



Department for
Energy Security
& Net Zero

Hydrogen Storage Business Model: Market Engagement on the First Allocation Round

December 2023



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Any enquiries regarding this publication should be sent to us at: hydrogenstoragebusinessmodel@energysecurity.gov.uk

Introduction

This Market Engagement publication sets out our approach to allocating Hydrogen Storage Business Model (HSBM) support to hydrogen storage projects. The aim of this publication is to support hydrogen storage projects to become operational at the earliest opportunity by providing certainty to industry about when and how the first allocation round will happen. We are outlining the process and timings early to give stakeholders better certainty about the direction of travel, and an understanding of when they will need to be ready to apply for HSBM support. This allows projects to provide feedback on our proposed approach and begin collating the necessary evidence ahead of the allocation window opening.

Ensuring that hydrogen storage projects can be operational at the earliest opportunity supports the commitments set out in the British Energy Security Strategy.¹ These include an ambition to build up to 10GW of new low carbon hydrogen production capacity by 2030, subject to affordability and value for money, and, to design new business models for hydrogen transport and storage infrastructure by 2025.

Building on the British Energy Security Strategy, we published our minded to position in August 2023 alongside our response to the consultation on Hydrogen Transport and Storage.² The minded to position set out the high-level design of the HSBM, where we proposed a revenue ‘floor’ to mitigate demand risk for storage providers, an incentive to maximise sales to users and a mechanism to give the subsidy provider a potential share of the upside. The initial focus of support will be geological storage, and support will be delivered through a private law contract lasting at least 15 years. Following on from our minded to position, we consider the proposed design of our allocation process for the first HSBM allocation round in this Market Engagement document. This includes strategic objectives and ambition, proposed process and timings, eligibility criteria and high-level assessment criteria. We plan to gather feedback from stakeholders ahead of launching the first allocation round and adjust the approach accordingly. See the ‘How to respond’ section of this document for further information on how to feed into this Market Engagement exercise.

Whilst this document aims to provide a forward look of the HSBM allocation process, it does not necessarily indicate a final decision on the details of the first HSBM allocation round. The contents of this document may be subject to change as government further develops this policy. Some aspects of allocation are not set out here and will be covered in the full HSBM application guidance, which we plan to publish in Q2 2024. Details of such aspects are outlined in the ‘Next steps’ section of this document. Further details on the commercial design of the business model will follow in due course.

¹ <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

² <https://www.gov.uk/government/consultations/proposals-for-hydrogen-transport-and-storage-business-models#full-publication-update-history>

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General information

Why we are engaging

The purpose of this Market Engagement exercise is to seek views on a proposed approach to allocating HSBM support to hydrogen storage projects. Feedback received from stakeholders on the proposals in this publication will inform further policy development, ahead of launching the first allocation round in 2024.

The proposals set out in this document consider feedback we have already received from industry via our consultation published in August 2022 and through subsequent meetings with stakeholders.³

We intend to publish the full application guidance for the first allocation round in Q2 2024. 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: Thursday 14 December 2023

Respond by: Thursday 1 February 2024

Enquiries to: hydrogenstoragebusinessmodel@energysecurity.gov.uk

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3-8 Whitehall Place
London
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Audiences: Developers, users and investors of potential hydrogen storage 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 the hydrogen economy across the UK. We will continue to work with the devolved administrations as we develop future allocation processes.

³ <https://www.gov.uk/government/consultations/proposals-for-hydrogen-transport-and-storage-business-models#full-publication-update-history>

How to respond

Stakeholder forum

We intend to hold engagement sessions with stakeholders on Monday 15 January (joint with the Hydrogen Transport Business Model team), and Tuesday 16 January 2024 to explain the contents of this document in detail and allow stakeholders to ask questions and submit their views on this Market Engagement document.

If you are interested in attending these engagement sessions, please email:

hydrogenstoragebusinessmodel@energysecurity.gov.uk

Written responses

If you would like to provide a written response to this Market Engagement document, please email:

hydrogenstoragebusinessmodel@energysecurity.gov.uk

Please note that responses will not be accepted after Thursday 1 February 2024.

Confidentiality and data protection

Information you provide in response to this consultation, 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](#).

