Hydrogen East

H2 News Hub

Issue 10

H_2 East

September 2021

Top stories

In issue 10 of **Hydrogen East**'s Sector Review, we take a look at important publications and developments over the month of August (2021).

August saw the government release its long awaited **UK Hydrogen Strategy**, detailing its plans to build a world-leading hydrogen economy. It is centred around a vision where, by 2030, the UK is a global leader on hydrogen, with 5GW of low carbon hydrogen production capacity in place, and clear plans for future scale-up towards the Sixth Carbon Budget (CB6) and net zero.

Last month also saw Hydrogen East publish the paper, **The New Anglia "Hydrogen Hub": A different type of cluster**, with a cut-down version of the 12-page perspective featured.

Regen was commissioned by **Cornwall Council** and the **Cornwall and Isles of Scilly LEP** to undertake a study identifying opportunities for hydrogen in the region up until 2030, with promising findings in the maritime and marine, and specialist vehicle sectors.

The **Society of Motor Manufacturers and Traders** published a study, calling for government to work with industry to develop a plan to enable a transition to zero emission HGVs, before committing to a phase-out date for the sale of conventionally fuelled trucks, noting that just 0.2% of HGVs were alternatively fuelled in the UK in 2020 – 14 years behind the progress of cars.

Contents

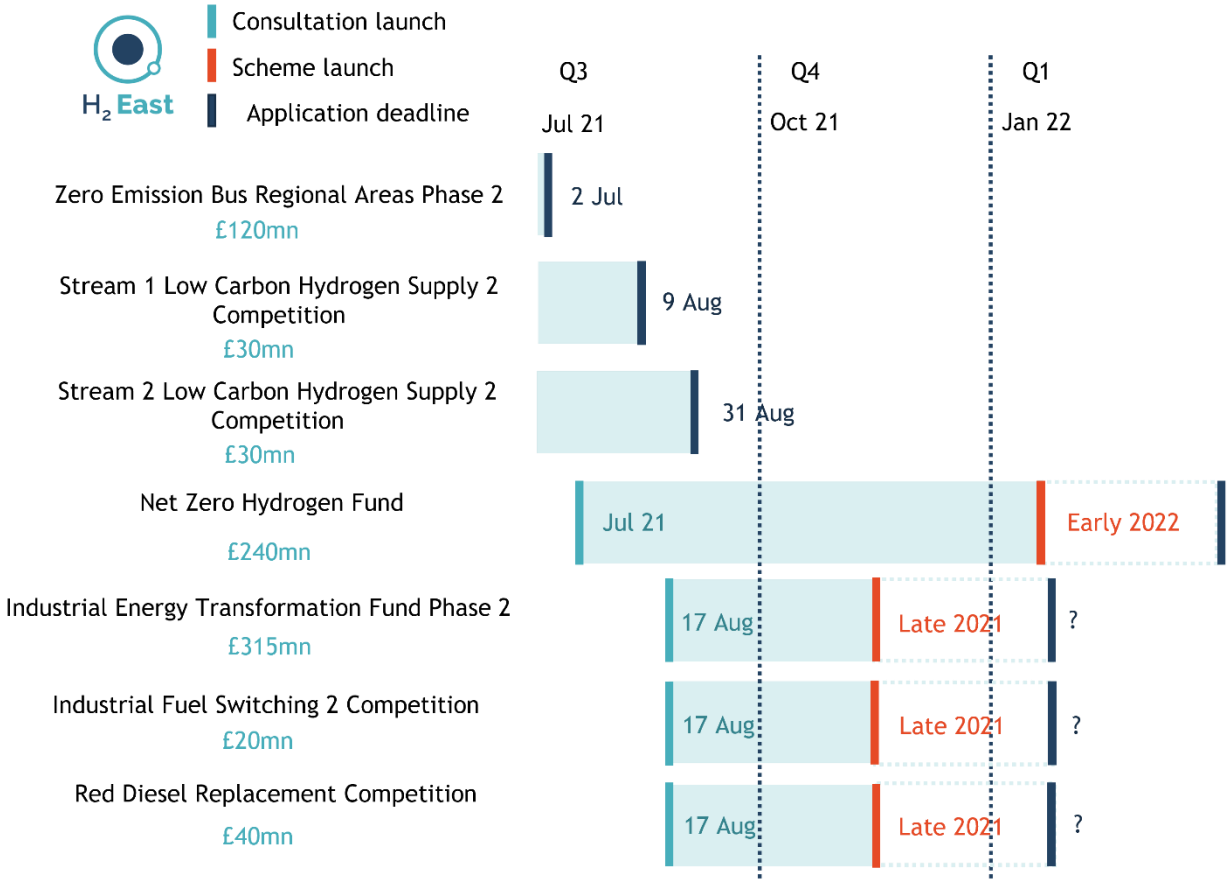
Upcoming webinars

1-2 Sep – **DNV:** Global launch of Energy Transition Outlook 2021 | **1-2 Sep** – **Net Zero Technology Centre:** 2nd UK CCUS & Hydrogen Decarbonisation Summit | **2 Sep** – **SHFCA & NS HyMaP:** Hydrogen Bridges Across the North Sea Region | **8 Sep** – **HTP:** Hydrogen Valley project safety and technical design | **15 Sep** – **Hydrogen East:** The Hydrogen Strategy and the implications for New Anglia | **21-24 Sep** – **HySafe:** International Conference on Hydrogen Safety 2021

