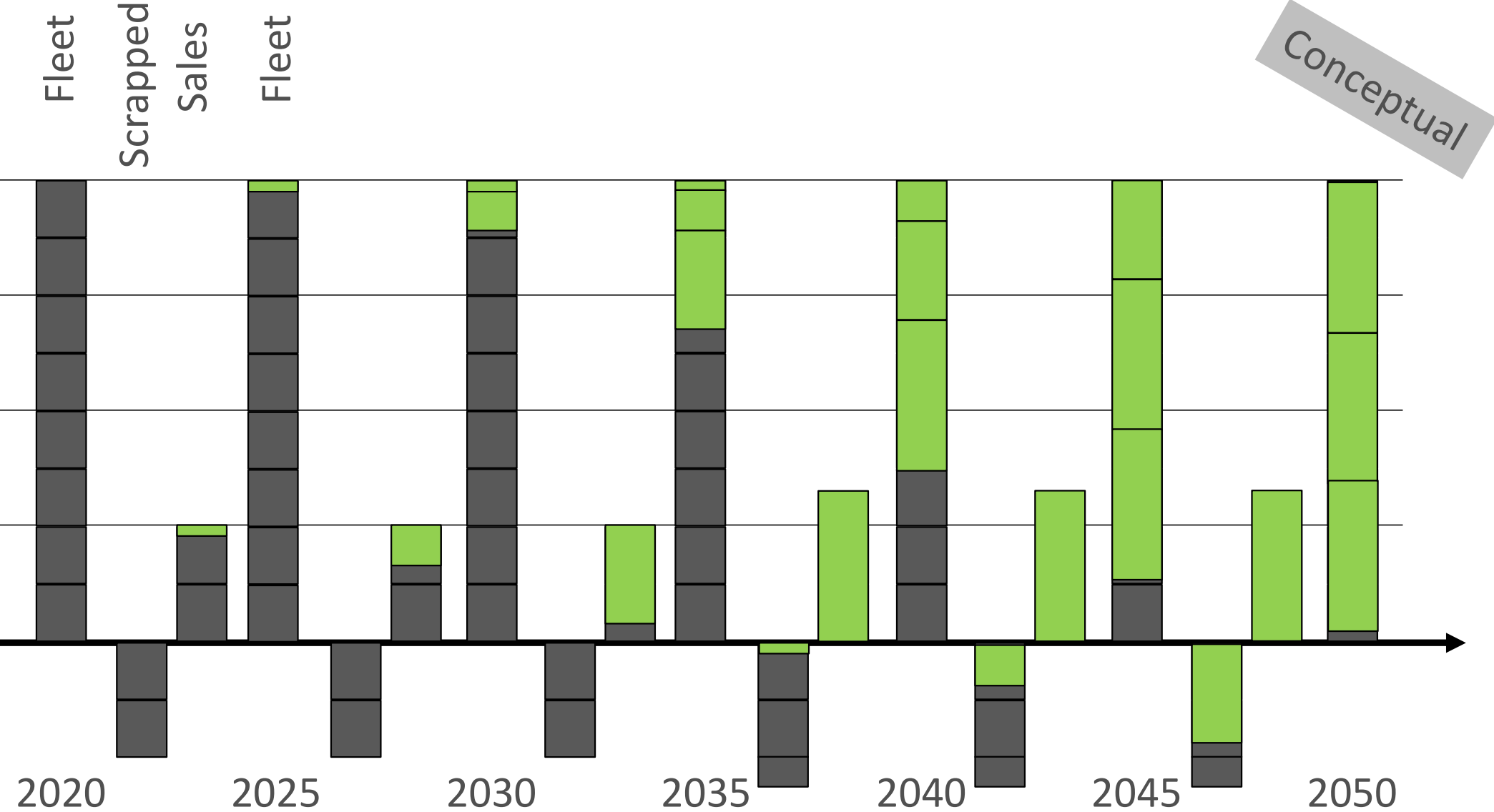
Conceptual



“WORST SITUATION” (CO2 EMISSION STANDARDS AND OTHER POLICIES WEAKENED, SLOWING THE TRANSFORMATION)

