



Department for
Energy Security
& Net Zero

Hydrogen Strategy Update to the Market: December 2024



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Ministerial forward

The Government stands for growth, or it stands for nothing. Creating good jobs, putting more money in people's pockets and making the most of new technology will only happen if we make the right policy decisions now to enable the private sector to invest in the UK.

I am convinced that hydrogen must be at the heart of our plans to grow the economy and to become net zero by 2050.

Low carbon hydrogen has a unique role to play in supporting the decarbonisation of power and in transitioning vital UK industries away from fossil fuels. Backing the UK hydrogen sector can unlock significant economic opportunities, whilst delivering a cleaner and more resilient energy system. Already, Government and industry are delivering real projects to kickstart the UK hydrogen economy, as demonstrated by the contract signings for successful projects from the first Hydrogen Allocation Round.

This publication sets out the 2024 progress in developing policies and projects across the hydrogen value chain and showcases a forward look of our hydrogen plans in 2025. I am excited to build on early lessons from the UK's low carbon hydrogen sector and deliver a world-leading hydrogen economy that achieves the Government's ambitions for clean energy, net zero, and growth.

Sarah Jones MP, Minister of State for Industry

Introduction

Low carbon hydrogen is essential to achieve the Government's Clean Energy Superpower and Growth Missions. It will be a crucial enabler of a low carbon and renewables-based energy system and will help to deliver new clean energy industries which can support good jobs in our industrial heartlands and coastal communities. Hydrogen presents significant growth and economic opportunities across the UK, by enhancing our energy security, providing flexible, cleaner energy for our power system and helping to decarbonise vital UK industries.

Hydrogen has a critical role in helping to achieve our Clean Energy Superpower Mission. It can provide flexible low carbon power generation, meaning we can use hydrogen to produce electricity during extended periods of low renewable output. Hydrogen can also provide inter-seasonal energy storage, through conversion of electricity into hydrogen and then back into electricity at times of need, using a combination of hydrogen production, storage, and hydrogen to power.

To advance our Clean Energy and Growth Missions hydrogen also has a unique role in transitioning crucial UK industries away from oil and gas and towards a clean, homegrown source of fuel. Hydrogen can decarbonise hard-to-abate sectors like chemicals and heavy transport, complementing our wider electrification efforts and accelerating our progress to net zero. Using our strong domestic expertise and favourable geology, geography, and infrastructure, backing UK hydrogen can unlock significant economic opportunities and new, low carbon jobs of the future. Government has an ambitious range of policies in place to incentivise and support industry to invest in low carbon hydrogen. The recent Hydrogen Skills Workforce Assessment, an industry-led study undertaken by the Hydrogen Skills Alliance, estimated that the UK hydrogen economy could support 29,000 direct jobs and 64,500 indirect jobs by 2030.

Since establishing in Summer 2024, this Government has already made significant progress in delivering the UK hydrogen economy. This includes confirming support for the 11 successful Hydrogen Allocation Round 1 projects, announcing up to £21.7 billion of available funding to launch the UK's new carbon capture, utilisation and storage industry, and publishing our hydrogen to power consultation response with an aim to establish a new hydrogen to power business model. We have also launched three new bodies – the National Energy System Operator, Great British Energy, and the National Wealth Fund – which will help to deliver a world-class energy system, including for low carbon hydrogen.

This December 2024 Hydrogen Strategy Update to the Market sets out the key milestones achieved by the Department for Energy Security and Net Zero in 2024 to deliver the hydrogen economy and an ambitious forward look at our next steps and upcoming opportunities. To achieve net zero and create a thriving and resilient energy landscape, we are already working at considerable pace to deliver a world-leading UK hydrogen sector.

Hydrogen production

Low carbon hydrogen production will be a critical part of our future energy system. It can help achieve our mission to be a Clean Energy Superpower by enabling use of hydrogen to provide long-duration energy storage in the power sector and by decarbonising key UK industries. It can support our Growth Mission by unlocking investment and jobs.

The UK is well positioned to secure a competitive advantage in multiple low carbon hydrogen production technologies, primarily electrolytic and carbon capture, utilisation and storage-enabled hydrogen. We have the largest offshore wind sector in the world, natural assets and expertise in carbon capture and storage, and UK companies are already at the forefront of hydrogen technology development.

The Government remains committed to supporting hydrogen production and kick starting the UK's hydrogen economy. We are now firmly in delivery mode, supporting production projects through the Hydrogen Allocation Rounds and working towards final investment decisions through the Carbon Capture, Utilisation and Storage Cluster Sequencing Process. This progress has been possible due to the UK's strong policy framework for growing low carbon hydrogen production – including our Hydrogen Production Business Model, Low Carbon Hydrogen Agreement and our Low Carbon Hydrogen Standard. Together this framework has leveraged private investment to kickstart the UK's hydrogen economy.

Low Carbon Hydrogen Standard and Certification Scheme

The UK [Low Carbon Hydrogen Standard](#) sets a maximum threshold for greenhouse gas emissions for hydrogen to be considered 'low carbon'. This is to ensure that low carbon hydrogen production contributes to decarbonisation efforts. The Low Carbon Hydrogen Certification Scheme is currently under development. It will verify the emissions intensity of hydrogen, determined using the Low Carbon Hydrogen Standard methodology. This will enable low carbon hydrogen producers and users to prove the low carbon credentials of hydrogen.

- [Version 3 of the Low Carbon Hydrogen Standard](#) was published in 2023. We are now **developing Version 4 of the Low Carbon Hydrogen Standard** to make updates that will ensure that the Standard remains fit for purpose and keeps pace with our growing understanding of how new technologies work in practice. Future versions of the Standard will also refine the requirements in preparation for the launch of the certification scheme.
- Following the [consultation response](#), we are continuing to **develop the detailed design of the Low Carbon Hydrogen Certification Scheme** in consultation with industry via the Hydrogen Delivery Council's Standards and Certification Working Group.

Funding hydrogen production

Net Zero Hydrogen Fund

We are supporting producers through the [Net Zero Hydrogen Fund](#), which provides **up to £240 million to support the development and construction of new low carbon hydrogen production plants**. The Fund has been open to multiple production technologies, including carbon capture, utilisation and storage-enabled and electrolytic hydrogen, and targeted at projects that can begin production during the 2020s. The Net Zero Hydrogen Fund's grant allocation is split into four strands.

Strand 1: provides development expenditure for front end engineering design studies and post-front end engineering design costs.

Strand 2: provides capital expenditure for projects that do not require revenue support through the Hydrogen Production Business Model.

Strand 3: provides capital expenditure for projects that require revenue support through the Hydrogen Production Business Model and are part of the first Hydrogen Allocation Round.

Strand 4: provides capital expenditure for carbon capture, utilisation and storage-enabled hydrogen projects that require revenue support through the Hydrogen Production Business Model and are part of the Phase 2 cluster sequencing process.

