Hydrogen East

H2 News Hub

Issue 8

H2 East

July 2021

Top stories

In Issue 8 of **Hydrogen East**'s Sector Review, we take a look at important publications and developments over the month of June (2021).

In its latest progress reports to government, the **Climate Change Committee** warned government has proven too slow to follow historic climate promises made over the past year with delivery, with key publications such as a Hydrogen Strategy now urgently needed.

This was echoed in a joint statement, with **Hydrogen East** among the signatories, calling for support now if hydrogen is to be rolled out on a wide scale by 2030.

Hydrogen Strategy Now released the findings from its State of the Hydrogen Nation survey, which found that almost 8 in 10 (78%) of industry leaders want a more ambitious hydrogen production target than the 5GW government has committed to for 2030.

In another survey, **DNV** sought to explore the outlook for emerging hydrogen value chains and found three-quarters (73%) of respondents do not feel the Paris Agreement will be achieved without a large-scale hydrogen economy. We also take an in-depth look at the **Fuel Cells and Joint Hydrogen Undertaking**'s report into hydrogen valleys, which looks into how they can reach their full potential.

Contents

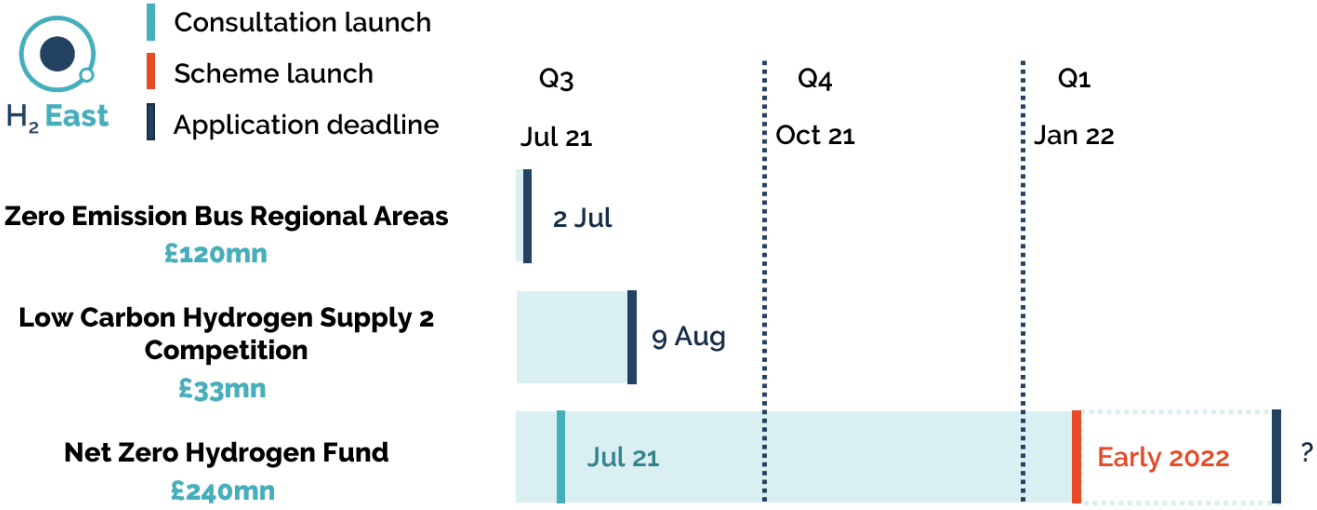
Upcoming webinars

7 July – **SHFCA:** Hydrogen Aviation Opportunities | **8 July** – **Aurora:** Shades of green (hydrogen): optimising electrolyser business | **13 July** – **AB Energy UK:** Accelerating NET ZERO with GREEN GAS | **14 July** – **H2FC Supergen:** Progress and Future Challenges in Hydrogen and Fuel Cell Research | **21 July** – **FLN:** Hydrogen in the UK | **21 July** – **IES:** The potential role of hydrogen in the decarbonisation of energy

