Small-scale hydrogen transport and storage

Hydrogen business model stakeholder workshops

Thursday 11 August 2022

Agenda

1. Small-scale hydrogen transport and storage scenarios
2. Ownership of small-scale assets supported by HBM
3. Summary of additional H2 T&S current thinking

Aims

- Work together with projects, investors and other interested parties to deliver an investable and value for money hydrogen business model
- Stakeholder workshops aim to improve policy development by enabling us to test initial policy thinking with projects and potential investors
- Today we'll go through each agenda item and briefly outline what the issue is, what we're thinking and why
- We'll then invite views from you to understand the issue more as projects and investors

Note –
- The content in the following slides does not represent BEIS policy, but provides ideas for discussion.
- This session will be recorded for BEIS internal use only.

Using design principles to develop the hydrogen business model

- Team driving at delivering an investable and VfM HBM, enabling the first contracts to be allocated from 2023
- We are focused on managing the main risks: price and volume risk
- We are using these design principles to guide policy development

Principle	Description
Promotes market development	*Incentivise producers to develop hydrogen demand and promote its use*
Promotes market competition	*Not create barriers to market entry, enable abuse of market power, or provide enduring competitive advantage to first movers*
Investable	*Provide sufficient predictability over revenues and returns to investors and mitigate risks which investors are not best able to bear*
Value for money	*Be effective in achieving its intended purpose at the lowest possible cost to government and prevent excessive returns to developers*
Reduces support over time	*Allow support to reduce over time by responding to market conditions and encouraging learning, innovation, and cost reductions over time*
Suitable for future pipeline	*Work for FOAK projects and NOAK projects with minor adjustments*
Compatible	*Be compatible with other policies and not allow double subsidy*
Technology agnostic	*Be applicable to a range of production technologies*
Size agnostic	*Be applicable to a range of project sizes and not incentivise inefficient sizing of production plants*
Avoids unnecessary complexity	*Avoid unnecessary complexity in its design, implementation and administration, and be transparent for producers to comply with*

Small-scale hydrogen transport and storage in the HBM

- Recognise that currently no alternative support mechanism exists for H2 T&S, but that HBM is not the natural long term solution
- Pragmatic approach to support small-scale H2 T&S costs
- Support will be assessed on a project-by-project basis taking into account, necessity, affordability and value for money
- Working closely with colleagues in H2 T&S policy teams, designing hydrogen transport and storage business models by 2025

Small-scale H2 T&S in the indicative HoTs

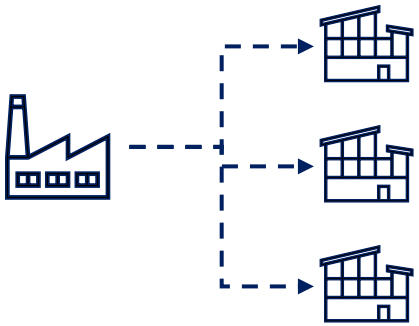
4.3	Strike Price	The **"Strike Price"** (expressed in £ per MWh (HHV)) will reflect the price a Producer needs to achieve to cover its costs of low carbon hydrogen production and an allowed return on investment. BEIS expects the level of the Strike Price and cost components to vary for different low carbon hydrogen technology types. BEIS is considering the potential constituent elements of the Strike Price and is minded to include the following within the calculation of the Strike Price (which will be negotiated on a project-by-project basis, although BEIS is still considering this position). This list is not exhaustive: (a) capex and opex associated with the construction and operation of the Facility (excluding capex funded by the NZHF GFA); (b) an allowed return on investment; (c) capex, but not opex, associated with small-scale hydrogen transport infrastructure (negotiated on a project-by-project basis by taking several factors into account including necessity, affordability and value for money for Government); and (d) capex and/or opex associated with a small-scale hydrogen storage infrastructure (negotiated on a project-by-project basis by taking several factors into account including necessity, affordability and value for money for Government). In relation to the costs referred to in limbs (c) and (d), the proposed position reflects a pragmatic approach when considering whether to support small scale hydrogen transport and storage costs for initial projects awarded a Low Carbon Hydrogen Agreement. The exclusion of opex associated with hydrogen transport infrastructure is to incentivise efficient hydrogen transport approaches, while also providing producers with flexibility to change their transport approach as the market develops and end users and offtakers change.

Small-scale hydrogen transport and storage scenarios

- Support for small-scale hydrogen transport and storage in HBM intended to provide a bridge to large-scale hydrogen transport and storage
- Five scenarios used to develop policy positions reflecting that projects and infrastructure designs/requirements are in the early stages, and that large-scale projects will emerge in time

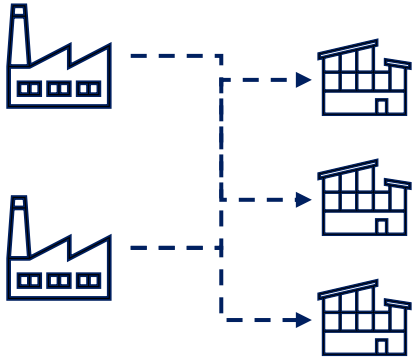
(a) Vehicular transport (e.g. truck, train etc)

This could be a producer buying or renting trucks (or other non-pipeline transport)



(b) Pipeline transport – *one producer to one or multiple offtakers*

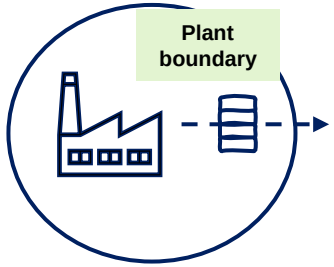
This could be a single producer either (a) building and owning a pipeline or (b) accessing an existing pipeline



(c) Pipeline transport – *many producers to one or multiple offtakers*

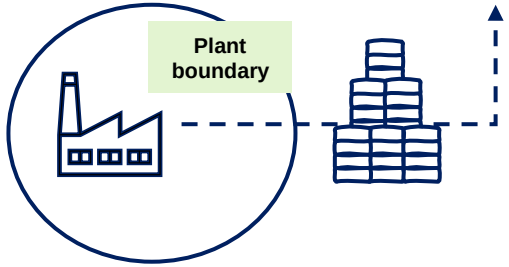
This could be multiple producers either (a) building and owning a pipeline or (b) accessing an existing pipeline

Question for stakeholders:
How do these scenarios reflect your understanding of project requirements and infrastructure setups?



