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HYDROGEN IN THE EU ETS

IMPLICATIONS FOR COMPETITIVENESS AND EMISSIONS REDUCTIONS

Nils Bruch and Michèle Knodt – Technical University Darmstadt

Jana Nysten and Fabian Pause – Stiftung Umweltenergierecht



GEFÖRDERT VOM

HYDROGEN PRODUCTION IN THE EU



Share of Hydrogen Production in the EU (2022)

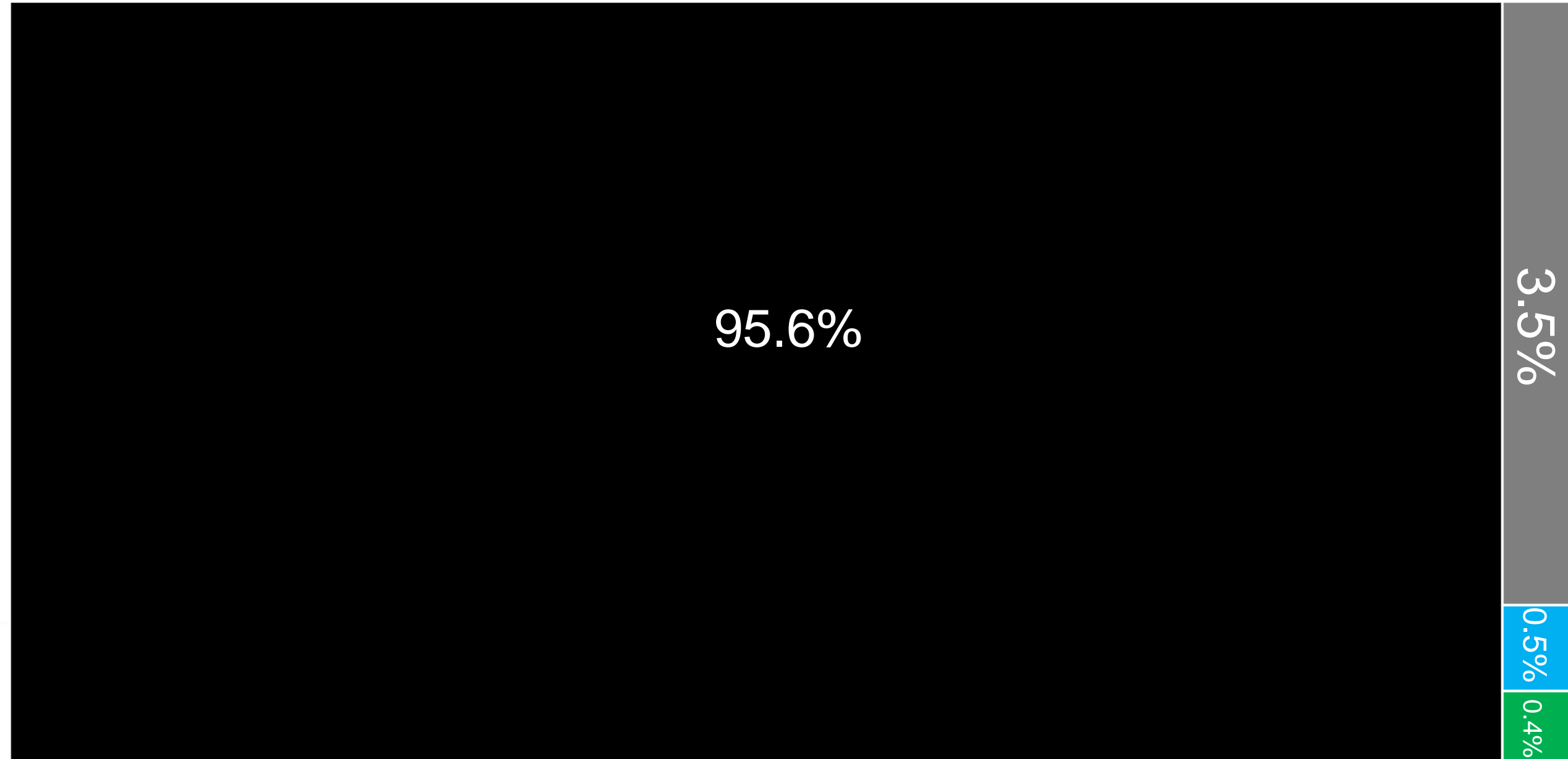
■ Fossil Hydrogen (Reforming) ■ Fossil Hydrogen (By-Product) ■ Low-Carbon Hydrogen ■ Water Electrolysis