Funding tracker

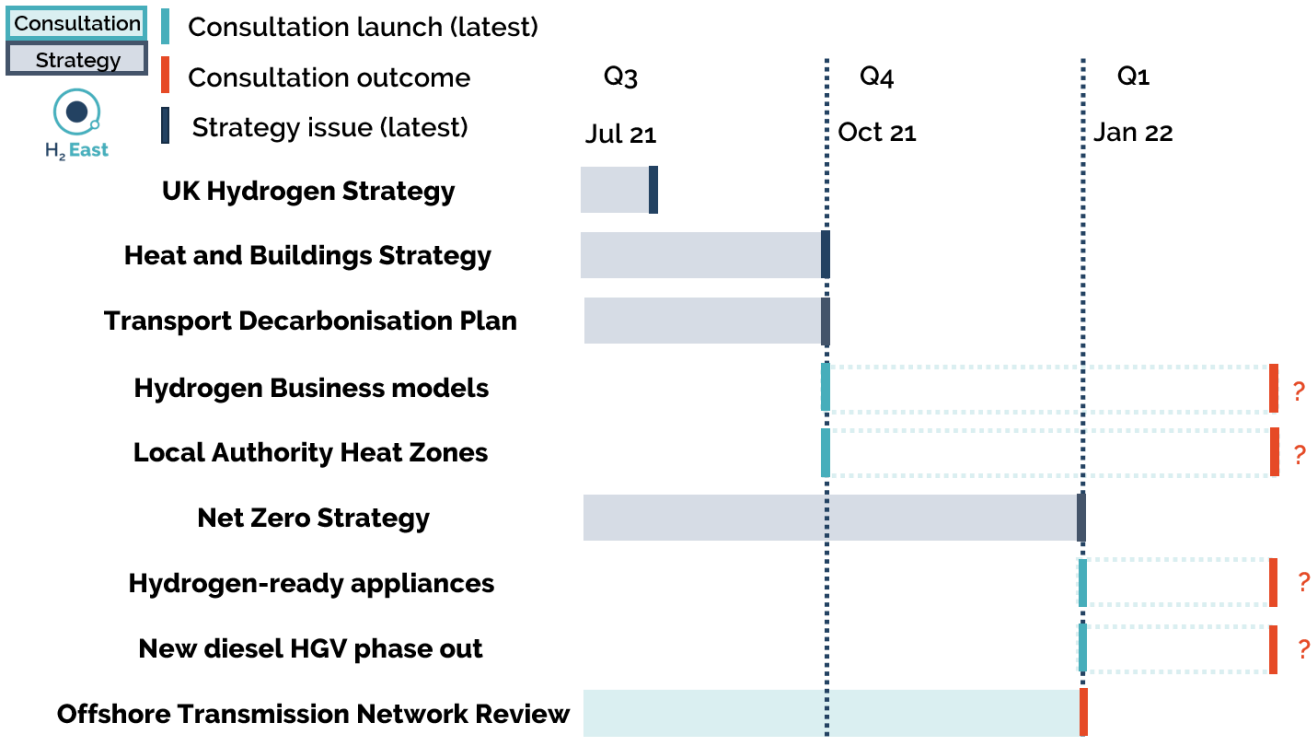
There are a number of funds already available for developers, local authorities and innovative organisations. These cover both feasibility studies and demonstrator projects.

The **Net Zero Hydrogen Fund**, expected to be consulted on in July 2021, has been promised for early 2022. This will be the primary area of government funding for hydrogen projects in the near-term, with up to £240mn on offer.



Policy tracker

A number of consultations and strategies are in development and are expected to be issued in 2021. Most crucially, the UK government has committed to launch of a **UK Hydrogen Strategy**, which is currently ear-marked for July 2021.

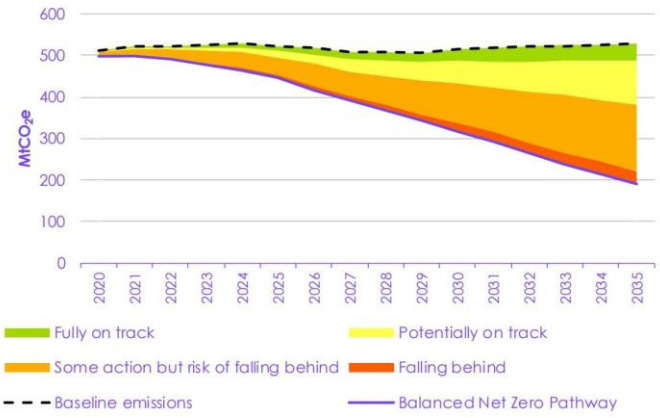


Delivery must now be focus for net zero and hydrogen

An "urgently needed" ambitious Heat and Buildings Strategy that works for consumers and a Hydrogen Strategy are among the key bits of policy government has been told to deliver.

Figure 1: Is government ambition on track?

(Source: CCC)



On 24 June, the Climate Change Committee (CCC) published its latest progress report, warning that despite government making historic climate promises over the past year, it has been too slow to follow them with delivery. Uncertainty and delays to new climate strategies have hampered what should be a "defining year for the UK's climate credentials" with progress now needed across a range of areas to get on track to net zero.

Lockdowns contributed to 2020 seeing a record decrease in emissions – 13% on 2019 – but they are expected to rebound next year. Furthermore, with delays to the publication of key plans, there is a large gap in policy. Credible policies for delivery were found to cover just 20% of the emissions reductions required to meet the Sixth Carbon Budget.

Success in decarbonising electricity must continue and be matched with strong policy commitments to decarbonise UK buildings, transport, industry and agriculture. Delivering the emissions reductions needed will call for government leadership, underpinned by the Net Zero Strategy, with the CCC outlining a comprehensive set of recommendations.

This includes delivering a Hydrogen Strategy, one that outlines a vision of the role for hydrogen on the path to net zero and the steps needed to realise it. It should focus on hydrogen use in sectors that cannot decarbonise without it and low carbon hydrogen production routes to 2035, with a goal to commence large-scale trials in the 2020s.

The need to focus on delivery echoes a joint media statement from Hydrogen East, the UK Hydrogen and Fuel Cell Association, Energy UK, RenewableUK, Decarbonised Gas Alliance, Midlands Hydrogen and Fuel Cell Network and British Compressed Gases Association. With the CCC forecasting £50bn per year will be needed by 2050 in decarbonisation spending, the 2035 target of a 78% reduction in emissions means this investment must be unlocked quickly to deliver the infrastructure future society will rely on.

On hydrogen in particular, the group said support is needed now if it is to be rolled out on a wide scale by 2030. Considering its many potential uses in heavy industry, heating, transport, aviation and supporting the power industry, the group deemed current debates around hydrogen to be "unhelpful" and detracting from the overall net zero goal.

For example, there is little public benefit to debating merits of battery compared to fuel cell-powered electric vehicles when both are needed for net zero, or whether carbon capture will be needed considering the CCC, among others, has already affirmed its importance. While it is important net zero energy policy is considered, iterative and affordable, "paralysis through analysis" will be more costly to the UK's decarbonisation efforts than investing more in one net zero technology than another once the first projects are delivered. Instead, the only way to learn how technologies can truly enable the transition is by building and learning from them.

