Fresh funding approaches to grow the hydrogen economy

Developers and governments are seeking to take the low-carbon hydrogen sector towards commercial maturity, but their success relies on finding smart funding solutions. We look at current best practice and ask, ‘What’s next?’ as the industry strives to initiate growth.

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Introduction

More than 74 countries are seeking to gain a foothold in the low-carbon hydrogen sector, according to the International Renewable Energy Agency. These countries see low-carbon hydrogen as key to their plans for net zero and to cut emissions in hard-to-abate sectors.

The number of projects globally continues to rise. As of November 2024, the International Energy Agency is tracking over 2,200 projects across planning, construction, and commissioning phases – a 12-month increase of over 40%. Of these, 434 projects reached a final investment decision (FID) by September 2024, representing $75bn in committed investment. That total investment across project phases has leapt from $90bn in 2020 to $680bn in 2024 during a period of inflation, rising interest rates, and market uncertainty is indicative of the private sector's appetite to support clean hydrogen.[1]

However, tangible progress has been slower than expected during the last year as developers have grappled with financial reality at their schemes. Bloomberg New Energy Finance (BNEF) estimates that just 30% of capacity announced for commissioning by the end of the decade is likely to come online.[2] After plenty of hype in the industry, the lack of progress in project deployment indicates that, while various support mechanisms have been successful in building out pipelines, more work is needed to increase capacity.

In this report, we look at the existing approaches to funding low-carbon hydrogen projects:

- How market progress has stalled despite growing demand and burgeoning financial support, and what this tells us about funding for low-carbon hydrogen projects.
- Analysis of how businesses and governments are working together to unlock the growth of green hydrogen in the UK, the European Union and Japan.
- Discussion of what comes next in terms of new support mechanisms to expedite sector growth.

Finding the right funding solutions and refining support mechanisms will be vital if the low-carbon hydrogen sector is to grow and follow renewables down the cost curve.

"Tangible progress has been slower than expected during the last year as developers have grappled with financial reality at their schemes."

1 Hydrogen Council, 'Global hydrogen industry reports $75 billion in committed capital but climate targets at stake due to project delays'
2 BNEF, Hydrogen Supply Outlook 2024

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Overview of the **hydrogen market**

BNEF's New Energy Outlook for 2025 emphasises the challenge of building new projects in the hydrogen market: the contrast between the role of low-carbon hydrogen in BNEF's 'Economic Transition Scenario' and 'Net Zero Scenario' is stark. Although global demand for clean hydrogen is projected to reach 585 million tonnes per annum (mtpa) by 2050, demand for clean hydrogen as an economic transition opportunity is very low.

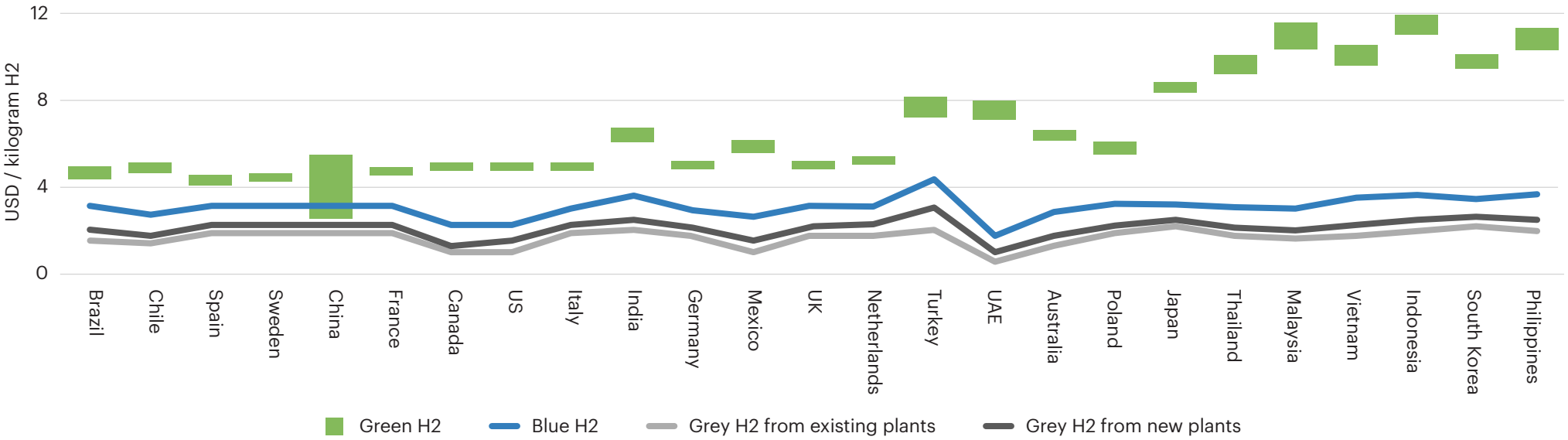
In the US, trade tariffs and tax credit cancellations are weakening the economic case still further. The global industry will likely be affected by short-term cost increases, but the US' loss could be to the gain of the UK, the EU, and the Middle East to emerge as new focal points of industrial development. It may also push project owners towards Chinese technology to improve project economics.

