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# HYDROGEN IN THE EU ETS IMPLICATIONS FOR COMPETITIVENESS AND EMISSIONS REDUCTIONS

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# HYDROGEN PRODUCTION IN THE EU



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# Share of Hydrogen Production in the EU (2022)

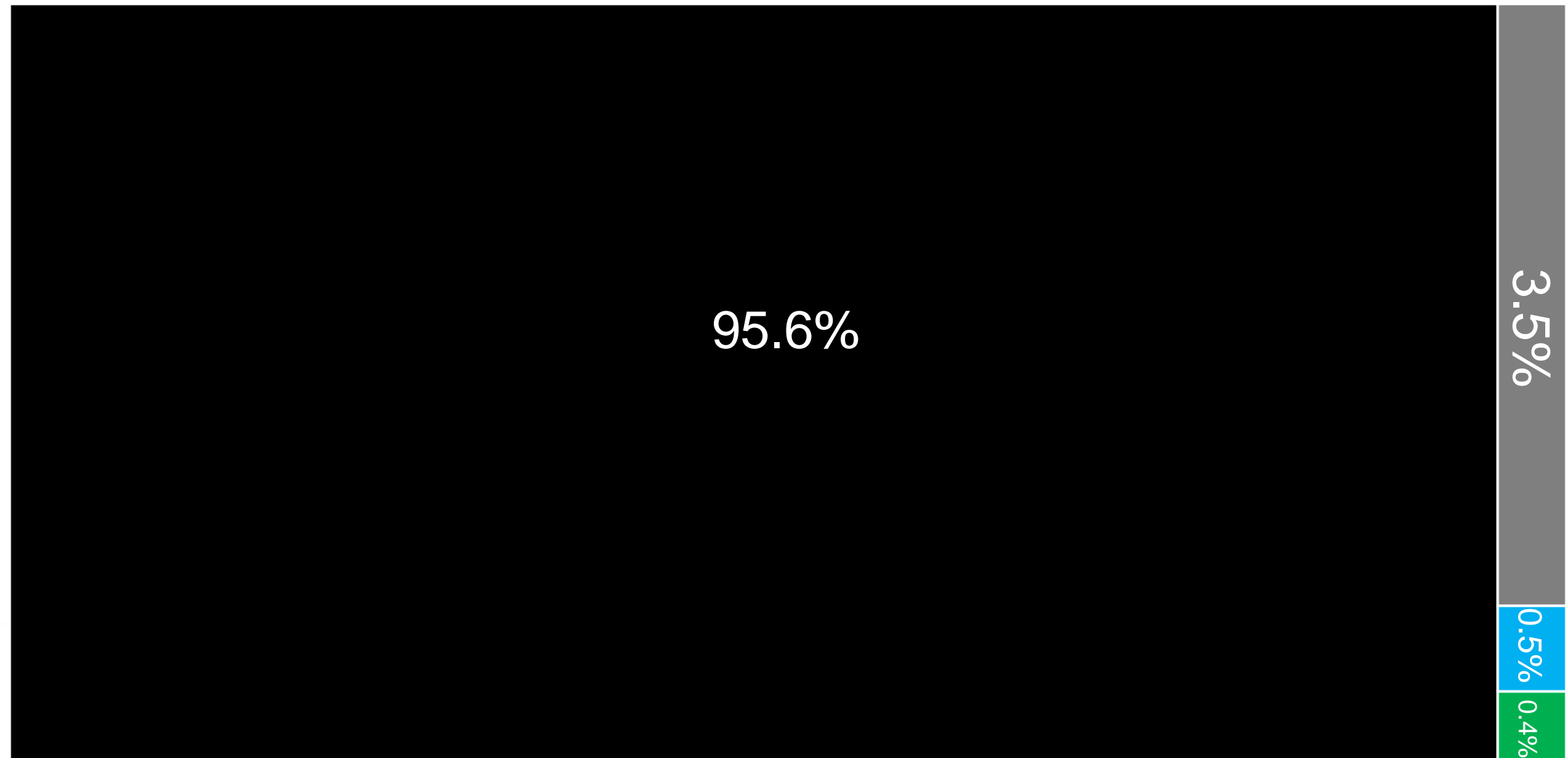
■ Fossil Hydrogen (Reforming) ■ Fossil Hydrogen (By-Product) ■ Low-Carbon Hydrogen ■ Water Electrolysis