Hydrogen Strategy set to be published in July

The UK Hydrogen Strategy will be published "before the summer recess", according to Energy Minister, Anne-Marie Trevelyan.

On 11 June, Trevelyan answered a question from Conservative MP, Peter Aldous, on when BEIS is planning to publish the strategy, as well as what assessment it has made of progress on expanding the UK's hydrogen production capacity to date. With the House of Commons set to rise for summer recess on 22 July, it suggests the strategy is imminent, with Trevelyan stating it will map out what is required to build a hydrogen economy fit for 2030, the Sixth Carbon Budget and beyond, while maximising economic benefits and supporting jobs and skills.

With regards to the second part of the question, Trevelyan noted the need for a "significant increase in production levels" of hydrogen to meet future energy needs and cited the publication of an expression of interest for the government's Low Carbon Hydrogen Supply 2 Competition as part of efforts to support further innovation in this area.

Trevelyan also assured that, alongside the strategy, the government will consult on policy instruments to further support an increase in low carbon hydrogen production, including the £240mn Net Zero Hydrogen Fund and the government's preferred long-term, sustainable business model, which will be finalised in 2022.

Rail industry calls for hydrogen train fleet commitment

Government has been told to commit to a hydrogen train fleet in the Hydrogen Strategy.

On 23 June, the Railway Industry Association (RIA) published a briefing, highlighting the role hydrogen can play on the rail network, including how it could kickstart its decarbonisation. Hydrogen trains can reach up to 100mph and have a range of 600 to 800 miles. This makes them a feasible replacement for existing diesel passenger rolling stock on longer and less intensively used regional routes, where speeds are 100mph or less and there is no economic case for electrification.

It further cited how 3,000-3,300 diesel passenger vehicles will need to be replaced, re-engined or converted for the rail network to be decarbonised by 2040. As many as 2,400 of these could be replaced with alternative low carbon options, such as hydrogen. Other reasons to commit to a hydrogen train fleet include how it would support jobs, investment and economic growth at a key time for the UK economy. It would also further investment, providing an industry capability that the UK could export abroad.

Applications open for low carbon hydrogen supply competition

The government has opened applications for its Low Carbon Hydrogen Supply 2 competition.

On 25 June, BEIS announced that Stream 1, Phase 1 and Stream 2 of the competition have opened to applications, with up to £60mn set to be awarded to projects that can help to develop a wide range of innovative low carbon hydrogen supply solutions. The competition is striving to support innovation in the supply of hydrogen, reduce the costs of supplying hydrogen, bring new solutions to market and ensure the UK develops world leading hydrogen technologies for a future hydrogen economy.

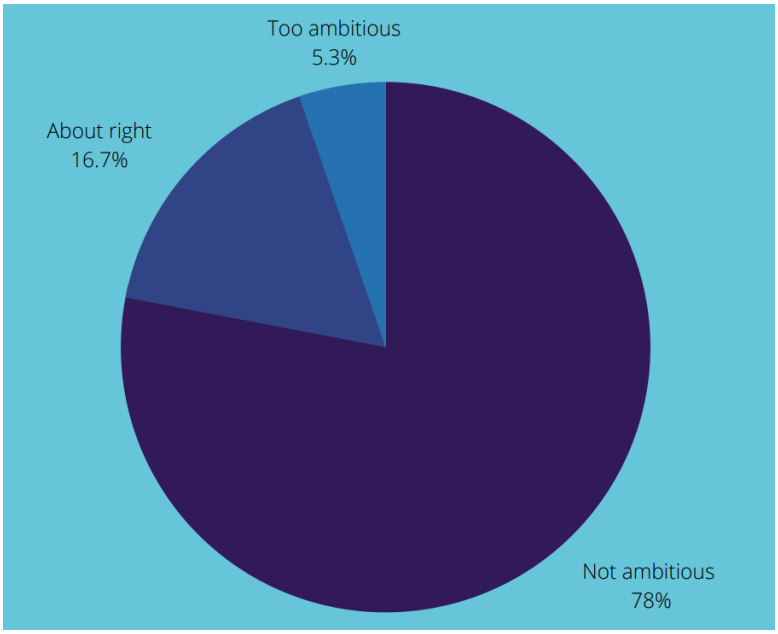
The first phase of Stream 1 – which will run over two phases – will support the development of feasibility studies with technology readiness levels between 4 and 6 with projects valued at up to £300,000. The second phase will support demonstrations at up to £6mn per project. Stream 2, meanwhile, will support demonstration of projects that are closer to market with technology readiness levels between 6 and 7. Projects will supported with up to £10mn to demonstrate hydrogen supply opportunities. The deadline for applications is noon on 9 August 2021.

Hydrogen industry eager for an increase in ambition

A majority (78%) of industry leaders want a more ambitious hydrogen production target than the 5GW set out within the 10-point plan, a survey has revealed.

Figure 2: "Do you think current hydrogen targets are ambitious enough?"

(Source: Hydrogen Strategy Now)



On 17 June, Hydrogen Strategy Now published the findings from its State of the Hydrogen Nation survey, which had sought to collate views from industry leaders on the progress and potential of the UK hydrogen sector to date.

It also looked into the policy measures required to maximise the sector's ability to create jobs and achieve major net zero gains, with a "bigger, bolder" production target recommended as it would support further and faster private investment and job creation into UK hydrogen projects

In terms of what the most important measure is government has taken on hydrogen to date, respondents overwhelmingly felt hydrogen's inclusion as the second point of the 10-point plan was the most important measure. The commitment to publish a UK Hydrogen Strategy, the creation of hydrogen hubs in Teesside and Holyhead, proposals for a Clean Maritime Fund, consideration of hydrogen-ready appliances and the creation of a Hydrogen Advisory Council were also all cited as encouraging measures.