Funding tracker

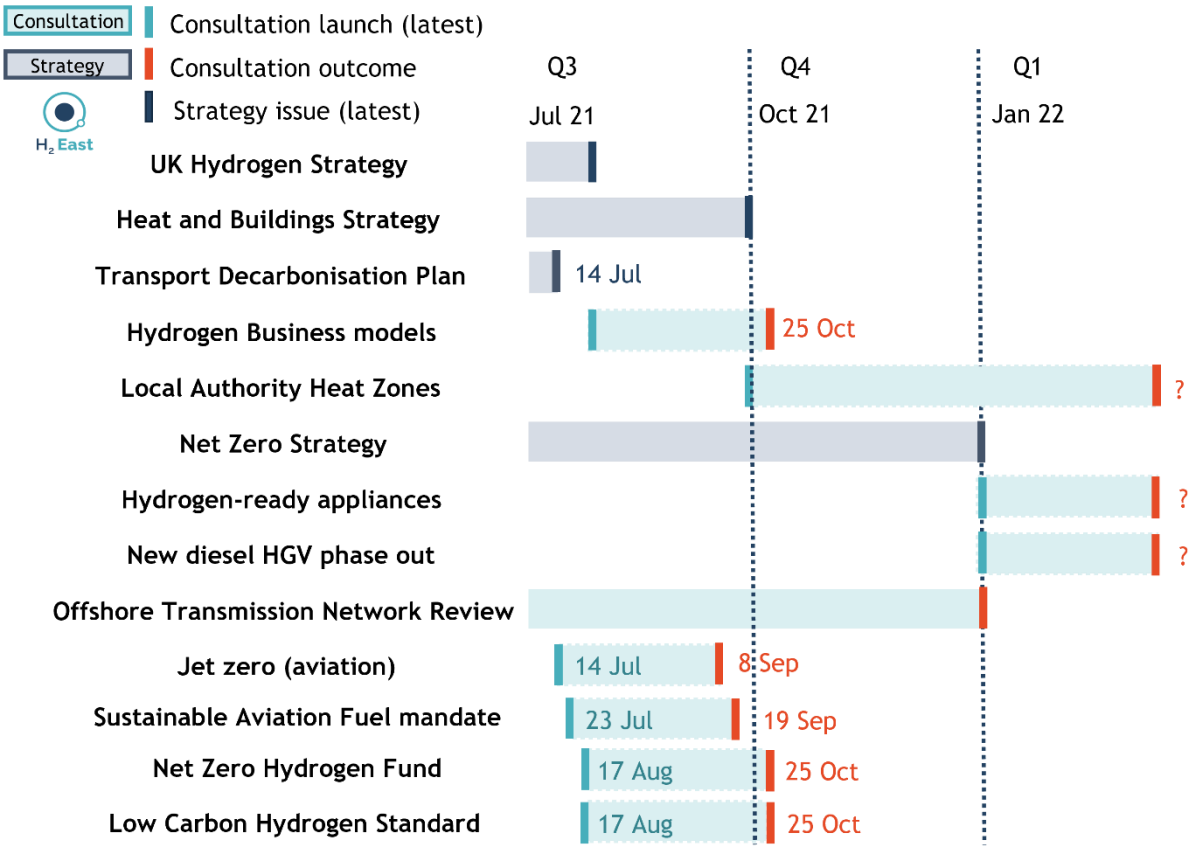
There are a number of funds already available for developers, local authorities and innovative organisations. These cover both feasibility studies and demonstrator projects.

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.



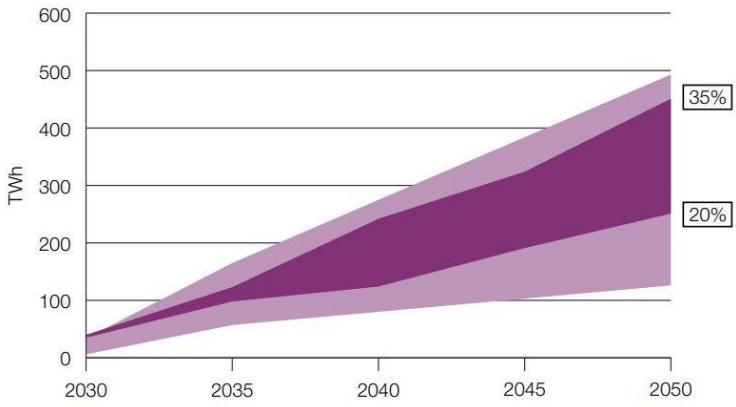
UK looks to become global hydrogen leader with launch of first-ever strategy

The government has unveiled its plans to build a world-leading hydrogen economy with the launch of its UK Hydrogen Strategy.

Published on 17 August, the strategy is centred around a vision where, by 2030, the UK is a global leader on hydrogen, with 5GW of low carbon hydrogen production capacity in place, and clear plans for future scale-up towards the Sixth Carbon Budget (CB6) and net zero. Low carbon hydrogen is set to be essential to achieving both, with analysis for the government finding that between 250 to 460TWh of hydrogen could be needed in 2050, accounting for 20-35% of final energy consumption.

Figure 1: Hydrogen demand and proportion of final energy consumption in 2050

(Source: BEIS)



% = hydrogen as proportion of total energy consumption in 2050

The strategy, therefore, seeks to map out how the UK will rapidly and significantly scale up production and lay the foundations for a 2030 low carbon hydrogen economy, while supporting innovation and stimulating investment during the 2020s.