Despite the best intentions of the industry and government support, progress in this sector has stalled with developers struggling to take projects to completion. This is apparent with the announcement of second-round subsidy auction results in the UK and the EU before first-round projects have closed.

There are two key barriers to growth in the market. The first is the cost gap to grey hydrogen which has not lowered sufficiently to deliver projects consistently (see Figure 1). And the second is the lack of appetite amongst potential offtakers – without whom projects are unlikely to achieve bankability,

Figure 1: Levelised cost of hydrogen in 2023, by market

Today, Green Hydrogen Is Consistently More Expensive Than Grey



Source: BNEF

Note: Blue H2 is the average of auto-thermal reforming (ATR) and steam methane reforming (SMR) production. Green H2 includes Western-made proton-exchange membrane electrolyzers (top of range) and alkaline electrolyzers (bottom of range), except in China, which includes Chinese-made alkaline electrolyzers (bottom of range).

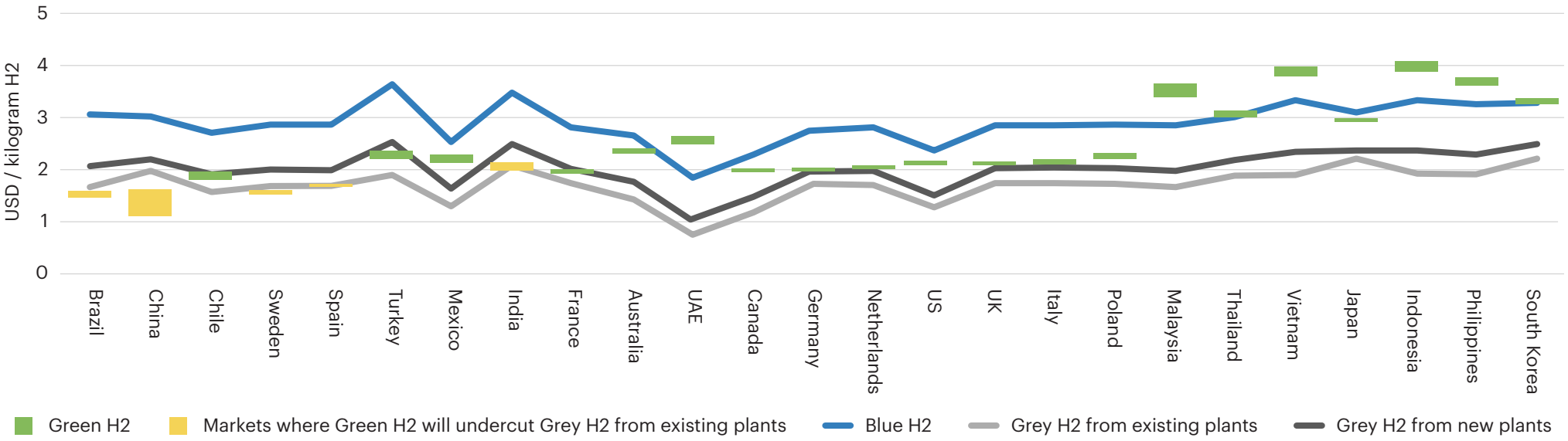
To bridge the cost gap, governments in the UK, the EU, and Asia have issued support mechanisms targeting hydrogen production with initiatives to bolster supply. These initiatives coincide with a 90% uptick in projects worldwide reaching FID.[3] Meanwhile, BNEF estimates that, by 2030, five countries will have achieved the task of making green hydrogen cheaper than grey, with others following their progress (see Figure 2).