However, six in 10 (61%) are not confident the forthcoming strategy will create a "world leading" hydrogen market. This was cited as a finding ministers should closely consider as to create a world leading market, businesses must have the confidence to invest. Furthermore, the lack of a hydrogen strategy to date was referenced by half (49%) of respondents as stifling investments in the sector to date. Over two-thirds (38.4%) also stated the UK is harder to invest in than other countries. Considering these findings, Hydrogen Strategy Now emphasised the need for government to stick to its commitment and publish a UK Hydrogen Strategy within the first half of the year.

Government was deemed to be "somewhat" coordinated across departments on hydrogen by 65%, with the campaign referring this as a strong position to build from, recommending a cross-government political working group on hydrogen is created including representatives from the devolved administrations and local government. On local government, 41% have spoken to their MP about policies required to enable them to invest in hydrogen in the UK, 47% have spoken with their local council and 47.6% have spoken to a Combined Authority. While industry is engaging with politicians at all levels, the report said this is mixed and is something that could be improved.

Large-scale hydrogen economy key to clean energy future

The Paris Agreement will not be achieved without the emergence of a large-scale hydrogen economy, according to research.

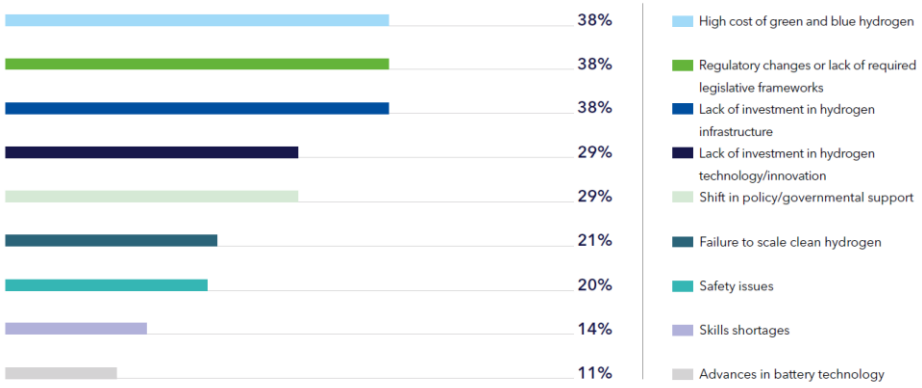
Rising to the challenge of a hydrogen economy, published by DNV, explored the outlook for emerging hydrogen value chains through a survey of more than 1,100 senior energy professionals. Over the past 12 months, three-quarters (74%) felt the outlook for a hydrogen economy has improved substantially while 67% expect this to continue in the coming year. The energy industry looks set to rise to the challenge of establishing a hydrogen economy, with two thirds (64%) of hydrogen revenue generators and consumers expecting hydrogen to account for more than 10% of their company's revenue or spending by 2030. Over a quarter (26%) expect it to account for more than 50%.

On the reasons why companies are getting involved in the hydrogen economy, the fact it is a profitable business opportunity (54%) was seen as the main driver, followed by an ethical conviction of the need to contribute to a net zero energy system (46%) and the need to replace a carbon intensive part of the business (46%).

Its role in the fight against climate change was emphasised by respondents with 84% believing it to have the potential to be a major component of a global, low carbon energy system, 73% warning the Paris Agreement will not be achievable without a large-scale hydrogen economy and 74% stating that, whether economically viable or not, it will be impossible to achieve a zero carbon economy in 2050 without hydrogen.

Figure 3: Greatest risks in progressing the hydrogen economy

(Source: DNV)



However, despite hydrogen's value to a future energy system, seven in 10 (71%) feel current ambitions underestimate the practical limitations and barriers to adoption. Infrastructure and cost were highlighted as the biggest hurdles, whereas the right regulations and carbon pricing were deemed to be the biggest enablers. Proving the safety case for hydrogen was also cited as important to scaling the hydrogen economy.

In terms of the future, 80% expect hydrogen and electrification to work in synergy by 2030, helping one another to scale up, while half (47%) think more blue hydrogen will be produced and consumed than green hydrogen by 2030, compared to 35% who believe the opposite. A majority (52%) believe hydrogen markets will be highly regional, without significant imports and exports and intercontinental transport, compared to four in 10 (42%) who feel it will be a fully globalised market by 2030. As for pricing models, 43% feel hydrogen will be priced like electricity or water, with industry receiving a regulated, stable rate of return.

OGA publishes study on role of Bacton as a clean energy hub

The OGA has published a short-version report of a study by Progressive Energy on Bacton's potential to become a significant hub for clean energy and hydrogen.

The report highlights the role for a combination of natural gas to make blue hydrogen and wind to produce green hydrogen. It noted the potential for "very significant hydrogen demand" in the Bacton Catchment Area in a context where "Bacton wind farms could produce nearly 40% of the Government's 40GW by 2030 target" for offshore wind. This could be the equivalent of almost 20% of the government's 2030 5GW low-carbon hydrogen production target. The report also makes the case for potential use of constrained wind energy for generation of hydrogen at Bacton with blending into the National Transmission System. It notes that producing hydrogen through otherwise curtailed wind energy could meet 50% of local hydrogen demand.