95.6%

3.5%

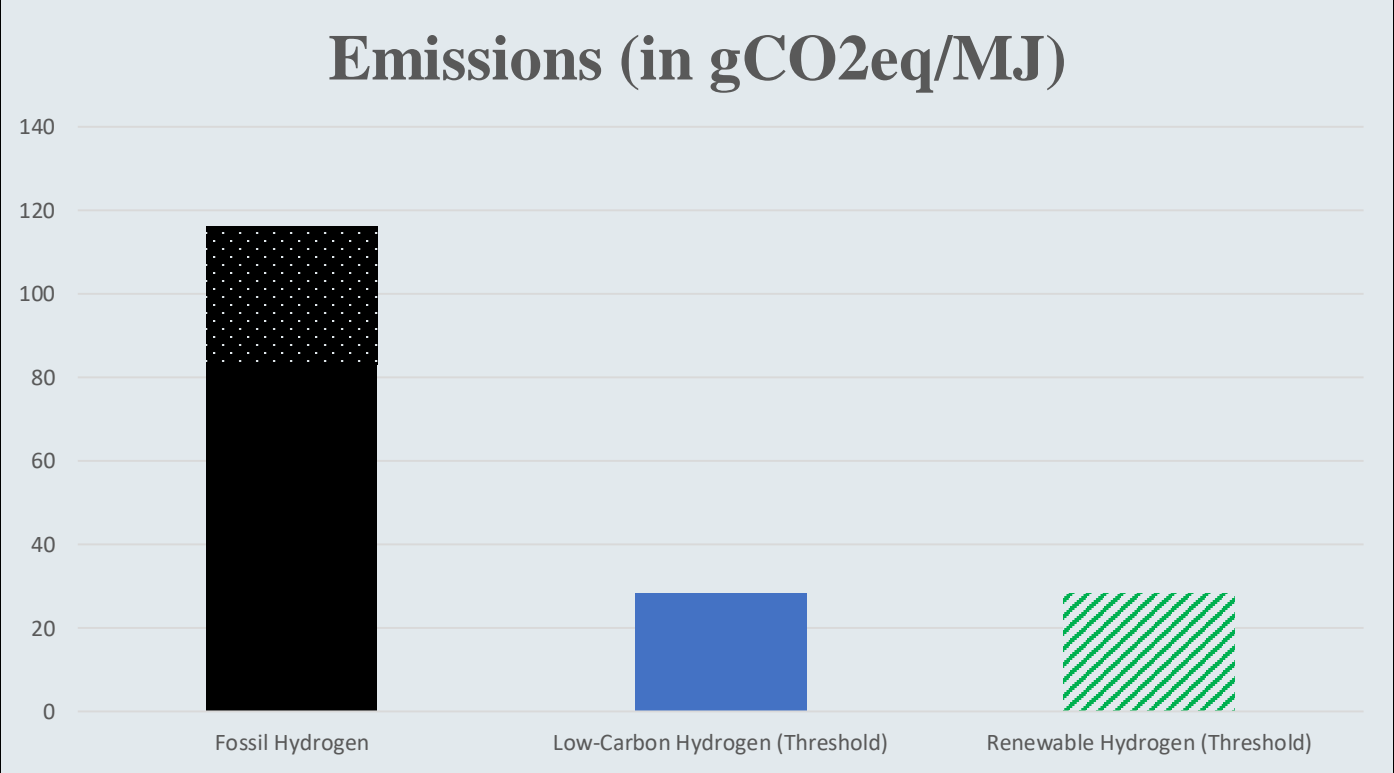
0.5%

0.4%



Share of Hydrogen Production in the EU (2022)

■ Fossil Hydrogen (Reforming) ■ Fossil Hydrogen (By-Product) ■ Low-Carbon Hydrogen ■ Water Electrolysis



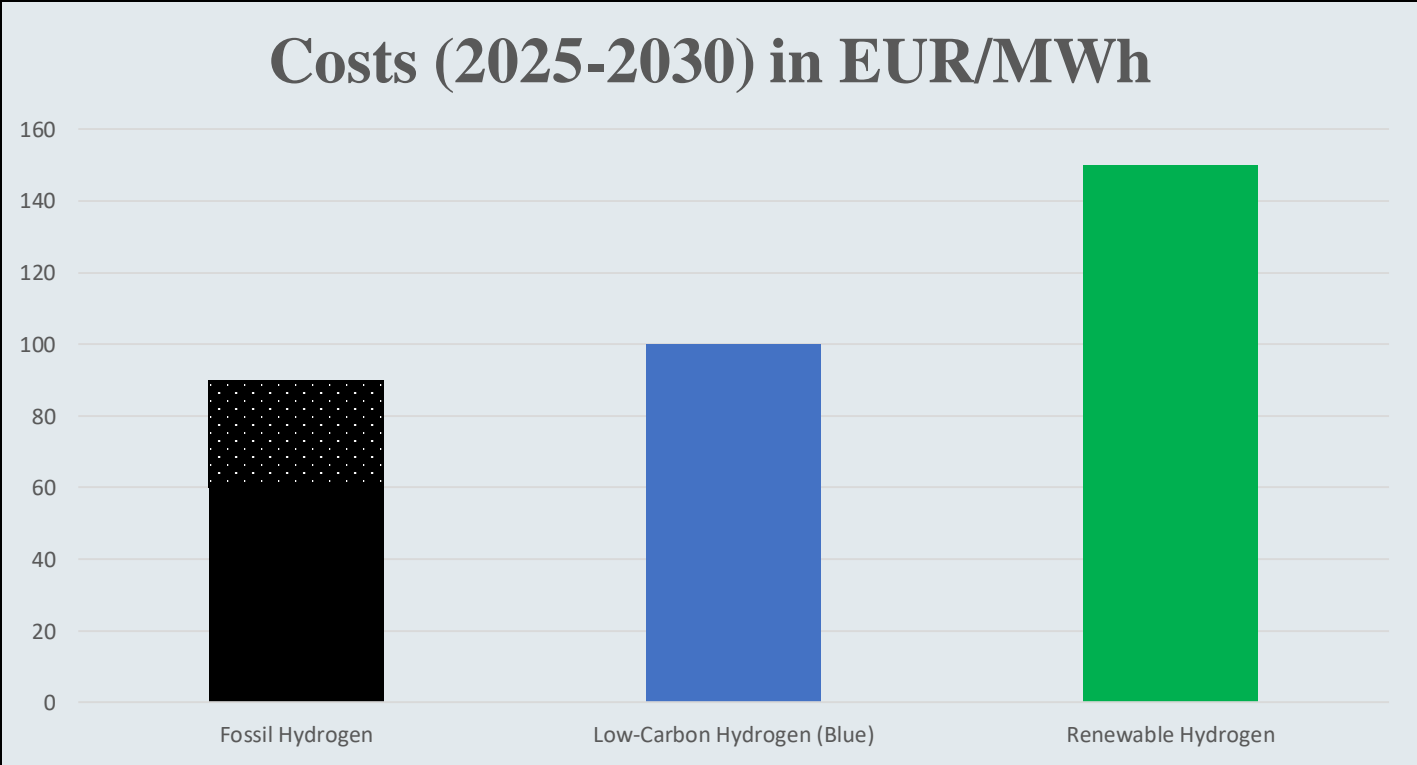
3.5%

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0.4%

Share of Hydrogen Production in the EU (2022)