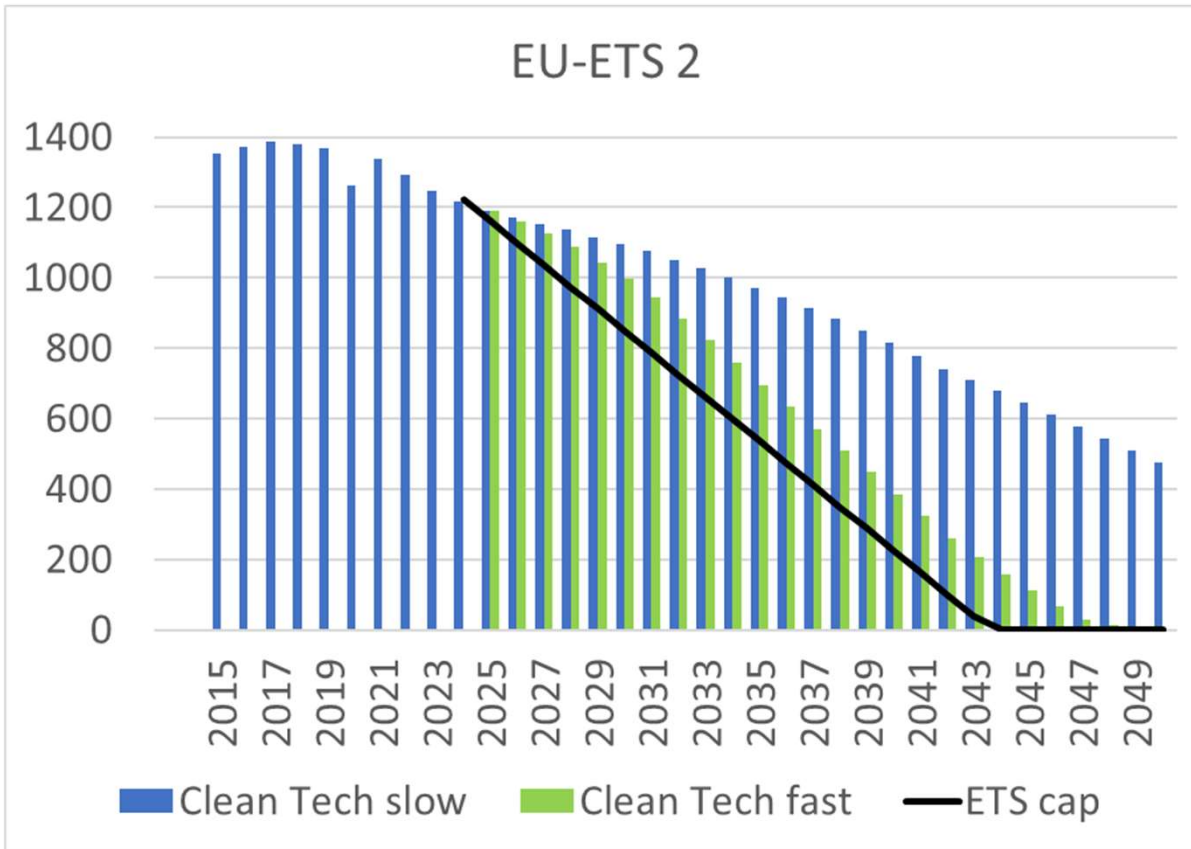


“BEST SITUATION” (UNCHANGED CO2 EMISSION STANDARDS, CAR LIFETIME SHORTENED TO 15 YEARS)

