Department for
Business, Energy
& Industrial Strategy

Hydrogen Business Model and Net Zero Hydrogen Fund: Market Engagement on Electrolytic Allocation

A Market Engagement exercise seeking views on a proposed approach to allocating Hydrogen Business Model and Net Zero Hydrogen Fund support to electrolytic hydrogen projects.

Closing date: 6 May 2022

April 2022

Any enquiries regarding this publication should be sent to us at:
Hydrogen.BusinessModels@beis.gov.uk

Introduction

This Market Engagement document sets out our proposed approach to a joint Hydrogen Business Model (HBM) and Net Zero Hydrogen Fund (NZHF) allocation process for electrolytic hydrogen projects. This includes an indicative timeline, proposed eligibility and evaluation criteria, and proposed approach to agreeing an offer of support with shortlisted projects.

In the consultation on a business model for low carbon hydrogen[1], published in August 2021, we confirmed our intention to provide a route forward for initial projects not eligible for the CCUS cluster sequencing process (e.g., electrolytic hydrogen projects) to apply for business model support. This was with a view to inviting project applications in 2022, for assessment against defined eligibility and evaluation criteria, followed by a process to agree an offer with selected projects to enable final investment decisions to be made from 2023. Alongside this, we published a separate consultation on designing the NZHF.[2] This proposed grant funding (to be co-funded with private sector funding) to support multiple hydrogen production technologies, including electrolytic hydrogen.

In October 2021, the Net Zero Strategy confirmed that up to £100 million would be provided to award HBM contracts to up to 250MW of electrolytic projects in 2023.[3] We have also announced a second allocation round opening next year. Our new Energy Security Strategy sets out our ambition to support up to 1GW of electrolytic hydrogen production projects to be operational or in construction by 2025. We aim to run yearly electrolytic allocation rounds for the HBM and move to price-competitive allocations by 2025 as soon as market conditions and legislation allows.

We have taken on board the feedback we have received via the HBM and NZHF consultations and, working with stakeholders further, we are setting out a proposed joint allocation process for initial electrolytic hydrogen projects. Our aim for this process is to support projects to deploy at the earliest opportunity, advancing government's aspiration to deploy up to 10GW of low carbon hydrogen production capacity by 2030, subject to affordability and Value for Money (VfM), with the intention that at least half of this will be from electrolytic hydrogen.

This Market Engagement document seeks views on the proposed 2022 HBM/ NZHF electrolytic allocation round and will be of interest to electrolytic hydrogen projects that require revenue support through the HBM and CAPEX support through the NZHF. Engagement with industry on our proposed allocation round will take place over 4 weeks. Stakeholders can also submit views by attending a workshop or online via Citizen Space. See the 'How to respond' section of this document for further information on how to contribute to this Market Engagement exercise.

[1] Design of a business model for low carbon hydrogen consultation: https://www.gov.uk/government/consultations/design-of-a-business-model-for-low-carbon-hydrogen
[2] Designing the Net Zero Hydrogen Fund consultation: https://www.gov.uk/government/consultations/designing-the-net-zero-hydrogen-fund
[3] Net Zero Strategy: https://www.gov.uk/government/publications/net-zero-strategy

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General information

Why we are engaging

The purpose of this Market Engagement exercise is to seek views on a possible approach to allocating Hydrogen Business Model and Net Zero Hydrogen Fund support to initial electrolytic hydrogen projects in 2023. This is primarily with a view to developing and refining our proposals, in conjunction with interested stakeholders, ahead of the first allocation round's intended launch in Summer 2022. Responses will also be used to inform the approach to the future allocation rounds, although eligibility and evaluation criteria will be specific to each round and may change between them where appropriate.

The proposals set out in this document take into account feedback we have already received from industry via our HBM and NZHF consultations and the Electrolytic Hydrogen Working Group. This Group was specifically set up to receive feedback through regular meetings on the joint HBM/ NZHF allocation process. Members of the Group include developers of proposed electrolytic hydrogen projects, investors, and the wider supply chain.

Proposals will be reviewed in light of Market Engagement responses, as well as ongoing policy developments and subsidy control rules. Finalised proposals will be published in Summer 2022 in the application guidance document and will be accompanied by a summary of the responses received to this Market Engagement exercise. Nothing in this document creates any basis for any form of expectation or reliance. Government reserves the right to amend or discontinue any proposed process at any time for any reason.

Market Engagement details

Issued: 08/04/2022

Respond by: 06/05/2022

Enquiries to: Hydrogen.BusinessModels@beis.gov.uk

Market Engagement reference: Hydrogen Business Model and Net Zero Hydrogen Fund: Market Engagement on Electrolytic Allocation

Audiences: Developers and investors in potential electrolytic hydrogen projects.

Territorial extent:

The scope of this Market Engagement is UK-wide. Our preferred approach is to allocate support on a UK-wide basis to support decarbonisation across the UK. We will continue to work with the devolved administrations as we develop and finalise the allocation process.

How to respond

Attend a workshop

Engagement with industry on our proposed allocation process will take place over four weeks with two workshops of the same format, which stakeholders can attend to submit views.

To attend Workshop 1, taking place on Thursday 21 April 2022, stakeholders should complete this expression of interest form by Tuesday 19 April 2022. Or, to attend Workshop 2, taking place on Thursday 28 April 2022, stakeholders should complete this separate expression of interest form by Thursday 21 April 2022. The forms ask for basic information about the project and whether the project is interested in applying, to help BEIS plan resourcing for the proposed upcoming allocation round. These workshops will follow the same format and you should only attend one. BEIS reserves the right to limit attendance where workshops are oversubscribed.

