**REA’s discussion paper on financial support for hydrogen blending into the gas network**

**Key recommendations**

* ***Given the strategic role of hydrogen blending, as set out in this and a previous REA’s*** [***paper***](https://www.r-e-a.net/resources/rea-submits-to-beis-its-position-on-hydrogen-blending-into-the-gas-network/)***, it is crucial it is commercially supported by BEIS.***
* ***The preferred option to commercially support blending in the short term would be via the hydrogen business model. We would therefore encourage BEIS to reconsider their position that hydrogen blending is not an eligible offtaker under the first round of allocation of the Net Zero Hydrogen Fund and the Hydrogen Business Model (strand 3).***
* ***We would not support the introduction of a financial support for blending based on a tiering structure for the reasons set out below, but we suggest here other options and we would be happy to discuss these further with BEIS.***
* ***In the longer term, the successor scheme to the Green Gas Support scheme may also be an appropriate way to support hydrogen production and injection via a more market-led approach and we would be happy to explore this further with BEIS.***

The REA believes hydrogen blending into the gas network has a key role to play in the development of the UK’s low carbon hydrogen sector and the Government should take steps to underpin investment given the strategic role it can play in the transition to a net zero energy system. We have recently set out the reasons for this in [this position paper,](https://www.r-e-a.net/resources/rea-submits-to-beis-its-position-on-hydrogen-blending-into-the-gas-network/) which was submitted to BEIS in April 2022.

As explained in this paper, we consider that blending of hydrogen is crucial in the first years of the hydrogen production market as the ability to inject directly into the existing gas grid allows a materially lower risk option for hydrogen production developers to be able to develop projects, fund and build them. Blending materially de-risks the project and, crucially, allows for a much larger uptake of hydrogen production. However, the full benefits of this de-risking will only be unlocked if hydrogen output that ends up being blended is sufficiently remunerated.

Blending would also commence the creation of a GB-wide market for hydrogen production and consumption; it would deliver additional learnings on the challenges to and benefits of blending and is likely to be lower cost as well as lower risk, given the lower storage requirements and greater flexibility provided by a more constant consumption profile.

In addition, hydrogen blends can reach many end users, not just a few large industrial users within the industrial clusters and can therefore provide some decarbonisation effect for all of them. It enables blending to play a crucial role as a steppingstone towards a decarbonised gas system.

The Government currently sees blending as a transitional option rather than a long-term, majority offtaker and this is because natural gas heating has a limited role under net zero and therefore ‘blending has less long-run decarbonisation potential compared with other end-uses for 100% hydrogen, such as industry, transport or power generation’.

BEIS has been considering support of hydrogen blending as a ‘demand backstop’ under the Hydrogen Business Model (HBM), for producers facing volatile, or temporarily unavailable demand – for example, when other offtakers considered to be ‘higher priority’ by BEIS, such as industry, transport and power, have reduced aggregate demand. However, this position fails to recognise the important role that blending can play to support the scale up of the hydrogen sector and in developing the knowledge required to move to 100% hydrogen in the gas networks.

The key for BEIS is to see hydrogen production take place as soon as possible to secure progress to the target of 10GW by 2030, and we strongly believe blending would help BEIS facilitate this rapid roll out of production.

We would, therefore, urge BEIS to reconsider their position on blending as purely a demand backstop or demand-sink, at a stage in the market where the UK has virtually zero low carbon hydrogen production.

Although we recognise some of the trade-offs around other uses of hydrogen, stifling the growth of production at this early stage in development risks government missing its 10GW target. Members highlighted that if blending is indeed a transitional option, then longer-term displacement of other end uses of hydrogen should be less of a concern.

Finally, we would ask BEIS to reconsider their position that hydrogen blending is not an eligible offtaker under the first round of allocation of the Net Zero Hydrogen Fund and the Hydrogen Business Model (strand 3). We explained the reasons for this in our [response](https://www.r-e-a.net/resources/rea-response-to-joint-electrolytic-allocation-for-hydrogen-business-model-and-net-zero-hydrogen-fund/) to BEIS consultation on the joint allocation round for electrolytic projects.

In our [position paper on blending](https://www.r-e-a.net/resources/rea-submits-to-beis-its-position-on-hydrogen-blending-into-the-gas-network/) we said that it is crucial that blending is commercially supported by BEIS and that we will be sharing our views on this with BEIS as soon as we have agreed a position with our members. We have now gauged feedback from our members on the best ways hydrogen blending should be commercially supported, to inform our position and influence Government policy. We have set out some options below.

**Inclusion of Hydrogen blending as an offtaker under the Hydrogen Business Model (HBM): tiering approach vs a ‘materiality threshold’ approach**

*We thank our member Progressive Energy for the significant contribution to the considerations set out in this paper on different approaches to financial support for blending*

BEIS is currently in the process of assessing different market arrangements and commercial support options to deliver blending, including whether and how the Hydrogen Business Model could be designed to ‘deliver blending’s intended role as a backstop’.

We understand that BEIS may be currently considering financial support for blending based on a tiered structure, to ensure blending doesn’t come ahead of preferred offtakers such as industry, power or transport. Under this approach the HBM would provide a lower financial incentive (pence/kWh) for hydrogen blended into the networks compared to other higher value applications.