■ Fossil Hydrogen (Reforming) ■ Fossil Hydrogen (By-Product) ■ Low-Carbon Hydrogen ■ Water Electrolysis



3.5%

0.5%

0.4%

THE EU ETS REFORM



FUNCTIONING OF THE EU ETS

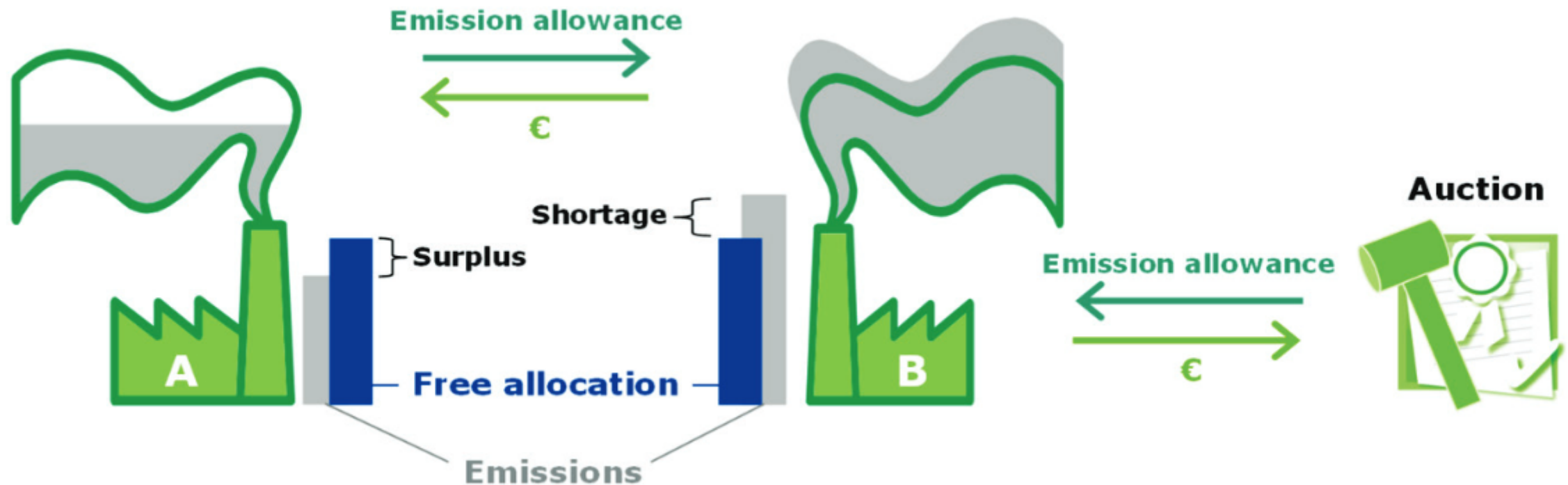


Figure from DG CLIMA (2015): EU ETS Handbook.

HYDROGEN IN THE EU ETS

“[...] the **free allocation regime** could lead to **unequal treatment** of industrial installations and effectively act as a **barrier to the use of decarbonization techniques** such as green hydrogen and the electrification of industrial processes.” – European Commission: SWD(2021) 601 final

HYDROGEN IN THE EU ETS

› EU ETS Reform

- › Inclusion of all hydrogen production methods (fossil, low-carbon and renewable)
- › Obligation for installations producing > 5 tonnes/day of hydrogen

› Free Allocations for Hydrogen Production

- › Calculated via product benchmarks (avg. emissions of hydrogen production)
- › Bonus/Malus System
 - › Rewards energy-efficient producers (+10% allowances)
 - › Penalizes less efficient one (-20% allowances)
- › Adjusted by a phase-out factor linked to CBAM
- › End of free allocations in 2034

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HYDROGEN IN THE EU ETS – KEY QUESTION

› **What impact does the inclusion of renewable and low carbon hydrogen into the EU ETS have on the market ramp-up of renewable hydrogen?
Does it really „level the playing field“?**