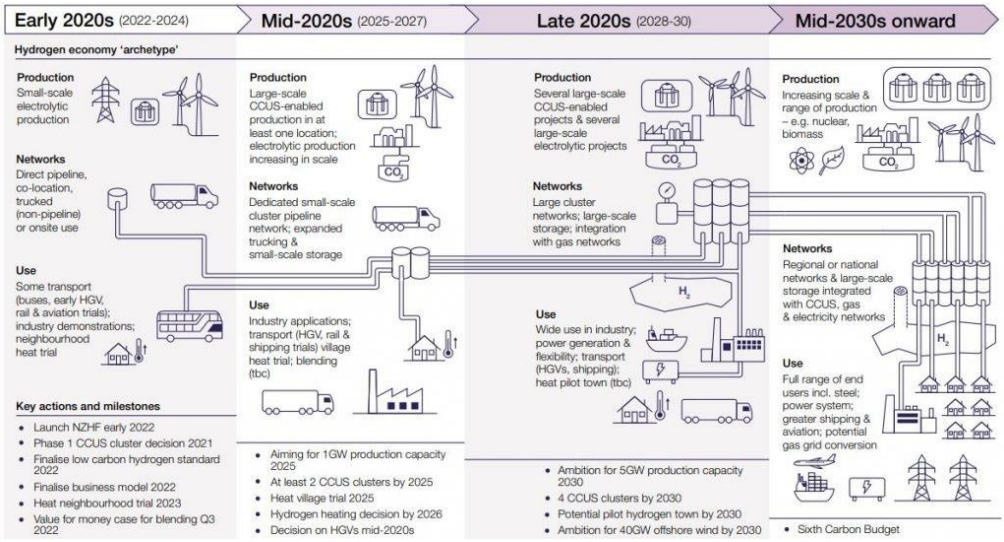
There are significant emission savings that could result from the 5GW target – potentially 41MtCO2e between 2023 and 2032, rising higher in future through further scale-up. It could also result in 9,000 jobs and £900mn in GVA by 2030, with government action to de-risk early projects leading to £4bn in private sector co-investment being unlocked too. By 2050, up to 100,000 jobs could be supported and £13bn in GVA generated. However, there are a number of challenges that must be overcome, such as the cost of hydrogen relative to existing fuels and uncertainties surrounding technologies, policy and regulation.

The government is proposing a whole-systems approach to developing a hydrogen economy, with the strategy laying out a comprehensive roadmap (see Figure 2), detailing the key policies and actions set to be needed throughout the 2020s to drive progress. A twin-track approach to production will be taken, supporting both electrolytic green hydrogen and carbon capture enabled blue hydrogen production, alongside other potential production routes. Further detail on the government's production strategy will arrive in early 2022.

Alongside the strategy, consultations were published on the design of the £240mn Net Zero Hydrogen Fund, set to launch in early 2022; a UK standard for low carbon hydrogen, to be finalised in early 2022; and a Hydrogen Business Model, to be finalised in 2022 with contracts allocated in the first quarter of 2023.

Figure 2: Hydrogen economy 2020s Roadmap

(Source: BEIS)

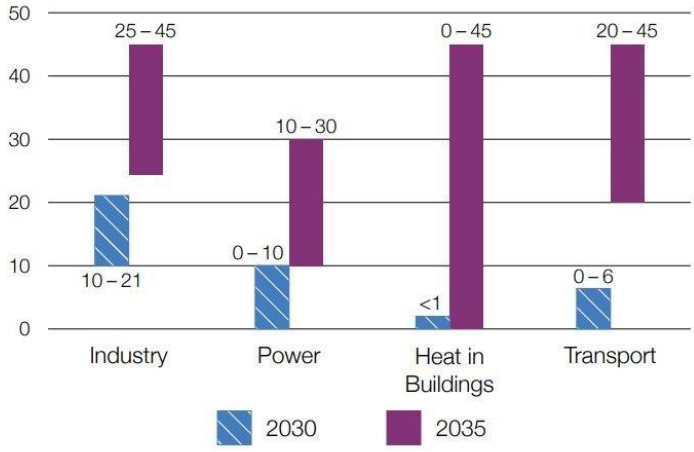


A call for evidence will be launched on the future of the gas system later in 2021, with a review of systemic hydrogen network and storage requirements in the 2020s and beyond undertaken, including the need for economic regulation and funding. An update on the latter is being earmarked for early 2022.

In terms of demand, up to 38TWh is being envisaged by 2030 – not including use of hydrogen for blending into the gas grid – split across industry (21TWh), power (10TWh), heat in buildings (1TWh) and transport (6TWh). This could rise to 55-165TWh in 2035.

Figure 3: Illustrative hydrogen demand in 2030 and 2035

(Source: BEIS)



To further explore hydrogen use, calls for evidence will be launched on hydrogen-ready industrial equipment by the end of 2021 and on a phase out of carbon intensive hydrogen production in industry within a year. The second phase of the £315mn Industrial Energy Transformation Fund, the launch of a £55mn Industrial Fuel Switching 2 competition, and preparations for hydrogen for heat trials – a hydrogen neighbourhood in 2023; a hydrogen village in 2025; and a potential pilot hydrogen town by 2030 – can all also be expected, as can a consultation on hydrogen-ready boilers for 2026 and continued multi-million pound support for the decarbonisation of transport.

The strategy also looks into creating a hydrogen market, noting it must be fit to serve a deeply decarbonised energy system, which will require concerted action to bring forward the

necessary private investment across the value chain and enable the balance of supply and demand in a nascent market.

Here, government will set out further detail on the revenue mechanism which will provide funding for the Business Model and establish a Hydrogen Regulators Forum, both in 2021; assess market frameworks to drive investment and deployment of hydrogen, as well as investigating regulatory barriers facing hydrogen projects, both of which can expect an update in early 2022; and complete an indicative assessment of the value for money case for blending up to 20% of hydrogen into the existing gas network by late 2022, with a final policy decision targeted for late 2023.

