

Renewable Energy Directive (RED III)

Case study for:
Mandatory Quotas

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Case Study: Renewable Energy Directive (RED) III (1/3)

Jurisdiction: European Union 

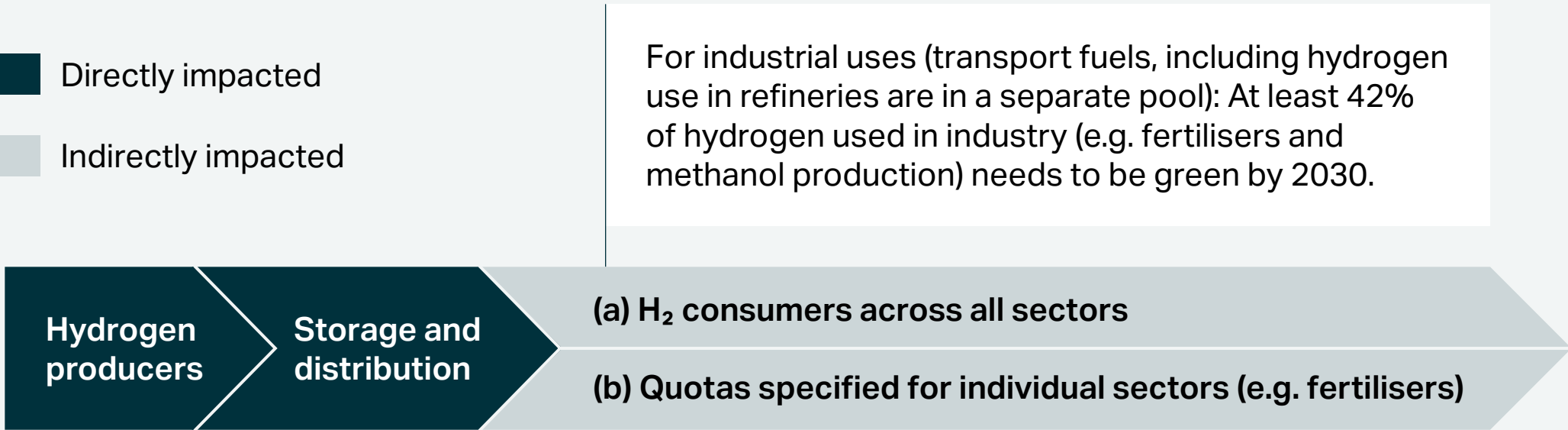
Adopted: 2023

Applies to: Industrial hydrogen users

RED requires member states to ensure that at least 42% of hydrogen used in the industry by 2030 is green - rising to 60% in 2035. Depending on the wider context (e.g. progress on economy-wide decarbonisation, consumption of other non-fossil hydrogen, and plans to abate existing production emissions via carbon capture and storage) these targets could be reduced. By 2025, member states are required to transpose these targets into national law and choose a range of implementation options including a) passing the quota onto industry b) setting mandates on specific sectors or c) introducing subsidies and demand-side measures to spur uptake. Here we consider options 'a' and 'b' in detail.

Industrial hydrogen value chain

Stakeholders impacted by option (a) and (b)

