Westwood Global Energy Group

Europe's Hydrogen Future: How much is realistically achievable?

April 2025

Hydrogen ENERGY TRANSITION

Executive Summary

Hydrogen was positioned as pivotal in Europe's decarbonisation strategy, with ambitious 2030 production targets set in early policy roadmaps. Substantial funding commitments followed, with €32.9 billion allocated or announced in 4Q 2024 alone to support hydrogen production and infrastructure.

However, progress has lagged due to regulatory hurdles and delays, high costs, economic challenges, and weak demand for hydrogen. As a result, approximately 20% of the European hydrogen project pipeline to 2030 – comprising 23 projects with a combined capacity of 29.2 GW(LHV) – has been either cancelled or stalled[1].

The question is how much can realistically be achieved in the European hydrogen market?

What will support the hydrogen market to realise its potential depends on three critical factors:

Policy Frameworks

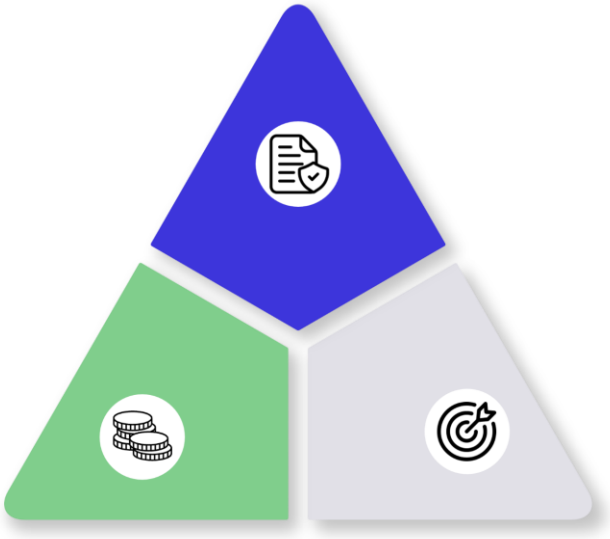
Finalisation of enabling policy frameworks to provide clarity and stability (e.g. the Delegated Act on low-carbon hydrogen to be implemented in 1Q 2025).

Funding Mechanisms

Effective allocation and evolution of funding mechanisms to support key demand sectors (e.g. second and third European Hydrogen Bank auctions).

Demand-side Mandates

Implementation of demand-side mandates to stimulate hydrogen adoption (e.g. EU RED III mandates to be transposed in May 2025).

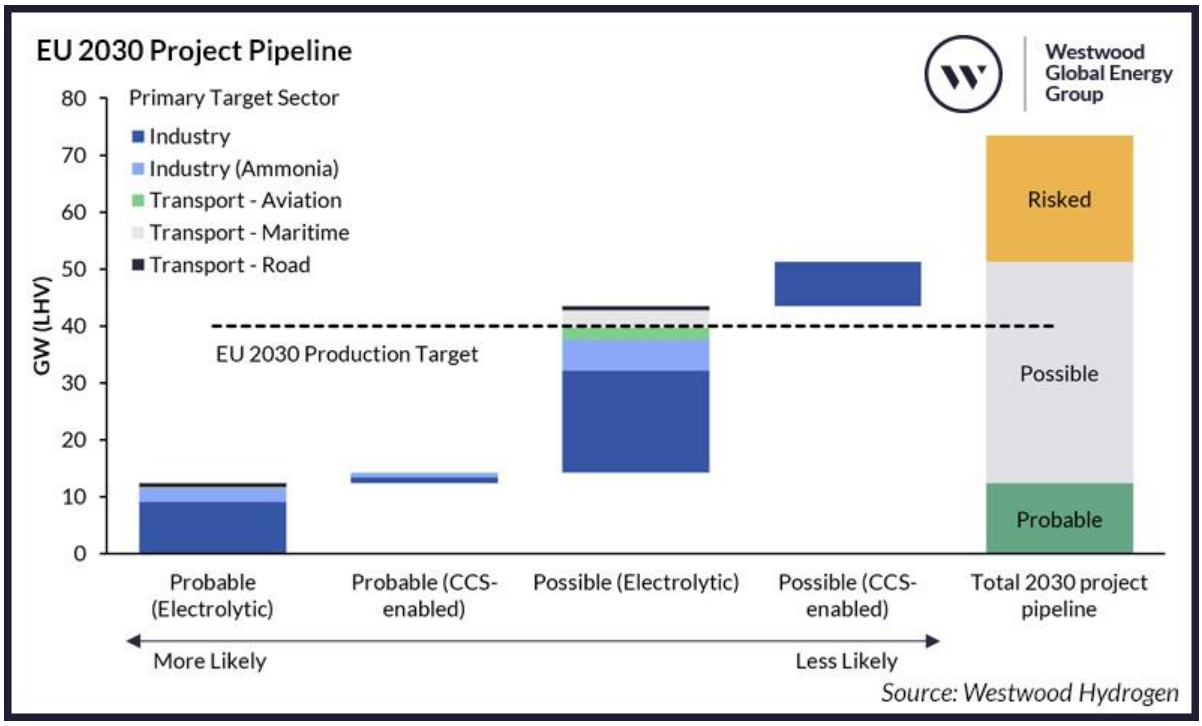


Westwood analysis estimates that depending on how each of these factors progresses, the range of outcomes is considerable – but it is clear that targets are likely to be missed, and a significant portion of the pipeline will not be developed.