Even so, the theme of the EU's subsidy auctions has been low-priced winning bids and delays in reaching FID, meanwhile for the UK auctions it has been lengthy project delays for contract winners.

3 Hydrogen Council, 'Global hydrogen industry reports $75 billion in committed capital but climate targets at stake due to project delays'

Figure 2: Levelised cost of hydrogen in 2030, by market

Green Hydrogen Is Cheaper Than Grey in Five Markets in 2030



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Learning from projects that have made it out of the pipeline, the security of a firm offtake agreement is just as important as subsidised production. This has been a major challenge affecting all producers in the hydrogen market – not just small-scale developers, but large commercial players too. The common experience of schemes being unable to advance due to a lack of offtake opportunities is a limiting factor that the market must overcome if it is to reach maturity and benefit from the entrance of large-scale industrial players.

"The security of a firm offtake agreement is just as important as subsidised production."

Overall, while existing support mechanisms offer some solutions, project execution challenges remain. Understanding which measures are currently working and identifying where shortfalls in support persist will help refine initiatives and re-direct the industry to the pathway towards commercial adoption.

Hydrogen funding approaches in **three key markets**

The policymakers in leading energy transition regions have upped their support for low-carbon hydrogen over the last few years. But how do their initiatives work and what are the next steps that they should take?

HYDROGEN FUNDING APPROACHES IN THREE KEY MARKETS

United Kingdom

The UK's Hydrogen Roadmap targets 10GW of low-carbon hydrogen production capacity by 2030. To achieve this, the Government introduced a CfD-style auction, Hydrogen Allocation Round (HAR), to award 15-year contracts under the Hydrogen Business Model (HBM). This scheme provides revenue certainty for key stakeholders and supply chain companies and de-risks investment.

In HAR2, 765MW of new projects were shortlisted, falling below its 875MW target. This far outstrips HAR1's 125MW of shortlisted capacity but still comes in short of the government's goal to have 1GW under construction by the end of 2025.

"The withdrawal of larger projects from HAR1 underlined that production subsidies alone are not enough to drive deployment without incentivised offtake. "

The high average strike price of £241/MW (approximately £9.49/kg of hydrogen) for HAR1 highlights the focus on closing the financing gap that makes projects inviable. Though yet to be confirmed, we anticipate that the average strike price for HAR2 will remain comparatively high.

Even with this support, the withdrawal of larger projects from HAR1 underlined that production subsidies alone are not enough to drive deployment without incentivised offtake. In the context of these withdrawals and given that half of the HAR1 projects are still under negotiation, the announcement of HAR2 before the conclusion of these negotiations seems rushed, missing an opportunity to learn important lessons from HAR1.

The Department for Energy Security and Net Zero (DESNZ) targets 1.5GW of capacity across future HAR3 and HAR4 auctions, but it will not be enough to only fund initial development costs or provide revenue support for hydrogen production as before. DESNZ needs to establish a synergy between production and demand for hydrogen across various industrial sectors.

The government has started to address offtake with incentivised measures through The British Industry Supercharger initiative and the UK Emissions Trading Scheme. These should stimulate appetite in key industries for potential offtakers – for example, in chemicals, metals, and fertiliser production, and in the transport sector. Additionally, the UK Carbon Border Adjustment Mechanism, proposed for January 2027, should increase offtake appetite to avoid being penalised by a carbon levy. Already, we have seen more projects geared towards metals and fertiliser production in HAR2.

Moreover, domestic producers who convert low-carbon hydrogen to ammonia downstream for export are eligible for Hydrogen Production Business Model backing – so long as the ammonia is not cracked back to hydrogen once it reaches its destination. The government's Clean Energy Industries Sector Plan, released in June 2025, highlights that UK Export Finance aims to support £10bn of clean growth finance between 2024-2029 which should improve export opportunities for UK hydrogen producers.

As with HAR1, the real success of these mechanisms depends on the execution of shortlisted projects in HAR2, and this should be the priority before moving onto HAR3 and HAR4.