95.6%

3.5%

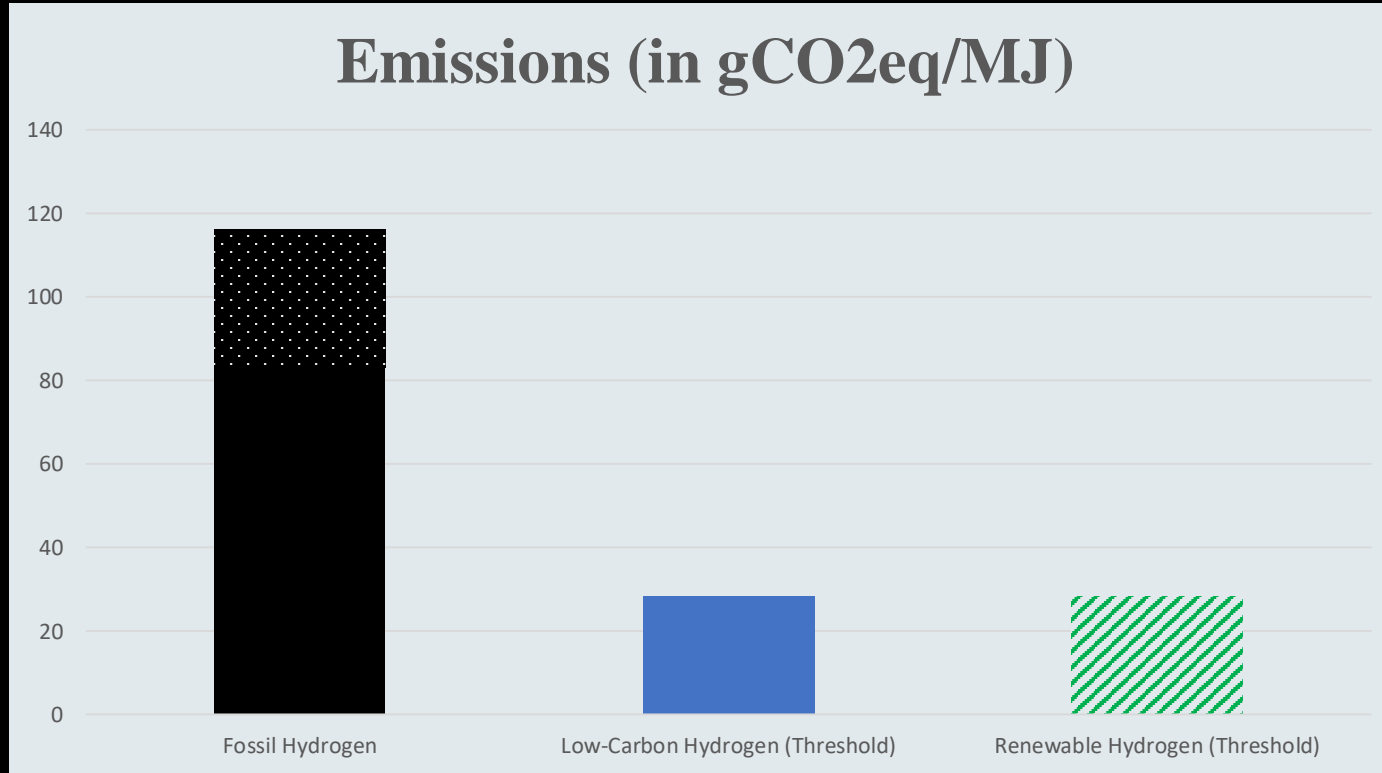
0.5%

0.4%



# Share of Hydrogen Production in the EU (2022)

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



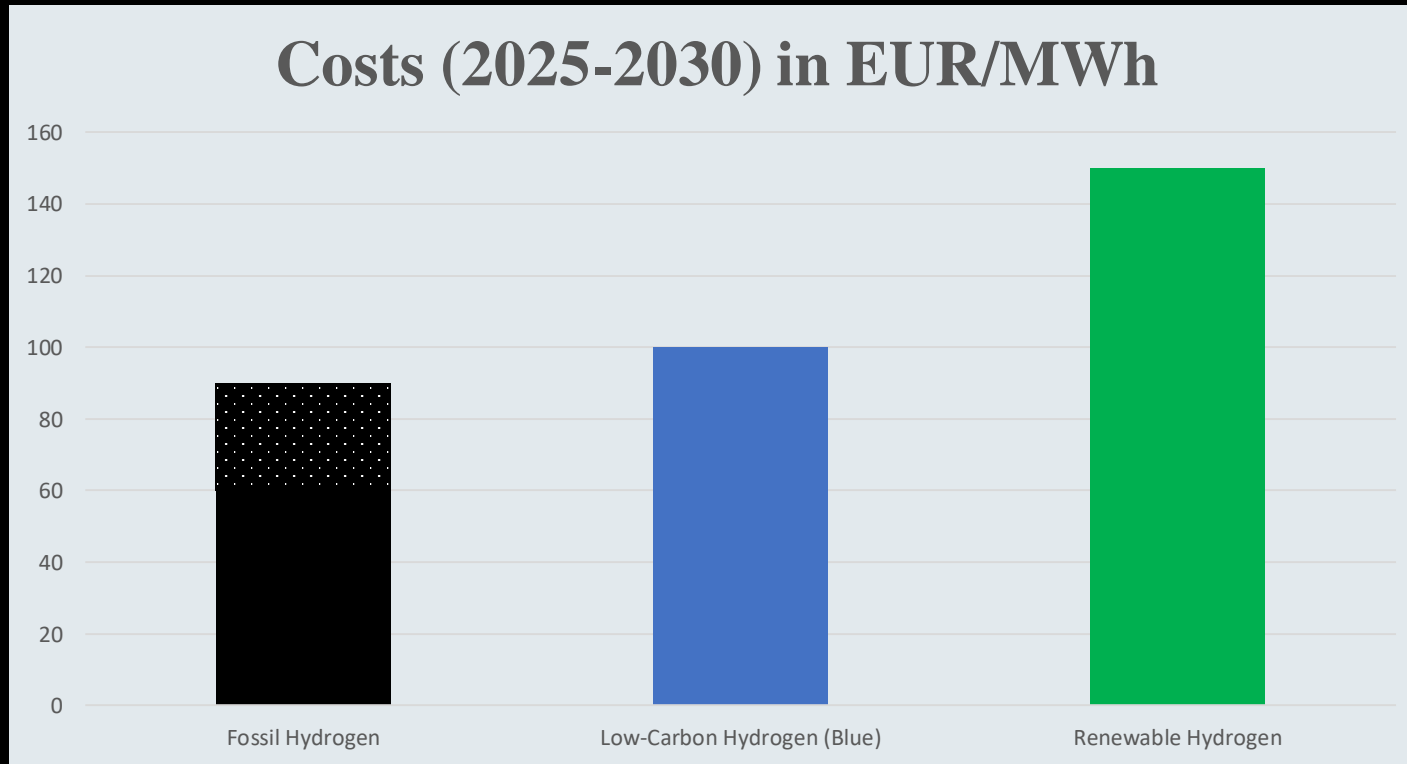
3.5%