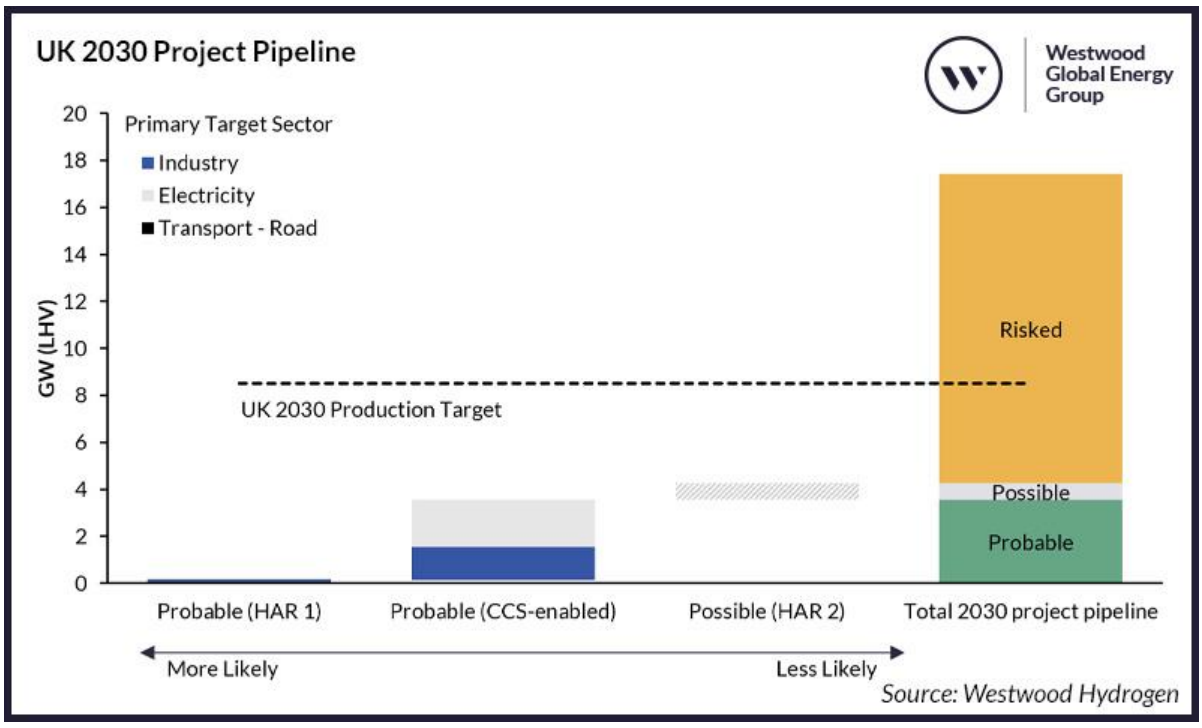
At the lower end of the estimate – where little to no progress is made in the three critical factors – as little as 17% of the EU's hydrogen project pipeline is likely to come online by 2030. However, if the planned policy frameworks, funding mechanisms, and demand-side mandates are all effectively developed and implemented, then up to 70% of the current pipeline could materialise – meaning the EU's production target could theoretically[2] be reached. It is also noteworthy that the majority of this is hydrogen targeting industrial or ammonia demand.

[1] Westwood Insight – Over a fifth of all European Hydrogen projects stalled or cancelled

[2] This assumes 100% utilisation of production projects



EU 2030 Project Pipeline[3]
Source: Westwood Hydrogen; Westwood's Hydrogen Project Certainty Assessment provides the likelihood that a project will reach FID based on nine criteria and categorised into three project certainty statuses: Risked, Possible, and Probable



UK 2030 Project Pipeline
Source: Westwood Hydrogen; The UK hydrogen target is 10 GW(HHV) which is equivalent to 8.5 GW(LHV)

[3] Westwood's Hydrogen solution currently covers Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, and the UK

In the UK, the potential range of the current pipeline coming online by 2030 is similarly stark – ranging from 1% up to 24%. Notably the upper percentage is much lower than the EU, highlighting the sizable policy, funding and mandate gap that needs to be filled in the UK to support the growth of a hydrogen industry. Currently the UK landscape is also more favourably aligned to CCS-enabled hydrogen production, and so any realistic growth outlook by 2030 is dominated by this technology (albeit from fewer projects).

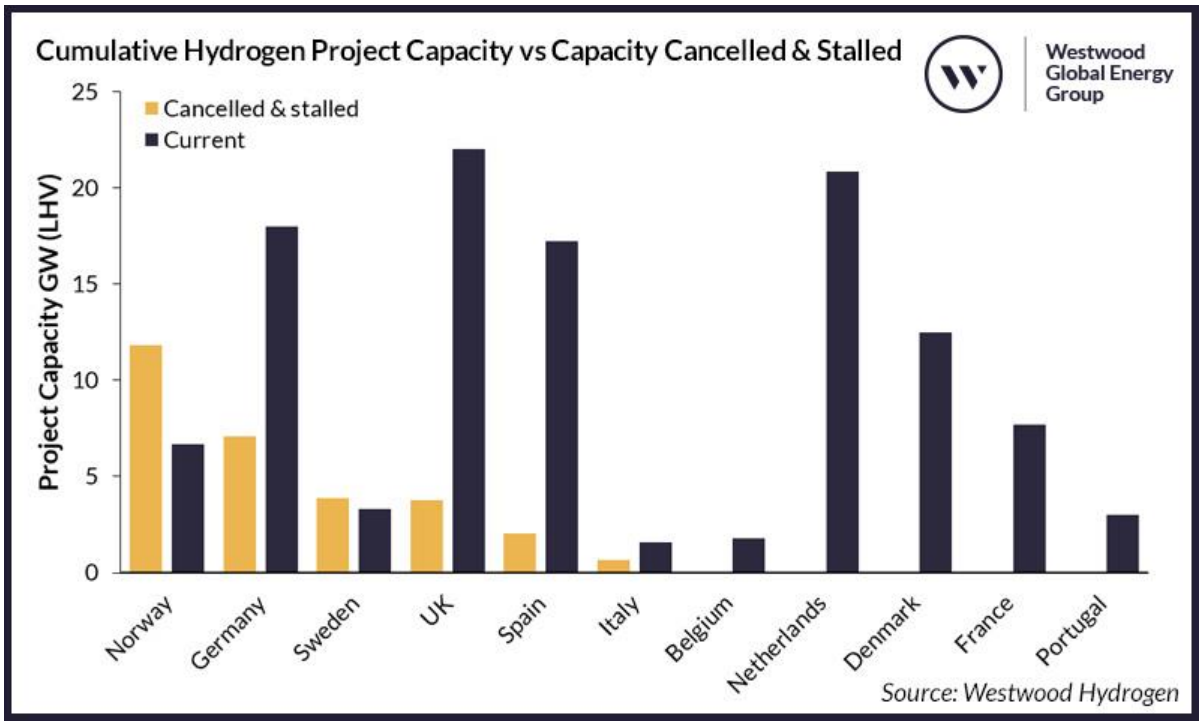
Ultimately, urgent progress in policy frameworks, funding mechanisms, and demand-side mandates will determine the trajectory of Europe's hydrogen market.