HYDROGEN FUNDING APPROACHES IN THREE KEY MARKETS

European Union

The EU is a front-runner in the energy transition and has a 2030 goal to domestically produce 10 million tonnes of green hydrogen and import a further 10 million tonnes. Moreover, under the Renewable Energy Directive, the EU expects 42% of all hydrogen used in industry by 2030 to come from renewable fuels of non-biological origin.[4]

To accelerate the growth of the hydrogen value chain, the European Commission developed a funding scheme, the European Hydrogen Bank (EHB), for developers to bid at auction for 10-year fixed premiums of up to €4.50/kg. As with HAR, the aim is to cover the cost gap for revenue certainty and de-risked investment.

The pilot auction attracted bids from 132 projects across 17 countries and announced seven winning projects in April 2024, promising 1.5GW of electrolyser capacity for fuel, steel, chemicals, marine, and fertiliser sectors.

4 European Commission, 'Renewable Hydrogen'

"While the clearing price might look impressive on paper – hinting at a hydrogen market headed for self-sufficiency in the EU – we have no evidence yet to confirm that this funding approach is successful in executing new projects."

However, unlike HAR, the premium awarded for the successful projects ranged between €0.37/kg and €0.58/kg – significantly below the ceiling price. In October, six of the projects signed grant agreements, but the bidder with the lowest subsidy withdrew from the process, and the extent of the "green" premium offtakers are paying remains unclear. None of these projects have reached FID yet.

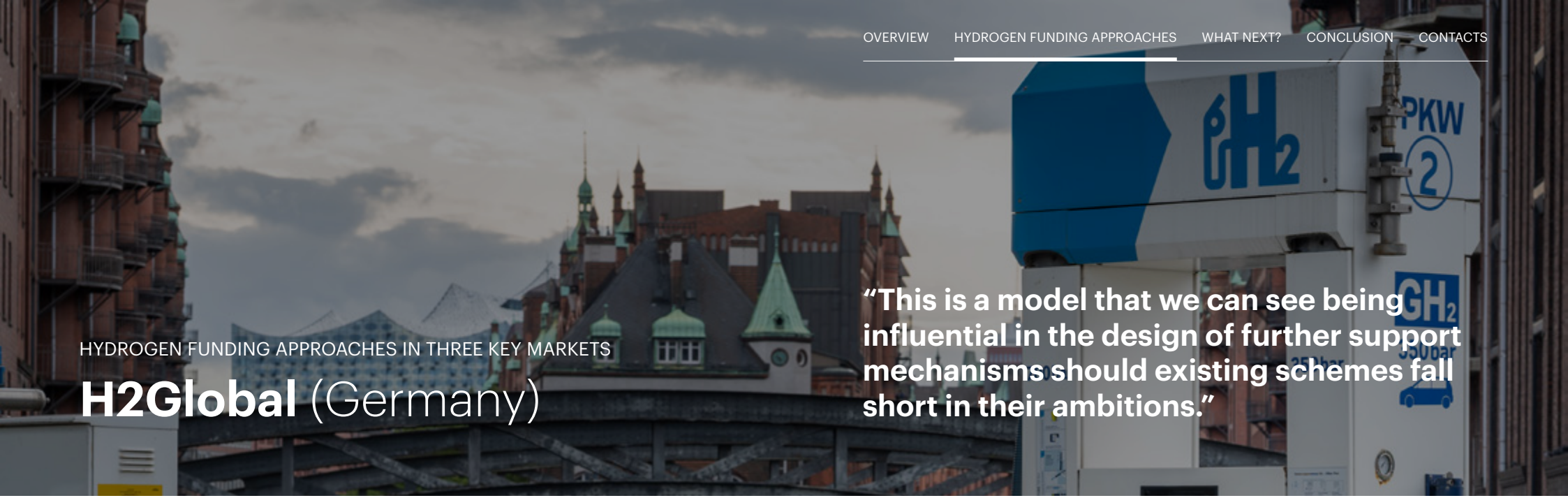
The second auction recently closed with a reduced ceiling price of €4/kg (see Figure 3). Once again, the average bid price is on the low side, ranging between €0.20/kg and €0.60/kg (excluding one winner at €1.88/kg). Across these 15 projects, it is expected that nearly 2.2mtpa of renewable hydrogen will be produced – assuming all projects sign contracts and progress.

