”Crunch issues” in the hydrogen and gas Directive

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Structure and context

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How could the proposed Directive help hydrogen to be used where is needed the most?

How could the definition for low-carbon hydrogen be improved?

Does the proposed regulation on third-party access foster or hinder the development of a hydrogen economy in the EU?

Where is hydrogen most needed & how much?

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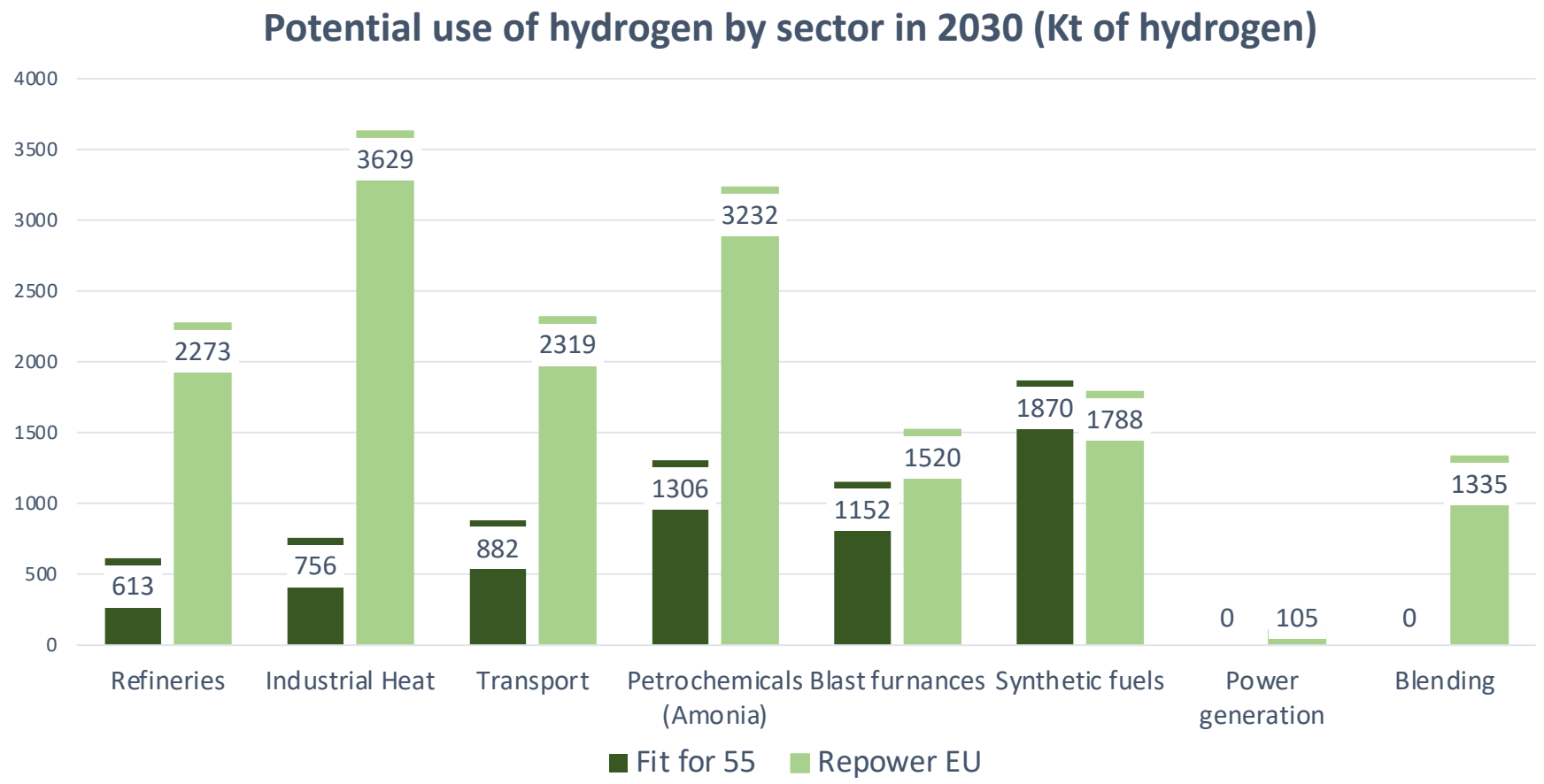
- Hard to abate sectors + energy sector (balancing, flexibility, energy storage) + heavy duty transportation



Source: Own elaboration with data from the European Commission

How could the Directive help

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- **Definition for low carbon hydrogen**
  - The definition for low-carbon hydrogen should be completed as soon as possible in order to provide clarity and predictability for investments.

- **Unbundling**
  - We see merit in adopting a flexible approach to unbundling that takes into account both the extra costs/risks of an ex-post regulation and the uncertainy when it comes quantities and end uses of hydrogen for 2030.

- **Third party access**
  - We see also merit in implementing a negotiated TPA to hydrogen grids at least until December 2030.