Natural gas reserves for blue hydrogen production were outlined to potentially be sufficient "to last until the 2040s" with carbon captured and stored offshore from Bacton. Blue hydrogen with Carbon Capture and Storage (CCS) could reduce emissions equivalent to nearly 15% of the 10-Point-Plan's target for removal of 10MT of CO_2 by 2030. Nuclear energy was also flagged as a potential contributor to hydrogen production with Sizewell B and the planned Sizewell C offering scope for higher load factors for hydrogen produced through electrolysis. (See our summary on the potential for Sizewell and hydrogen here).

Opportunity was also highlighted for Bacton to contribute to decarbonisation in wider parts of GB such as in London and the South East of England across domestic, commercial and industry and transport demand sectors.

In May 2021, Hydrogen East published its report on the role of Bacton in stimulating hydrogen development across Norfolk and Suffolk. The report compliments recommendations made by the OGA-commissioned study, with granular analysis on potential hydrogen demand build-out across New Anglia Local Authorities for road, rail, heating and power generation through to 2050. It also supports the potential role for green hydrogen through the region's significant offshore wind resource and nuclear facilities, in addition to an abundance of solar PV and other distributed generation. The proximity of Bacton to the Southern North Sea and its access to natural gas reserves into the future also creates significant scope for blue hydrogen production at the terminal. The Hydrogen East study Summary Report can be accessed here.

First hydrogen double decker buses launch in England

England's first hydrogen double decker buses have been introduced in London.

On 23 June, the 20 hydrogen fuel cell double decker buses were launched, marking a significant step towards making all of London's buses zero emission by 2030 and improving the capital's air quality. They will join over 500 electric buses already in operation in the core fleet and are expected to provide smoother, quieter journeys due to fewer vibrations. Transport for London (TfL) has provided £6mn in funding, along with over £5mn from the Fuel Cells and Hydrogen Joint Undertaking (FCH JU) and Innovation and Networks Executive Agency (INEA), and £1mn from the Office of Zero Emission Vehicles.

The investment has supported jobs across the UK, with the buses manufactured by Wrightbus in Northern Ireland, gas cylinders produced by Luxfer in Nottingham and hydrogen produced at Air Liquide's plant in Runcorn. From 2023, the hydrogen will be produced by electrolysis from a direct connection to an offshore windfarm. Ryze Hydrogen, based on Oxfordshire, has been tasked with transporting the hydrogen to the fuelling station. The station itself, completed by Danish firm, Nel Hydrogen, can top up each bus, once per day, in just five minutes.

Government told to fast track floating wind and hydrogen scheme

The UK and Scottish governments have been told to make an "exceptional case" for a £10bn floating wind and hydrogen scheme that its developers assure would deliver an "extraordinary outcome" for both the economy and the environment.

On 1 June, Cerulean Winds unveiled its plans to accelerate decarbonisation of oil and gas assets through an integrated 200-turbine floating wind and hydrogen development. It will have the potential to abate up to 20mn tonnes of CO2 through simultaneous North Sea projects West of Shetland and in the Central North Sea, as well as safeguarding as many as 160,000 current oil and gas jobs and creating 200,000 new ones in the floating wind and hydrogen sectors over the next five years.

The proposed development specifically includes over 200 of the largest floating turbines at sites in the West of Shetland and the Central North Sea with 3GWh of capacity, feeding power to offshore facilities and excess 1.5GWh power to onshore green hydrogen plants.

It also involves the ability to electrify the majority of current UKCS assets, along with future production potential from 2024 to reduce emissions "well ahead" of abatement targets; 100% availability of green power to offshore platforms at a price that is below current gas turbine generation through a self-sustained scheme with no upfront cost to operators; the development of green hydrogen at scale and £1bn hydrogen export potential; and it will have no need for subsidies or CfD requirements, while providing hundreds of millions in revenue through leases and taxation to 2030.

Cerulean has undertaken necessary infrastructure planning for the scheme, ensuring it has the required level of project readiness, with financial close targeted for Q1 2022. Construction would follow shortly after, ahead of energisation in 2024. A formal request for seabed leases has been submitted to Marine Scotland.

Joint funding bid for decarbonising of Port of Immingham

Uniper, Siemens Energy, Toyota Tsusho and Associated British Ports (ABP) have joined forces to submit a joint funding bid for decarbonising the Port of Immingham.

On 2 June, the group announced a bid had been submitted to the Clean Maritime Fund for matched funding, as they develop a vision for a low carbon hydrogen supply to the port. Should it prove successful, work on a full feasibility study for the project could commence as early as September. This would explore the technical and economic feasibility for reducing the port's greenhouse gas emissions with hydrogen and develop a clear plan for future development.

With the Port of Immingham handling over 54Mt of cargo annually, the four companies believe it to be ideally placed to take advantage of existing infrastructure in the region, as well as capitalising on the respective expertise each of them offers. The project is targeting a scalable decarbonisation solution within the port that could be replicable to others, acting as a first step in the uptake of hydrogen as a fossil fuel alternative across the maritime sector.

The project could see an initial 20MW supply of green hydrogen to the Port of Immingham by 2025, with to produce it from electrolysis, using a renewable energy source such as offshore wind, with this then used as a direct replacement to diesel and heavy fuel oil, or for producing clean shipping fuels. Uniper's nearby Killingholme power station has already been identified as a potential location for an electrolyser to produce this hydrogen for the port. Uniper would lead the feasibility study, with Toyota Tsusho carrying out an assessment of the conversion, replacement or retrofitting of port equipment, hydrogen refuelling infrastructure and achievable greenhouse gas reductions.