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%

0.5%

0.4%

# THE EU ETS REFORM



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# FUNCTIONING OF THE EU ETS

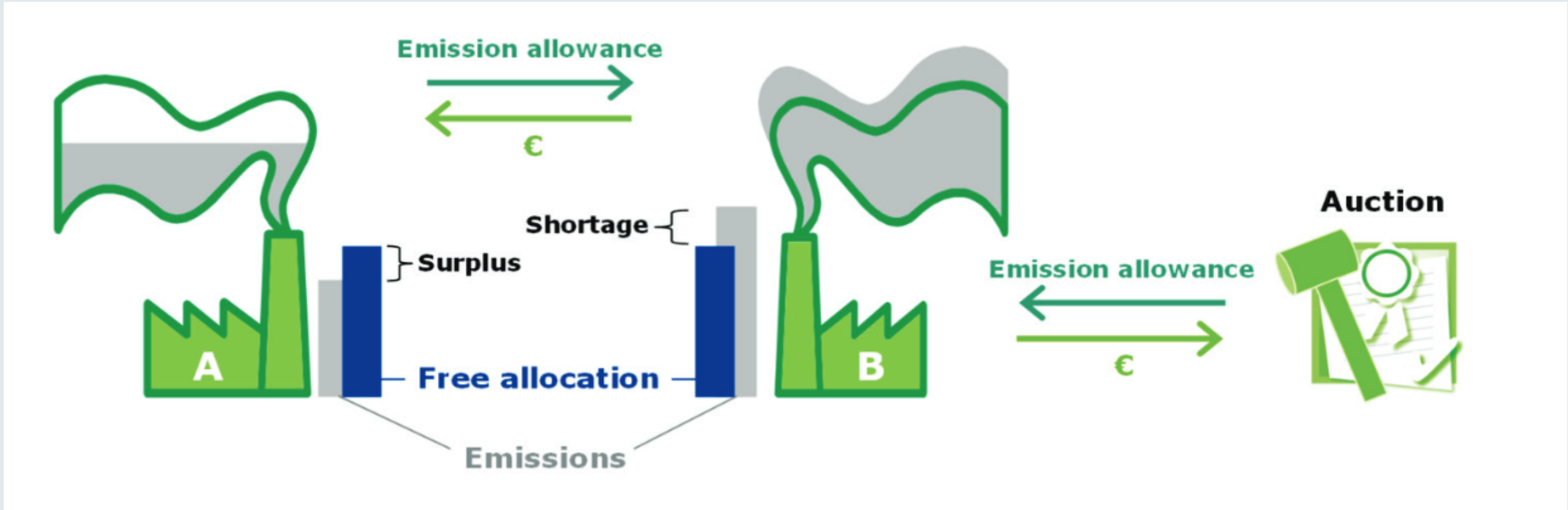


Figure from DG CLIMA (2015): EU ETS Handbook.