Quality assurance

We believe that a market engagement exercise is favourable over a formal consultation. This approach allows us to continue working at pace, allowing us to gather feedback more quickly and incorporate it into our policy development as we progress. We believe this process is also proportionate to the narrower range of stakeholders with an interest in the detail of HSBM design.

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 consultation has been conducted, please email: bru@energysecurity.gov.uk.

Proposed approach to allocation

This section sets out strategic objectives for storage and the ambition for the first allocation round, as well as an outline of the proposed allocation process and timings, proposed eligibility and assessment criteria, and how we intend to coordinate the allocation of hydrogen storage and transport projects.

We also consider proposals for providing development funding, as well as treatment of projects which plan to expand their facilities over time.

All of the proposals outlined in this document, including the ambition are intended to apply to the first allocation round and may be subject to change in response to feedback from stakeholders, and further internal analysis. Whilst we expect many aspects to remain the same or similar for future allocation rounds, government reserves the right to make amendments. To give certainty to industry, we plan to publish application guidance outlining the allocation process, timings, eligibility and assessment criteria ahead of each allocation round. Any changes between rounds will be clearly communicated.

Strategic objectives

The Hydrogen Transport and Storage Networks Pathway sets out the strategic objectives which will guide the roll-out of transport and storage infrastructure. The three overarching objectives are:

- To promote net zero by supporting decarbonisation at pace;
- To enable whole energy system benefits, including security of supply and helping manage environmental impacts;
- To unlock the development of an economic and efficient hydrogen market that supports wider growth.

For further detail on these objectives, please refer to the Networks Pathway document.⁴

The HSBM allocation process proposed in this document has been designed with a view to furthering these objectives. The objectives have influenced the proposed eligibility and assessment criteria, and form a key part of the proposed transport and storage cohort assessment stage which ensures coordinated allocation between the HSBM and the Hydrogen Transport Business Model (HTBM).

Ambition for the first allocation round

Our ambition for the first allocation round for hydrogen transport and storage infrastructure is to support up to two hydrogen storage projects, at scale and associated regional pipeline infrastructure. These should be in operation or construction by 2030.

We intend to hold additional allocation rounds in the future, and are currently developing our evidence base as to how frequently we will need to run these, as well as corresponding ambitions. We will confirm the final ambition for the first HSBM allocation round and its

⁴ <https://www.gov.uk/government/publications/hydrogen-transport-and-storage-networks-pathway>

interdependence with the HTBM in 2024, as well as provide more information on future rounds and overarching ambitions for hydrogen transport and storage.

Proposed allocation process

In line with our key design principle to avoid unnecessary complexity, our aim is to create a streamlined allocation process which is simple both for project developers to navigate, and for government to assess applications. We have learnt lessons from other business models to inform the design of the HSBM allocation process.

The HSBM is expected to have a lower number of applicants than the hydrogen production business model, for example. We have therefore designed the allocation process to be proportionate to the potential number of applicants, while ensuring the process is fair, transparent and delivers against our strategic objectives.

Our proposed allocation process is set out below:

1. **Full application guidance** is published in advance of the allocation round opening for applications, including full eligibility and assessment criteria.
 - This allows project developers to determine whether they are at the right stage of development to apply, and time to gather the required evidence.
2. **Pre-launch engagement** events are held with industry.
 - This is to ensure potential applicants understand the process and evidence required to apply.
 - We will publish the answers to clarifying questions from industry.
3. **Allocation round is launched** with a clear application window and a deadline for project developers to submit applications.
 - We may implement an expression of interest process to gauge the number of applicants in advance.
4. At **eligibility stage** applicants are assessed against the pre-published eligibility criteria.
 - Applicants must meet all eligibility criteria in order to progress.
 - Any applicants deemed ineligible will be notified and provided with feedback to support future applications.
5. At **assessment stage** eligible projects are scored and ranked against the pre-published assessment criteria.
 - Applicants must meet the minimum threshold for deliverability in order to progress.
 - Applicants who do not meet the minimum threshold for deliverability will be notified and provided with feedback to assist with application to subsequent allocation rounds.
 - We may use interviews in addition to written evidence at assessment stage.