Similarly to HAR, this second auction result comes before any first auction winners have made it out of the pre-construction phase and we are waiting to see if these projects can bridge the cost gap with such low bids. While the clearing price might look impressive on paper – hinting at a hydrogen market headed for self-sufficiency in the EU – we have no evidence yet to confirm that this funding approach is successful in executing new projects. Indeed, It is still expected that offtakers will need to see value in RFNBO compliant hydrogen in order to justify the premium over grey hydrogen.

Figure 3: EHB second auction results

Project Name	Coordinator	Country	Bid Volume (kilotonnes CO2e over 10 yrs)	Bid Capacity (MW electric)	Expected GHG avoidance (kilotonnes CO2e over 10 yrs)	Bid Price (EUR/kg)
General topic						
VILLAMARTIN H2	GALENA RENOVABLES 6, S.L.	Spain	126	252	859	0.2
PUERTO SERRANO H2	GALENA RENOVABLES 7, S.L.	Spain	49	98	337	0.25
Kristinestad PtX	Koppö Energia Oy	Finland	258	200	1,763	0.33
SolWinHy Cadiz	Viridi RE GmbH	Spain	63	80	431	0.4
H2LZ	IGNIS HIDROGENO ALFA	Spain	26	20	179	0.41
AGS	ARMONIA GREEN SEVILLA	Spain	238	198	1,631	0.41
AGG280	ARMONIA GREEN GALICIA, S.L.	Spain	238	198	1,629	0.42
H2CRI	GREEN DEVCO ENERGY 6, S.L.U.	Spain	30	30	204	0.44
KASKADE	Meridiam SAS	Germany	354	367.5	2,424	0.45
H2-Hub Lubmin	H2-Hub Lubmin GmbH	Germany	238	210	1,628	0.47
TORDESILLASH2	Elawan Energy	Spain	17	15	115	0.48
Zeevonk Electrolyser	Zeevonk Electrolyser	Netherlands	411	560	2,812	0.6
Maritime topic						
RjukanH2	NORWEGIAN HYDROGEN AS	Norway	29	18.75	201	0.45
Gen2-LH2	Gen2 Energy AS	Norway	104	82.21	714	0.59
HammerfestH2	GREEN H AS	Norway	12	7.5	80	1.88

Source: https://ec.europa.eu/commission/presscorner/detail/en/ip_25_1264



HYDROGEN FUNDING APPROACHES IN THREE KEY MARKETS

H2Global (Germany)

“This is a model that we can see being influential in the design of further support mechanisms should existing schemes fall short in their ambitions.”

Another important low-carbon hydrogen funding scheme operating in the EU is the private-public partnership foundation of H2Global, managed by energy sector companies and German government agencies.

Unlike HAR and the EHB, H2Global runs a dual-auction process in three separate lots for ammonia, methanol, and eSAF. Hintco, the implementation agency, issues a tender for 10-year hydrogen purchase agreements which are then auctioned on one-year contracts to buyers. Hintco then covers the remaining cost gap to secure both revenue certainty for global hydrogen producers and supply at competitive prices for buyers.