(a) Onsite storage

This could be where a producer builds onsite hydrogen storage. The hydrogen doesn't leave the site boundary.



(b) Offsite storage

This could be where a producer accesses 3rd party large-scale storage. The hydrogen leaves the site boundary.

Ownership of small-scale H2 T&S assets supported by HBM

Why is this important?

- The amount of H2 T&S infrastructure proposed by projects will be supported by the HBM will depend on ownership of the infrastructure

What are the key considerations?

- Simple and proportionate approach to small-scale H2 T&S, noting future development large-scale H2 T&S
- Opportunities for integration between projects, depending on location and expected offtakers
- Expected low interest in small-scale infrastructure from 3rd parties

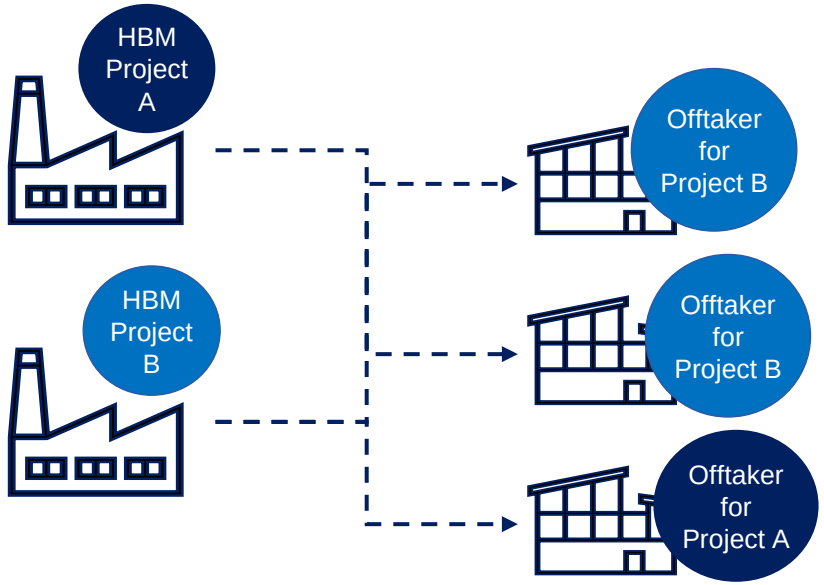
Options we've considered

a. Ownership of H2 T&S assets supported by the HBM **not** able to be divided. Assets must be owned by HBM producer to receive support for them.

b. Ownership of H2 T&S assets supported by the HBM **able** to be divided between **only** HBM producers. If assets are divided between HBM producers, support paid to each HBM producer proportionate to ownership. ***Current thinking***

c. Ownership of H2 T&S assets supported by the HBM **able** to be divided between HBM producers and 3rd parties. If assets are divided between HBM producers, support paid to each HBM producer proportionate to ownership.

Example of option b, where ownership of H2 T&S is divided between HBM producers only



Summary of additional H2 T&S policy current thinking

Issue	Description	Current thinking
Strike price	Treatment of H2 T&S costs in the strike price. Whether to account for H2 T&S separately in strike price when producing billing statement and through the indexation mechanism.	Keep separate in strike price.
	Returns. Whether to allow returns on capital invested in small-scale H2 T&S supported under HBM.	Allow return on capital invested in H2 T&S. Ensure return on H2 T&S assets reflects different risks compared to production asset.
Strike price indexation	Transport capex. Whether to index capex supported within the HBM for small-scale hydrogen transport infrastructure. *Note, transport opex is not supported under HBM.*	CPI, reflecting the approach to capex for the building of the hydrogen production facility.
	Storage capex and/or opex. Whether to index: capex and/or opex associated with a small-scale hydrogen storage infrastructure.	CPI, reflecting the approach to capex and opex for the building of the hydrogen production facility.
Transfer of the H_2 T&S Infrastructure (e.g. sale and disposal of)	In the event the producer seeks to transfer the H2 T&S (supported by the HBM) to a large-scale H2 T&SCo or other third party.	Require counterparty consent and consequent adjustments to strike price costs to reflect changes in costs supported. *Note, this means both physical transfer and the transfer of ownership. Any change to existing ownership agreements on H2 T&S would require the producers to seek consent from the counterparty*

Integration into future large H2 T&S

- Support for small-scale hydrogen transport and storage in HBM intended to provide a bridge to large-scale hydrogen transport and storage
- LCHA focused on managing near term implementation of hydrogen transport and storage
- Ongoing engagement with colleagues working on hydrogen transport and storage policy, including to deliver the commitment to design hydrogen transport and storage business models by 2025
- We will continue to communicate the development of large-scale hydrogen transport and storage and how it interacts with the HBM

Thank you and questions

Thank you for joining today's stakeholder workshop

We appreciate that you continue to provide invaluable insight and feedback on the hydrogen business model

Any further questions, please contact one of us directly or use the hydrogen business model inbox

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