FUNCTIONING OF THE EU ETS

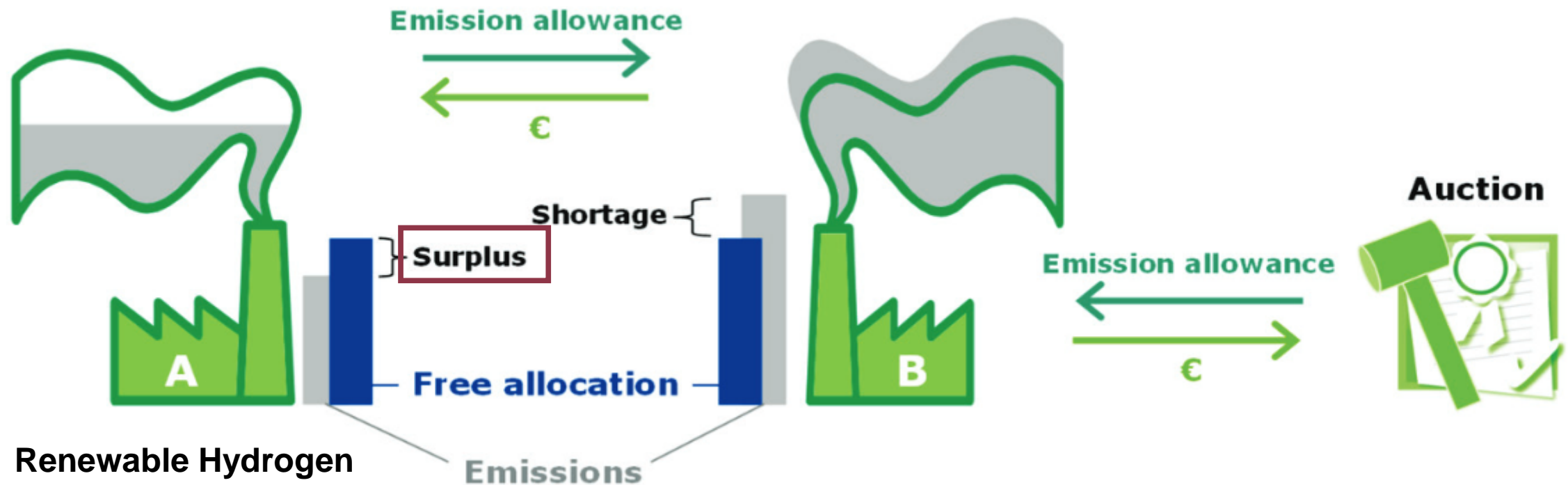


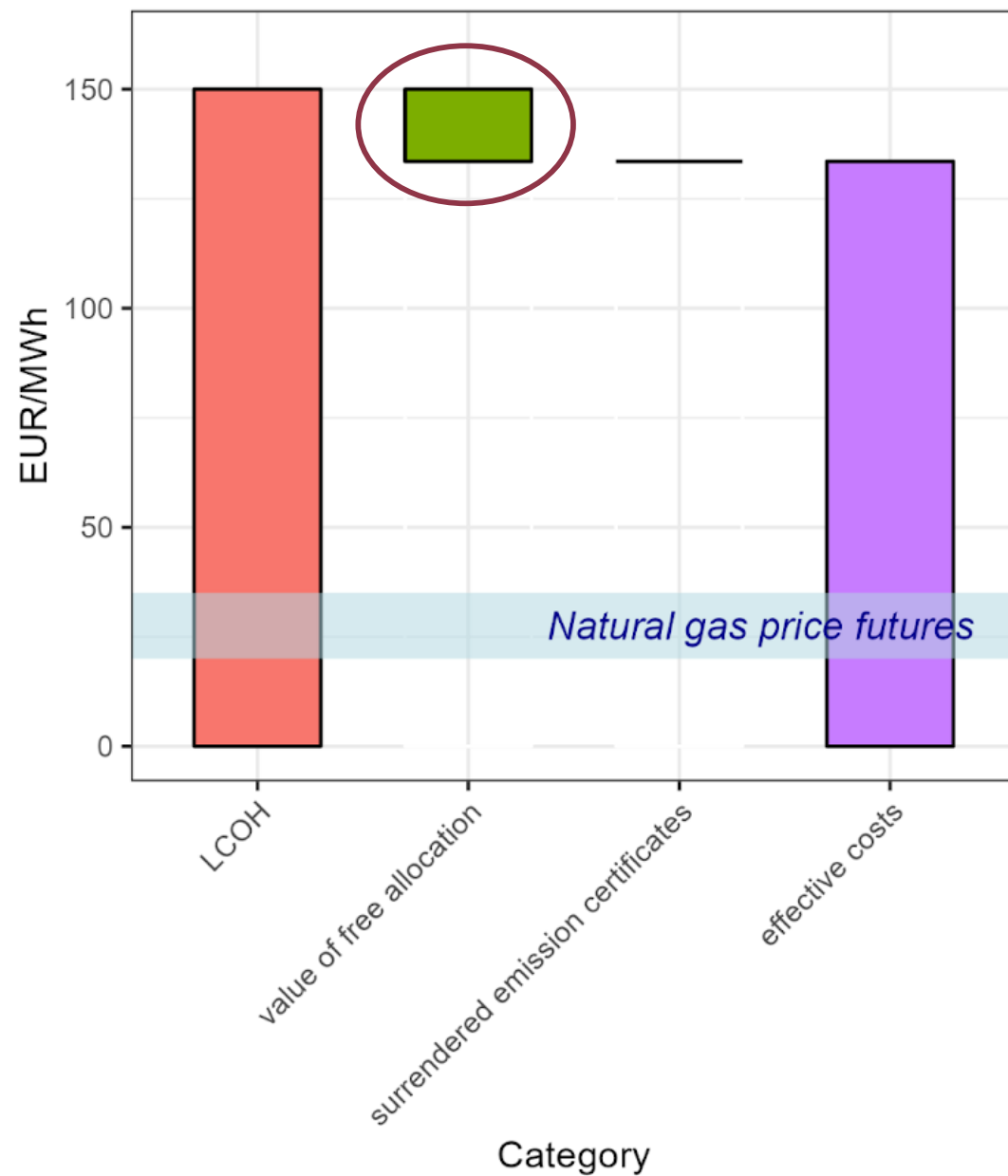
Figure from DG CLIMA (2015): EU ETS Handbook.