- In February 2024, the Department for Energy Security and Net Zero announced [seven successful applicants](#) for **Round 2 of the Net Zero Hydrogen Fund Strands 1 and 2 competition**. These applicants will be allocated up to a total of £21 million for new hydrogen production projects across England, Scotland and Wales, subject to contracts being signed. This announcement follows Round 1 of the NZHF for Strands 1 and 2 through which [15 successful projects](#) were allocated £37.9 million.
- Following the launch of the first [Hydrogen Allocation Round](#) in July 2022, we have selected the successful projects to be offered contracts (see the Hydrogen Allocation Rounds section below for further information). **Over £90 million from the Net Zero Hydrogen Fund Strand 3 will be allocated** to support the construction costs of these projects, subject to contracts being signed. Contracts have been issued – via the Low Carbon Contracts Company – to the first three Hydrogen Allocation Round 1 projects and signing contracts will enable these projects to take final investment decisions and begin construction.
- To support the development of carbon capture, utilisation and storage-enabled low carbon hydrogen production plants which have been selected through Track-1 cluster sequencing programme (further information is in the Carbon Capture, Utilisation and Storage Cluster Sequencing Process section, below), the **Net Zero Hydrogen Fund Strand 4 will provide capital support to help construction begin**, subject to contracts being signed.

Hydrogen Production Business Model

The [Hydrogen Production Business Model](#) provides revenue support to incentivise investment in new low carbon hydrogen production and encourage users to switch to low carbon hydrogen by making it a price competitive decarbonisation option.

The Hydrogen Production Business Model will stimulate demand for low carbon hydrogen as the subsidy paid to hydrogen producers will enable them to sell hydrogen at a price that users can afford to pay. By providing the subsidy to hydrogen producers, we are directly addressing barriers to investment in production, which will help achieve our Clean Energy Superpower and Growth Missions at pace.

The model is delivered through the Low Carbon Hydrogen Agreement, which is a private law contract signed between a hydrogen producer and a government counterparty, the Low Carbon Contracts Company. The Department for Energy Security and Net Zero published the draft terms of the Low Carbon Hydrogen Agreement in August 2023 and, in January this year, notice was given to the LCCC [designating the company as a counterparty for hydrogen production revenue support contracts](#) under the Energy Act 2023.

The Hydrogen Production Business Model is applicable to a range of hydrogen production pathways. Support for non-carbon capture, utilisation and storage-enabled production, such as electrolytic, is provided through the **Hydrogen Allocation Rounds**. Support for carbon capture, utilisation and storage-enabled production is provided through the **Carbon Capture, Utilisation and Storage Cluster Sequencing Process**. The latest progress for these programmes is detailed below.

Hydrogen Allocation Rounds

The Hydrogen Allocation Rounds allocate revenue support through the Hydrogen Production Business Model to non-carbon capture, utilisation and storage-enabled hydrogen production facilities across the UK.

- Following the announcement of [11 successful projects to be offered contracts under the first Hydrogen Allocation Round](#), totalling 125MW capacity, **the Low Carbon Contracts Company have issued the first Low Carbon Hydrogen Agreements to the first three Hydrogen Allocation Round 1 projects**. Signing contracts will enable these projects to be among the first commercial scale hydrogen projects in the world to take final investment decisions and move into construction. We expect that contracts will be issued to the remaining Hydrogen Allocation Round 1 projects in early 2025, with the first project expected to be operational in 2025.
- **The second Hydrogen Allocation Round was launched in December 2023 and was oversubscribed**. This includes a spread of applications across the delivery years between 2026 and March 2029. We aim to publish a shortlist of Hydrogen Allocation Round 2 projects in due course to be invited to the next stage of the process.

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- **We are currently developing our approach to future Hydrogen Allocation Rounds, including the third Hydrogen Allocation Round**, to ensure they deliver on the Government's priorities. We will seek feedback on the proposed design and delivery of Hydrogen Allocation Round 3 through a market engagement exercise, similar to the approach taken for the second Hydrogen Allocation Round. Further details will be provided in due course.
 - **In 2025, we will review the design of allocation rounds beyond Hydrogen Allocation Round 4**. This could include moving to an independent allocation body and a price-based competitive allocation (e.g., auction) model. When conducting this review, we will take into consideration the relevant market conditions and our experience of earlier rounds. This should give industry appropriate sight before potentially implementing a new delivery model.

Carbon Capture, Utilisation and Storage Cluster Sequencing Process

As part of the Carbon Capture, Utilisation and Storage Cluster Sequencing Process, revenue support to carbon capture, utilisation and storage-enabled new hydrogen production facilities will be allocated through the Hydrogen Production Business Model.

- Government is committed to carbon capture, utilisation and storage. In October this year, we reached commercial agreement with the private sector and we [announced up to £21.7 billion of funding available over 25 years to launch the UK's new carbon capture, utilisation and storage industry](#). This announcement will help turbocharge the low carbon hydrogen sector by paving the way for the UK's first large-scale hydrogen production plant, decarbonising vital industrial sectors. The Track-1 Cluster Sequencing Process launched in 2021 with the **East Coast Cluster** and **HyNet Cluster** selected as the first two clusters in the UK. The shortlist of projects for final negotiations was later confirmed in March 2023 and included two new carbon capture, utilisation and storage-enabled hydrogen projects: BP's H2Teesside (708MW) to connect to the East Coast Cluster, and EETH's Hydrogen Production Plant 1 (354MW) to connect to HyNet Cluster.
- The next stage of the carbon capture, utilisation and storage programme includes further building out of the first two Track-1 clusters.
- The **Track 1 HyNet expansion process** [was launched in December 2023](#) and the application window closed in March 2024. In September this year, we notified projects of the deliverability assessment outcomes, and successful projects progressed into the shortlisting and cluster integration stage of the process. The objective of this stage is to choose which projects The Department for Energy Security and Net Zero will take through to negotiations and will culminate in the announcement of a Project Negotiation List from Spring 2025.

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- Following the announcement in October 2024 of funding for the initial Track 1 cluster, further decisions for continued carbon capture, utilisation and storage deployment, including for Track 2 clusters, will be taken in due course.

Hydrogen production technologies, impact and integration

- In the 2023 [Hydrogen Production Delivery Roadmap](#), the Department for Energy Security and Net Zero updated on policy work on the environmental impacts of different methods of hydrogen production. We will continue to work across Government, with academia and with industry to further develop our understanding of environmental impacts and develop potential mitigations, where appropriate. As part of this, we are collaborating closely with the Hydrogen Delivery Council to further our understanding by harnessing academic and industry expertise.
- We intend to publish **a report on Water Demand for Hydrogen Production** shortly, produced by the [Climate Services for a Net Zero Resilient World](#) consortium and commissioned by the Department for Energy Security and Net Zero. This report will set out the expected water demand of leading production technologies in the context of expected water availability in the UK. We are working closely with relevant environmental regulators and Ofwat to understand the impact of regional water availability challenges in the context of the developing hydrogen economy. Early engagement between hydrogen producers and the environmental regulators on their water requirements is highly recommended.
- We are **continuing to assess the types of hydrogen production behaviours, configurations and locations that are optimal from an electricity system perspective**. We are reviewing key lessons learned from electricity sourcing for Hydrogen Allocation Round 1 projects, progressing policy work to assess the relative trade-offs of different electricity supply configurations and are conducting analytical systems modelling work on electricity system interactions. We intend to provide a further update once these ongoing workstreams have concluded.

