



SHEPHERD+ WEDDERBURN
THE BEIS HYDROGEN BUSINESS MODEL

1. Overview and context

- 1.1 Government is focussed on supporting hydrogen projects. The British Energy Security Strategy targets 10GW of low carbon hydrogen production capacity by 2030 with at least 50% from electrolytic hydrogen.
- 1.2 Around 20GW of hydrogen projects have been identified with commissioning dates up to 2037. BEIS estimates that hydrogen demand could be between 20-35% of final energy consumption by 2050, deployed in industry, power generation, heating and transport.
- 1.3 The purpose of this note is to outline some key aspects of the proposed Government support as contemplated by the Energy Bill:
- 1.3.1 Net Zero Hydrogen Fund, (**NZHF**). This is a fund of up to £240 million, with grants to be made from 2022 to 2025. It is designed to support upfront costs of low carbon hydrogen production facilities, including from nuclear energy, renewables and CCUS. It will provide capex and devex support.
 - 1.3.2 The Hydrogen Business Model, (**HBM**). This is a contract for difference type mechanism to provide revenue support to low carbon hydrogen production facilities on a long-term basis. The foundation of this is a recognition that that the price for hydrogen is higher than fossil fuel alternatives, and that low carbon hydrogen producers will not be able to recover their costs under current market prices.
 - 1.3.3 The UK Low Carbon Hydrogen Standard. This is an emissions standard for hydrogen production to ensure that support is targeted at projects that are consistent with net zero. As an example it addresses the issue of how hydrogen made from electricity can be determined to be low carbon. It sets a baseline emissions standard.
- 1.4 The focus of this element of Government policy is on promoting the supply side. This is because consumers will not switch unless there is a demonstrably secure supply of hydrogen. The Government view this as the first priority.
- 1.5 It is recognised that demand for hydrogen also needs to be stimulated. The Government is pursuing a range of wider hydrogen related initiatives to stimulate demand and remove barriers to low carbon hydrogen production and use.
- 1.6 Hydrogen policy is closely related to CCUS policy, as viable CCUS transportation and storage is essential for CCUS enabled gas based hydrogen production. Existing hydrogen production facilities may be eligible for support to fit carbon capture systems under the Industrial Carbon Capture Contract scheme.
- 1.7 The BEIS Hydrogen Investor Roadmap provides a summary of overall initiatives in this context and a timeline of potential funding rounds.¹

2. The Net Zero Hydrogen fund (NZHF)

- 2.1 The objective of the NZHF is to provide grant funding to support the upfront costs of low carbon hydrogen production projects. The Government's general policy is set out in *The Net Zero Hydrogen Fund Government response to consultation* published by BEIS in April 2022.² BEIS set out the proposed split of the NZHF's funds at page 8 of that document as follows:

¹ The BEIS Hydrogen Investor Roadmap, April 2022. [Link](#)

² [Link](#)

- “• *Strand 1: DEVEX (development expenditure) for Front End Engineering Design (FEED) studies and post FEED costs.*
- *Strand 2: CAPEX (capital expenditure) for projects that do not require revenue support through the hydrogen business model.*
- *Strand 3: CAPEX for non-Carbon Capture, Usage and Storage (CCUS) enabled projects that also require revenue support through the hydrogen specific business model.*
- *Strand 4: CAPEX for CCUS-enabled projects that require revenue support through the hydrogen business model.”*
- 2.2 The emphasis is on capital co-funding, with significant private sector funding required. The projects must be capable of deployment in the 2020s.³
- 2.3 BEIS has already launched funding competitions for projects under strands 1 and 2 under the NZHF.⁴
- 2.4 On strand 3 BEIS carried out a consultation in April – May 2022.⁵ The objective is to provide NZHF grant funding and hydrogen business model support for projects with a round in 2022. The indicative timeline contemplates launch in July 2022, an application deadline in September 2022, selection by early 2023 and conclusion of negotiations by December 2023.
- 2.5 Indicative timings of projects are set out in a BEIS document, “*Competition Timings for BEIS Hydrogen funds*”.⁶
- 2.6 There is also funding available for from the Scottish Government.

