

HYDROGEN BREAKFAST BRIEFING



INVESTING IN HYDROGEN: OPPORTUNITIES AND CHALLENGES

Hosted at international law firm Slaughter and May's offices on 14 January 2025, this event brought together members of the Global Infrastructure Investor Association, financiers, policy-makers, lawyers and industry groups to discuss the European market for low carbon hydrogen. Key points of the discussion are summarised below.

Speakers noted the developments and changes that have been seen across the hydrogen market in the last eighteen months, with opportunities in production, storage and transportation as well as in the manufacturing supply chain. Although there is plenty of reason to be optimistic about the future of hydrogen – especially in light of the high volume of projects which have already been announced – there still remain plenty of challenges to be faced in the sector.

The role of low carbon hydrogen in a decarbonised economy

There's a growing market for low-carbon hydrogen in Europe. A clear opportunity is to replace existing fossil-fuel derived, unabated grey hydrogen, primarily used in petrochemical and fertilizer production. However hydrogen can also play an important role in other sectors such as in hard-to-abate transport sectors (such as shipping and aviation fuel), in high-temperature heat processes, steel production, power storage and in other niche areas (such as in the whiskey industry in Scotland). Some of these sectors are easier to break into than others.

Location, location, location

The low carbon hydrogen market continues to evolve: in the early 2020s production projects announced were initially clustered around traditional oil and gas hubs – for example, in Rotterdam. Today, proposed production projects are spread all over Europe. For electrolytic hydrogen, production is often located in areas with lower power prices but also close to demand. Opportunities depend on their particular circumstances; the specific assets, demand, cost and complexity can vary significantly depending on where the project is based.

Outside of Europe demand is low, but these countries often have very attractive resources and the potential to build projects on a huge scale, reducing capex. In these locations, even though the hydrogen will need to be

transported to areas with higher demand at extra cost, projects find that they can remain price competitive.

Factors contributing to successful production projects

It was recognised that the number of new production project proposals reduced significantly due to the various challenges faced in the market. However, we are now seeing a growing number of projects reaching Final Investment Decision ("FID"). The general trend is that the projects which are successfully reaching FID are those with some link to the industrial sector; industry is seen as a critical off-taker for the sector at this stage of the market.

Successful projects require (i) a credit-worthy off-taker (reliability and long-dated tenors are important); (ii) a well-developed policy framework (including standards / certification); (iii) a well-designed support package for production, transport, storage and demand; and (iv) for electrolytic projects, a robust power sourcing strategy. The H2 Green Steel project was discussed as an example of a project which brought together these factors. The panel considered the role that legislation may play in creating reliable market demand, providing both carrots (such as subsidies and support schemes) and sticks (such as a regulated carbon price) to stimulate demand.

Types of support schemes for production projects

The panel then discussed the support available to production projects in the UK and Europe. In December last year the UK Low Carbon Contracts Company ("LCCC") signed the first three low carbon hydrogen agreements ("LCHA") with electrolytic hydrogen production projects. These agreements were awarded via a competitive process and following extensive negotiations with and due diligence by the Department for Energy Security and Net Zero ("DESNZ"). The LCHA is structured as a two-way Contract for Difference ("CfD"). The strike price is set at a level that the producer needs in order for the project to be economic and the producer is topped up from the achieved sales price (subject to a floor) but has to pay back revenue earned above the strike price. As a result, increases in operating costs may be difficult to recover where they exceed the level of indexation of the strike price. This differs from the European Hydrogen Bank EU auction

which is structured as a fixed premium, so is paid on top of revenues from the offtake, regardless of their level. However, the panel observed that the allocation process for the UK scheme may result in more investor confidence, given the lower barrier to entry set for the European scheme.

Delivery of transportation and storage will be key for the sector

It was widely agreed that the mid-stream elements of the industry need to be scaled and more investment (and more *diverse* investment) is needed. These elements also ensure that projects can make use of lower electricity costs in locations where this is available because the end-product hydrogen can then be transported to areas of higher demand. As well as development of new infrastructure, there is an opportunity to repurpose existing assets. To ensure that assets are sited efficiently, there is also a role for government and regulators in coordinating infrastructure deployment but this needs to strike a delicate balance between a top-down approach and market-driven development.

Different types of investment will be needed, including the use of public finance to crowd in private investment. The UK government are working closely with the National Wealth Fund and GB Energy to look at the potential to make investments into this area. In Germany, the KfW will compensate network operators via a so-called amortisation account to keep network fees to a reasonable level while hydrogen mid-stream infrastructure is being developed, with plans to have the costs paid back by 2055.

The role of regulation and standards

There is a clear role for regulation to create the right conditions for development of the market, and particularly in driving demand.

For hydrogen to develop as a tradable commodity, progress is needed towards mutual recognition of national or regional standards. Currently, standards vary across geographical regions and are hard to compare. The UK has developed the Low Carbon Hydrogen Standard which will be used for its certification scheme, but there is another methodology under the Renewable Transport Fuel Obligation scheme. The EU has published its requirements for Renewable Fuels of Non-Biological Origin and is currently consulting on requirements for other low carbon fuels. For traders and production projects looking to export volumes, differing standards can create additional costs and risks, particularly if standards change over time. Steps towards international cooperation on low carbon hydrogen were made at COP28, but further action is needed.

What to expect in 2025

Looking forward to the rest of 2025, we are likely to see a development in hydrogen's key role in energy sovereignty, and security, especially given the geopolitical tensions across the globe. The importance of confirming demand (and the role regulators will play in ensuring this) is also likely to be a key developing theme.



We are also delighted to share **Horizon Scanning 2025**, our flagship look-ahead at the key macro trends shaping the year. Covering themes including Capital Flows, Governance & Sustainability, Energy Transition, Digital, and Crisis Management, the programme provides expert insights across more than 30 short articles and podcasts.

In addition, we have included our latest **UK Energy and Infrastructure: What's to Come in 2025** article, exploring the key trends under the new Labour government.