Hydrogen networks and storage

Hydrogen transport and storage infrastructure will be vital to connect producers with consumers of hydrogen and to balance misalignment in supply and demand. It will be critical to enable our hydrogen ambitions and to reach our Clean Energy Superpower and Growth Missions, by creating a world-leading hydrogen network across the UK.

To remove market barriers and unlock private sector investment, we are continuing to develop new business models for hydrogen transport and storage infrastructure. The [Energy Act 2023](#) provided the legislative framework that will underpin the delivery of the Hydrogen Transport Business Model and the Hydrogen Storage Business Model.

A level of strategic planning can also provide greater certainty on future transport and storage network requirements and development, for both domestic need and to align with our trade ambitions. We are continuing to assess the growing evidence of emerging hydrogen transport and storage network requirements to determine what infrastructure is needed, where and when.

Hydrogen transport and storage business models

- Since publishing the [minded-to position on the high-level designs of the Hydrogen Transport Business Model and the Hydrogen Storage Business Model](#) in 2023, work is progressing on their detailed design, including the process and ambition for their first rounds. **We aim to publish details for the first rounds in 2025, and to open the rounds as soon as possible.**
- We intend to design the first Hydrogen Transport Business Model round to contribute towards **an ambition of incentivising the development of regional pipeline infrastructure to be in operation or construction by 2030.**
- We intend to design the first Hydrogen Storage Business Model round to contribute towards **an ambition to support up to two storage projects at scale to be in operation or construction by 2030.**
- Government is continuing to work at pace to identify further transport and storage requirements to inform the scope, scale and timing of future allocations of the Hydrogen Transport Business Model and the Hydrogen Storage Business Model. We intend to publish the results of this next phase of strategic planning for transport and storage in due course.

Strategic planning for hydrogen transport and storage infrastructure

As the interim strategic planner for the build out of hydrogen transport and storage infrastructure, we will continue to work closely with Ofgem and industry to provide early strategic direction. This was previously outlined in the [Hydrogen Transport and Storage Networks Pathway](#) published by the Department for Energy Security and Net Zero in December 2023.

- **We launched the National Energy System Operator in October 2024.** We are aiming for the [National Energy System Operator](#) to be responsible for strategic planning of hydrogen transport and storage infrastructure from 2026.
- In early 2025, we intend to take forward work on the **National Energy System Operator's scope of activities for strategic planning of hydrogen transport and storage infrastructure**, including through consultation and engagement with industry where appropriate.

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- We are continuing to develop our approach to strategic planning for hydrogen transport and storage infrastructure as a priority to help identify and prioritise early strategically significant projects, which will inform the allocation of the Hydrogen Transport Business Model and the Hydrogen Storage Business Model.
 - The strategic planning process for hydrogen transport and storage will be an iterative one, just as it is for existing energy networks. We continue to assess new evidence of transport and storage network needs and intend to produce further analysis on transport and storage infrastructure requirements as evidence on the growth of hydrogen production and demand evolves.

Use of hydrogen

Low carbon hydrogen is essential to achieve the UK's net zero ambitions and to deliver both our Clean Energy Superpower Mission and Growth Mission.

Hydrogen has a unique role in transitioning crucial UK industries away from oil and gas and towards a clean, homegrown source of fuel. It can decarbonise hard-to-abate sectors like chemicals and heavy transport, complementing our wider electrification efforts and accelerating our progress to net zero.

Power

Government has introduced the Clean Energy Superpower Mission, one of the Prime Minister's five main priority areas. There are two parts to this mission, delivering clean power by 2030, and accelerating net zero. Delivering these means we will increasingly rely on a renewables-led power system supported by low carbon, long-duration flexible generation. As outlined in the December 2024 [Clean Power 2030 Action Plan](#), it is estimated that 40-50 GW¹ of dispatchable and long-duration flexible capacity could be needed by 2030 to support our power system and provide a reliable source of electricity to match supply with demand. As part of our 'Clean Power Capacity Range', 2-7 GW of low carbon dispatchable power reflects the range of possible installed capacity by 2030.

Hydrogen to power, which is the conversion of low carbon hydrogen to produce low carbon electricity, is one of the few technologies capable of providing sustained generation to support delivery of clean power. Hydrogen to power can provide low carbon flexible generation at a

¹ The sum of low carbon dispatchable power, unabated gas, and long-duration electricity storage capacities in Table 1 of the Clean Energy Action Plan (page 32), rounded to the nearest 5GW. Dispatchable technologies are ones which combust fuel to produce electricity and, by varying the rate at which fuel is burned, can respond to meet the needs of the grid with varying levels of flexibility.

range of scales. When paired with low carbon hydrogen storage, hydrogen to power provides inter-seasonal long-duration and low carbon flexible electricity generation. It is also economical at the lower load factors that flexible generation is likely to operate in within a clean power system. Hydrogen to power is one of the first-of-a-kind technologies that the [National Energy System Operator considers important for a clean power system in 2030](#).

- Government [published](#) the **Clean Power Mission Action Plan** in December this year which recognised the value hydrogen to power can add to a clean power system and set out practical steps to deliver on clean power and accelerate towards net zero.
- In December this year, we also announced our **intention to implement a Hydrogen to Power Business Model** to support the accelerated deployment of hydrogen to power. The hydrogen to power business model will be based on the Dispatchable Power Agreement. This confirms that Government sees an important role for hydrogen power generation to support the delivery of a clean power system. This was published as part of the Government response to the [consultation on the need and design for hydrogen to power market intervention](#).
- We plan to continue with market engagement and **aim to publish further detail on our approach to the design of the Hydrogen to Power Business Model in Spring 2025**.
- We will look to enable hydrogen to power to participate in the Capacity Market soon as practical.
- We have established a **Hydrogen to Power Expert Working Group** to provide a key forum for Hydrogen to Power Business Model design considerations.
- We intend to launch **market engagement in early 2025 seeking industry views on bringing forward innovative hydrogen to power activities** to deliver early hydrogen to power projects ahead of large-scale hydrogen infrastructure coming online. These activities could make an important contribution to accelerate deployment of hydrogen to power and complement the Hydrogen to Power Business Model.
- In October this year, we published the [Decarbonisation Readiness Government Response and Statutory Instrument](#). **This will help ensure new build and substantially refurbished combustion power plants in England are built with a viable route to decarbonise**, either through retrofitting carbon capture technology or converting to hydrogen firing. The requirements will come into force from 28 February 2026.

Industry

Hydrogen is likely to be a leading option to decarbonise industrial processes that are harder or more expensive to electrify. This includes the use of hydrogen both as a fuel in high-temperature, energy intensive equipment and a feedstock for certain industrial processes.

Near term opportunities include use in sectors such as chemicals and refineries and as an alternative to diesel for off-road machinery. This will especially be the case in industrial clusters which have a high concentration of likely demand alongside early access to hydrogen supply and infrastructure such as large-scale hydrogen storage. In the early years of the hydrogen economy, it is likely that most industrial demand for hydrogen will be located within these clusters where sites can share infrastructure, speeding up rollout and lowering costs. Hydrogen could be important for a range of industrial processes, in particular those that require high temperatures or direct firing such as in the glass or ceramics industry.