If stakeholders would like to provide a written response instead of or in addition to attending a workshop, please respond online at: https://beisgovuk.citizenspace.com/industrial-energy/hbm-nzhf-market-engagement-electrolytic-allocation. Please note that responses will not be accepted after the Market Engagement exercise closing date of 6 May 2022.

Confidentiality and data protection

Information you provide in response to this Market Engagement exercise, including personal information, may be disclosed in accordance with UK legislation (the Freedom of Information Act 2000, the Data Protection Act 2018 and the Environmental Information Regulations 2004).

If you want the information that you provide to be treated as confidential, please tell us, but be aware that we cannot guarantee confidentiality in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not be regarded by us as a confidentiality request.

We will process your personal data in accordance with all applicable data protection laws. See our privacy policy.

We will summarise all responses and publish this summary on GOV.UK. The summary will include a list of names or organisations that responded, but not people's personal names, addresses or other contact details.

Quality assurance

This Market Engagement exercise has been carried out in accordance with the Government's consultation principles.

If you have any complaints about the way this Market Engagement exercise has been conducted, please email: beis.bru@beis.gov.uk.

The proposals

Section 1: Background and Strategic objectives

The UK has set a world–leading net zero target by 2050, the first major economy to do so, and hydrogen will play a vital role in delivering on this commitment. Analysis by BEIS suggests 250 – 460 TWh of hydrogen could be needed in 2050, meeting 20 - 35% of total energy demand.[4]

The UK is aiming to develop up to 10GW of low carbon hydrogen generation by 2030, subject to affordability and VfM, with the intention that at least half of this will be from electrolytic hydrogen.

In August 2021, the Government published further documents (the Strategy Package) building on the measures set out in the Ten Point Plan to support this aim:

- Hydrogen Strategy: this set out a series of commitments and actions which show how government, in partnership with industry, the innovation community, and wider civil society, will deliver our vision for a UK hydrogen economy in 2030 and beyond.[5]
- Hydrogen Business Model (HBM) consultation: this set out a proposal for a contractual business model for hydrogen producers to incentivise the production and use of low carbon hydrogen through the provision of ongoing revenue support.[6]
- Net Zero Hydrogen Fund (NZHF) consultation: this set out the proposed scope, design, and delivery of the £240 million NZHF, which intends to make grant funding available to support the upfront costs of developing and building low carbon hydrogen production projects.[7]
- Low Carbon Hydrogen Standard consultation: this set out options for an emissions standard that could underpin the deployment of low carbon hydrogen for use across the economy. One of the objectives of the

[4] Department for Business, Energy and Industrial Strategy (2021), 'Carbon Budget 6 Impact Assessment'. Hydrogen as a proportion of final energy consumption in 2050 in agriculture, industry, residential, services and transport sectors; excludes energy demand for resources, processing and electricity generation
[5] UK Hydrogen Strategy: https://www.gov.uk/government/publications/uk-hydrogen-strategy
[6] Design of a business model for low carbon hydrogen consultation: https://www.gov.uk/government/consultations/design-of-a-business-model-for-low-carbon-hydrogen
[7] Designing the Net Zero Hydrogen Fund consultation: https://www.gov.uk/government/consultations/designing-the-net-zero-hydrogen-fund

standard will be to ensure that hydrogen projects supported by government are consistent with our net zero ambitions.[8]

The Net Zero Strategy, published in October 2021, proposed up to £100 million via the Industrial Decarbonisation and Hydrogen Revenue Support (IDHRS) scheme to award HBM contracts of up to 250MW in 2023 for electrolytic projects.[9] We also announced a second allocation round opening next year.

Our new Energy Security Strategy sets out our ambition to support up to 1GW of electrolytic hydrogen being in construction or operational by 2025. We aim to run yearly electrolytic allocation rounds for the HBM and move to price-competitive allocations by 2025 as soon as market conditions and legislation allow. This Market Engagement document sets out our proposed approach to the first HBM/ NZHF electrolytic allocation round in 2022.

Alongside this Market Engagement document, the Government has published the following consultation responses:

- HBM consultation response: this sets out our proposed policy and current thinking on the business model design following feedback from stakeholders through the consultation. This includes further considerations on eligible uses of hydrogen supported through the HBM.[10]
- NZHF consultation response: this sets out a high-level overview of the NZHF scheme design, including how we responded to stakeholder feedback by splitting the Fund into 'strands' and making minor alterations to the Fund's scope.[11]
- Low Carbon Hydrogen Standard consultation response: this sets out the key design elements of the low carbon hydrogen standard. The standard will provide a clear definition of what the Government considers to be 'low carbon' hydrogen and will establish a threshold for the amount of greenhouse gas emissions allowed in the production process for the hydrogen to be considered low carbon.[12]

Strategic objectives for the 2022 HBM/ NZHF electrolytic allocation round

[8] Designing a UK low carbon hydrogen standard: https://www.gov.uk/government/consultations/designing-a-uk-low-carbon-hydrogen-standard
[9] Net Zero Strategy: https://www.gov.uk/government/publications/net-zero-strategy
[10] Design of a business model for low carbon hydrogen: https://www.gov.uk/government/consultations/design-of-a-business-model-for-low-carbon-hydrogen
[11] Designing the Net Zero Hydrogen Fund: https://www.gov.uk/government/consultations/designing-the-net-zero-hydrogen-fund
[12] Designing a UK low carbon hydrogen standard: https://www.gov.uk/government/consultations/designing-a-uk-low-carbon-hydrogen-standard

To aid the design of the 2022 HBM/ NZHF electrolytic allocation round, we have set the following strategic objectives:

- Kickstart the low carbon hydrogen economy across the UK
- Support projects to deploy at scale at the earliest opportunity, advancing government's aim to deploy 10GW of low carbon hydrogen production capacity by 2030, with at least half of this being from electrolytic hydrogen, and to do so at affordable costs by harnessing economies of scale.
- Deliver carbon savings to allow us to stay on track to meet CB5, CB6 and other net zero commitments.
- Ensure the application process is simple and accessible for applicants.
- Ensure the application process is fair and transparent.