In terms of how the strategy has been received, dominant themes have included a lack of details, which is something acknowledged by the government, and an overly strong focus on blue hydrogen with CCUS – something that led Chris Jackson to step down as chair of the UK Hydrogen and Fuel Cell Association (UK HFCA) Chair, prior to the strategy's release. A number of operators have also expressed disappointment with regards to it being downbeat on prospects for green hydrogen, at least through until 2030.

New Anglia LEP Chief Executive, Chris Starkie, said the planned increased use of hydrogen does represent huge opportunities for the region, with Norfolk and Suffolk ideally placed to help the government deliver a world-leading hydrogen economy.

Starkie noted the "strong foundations" that the region has to support early deployment of a hydrogen cluster, highlighting the continued development of facilities at the Bacton gas terminal and its transformation into a diversified energy hub. He continued: "Recent reports from the Oil and Gas Authority and Hydrogen East have borne out the potential for early deployment of both blue and green hydrogen close to the site and a range of near-term use cases have been identified. Meanwhile, the planned Freeport East Hydrogen Hub promises to be one of the world's most exciting and innovative nuclear, hydrogen, maritime and transport decarbonisation schemes."

ScottishPower's Director of Hydrogen, Barry Carruthers declared the strategy to be a "clear sign" of the UK's ambition to become a hydrogen leader, stating the ambition show matches the size of the opportunity. David Smith, Chief Executive of the Energy Networks Association, meanwhile, called the strategy a "much needed and welcome first step" but stressed the need for more ambition than 5GW by 2030, recommending a "figure twice that amount."

The issue of the government's 2030 target was also something discussed by RenewableUK, with its CEO, Dan McGrail, welcoming steps such as the Net Zero Hydrogen Fund but pointing out that the strategy had not focused on developing a world-leading green hydrogen industry. Instead, McGrail called for there to be a target for 5GW of renewable hydrogen electrolyser capacity by 2030, as well as calling for there to be a roadmap to set out how to get there.

Regen described the strategy as being high in ambition but light on clear strategic direction, citing a lack of a mention for developing demand markets and new hydrogen applications. Cadent Chief Strategy and Regulation Officer, Dr Tony Balance expressed support for plans to introduce hydrogen blending into the wider gas network, calling for this to be aligned with a mandate to introduce hydrogen-ready boilers from 2025.

The UK Hydrogen and Fuel Cell Association (UK HFCA) believed the strategy could have been more ambitious, stating industry's belief that with the right support a 20GW mix of blue and green hydrogen could be deployed by 2030. The North West Hydrogen Alliance welcomed the commitment for a Hydrogen Sector Development Action Plan and also called for a drive to start raising public awareness of hydrogen, declaring now to be the time.

Government unveils plans for low carbon hydrogen business model

The government is seeking views on its preferred design for a low carbon hydrogen business model as it targets 5GW of low carbon hydrogen production capacity by 2030.

On 17 August, it published a consultation – alongside the Hydrogen Strategy – where it acknowledged that any business model must help to overcome some of the key barriers preventing the deployment of low carbon hydrogen projects. Such barriers include the cost gap between low carbon hydrogen and high carbon alternatives, high technological and commercial risks for investment in first-of-a-kind projects, and a lack of market structure and long-term policy and regulatory framework.

It is proposing to move forwards with a variable premium price support model on a sliding scale to support blue and green hydrogen production. Under this approach, a strike price would be set, representing the price of a hydrogen producer must achieve to cover production costs, as well as a reference price to represent the market value for hydrogen.

Justifying the variable premium, it explained it offers price support intervention flexibility and adaptability that would not be provided under fixed price and fixed premium approaches. For example, the level of subsidy could be reduced over the length of the contract as the market evolves, instead of just in the allocation rounds. The challenge, however, of taking such an approach comes with setting the reference price in the absence of an observable market benchmark price for low carbon hydrogen. The government's preferred option here will be to have the reference price made up of the two highest inputs – natural gas price and achieved sales price – for initial projects, before integrating a market benchmark price into the reference price "at the earliest opportunity" for future projects.

Its choice of a sliding scale mechanism, meanwhile, will ensure that volume risk is managed through the price received by a producer for different volumes of hydrogen. It would see a higher level of price support paid on initial volumes, meaning the producer can recover fixed costs at relatively low offtake volumes, with the level of price support falling as volumes increase. This will see to the last volumes only recovering marginal costs and equity returns. Justifying its approach, government said it offers the best balance between investability from the perspective of producers and value for money from its own.

The consultation will close at 11:45pm on 25 October 2021, with the aim for the business model to be finalised in 2022 and first contracts then allocated in the first quarter of 2023.

UK-based company looks to convert ICE vehicles to hydrogen

Caigan Vehicle Technologies has launched a new hydrogen fuel cell convertor for internal combustion engine (ICE) vehicles.

On 26 August – reported by H2 View – the UK-based company said its engineers can replace traditional combustion engines with a complete hydrogen fuel cell power system. The process involves the existing engine and fuel systems being removed, with a hydrogen storage thank then retrofitted, along with a fuel cell to convert the hydrogen gas to electricity, a traction battery and an electric drive motor. It will allow fleet managers to upgrade vehicles to cut emissions and meet net zero targets.

Steve Turner, Caigan Vehicle Technologies MD, said: "Hydrogen fuel cell technology isn't a compromise or a half measure. Fuel cells only emit water vapour and a little heat, so harmful tailpipe emissions are zero. The most polluting vehicles can drive into our workshop and drive out with no emissions at all. The latest fuel cell cars actually clean the air as they drive which is a game-changer for the environment"

First UK hydrogen transport trials set for Tees Valley

The Tees Valley area is set to play host to the UK's first hydrogen transport pilots, after the government unveiled the winners of £2.5mn R&D competition.