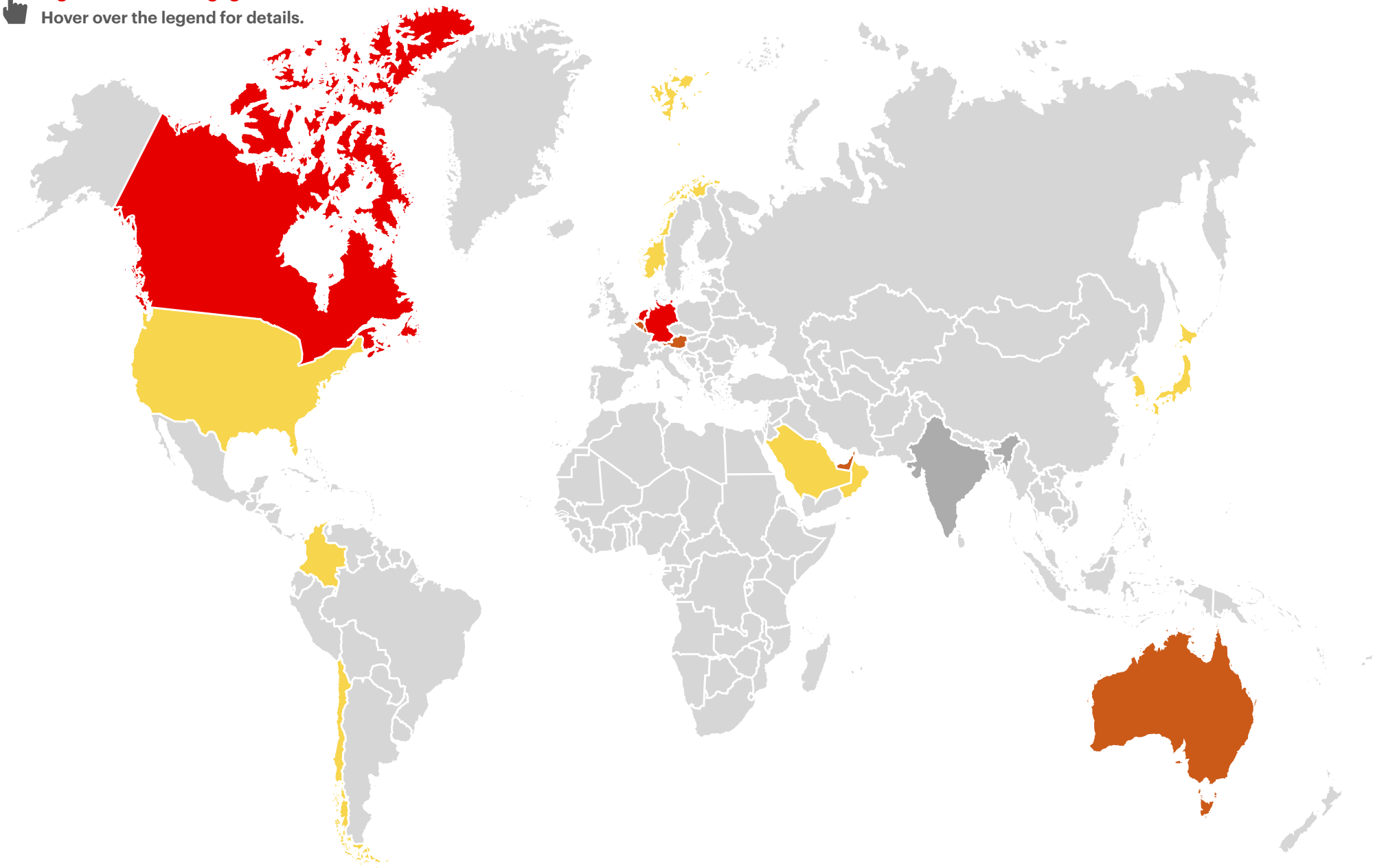
Abu Dhabi-based Fertiglobe was the sole winner of the pilot auction, signing a €397m contract to deliver renewable ammonia to Europe at a price of €1,000/tonne until 2033. As Fertiglobe will start delivering in 2027, we expect to see H2Global launch its first sales auction in early 2026 and it will be interesting to see the level of offtake demand the mechanism has attracted when that process starts.

H2Global’s funding approach does two things very well: first, the price certainty enables key stakeholders to build their strategies around reliable figures; and second, it relieves developers from the pressure of finding their own offtake options.

For the second auction, Hintco announced a tender of €2.5bn as buyer-side investment from the Netherlands and producer-side investment from Australia and Canada helps it ramp up support for global low-carbon hydrogen production and offtake. This is a model that we can see being influential in the design of further support mechanisms should existing schemes fall short in their ambitions.

Figure 4: Global engagement across H2Global auction and mechanism

Hover over the legend for details.



Outreach countries | Countries with funding commitments | Countries with active discussions to use the H2Global mechanism

Source: h2-global.org

HYDROGEN FUNDING APPROACHES IN THREE KEY MARKETS

Japan

In October 2020, Japan became the first country to release a national hydrogen strategy to support its 2050 net zero goal – this strategy aims to produce 20mtpa of low-carbon hydrogen by 2050. Japan has initiated several direct funding options to drive this, including a CfD mechanism similar to the UK's, an industrial cluster support scheme, and a ¥2 trillion (~$13.8bn) Green Innovation Fund to support R&D.

Japan introduced a ¥3 trillion (~$20bn) CfD auction scheme for hydrogen/ammonia projects at the end of 2024, for which 27 applications were submitted. The subsidy programme is designed to cover the production cost gap between low-carbon fuels and conventional fuels over the course of 15-year contracts, providing revenue stability.