RESULTS

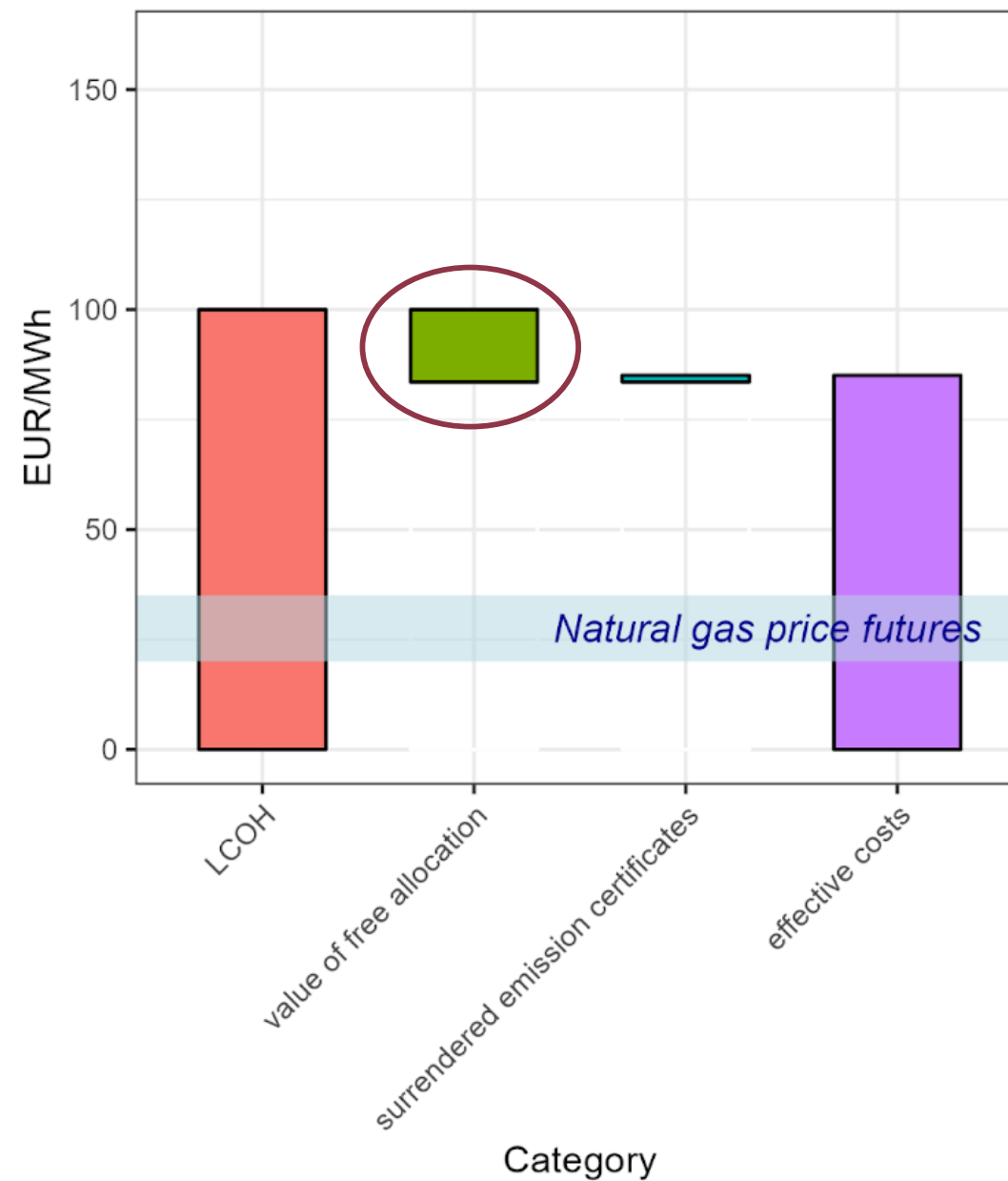


a

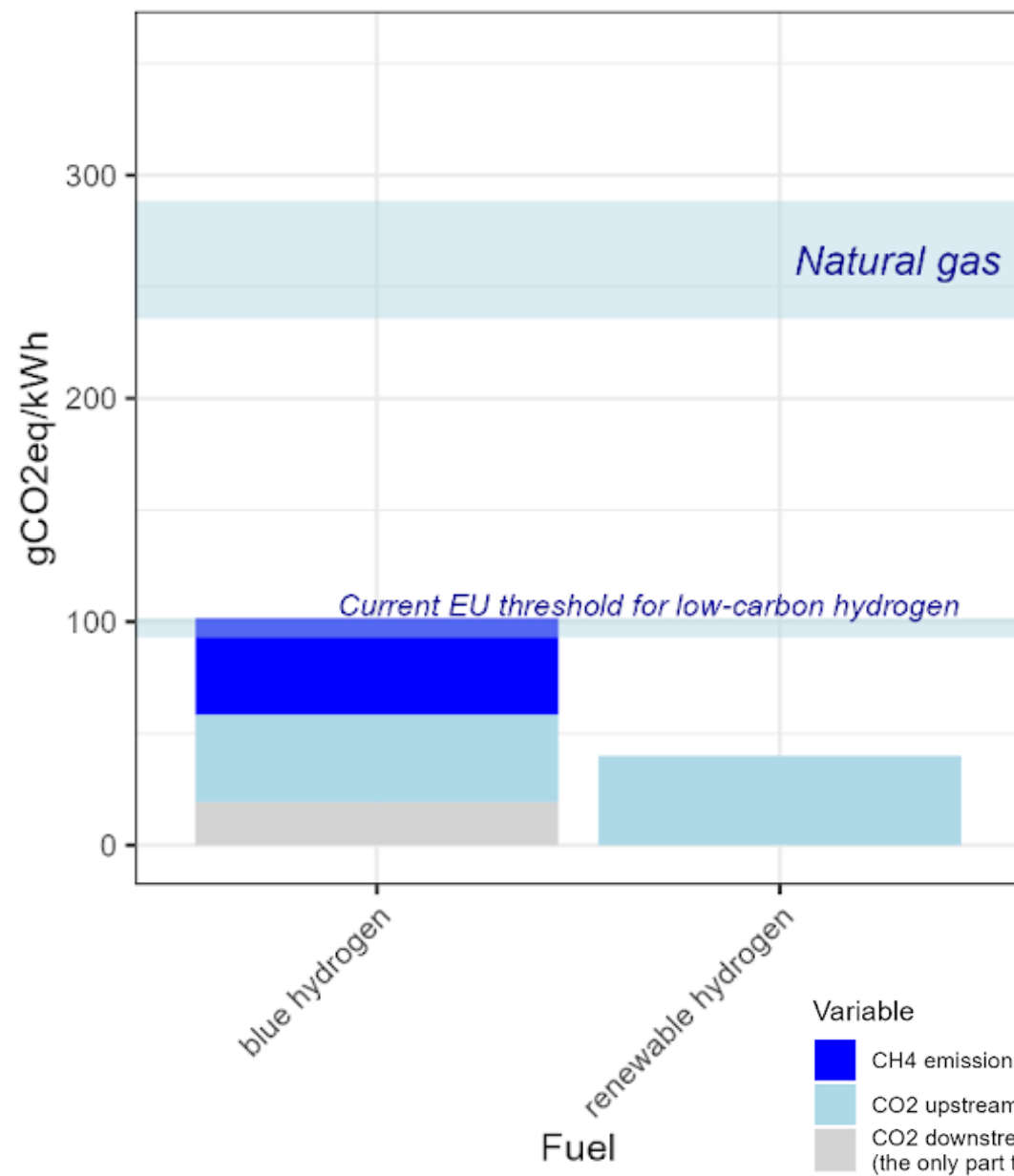
Renewable hydrogen cost and ETS revenue

**b**

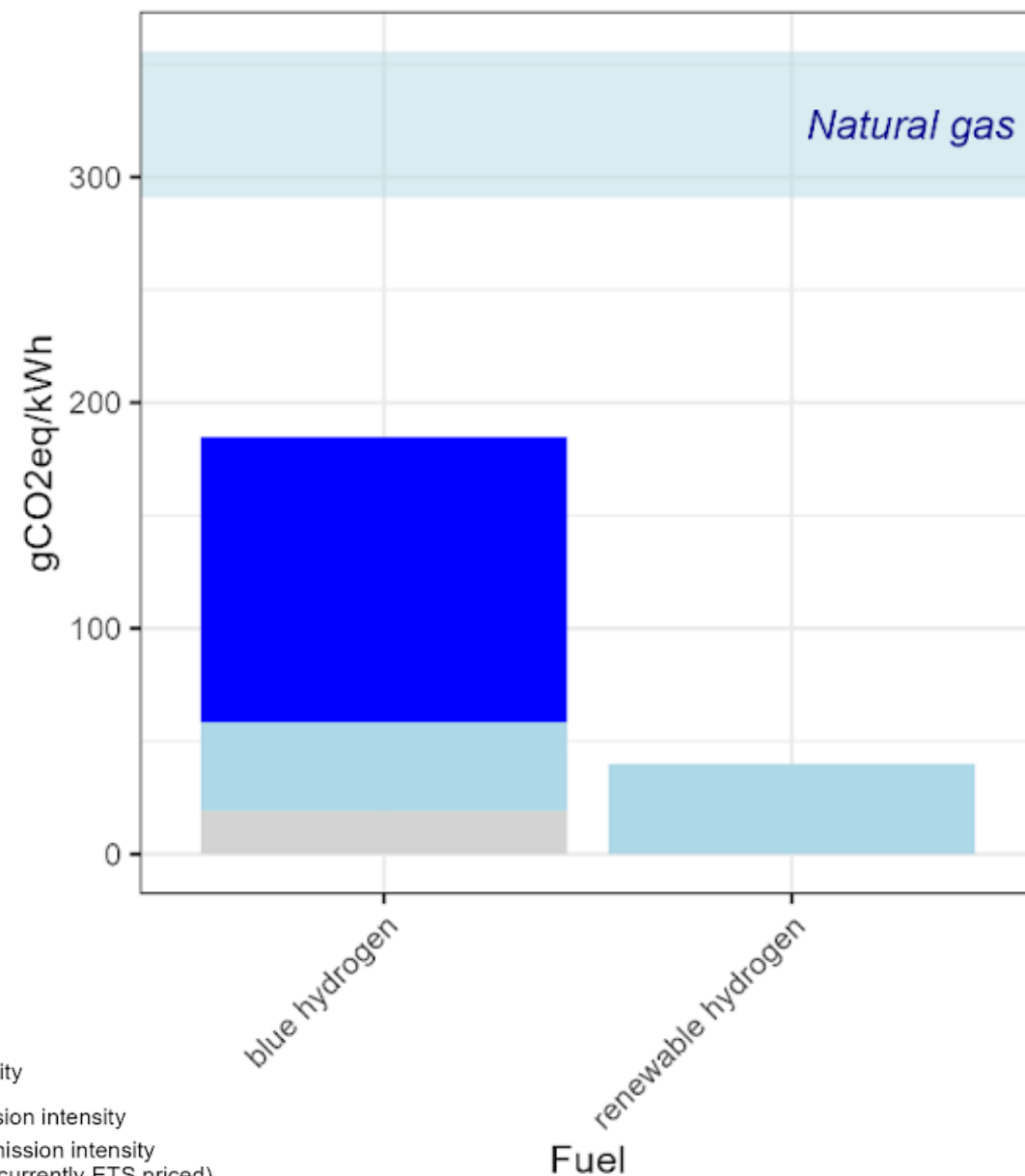
Blue hydrogen cost and ETS revenue



a **GWP100:** Emission intensity of blue and renewable hydrogen



b **GWP20:** Emission intensity of blue and renewable hydrogen



Fuel-switching CO2eq prices (FSCP)