6. **Projects are ranked by assessment score, and the top-scoring projects are progressed** for support.
 - The number of projects that progress will correspond to the ambition for each allocation round.
7. **At transport and storage cohort assessment stage**, assessors combine the progressed hydrogen transport and storage projects to create a cohort.
 - Assessment of the cohort of projects allows government to check that transport and storage projects align with one another, and that the cohort contributes towards our strategic objectives.
8. **Shortlisted projects** are announced.
9. **Bilateral negotiations** take place between shortlisted projects and government, and due diligence is conducted by government.
10. **HSBM contracts are awarded** to successful projects once negotiations conclude.
11. Successful projects become commercially operational within the window indicated in each allocation round.

Proposed timings for the first allocation round

We have listened to calls from industry to accelerate HSBM timelines given the long lead times to develop hydrogen storage facilities and the need for more certainty around government support for project developers to attract investment. Table 1 sets out our proposed timelines for the first allocation round.

We plan to launch the first allocation round in Q3 of 2024 in parallel with finalising the design of the contract. This should enable government to award HSBM contracts from Q4 of 2025 onwards, subject to the necessary secondary legislation being in place and the HSBM contract being finalised. This is in line with government’s commitment to design the storage business model by 2025. HSBM allocation will be coordinated with the HTBM.⁵

Table 1: Proposed timelines for the first allocation round

Proposed Timing	Activities
Q1 2024	<ul style="list-style-type: none"> • Feedback is gathered on the proposals in this document from stakeholders and used to inform further policy development
Q2 2024	<ul style="list-style-type: none"> • Full application guidance is published • Engagement with stakeholders takes place ahead of the launch of the first allocation round
Q3 2024	<ul style="list-style-type: none"> • First HSBM allocation round is launched ⁶

⁵ Details of the timings and process for HTBM allocation are set out in the [Hydrogen Transport Business Model Market Engagement document](#), published alongside this document.

⁶ We expect to continue engaging with industry separately on the development of the HSBM contract.

	<ul style="list-style-type: none"> Engagement with stakeholders continues. This may include requests for further information from applicants or interviews to support assessment of applications
Q1 2025	<ul style="list-style-type: none"> Shortlisted projects are announced
Q1-Q3 2025	<ul style="list-style-type: none"> Bilateral negotiations between shortlisted projects and government, due diligence conducted by government
Q4 2025	<ul style="list-style-type: none"> Government approvals Successful projects announced Contracts are awarded
2028-2032	<ul style="list-style-type: none"> Successful projects become operational (subject to contract award date)

Proposed eligibility criteria

This section sets out the proposed eligibility criteria for the first HSBM allocation round, the rationale behind these requirements and the evidence we propose to require project developers to submit to prove they meet the criteria.

Purpose of criteria

Eligibility criteria serve several functions. They will:

- Set a minimum threshold that storage projects must meet in order to receive HSBM support;
- Ensure HSBM support is aligned with our strategic objectives for hydrogen storage;
- Provide clarity to market participants on which projects can receive financial support; and
- Discourage speculative applications.

In the design of the eligibility criteria, we have aimed not to be overly restrictive to avoid reducing the pool of applicants too early in the process. Eligibility criteria should aim to rule out projects which do not or cannot, meet key requirements at the point of application. All eligibility criteria must be met for a project to advance to the assessment phase of the allocation process.

Projects that are in receipt of government funding may be eligible to apply for support in this first allocation round, subject to meeting subsidy control rules and preventing subsidy cumulation in relation to the same costs.

Full list of proposed criteria

Table 2: Proposed eligibility criteria, justification, and proposed evidence requirements

	Proposed eligibility criteria	Description	Justification	Proposed evidence required
1	a) Geological storage projects ⁷	Project must be a new build or converted mothballed geological gas storage facility. ⁸	Geological storage provides greater capacity relative to other storage types at the lowest cost (per unit of hydrogen stored).	Applicants must complete and include all of the following in a report: <ul style="list-style-type: none"> • Business feasibility study • Desktop geotechnical study • Preliminary site investigation and preliminary design • Geotechnical risk register
	b) Geophysical survey requirements	Applicants must have undertaken geophysical tests on the subsurface elements of the storage site.	Discerns whether projects are credible from a technical, safety and geological feasibility perspective.	
2	Permission to use above ground and geological operational area	Applicants should have permission, or be taking substantive steps towards securing permission to use the above ground operational area,	A key prerequisite to becoming commercially operational is having the appropriate permissions to access the geological formations and	Applicants must provide one of the following pieces of evidence which show progress towards gaining access and stewardship over the necessary geological formation and above ground operational area:

⁷ Geological storage is defined as: Underground storage in specific geological formations which have been engineered to store hydrogen such as salt caverns, depleted gas fields, aquifers or lined rock caverns. Cushion gas is required in most cases. Dependent on the deployment of transport infrastructure. For more information, see the Hydrogen Transport and Storage Infrastructure: Minded to Positions: <https://www.gov.uk/government/consultations/proposals-for-hydrogen-transport-and-storage-business-models>

⁸ Existing natural gas storage facilities will not be eligible for this allocation round, to ensure security of natural gas supply. Eligibility of existing natural gas storage facilities will be kept under review for future allocation rounds.

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		and the subsurface geological formations required.	operate a geological storage facility on the site.	<ul style="list-style-type: none"> • A deed confirming ownership of the above ground and subsurface areas • A signed lease with the above ground and subsurface landlord(s) • A memorandum of understanding with the above ground and subsurface landlord(s) • A letter of support from the above ground and subsurface landlord(s) confirming that they intend to work with the applicant
3	Commercial Operational Date (COD)	New build or converted mothballed storage facilities should adhere to a COD window of 2028-2032 (subject to contract award in Q4 2025).	This window enables government to select projects that will be operational in line with government’s objectives, whilst avoiding incentives to accelerate project timelines to the detriment of pre-FEED and FEED work.	<p>Applicants can evidence their COD by providing a project timeline (Gantt chart or similar) showing the timing of decision gate phases, including but not limited to:</p> <ul style="list-style-type: none"> • Feasibility study • Pre-FEED • FEED • Financial Investment Decision (FID) • Project delivery

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4	Project sponsor and facility location	The applicant must be a UK registered business. The geological storage facility must be in the UK. This includes carrying on activities in, above or below: (a) the territorial sea adjacent to the United Kingdom; (b) waters in a renewable energy zone (within the meaning of Chapter 2 of Part 2 of the Energy Act 2004); (c) waters in a Gas Importation Storage Zone (within the meaning given by section 1 of the Energy Act 2008).	Government is currently only interested in supporting the deployment of hydrogen storage infrastructure within the UK, to enable the development of a domestic hydrogen market. We expect to sign contracts with UK entities for ease of due diligence.	<ul style="list-style-type: none"> • The applicant must prove they are registered in the UK by providing their companies house listing and; • The applicant must disclose the address of the site.
5	Minimum Technology Readiness Level (TRL)	The proposed geological storage site and associated above ground infrastructure must meet a comprehensive minimum TRL of 7.	<p>Government wants to target technologies that are proven, commercially viable and subject to low project risk. A TRL of 7 can reduce applications from projects using low TRL technologies which do not currently have a commercially viable business case.</p> <p>The operational profile and use case would also be considered. By outlining the use case and separating the technological maturity from the operational profile, government can differentiate between static and fast cycling storage, understand how the storage technology</p>	<p>Applicants can provide a statement of their TRL with accompanying evidence. Applicants must also outline all of the following:</p> <ul style="list-style-type: none"> • How the geotechnical risk has been mitigated for the project's use case(s) • The anticipated operational profile e.g., fast cycling, static feedstock storage etc

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			would be used in detail, and any geotechnical risk this may pose.	
6	Capacity Requirements	The proposed geological storage facility is to have a minimum energy value of 50GWh (HHV ⁹) of working gas.	Government is interested in supporting larger scale, lower cost per unit storage at this stage in the development of the hydrogen economy.	Applicants must provide any geophysical tests and/or seismic data reports which prove the theoretical total energy value of working gas and corresponding cushion gas volume.
7	Third party access	The proposed geological storage facility is to be open for access by third parties. ¹⁰	To ensure as many users as possible can benefit from access to storage, government is interested in the first operational facilities to be open to third party access.	Applicants are to provide a declaration of their intention to operate an open access facility. ¹¹
8	Prospective user(s) and access to user base	Applicants must provide evidence of who they anticipate their user(s) of storage and transport partner(s) are likely to be, any engagement with partners to date, and user demand profile after COD. Applicants should have a plan of how they will connect their facility to a local hydrogen network.	Government is looking to support storage providers with an identified user base as they will likely be able to generate user revenues sooner.	Applicants must provide all of the following: <ul style="list-style-type: none"> • Analysis or justification of the choice of the size of the facility (justification should be relative to anticipated user demand, not based on what is possible in geological terms) • Evidence of the volume of users:

⁹ Higher heating value (HHV) indicates the upper limit of the available thermal energy produced by a complete combustion of fuel

¹⁰ Whilst third party access forms part of the eligibility criteria, this does not necessarily mean the facility must be entirely open access. As we develop the eligibility criteria further, we will consider whether there should be a minimum proportion of the capacity made accessible to third parties.