Figure 5: Hydrogen Funding Options in Japan[5]

Decarbonisation of energy supplies	Decarbonisation of manufacturing processes	End-use sector	R&D for Green Innovation Fund
JPY 4tr/yr+ (c.USD 27bn+) for energy JPY 20tr (c.USD 135bn) through sovereign GX Transition Bonds: JPY 14tr for use of proceeds and JPY 6tr for additional allocation	JPY 1.3tr/yr (c.USD 9bn)	JPY 2tr/yr (c.USD 13.8bn)	JPY 2tr/yr (c.USD 13.8bn) (expected to increase)

5 Figures from the Ministry of Economy, Trade, and Industry, 'Pathways to Japan's Green Transformation (GX)

It is thought that this mechanism will not be repeated and that broader industrial CfDs will support the uptake of hydrogen and ammonia more indirectly in future. Even so, this kick-starter has drawn more engagement than South Korea's low-carbon hydrogen power generation tender in November 2024 where there was a solitary winning bid. In that tender, the high cost of clean co-firing fuels deterred potential buyers so it will be instructive to see how many bids have learned from that and prove to be successful later in the year.

By contrast, Japan's Clusters Support Scheme works through concentrated grant funding and has identified eight clusters for hydrogen infrastructure development. This approach aims to displace grey hydrogen in heavy industrial processes and reduce transportation logistics costs. A budget of roughly ¥1.4bn (~$9.1m) has been finalised for the feasibility study phase and a further ¥5.7bn (~$38m) is expected to support the completion of FEED works by 2026. Hubs need to start supplying hydrogen by 2030.

In addition to supporting H2 imports and consumption, further regulatory and revenue support is necessary to encourage development of the H2 hubs targeted by the Japanese government. If support schemes underpinning these hubs focus on building out a robust value chain of production, storage, bunkering, and distribution facilities then it will enable the Japanese hydrogen market to raise its competitiveness and hone its business case for developers, offtakers, and investors.

"The high cost of clean co-firing fuels deterred potential buyers so it will be instructive to see how many bids have learned from that."

What **next?**

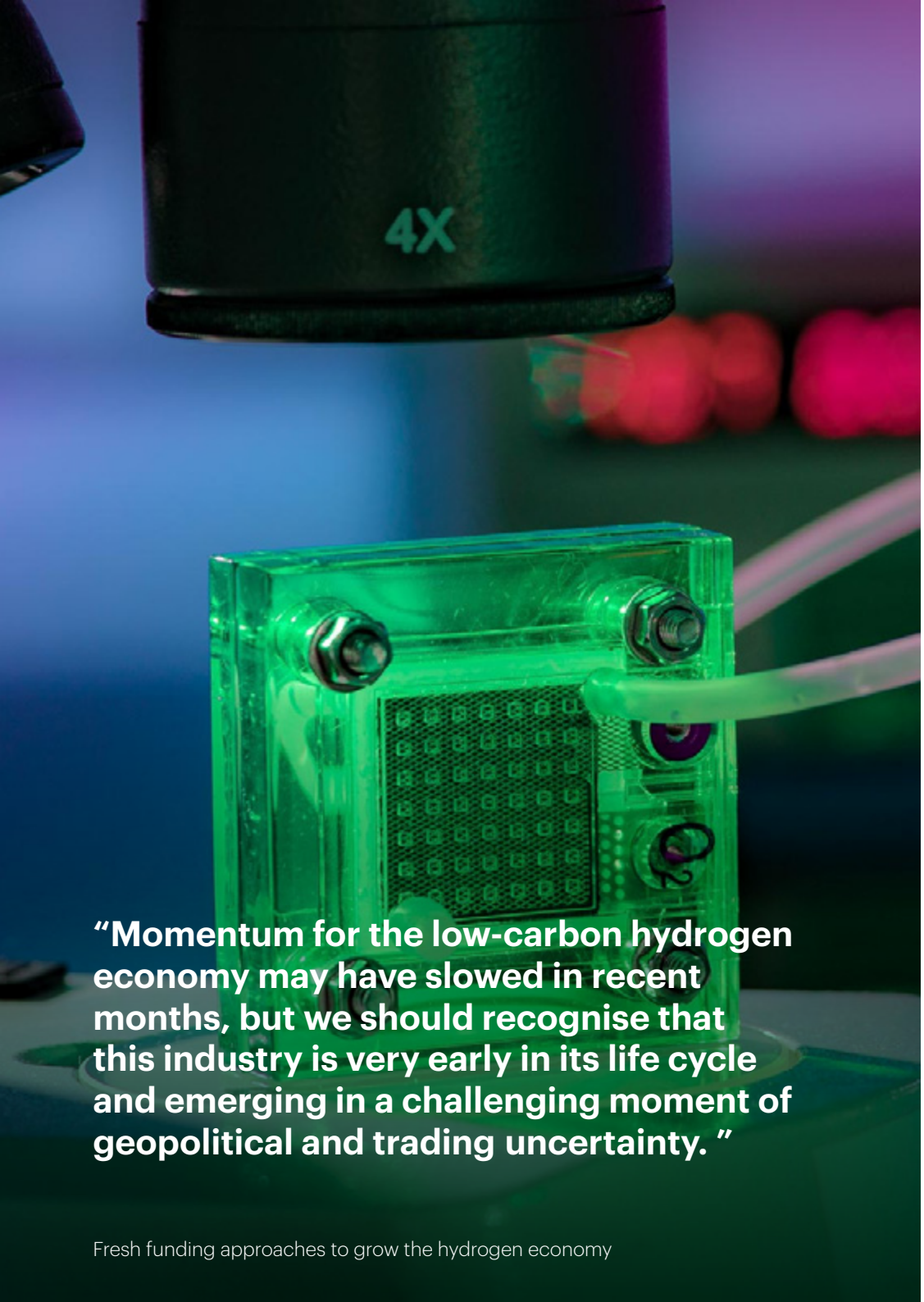
While existing mechanisms have concentrated on revenue certainty, work is required to bring more offtakers to the table. Currently, mechanisms depend upon finding offtakers willing to commit to long procurement contracts, which breaks from traditional short-term procurement approaches. The offtake agnostic approach taken by governments often ends up diluting the impact of subsidies bridging the cost gap.