3. The hydrogen business model (HBM)

- 3.1 BEIS consulted on the HBM in August 2021.⁷ The Government’s response was published in April 2022,⁸ along with indicative heads of terms.⁹

Next steps

- 3.2 BEIS wish to finalise the business model in 2022, with the first set of contracts being allocated in 2023. At present, material elements of the operation of the model remain uncertain.

Objective

- 3.3 The objective is to support production via a contractual support mechanism which provides revenue support. In very simple terms, the mechanism recognises that the price at which hydrogen can be sold will not cover the costs of production and a reasonable return to investors. It therefore provides for “top-up” payments to account for this difference, and provide investors with a measure of revenue certainty.

The price support

- 3.4 BEIS propose a difference payment via a “variable premium mechanism”. This will involve payments to cover the difference between:
- 3.4.1 the “strike price”, which is designed to cover the facility’s costs and a reasonable return to investors. This will be adjusted for cost changes, a point we discuss below; and
- 3.4.2 a “reference price”, which is the price received by the producer for each unit of hydrogen sold. BEIS aim to move to a market benchmark price “at the earliest opportunity”.

³ The objective is not to support transportation and storage facilities. BEIS aim to develop business models by 2025 for this and are carrying out a review to understand the likely T&S infrastructure requirements in the 2020s. [Link](#)

⁴ For the summer 2022 strands 1 and 2 competitions see BEIS Notice Net Zero Hydrogen Fund strand 1 and strand 2. [Link](#)

⁵ See Hydrogen Business Model and Net Zero Hydrogen Fund: market engagement on electrolytic allocation. BEIS, April 2022.

⁶ [Link](#)

⁷ Low Carbon Hydrogen Business Model: consultation on a business model for low carbon hydrogen, BEIS, August 2021, [Link](#)

⁸ Government response to the consultation on a Low Carbon Hydrogen Business Model, [link](#)

⁹ Agreement for the Low Carbon Hydrogen Business Model Indicative Heads of Terms. [Link](#)

- 3.5 If the price of hydrogen increases the level of support will fall.
- 3.6 The proposal is that the reference price is an actual “achieved sales price” because there is not a liquid market for hydrogen. The position is different to, for example, electricity, where there is a day-ahead market which provides market prices which can then be used as the reference price in the renewables Contract for Difference.
- 3.7 BEIS propose two additional elements to the reference price.
- 3.7.1 A floor, below which support would not be provided. This is currently proposed to be based on the gas price. This is because BEIS’ view is that the most common and lowest cost fuel from which users will switch is gas. It follows that they should be willing to pay the gas price for hydrogen.
- 3.7.2 A “contractual price discovery mechanism” designed to incentivise producers to obtain a higher price. However, BEIS also wish to ensure that prices are not too high to ensure that users are protected.
- 3.8 BEIS have confirmed that they will continue to develop this approach.

Indexation and input cost changes

- 3.9 BEIS continues to consider on what basis the Strike Price can be adjusted to take account of cost changes.
- 3.10 The two key feedstocks for hydrogen production are likely to be renewable electricity and natural gas. Both (not least at present) are subject to significant fluctuations, reflecting gas market conditions. Some respondents to BEIS’ consultation noted that there is not a market in long-term gas contracts in the UK, whereas long-term PPAs for electricity are available. Accordingly gas produced hydrogen faces a further challenge as it is not possible for hydrogen producers to achieve input cost certainty in the same way as it is for electricity.
- 3.11 As part of the development of the mechanism, BEIS will continue to consider indexation and input cost changes. This will be targeted at uncontrollable and unmanageable changes to prices.
- 3.12 The recent gas market problems, and the Russian invasion of Ukraine, along with a renewed focus on nuclear more generally and nuclear fusion all go to explain the current interest in nuclear power as a feedstock.

Volume support

- 3.13 There is a clear risk that plants will not be able to sell sufficient volumes, This risk will be addressed via a sliding scale mechanism. This will offer more support when volumes are low, with the level of support tapering as volumes increase. If volumes drop to zero no sums will be payable. The Government will not act as a “buyer of last resort”.
- 3.14 This means that it is essential for developers to identify robust offtake arrangements.