Support offered through the proposed 2022 HBM/ NZHF electrolytic allocation round

Feedback gathered via the HBM and NZHF consultations, and stakeholder engagement sessions since, has indicated that a significant number of electrolytic projects wish to apply for both capital support through the NZHF and revenue support via the HBM.

We recognise that projects are likely to see a HBM as the main factor driving decisions towards Final Investment Decision (FID). However, we anticipate that projects may also require or benefit from NZHF capital co-funding to lower the quantum of upfront costs and risks, and lower financing costs. This could result in a project requiring less HBM support overall. As such, a common theme raised by stakeholders was the importance of an integrated HBM and NZHF application process.

In response, we are proposing a joint HBM and NZHF allocation process that is streamlined for applicants and delivers best VfM for government. For the 2022 HBM/ NZHF electrolytic allocation round, we are proposing that potential projects can apply for HBM revenue support only, or they can apply for joint HBM revenue support and CAPEX support through the NZHF. We encourage projects to consider applying for NZHF CAPEX support alongside HBM revenue support in this window where appropriate, as it is expected to provide optimum VfM.

Projects successful at assessment and negotiations in the 2022 HBM/ NZHF electrolytic allocation round will receive:

- Ongoing contractual revenue support via the HBM – this is expected to provide price support through a variable premium model, with volume support provided indirectly via a sliding scale approach.
- Where relevant, an offer of capital grant support through the NZHF to help overcome the high upfront costs and risk associated with initial electrolytic hydrogen production projects. We propose this could be up to 20% co-funding support, although this number is subject to change. Projects who wish to receive CAPEX support in addition to HBM support will need to indicate this in their applications.

Section 2: Proposed electrolytic allocation process and delivery

2.1 Overview of proposed allocation process

We are proposing a joint HBM and NZHF allocation process to keep the applications for each funding mechanism as simple and efficient as possible. We are therefore fully integrating the application process for both revenue support through the HBM and CAPEX support through the NZHF. This will mean a single application form where projects can indicate whether they wish to receive CAPEX support in addition to HBM support and the same eligibility and assessment criteria to consider the optimum funding package that should be offered to projects.

Building on Phase 2 of the cluster sequencing process,[13] which opened for applications from CCUS-enabled hydrogen plants in November 2021 for HBM support, we are minded to use the following process.

- Eligibility check – assessors will complete an eligibility check following submission of applications to confirm the application meets the defined eligibility criteria (see Section 3 of this document for our proposed eligibility criteria). Those that meet the eligibility criteria will proceed to evaluation.

[13] Cluster Sequencing for Carbon Capture Usage and Storage Deployment: Phase-2: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1031856/ccus-phase-2-guidance.pdf

- Evaluation – applications will be assessed against a set of defined evaluation criteria and sub-criteria (see Section 4 of this document for our proposed evaluation criteria). These criteria will recognise the costs and wider benefits of each project. At the end of this stage, projects will have a total weighted score, with highest scoring projects ranked first. We will then consider what portfolio of high-ranking projects will be considered for an offer of support.
- Agreeing an offer stage – for shortlisted projects, this step covers due diligence and final contract negotiation. See Section 5 for our proposed approach to agreeing an offer. More information on this stage will be shared in the guidance document launching the 2022 HBM/ NZHF electrolytic allocation round.

2.2: Indicative timeline

This section sets out the indicative timings for the first 2022 HBM/ NZHF electrolytic allocation round and explains how it differs from other BEIS funding rounds opening in 2022.

Timings

A high-level timeline for each stage of the allocation process is set out below. Please note that all dates are subject to change and further details will be provided in the application guidance document:

- Launch application window: early July 2022.
- Close application window: September 2022.
- Confirm shortlist of projects and commence negotiations: early 2023.
- Sign contracts and award funding: we expect all contracts to be signed no later than December 2023.
- Projects to take a final investment decision within three months from award of funding.
- Projects in operation: by end of 2025.

Other funding options for projects that do not require HBM support

Alongside this 2022 electrolytic allocation round for HBM and NZHF support, there are a number of other funding sources that a project might wish to consider, including allocation rounds for NZHF support that are not linked to the HBM.

Feedback from the NZHF consultation responses and wider stakeholder engagement events indicated that there are hydrogen projects that do not require revenue support via the HBM to take FID. We believe these are likely to be smaller, often electrolytic hydrogen projects which:

- expect to secure revenue via the Renewable Transport Fuel Obligation (RTFO)[14]; or
- are proposing an end user for their hydrogen who will use it to replace an expensive counterfactual fuel e.g., diesel; or
- do not require revenue support for another reason e.g., because they are selling to an existing market.