Government has an ambitious range of policies in place to incentivise and support industry to invest in innovative, clean technologies, including low carbon hydrogen.

- The [Industrial Energy Transformation Fund](#) offers up to **£500 million to support industrial sites and off-road machinery with high energy use to transition to a low carbon future**. The Industrial Energy Transformation Fund aims to support industry to cut energy consumption and carbon emissions by investing in energy efficiency and low carbon technologies, including hydrogen fuel switches. The Phase 3 Spring 2024 window closed in April 2024. Further announcements will be made in due course. To date, the Fund has supported over 150 industrial sites and details on [successful Industrial Energy Transformation Fund projects](#) are regularly published on gov.uk.
- The [Local Industrial Decarbonisation Plans](#) competition, of up to £6 million, is designed to **support industrial stakeholders in local clusters to develop plans to decarbonise**. The competition ran from June to August 2023, with [13 successful projects announced](#) in January this year.
- The Department for Energy Security and Net Zero is sponsoring the British Standards Institution to develop a Publicly Available Specification to develop a code of practice for the safety, design, construction, testing and performance of large combustion equipment fired with hydrogen in industrial and commercial settings. This document – **PAS 4445 - Large hydrogen-firing equipment and hydrogen conversion for large gas-fired equipment – Code of Practice** – was submitted for public consultation in October 2024 and is due for publication in early 2025.
- In September 2024, we **launched research to assess the merits of extending the Decarbonisation Readiness requirements** to also include combustion plants solely for the generation of heat. This work may form the basis of a future consultation as we look to support the decarbonisation of industry, including through hydrogen fuel switching. Further details of the Decarbonisation Readiness proposals for power generation are provided in the Power section above.
- In September 2024, it was [announced](#) that the government, with the assistance of independent experts, will **review the viability of technologies for the production of primary steel**. Technologies for making iron for primary steel can include the direct reduction of iron using natural gas or hydrogen. More information about the review will follow in due course.

Off-road machinery

Off-road machinery broadly refers to any mobile machine, transportable equipment or vehicle not intended for the transport of goods or passengers on the road, and which has a combustion engine. Examples include construction machinery and agricultural machinery.

Alongside other technologies, Government supports the use of hydrogen either in a fuel cell or in an internal combustion engine as decarbonisation options for off-road machinery. Hydrogen could be particularly well-suited for larger, higher-powered machines that are mobile, have heavy duty cycles, require round-the-clock working, or operate on remote or grid-constrained sites.

The Department for Energy Security and Net Zero is working closely with other Government departments on the development of options to decarbonise off-road machinery, including through the use of hydrogen.

- Government published a [call for evidence on off-road machinery decarbonisation options](#) which closed in March 2024. A high number of respondents considered hydrogen, alongside other fuel switching options such as electrification and biofuels, to be necessary to decarbonise off-road machinery. A summary of responses to the call for evidence will be published in due course. In response to the findings of the call for evidence, **the Department for Energy Security and Net Zero has committed to publish an Off-Road Machinery Decarbonisation Strategy**, as recommended by the Climate Change Committee.
- In December 2023, the Department for Energy Security and Net Zero convened an industry-led working group to share and consider evidence on the **potential role of hydrogen internal combustion engines as a decarbonisation option for diesel engines**, primarily focused on off-road machinery. The group presented its final output to the Hydrogen Delivery Council in October 2024 and published [their full report here](#). Officials at the Department for Energy Security and Net Zero are currently working with other Government departments to review the evidence and recommendations provided.
- [Regulation 94 of The Road Vehicles \(Construction and Use\) Regulations 1986](#) does not permit the road use of hydrogen powered off-road machinery in the UK. This has been highlighted by off-road machinery manufacturers as a barrier to using hydrogen in this sector. Following a [consultation that closed in April 2024](#), **the Department for Transport is developing an amendment to this regulation which will allow hydrogen powered off-road machinery on the road**. This is expected to enter into force in early 2025.

Transport

The Department for Energy Security and Net Zero and the Department for Transport are working together to ensure the use of hydrogen in transport is realised, both to decarbonise the transport sector and capture the economic opportunities of hydrogen in transport.

Hydrogen can support the decarbonisation of heavier transport applications such as aviation and shipping, and potentially some coaches and heavy goods vehicles. Government expects battery electrification to remain the dominant zero emission technology for cars, vans and buses, but there may be niche use cases for lighter duty vehicles where fleet operational considerations could favour the use of hydrogen over battery electrification.

Cross-modal

- The [Tees Valley Hydrogen Transport Hub](#) is bringing together hydrogen supply (refuelling infrastructure) and demand (transport applications) with the aim of **demonstrating the commercial viability of hydrogen in transport**. With £13 million funding, three projects are using hydrogen as a fuel with a fuel cell for a range of road vehicles, and through combustion for airside support vehicles, and supporting new publicly accessible refuelling infrastructure.

Maritime

- **This Government is committed to maritime decarbonisation**, including going further and moving faster on the green transition. This is expected to be driven through the uptake of zero, and near-zero, greenhouse gas emission fuels, including hydrogen and its derivatives.
- In October 2024, **the UK pushed for high ambition at the UN's International Maritime Organization Greenhouse Gas negotiations**. This took us one step closer to an international fuel standard and emissions pricing for maritime, to be formally agreed at the International Maritime Organization in April 2025. These measures can be expected to stimulate demand for hydrogen and its derivatives in the sector by incentivising shipping operators and suppliers to purchase, supply and use these fuels and other zero, or near-zero, greenhouse gas emission solutions.
- In 2024, the [UK Shipping Office for Reducing Emissions \(UK SHORE\)](#) programme **announced the winning projects of the fourth and fifth round of the [Clean Maritime Demonstration Competition](#)**. The fourth round supports the design and development of technologies at low to medium technology readiness level and the fifth round funds feasibility studies into international green corridors. These bring the total investment across the Clean Maritime Demonstration Competition portfolio to £129 million, funding 142 projects across the UK, including projects focused on hydrogen and hydrogen derived fuels.

Aviation

- The **Sustainable Aviation Fuel Mandate** is the UK's key policy mechanism to secure demand for sustainable aviation fuel, by obligating the supply of an increasing amount of sustainable aviation fuel in the overall UK aviation fuel mix. It will incentivise greenhouse gas reductions by awarding tradeable certificates in proportion to greenhouse gas savings delivered. Hydrogen used directly as aviation fuel or in the synthesis of other aviation fuels will be eligible for support under the Mandate, providing it meets the eligibility criteria.
- The [Sustainable Aviation Fuel Mandate statutory instrument](#) has been signed into law and will come into force on 1 January 2025. The Mandate sets out that **from 2025, 2% of all jet fuel in flights taking off from the UK must come from sustainable sources**, increasing to 10% by 2030 and 22% in 2040.
- Following the King's Speech in July 2024, the Government will be laying legislation to introduce a revenue certainty mechanism. **This Bill will support sustainable aviation fuel production in the UK** by providing revenue certainty to encourage investment in the construction of sustainable aviation fuel plants across the UK. We expect the legislation for a revenue certainty mechanism to be in place by the end of 2026. We will continue to monitor the estimated delivery date and work with industry to deliver an effective revenue certainty mechanism as soon as possible.