While only 17% of the EU's 2030 project pipeline being realised may seem underwhelming, it still represents 12 GW(LHV) of capacity – a substantial, if more realistic, outcome.

Targets are likely to be missed, but with effective progress, there remains potential upside for the EU and UK pipelines to get closer to 2030 goals. However, the final outcome in the next five years remains potentially wide ranging and far from certain.

Introduction

Although roadmaps, strategies, and production targets were initially established for the adoption of renewable hydrogen, significant progress has been limited. This slow pace has largely resulted from stringent regulatory frameworks and the substantial cost gap between renewable, low-carbon and fossil-based hydrogen, which has made securing long-term offtake agreements difficult. As a result, around 20% of the European hydrogen project pipeline to 2030 – comprising 23 projects with a combined capacity of 29.2 GW(LHV) – have been either cancelled or stalled[4].



Cumulative Hydrogen Project Capacity vs Capacity Cancelled & Stalled
Source: Westwood Hydrogen; As of December 2024; Coverage includes: Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, and the UK

These challenges have been particularly evident across key sectors initially considered viable, such as heating, road transport, and export. For instance, Equinor's proposed €3 billion hydrogen pipeline between Norway and Germany and the accompanying 10 GW(LHV) hydrogen project for export and to supply RWE's power stations was cancelled in September 2024 due to "excessive costs and market uncertainty"[5].

Similarly, hydrogen adoption for residential heating has encountered substantial barriers, including inefficiency, high costs, and a policy preference for electrification. The UK's Climate Change Committee (CCC) has now even formally recommended against hydrogen for home heating, following the cancellation of several trials, including the 2025 Redcar trial in Teesside due to insufficient local hydrogen production.

In road transport, hydrogen's anticipated role has notably diminished. Reflecting this decline, H2Mobility recently announced closures of over 25% of German hydrogen stations, pivoting towards commercial and heavy-duty vehicles. The CCC now predicts a predominantly battery-

[4] Westwood Insight – Over a fifth of all European Hydrogen projects stalled or cancelled
[5] Reuters 09/20/2024

electric road transport future for the UK by 2050, reserving hydrogen for niche applications such as construction and heavy industry equipment.

Three Critical Factors

Given the challenges hydrogen has faced, a critical question emerges of how much can realistically be achieved in Europe's hydrogen market. Based on our analysis of the market, we believe that successfully unlocking hydrogen's potential in the EU and UK hinges upon three essential factors:

Policy Frameworks

Finalisation of enabling policy frameworks to provide clarity and stability (e.g. the Delegated Act on low-carbon hydrogen to be implemented in 1Q 2025).

Funding Mechanisms

Effective allocation and evolution of funding mechanisms to support key demand sectors (e.g. second and third European Hydrogen Bank auctions).

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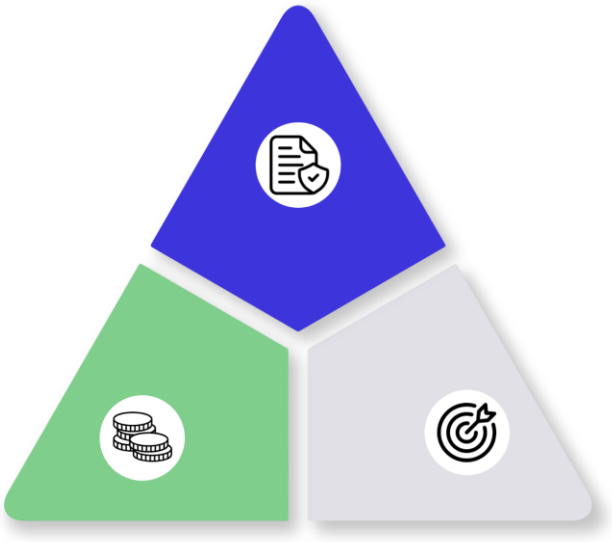


In the following sections we will delve into each of these three factors to better understand why they are important, what the status is, and what gaps need to be bridged to support hydrogen's potential.

1. Policy Frameworks

Policy frameworks help to ensure that ambitions are translated into actionable strategies. However, in the European hydrogen market, current regulations are falling short of enabling growth. In the EU, this has for example led to widespread calls for RFNBO[6] regulation reassessment. However, changes are unlikely before July 2028 to maintain policy stability. Meanwhile, the EU's upcoming Delegated Act on low-carbon hydrogen may expand production pathways via CCS and nuclear power, aligning with Belgium and Germany's push for broader hydrogen strategies to generate progress. In the UK, progress remains slow as the industry awaits updates on key policies and so, faces challenges in scaling before 2030. With both the EU and the UK at critical junctures, timely and decisive regulatory action is essential to unlock hydrogen's full potential.

The EU's RFNBO requirements were formally adopted in June 2023. Since then, the delegated acts have faced significant criticism for their perceived inefficacy, prompting calls from government officials, project developers, and industry for policy revisions.

Most recently in March, energy ministers from several EU member states – including Austria, Belgium, Czechia, Denmark, France, Germany, Hungary, the Netherlands, Romania, and Slovakia – have urged the European Commission to soften its rules around additionality and temporal correlation. They requested a reassessment and delay of implementation dates to better align with market realities. While their appeal did not constitute an official proposal, it underscores a collective and persistent push by major EU nations to ensure that policy frameworks enable rather than obstruct the growth of the hydrogen industry.

However, despite these efforts, we do not anticipate regulatory revisions before the scheduled review in July 2028. Stability remains a priority, as changes could undermine investor confidence, disrupt project commitments, and undo more than three years of regulatory work.