[14] RTFO is a policy for reducing greenhouse gas emissions from the road transport sector in the UK by encouraging the supply of renewable fuels: https://www.gov.uk/guidance/renewable-transport-fuels-obligation

Following analysis of stakeholder feedback and consultation responses, we are proposing to split the NZHF's grant allocation into four strands as follows:

- **Strand 1:** development support for FEED studies, to grow the future pipeline of hydrogen projects in the UK.
- **Strand 2:** CAPEX for projects that do not require a hydrogen specific business model. These are low carbon hydrogen projects that can deploy on the basis of capital expenditure support and are able to start construction rapidly.
- **Strand 3:** CAPEX for projects that require a HBM and sit outside of the Phase 2 cluster sequencing process. The first Strand 3 window is the proposed joint HBM/ NZHF electrolytic allocation window set out in this document.
- **Strand 4:** CAPEX for CCUS-enabled projects that require a HBM and are part of the Phase 2 cluster sequencing process.

We are aiming to open the first funding window for Strands 1 and 2 in April 2022, with potential of a further funding window in 2023/24. Further information can be found in the NZHF consultation response[15] and the upcoming launch document.

Projects should carefully consider which of the funding windows best meets their needs before applying, as they are only able to submit an application for one NZHF application window at any time.

[15] Designing the Net Zero Hydrogen Fund: https://www.gov.uk/government/consultations/designing-the-net-zero-hydrogen-fund

Section 3: Proposed eligibility criteria

This section sets out the proposed eligibility criteria for projects that apply for the 2022 HBM/ NZHF electrolytic allocation round and the rationale behind these requirements.

Eligibility criteria serve several functions. They help ensure financial support is aligned with the HBM and NZHF's strategic objectives (as set out in Section 1 of this document); provide clarity to market participants on what projects could potentially receive financial support; and can discourage speculative applications.

The proposed eligibility criteria build on the core eligibility criteria set out in the NZHF consultation, which was positively received by respondents (with 72% agreeing with the high-level eligibility criteria). However, some differences are necessary to achieve the objectives of this allocation round. For example, as detailed below, we are proposing that projects would need to be electrolytic hydrogen production facilities to be eligible to apply for this allocation round, while the NZHF only strands outlined in Section 2 of this document are technology neutral.

Projects that pass the eligibility check would progress to evaluation, details of which are set out in Section 4 of this document.

Located in the United Kingdom

We are proposing that hydrogen production facilities should be located in the UK to be eligible to apply to this allocation process. This proposed criterion reflects government's aim, as set out in the Hydrogen Strategy, to deploy up to 10GW of low carbon hydrogen production capacity by 2030. It also supports decarbonisation across the UK in line with our 2050 net zero target and CB6 obligations.

Commercial Operational Date (COD) of end of 2025

This criterion has been proposed to align with government's aim to deploy up to 10GW of low carbon hydrogen production capacity by 2030, subject to affordability and VfM, with the intention that at least half of this will be from electrolytic hydrogen. COD in the context of new build hydrogen production facilities means the date when the facilitiy is commissioned and ready to commence operations. Note that this is intended as a backstop date; having an earlier COD could count favourably towards the project evaluation stage.

Using Core Technology That Has Been Tested in a Commercial Environment,**Technology Readiness Level (TRL) 7 or more**

We are proposing that core production technology should be TRL 7 or more to be eligible to apply to this allocation process. This criterion ensures our funding picks up where innovation funding ends.

For the purpose of this document, we are defining TRL 7 as ‘Integrated Pilot System Demonstrated: Prototype near or at planned operational system, requiring demonstration of an actual system prototype in an operational environment’. Table 1 sets out definitions of Technology Readiness Levels 1 to 9 for reference.

Table 1: Definitions of Technology Readiness Levels 1 to 9

TRL 1 – Basic Research	Scientific research begins to be translated into applied research and development.
TRL 2 – Applied Research	Basic physical principles are observed, practical applications of those characteristics can be 'invented' or identified. At this level, the application is still speculative: there is not experimental proof or detailed analysis to support the conjecture.
Applied research and development	
TRL 3 – Critical Function or Proof of Concept Established	Active research and development is initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative.
TRL 4 – Laboratory Testing/Validation of Component(s)/Process(es)	Basic technological components are integrated - Basic technological components are integrated to establish that the pieces will work together.
TRL 5 – Laboratory Testing of Integrated/Semi-Integrated System	The basic technological components are integrated with reasonably realistic supporting elements so it can be tested in a simulated environment.
Demonstration	
TRL 6 – Prototype System Verified	Representative model or prototype system, is tested in a relevant environment.
TRL 7 – Integrated Pilot System Demonstrated	Prototype near or at planned operational system, requiring demonstration of an actual system prototype in an operational environment.
Pre-commercial deployment	

TRL 8 – System Incorporated in Commercial Design	Technology is proven to work - Actual technology completed and qualified through test and demonstration.
TRL 9 – System Proven and Ready for Full Commercial Deployment	Actual application of technology is in its final form - Technology proven through successful operations.

New build hydrogen production facilities

We are proposing that only new build hydrogen production facilities would be eligible to apply to this allocation process. For the purpose of this document, we are defining 'new build' as newly constructed facilities built for the specific purpose of producing hydrogen. Where new hydrogen production equipment shares pre-existing balance of plant, hydrogen transport and/or storage equipment, this shall be deemed permissible. This proposed criterion reflects government's aim to deploy up to 10GW of low carbon hydrogen production capacity by 2030, subject to affordability and VfM, with the intention that at least half of this will be from electrolytic hydrogen.

We are considering exempting hydrogen generation projects from this proposed requirement who have received funding from the SICE Net Zero Innovation Portfolio programmes, and may already be under construction.