Mechanisms like H2Global – that act as a conduit for industry instead of relying on potential buyers to enter into long-term agreements – offer a model for more effective support moving forward. If other markets can find a way to mediate between long-term production price security and flexible procurement on an annual basis, we believe the rate of project deployment would increase.

The alternative is to further incentivise buyers to change their procurement behaviours. One way to do this could be to offer tax credits for low-carbon hydrogen sold to strategic sectors. Equally, weighting CfD strike prices according to the offtaker type could produce a similar effect. These approaches would improve demand certainty and help the industry deploy more projects by reassuring buyers of price stability, with more flexible offtake strategies available as a result.

Overall, even with subsidy support the industry is struggling to get projects over the line. We believe a greenium is still necessary to bridge the cost gap, but support mechanisms can still do more to establish offtaker trust and engagement because, without this, it is unlikely that projects in the pipeline will consistently be built.

“The offtake agnostic approach taken by governments often ends up diluting the impact of subsidies bridging the cost gap.”



“Momentum for the low-carbon hydrogen economy may have slowed in recent months, but we should recognise that this industry is very early in its life cycle and emerging in a challenging moment of geopolitical and trading uncertainty. ”

Conclusion

Momentum for the low-carbon hydrogen economy may have slowed in recent months, but we should recognise that this industry is very early in its life cycle and emerging in a challenging moment of geopolitical and trading uncertainty.

In general, it is not a bad thing for the industry that projects with marginal business cases are paused or cancelled. As in the early days of wind and solar, those that fall away allow more viable projects to drive the industry forward. This is a vital step if the low-carbon hydrogen industry is to achieve commercial maturity.

Even so, now that we have seen the potential of support mechanisms to build out pipelines for industry growth, the priority must be to ensure that these projects make it to completion. Moreover, industry uncertainty can work in the favour of markets outside the US in the mid-term who now have an opportunity to become leaders in low-carbon hydrogen production.

To break the hype-disappointment cycle, we believe it is crucial that support mechanisms are refined to better stimulate offtake demand. Just as funding schemes have focused on closing the cost gap, they must also focus on closing the gap between producers and buyers.

There is great potential in the low-carbon hydrogen industry, but success and consistent deployment relies on all stakeholders in the value chain working together to meet their needs.

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