While short-term revisions appear unlikely, the EU is advancing new policies to support hydrogen market development. Expected by the end of 1Q 2025, the upcoming Delegated Act on low-carbon hydrogen should create opportunities for developers utilising and exploring alternative production pathways, including via carbon capture & storage (CCS) and nuclear power. This legislation will be particularly important for countries like Belgium, whose new government announced the support for all forms of low-carbon hydrogen production. Germany's newly elected government have echoed this sentiment, endorsing CCS and nuclear energy as viable steps toward decarbonising its steel industry. Opening policy to other production pathways may be the regulatory shift needed to accelerate realistic hydrogen industry growth.

Meanwhile, in the UK, the industry awaits updates on the Hydrogen to Power Business Model (H2P BM), transmission-level gas grid blending, and hydrogen heating strategies. These updates, due this year, may have limited impact on the UK's hydrogen ambitions. As discussed, demand sectors including residential & commercial heating have struggled to gain traction, and according to DESNZ[7], the H2P BM will require further technological maturity, infrastructure development, and

[6] Renewable Fuel of Non-Biological Origin (RFNBO) outlined in the EU's first Renewable Energy Directive
[7] UK's Department for Energy Security and Net Zero; Hydrogen to Power: Market Intervention Consultation Response December 2024

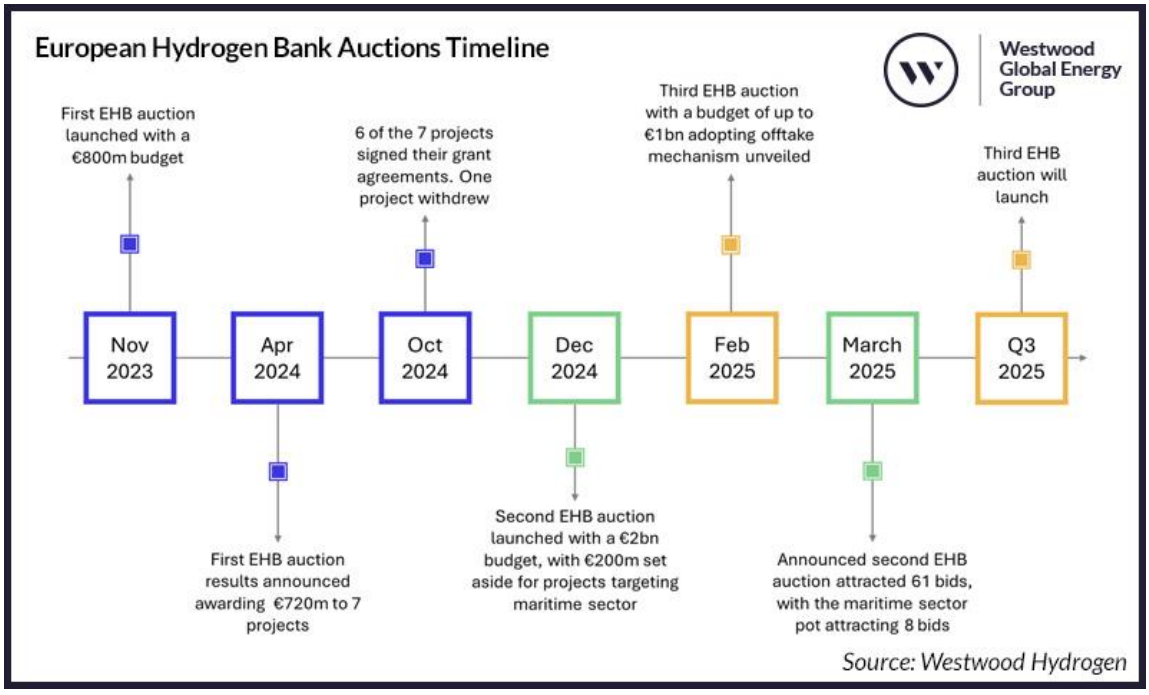
reduction in CAPEX and financing costs. Until these factors progress – unlikely before 2030 – hydrogen-to-power uses, in particular, will struggle to compete effectively.

Whether through revisions to existing regulations or the introduction of new frameworks, a consistent theme emerges: the need for clear, binding frameworks without further delays. These frameworks will define the context within which **funding mechanisms** and **demand-side mandates** are created, making them a decisive factor in shaping the hydrogen market. As we move into the second quarter of 2025, timely and decisive action will be essential to realising even the least risked hydrogen projects. With the right policy developments, the industry could not only mitigate risks but unlock additional growth potential, helping to shape the future of hydrogen in Europe and the UK.

2. Funding Mechanisms

Subsidies alone have proven insufficient in bridging the cost gap between renewable, low-carbon, and fossil-based hydrogen. This has prompted a strategic shift from production-centred subsidy mechanisms towards those that target key demand sectors and facilitate offtake agreements. While recent changes have been introduced in the European Hydrogen Bank, we are still awaiting tangible outcomes to fully evaluate their effectiveness. In the UK, delays and uncertainties in funding schemes highlight similar challenges, with further results needed to assess how these approaches may evolve and potentially improve future project viability.

The European Hydrogen Bank (EHB) was initially established to allocate fixed subsidies through competitive auction based on the production volume of renewable hydrogen in Europe. However, early results demonstrated the inadequacy of these subsidies alone in bridging the cost-gap between renewable hydrogen and existing fossil-based alternatives. The first EHB auction resulted in average subsidies around €0.50/kg, significantly below the projected 2030 hydrogen market price of approximately €6/kg[8] in favourable regions such as Spain. The auction awarded subsidies to seven projects; however, Benbros Energy withdrew its 60MW El Alamillo H2 Project in Spain, which was granted €0.38/kg to produce approximately 65,000 tonnes annually. The withdrawal was primarily due to a lack of clearly defined offtake plans and confirmed end-users. Notably, among the remaining six projects, which have yet to reach FID, three secured offtake agreements or partnerships primarily because the production and offtake functions involved the same stakeholders, ensuring direct operational integration. This highlights a critical gap of the first EHB scheme in ensuring project viability through secured end-use demand.



European Hydrogen Bank Auctions Timeline
Source: Westwood Hydrogen

[8] European Hydrogen Observatory

Acknowledging these limitations, the EHB shifted its strategy in the second auction which was launched in December 2024. This auction featured more targeted subsidy mechanisms, allocating €200 million explicitly for maritime-focused hydrogen projects, which attracted considerable interest, potentially driven by clear regulatory mandates targeting maritime emissions reduction. This trend mirrors other European national initiatives, such as Denmark's e-methane and renewable biogas auction and France's CfD scheme targeting industrial hydrogen applications.