Blue -> Renewable Hydrogen

2.500 €/tCO2

Natural Gas -> Renewable Hydrogen

500 €/tCO2

Natural Gas -> Blue Hydrogen

300 €/tCO2

FSCP in EUR/tCO2eq

Scope of emission accounting

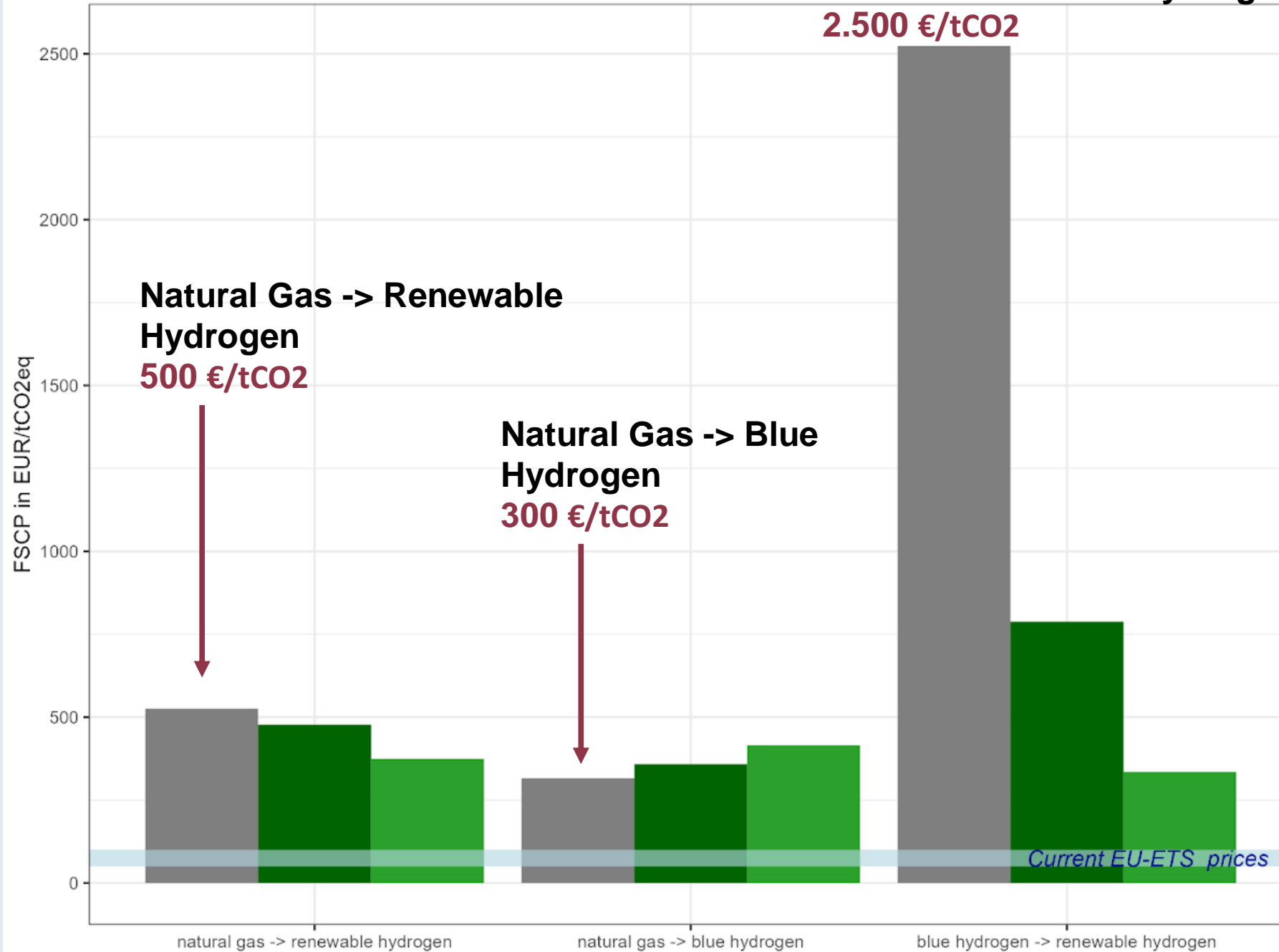
- CO2 downstream emission intensity (the only part that is currently ETS priced)
- full emissions based on GWP100 (including upstream CO2 and CH4)
- full emissions based on GWP20 (including upstream CO2 and CH4)

Current EU-ETS prices

natural gas -> renewable hydrogen

natural gas -> blue hydrogen

blue hydrogen -> renewable hydrogen



Fuel-switching CO2eq prices (FSCP)

Blue -> Renewable Hydrogen

2.500 €/tCO2

FSCP in EUR/tCO2eq

2500
2000
1500
1000
500
0

Scope of emission accounting

- CO2 downstream emission intensity (the only part that is currently ETS priced)
- full emissions based on GWP100 (including upstream CO2 and CH4)
- full emissions based on GWP20 (including upstream CO2 and CH4)