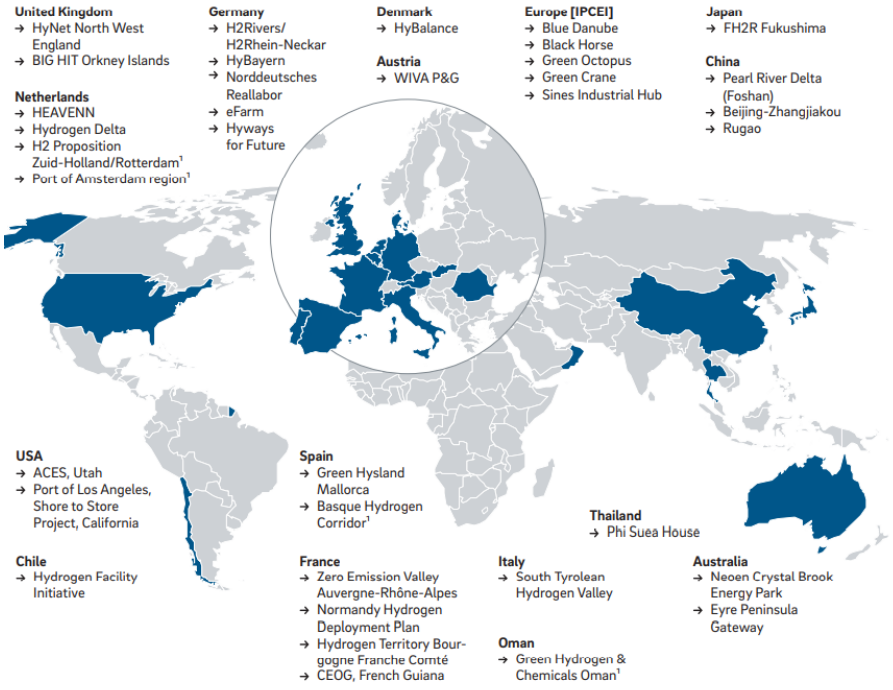
Report explores how hydrogen valleys can reach their full potential

A clear development framework, along with a conducive regulatory environment, are among the key drivers to enable hydrogen valleys to fulfil their potential, a report has said.

On 2 June, the Fuel Cells and Hydrogen Joint Undertaking (FCH JU) released a report into hydrogen valleys. It was unveiled during the launch of the Mission Innovation Hydrogen Valley Platform, a global platform featuring more than 30 global hydrogen valleys with a collective investment volume of over €30bn, offering a first-of-its-kind look into the global hydrogen valley project landscape.

Figure 4: Hydrogen valleys on the Mission Innovation Hydrogen Valley Platform (as of 31 May 2021)

(Source: FCH JU)



The report explored some of the findings from this, highlighting best practice and exploring how policymakers can ensure hydrogen valleys are able to achieve their full potential as enablers of a global hydrogen economy. Emerging globally over the past few years, hydrogen valleys have formed some of the first regional hydrogen economies which can act as bottom-up stepping stones for developing an overall hydrogen economy.

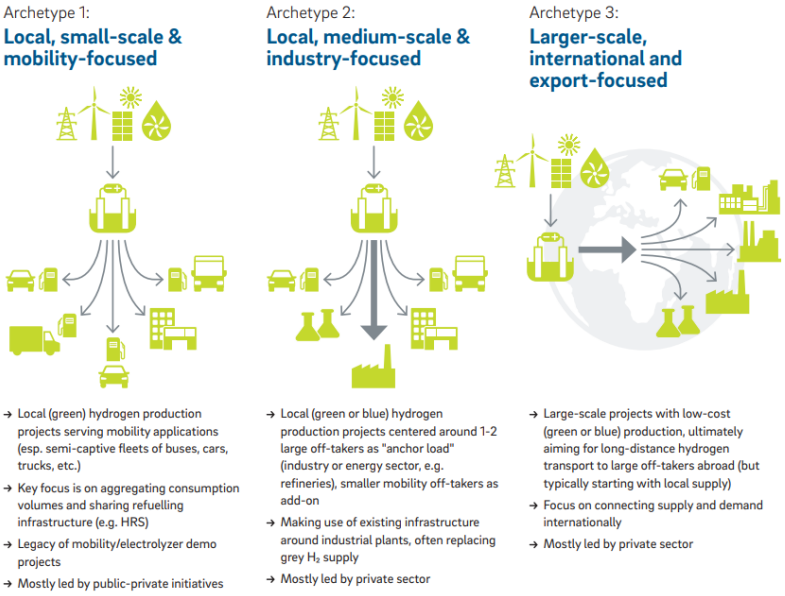
They have increasingly been driven by the private sector, with three typical set-ups observed: local, smaller-scale and mobility-focused projects; local, medium-scale and industry-focused projects; and larger-scale, international export-focused projects (see figure 5 for greater detail). Over the 2020s, they will mature significantly, driven by an increasing number of overall projects and projects themselves growing in size and complexity.

Factors identified as being key to the successful development of hydrogen valleys include a convincing project concept with hydrogen value chain coverage, leveraging local assets and addressing local needs, along with the development of a viable business case linking

competitive clean hydrogen production with off-takers willing to pay. Public support and funding are also vital, as is effective partnering and stakeholder cooperation.

Figure 5: Hydrogen Valley archetypes

(Source: FCH JU)



Barriers, meanwhile, include securing funding and offtake commitments for clean hydrogen, as well as regulatory provisions, something cited by 40% of projects.

The report stressed they can be overcome, however. When working to secure private funding, hydrogen valleys rely on a structured development approach, early involvement of off-takers and equity partners, de-risking the project. To mitigate technological readiness and technological performance barriers, it highlighted the importance of hydrogen valleys remaining flexible in terms of the project's general direction.