Definition for Low-Carbon Hydrogen

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- **Definition of low-carbon hydrogen in the H2 and Gas package:** hydrogen the energy content of which is derived from non-renewable sources and which meets a greenhouse gas emission reduction threshold of [70%].

- **Recital 9:** *methodological approach for certification should be based on a* ***life cycle assessment of their total greenhouse gas emissions.***

- **Art. 8:** *by 31 December 2024, the Commission shall adopt delegated acts to supplement this Directive by specifying the methodology.*

Working out a definition for low carbon H2

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Fossil fuel comparator

Not clarified in the proposed Directive

Emissions' scope

The Directive mentions a lifecycle approach should be used

% Emissions' reduction

70%

Methodology

To be developed by Delegated acts

DA on the share of RES electricity for the production of RFNBOs

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Scope

- Sets out the requirements for renewable electricity used to produce RFNBOs so they can be counted as fully renewable
- Establishes a methodology to define when the electricity feeding the electrolyser can be considered renewable
- If the share of RES in a bidding zone is above 90%, there is no need to prove additionality
- Exemption from additionality rules until 1st January 2027

Direct connection:

- 3-year period for directly connected ELY plants. The ELY needs to start operation within the first 3 years after the RES plant has been commissioned. (Before was same calendar year)

Connection to the grid

- Time frame: The ELY needs to start operation no later than 3 years after the RES power plant was connected to the ELY through a PPA has been commissioned.
- **Temporal correlation:** 1 hour. Until December 2026 monthly.
- **Geographical correlation:** Same bidding zone, Neighbouring bidding zone where Day-ahead electricity prices for the same hour are equal or higher than in the bidding zone where the ELY plant is located, Offshore adjacent bidding zone

DA on a methodology setting out rules for assessing the GHG emissions savings of RFNBOs and Recycled Carbon Fuels

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Fossil fuel comparator

The recently proposed delegated act refers to a FFC for RFNBOs of:

94 gCO2eq/MJ = 11.28 tCO2e/tH2.

% Emissions' reduction

For both RFNBOs and RCF= 70% / 30% of 11.28 tCO2e/tH2

3,38 tCO2e/tH2

Methodology

E = e i + e p + e td + e u – e ccs

e in= e I elastic + e I rigid - e ex-use: emissions from **supply of inputs** (gCO2eq / MJ fuel)
e p = **emissions from processing** (gCO2eq / MJ fuel)
e td = **emissions from transport and distribution** (gCO2eq / MJ fuel)
e u = **emissions from combusting** the fuel in its end-use (gCO2eq / MJ fuel)
e ccs = **emission savings from carbon capture and geological storage** (gCO2eq / MJ fuel

* Emissions from the manufacture of machinery and equipment and emissions from compressing and distribution of hydrogen are not accounted.

Working out a definition for low carbon H2

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- LCH includes all remaining H2 production processess besides RFNBOs. (including SMR, Pyrolysis and nuclear)
- The GHG emissions methodology used for RFNBOs and recycled carbon fuels is a good starting point.
- It also considers CCS.
- It is coherent with the fossil fuel comparator, which also includes Methane leakeage.

- Where the number of full load hours the electrolyser is producing is equal or lower than the number of hours in which the marginal price of electricity was set by renewable electricity or nuclear power, grid electricity shall be attributed a greenhouse gas emissions value of zero g CO2eq/MJ.

Third party access

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What is third party access

- Third party access requires owners of a natural monopoly to grant access to a facility that is considered essential (for a third party to access) to offer its product/service on a market. This protects against the abuse of a dominant position and enhances competition.

Are current H2 pipes natural monopolies?

- The consequence of natural monopolies is that only one firm in the market is able to efficiently provide the service in a certain territory.

Are H2 pipes essential facilities? Is this problem relevant today?

- An essential facility is an asset to which a third party needs access to offer its own product or service on the market.
- Today, just 10% of the hydrogen consumed is outsorced and even a smaller fraction is outsorced through pipelines.
- A big share of already deployed hydrogen pipes, due to their construction features, do not allow for high H2 transportation volumes.
- There are 1.600 km of H2 pipes today
- Gas for climate as part of the envisaged H2 backbone is talking about 40.000 Km for 2030