Further signalling a shift towards demand-focused funding strategies, the European Commission recently unveiled its third EHB auction under the new Clean Industrial Deal, featuring an innovative offtake mechanism designed to directly connect hydrogen producers with committed end-users. Similarly, the H2GlobalScheme initiative has been established, operating through a double-auction model providing producers with guaranteed long-term offtake agreements.

However, the effectiveness of these strategic adjustments remains uncertain. The outcomes of the second EHB auction are yet to be announced, and critical details about the operational implementation of the offtake mechanism in the third auction are still pending. Whilst results are still awaited, it is anticipated that these changes will help address previous challenges and accelerate project viability.

In contrast, the UK's progress in developing its hydrogen economy has been impeded by significant bureaucratic hurdles and delays, lagging behind the EU's evolved funding approach. Despite allocating approximately £2 billion in revenue support through its Hydrogen Allocation Round (HAR1), prolonged uncertainties and slow timelines has resulted in only 3 out of 11 projects securing grant agreements to date. We are still waiting for the shortlisting of HAR2, intended to support 875MW of electrolytic hydrogen capacity. The UK is also pursuing funding towards other low-carbon pathways; in October 2024, it announced £21.7 billion in funding to support the construction of two carbon capture clusters that include large blue hydrogen projects.

Developments seen in the EU underscore the strategic pivot from production-centric subsidies towards demand-driven and offtake-focused mechanisms. It will also be important to observe whether UK funding mechanisms evolve following initial outcomes and feedback from current initiatives. Overall, this highlights the critical need for clear end-use markets and evolution of existing mechanisms to ensure the long-term viability and scaling of renewable hydrogen projects.

3. Demand-side Mandates

Key mandates are shaping hydrogen demand by targeting specific end-use sectors through binding targets, penalties, and incentives. While the EU has multiple mandates set to take effect by 2030, the UK has only the one – its SAF mandate in aviation, which does not explicitly require hydrogen use. This disparity highlights a critical gap in the UK's hydrogen strategy and a key area for policy development. Ultimately, the success of these mandates will hinge on effective implementation, but prioritising sectors with the strongest potential – where hydrogen can have the greatest impact on decarbonisation – will be essential for realistic and meaningful progress.

Sector	Regulation/Policy	Target Year	Hydrogen Demand
Industry	RED III	2030	42% RFNBO use in hydrogen production
Fertiliser (Ammonia Production)	RED III and Fertiliser European Target	2030	42% binding RED III target and 50% RFNBO non-binding target
Maritime Transport	FuelEU Maritime	2025	GHG savings from RFNBO's are counted twice until 2033. 1% usage of RFNBO's by 2031
Aviation	ReFuelEU	2030	1.2% aviation fuel to come from synthetic aviation fuels
Road Transport	RED III	2030	1% target for RNFBO's in road energy supply
Steel	CBAM and EU ETS	2034	Free carbon allowances for EU steel producers fully phased out

EU Mandates for Hydrogen
Source: Westwood Hydrogen; See further information in the Appendix

RED[9] III

As the 21 May 2025 deadline approaches for EU member states to transpose RED III regulations into national law, varying approaches to implementation have emerged.

The Netherlands plans to enforce RED III mandates through its proposed 'Act on the Annual Obligation for Renewable Fuels of Non-Biological Origin in Industry'. Expected to take effect on 1 January 2026, the bill will require industrial operators consuming large amount of hydrogen to source a portion of their supply from RFNBOs.

To ensure compliance, a registry for certification will be established, verifying electricity source, additionality, and a minimum 70% reduction in greenhouse gas emissions – ensuring the physical traceability of hydrogen. The Netherlands Emissions Authority and the Netherlands Enterprise Agency will oversee enforcement, issuing tradeable units called 'renewable hydrogen unity industry' (HWI) credits. Companies can acquire HWIs either by producing and registering RFNBO use or by purchasing credits from others.

[9] The EU's Renewable Energy Directive III (RED III) which includes a requirement for industries to source 42% of their hydrogen from renewable sources by 2030. It also includes a 1% requirement of all transport fuel to be RFNBO compliant by 2030

For the Road Transport mandate under RED III, operators can either use renewable hydrogen directly or rely on transport fuels derived from renewable hydrogen produced in refineries. However, the Ministry of Infrastructure and Water seeks to incentivise direct hydrogen use by applying a correction factor of 0.4 to fuels produced via refineries – meaning only 40% of an equivalent direct-use credit will be awarded. Refinery operators have criticised this policy, arguing that it may discourage investments in renewable hydrogen. Shell Netherlands CEO Frans Everts has warned[10] that this calculation method significantly hampers further development beyond the sanctioned 200MW Holland Hydrogen 1 project.

Belgium, by contrast, plans to fully credit renewable hydrogen-use in oil refining toward RED III mandates, aligning its policy more closely with Germany's. Germany has opted not to impose company-specific obligations or quotas, instead prioritising emissions reduction. This pragmatic approach aims to increase hydrogen adoption, particularly through government support for CCS-enabled low-carbon hydrogen. While the true effect of these mandates is yet to be seen, Belgium and Germany's strategy to broaden definitions and accelerate project deployment across hydrogen production pathways could provide the momentum the hydrogen industry urgently needs.

Maritime Transport

While FuelEU Maritime has been in effect since 1 January 2025, the outcome of the IMO's April meeting to finalise a global decarbonisation mechanism for the shipping industry will be a crucial milestone.

The proposed 'IMO GHG Strategy Implementation Fund' aims to impose mandatory GHG emissions charges on shipping companies, with revenues directed toward bridging the cost gap between zero/net-zero GHG emission (ZNZ) fuels and conventional marine fuels. However, unlike FuelEU Maritime, the IMO's proposal does not include a clear RFNBO mandate, raising concerns that it may not directly drive the adoption of renewable hydrogen-derived fuels.