Surface transport

- There are **approximately 265 registered hydrogen vehicles in the UK**, including buses, heavy goods vehicles, vans and cars.
- The **Zero Emission Heavy Goods Vehicle and Infrastructure Demonstrator Programme** will be demonstrating dozens of hydrogen fuel cell heavy goods vehicles and their associated refuelling infrastructure, alongside battery electric heavy goods vehicles to determine which technology may be better suited for specific UK use-cases. The programme focuses on 40-44 tonne heavy goods vehicles, with all vehicles and infrastructure to be in place by March 2026. There will then be a five-year demonstration period, throughout which data from the programme will be published to inform fleet operators' commercial investment decisions.
- Research continues around feasibility and safety for the usage of hydrogen for rail where its use makes operational and economic sense. Since 2019, **£12.5 million has been allocated to 33 first of a kind projects helping to decarbonise the railway or reduce its harmful emissions**, including £750,000 for the [UK's first hydrogen-ready passenger train, HydroFLEX](#), which was showcased at COP26 and Rail Live 2023.
- A [call for evidence on the past performance and future of the Renewable Transport Fuel Obligation](#) was published in November this year and is open for responses until 27 January 2025. This invites stakeholders from across the low carbon fuels sector to feedback on the operation of the scheme and how it could be improved to better deliver

its aims. The Renewable Transport Fuel Obligation supports the supply of renewable and low carbon hydrogen in the transport sector.

Heat in buildings

The previous Government committed to taking a decision in 2026 on the role of hydrogen in home heating. This has been an area of extensive debate within the sector, and much has changed since the 2026 date was set, including decisions not to progress with the village trials and pause work on the planning for the town pilot.

We want to provide strategic clarity on decarbonising home heating as soon as possible in order to best support our mission to make the UK a Clean Energy Superpower. Over the coming months we will assess the latest evidence before consulting in 2025 on the role of hydrogen in home heating.

The Health and Safety Executive will continue its work to assess the safety evidence for hydrogen heating and we are expecting its conclusions later next year.

- [Construction on the neighbourhood trial in Fife \(“H100”\) is underway](#) and SGN is planning for this to go live by summer 2025.

Blending

Blending low carbon hydrogen into the existing gas networks may have value, in certain circumstances, to support the early development of the hydrogen economy and the wider energy system.

- We recognise the need to provide clarity to industry on blending hydrogen into the existing GB gas transmission system and set out an intention to provide an update on timings in 2024 for a transmission level blending policy decision. Following analysis and stakeholder engagement, **we intend to consult on transmission-level blending within GB in early 2025, with the aim of making a strategic policy decision on whether or not to support transmission-level blending in 2025.**

Regulatory framework

To scale up delivery of the hydrogen economy, an appropriate market and regulatory framework is required to bring forward private investment across the value chain.

Responses to the Department for Energy Security and Net Zero [2022 consultation on hydrogen transport and storage business models](#) revealed concerns amongst stakeholders

about the applicability of the incumbent market framework, as provided by the [Gas Act 1986](#), to hydrogen. They highlighted that these existing arrangements were developed to support a mature gas industry, whereas the hydrogen economy is in its infancy. Furthermore, they noted that aspects of the market framework are concerned with natural gas specifically. The Department for Energy Security and Net Zero acknowledged these concerns and said that it would keep the market framework under review, with a view to introducing timely amendments where they are needed.

We are also working closely with industry, regulatory bodies and devolved administrations to consider the suitability of existing regulatory frameworks for hydrogen, including through the Hydrogen Regulators Forum. We are taking a proactive approach to identify and address existing and emerging regulatory challenges for the hydrogen economy.

Market framework

The [Gas Act 1986](#) provides a market framework for the conveyance of gas, which includes hydrogen, through pipes. Through an arrangement of licences and codes, obligations and prohibitions, it allocates roles and responsibilities to market participants and sets out how they must interact with one another.

We recognise that the market framework plays a critical role in enabling the hydrogen economy. It will be important that it can be capable of appropriately supporting the first small-scale hydrogen pipeline projects that are expected to come online in the mid-2020s. Equally, it must be sufficiently flexible such that it can accommodate larger, possibly interconnected networks as the hydrogen economy matures.

- We have been undertaking a program of work throughout 2024 which aims to **develop a market framework for the conveyance of hydrogen through pipes**. This work has drawn on the expertise of industry stakeholders, predominantly through the Hydrogen Delivery Council's Transport & Storage Working Group.
- At the beginning of this year, **the Hydrogen Delivery Council's Transport & Storage Working Group established a market framework sub-group**, which was assembled to work-up and test a range of market framework options. It presented its initial findings to government this summer.
- We are continuing to progress its work in this area, with a view to ensuring the market framework is clarified and implemented well in advance of the first hydrogen pipeline networks commencing operations.

Non-economic regulation

We are committed to ensuring regulations are optimal for supporting the Department's hydrogen ambitions. After successfully implementing regulatory changes for offshore hydrogen

pipelines and storage projects in 2023, we are continuing to review the broader regulatory framework for hydrogen projects.

- **We are exploring the need for a 100% hydrogen pipeline gas quality standard.**
- We conducted a **stocktake of the development of regulations and standards related to hydrogen combustion in industry and power sectors**. [The full report of this stocktake was published in December](#).
- In March this year, the Environment Agency released [guidance for emerging techniques on hydrogen production by electrolysis of water](#).
- In October this year, the Environment Agency released [guidance on how to comply with emission limit values for hydrogen combustion plants greater than 1MW thermal input](#).
- The **Hydrogen Regulators Forum** aims to support this objective by meeting to discuss updates within the hydrogen regulatory space and priority regulatory challenges. It endeavours to promote greater coordination and policy action amongst relevant regulators. The Forum meets regularly, most recently in February, April and October this year, and aims to continue identifying regulatory issues and work to ensure that the regulatory framework is suitable for delivering hydrogen ambitions at pace.

Hydrogen sector development

Delivering economic growth is one of the UK Government's core national missions. Developing the hydrogen economy can contribute directly to this mission by fostering investment and creating good jobs in the construction and operation of projects and the associated supply chain. [Analysis from the Department for Energy Security and Net Zero from 2022](#) previously indicated that achieving 10GW of low carbon hydrogen production capacity could be worth over £900 million and support 12,000 jobs in 2030, unlocking over £11 billion in private investment. Job creation in the hydrogen economy has the potential to span various sectors, including manufacturing, infrastructure and research and development. A recent [Hydrogen Skills Workforce Assessment](#), undertaken by the Hydrogen Skills Alliance on behalf of industry, also estimated that the UK hydrogen economy could support 29,000 direct jobs and 64,500 indirect jobs by 2030.²

The Government is committed to further deepening its partnership with business to invest in the UK's future via engagement and effective policy, such as through hydrogen business models and the recently announced National Wealth Fund. Ensuring UK workers have the skills and qualifications to access jobs and support sector growth is a vital challenge that we

² Note that this is industry-led analysis, including jobs from hydrogen production, transmission, distribution, storage and end use. It is not directly comparable with government analysis on hydrogen jobs. Government analysis does not include jobs in hydrogen end use and is based on different underlying deployment scenarios.

continue to address including through the creation of [Skills England](#) and the Office for Clean Energy Jobs.