# 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

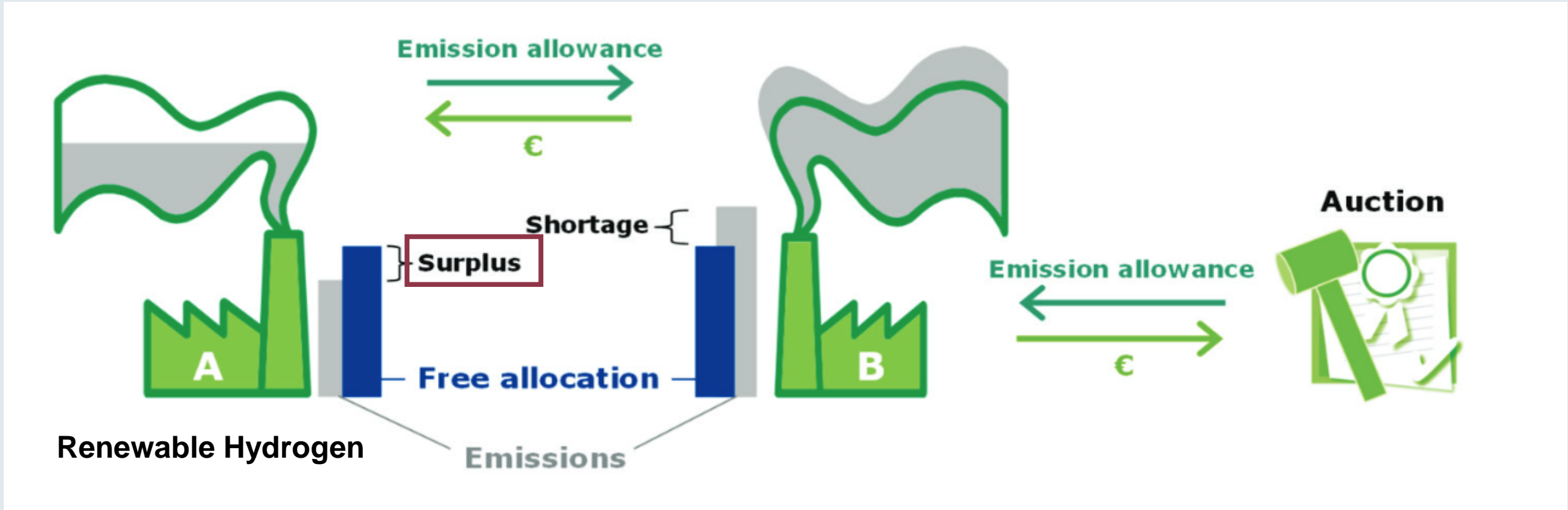


Figure from DG CLIMA (2015): EU ETS Handbook.

