RENEWABLE HYDROGEN: WHAT WAY FORWARD?

Brussels, Oct 3rd, 2023

Andrei Marcu
Olivier Imbault
Gabriele Romeo

ERCST
Roundtable on
Climate Change and
Sustainable Transition

Updated EU RES H2 regulation

ERCST
Roundtable on Climate Change and Sustainable Transition

- **Delegated Act 2023/1184 - RFNBOs definition**
  - Proof geographical & temporal correlation and PPA needed when the grid emission intensity of electricity is lower than 18 gCO2eq/MJ.
  - Above proofs not needed in case of: producer-consumer direct connection, bidding zone with RES supply > 90% in y-1, production during imbalance settlement period.

- **Renewable Energy Directive - sectoral uptake targets**
  - Industry: lower bound of 42% H2 used by 2030 and 60% by 2035 as RFNBOs (caveats apply, e.g. conditional 20% discount).
  - Transport: 1% of renewable energies supplied to sector in 2030 as RFNBOs.

EU RES H2 strategy – financial incentives

ERCST
Roundtable on Climate Change and Sustainable Transition

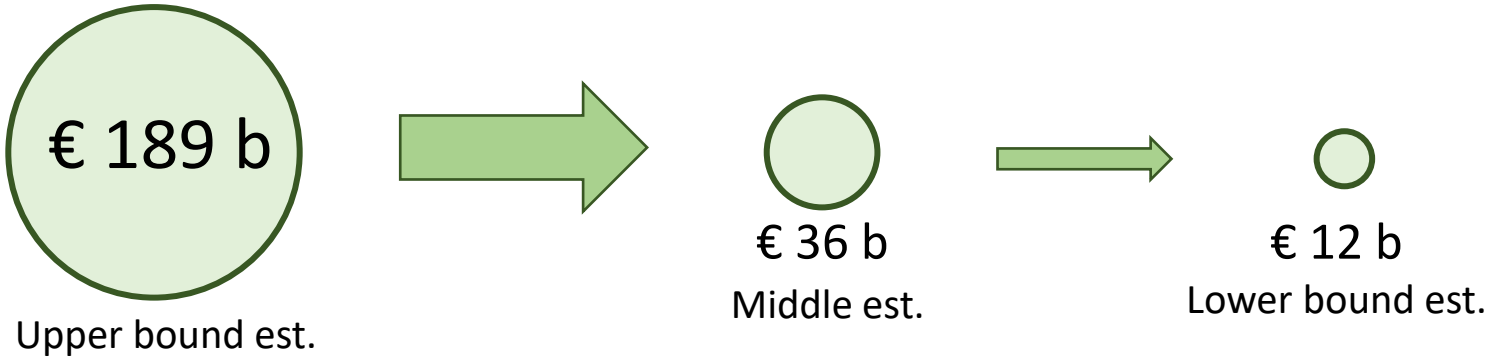
EU funds potentially supporting hydrogen, 2021-2027, by category.

Fund	Support specifics	deployment stage	Tech neutral	EU wide	Funding amount (EUR b)
ERDF-REACT-CF[1]	Grants[2]	US - DS	YES	YES	73.9[3]
CEF-T[4]	Grants - guarantees - bonds	DS	YES	YES[5]	25.8
INN-F[6]	Grants - fixed premium	MS-DS	NA[7]	YES	25.4[8]
H-EU[9]	Grants	US	NA[10]	YES	25.4[11]
MF[12]	NA[13]	NA	YES	NO	25[14]
JTF[15]	Grants	NA	YES	YES[16]	9[17]
CEF-E[18]	Grants - guarantees - bonds	DS	YES	YES	4.7[19]

99%
Tech neutral funds

Mid-stream virtually missing

Direct market uptake implications



EU RES H2 – additional components

ERCST
Roundtable on Climate Change and Sustainable Transition

- Electricity Market Design
  - Paramount importance of electricity in RES H2 cost structure.
  - Serious obstacle jeopardizing a classical technology learning curve pattern.