¹¹ Open access storage refers to any hydrogen storage facility which makes its capacity available to third parties on the open market

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				<ul style="list-style-type: none"> ○ At least one user identified ○ Evidence of engagement with them ● Any studies which estimate users' expected energy consumption (to show the potential volume of storage required per user) ● Evidence of early-stage planning with a hydrogen transport partner(s) via correspondence or agreements in principle with the partner(s)
9	Financial viability of project or project sponsor	Applicants must provide evidence of the ability to attract private investment and secure funding.	Without sufficient financial backing, a project would not be deliverable.	<p>Applicants should provide any of the following documents. A document from both part A and part B must be provided.</p> <p>Part A (pre-FID):</p> <ul style="list-style-type: none"> ● Confirmation of the ability to reach FID from existing liquidity sources (equity) ● Letters of support from the board of equity shareholders <p>Part B (post- FID):</p>

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				<ul style="list-style-type: none"> • Confirmation of the ability to fund post FID from existing liquidity sources • Letters of support from debt providers • Proof of engagement with financiers for support post FID
10	Engagement with planning authorities and the local community	Applicants must have a strategy and timetable for receiving permission from local planning, environmental and safety authorities to construct a new geological storage facility or repurpose a mothballed geological storage facility. Applicants must also have a plan to engage the local community.	<p>A strategy for engagement with local authorities at an early stage may reduce the likelihood of unforeseen issues that might delay or derail the timely development of a geological storage project.</p> <p>Storage facilities may be subject to opposition from local communities if they are not properly consulted and engaged in the planning and construction process. Applicants can mitigate this risk by treating the local community as a key stakeholder.</p>	<p>Applicants must provide all of the following:</p> <ul style="list-style-type: none"> • Evidence of any permissions received • Evidence of any scoping applications and/or planning permission application • A timeline of when and how they plan to apply for scoping to notify local authorities of their intention to begin construction • A clear written strategy for achieving planning permission (plan of engagement) • A timeline of when and how they plan to engage with ecological, environmental and safety authorities • A plan to engage with local communities beyond industry

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11	Prior Experience	<p>Applicants must employ the expertise of an energy storage expert internally or externally. Expert(s) must have 8 years' experience (across their career) in the planning, development, and/or operation of an energy storage facility, ideally a geological gas storage facility.</p>	<p>The development and operation of a gas storage facility requires high levels of specific, technical expertise. A lack of this expertise may pose significant risks to the timely development, and safe, effective operation of a hydrogen storage facility.</p> <p>Eight years suggests that an expert has worked on the operation of a project through the entire / the majority of the development cycle or has worked on several shorter projects, gaining a strong understanding of the development, delivery and operation of a gas storage facility.</p>	<p>Applicants must provide evidence of energy storage expert(s) with a minimum of 8 years' experience and a description of their role(s) in the project.</p>
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Proposed assessment criteria

This section outlines the proposed assessment criteria for the HSBM. We would like to gather views on the criteria, and use feedback to develop the criteria further and design the scoring methodology.

Purpose of the assessment stage

Once projects have met a minimum threshold of eligibility, the assessment stage of the allocation process is intended to provide assessors with a snapshot in time of a project and its development.

The assessment criteria have been designed to test a project's credibility, whether it represents value for money for government, and whether it meets government's strategic objectives for hydrogen storage as well as our overarching objectives for the hydrogen economy.

Assessment criteria will likely require both qualitative and quantitative evidence from projects, and a scoring methodology will be designed as part of the next stage of our work in early 2024. The scoring methodology will allow us to differentiate between projects based on their individual merits and rank them by score. The highest scoring projects at assessment stage will progress to the transport and storage cohort assessment stage.