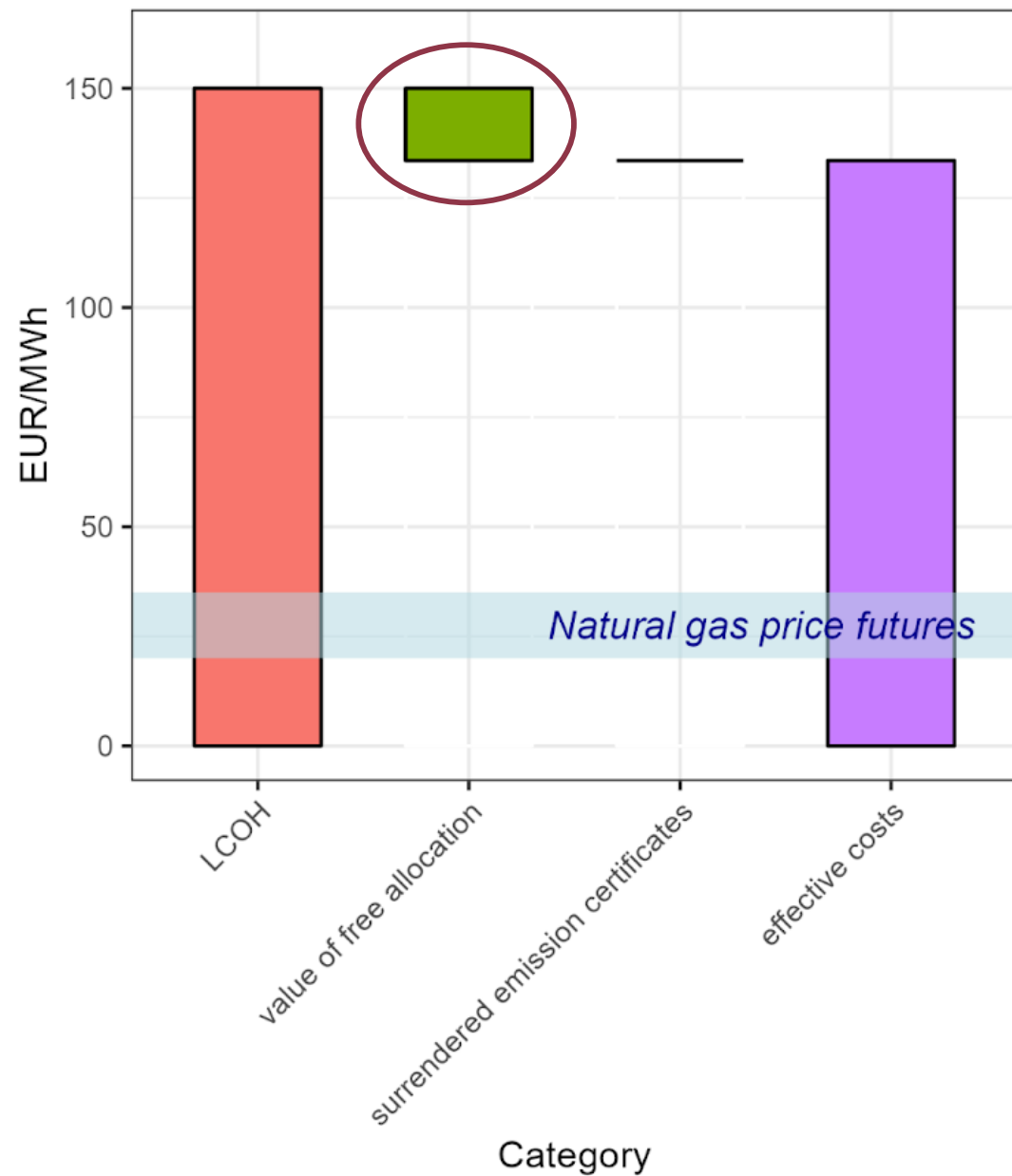
# RESULTS



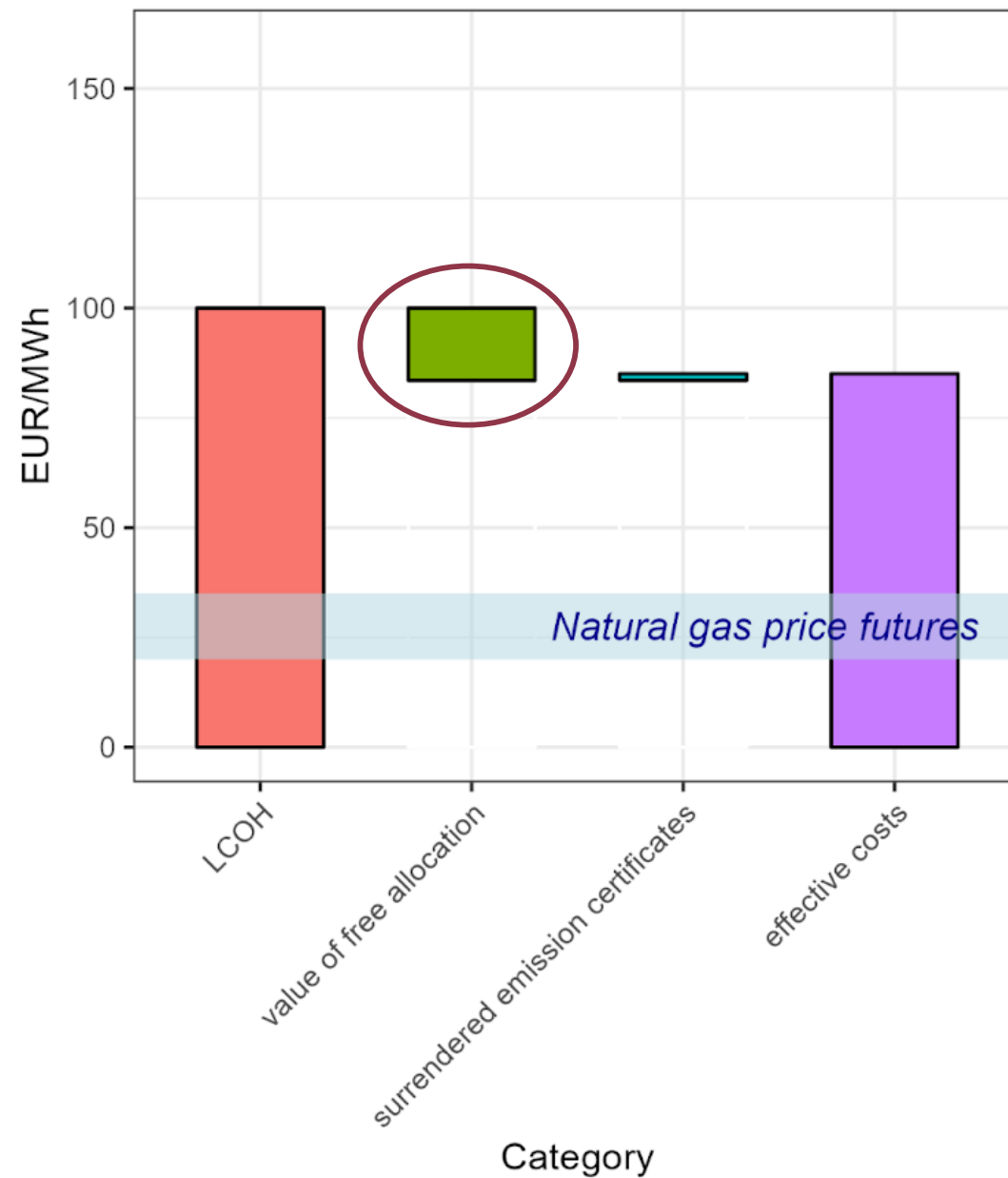
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**a**