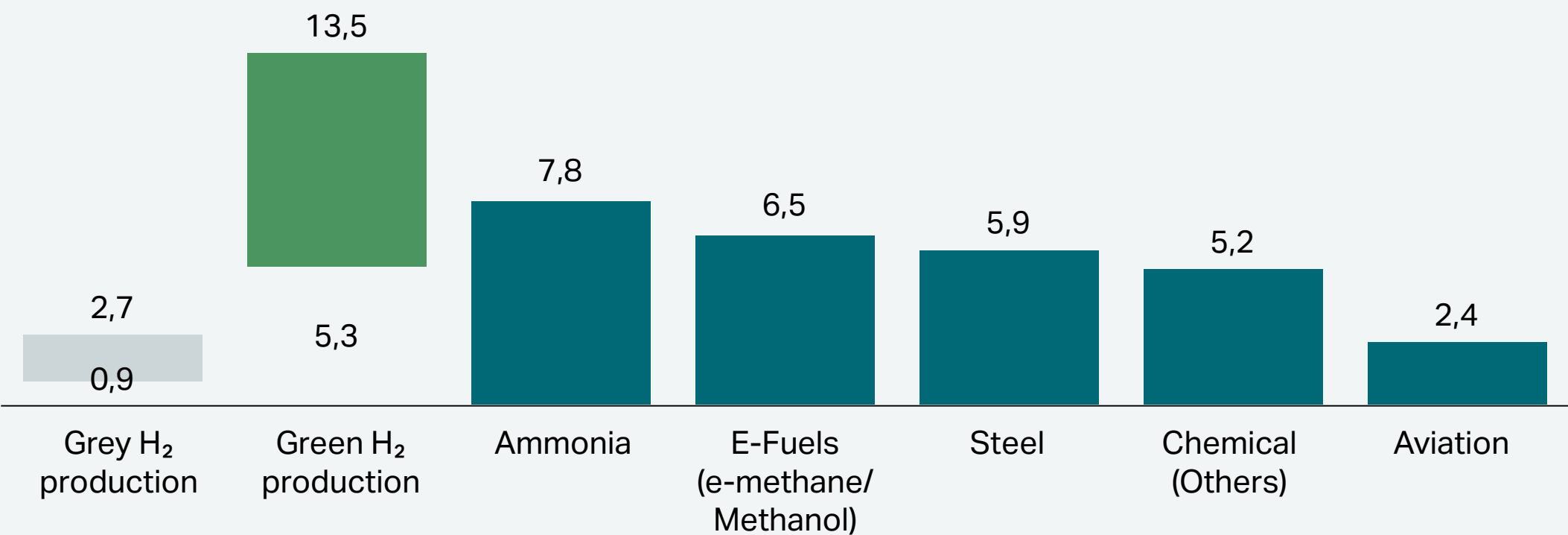


Note: many industrial players produce their own hydrogen on site, so these stakeholders may not be distinct

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- **Demand creation:** if achieved, the RED targets could drive consumption of green hydrogen to 1.6 – 4 million metric tonnes (MMT) by 2030, and 2.3 – 7.5MMT by 2035. Estimates vary depending on forecasted total hydrogen demand¹.
- **Impact on willingness to pay:** although states have yet to implement the RED targets, there are already indications that RED and other measures have increased European willingness to pay for green hydrogen. The European Hydrogen Bank (EHB), an auction-based subsidy mechanism run by the European Commission, published average hydrogen production costs and average offtake prices by sector, identified through its pilot auction. Average offtake prices ranged from €5.7 – €8.3/kg H₂ (\$6.2 – \$9.0/kg H₂) depending on sector, which are significantly higher than grey H₂ levelised costs.

Grey and green hydrogen production costs (€/kg H₂) vs average offtake bid prices by sector (EHB) (non-exhaustive)



1: [BNEF](#), European Hydrogen Observatory
Sources: TUV Sud, [European Commission](#), European Environment Agency, [Hydrogen Europe Position Paper](#), Bloomberg NEF, S&P Global Commodity Insights, NOW gmbh, [H2Global Pilot Auction Results – Bid insights](#) – Bid insights;

Case Study: Renewable Energy Directive (RED) III (2/3)

RED places a requirement on EU member states to meet the 2030 and 2035 targets, but does not prescribe the national and sub-national regulatory incentives that should be used to meet these. Member states have the flexibility to adapt their policies to ensure a level playing field for hydrogen consumers. The mandatory quotas send a clear demand signal to hydrogen producers, encouraging an increase in investment and in the supply of green hydrogen. Below, we explore the advantages and disadvantages of two indicative options for passing on the mandate to industry.