Full list of criteria

Table 3 sets out a description of the proposed assessment criteria, considerations for designing the scoring methodology and a proposed weighting for each criterion signifying its impact on a project's overall score.

Table 3: High level assessment criteria and proposed weightings

Criterion	Description	Considerations	Proposed weighting
Deliverability	<p>Assessment of the applicant’s ability to construct, commission and operate the storage facility. We intend to ask applicants to submit evidence for all of the following sub-criteria:</p> <ul style="list-style-type: none"> • Geophysical tests and operational profile • Plans to secure cushion gas • Commercial operational date (COD) • Prior experience • Environmental impacts • Financial viability • Planning permissions 	<p>We are minded to:</p> <ul style="list-style-type: none"> • Set a minimum score to ensure only deliverable projects (which have scored above the threshold) can be shortlisted, • Assess deliverability first to reduce burden on assessors, • Set sub-criterion weightings given the range of factors being assessed under deliverability. <p>Geophysical tests:</p> <ul style="list-style-type: none"> • We plan to seek support from technical experts on how to score geophysical testing undertaken by applicants indicating the level of geotechnical risk associated with the geological site. We will assess this in relation to the operational profile of the facility and any development work undertaken to de-risk the facility. <p>Plans to secure cushion gas:</p> <ul style="list-style-type: none"> • Cushion gas will be essential to the functioning of some storage facilities – we intend to seek evidence of realistic plans to secure the required volumes of hydrogen (if applicable). 	40%

		<p>COD:</p> <ul style="list-style-type: none"> • COD should be within the eligible window, though we are minded to allow assessors to adjust CODs if they believe estimates are overly optimistic. • We intend to assess the ability of the applicant to commission before the COD deadline. <p>Relevant experience in building and/or operating gas storage facilities:</p> <ul style="list-style-type: none"> • We intend to assess both the applicant’s corporate expertise, as well as the expertise within the project team. • We will consider how prior experience is scored to ensure objectivity. <p>Environmental impacts</p> <ul style="list-style-type: none"> • We plan to require applicants to consider their environmental impact and provide evidence of their plans to avoid, mitigate or compensate for such impacts in line with legal requirements. This will include compliance with relevant environmental assessment regimes, and monitoring and mitigating hydrogen leakage. <p>Financial viability</p> <ul style="list-style-type: none"> • This will likely make up a significant proportion of the deliverability criterion, and we plan for a project’s score for financial 	
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		<p>viability to be used as a multiplier to the scores of the other components of the deliverability criterion.</p> <ul style="list-style-type: none"> The financial viability of the project will be assessed across the different stages of development and delivery of the contracts. The strength of the financing plan, including the level of commitment of the financiers and sponsors of the project, the organisational structure, the alternatives being considered if the plan does not materialise and other financing risk management considerations, will be evaluated. We are likely to assess the ability to deliver the additional phases of the contract, if any, that are being set out. <p>Planning permission</p> <ul style="list-style-type: none"> We intend to assess the progress the applicant has made toward applying for and receiving planning permission. We plan to consider how likely the applicant is to receive timely permission(s). 	
Commercial case	<p>Assessment of the ‘business case’ for the project including:</p> <ul style="list-style-type: none"> Viability of pipeline connection and prospective user base 	<p>Under this criterion assessors would require evidence that the applicant has a clear plan for a pipeline connection, including any agreements or planning that has already taken place with a hydrogen transport partner.</p> <p>We would also require evidence that the project has properly considered who its users are likely to</p>	20%

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	<ul style="list-style-type: none"> Justification for sizing (including future expansion plans) 	<p>be both initially and over time, how much storage capacity these users are expected to need, and how this information relates to the choice of sizing of the facility.</p> <p>Government is conscious that there is inherent uncertainty which would affect the evidence applicants can provide against this criterion, particularly around which hydrogen storage users will use their facility and when. We therefore propose a lower weighting for this criterion to compensate for this.</p>	
<p>Cost per unit of capacity</p>	<p>Evaluation of how affordable the facility is and whether it represents value for money</p>	<p>Applicants would need to provide robust estimates of the cost of their storage facility in terms of development, construction and operation. This would be compared to the capacity of working gas storage the facility can provide. The assessment would include any plans for expansion, but given that this is somewhat speculative, we would weight the scoring appropriately so that facilities with a lower cost per unit of capacity by virtue of expansion plans are not overly favoured.</p> <p>We are conscious that cost estimates will be somewhat uncertain, and that this will be difficult to reduce a single figure. We plan to consider ways to manage this within the design of our scoring methodology, such as adjusting the figure based on the proposed cycling rate of the facility. We also intend to consider whether cost should be scored against a baseline set by government, or whether projects should be scored relative to one another.</p>	<p>25%</p>