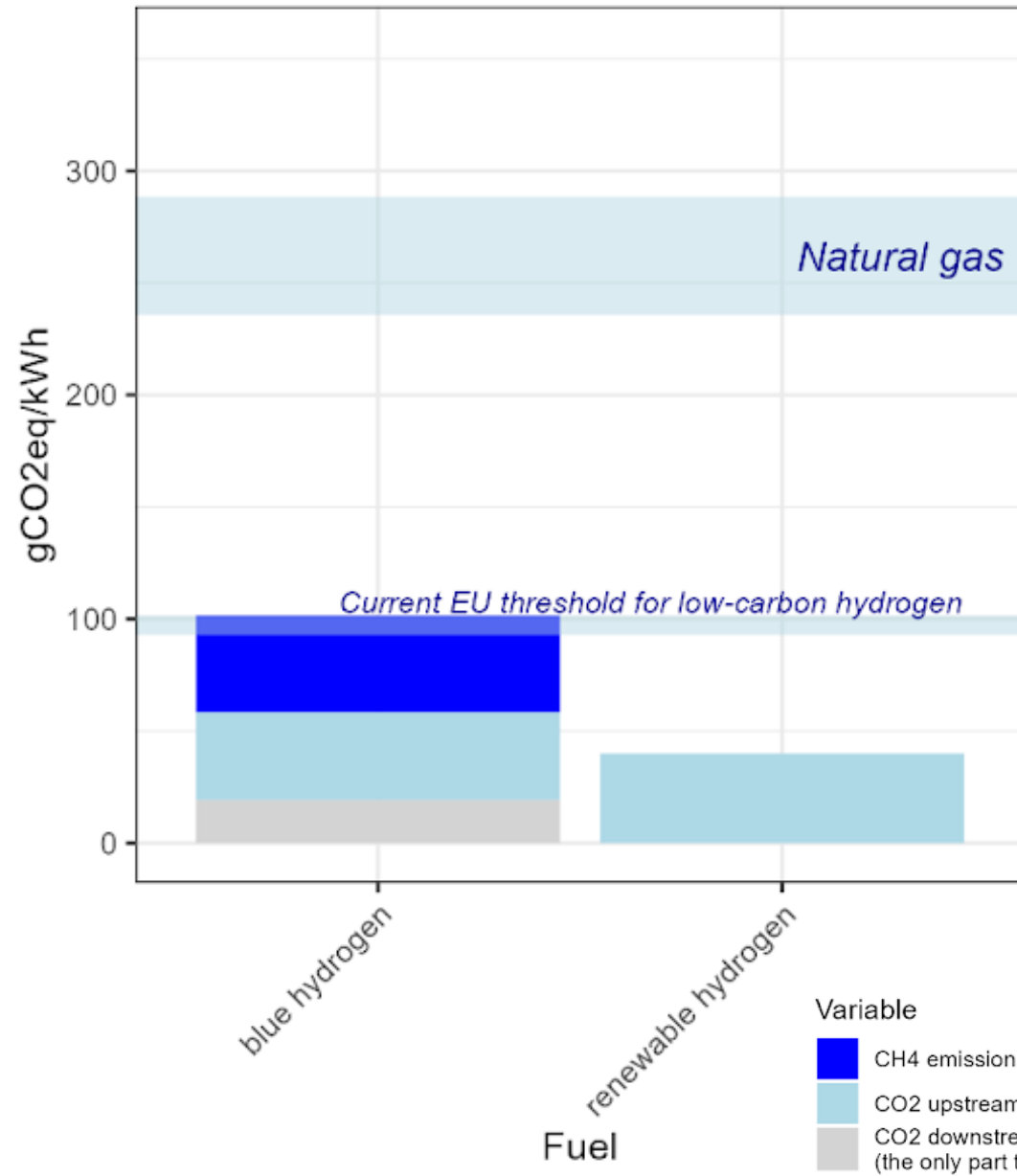
Renewable hydrogen cost and ETS revenue

**b**

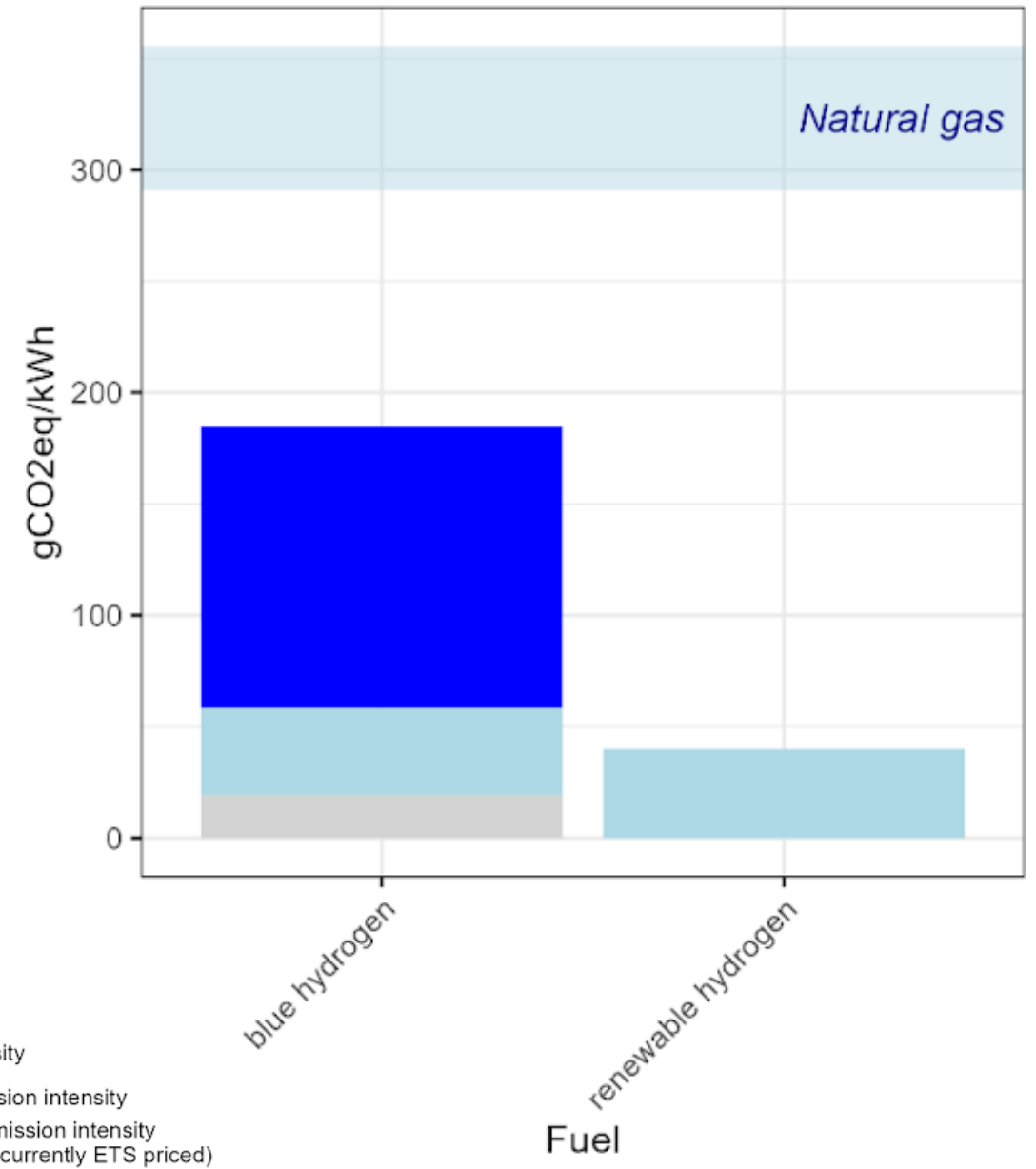
Blue hydrogen cost and ETS revenue



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

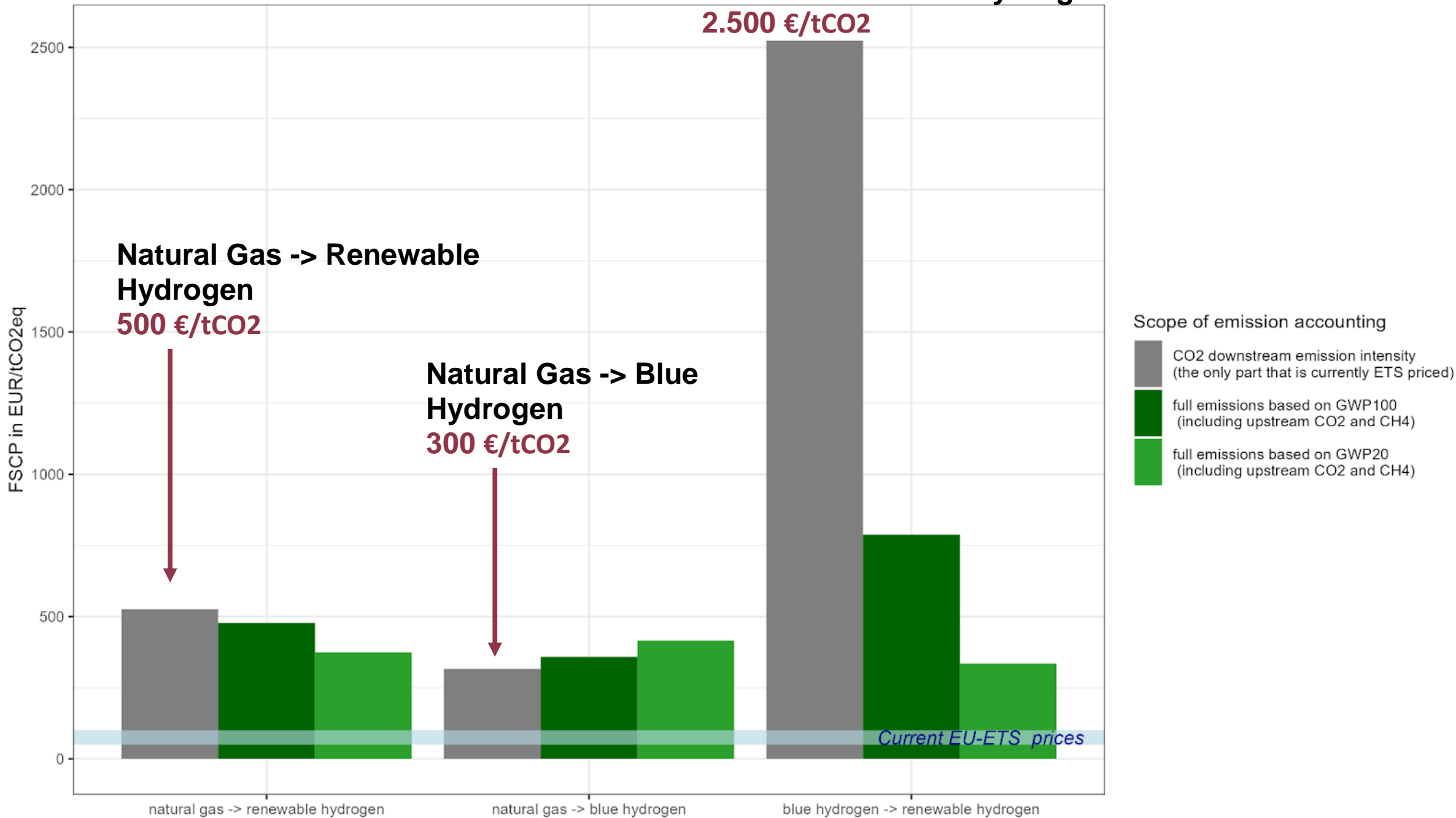


**b** **GWP20:** Emission intensity of blue and renewable hydrogen