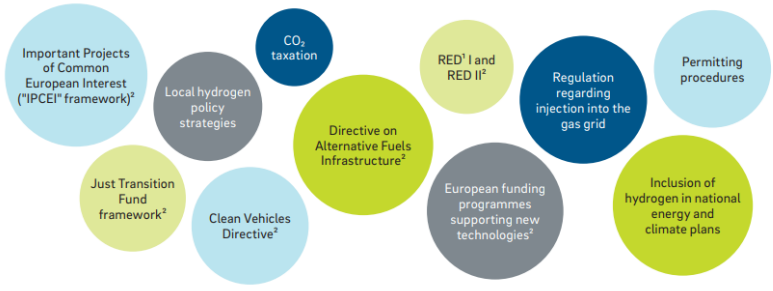
Despite the landscape for hydrogen valleys growing favourable, greater efforts are needed to facilitate their emergence, with the report making a series of recommendations for policymakers, including having a clear vision of the country's future hydrogen economy in a national hydrogen strategy that sets out a framework for hydrogen valley development.

This is as, for hydrogen valleys to be successfully developed, project developers need to have a clear understanding of the country's overall strategy regarding the future role of hydrogen and a country's envisaged hydrogen value chain. They also need to establish clarity over their position in a global hydrogen market that is constantly evolving, involving sector studies and strategies to project long-term needs for hydrogen. These boundaries that are set as a result will give hydrogen valleys the necessary base to develop a convincing project concept in line with a country's capacities and needs.

It also called for a regulatory environment that is conducive to the development of hydrogen valleys by creating business certainty, as well as adequate incentive and support schemes; to close the gaps in, or amend, permitting procedures for hydrogen valleys; and for policymakers to act as matchmakers, enabling the setup of hydrogen valleys locally and to stimulate the sector overall.

Figure 6: Quotes from hydrogen valleys globally on key regulatory provisions

(Source: FCH JU)



Norway unveils hydrogen roadmap

The Norwegian government has unveiled a roadmap to establish a domestic market for the production and use of hydrogen by 2050.

Publishing the blueprint on 11 June, which builds on a hydrogen strategy released last year, it cited the need to develop a market and associated technologies for hydrogen to realise its potential as a vital energy carrier to support Norway in its journey to becoming a low emission society by 2050. In the short-term, this will see the government collaborate with the private sector to establish five hydrogen hubs in the area of maritime transport by 2025.

This collaboration will also seek to establish "one or two" industrial projects with associated production facilities between five and 10 pilot projects that develop and demonstrate new, cost effective hydrogen solutions and technologies. By 2030, the ambition is for hydrogen to be established as a realistic alternative in the maritime sector, along with the prospect of market-based development.

Coordination of funding agencies will be key to following the roadmap, making it easier for authorities to closely monitor and follow up on good ideas and initiatives that emerge from within the hydrogen sector. There are funding schemes already available to support hydrogen's development, while the Research Council of Norway and Enova have launched a new partnership called HEILO – Hydrogen as an Energy Carrier for Low Emissions and Conversion – to further support it.

The Norwegian government further pointed out how, in its revised budget, it proposed strengthening the financing for the development of infrastructure and markets for hydrogen. It will also establish a research centre for environmentally friendly energy where hydrogen and ammonia will be key areas of focus.

Australia eyes certification scheme for Hydrogen Guarantees of Origin

The Australian government has opened a consultation on a certification scheme for Hydrogen Guarantees of Origin (GO).

On 21 June, it outlined how the proposed scheme – which was cited as a priority action in Australia's National Hydrogen Strategy – will be key when it comes to giving purchasers transparency as Australia and the world strive to facilitate clean hydrogen trade. It will measure and track carbon emissions from hydrogen production, allowing customers who buy hydrogen in future to choose the product that best aligns with their needs. It will cover hydrogen produced from electrolysis, coal gasification with carbon capture and storage (CCS) and steam methane reforming with CCS and could include more over time.

As a starting point, a well-to-gate boundary is being proposed, allowing a domestic scheme to quickly establish itself while aligning with international frameworks. This would include all upstream emissions associated with supply of feedstocks and emissions that are incurred during hydrogen production.

The intention is for the scheme to be built on over time to form a broader framework, one that can guarantee the origin of a range of decarbonised or low emission products. With hydrogen to be an internationally traded commodity and Australia having the potential to be a major exporter, the methodology underpinning hydrogen GO schemes must be consistent to enable an accurate comparison of hydrogen produced by different countries.

The Australian government pledged to provide a trial of a hydrogen guarantee of origin scheme in its 2021-22 Budget, with the results from the consultation – which will run until 30 July – to inform a trial phase set to be launched in the latter half of 2021.

World's first multimodal hydrogen refuelling station opens

CMB.TECH has opened the first multimodal hydrogen refuelling station in the world in Antwerp, as well as launching a hydrogen truck.

On 3 June, it outlined how the station will produce green hydrogen to power ships, tube trailers, cars, trucks and buses. It has been located at the Port House in Antwerp due to its proximity to both the city and port, meaning it can supply hydrogen to as many industrial applications on the port as possible, while still being easily accessible to the general public.

The hydrogen truck is the first dual fuel truck to run on hydrogen with the technology use feasible, affordable and green, something that will allow conversion of different applications in the short-term and kickstart emission reductions in the logistics sector.

As well as the refuelling station, the site includes two trailer docks which can have ecologically produced hydrogen pumped into them to supply port applications developed by CMB.TECH with hydrogen. Additionally, there are a number of ultra-fast charging stations for electric cars with charging times of less than 15 minutes.