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<p>Economic benefits</p>	<p>Evaluation of benefits including:</p> <ul style="list-style-type: none"> • Provision of jobs • Investment in skills • Contribution to the local / regional hydrogen economy • Contribution to the development of hydrogen supply chains • Security of supply 	<p>We are conscious that hydrogen storage facilities may not have a significant impact on the local economy and are likely to have more impact on the surrounding hydrogen network. Therefore, this criterion would consider both elements, measuring not only the jobs and skills a storage facility can provide, but also the wider impact and value the facility is likely to provide for hydrogen producers, offtakers and the energy system as a whole.</p> <p>We want to ensure that this criterion is balanced. Our assessment is intended to take account of applicants' investment in the local community. We would account for projects that may be geographically distanced from local communities in our scoring methodology.</p>	<p>15%</p>
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Proposed transport and storage cohort assessment

Purpose of assessment

Our ambition for the first allocation round, as set out in the Networks Pathway document, is to allocate support for up to two storage projects at scale, with associated pipeline infrastructure. These projects should be in construction or operation by 2030. It is very important therefore for storage projects to have a corresponding project providing pipeline transport: for storage projects in Great Britain this means an associated transport project seeking HTBM support, for offshore storage projects and storage projects in Northern Ireland it means having credible plans in place for an appropriate transport provider.

We have taken steps to align the HSBM and HTBM allocation processes with a view to meeting this ambition. The proposed HSBM eligibility criteria include a requirement that storage projects should identify and work with a transport partner, whilst the proposed HTBM eligibility criteria include a requirement that projects provide a credible plan for interfacing with large-scale hydrogen storage facilities.

We propose a final stage of the assessment process as a failsafe mechanism to ensure alignment between transport and storage projects coming through the respective allocation processes, and with our overarching transport and storage strategic objectives. To do this, assessors would combine the progressed projects for transport and storage to create a 'cohort'.¹² Our proposed process for this is set out below.

Proposed transport and storage cohort assessment process

Step 1: HSBM and HTBM projects that progress to the cohort assessment stage are combined to create a cohort of transport and storage projects, ranked according to their scores from the individual business model assessment processes.

Step 2: Do the transport and storage projects within the cohort align?

- Assessors would check the alignment of the cohort of progressed projects. For the first allocation round, this would mean checking each progressed storage project has a corresponding progressed transport partner and this may involve considering:
 - The relative locations of transport and storage projects – are the storage facility and transport connection suitably co-located?
 - The alignment of commercial operation dates – will the projects be operational within a reasonably similar timeframe to support one another?
 - Demand – as a 'partnership', can the co-located transport and storage projects demonstrate sufficient demand to justify choosing these projects in this allocation round?
 - Sizing – are the projects of a complementary size or capacity to meet user demand and enable market growth?
 - Planning – have the projects reached an appropriate phase of receiving planning permission in line with their corresponding transport partner?

¹² The 'cohort' is the pool of progressed projects which would emerge from the HTBM and HSBM assessment stages.

Step 3: Does the cohort of progressed transport and storage project partnerships align in terms of the strategic objectives?¹³

- Assessors would check that the cohort of progressed projects together enables us to achieve our strategic objectives, which include:
 - To promote net zero by supporting decarbonisation at pace;
 - To enable whole energy system benefits - including security of supply, and helping to manage environmental impacts;
 - To unlock the growth of an economic and efficient hydrogen market that supports wider economic benefits.

At this point, value for money across both partnerships would also be considered.

Step 4: Is there an issue with alignment within the cohort, or with the cohort achieving our strategic objectives?

- If assessors find any issue with alignment within the cohort of selected transport and storage projects, or with the cohort meeting the strategic objectives, then they would look at the next highest scoring projects and reorder the progressed projects accordingly.
- Should any change to the progressed projects be made, this would be clearly communicated to the stakeholders involved, and justification provided.
- If no issues arise with either alignment or meeting our strategic objectives, no reassessment of the progressed projects is triggered. The cohort of projects are shortlisted, and these shortlisted projects move through to due diligence and bilateral negotiations.