- ETS
  - Electrolysis' eligibility for free allocations is a direct stimulus to RES H2.
  - Hydrogen product benchmark likely to drop and ripple effects on low-carbon H2.

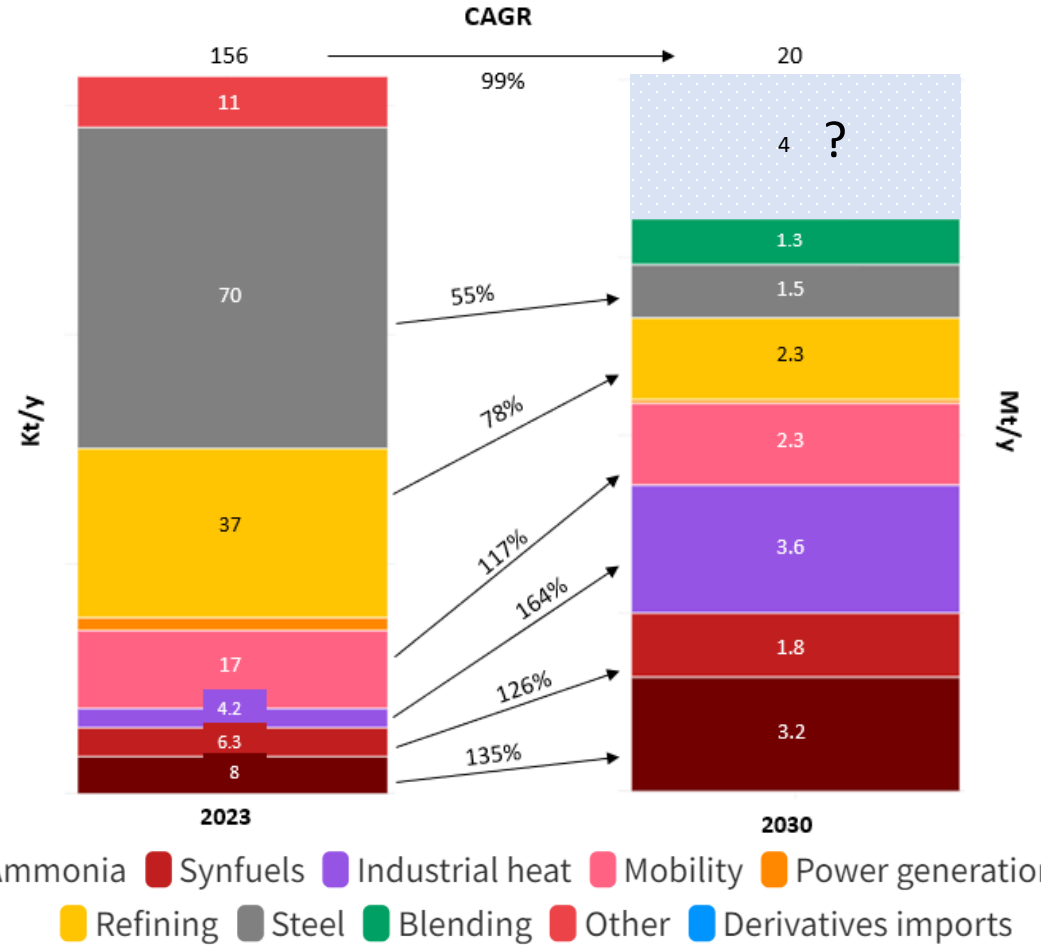
- CBAM
  - Hydrogen free allocations phased out from 2034 onwards.
  - Incorporation of H2 under CBAM makes it eligible to support through aid claims to compensate for indirect emissions costs.