Investment

- The high level of interest we received for the second Hydrogen Allocation Round with 87 applications totalling over 2.8GW of potential production capacity provided a strong signal that **the UK's developing policy and regulatory framework for hydrogen presents an attractive investment opportunity.**
- In February 2024, the Department for Energy Security and Net Zero provided an **annual update to the [Hydrogen Investment Roadmap](#)** to showcase the UK hydrogen offer and our scale of ambition for the hydrogen economy in meeting net zero. It sets out investment opportunities across the hydrogen value chain – from production, through transport and storage to the range of potential end uses, including industry, power, transport and heating.
- The Department for Energy Security and Net Zero also **co-hosted the second Hydrogen Investor Forum in February** with Hydrogen UK. The event attracted around 400 attendees including industry leaders, investors, Ministers and government officials. With a keynote speech by the Secretary of State and remarks by both the Hydrogen and Investment ministers, the event gave a unique opportunity to showcase the best of the UK hydrogen industry and facilitate networking between hydrogen investors, project developers, supply chain companies and policy officials.
- To foster investment into the UK, **we hosted a delegation of US hydrogen and carbon capture, utilisation and storage stakeholders in October** to highlight UK hydrogen policy developments and strategies and encourage investment.
- With a total **capitalisation of £27.8 billion** and building on the UK Infrastructure Bank's leadership and expertise, we expect to see **the new [National Wealth Fund](#)** use its expanded suite of financial instruments and higher risk appetite to mobilise significant private investment, including potentially across the hydrogen value chain.
- In parallel to this, **[Great British Energy](#), backed by £8.3 billion**, will be at the heart of the mission to make Britain a Clean Energy Superpower. As Great British Energy is established, the investment activity will be undertaken by the National Wealth Fund, helping it to make initial investments as quickly as possible and draw on the National Wealth Fund's resources, experience and pipeline of projects.
- In October this year, the **Government hosted the [International Investment Summit](#)**, bringing together industry leaders from around the world to catalyse investment by making clear the UK is open for business. From the Department for Energy Security and Net Zero, the Secretary of State and Permanent Secretary met with CEOs from a range of companies across the hydrogen and carbon capture, utilisation and storage value chain, including manufacturers, developers and investors. A total of **[£63 billion of private investment](#)** was committed around the Summit, including over £24 billion across energy

and net zero sectors announced ahead of the Summit. The figure demonstrates that businesses have confidence in Britain as a place to invest.

- [Government recently consulted on 'The UK's modern industrial strategy – Invest 2035'](#), which is the UK government's credible, **10-year plan to deliver the certainty and stability businesses need to invest in the high growth sectors that will drive our Growth Mission**. It has identified 'clean energy industries' as a focus area. This green paper sets out the government's approach and asked for views and evidence to help develop a successful, modern industrial strategy to be launched in Spring 2025.

Supply chains

We are continuing to work in partnership with industry to identify key supply chain strengths and opportunities and consider proposals on how to develop them.

- As mentioned in the Investment section above, **the National Wealth Fund will mobilise billions of pounds of investment in the UK's world-leading clean energy and growth industries**. This includes the potential to support companies in the hydrogen supply chain, as well as specific delivery projects, with an expanded suite of financial instruments. The policy paper [National Wealth Fund: Mobilising Private Finance](#), published in October, sets out key next steps.
- Government has set out in the founding statement for **Great British Energy** that **supply chains will be one of its five functions**. It will work with the Department for Energy Security and Net Zero, the Crown Estate, the National Wealth Fund and other parts of the public sector to deliver a comprehensive package of support for domestic energy supply chains.
- The **Industrial Strategy** intends to channel support to eight growth-driving sectors, which will include Clean Energy Industries. **Government aims to publish the strategy, including sector plans, in Spring 2025**.
- **Hydrogen UK published the industry-led [Hydrogen Supply Chain Strategic Assessment](#)** in September this year. Overseen by the Hydrogen Delivery Council's jobs, skills and supply chains working group, the strategy identifies areas of the hydrogen supply chain which will have the highest growth impact and where the UK is well placed to lead. These areas include electrolyser stacks, power electronics, hydrogen network pipes, and compressed hydrogen storage tanks. The assessment reiterates the voluntary, industry-led commitment to use 50% UK content in hydrogen projects from 2030. Government is now working via the Hydrogen Delivery Council to consider the recommendations set out in the report.
- The Department for Business and Trade has reviewed the objectives of its **Hydrogen Propulsion Manufacturing Taskforce**, with a renewed mandate to contribute to the works of the Industrial Strategy. The taskforce will agree the vision for hydrogen propulsion manufacturing in the UK, setting out a joint Government-industry approach which will be reflected in the Advanced Manufacturing Sector Plan. The taskforce will

continue working in 2025 to identify the size of the opportunity to invest in the UK design and development of hydrogen propulsion technologies across land, maritime, and air transport. Recommendations will consider our manufacturing strengths, the potential of hydrogen propulsion systems across applications, and foreseeable technology developments to 2050. The Taskforce reports to Department for Business and Trade Ministers and into the Hydrogen Delivery Council.

Jobs and skills

- [Skills England](#) is a new arms-length body that will play a critical part in the government's growth mission by bringing together key partners to meet the skills needs of the next decade. The body's first report, [Skills England: Driving growth and widening opportunities](#), was published in September this year. This highlighted hydrogen as one of the sectors expected to grow in the net zero transition but also highlighted that existing green-skilled workforces will need to grow substantially to meet new demand. Skills England is currently set up in shadow form within the Department for Education with plans to be fully established next year.
- The **Office for Clean Energy Jobs** has been created within the Department for Energy Security and Net Zero to engage across key groups relevant to the clean energy sector workforce including trade unions and industry. The Office will work closely with Skills England and Department for Education to ensure the UK workforce has the skills needed to deliver net zero and the Clean Energy Mission feeding into further iterations of Skills England's need assessments and supporting with targeted delivery of specific policy solutions, including for hydrogen.

International trade and engagement

While our priority remains establishing the UK hydrogen economy, we also want to play a leading role globally in shaping hydrogen markets, regulations and standards. We want to support our domestic hydrogen sector to fully participate in, and benefit from, the opportunities of the global transition to low carbon hydrogen, positioning the UK as a future exporter of hydrogen and related goods and services and as an important hydrogen investment destination.

We have developed close relationships with key partner countries, multilateral organisations, industry and investors, sharing the UK's hydrogen policy expertise, collaborating to address barriers to deployment, and shaping the development of a global hydrogen economy. Together with the Department of Business and Trade, the Foreign Commonwealth and Development Office and their international networks, we are working to proactively showcase UK policy and commercial strengths on the global stage, and in priority markets, to increase collaboration opportunities for UK business and attract investment.