Aberdeen City Council looks for hydrogen hub partner

Aberdeen City Council has launched its search for a strategic partner for what will be a first-of-its-kind hydrogen production facility in Scotland.

On 23 June, it announced that its Aberdeen Hydrogen Hub is looking for a partner to supply its range of public sector vehicles. This will build on the city's existing hydrogen infrastructure and transport projects, including a fleet of hydrogen-powered buses, public sector vehicles and waste trucks. Securing a joint venture partner for the hub is regarded as an "important step" in implementing Aberdeen's Net Zero Vision.

Aberdeen City Council added that the announcement follows on from market engagement conducted earlier in the year, where "significant interest" was expressed in investing in a commercial scale hydrogen production facility. This, it said, shows the appetite for this type of project is out there.

The Aberdeen Hydrogen Hub, which will work across housing, heating and transport, could make a substantial contribution to both the UK and Scottish government's climate targets both in its initial and subsequent phases.

Europe's first hydrogen ferry takes step closer to setting sail

An emission free hydrogen fuel cell sea-going passenger and car ferry is set to be designed under a new project.

On 7 June, AqualisBraemar LOC (ABL) announced that it had been appointed by Caledonian Maritime Assets (CMAL) as a partner in HySeas III. Funded by Horizon 2020, HySeas III will aim to build on the findings from the previous two projects through demonstrating that fuel cells can be successful integrated with a proven marine hybrid electric drive system, along with associated hydrogen storage and bunkering arrangements. It will develop, construct and validate data in a full-sized drive train on land.

The scope of ABL's work will be to design a double-ended sea going passenger and car ferry that can use the hydrogen powered drive train and run entirely free of emissions. It will be designed to operate between Kirkwall and Shapinsay in Orkney, though with the potential to operate at other ports where hydrogen could become available in future.

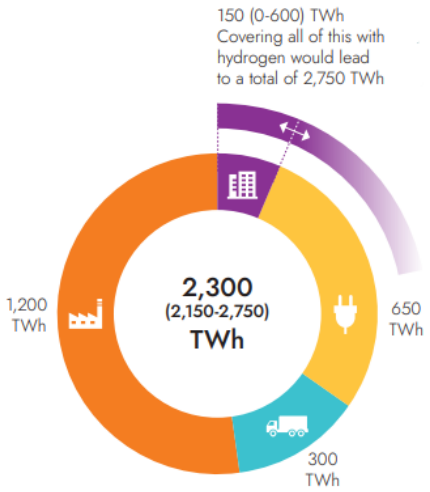
The ferry will have the capacity for 120 passengers and 16 cars, or two trucks.

Hydrogen crucial to a climate-neutral Europe

Within the EU and UK there is sufficient potential to produce enough hydrogen to exceed projected demand, a study has found.

Figure 6: Future European hydrogen demand by sector

(Source: EHB)



On 15 June, the European Hydrogen Backbone (EHB) initiative published analysis from Guidehouse exploring the future demand, supply and transport of hydrogen across Europe, building on its previously published maps outlining a 40,000km hydrogen pipeline network across 19 EU Member States, the UK and Switzerland. By 2050, it found 2,300TWh of hydrogen demand across the EU and UK, corresponding to 20-25% of their final energy consumption. Industry (1,200TWh) and dispatchable electricity production (650TWh) account for the majority of this, with 300TWh of demand in transport.

In heating for buildings, hydrogen demand is set to depend on renovation rates, relative shares of biomethane and hydrogen, and the mix of technologies. Using an accelerated renovation scenario, the study forecast gas demand from the building stock to be 600TWh by 2050, met by biomethane and hydrogen, which would account for around 150TWh.

Building on this, the study found domestic European green and blue hydrogen supply potential is vast and would exceed projected demand in all sectors. Green hydrogen supply potential in the EU and UK was estimated at 450TWh in 2030, 2,100TWh in 2040 and 4,000TWh in 2050. By 2040, green hydrogen supply potential would be sufficient to meet projected demand in all sectors at lower costs than grey hydrogen and fossil alternatives. By 2050, almost all of the potential 4,000TWh of green hydrogen could be produced for less than €2/kg, with as much as 600TWh of this produced for €1/kg or less. However, it stressed that realisation of this potential is subject to both public acceptance and an accelerated expansion of renewable installed capacity beyond what is currently planned.

There is also significant potential to produce blue hydrogen as supply is virtually unlimited due to natural gas supply and CO2 storage potential exceeding total foreseen hydrogen demand. Blue hydrogen will be key to quickly driving down emissions and accelerating the transition, especially during the ramp-up phase of the market from 2030. As for transport, the report emphasised how the EHB itself will prove essential in facilitating the creation of a European hydrogen market. By 2030, even under modest flows, countries with low domestic hydrogen supply potential compared to their expected demand will have to import hydrogen to meet national requirements, creating a clear role for repurposed existing gas infrastructure connecting hydrogen supply and demand.

Hydrogen pipelines were deemed the most cost-efficient option for long-distance, high volume transport at €0.11-0.21/kg per 1,000km, outcompeting transport by ship for all reasonable distances within Europe and its neighbouring regions. Furthermore, transporting volumes of energy corresponding to a single 48-inch hydrogen pipeline – up to 16.8GW – through power transmission would require the equivalent of seven overhead transmission lines. It also highlighted how the favourable economics of pipeline transport would allow for cost-competitive imports from the likes of North Africa, Norway and Ukraine, as well as the EU and UK.

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