	Option A: applying the mandate across ALL sectors	Option B: quotas specified for individual sectors
Description	Companies are responsible for achieving mandated targets, which are applied uniformly across all sectors. The mandate/quota can be applied one time or gradually increased over time.	Companies are responsible for achieving mandated targets. Different targets are applied depending on the sector.
Pros	- With the same standard/target being implemented across all sectors, it will be easier for the government to enforce such standards and ensure compliance. - It could be implemented with a book and claim mechanism, spreading the impact across a wider range of actors.	By tailoring the targets to specific sectors, the targets can be made more achievable within the given time frame, helping companies navigate specific sectoral challenges e.g. international competition and economic structures.
Cons	- This option does not consider the differences between sectors in investment cycles, exposure to international competition, level of risk of carbon leakage, etc. Thus, some sectors may struggle more to meet the targets than others. - Downstream companies may decide to procure from competitors outside the scope of the mandate if the uptake of green materials/ fuels implies rising cost.	- The regulation and level of stakeholder engagement increases in complexity as measures are tailored by sector, increasing the difficulty of monitoring and enforcement. - Member states with a larger industrial footprint have more flexibility on implementing the mandates, while those with a smaller footprint will impose more restrictions on a smaller group of stakeholders. This could increase the risks of market distortions within the EU.

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Key challenges/risks

1 Carbon leakage

- Member states are encouraged to coordinate their policies in order to reduce intra-EU carbon leakage risks. The EU has also published [implementation guides](#), including the implementation of targets for [green hydrogen](#) for RED.
- The rules on how imported grey hydrogen derivatives (e.g. methanol, ammonia) are accounted for through the quota are currently not clear. To avoid carbon leakage and ensure a level playing field, it is key that the quota applies fairly to imports and domestic production.

2 Uncertainty over prices

- It is currently not yet clear how member states will transpose the RED targets into national laws. If they choose to implement this via national level binding quotas, these will need to be underpinned by sufficiently high penalties/buyouts for non-compliance. Setting these may be a challenge due to lack of market data.

3 Need for flexibility to cater to varying geographical/sectoral contexts

- In order to function effectively, it is key that any mandatory quota is underpinned by a book and claim system that can improve the overall efficiency of meeting the requirements. This is particularly important in the case of industrial use of green hydrogen/hydrogen derivatives, where distribution infrastructure is currently very nascent - and the use of such commodities is likely to be predominantly concentrated to a handful of large industrial facilities (e.g. chemical/DRI-steel plants and refineries).

4 Means to reduce targets could lower hydrogen uptake

- Targets can be reduced by 20% in 2030 and 2035 if certain conditions are met.¹ On a specific case-by-case basis, low carbon hydrogen (i.e. with at least a 70% reduction relative to fossil fuels) produced via means other than electrolysis, may be excluded from the quota. This could potentially reduce the overall impact on green hydrogen uptake.

5 Managing the green premium and increased risks

- The increased costs of green hydrogen for downstream industries needs to be managed alongside the mandate. Additional funding to support green hydrogen producers and offtakers could be used to manage this. This may be particularly key for industries where margins are especially tight (e.g. in the agricultural sector, additional support may be necessary to support farmers to manage increased fertiliser costs).

6 Ensuring sufficient supply

- To meet mandatory targets, it is important that the supply of green hydrogen is supported to ramp up. While increased certainty of demand will incentivise production, measures to support the production and distribution of green hydrogen, and its derivatives directly, can also be used. The EU Hydrogen Strategy also includes policies to increase investment in green hydrogen production.

1: For more information, see the European Commission's [Guidance on targets](#);

Source: TUV Sud, [European Commission](#), European Environment Agency, [Hydrogen Europe Position Paper](#), BloombergNEF, [S&P Global Commodity Insights](#), NOW gmbh, [H2Global Pilot Auction Results – Bid insights](#) – Bid insights;