As the industry awaits the IMO's decision, one thing remains clear: for shipping companies to commit to long-term fuel contracts and enable marine fuel projects to progress, a combination of economic penalties and targeted incentives will be essential to accelerate the transition towards sustainable marine fuels.

Aviation

The EU Aviation Safety Agency has introduced strict penalties for airlines that fail to meet e-SAF targets under the ReFuelEU Aviation directive. Non-compliance will result in fines at least twice the reference price of e-SAF, with exact penalties determined by each EU member state. The reference price, published annually, serves as a benchmark for enforcement. Notably, this is currently the only EU directive mandating RFNBO use with financial penalties, setting a precedent that could influence regulatory frameworks in other sectors the European hydrogen market.

In contrast, the UK's only demand-side mandate, set to take effect in 2025, requires SAF to comprise 2% of total UK jet fuel demand, increasing linearly to 10% by 2030 and 22% by 2040. However, the mandate does not specify feedstock requirements, meaning the SAF used may not necessarily be hydrogen-derived. As a result, its direct impact on hydrogen production and adoption in the UK remains uncertain.

[10] *Groene waterstof: hoe staan we er na drie jaar voor?* via LinkedIn

Steel

Starting in 2026, CBAM will impose a carbon price on imported goods in emissions-intensive industries, including steel, ensuring that foreign producers face the same carbon costs as EU-based manufacturers under the Emissions Trading System (ETS). By 2034, free carbon allowances for European producers will be fully phased out, forcing domestic manufacturers to either decarbonise or pay rising carbon costs.

The European Commission has also introduced the Steel and Metals Action Plan, which aims to boost demand for low-carbon metals, particularly renewable hydrogen-based steel. A key measure involves new 'non-price' criteria in public procurement, requiring public bodies to prioritise materials that are clean, resilient, circular, and cybersecure. Part of the Industrial Decarbonisation Accelerator Act, this initiative seeks to establish lead markets for low-carbon steel, helping manufacturers secure a green premium and drive further investment in sustainable production.

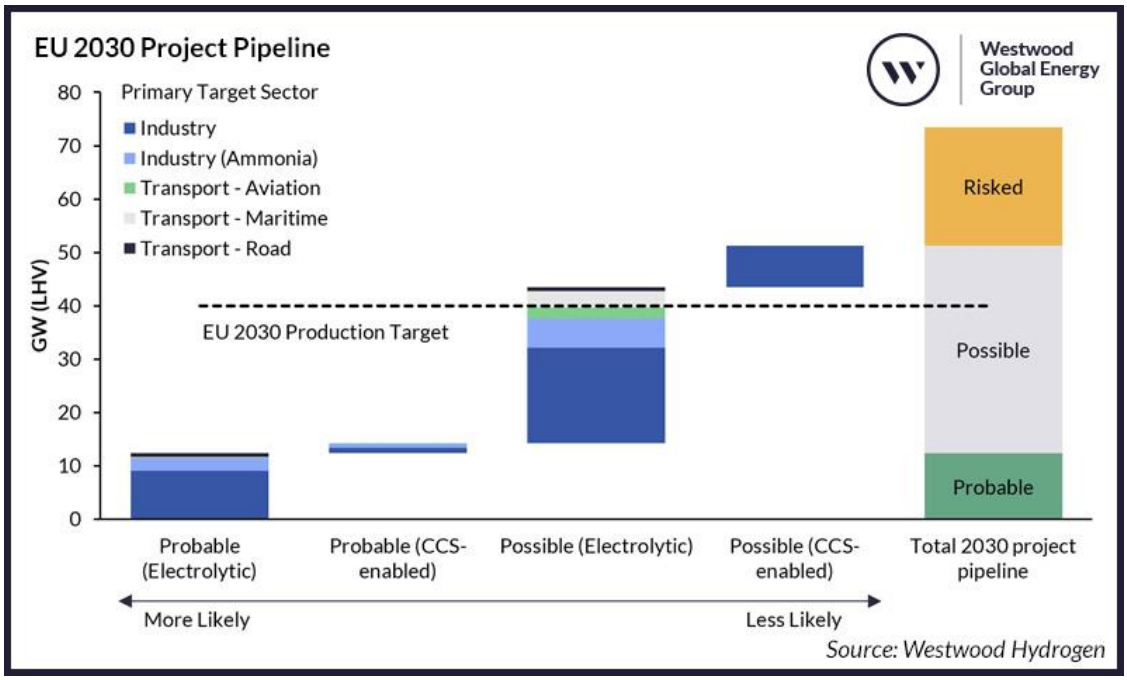
The UK currently has no plans to incorporate hydrogen-derived direct reduced iron (H-DRI) into its steel decarbonisation strategy. Instead, it intends to rely primarily on recycled scrap steel as feedstock for its planned electric arc furnaces (EAFs). However, this remains an area ripe for consideration, as a significant opportunity for hydrogen adoption could emerge if the UK government commits to producing primary steel using H-DRI at the planned EAFs in Scunthorpe and Port Talbot.

How much is realistically achievable?

Based on the three critical factors explored, a realistic outlook for the European hydrogen market emerges. In the EU, if progress on policy frameworks, funding mechanisms, and demand-side mandates remains limited, only 17% (12 GW(LHV)) of the hydrogen project pipeline may come online by 2030. However, with successful implementation, an additional 29 GW(LHV) could materialise, enabling the EU to reach its 2030 production target. In contract, the UK's hydrogen landscape leans more toward CCS-enabled production, with up to 24% of its current pipeline potentially coming online by 2030 – primarily driven by its industrial clusters. While targets are likely to be missed, meaningful progress could create further opportunities across Europe.