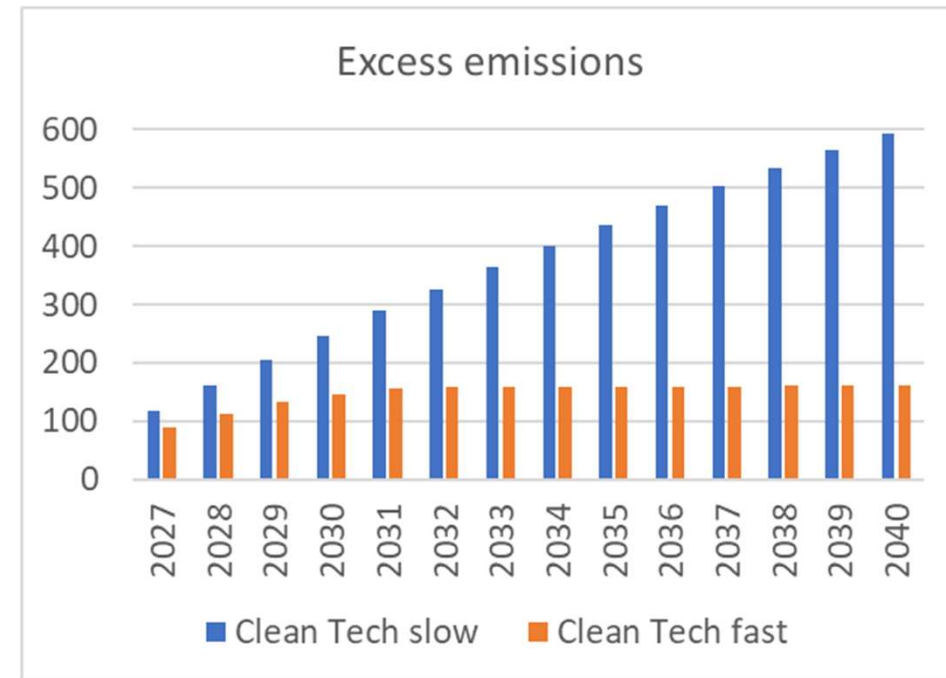


HOW DO ETS2 CAPS ALIGN WITH EMISSIONS?