The full methodology for this approach will be developed in detail as part of the next phase of our work; we will consider feedback from stakeholders and whether it should be incorporated into our final design.

To note: the HTBM cannot support transport projects in Northern Ireland or offshore transport projects in the first allocation round. For this reason, storage projects in Northern Ireland and offshore storage projects may apply for HSBM support but would need to have credible plans for an appropriate transport provider outside of the scope of HTBM support. Step 2 of the Cohort Assessment process outlined above would not be applied to either offshore or Northern Ireland-based storage projects.

We intend to have a similar stage in the process for future allocation of the business model - we propose that this be tailored to the strategic needs set out through strategic planning. Any changes to the process will be set out in the application guidance for each allocation.

¹³ See the [Hydrogen Transport and Storage Networks Pathway](#) document for more detail.

Development funding

In response to our consultation on hydrogen transport and storage infrastructure, the majority of respondents favoured interim measures to support with the long lead times and high costs of constructing storage facilities and securing planning and regulatory permissions. Suggestions for interim measures included government providing development funding (devex).

Government recognises the high barriers faced by storage project developers and has carefully considered the options available. For the first allocation round, we propose devex is included as an allowable cost in the HSBM contract. This would allow project developers to recover devex as part of the revenue floor. Further information on the recovery of devex will be set out in the full application guidance which we plan to publish ahead of the launch of the first allocation round in Q2 2024.

Our approach to devex for future allocation rounds will be kept under review and we intend to consider other methods of providing developers with support for development costs.

In addition, we are conscious of the possible need for innovation funding to support geological hydrogen storage technologies that do not yet have a TRL of 7, for example. We will continue to work across government to make this kind of support available to projects that need it. Government will also continue to work on making innovation funding available to other hydrogen storage technologies, including those which are not currently eligible for HSBM support.

Allocation of support for phased projects

In our minded to position, we discussed how the HSBM could support facilities planning to expand over time and set out some examples of the obligations the contract should place on both parties in relation to the later project stages at the point of contract signing.

The design of the contract is still in development, but we are in a position to set out how phased projects should submit applications for HSBM support, and how the allocation process will be applied.

For the purposes of allocation, we intend to encourage multi-staged projects to apply setting out the details of their entire project, making each expansion stage clear and providing the appropriate details for each phase (e.g. additional capacity and costs, timing of expansion etc.). At the assessment stage, we plan to focus on the first stage of projects, but to also take any expansion plans into account, albeit with a lower weighting applied to account for uncertainty. Further details on our methodology for this will be included in the full application guidance.

Next steps

This Market Engagement exercise seeks views on the government's proposed approach to the allocation of hydrogen storage business model contracts. Stakeholders can contribute their views by attending our engagement sessions, which we intend to hold on Monday 15 January and Tuesday 16 January 2024, or writing to us via email before Thursday 1 February 2024. The responses to this Market Engagement exercise and continued engagement with stakeholders will help shape the final design of the allocation process.

We intend to publish the full application guidance for the first HSBM allocation round in Q2 2024. This will include aspects of the allocation process which have not been included here, including the full assessment criteria, evidence required from applicants and scoring methodology; a firm timeline for the launch of the first allocation round and subsequent stages of the process; and details of engagement ahead of launching the first allocation round. Ahead of the application window opening (planned for Q3 2024), we intend to offer further engagement with prospective applicants to ensure they understand the application process and know what evidence they will need to submit.

Beyond the HSBM, there are several pending government decisions that affect hydrogen storage. One of these is the decision on hydrogen heating. We recognise that there is uncertainty around the place of hydrogen heating within the hydrogen economy until strategic decisions are made in 2026. We are also considering which types of storage would be needed to support hydrogen heating and how this could be delivered in the case of a positive decision in 2026.

Annex

Table 4: 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 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.
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.

This Market Engagement document is available from:
www.gov.uk/government/consultations/hydrogen-storage-business-model-market-engagement-on-the-first-allocation-round

If you need a version of this document in a more accessible format, please email alt.formats@energysecurity.gov.uk. Please tell us what format you need. It will help us if you say what assistive technology you use.