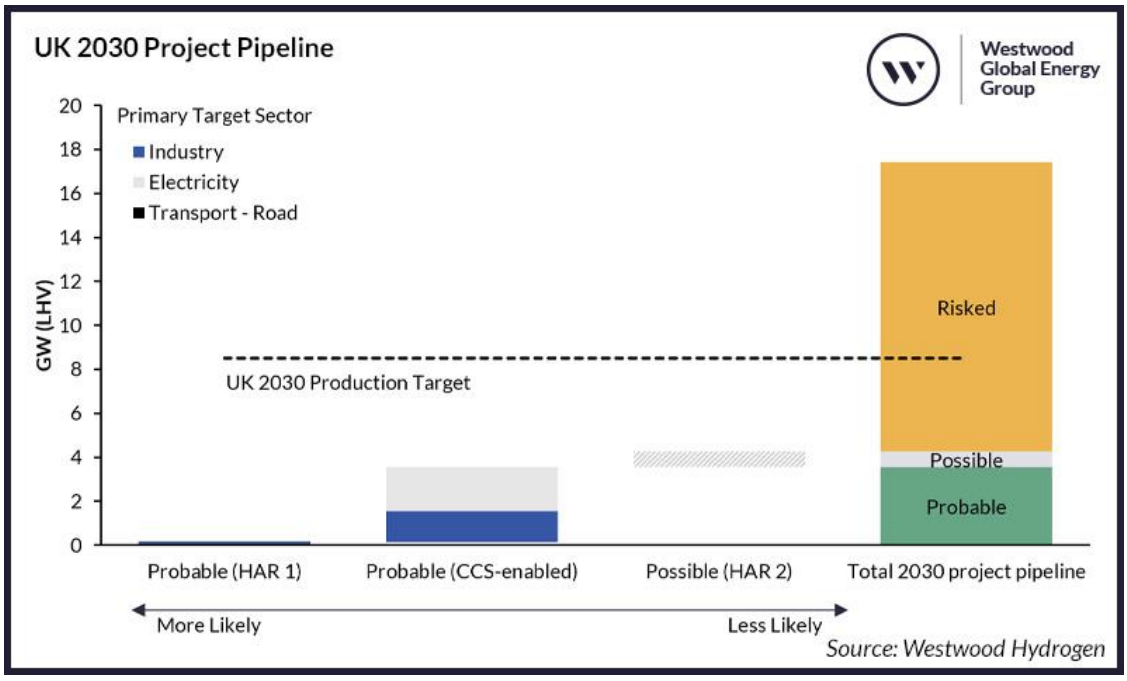
Westwood currently tracks a total of 74.2 GW(LHV) of hydrogen projects that are due to be online by 2030. Considering the industries that have mandates for RFNBO hydrogen usage – industry, fertiliser, maritime transport, aviation and road transport – and Westwood's project certainty criteria, around 12.4 GW(LHV) of electrolytic projects are expected to be online by 2030. With the EU's upcoming Delegated Act on low-carbon hydrogen potentially opening further opportunities for alternative production pathways, the potential EU capacity rises to 13.5 GW(LHV) if 'Probable' CCS-enabled[11] hydrogen projects are included.

Of the 29 GW(LHV) of hydrogen projects categorised as 'Possible', 72% lack a confirmed offtaker, highlighting one of the biggest challenges for the hydrogen market. Without offtake agreements, these projects risk delays or cancellations, reinforcing the need for stronger demand-side policies and incentives to drive market confidence.



EU 2030 Project Pipeline[12]
Source: Westwood Hydrogen; Westwood's Hydrogen Project Certainty Assessment provides the likelihood that a project will reach FID based on nine criteria and categorised into three project certainty statuses: Risked, Possible, and Probable (more in appendix)

[11] Sometimes referred to as low-carbon hydrogen or blue hydrogen
[12] Westwood's Hydrogen solution currently covers Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, and the UK



UK 2030 Project Pipeline
Source: Westwood Hydrogen; The UK hydrogen target is 10 GW(HHV) which is equivalent to 8.5 GW(LHV)

Westwood tracks 16.7 GW(LHV) of hydrogen projects aiming to come online by 2030 in the UK – against its target of 8.5 GW(LHV), split 60-40 between electrolytic and CCS-enabled production. However, the Labour government has only committed to supporting HAR 1 and HAR 2, representing just 0.8 GW(LHV) of electrolysis capacity.

In contrast, CCS-enabled hydrogen has greater potential, with 4 GW(LHV) categorised as 'Probable' within the first two 'Track 1' clusters. The UK government committed to £21.7 bn in investment over 25 years to be allocated between the Hynet cluster, in Liverpool, and the East Coast Cluster, in Teesside. The funding will be available to CCUS and hydrogen projects in these clusters. CCS-enabled hydrogen projects are central within these clusters, with the UK government confirming funding for the first 350MW (LHV) phase of the Hynet HPP1 project in Q4 2024.

The UK may need a more pragmatic approach to electrolytic hydrogen, as only 3 of the 11 HAR 1 projects have signed contracts since being shortlisted in December 2023. Meanwhile, prioritising industrial cluster development and accelerating CCS-enabled hydrogen production – where progress is stronger – could be a more effective strategy.

Conclusion

Unlocking the European hydrogen market's potential now hinges on 3 critical factors: the finalisation of **enabling policy frameworks**; allocation and evolution of **funding mechanisms**; and implementation of **demand-side mandates**.

The market has made it clear that current regulations in the European hydrogen market are hindering growth, prompting calls for reassessment, particularly of the EU's RFNBO rules. While the EU's upcoming Delegated Act may broaden production pathways through CCS and nuclear power, the strict RFNBO rules are unlikely to change before July 2028. Across the Channel, the UK is awaiting key policy updates, without which scaling before 2030 becomes a challenge. With both regions at critical points, Westwood sees the need for swift and decisive regulatory action as being crucial for hydrogen market development.

Subsidies alone have not closed the cost gap between renewable and fossil-based hydrogen, leading to a shift towards targeting key demand sectors and facilitating offtake agreements. While the European Hydrogen Bank has introduced changes, the effectiveness of these measures remains to be fully seen. Similarly, delays and uncertainties in the UK's funding schemes pose challenges, with further results needed to determine how these approaches may enhance project viability in the future.

Mandates have real potential in driving hydrogen demand by targeting specific sectors with binding targets, penalties, and incentives. While the EU has several mandates set for 2030, the UK only has a single mandate in aviation, which does not explicitly require hydrogen use, revealing a gap in the UK's hydrogen strategy. Effective implementation of these mandates, particularly in sectors with the greatest decarbonisation potential, will be crucial for achieving meaningful progress.