On 17 August, it outlined how the successful projects will see supermarkets, emergency services and delivery companies use hydrogen-powered transport to move goods and carry out local services. The trials will also prove key to build understanding of the role hydrogen will have in meeting net zero ambitions, helping to inform future investment decisions as well as export opportunities.

One pilot will see Ricardo work with Stagecoach to retrofit a double-decker diesel bus with a hybrid fuel cell system, with the bus then being driven on local routes, informing future cell retrofit technologies in public transport UK-wide. Toyota, meanwhile, will deliver a number of hydrogen vehicles to be deployed across the town's rapid response services, including emergency response units for Cleveland Police and NHS patient support.

Elsewhere, HY Systems will look to demonstrate the use of hydrogen in delivery vans in the Tees Valley area. They will be used in collaboration with a leading supermarket chain, running between 19 superstores and their main distribution centre. Finally, Element Energy will work with Sainsbury's to trial a hydrogen-powered heavy goods vehicle in the area, operating from a local distribution centre with goods deliveries carried out in the area.

ULEMCo to bring hydrogen fuelled fire engines to Oxfordshire

ULEMCo and its partners are set to bring hydrogen fuelled fire engines to Oxfordshire through a new project.

On 13 August, it announced that alongside Oxfordshire County Council and its Fire and Rescue Service, funding has been awarded to produce an optimised design for specialised hydrogen fuelled vehicles. Work on HySPERT is expected to take eight months, with the partners developing a deep understanding of the specific duty cycles for emergency service vehicles that require 24/7 readiness in the first phase of the project. It will see a thorough understanding and detailed model of the current energy requirement created, including the energy needed to pump water for at least four hours.

ULEMCo will design the fuel cell electric powertrain for the Fire and Rescue Service. A key output will be a full specification and detailed engineered design for a prototype vehicle, ahead of the physical building of a prototype in the next stage of development.

Alongside this, Oxfordshire County Council will develop a plan for the hydrogen refuelling requirements across the Fire and Rescue Service. It will assess how this fits in with wider plans to develop a hydrogen infrastructure across the county.

Plans move forwards for Greater Manchester hydrogen hub

Plans have now been submitted for Manchester's first hydrogen fuel hub.

On 11 August, Trafford Green Hydrogen – subsidiary of Carlton Power – submitted a planning application for the 200MW hydrogen fuelling hub, set to be the largest in the UK. It will support businesses in the Greater Manchester region that use hydrogen for transportation fleets or with heating requirements, handing them easy access to hydrogen fuel. It will produce and store hydrogen at scale, while helping to integrate renewable energy regionally, through storage of solar and wind.

The hub is set to be based at the Trafford Low Carbon Energy Park and, subject to planning approval and financing, could see construction commence in early 2022 ahead of commercial operation beginning in 2023.

Hydrogen East perspective: A different regional cluster

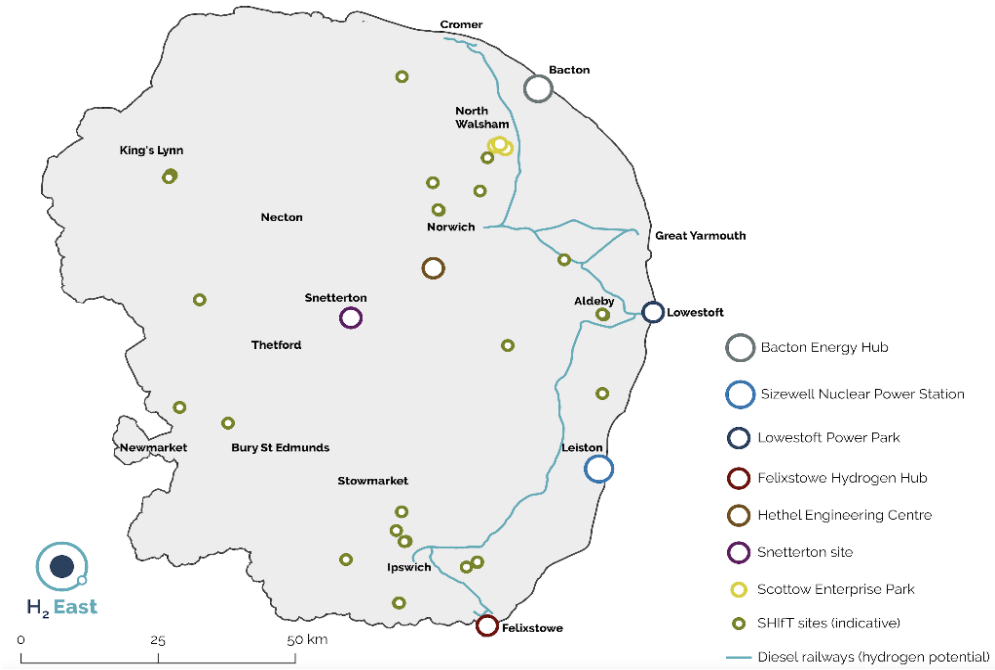
Here at Hydrogen East, we believe hydrogen development will typically grow out of local conditions and lead to the formation of clusters with strong regional characteristics reflecting place-based opportunities and other decarbonisation measures adopted locally.