Third party access

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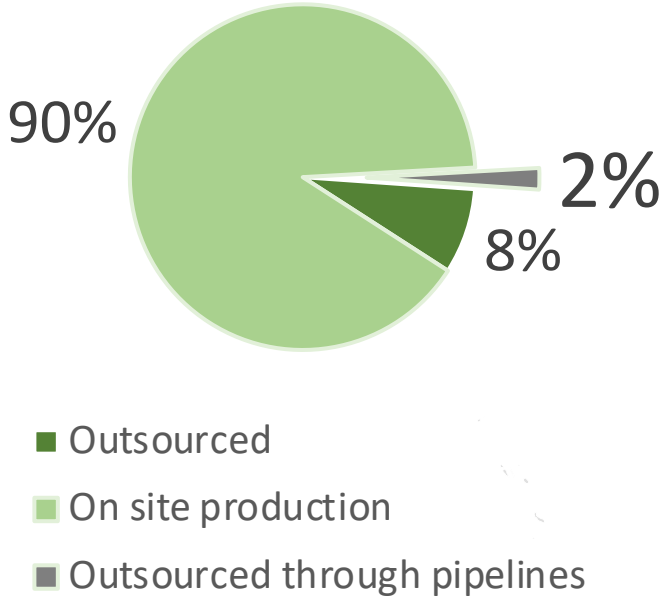
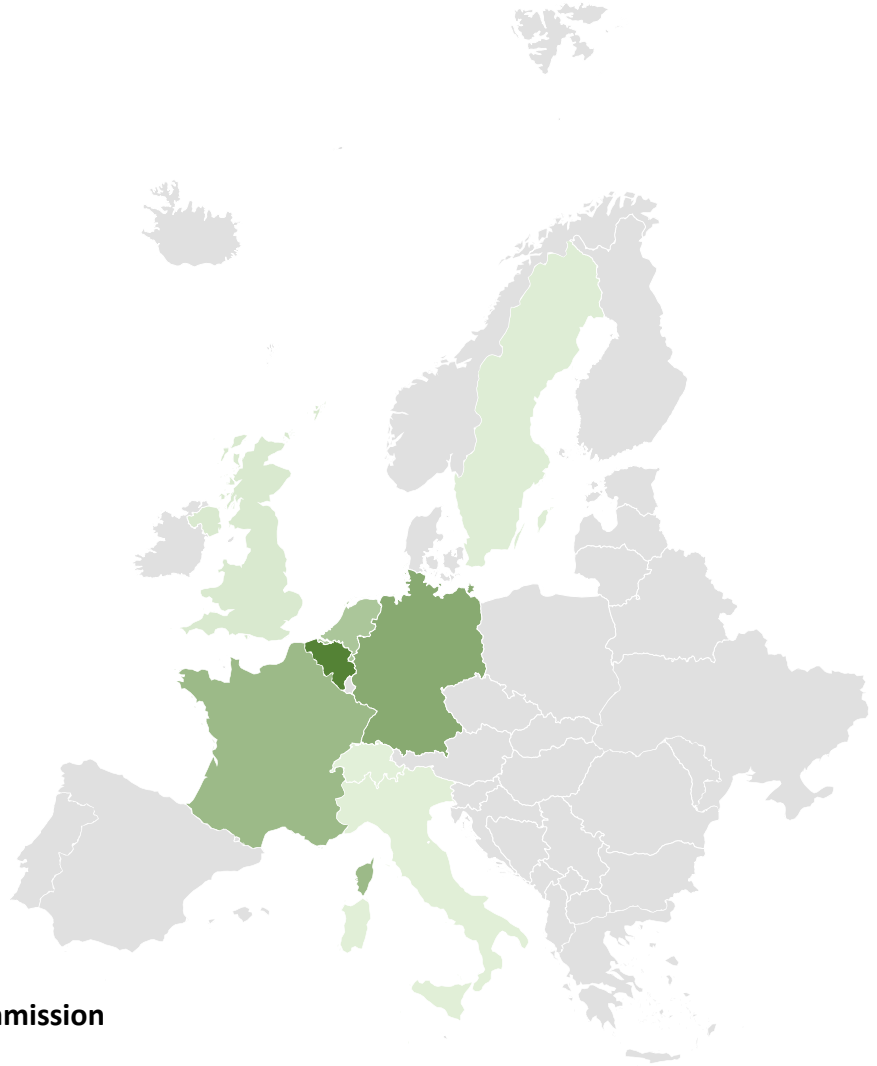
Hydrogen pipelines in the EU + UK and Switzerland

Outsourced vs. on site production





Belgium	613
France	303
Germany	390
Italy	8
Netherlands	237
Sweden	18
Switzerland	2
UK	40
Total	1611

Source: Own elaboration with data from the European Commission

Third party access

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	Pros	Cons
No rules TPA, business as usual	• Incentivize investments in H2 networks mainly by vertically integrated H2 suppliers	• Risks of non-competitive market outcomes • (Lower risk for existing infrastructure)
Negotiated TPA	• Enables competition • Lower regulatory burden than regulated TPA • Enables more flexibility in the rump-up phase of the market	• Reduces commercial freedom of hydrogen network operators • Decreases potential revenues of hydrogen network operators • Higher risk of anticompetitive outcomes when compared with RTPA • Unharmonized TPA may hinder cross-border trade • Do not take account of the reality of current infrastructure
Regulated TPA	• Ensure non-discriminatory third-party use of hydrogen networks • Ensures cost-reflectiveness of access tariffs • Harmonized TPA regimes would facilitate interconnections and thereby cross-border trade	• RTPA would allow for less-flexibility in a ramp-up phase • Do not take account of the reality of current infrastructure.