EU RES H2 market – demand

ERCST
Roundtable on Climate Change and Sustainable Transition

- A deep gap is likely to ensue between the ambitious consumption targets and real uptake.
- The implied compounded annual growth rate (CAGR) of RES H2 demand is 99% from 2023 to 2030.
- Industry emerges as key recipient of demand-pull policies.

Figure: current and targeted RES H2 EU consumption



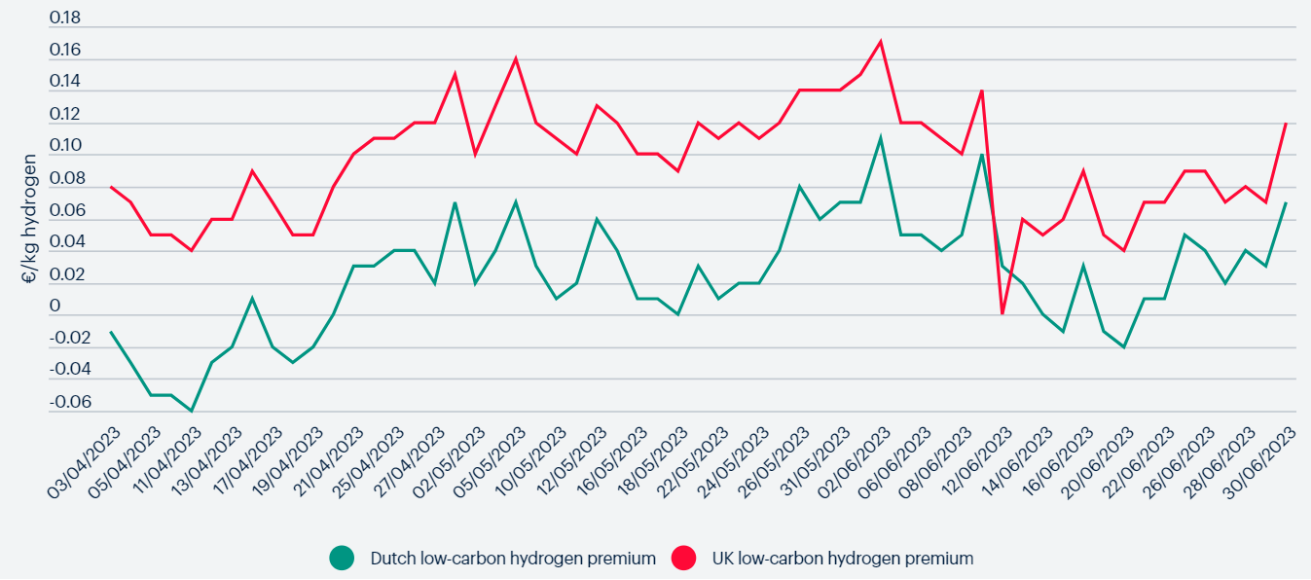
Source: ERCST based on European Hydrogen Observatory and EC modelling using PRIMES.

Low carbon H2 – the elephant in the room?

ERCST
Roundtable on Climate Change and Sustainable Transition

- The EU framework is hesitant about regarding low-carbon H2 as an integral part of the solution.
- The EU low-carbon H2 definition is incomplete without a methodology to assess the GHG emissions savings from low-carbon fuels. Commission – Council misalignment on on delivery timing of methodology.
- Autothermal Reforming (ATR) with CCS is nevertheless cost-competitive with unabated Steam Methane Reforming (SMR).

Figure: low-carbon H2 premium, NL & UK, Q2 2023. Source: ICIS



EU RES H2 market at the crossroads

ERCST
Roundtable on Climate Change and Sustainable Transition

Under the current conditions, there are several possibilities to ramp-up the renewable H2 market uptake in the EU.

Nonexclusive scenarios to be discussed:

- Stimulating demand with downstream products' RES H2 obligations;
- Protecting the EU industry through CBAM and indirect cost compensation;
- Prioritizing supports/financing to specific sectors, through instruments such as the Hydrogen Bank;
- Other.