Electrolytic hydrogen production facilities

We are proposing that the 2022 HBM/ NZHF electrolytic allocation round provides funding only to low carbon electrolytic hydrogen production facilities. Pipeline analysis suggests that almost all projects likely to meet other proposed eligibility criteria will be using electrolytic hydrogen production technology, for example 'TRL 7 or more', 'Minimum production capacity of 5MW' and 'COD of end of 2025'. This will allow for better comparison between projects with similar technologies in this first allocation round and ensure the assessment remains on track to meet the ambitious timelines we have set out in Section 2 of this document.

This does not preclude the inclusion of other technologies in future allocation rounds, in line with government's ambition to support a range of technologies where they can make a significant contribution to our hydrogen production ambitions whilst also supporting broader energy policy.

Has identified at least one offtaker

Hydrogen producers looking to apply for support would need to have identified at least one offtaker for their hydrogen. This is to give assurance that, if the project were to receive funding, it is sufficiently developed in concept to deploy at the earliest opportunity and deliver carbon savings. For clarity, in the context of the electrolytic allocation process, an offtaker is both the end user of low carbon

hydrogen and, where relevant, any intermediary party who may purchase and resell hydrogen to end users.

To demonstrate this, projects should have an agreement or evidence of progress towards an agreement with potential offtakers, as well as provide details in the project application form. At the evaluation stage, further checks will be undertaken regarding the robustness and appropriateness of the offtaker(s) and any offtaker agreements. For this electrolytic allocation process, all uses of hydrogen that lead to a reduction in carbon emissions against a counterfactual will be counted as a valid offtaker.

Gas blending as an offtaker

Under current health and safety regulations (the Gas Safety (Management) Regulations 1996 (GSMR)), the amount of hydrogen allowed in the existing gas network is no greater than 0.1% by volume. The Government has committed to make a policy decision in 2023 on whether to enable blending up to 20% hydrogen (by volume) into GB gas networks, subject to the outcomes of ongoing economic and safety assessments and wider strategic considerations.

BEIS currently views blending as a transitional option as, due to the limited role of natural gas in heating under net zero, it only has limited long-run decarbonisation potential compared with other end users of hydrogen, such as industry, transport, or power generation. However, we consider there may be significant value in having blending available to help producers manage volume-risk, particularly during the initial years of the hydrogen economy as the number of hydrogen end users available grows, and hydrogen transport and storage infrastructure develops. If the Government decides to take steps to enable blending, we will look to ensure that blending does not displace supply of hydrogen to these longer-term end users, but rather acts as a backstop for hydrogen producers facing volatile, or temporarily unavailable demand.

BEIS are in the process of assessing different market arrangements and commercial support options to deliver blending, including whether and how HBM support could be designed to deliver blending's intended role as a backstop. BEIS does not anticipate completing this in time for the award of initial HBM contracts awarded through this allocation round. However, we will consider a contractual re-opener for initial contracts which could enable support for blended volumes in the future.

We will confirm whether or not producers with gas blending as an offtaker are eligible in the application guidance document. Noting the above policy considerations, it is a possibility that gas blending as an offtaker will not be eligible in this allocation round.

Has identified an electrolyser supplier(s)

Hydrogen producers looking to apply for support would need to have identified an electrolyser supplier(s). This is to give assurance that, if it were to receive funding, the project is sufficiently developed in concept to deploy at the earliest opportunity.

Projects should demonstrate their engagement with electrolyser supplier(s), for example through a budgetary quote or a completed Request for Information (RFI) response from a supplier.

Minimum hydrogen production capacity of 5MW

We are proposing a minimum production capacity (MW output) to ensure we are bringing forward larger projects which will achieve scale up, and so that assessment remains on track to meet the ambitious timelines we have set out in Section 2 of this document.

We have considered setting this minimum production capacity threshold at 10MW, however our minded to position is to set it at 5MW. This is in recognition of the nascent stage of the hydrogen market and the uncertainties around the project pipeline. We do not want to introduce overly restrictive requirements at eligibility stage that will reduce competition for this first allocation round.

If, following the Market Engagement period, BEIS receives more information to suggest there is a much larger pipeline of projects above 10MW and they can be operational by 2025, we may consider if 10MW is more appropriate, although at this stage we think this is unlikely. We may also consider increasing this minimum production capacity threshold for future allocation rounds as the market develops.

Equally, we did consider setting no minimum threshold, but are not minded to proceed with this as we do not consider supporting projects less than 5MW best use of business model support given the other routes of support available for these types of projects. Projects with a production capacity of less than 5MW would be able to apply to the NZHF only allocation rounds outlined in Section 2 of this document, if they meet all other criteria.

Meets the requirements of the Low Carbon Hydrogen Standard (LCHS)

The requirements of the LCHS are set out here.[16] This proposed criterion would ensure that hydrogen production receiving HBM and NZHF support is sufficiently low carbon. Specifically, the standard will establish a threshold for greenhouse gas emissions in the production process for hydrogen to be considered low carbon, and a methodology for calculating these emissions. The standard will have a single threshold for absolute emissions, set at point of production at 20 $gCO2_e/MJ_{LHV}$ of hydrogen in the first iteration of the standard. The standard will also define principles

[16] Designing a UK low carbon hydrogen standard: https://www.gov.uk/government/consultations/designing-a-uk-low-carbon-hydrogen-standard

for low carbon electricity input that must be met by electrolysers to demonstrate compliance with the standard. These include: 1) energy attribute information to demonstrate ownership of the low carbon electricity input; 2) proven links to low carbon electricity input; and 3) temporal correlation to prove time-based links between generation and consumption in the hydrogen production process.