External reports confirm that the UK continues to offer one of the world's most attractive business and investment environments. The 2024 index of UK investment attractiveness [published by EY](#) placed the **UK as a top destination for inward investment**, ranking highest in Europe for new projects and the number of jobs created. A 2024 [PWC Survey](#) ranked the **UK as the number one investment target for US CEOs**, and fourth among global CEOs. This was reflected in the October International Investment Summit which unlocked almost £40 billion investment in clean energy projects.

- **We have continued to develop strong bilateral ties on hydrogen with our European neighbours.** We have Energy and Climate memorandums of understanding with Norway, Ireland, Denmark, France and Belgium and frequent policy exchanges with all our European neighbours, including the Netherlands, Austria, Switzerland and Spain as well as with the European Commission. As part of our [UK-Germany Hydrogen Partnership](#) (and [wider Energy and Climate Partnership](#)), we have regular exchanges on our respective hydrogen approaches and collaboration opportunities across the hydrogen value chain.
- Beyond Europe, we have continued to ramp up collaboration with countries across the globe and signed broader energy partnerships, including hydrogen, with Chile (October 2024), and with Texas (March 2024). **We have hosted foreign delegations and had policy dialogues to share our experiences**, including with the USA (February and September 2024), Brazil as part of the [UK-Brazil Hydrogen Hub](#) (February 2024), Azerbaijan (July 2024) and Chile (July and November 2024).
- **The UK continues to be actively involved in numerous multilateral initiatives on hydrogen** such as the International Partnership for Hydrogen and Fuel Cells in the Economy, the Clean Energy Ministerial Hydrogen Initiative, and the IEA's Hydrogen Technical Collaboration Partnership, as well as co-leading Mission Innovation's Hydrogen Mission and the Breakthrough Agenda. Earlier this year, we also became involved in the committee developing the global methodology for hydrogen standards, as part of our ongoing work with the International Organisation for Standardisation.
- **We have held hydrogen industry roundtables with international and UK industry and government representatives**, including during E-world 2024, the Berlin Energy Transition Dialogue (March 2024) and the World Hydrogen Summit (May 2024). We also welcomed industry delegations from abroad to our Hydrogen Investor Forum (February 2024). Under the UK-Germany partnership, we are also exploring options to further increase commercial collaboration between UK and German companies.
- Commercially, **UK companies are entering into strategic partnerships to accelerate exports of their world-leading technologies globally.**
 - In March, **ITM Power** exported a NEPTUNE 2 electrolyser to Tokyo Gas Co Ltd's Yokohama Techno Station, the first megawatt-class Proton Exchange Membrane electrolyser to be imported into Japan, followed in June by the inauguration of the largest operating Proton Exchange Membrane system in Europe with the opening

of a 24MW project at Yara's Herøya Industrial Park in Norway for the manufacturing of green ammonia.

- **Ceres Power** have partnered with energy solutions provider Thermax to accelerate the deployment of solid oxide electrolysis cell technology in India.
- **CPH2** announced in October that it has renewed contract terms for providing its 1MW Membrane-Free Electrolyser™ to its manufacturing partner Fabrum Solutions in New Zealand, and in November that it has entered into a Licence Agreement with Hidrigin (Ireland) to construct 2GW of membrane-free electrolyzers to be used exclusively by Hidrigin in its own Solar Photovoltaic and Wind Farms worldwide. In addition, CPH2 will supply a 1MW MFE220 electrolyser unit for delivery in 2025.
- Thanks to our unique geographical location, geology and extensive renewable energy resources, **the UK has a strong potential to export hydrogen in the future via pipeline**, especially to Europe where we see strong demand signals. In the longer term, we also recognise the role that imports of low carbon hydrogen could play in supporting energy security as part of a diverse supply mix.
- **We are taking steps to facilitate the trade of hydrogen**, including seeking to keep UK standards and certification for low carbon hydrogen consistent with international standards and schemes where appropriate, understanding options for international transportation, networks, and storage and reviewing offshore and international regulations.
- To help inform this, the Department for Energy Security and Net Zero **commissioned a [study to consider the options and UK potential to export hydrogen from the UK to continental Europe](#)**, which was published in May. This study provided the first comprehensive piece of evidence from the UK on exporting hydrogen to continental Europe.
- Building on this, and the wider UK-Germany Hydrogen Partnership, in May the Department for Energy Security and Net Zero **commenced a joint study with Germany to consider the feasibility of a hydrogen pipeline between the UK and Germany** in the future, which is planned to be published in early 2025.

Research and innovation

The **£1 billion [Net Zero Innovation Portfolio](#) continues to accelerate the commercialisation of low carbon technologies, such as hydrogen**. Other support to research and innovation comes from UK Research and Innovation, the Department of Transport, and other public sector bodies.

- Notable recent successes achieved through the Net Zero Innovation Portfolio include progress on ERM's Dolphyn project under the **[Low Carbon Hydrogen Supply 2 competition](#)**, which is **developing a system for producing electrolytic hydrogen from**

seawater on offshore floating marine platforms with Net Zero Innovation Portfolio support.

- Several projects supported through the [Hydrogen BECCS \(bioenergy with carbon capture and storage\) programme](#) including projects being led by [Biorenewables Development Centre](#) and [Compact Syngas Solutions](#) are in advanced stages of **demonstrating the generation of hydrogen from biogenic feedstocks**, whilst capturing carbon.
- The [Hydrogen for the Decarbonisation of Sheffield Steel \(HYDESS\) project](#) led by E.ON with Net Zero Innovation Portfolio [Industrial Hydrogen Accelerator](#) funding has completed a major front end engineering design study to **demonstrate the feasibility of hydrogen supply for use in steel manufacturing**. The project has proposed advanced plans for a solution to produce and deliver hydrogen from their Blackburn Meadows site and signed offtake agreements for hydrogen use in steel manufacturing to locations throughout Sheffield.
- The Net Zero Innovation Portfolio's [Industrial Fuel Switching programme](#), through the HyCrem project has successfully completed the trial phase of converting to hydrogen fuel at the Worthing Crematorium site. This is a [world first trial](#) to **convert the operation of crematoriums fuelled by natural gas to 100% green hydrogen fuel**.
- The UK Research and Innovation's [Engineering and Physical Sciences Research Council](#) investments continue to **support national and international hydrogen research to facilitate key technological developments** through the [Global Hydrogen Production Technologies Center](#), the [UK Hub for Research Challenges in Hydrogen and Alternative Liquid Fuels](#) and the [Hydrogen Integration for Accelerated Energy Transitions Hub](#).
- The Engineering and Physical Sciences Research Council has provided **new investment in skills** through [Centres for Doctoral Training in Engineering Hydrogen Net Zero](#) led by Loughborough University, and [Green Industrial Futures](#) led by Heriot-Watt University.
- The Engineering and Physical Sciences Research Council has invested in the [Great Western Supercluster for Hydrogen Impact for Future Technologies](#) initiative. The University of Bath **is coordinating efforts to grow the hydrogen cluster in the South West of England and South Wales**. The University of Bath is also leading project [Zero Emission: The Next Generation of Integrated Technologies for Hydrogen \(ZENITH\)](#) with GKN Aerospace, **tackling hydrogen storage and structure challenges for aircraft**.
- The Clean Hydrogen Innovation Programme, led by Carbon Trust and supported by Department for Energy Security and Net Zero, has [awarded three contracts from its first round of innovation projects](#) to **address uncertainties around three vital technologies in the hydrogen supply chain: compressors, purification, and distribution by pipeline and tube trailer**. The projects will use evidence on existing and near-market technologies to highlight opportunities where innovation and

demonstration could significantly advance market offerings, with results aimed for early 2025.