Given these dynamics, the range of outcomes could vary significantly depending on the actions taken to swiftly finalise policy frameworks, implement funding mechanisms targeting demand and offtake, and the effective use of mandates. As a result, Westwood has estimated that the EU's hydrogen production capacity by 2030 could range from as little as 17% (12 GW(LHV)) of its pipeline to potentially meeting its 40 GW(LHV) target. In contrast, the UK's hydrogen ambitions remain more constrained, with CCS-enabled production leading its current trajectory, with up to 24% of the pipeline likely to materialise.

While targets may ultimately be missed, there is still potential for the EU and the UK pipeline to move closer to their 2030 goals. Even if some targets fall short, the right actions can support existing projects and generate new growth opportunities, shaping the future of hydrogen across the region. However, the outcome over the next five years remains highly uncertain, with a wide range of possibilities still in play. The time for action – on the three critical factors – is now.

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Appendix

Project Certainty

Given the current investment climate and the uncertainty stakeholders face, our Project Certainty feature allows clients to adopt a risked perspective of the overall pipeline and assess the likelihood of low-carbon and renewable hydrogen supply projects reaching final investment decision (FID). This in turn enables a data-driven approach to corporate decision-making on investment, asset and resource allocation.

Each pre-sanctioned (i.e. pre-FID) hydrogen project is evaluated based on 9 criteria and subject to a scoring process. Criteria applied includes a mixture of country-specific and project-specific factors, some of which are qualitative and based on house-views.

Project Certainty Status	Certainty Score	Overview
Probable	>=75%	Projects are well progressed and typically deemed likely to reach FID by the stated timeline.
Possible	50-74%	Projects will possibly reach FID by the stated timeline but present an element of uncertainty and therefore should be closely monitored.
Risked	<50%	Projects are deemed to be at risk of reaching FID by the stated timeline.

Mandates

Industry – The EU's RED III mandates that 42% of hydrogen used in industry must come from RFNBOs by 2030, increasing to 60% by 2035. If hydrogen consumption in industry remained constant at 2023 levels – around 5.2Mt – this would require a RFNBO hydrogen demand of 2.2Mt or around 19.7 GW(LHV) of dedicated electrolyser capacity.

Fertiliser – The fertiliser industry falls under the same binding 42% target, however, Fertiliser Europe, who represents around 80% of fertiliser producers in Europe, have set a non-binding ambition to use up to 50% RFNBO hydrogen in ammonia production by 2030 under their 'Green Hydrogen Pathway'. This would require 6.3 GW(LHV) of dedicated electrolyser capacity.

The fertiliser industry is responsible for around 40% of Europe's hydrogen consumption through its requirement for ammonia in the production of fertiliser. 70% of ammonia is used for the production of fertiliser.

Maritime Transport – The International Maritime Organisation (IMO) has set ambitious emissions reduction targets: a 40% reduction in CO_2 per transport by 2030, 70% by 2040, and net-zero emissions by 2050. The FuelEU Maritime sets maximum limits for the yearly average GHG intensity of the energy used by ships calling at European ports above 5,000 gross tonnage. Targets will ensure that the greenhouse gas intensity of fuels used in the sector will gradually decrease over time, starting with a 2% decrease by 2025 and reaching up to an 80% reduction by 2050. A key provision of this regulation is incentivising RFNBOs, including hydrogen-derived fuels, through a multiplier mechanism that allows their greenhouse gas savings to be counted twice in emissions calculations until 2033. Additionally, if RFNBOs fail to make up at least 1% of the maritime fuel mix by 2031, a mandatory 2% quota will be imposed by 2034. This would require 1.2 GW(LHV) of dedicated electrolyser capacity by 2030.

Aviation – The EU's ReFuelEU mandate requires increasing levels of sustainable aviation fuels (SAF) including SAF derived from hydrogen. Hydrogen-derived SAF is specifically required to make up 1.2% of aviation fuel in 2030 rising to 35% in 2050. Given that Europe used 65Mt of kerosene in 2023, the EU would require 3.6 GW(LHV) of dedicated hydrogen electrolysis capacity to achieve 1.2% SAF target at 2023 levels.

The UK currently only has one mandate that could potentially support the uptake of hydrogen. Its SAF mandate, set to begin in 2025, requires SAF to account for 2% of total UK jet fuel demand, increasingly linearly to 10% by 2030 and 22% by 2040. However, as the mandate does not specify feedstock requirements, the SAF may not necessarily be hydrogen-derived, limiting its direct impact on hydrogen production in in the UK.

Road Transport – Under RED III, the EU has set a combined sub-target of 5.5% for advanced biofuels and RFNBOs in transport energy supply by 2030, with a minimum requirement that at least 1% must come from RFNBOs. At 2023 levels of consumption this would require around 1 GW(LHV) of dedicated electrolyser capacity.

Steel – As CBAM phases out free carbon allowances, hydrogen-based steel production is expected to become the dominant low-carbon alternative. The direct reduced iron (DRI) process, which replaces coal with hydrogen as a reducing agent, is emerging as the preferred pathway.

About Westwood

The energy landscape is changing; and Westwood Global Energy Group is evolving in-step to answer the strategic, commercial and technical questions industry stakeholders face each day. As the energy transition develops, those questions only multiply and intensify, and organisations need answers that keep pace with the rate of change.

Home to some of the leading solutions in energy market intelligence, Westwood Global Energy Group offers subscription-based research, bespoke insights and consultancy services across Exploration & Production, Offshore and Onshore Energy Services, alongside a dedicated Energy Transition division, which provides both independent insights and critical intelligence across our specialist areas. Our commitment to data quality, the unrivalled insight from industry experts, and our ability to integrate intelligence into daily workflows means that clients trust our solutions when making critical decisions – time and time again.

About Hydrogen

Hydrogen is our unique market intelligence offering focused on the major European markets. Stay on top of the evolving market opportunity and assess individual projects and pipeline risks.

Drawing on Westwood's New Energies sector knowledge, our Commercial Advisory services cater to both corporate strategy and transaction support. We offer a range of solutions from bespoke market sizing and forecasts to assessing the competitive landscape, procurement dynamics, route to market, peer group benchmarking, business planning and commercial due diligence in relation to M&A and financing situations.

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