Demonstrated access to finance

To ensure projects which enter the evaluation stage have the appropriate support to reach operation, we are proposing that projects must be able to show information about their financing plan and the status of discussions with financiers (if appropriate). This could be shown, for example, by a letter from the board of equity partners which commits to financing the project, letters of support from financiers, and/or confirmation of the ability to fund from existing liquidity.

Questions

1. **Do you agree with the proposed eligibility criteria for the first 2022 HBM/ NZHF electrolytic allocation round? Yes/ No/ Don't know. If not, please explain why.**

Section 4: Proposed evaluation criteria

This section sets out the proposed evaluation criteria for the 2022 HBM/ NZHF electrolytic allocation round, which would be used to evaluate eligible projects. We propose projects are evaluated against a set of six evaluation criteria, which are set out below. If an eligible project can demonstrate a strong performance against each of these criteria, it would build confidence that the project has the potential to offer good VfM.

Table 2: Headline Evaluation Criteria for the 2022 HBM/ NZHF electrolytic allocation round

Criteria	Definition
Deliverability	The level of confidence government has in the delivery plan put forward by the project and the date at which the project can, credibly, be operational[17] by.
Emissions	The extent to which the project delivers carbon savings to the economy and contributes to the UK government's 2030 aim and emission reduction targets, including CB6 and net zero.
Cost Considerations	Whether the project will deliver cost-effective hydrogen.
Economic Benefits	The contribution the hydrogen plant will make to the economy.
Market Development and Learning	The extent to which the project offers growth and learning opportunities in the production and usage of hydrogen.
Additionality of Electricity Source	Whether a project's low carbon electricity source is met by new low carbon generation and does not divert low carbon electricity from other users to avoid negative impacts on wider decarbonation.

These criteria mostly align with the Phase 2 HBM allocation criteria for CCUS-enabled projects.[18] There is a difference with the NZHF only allocation rounds which have another evaluation criterion, 'scalability/replicability', looking at whether a

[17] Defined here as the Commercial Operational Date
[18] Cluster Sequencing for Carbon Capture Usage and Storage Deployment: Phase-2: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1031856/ccus-phase-2-guidance.pdf

project could be replicated by others in the sector and/or is scalable. We anticipate for the NZHF only windows that smaller scale or earlier stage hydrogen production projects will apply. The criterion 'scalability/replicability' was included as a standalone criterion to support the first, smaller phases of strategically important projects. In contrast, in this 2022 HBM/ NZHF electrolytic allocation round, we aim to select a pipeline to reach the 2030 milestone. Furthermore, scalability/replicability will play a role within the 'Market Development and Learning' criterion, in line with the approach taken under Phase 2.

For each proposed criterion, we have set out below why we consider it to be important to government, alongside an indication of what a project would have to do to perform strongly against it. Full details on how project performance will be assessed will be set out in the application guidance document.

Deliverability

This criterion has been proposed to reflect our strategic aim of enabling projects to deploy at the earliest opportunity, to develop the low carbon hydrogen market and advance government's aim to deploy at least 10GW of low carbon hydrogen production capacity by 2030 and meet net zero and CB6 commitments.

To perform well against this criterion, a project would be expected to put forward a clear project execution plan and timeline. We propose that the deliverability score considers three key elements:

- The hydrogen production plant i.e., can it be operational by 2025?
- The energy input source i.e., are the necessary commercial and technical arrangements in place?
- The offtaker i.e., are the necessary commercial and technical arrangements in place with a viable offtaker/ offtakers?

Projects will need to score a minimum score on deliverability before being evaluated against the other criteria. This is to ensure that only deliverable projects are evaluated on their costs and benefits, and may then be considered for negotiations. The minimum score is to be decided.

Emissions

This criterion has been proposed to reflect government's commitment to UK emission reductions targets, and in recognition of the essential role that hydrogen production will play in decarbonisation and the transition to net zero.

As a minimum, all projects will be required to meet the proposed LCHS to be eligible to apply to the electrolytic allocation process, meaning they must produce hydrogen below the threshold of 20 $gCO2_e/MJ_{LHV}$ if they wish to seek funding.[19]

[19] Designing a UK low carbon hydrogen standard: https://www.gov.uk/government/consultations/designing-a-uk-low-carbon-hydrogen-standard

We propose eligible projects are scored on two sub-criteria:

- Total emissions reduction impact, to assess the extent to which a project can make a positive contribution to the UK's efforts to meet our net zero commitments (including, where relevant, the Scottish 2045 net zero commitment, the Welsh 2050 net zero commitment and any local emission reduction targets). This would calculate total emissions reduced over a period of time by offtakers displacing their high carbon fuel with low carbon hydrogen. The amount of hydrogen produced and consumed would also factor into this calculation.
- CO2e intensity of production, to identify which projects are using the lowest carbon and most efficient production pathways to produce hydrogen. To do this, we would calculate CO2e intensity per unit of hydrogen produced.

We propose to only assess projects' emissions reduction potential based on volumes operational by 2025.

Projects may also be required to describe the wider safety and environmental impacts, such as air quality and health and safety regulatory requirements, associated with the hydrogen production plant and how any negative impacts could be mitigated. More information on this will be available in the application guidance document.

Additionality of Electricity Source

The purpose of this criterion is to uphold the principles of the proposed LCHS which seeks to incentivise, but does not mandate, an additionality requirement around electricity source for electrolytic projects.