# Fuel-switching CO2eq prices (FSCP)

## Blue -> Renewable Hydrogen

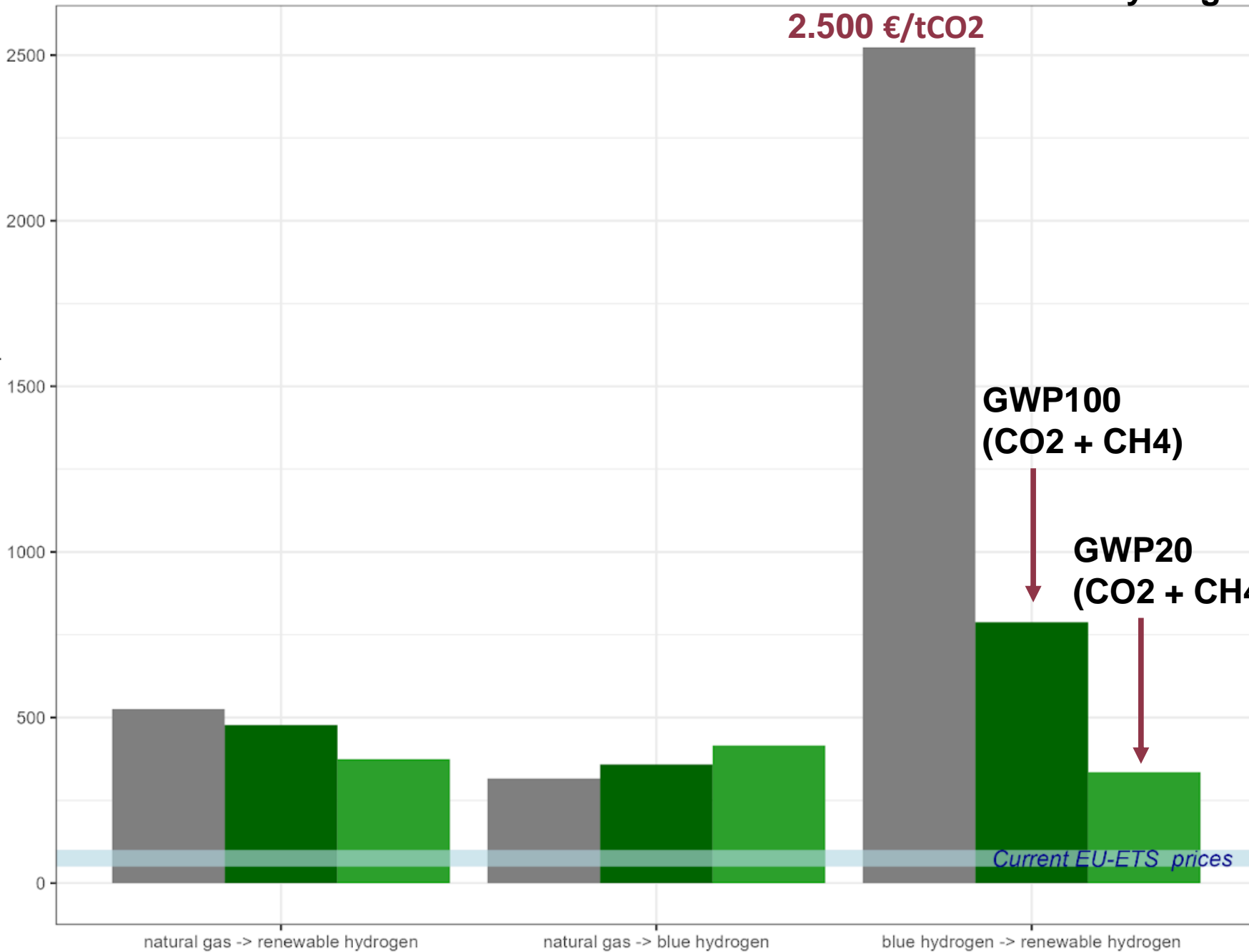


# Fuel-switching CO2eq prices (FSCP)

## Blue -> Renewable Hydrogen

2.500 €/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)

**GWP100  
(CO2 + CH4)**

**GWP20  
(CO2 + CH4)**

Current EU-ETS prices



# CONCLUSION



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## 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



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# PANEL DISCUSSION

*Esther Bollendorff – CAN Europe*

*Michele Casadei – Greens/EFA Group in the European Parliament*

*Michaela Holl – Agora Energiewende*

*Grzegorz Pawelec – Hydrogen Europe*