Length of support

- 3.15 The proposed duration is 10-15 years. BEIS is not minded to provide for extensions. BEIS also consider that it is preferable to have the same length for all technologies. However, the position remains under review.

Risk allocation

- 3.16 The allocation of risk between Government and hydrogen producers is an important part of the HBM. The following risks have been identified in particular:
- 3.16.1 CO₂ transport and storage risks. These risks include delay to the commissioning of the CO₂ network, which could in turn delay commissioning of a CCUS enabled hydrogen project. BEIS continue to consider this. The CCUS models developed by BEIS suggest that reasonable protection will be provided (as long as BEIS mirror those provisions).
- 3.16.2 Hydrogen transport and storage network. Developers of initial projects will need to identify themselves how the hydrogen they produce is to be transported and stored. No T&S network will be provided although the model can include an element of support for T&S costs incurred by the producer.

- 3.16.3 Change in law. Protection will be provided against unforeseeable and material changes in law.
- 3.16.4 Construction risk. The developer will bear construction risk. However, the contract will include some flexibility on construction timetables, similar to that applied in the electricity Contract for Difference regime.
- 3.16.5 Technology risk. Technology risk will sit with the developer.
- 3.16.6 Decommissioning risk. This will sit with the developer.
- 3.16.7 High gas prices. As mentioned above, BEIS are considering how this will be factored into the design.

Application to different technologies

- 3.17 BEIS continues to consider whether different technologies should have different indexation mechanisms and separate allocation processes.

Smaller projects

- 3.18 There will be no separate HBM scheme for smaller projects. A proposed criterion for eligibility is that projects are at least 5MW in capacity, although smaller projects may be eligible for other support, including under strand 2 of the NZHF.

Application to different types of projects

- 3.19 Existing production facilities will not be supported under this model. They may be eligible for CCUS Industrial Carbon Capture Contract support.

End uses

- 3.20 The regime will not permit support for production for all end uses. BEIS continues to consider a range of matters including the following.

Own use

- 3.21 BEIS propose that own use projects are supported. These are projects under which a developer constructs a project so that it can use the hydrogen in its own downstream activities, (as an example, power generation or an industrial process).
- 3.22 The difficulty this creates focusses on the incentive to obtain a reasonable “achieved sale price” and assist price discovery, which is important for minimising the cost of the policy. Negotiations may not be at arms’ length and if the user is the same company a contract is a legal impossibility, for the simple reason that you cannot contract with yourself.

Blending into the gas grid

- 3.23 BEIS continues to consider how it will apply the HBM to blending into the gas grid, which is viewed as a temporary source of demand, at most.

Heat

- 3.24 A potential long-term use of hydrogen is for heat. BEIS contemplate that a decision will be taken on this in 2026.

Hydrogen as a feedstock for other products

- 3.25 The model will apply to sale of hydrogen for feedstock purposes, but with potential measures to prevent over-compensation.

4. Other support

- 4.1 Support is also available under the Renewable Transport Fuel Obligation.
- 4.2 BEIS also contemplate that some projects will not require support, because the low carbon hydrogen will be cost competitive. This is expected to be for smaller projects.

5. Transportation and storage

- 5.1 There is no settled policy on transportation and storage. The Government is assessing this and aims to provide a design of a business model for this by 2025.
- 5.2 There is also work ongoing to assess the potential for hydrogen in the electricity system as a means of providing dispatchable firm low carbon generation, and assessing the role of hydrogen in heating.

6. The UK Low Carbon Hydrogen Standard

- 6.1 As noted above, this is an emissions standard for hydrogen production to ensure that support is targeted at projects that are consistent with net zero.
- 6.2 BEIS published its decision in April 2022, along with documents explaining how the standard will work. In simple terms these documents set out the methodologies for determining how the emissions associated with hydrogen production will be calculated.¹⁰
- 6.3 The standard requires hydrogen producers to: (i) meet a GHG emissions intensity of 20g CO₂e/MJLHV of produced hydrogen or less for the hydrogen to be considered low carbon; and (ii) calculate greenhouse gas emissions up to the point of production.

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¹⁰ See UK Low Carbon Hydrogen Standard Guidance on the greenhouse gas emissions and sustainability criteria, BEIS, April 2022 [Link](#)