- The Hydrogen Innovation Initiative published a first report, [The UK Hydrogen Innovation Opportunity](#), in April this year. The report outlines the **economic opportunity and critical role innovation could play in the UK for the emergent global hydrogen economy**.
- The [UK Research Partnership Investment Fund](#) have funded a £23 million [Hydrogen Integration Incubator](#) at Cranfield University, which will build a **world-class hydrogen aviation ecosystem at Cranfield's Global Research Airport**. It will design, validate and deliver green aviation at scale and shape emerging safety and environmental policies, helping the UK get closer to net zero aviation by 2050.

Hydrogen Delivery Council

The [Hydrogen Delivery Council](#) brings together stakeholders from across the hydrogen value chain and is the primary forum for government and industry to collaborate in achieving the UK's hydrogen ambitions. It is currently co-chaired Minister Jones, Minister of State at the Department for Energy Security and Net Zero, and the Department for Business and Trade and Jane Toogood, industry co-chair. The Council is focussed on activity required across the 2020s and 2030s to expand the UK low carbon hydrogen economy.

The Council recently conducted a membership review which has seen the addition of the hydrogen trade associations Hydrogen Energy Association and Hydrogen UK, as well as the Trade Union Congress and Arcadia E-fuels, a producer of net zero carbon fuels. These additions enable holistic industry perspectives and improves representation of jobs, skills and supply chain interests and from those involved in the use of hydrogen to decarbonise the transport sector.

The council oversees six industry working groups.

- The **Hydrogen Production Working Group** played an instrumental role in guiding Government thinking in the development of the 2023 [Hydrogen Production Delivery Roadmap](#). The group is now considering questions across a range of issues, such as further actions needed to support the commercialisation of different production technologies that are ready to deploy, our approach to system integration of electrolysis, and increasing our understanding of the environmental impacts of hydrogen production.
- The **Hydrogen Transport and Storage Working Group** has focused its attentions on the market framework for hydrogen conveyed through pipes, and the identification of “tipping points” in the emergence of the hydrogen economy - for example, instances where the market framework may need to evolve in response to substantive changes in infrastructure. The working group has completed a report on the development of a market framework for hydrogen which has been shared with Department for Energy Security and Net Zero for consideration. The working group is also considering the

establishment of a strategic planning sub-group to consider how industry might best support Government and the National Energy System Operator in the strategic planning of transport and storage infrastructure.

- The **Offtaker Working Group** recently presented a report to the Council setting out the key short-term barriers preventing hydrogen uptake. The group will aim to continue to develop key recommendations from this report as well as turning efforts to developing and interrogating our understanding of the best use cases for hydrogen using real world evidence. The working group also established an industry-led sub-group to share and consider evidence on the role of hydrogen internal combustion engines, primarily in off-road machinery. The group presented its final output to the Hydrogen Delivery Council in October 2024 and published [their full report here](#).
- The **Low Carbon Hydrogen Standard and Certification Working Group** is focused on the design of the UK's Low Carbon Hydrogen Certification Scheme and Low Carbon Hydrogen Standard, including consideration of international schemes and standards. Members have provided inputs into the potential future development of the Standard and on the policy design Certification scheme. An IT specific sub-group has been set up for the technical development of the IT system for Certification.
- The **Jobs, Skills and Supply Chains Working Group** is overseeing and steering a programme of work to develop and implement an industry-led Hydrogen Supply Chain Strategy, written by Hydrogen UK on behalf of industry, and a Hydrogen Skills Strategy, written by the Hydrogen Skills Alliance. The full phase one [UK Hydrogen Supply Chain Strategic Assessment](#) was published in September 2024 and phase two of the work, looking at end use sectors, is well underway.
- The **Hydrogen Regulators Forum** focuses on the hydrogen regulatory space, priority regulatory challenges, and promoting greater coordination and policy action amongst relevant regulators. The Forum aims to continue to identify regulatory issues and work to ensure that the regulatory framework is suitable for delivering hydrogen ambitions at pace.

Upcoming opportunities

Upcoming hydrogen policy milestones and opportunities to provide feedback on our policy development include:

Upcoming opportunities	
Hydrogen production	<ul style="list-style-type: none"> • We aim to publish a shortlist of Hydrogen Allocation Round 2 projects in due course to be invited to the next stage of the process. • We aim to have a market engagement exercise for feedback on the proposed design and delivery of Hydrogen Allocation Round 3, with further details to be provided in due course. • We aim to have a review in 2025 on whether and when to move to price-based competitive allocation (e.g. auctions) for the Hydrogen Allocation Round programme.
Networks and storage	<ul style="list-style-type: none"> • We aim to publish details for the first rounds of the Hydrogen Transport Business Model and the Hydrogen Storage Business Model in 2025.
Uses of hydrogen	<ul style="list-style-type: none"> • A market engagement exercise which will include an update on our approach to the design of the Hydrogen to Power Business Model, which we intend to publish in spring 2025 • A consultation on transmission-level blending within GB which we intend to publish in early 2025. • We aim to make a strategic policy decision on whether or not to support transmission-level blending in 2025. • A consultation on hydrogen for heating which we intend to publish in 2025.
Sector development	<ul style="list-style-type: none"> • Launch of the Industrial Strategy in the spring, following the recent consultation Invest 2035: the UK's modern industrial strategy. The Strategy will set out Government's full approach to supporting UK supply chains for clean energy sectors. • The next Hydrogen Delivery Council meeting, which is due to be held in early 2025.

Conclusion

Low carbon hydrogen is crucial to achieving net zero and delivering the Government's Clean Energy Superpower and Growth Missions. In this fifth edition of the Hydrogen Strategy Update to the Market, we recap the progress made in 2024 to deliver the UK hydrogen economy. This includes confirming support for the 11 successful Hydrogen Allocation Round 1 projects and publishing our [hydrogen to power consultation response](#) confirming our aim to establish a new business model. We also announced up to £21.7 billion of funding available to help launch the UK's new carbon capture, utilisation and storage industry and [launched the National Energy System Operator](#), National Wealth Fund and Great British Energy to help deliver a world-leading low carbon energy sector and support hydrogen economy growth.

We will continue to deliver the hydrogen economy at pace. Key upcoming milestones next year include our aims to publish a shortlist of Hydrogen Allocation Round 2 projects, publish details for the first allocation rounds of the Hydrogen Transport Business Model and Hydrogen Storage Business Model, and publish a consultation on transmission-level blending with an aim to make a strategic policy decision on this in 2025.

These milestones represent our significant progress in advancing our Missions and achieving net zero. We are working with industry, investors and innovators to deliver real projects and economic opportunities across the hydrogen value chain and across the UK.

This publication is available from: <https://www.gov.uk/government/publications/hydrogen-strategy-update-to-the-market-december-2024>

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