Additionality in this context means that hydrogen production should be met by new low carbon electricity generation and should not divert low carbon electricity from other users, avoiding negative impacts on wider decarbonation.

Projects would be scored on the extent to which they meet the additionality principles set out in the proposed LCHS. Further information will be shared in the application guidance document.

Cost Considerations

The purpose of the cost criterion is to ensure that the cost of delivering the 2022 HBM/ NZHF electrolytic allocation round is acceptable to the taxpayer and/or the consumer.

We propose scoring projects on two key factors, in line with the approach taken under Phase 2:

- The levelised cost of hydrogen (LCOH) delivered. This will calculate how much a unit of hydrogen costs to produce and deliver to offtakers.[20]
- Robustness of project costs.

We believe this is the fairest way to assess a project's costs while the HBM is being finalised and, specifically, what costs are included in the final strike price calculation. It also allows BEIS to complete an overall VfM assessment by evaluating the costs and benefits a project brings through the six evaluation criteria.

To perform well against this criterion, the hydrogen project would be expected to:

- Set out their development, capital and operational costs associated with producing and delivering hydrogen to their offtakers.
- Indicate the level of robustness of their estimates.

Economic Benefits

As noted in the Hydrogen Strategy, we want to see opportunities for the supply chain, businesses, technologies, and people to benefit from the growth of the hydrogen economy. Government is minded, therefore, to include specific criteria around economic benefits to ensure that project developers are offering fair opportunities for the supply chain, investing in relevant skills, and ensuring good quality jobs are created.

To perform well against this criterion, the project would be expected to demonstrate how it:

- Could deliver economic growth and contribute to the country's longer term industrial transformation to a green economy. In particular, by creating and maximising opportunities for investment and growth including local economies in the UK.
- Will deliver and support high skilled, high paid jobs and, in particular, develop a diverse workforce, and deliver training to employees to attain the skills needed for hydrogen production and deployment in ways that minimise skill shortages and increase productivity.
- Intends to embed sustainable business practices, including how it intends to identify and resolve gaps in capability and productivity among international and UK supply chains.

Hydrogen Market Development and Learning

[20] BEIS published a report setting out the levelised cost of hydrogen production technologies in August 2021 and how these are calculated. See Hydrogen Production Costs 2021.

This criterion would ensure that selected projects offer:

- Growth opportunities in the production, transportation, storage and usage of hydrogen.
- Innovation and learning opportunities and knowledge sharing.

The assessment of this criterion would consider the initial phase of hydrogen production (volumes operational by 2025) and any credible scale up plans (possible future volumes beyond 2025).

To perform well against this criterion, a project would be expected to demonstrate how it:

- Contributes to achieving the objectives set out in the Hydrogen Strategy Roadmap and develops the required hydrogen market infrastructure (including production, use and network infrastructure).
- Offers learning and development in relevant production technologies and enables research and innovation across the wider hydrogen value chain.
- Can coordinate, synergise, and facilitate other decarbonisation initiatives and activities (for example, but not limited to, green transport hubs, low carbon products markets, or the Hydrogen for Heat trials).
- Includes innovative proposals with the potential to generate learnings and be replicated to unlock the future low carbon hydrogen market.
- Has clear plans in place to disseminate knowledge within the hydrogen market.

Criteria weightings

Each of the criteria described above will be assigned a weighting, to reflect the importance of each criterion to our objectives and to allow projects to be scored fairly. Projects' overall score will be calculated using their final scores against each criterion, which are then combined according to the associated weightings.

As part of our commitment to a fair, objective, and transparent process, we have set out our proposed weightings for each of the six evaluation criteria below.

Table 3: Proposed ranking of the 2022 HBM/ NZHF electrolytic allocation round evaluation criteria

Criteria	**Proposed weightings**
Deliverability	30%

Emissions* *noting that all projects will meet the LCHS as a minimum	15%
Additionality of Electricity Source	5%
Cost Considerations	20%
Economic Benefits	20%
Hydrogen Market Development and Learning	10%

Portfolio selection

As well as considering how each project individually performs against the criteria, it may also be important for government to consider the appropriate portfolio of electrolytic projects. As such, government reserves the right at its absolute discretion to limit the number of projects which will be shortlisted to participate in the next stage. Government may consider portfolio factors such as:

- Location – we recognise the role that the 2022 HBM/ NZHF electrolytic allocation round can play in ensuring electrolytic hydrogen production across the UK and associated economic benefits. We propose using location-based portfolio factors to help ensure these benefits are spread across the UK.
- Affordability – a combination of projects selected through the 2022 HBM/ NZHF electrolytic allocation round would have to be affordable to government, both in terms of their demands on NZHF capital and HBM revenue envelopes. It may be that this can only be considered in combination following the agreeing an offer stage.

Government may also consider other portfolio factors, such as diversity of offtakers and/or range of project sizes.

The importance of these combination of portfolio factors could mean that it would be a sub-optimal decision for government to simply pick the individually highest performing projects.

Questions

2. **Do you agree with the proposed evaluation criteria for the first 2022 HBM/ NZHF electrolytic allocation round? Yes/ No/ Don't know. If not, please explain why.**

3. **Do you agree with the proposed portfolio factors? Yes/ No/ Don’t know. If not, please explain why.**

Section 5: Agreeing an offer

Following evaluation and possible application of portfolio factors, we aim for the selected projects to take part in a process to agree an offer of HBM support and, if desired, CAPEX support through the NZHF. This could allow projects to take FID and begin construction.