Based on preliminary feedback from some members we would be concerned that this approach would create distortions in the business model and may also still risk projects not going ahead as they would not be able to rely on blending to help with their financial viability, if the lower financial incentive does not cover the investor returns required. Members highlighted that if blended volumes don’t break even on a full-cost basis, then the benefits of de-risking are unlikely to be fully unlocked. They also stressed that the risk of this approach is that it may lead to BEIS trying to 'pick winners' in the decarbonisation of the economy.

The cost of hydrogen production is independent of the offtakers, therefore, if production support is off-taker specific and blending is given a lower incentive, either:

* hydrogen producers will simply not include blending as an offtaker in their financial model and therefore not contract for any blending, given that they would be doing so at a loss, or
* hydrogen producers will contract for blending but will need to recover the production costs from other offtakers.

Some members have suggested that an effective way to support hydrogen blending would be to structure support via a ‘materiality threshold’ (a cap on the proportion of hydrogen blended). This model would provide equal support to all offtakers (ie same pence/kWh) but capping the total amount of production that could be contracted for blending, say 30%. This would enable blending to still be supported by the HBM, whilst avoiding the risk of hydrogen production investments being based solely on blending, limiting the potential long-term liability if hydrogen for heating is not supported in subsequent policy decisions whilst still providing an appropriate framework to contract for hydrogen blending. Some members noted there is a risk that this approach is commercially too restrictive, but it would be better than not supporting blending at all.

Members of the REA suggested that the blending materiality threshold could either be a flat proportion applied equally, or a tracker threshold based on underlying market factors. The latter would provide BEIS with optionality to tune the materiality threshold to be responsive to market conditions, however the former would provide producers with a greater degree of certainty and is likely to be easier to implement and oversee. Both options would require due consideration to understand the optimal solution.

Another option could be to allow blending but to use ‘portfolio factors’ to limit the share of the 250MW of capacity that can be made up of blending projects, the same way as BEIS is proposing to have a mix of regions, offtakes etc in the final allocation of HBM support.

The proposed alternative solution based on a blending materiality threshold is deemed to overcome the significant market failures/distortions that will likely result from the current HBM framework, whilst also addressing the underlying uncertainty and liability concerns that would result from blending being an anchor off-taker for hydrogen production investment cases.

**Adapting the Green Gas Support Scheme (or designing its successor policy) to include hydrogen blending**

The Green Gas Support Scheme (GGSS) will be undergoing a mid-scheme review, which is due to commence later this year and complete in 2023. In addition, BEIS are at a very early stage of scoping the design of the market mechanism that should follow the Green Gas Support Scheme, from the mid-2020s.

The GGSS, which currently only supports biomethane injection to the gas grid from anaerobic digestion, and/or the policy that will come after the GGSS, could provide an important, alternative route to market for decentralised clean hydrogen production.

In practice the hydrogen molecules would be blended in the gas grid, but green gas certificates associated with each kWh of hydrogen injected could be linked to I&C customers, who are aiming to reduce their natural gas use. Guarantees of Origin for clean hydrogen awarded under the GGCS or other equivalent schemes will create opportunities to drive a market value for this gas, thereby reducing the direct subsidy required over time.

The combination of commodity value, GGSS type support and certificate value could make injection of hydrogen into an economic option which would help to develop the supply chain in 2022-25, in the same way the original Renewable Heat Incentive did in successfully creating the biomethane supply chain in 2012-16. The low carbon hydrogen injected into the gas grid and used to displace natural gas could also be considered a hydrogen storage project (the kWhs of hydrogen are stored in the same way as natural gas).

As highlighted above, BEIS will be designing a market mechanism that should follow the Green Gas Support Scheme, from the mid-2020s. One of the objectives of the mechanism will be to lead to biomethane production being subsidy free in the future.

There may be an opportunity to include clean hydrogen within the scope of such a mechanism as long as it meets the requirements of the Low Carbon Hydrogen Standard, however considerations will need to be made on whether the same market mechanism would be suitable to all green gases given the different level of maturity of different green gas sectors.

Some members have also expressed a concern that redesigning/designing a successor will take too long to implement vs. including blending under HBM support, so we would recommend the HBM is adopted in the short term and support via either the HBM or the GGSS is provided later on. Members have also highlighted that this route should be technology agnostic as long as the hydrogen meets the requirements of the Low Carbon Hydrogen Standard.

*Note on Implementation*

*The GGSS uses the same primary legislation as the RHI, which allows support to producers of biomethane, which must be made from biogas – where biogas is defined in section 100(3) of the 2008 Act as gas produced by the ‘anaerobic or thermal conversion of biomass’. Although the GGSS has chosen to limit eligibility within the scheme to gas produced from anaerobic conversion, this was a policy choice to keep the scheme relatively simple – it remains within the scope of the primary legislation to include biomethane produced from thermal conversion as well.*

*Arguably, hydrogen made from gasification of biomass already falls within this definition – or would be if otherwise met requirements for injection to the gas grid. The legislation also allows the biogas definition to be ‘modified’.[[1]](#footnote-2)[1] It should be possible to modify the definition to include low-carbon hydrogen – and a similar approach has been taken to the RTFO, where such fuels are known as Renewable Fuels of Non-Biological Origin.* *The RTFO is already looking at extending support to Recycled Carbon Fuels - and we would look for a similar extension here.*

1. [1] S100(5) of the Energy Act 2008 [↑](#footnote-ref-2)