These are likely to see development of hybrid technology groupings and cut across vectors depending upon the regional attributes and local demand. And, although the *Hydrogen Strategy* contains the useful map showing high-profile projects under development or being mooted, it does not do justice to the diversity of thinking and interest that is now burgeoning around local opportunities or address whole-systems developments that will arise from local flexibility markets, including the value these could deliver to local networks and energy supply bottlenecks.

We develop these ideas, in addition to in our full 12-page perspective piece, here.

Figure 4: Hydrogen East and possible hydrogen projects, as outlined in full perspective piece

(Source: Hydrogen East)



The East of England is a case in point. It already has strong foundations to support early deployment of a different type of hydrogen cluster through continuing development of the gas terminal at Bacton and the transformation of it into a diversified energy hub.

Recent reports, both from Hydrogen East and the Oil and Gas Authority, have borne out the potential for early deployment of both blue and green hydrogen close to the site and more generally within the region.

Important regional differentiators are:

- Likely early availability of blue hydrogen at scale from legacy Southern North Sea (SNS) gas assets produced in combination with CCUS that can be landed through existing pipes

- Excellent potential storage facilities offshore for CO2 storage and possibly hydrogen
- Good existing connections at the Bacton site with the onshore gas transportation system providing access to repurposed and new markets in London and the South East, but also major gas interconnectors connecting with mainland Europe, which could form part of the *European Hydrogen Backbone*
- Multiple opportunities for the early green hydrogen production from an array of renewable and low-carbon regional resources, notably the continuing aggressive build-out of wind generation off the East Anglian coast, but also solar power deployment onshore and possibly new nuclear development, including the use of waste heat
- These are all likely to make a major contribution in a rapidly changing but presently constrained electricity system at distribution level in some areas, and there will also be real opportunities to use increasingly frequent clean generation surpluses for conversion through use of electrolysers that could also have a local flexibility value supporting resilience of the electricity system
- Proximity of hydrogen availability to many parts of the gas system, which could see early development of "hydrogen neighbourhoods" on a place-specific basis, in a region that has relatively low dual-fuel penetration, easing the mass electrification of heat
- While the region does not have significant industrial load like many of the other clusters currently under discussion and in development elsewhere in Britain, it does have significant potential other markets in, among other things, heavy transport in various forms (trucks, rail and shipping), agriculture and food processing, all of which could offer security of demand and pull through the necessary infrastructure, and
- This is supplemented by a predominantly rural economy in which typical distances travelled and journey times are above average but where there are real issues about transport electrification in some areas.

Looked at together, these could provide a fertile base for a different type of clustering linking up small, diverse projects, including electrolysers that could be progressively scaled, and underpinning it with aggregated demand for a variety of emergent regional use cases.

Technology cost reductions are already surpassing expectations, with the gap between blue and green hydrogen set to narrow rapidly. (In this context, NEL Hydrogen are projecting aggressive cost reductions in electrolyser costs, especially as systems are scaled, as early as mid-decade, and the *Hydrogen Strategy* does acknowledge that electrolysers "could become cost competitive with CCUS-enabled methane reformation as early as 2025".)

The economic opportunity is therefore significant, especially if development can be targeted and aligned with regional strengths. The East of England offers early-mover benefits given the existing supply chain and skills already established from the oil, gas and renewables sectors, and which can be redeployed as we "build back better" as part of the green recovery.

The Hydrogen East study referenced above has already highlighted that there could be over 10TWh of demand in the New Anglia area alone as early as 2030 provided there is active regional development, coordinated action and appropriate policy support. This approach should allow local communities and businesses - who are likely to be adversely impacted by the loss of jobs associated with the wind-down of the traditional oil and gas sectors - to benefit directly through investment and job creation in a variety of clean growth sectors.

To see the full 12-page perspective piece, head over to our website, here.

Hydrogen East is hosting a live event on 15 September which will take a look at the headlines from the UK Hydrogen Strategy, its supporting policy documents and consultations, and its implications for hydrogen in the East of England. Sign up here.

BP pushes forwards with plans for Teesside hydrogen facility

BP's plans for blue hydrogen continue to take shape, after coming to a series of agreements with potential customers for its proposed facility in Teesside – H2Teesside.

On 5 August, it announced that Memoranda of Understandings (MoUs) had been signed with four customers for clean hydrogen set to be produced by the project, which is targeting up to 1GW of blue hydrogen production by 2030. As it unveiled its initial plans back in March, it revealed that it had signed MoUs with Venator and Northern Gas Networks to scope supply of hydrogen to them, before now adding another four, further supporting and accelerating development of the Teesside hydrogen cluster.

CF Fertilisers, one of the largest global producers of ammonia and ammonia-based fertilisers, has signed an MoU to scope supply of clean hydrogen as a fuel to cut hard to abate combustion emissions at its Billingham Plant, and has been joined by Mitsubishi Chemical Corporation, which has signed up to scope supply to its Teesside methyl methacrylate production plant .

Sembcorp Energy UK, meanwhile, has agreed an MoU to scope clean hydrogen supply to its combined heat and power plants and developing hydrogen infrastructure at Wilton International, allowing for hydrogen supply to third parties, while the MoU signed with alfanar Company to revolve around its waste-to-sustainable aviation fuel plant, which is currently under development in the region.

An online portal has also been launched, allowing the UK supply sector to take part in the project's development with them encouraged to register their interest. Those with connections across the north-east of England are of particular interest.

Octopus Hydrogen to supply ZeroAvia with 100% green hydrogen

Octopus Hydrogen has joined forces with ZeroAvia to supply green hydrogen for its HyFlyer II programme.