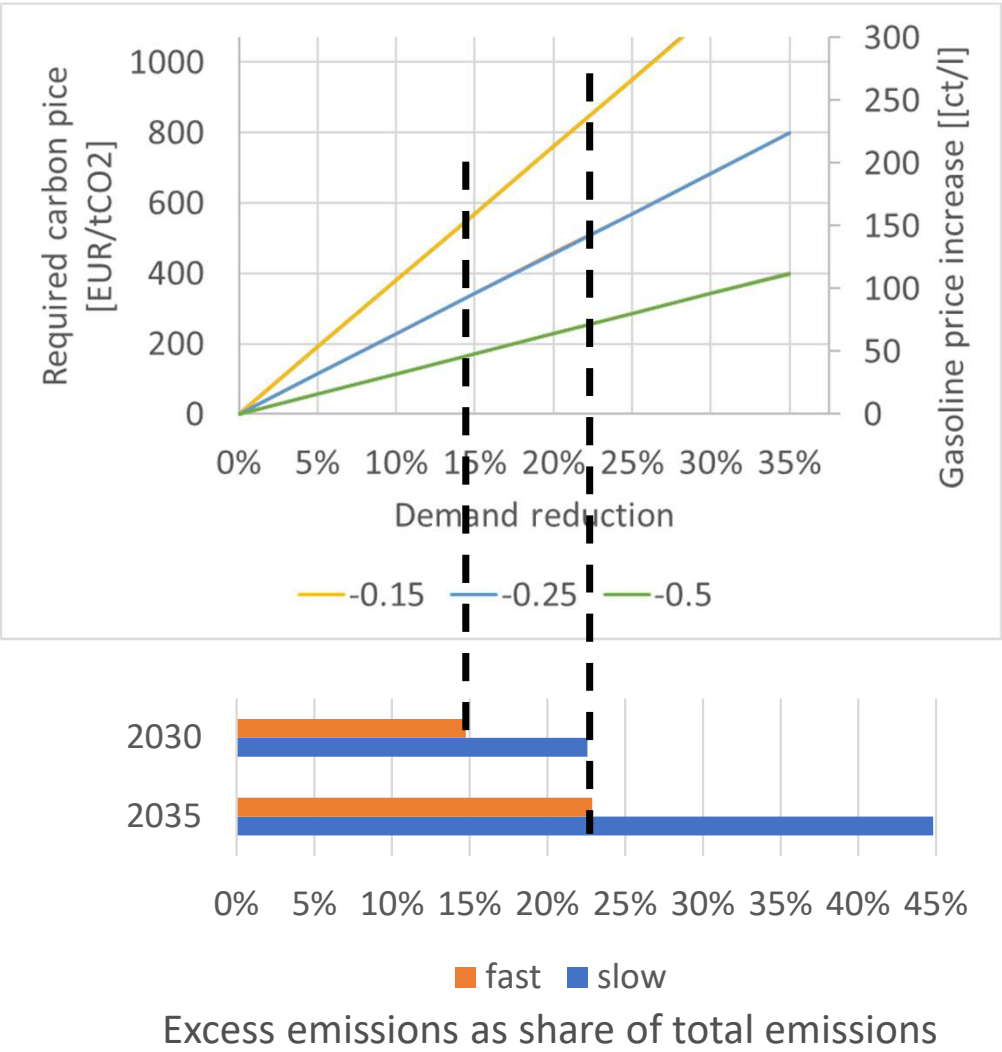
Conceptual
numbers are
rough estimates



- Substantial excess emissions
- Accelerating deployment can substantially reduce emissions
- But: this acceleration needs ~5 years to translate into relevant emission reductions

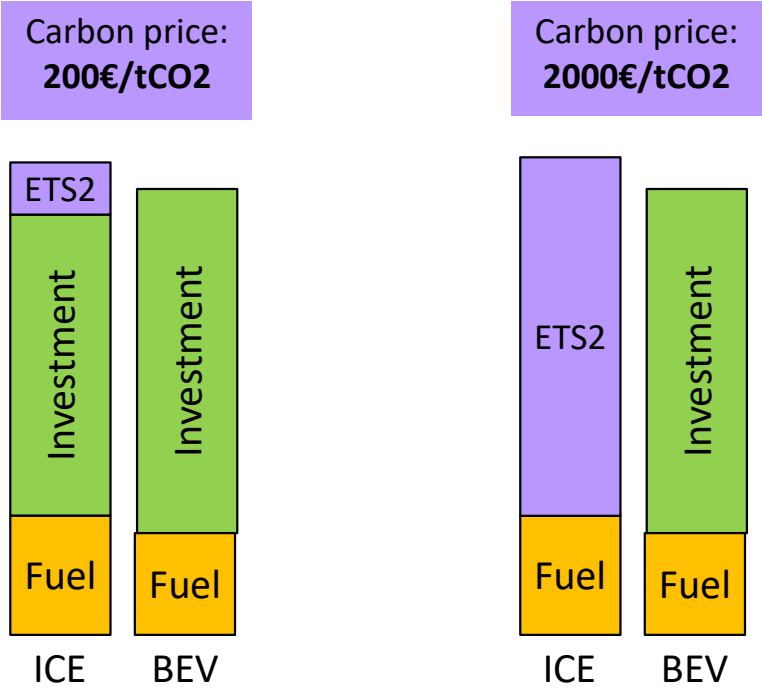


HOW HIGH ETS2 PRICES ARE NEEDED TO REDUCE DEMAND SUFFICIENTLY?



Conceptual
numbers are
rough estimates

- What about driving early retirement via ETS2?



MAIN TAKEAWAYS

- EU ETS2 will become biting much faster than the ETS1
- Current price expectations for 2030, 2035 vary widely: 135-400EUR/tCO₂ in 2035
- Carbon price instrument are borne by ALL consumers, but the main mitigation action is only available for the small share that is currently investing into a new appliance
 - ➔ good for the “endgame”, but not the best instrument for overcoming initial barriers and bringing new technologies to the market
- Other instruments are needed (and partially in place) for bringing new technologies to the market – CO₂ emission standards for vehicles, AFIR, EBPD,...
- Preliminary results seem to show that current caps might be quite tight - challenging to align with even most ambitious scale-up pathways of new technologies if technology lifetimes are not shortened