Agreeing a HBM offer

In the HBM consultation (August 2021)[21], respondents were asked to consider what the most appropriate allocation mechanism would be in the near-term for projects outside the cluster sequencing process. The majority of respondents agreed that bilateral negotiations were favourable compared with an auction due to the hydrogen market being in the 'price discovery' phase, and the possible administrative costs that taking part in an auction could incur.

BEIS is also considering whether it would be preferable to take a combination of different approaches and timelines to agreeing an offer for different types of electrolytic plants, in an effort to streamline the process where possible. This suggestion is something we have heard from a range of electrolytic hydrogen developers and could possibly reduce resourcing and administrative costs for projects, particularly smaller projects.

Taking industry feedback onboard, we are considering having two pathways to agreeing an offer with both pathways including due diligence, engagement and likely to involve strike price bids. While one pathway would be concluded by bilateral negotiation, the other would be lighter touch. This could involve a 'sealed bid' process and/or BEIS considering whether to offer a contract with no or minimal negotiation. We believe the approach of having a more streamlined pathway would help meet the strategic objective of enabling projects to deploy at scale at the earliest opportunity. We would appreciate your feedback on the different pathways we could adopt to agreeing an offer.

In addition to considering how the two pathways would differ, we are also considering how to select projects for each pathway and would appreciate your feedback on how best to do this. BEIS is considering using the pipeline and sizes of projects that apply to this round, their capacity to take part in bilateral negotiations and potentially their strike price bids to put shortlisted projects into one of the pathways.

[21] Design of a business model for low carbon hydrogen consultation: https://www.gov.uk/government/consultations/design-of-a-business-model-for-low-carbon-hydrogen

We will provide more detail on agreeing a HBM offer in the guidance document at the launch of the allocation round, subject to industry views. Please note that entering any pathway does not mean that any funding or contract will be awarded.

BEIS has also considered a more competitive approach for the initial allocation rounds, such as an auction. As mentioned above, the majority of respondents to the HBM consultation preferred bilateral negotiations in the near-term rather than an auction. This would also require complex analysis and time to establish and, therefore, would not meet our objective of supporting projects to deploy at scale at the earliest opportunity. We have an ambition to move to price-competitive allocations by 2025 as soon as market conditions and legislation allow.

Agreeing a CAPEX offer

The CAPEX grant amount allocated to projects who wish to receive CAPEX support is an important consideration and is closely linked to the HBM offer – an increase in the Government's share of capital co-funding would reduce the amount of private capital investment required, reducing the amount of support required via the HBM.

We propose setting a maximum grant funding intensity level (CAPEX %) for this allocation round. Under this approach, projects will be required to apply for a grant amount that falls below this maximum grant intensity level.

We are still considering whether the grant funding intensity will form part of the parameters of the bilateral negotiations, to optimise VfM for the taxpayer, while ensuring the additionality of public funding.

We are also currently working to understand the optimal maximum CAPEX offer for this allocation round, balancing project needs and the NZHF affordability envelope, and will confirm this in the application guidance document. We propose this to be up to 20% co-funding, but this is subject to change pending feedback and further policy considerations.

Questions

4. **Do you agree with our high-level approach to agreeing a HBM and CAPEX offer? Yes/ No/ Don't know. If not, please explain why.**

5. **Do you think up to 20% CAPEX co-funding alongside HBM support is sufficient to enable electrolytic projects to take FID? Yes/ No/ Don't know. Please explain your answer.**

6. **For agreeing the HBM offer, would you be in favour of having different pathways or negotiation approaches for projects? Yes/ No/ Don't know.**

If so, do you have any suggestions on how those pathways or approaches might look?

7. **Do you have any suggestions on what approaches could be used to differentiate projects and determine which pathway a shortlisted project goes into? What criteria would you use (e.g. MW)? What threshold would you use (e.g. 40MW)?**

Market Engagement questions

1. **Do you agree with the proposed eligibility criteria for the first 2022 HBM/ NZHF electrolytic allocation round? Yes/ No/ Don't know. If not, please explain why.**

2. **Do you agree with the proposed evaluation criteria for the first 2022 HBM/ NZHF electrolytic allocation round? Yes/ No/ Don't know. If not, please explain why.**

3. **Do you agree with the proposed portfolio factors? Yes/ No/ Don't know. If not, please explain why.**

4. **Do you agree with our high-level approach to agreeing a HBM and CAPEX offer? Yes/ No/ Don't know. If not, please explain why.**

5. **Do you think up to 20% CAPEX co-funding alongside HBM support is sufficient to enable electrolytic projects to take FID? Yes/ No/ Don't know. Please explain your answer.**

6. **For agreeing the HBM offer, would you be in favour of having different pathways or negotiation approaches for projects? Yes/ No/ Don't know. If so, do you have any suggestions on how those pathways or approaches might look?**

7. **Do you have any suggestions on what approaches could be used to differentiate projects and determine which pathway a shortlisted project goes into? What criteria would you use (e.g. MW)? What threshold would you use (e.g. 40MW)?**

Next steps

The purpose of this Market Engagement exercise is to seek a broad range of views on the Government's proposed approach to the joint HBM and NZHF electrolytic allocation process.

Projects can contribute to this Market Engagement exercise by responding online via Citizen Space or by attending a workshop. The workshops will take place on Thursday 21 April and Thursday 28 April.

We will use the responses to this Market Engagement exercise to help us develop this process and consider alternatives as appropriate, with a view to launching an allocation round window this summer as per the indicative timeline set out in Section 2 of this document.

Any publication in the summer will be accompanied by a summary of the responses received to this Market Engagement exercise.