On 26 August, ZeroAvia announced that the partnership will see Octopus Hydrogen provide 100% green hydrogen to its R&D centre at Cotsworld Airport in Kemble during testing, certification and first commercial operations of its zero emission hydrogen-electric aircraft powertrain technology as it continues with its HyFlyer II project. The eventual aim is to develop a certifiable 600kW hydrogen-electric fuel cell powertrain capable of powering a 19-seat aircraft with a 500 nautical mile range.

The goal is to bring the powertrain technology to market by 2024, allowing for early adoption of commercial zero emission flights.

The supply from Octopus Hydrogen – over 250kg of green, fuel cell grade, high pressure hydrogen per day – will be used to supplement ZeroAvia's on-site electrolysis hydrogen production and be delivered into its mobile refuelling unit. For the larger HyFlyer II programme, following the breakthrough flight testing programme of a six-seat aircraft in HyFlyer I, ZeroAvia and its partners identified the need for an additional, ready supply of green hydrogen necessary to complement on-site production.

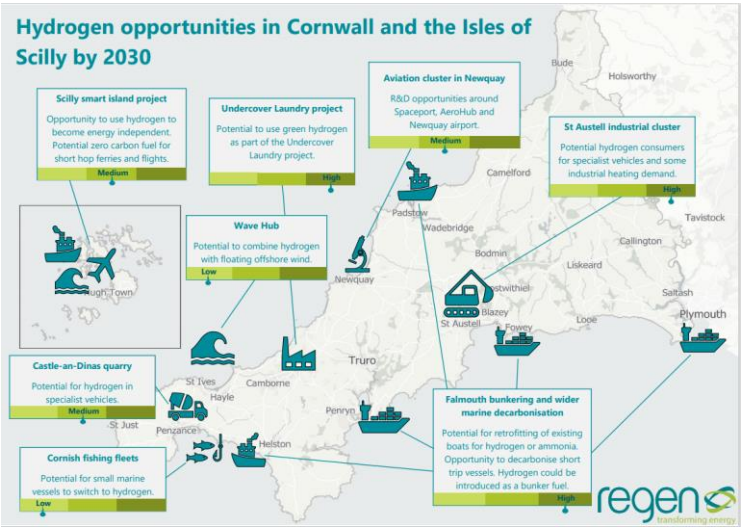
William Rowe, Octopus Hydrogen CEO and Founder, outlined how the company was started to deliver 100% green hydrogen to sectors unable to decarbonise using batteries alone, with aviation a "perfect use case" for it. Rowe added: "Global aviation accounts for around 2% of global human-induced CO2 emissions. So finding a way to maintain the benefits of flight without destroying our planet is a hugely exciting opportunity and critical for the UK to achieving Net Zero."

Study explores hydrogen opportunities in Cornwall and Isles of Scilly

There are significant opportunities for hydrogen activity in the maritime and marine, and specialist vehicle sectors in Cornwall and the Isles of Scilly, a study has concluded.

Figure 5: Hydrogen opportunities in Cornwall and the Isles of Scilly by 2030

(Source: Regen)



Cornwall Council and the Cornwall and Isles of Scilly LEP commissioned Regen to undertake an opportunity study, running from April 2021 to July 2021, to identify the potential for hydrogen as a low carbon fuel and a driver for innovation and economic growth in Cornwall and the Isles of Scilly up until 2030. It did this through exploring the region's unique geography, resources, strategic and decarbonisation priorities, existing hydrogen and non-hydrogen activity, as well as engaging with a range of stakeholders.

Cornwall does not have the attributes for large scale blue hydrogen production, existing chemical and refining, access to natural gas landings, locations for large-scale hydrogen and CO2 storage and large-scale hydrogen demand for industry. It does, however, have strong renewable energy resources well suited to producing smaller and medium-scale green hydrogen. There is also potential to import hydrogen or ammonia into Cornwall through shipping into Cornish ports. In terms of specifics, there are significant opportunities in particular in the marine and maritime sector and specialist vehicles.

It did stress, however, that many of these opportunities will not be realised until the latter part of the decade and beyond, with the low carbon hydrogen sector still emerging. Furthermore, the impact of drivers, such as the government's Hydrogen Strategy, future market regulation, project developer appetite and hydrogen technology development all needing progress before any significant uptake is seen. Government support, together with locational demand, will be key to bringing down the price of green hydrogen and incentivising fuel switching in carbon intensive industries.

It recommended further engagement with key sector stakeholders and electrolyser developers as a way of enabling Cornwall Council and the Isles of Scilly LEP to better understand the scale and location of the potential future demand for hydrogen in the region. This could be done through establishing a Cornwall hydrogen working group, with this structured engagement complemented by a spatial analysis of the electricity and gas networks to identify potential strategic locations for electrolysers in the region.

It also called for Cornwall Council to engage with the Hydrogen Strategy and wider government departmental strategies related to hydrogen. This would be due to there being the potential to influence policies to make sure that Cornwall and the Isles of Scilly are appropriately represented.

Paper makes case for a net zero hub in Firth of Forth

The Firth of Forth industrial hub should be central to Scotland's net zero strategy, while continuing to drive economic growth and job creation, according to a report.

On 17 August, Wood Mackenzie published a paper, making the case to establish the Firth of Forth as a net zero hub. This is due to it capturing the challenges faced by the UK and Scotland when it comes to decarbonisation and the opportunities set to emerge from a low carbon economy, both domestically and internationally. Scottish industry emits around 10.7Mt of CO2 a year. The Grangemouth and Mosmorran cluster accounts for around 40% of this total and 10% of Scotland's overall emissions. It is also a key part of the economy, sustaining thousands of jobs and producing multiple products and feedstocks that are essential to other industries and modern living.