**GWP100
(CO2 + CH4)**

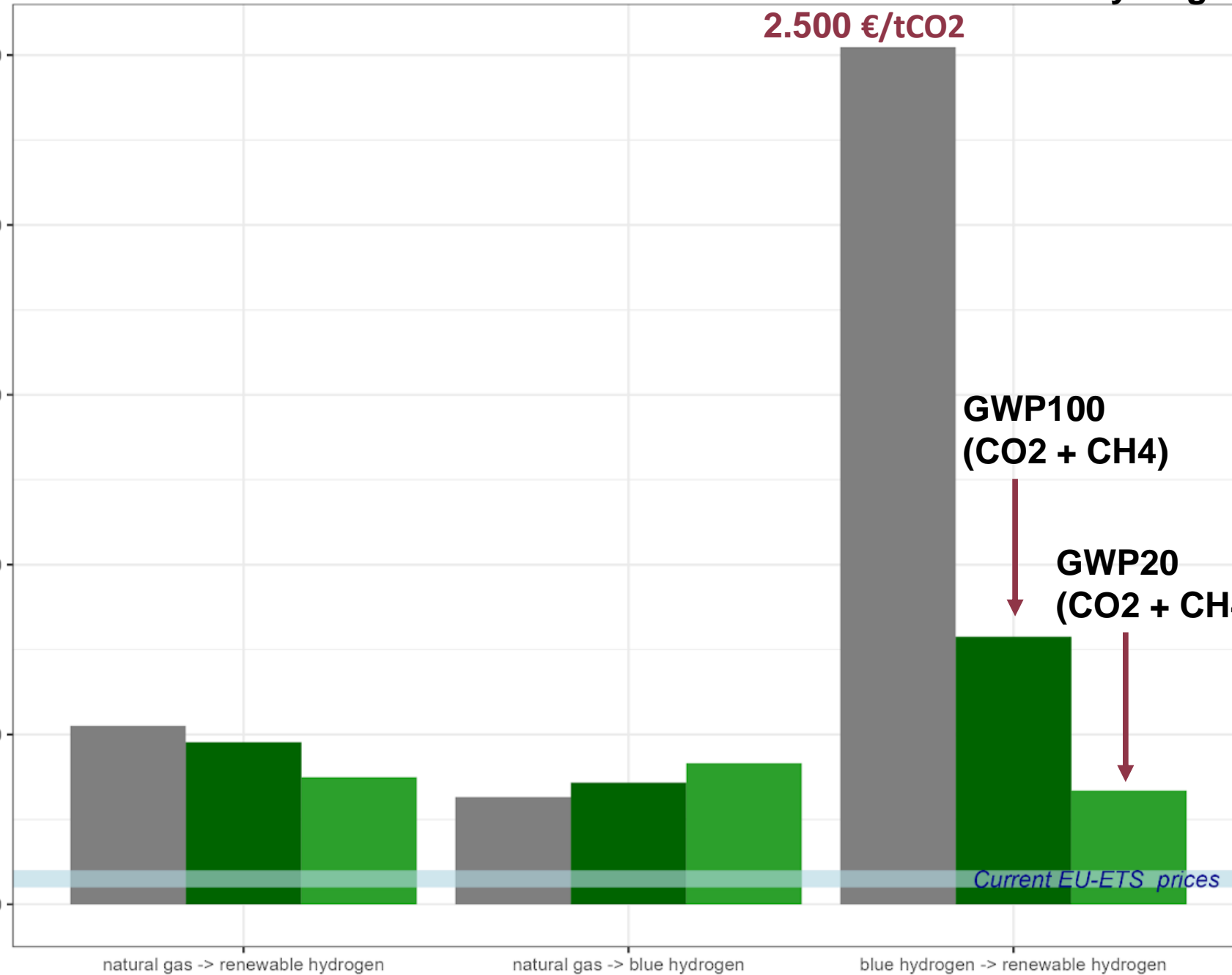
**GWP20
(CO2 + CH4)**

Current EU-ETS prices

natural gas -> renewable hydrogen

natural gas -> blue hydrogen

blue hydrogen -> renewable hydrogen



CONCLUSION



KEY POINTS

The EU ETS is designed for cost-effective emissions reductions across sectors, **not** as a support mechanism for specific industries or decarbonization approaches (e.g., hydrogen)

KEY POINTS

› Limited Impact of EU ETS on hydrogen

- › Carbon pricing is too low to drive significant emissions reduction in hydrogen production
- › High CO2 prices would be necessary to incentivize a fuel switch to cleaner options

› Methane Emissions and blue hydrogen

- › Upstream methane leakage contributes significantly to emissions
- › Methane emissions are not priced under the EU ETS, undermining its effectiveness for hydrogen
- › Methane Regulation: full enforcement until 2030, leaving emissions underregulated until then
- › DA relies on low, site-unspecific default values for upstream methane emissions

POLICY RECOMMENDATIONS

- › Maintain high CO2 pricing, e.g. through price floor
- › Price upstream emissions
- › Gradually lower thresholds for low carbon hydrogen emissions:
 - › Encourage innovation (e.g. from SMR to ATR)
 - › Prevent lock-ins
 - › Support transition to renewable hydrogen economy

QUESTIONS



PANEL DISCUSSION

Esther Bollendorff – CAN Europe

Michele Casadei – Greens/EFA Group in the European Parliament

Michaela Holl – Agora Energiewende

Grzegorz Pawelec – Hydrogen Europe