It has a number of advantages, notably its sheltered waters and deep water loading, ensuring access to international markets all year round, as well as its strategic position in Scotland to act as a perfect distribution hub for the petroleum products of today and low-carbon fuels and products of tomorrow. Scotland's abundance of renewable power and extensive sub-surface storage potential in the North Sea mean it can be a key player when it comes to hydrogen production and export, and import and long-term storage of CCUS.

The fact it's a centre of expertise with the skills necessary to achieve the multiple technical and commercial challenges set to arise in delivering net zero was highlighted as a critical differentiator for the area. This means that while part of the net zero challenge, it also has the potential to be part of the solution. Developing a vision for the region as a net zero hub would highlight its strategic importance alongside the many attractive characteristics it has that make it a compelling industrial and trading hub, creating long-term high quality jobs.

It further mapped out how through raising the area's profile under a net zero banner, focus and momentum will grow, generating ideas and initiatives. Government support will be needed, however, with a clear plan defining the ambitions, challenges and identifying projects that would help deliver on net zero, as well as citing the strategic, economic and social benefits, needed to attract funding.

Plans for Liverpool City Region hydrogen bus fleet take shape

Alexander Dennis (ADL) is set to deliver a fleet of 20 zero-emission hydrogen buses to Liverpool City Region after being selected as the supplier following a tendering process.

On 27 August, Liverpool City Region confirmed the fleet has been purchased through its Transforming Cities Fund and will be owned by the people of the city region. The purpose-built buses are part of a new generation of hydrogen vehicles from ADL, designed to be more energy efficient to cover greater distances between refuelling.

The buses are set to serve the region's busiest route, between St Helens and Liverpool city centre, operated by Arriva and Stagecoach. Subject to final approval, the first vehicles could be delivered as soon as 2022. Passengers will be given a range of special features when on board, including wireless phone charging and internet access, while improved accessibility is also a feature, with capacity for wheelchair users and audio and visual announcements for next stops.

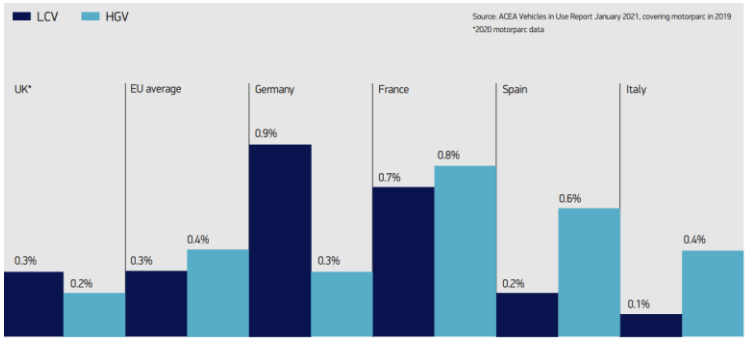
The hydrogen bus project is a key part of the Metro Mayor's *Vision for Bus*, which is aiming to build a better, more reliable and affordable bus network for the city region, while contributing to wider efforts to reach net zero by 2040. The hydrogen buses will join an existing fleet which is already more than 70% low emissions, with broader plans in place to build hydrogen refuelling facilities – set to be the first of their kind in the North West – later in 2021.

Commercial vehicle industry calls for decarbonisation plans before phase-out

The Society of Motor Manufacturers and Traders (SMMT) has called for government to work with industry to develop a plan that enables a transition to zero emission HGVs, before committing to a phase-out date for the sale of conventionally fuelled trucks.

Figure 6: How the UK's alternatively-fuelled commercial fleet compares with our neighbours

(Source: SMMT)



On 31 August, the SMMT published a report, *Fuelling the Fleet: Delivering Commercial Vehicle Decarbonisation*, where it highlighted how commercial, technological and operational barriers associated with the likes of hydrogen and batteries have left HGV alternative fuel use 14 years behind that of cars, with just 0.2% alternatively fuelled in 2020 Battery electric LCV use, meanwhile, is lagging a year behind that of cars, with battery electric van usage found to be 0.3% in 2020. In particular, it identified the proposed creation of two new infrastructure networks – electrical charging and hydrogen refuelling – as among the biggest challenges facing the UK to decarbonise road freight transport.

A significant increase in the provision of hydrogen for refuelling to realise opportunities for it as a zero-emission long-distance heavy transport fuel and beyond, with just 11 hydrogen fuelling points for vehicles of any size in the UK. Furthermore, the hydrogen dispensed from these fuelling points is made from fossil fuels or electrolysis of water, meaning that it will not be carbon neutral unless the electricity used is entirely from renewables.

The UK also needs a dedicated public HGV charging network to be rolled out "urgently" with the SMMT citing forecasts from the ACEA of the requirement for 8,200 public HGV charging points by 2030. This equates to more than two new charge points opening every day from now until the end of the decade.

It is clear, therefore, that decarbonisation of the commercial vehicle sector needs greater support from government and other stakeholders outside of the automotive industry, with the SMMT calling for a supportive policy framework that includes incentives for vehicle purchase and operation, an ubiquitous charging and refuelling infrastructure network, and a strategic drive to attract new technicians and upskill the existing workforce, enabling decarbonisation of commercial vehicles.

It also called for government to account for the range of vehicle weights and operational profiles when determining a timeline for phase-out; to offer significant and long-standing financial incentives to give certainty to operators to make the switch to zero emission vehicles; a clear roadmap on the development of fossil fuel free technologies to be agreed with industry and implemented to support the UK manufacturing and the supply chain; and a clear government strategy and strong financial offering to the logistics sector to ensure low carbon and zero emission vehicles are brought to the UK market as quickly as possible.

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