



FOCUS ON HYDROGEN: THE ROLE OF LOW CARBON HYDROGEN IN THE UK ENERGY TRANSITION

Over the last few months, several major economies (including the EU) have published national strategies promoting the use of clean hydrogen. We are now eagerly waiting for the UK Government to take similar steps. In this briefing we set out the latest developments on hydrogen in the UK in anticipation of a national strategy on hydrogen later this year.

CURRENT STATE OF PLAY

Apart from COVID-19, 2020 may also be remembered as the year that hydrogen finally took off as a central chapter in national decarbonisation plans. In the last few months we have witnessed a flurry of activity from capitals around the world, resulting in the publication of hydrogen strategies in the EU, Germany, the Netherlands, Portugal and Australia (Japan and China already had a national strategy and Chile is due to release its strategy this year).¹ The UK, which has often taken the lead in promoting new energy technologies, such as offshore wind, has not yet published its own holistic hydrogen strategy.

Despite the lack of a national strategy, over the summer there have been supportive statements from senior UK cabinet ministers, including from the Prime Minister, who confirmed during Prime Minister's Questions in July that "we will certainly invest massively in hydrogen." In addition, a cross-party group of more than 60 MPs and House of Lords peers have secured a debate in the House of Lords on 17 September to discuss a UK hydrogen strategy. This is not surprising as the Climate Change Committee's 2020 [Progress Report to Parliament](#) emphasised the role that hydrogen should play in decarbonising the UK economy (especially the industrial sector).

FIRST POLICY STEPS ON HYDROGEN IN THE UK

The UK Government has yet to release a full national hydrogen strategy. However, on 17 August, as part of its response to the consultation on potential business models for CCUS (**Government Response**), the Government included a chapter (as well as a separate [hydrogen economic report](#)) on low carbon hydrogen production, which includes a commitment to developing low carbon hydrogen.

Key issues

- Clean hydrogen is likely to play a significant role in the UK energy transition and there is much industry support for developing hydrogen projects.
- Unlike many leading economies, the UK Government has yet to release a full national hydrogen strategy.
- In August, the Government released its initial thinking alongside an economic report from Frontier Economics discussing potential hydrogen business models.
- It is widely expected that the energy white paper (due this autumn) will include policies on hydrogen.

¹ Please see our other client briefings on hydrogen [here](#) (under the Focus on Hydrogen section).

The Government Response is clearly only the first step in creating a low carbon hydrogen industry in the UK as there is also rising expectation that the much awaited (and delayed) energy white paper will also set out in more detail how the Government plans to support the low carbon hydrogen industry in the UK. It is also of note that the Government recently set up the [Hydrogen Advisory Council](#) to advise BEIS on hydrogen.

Strong industry support for hydrogen

Many respected organisations (such as the Climate Change Committee) as well as industry bodies and individual companies have for months been calling on the Government to act on hydrogen. For example, the Hydrogen Taskforce, which represents leading businesses with an interest in hydrogen, such as Cadent Gas Networks, Shell, BNP Paribas and ITM Power, has published an [economic impact assessment](#) estimating that the economic contribution of hydrogen in the UK economy could be as much as £18 billion by 2035.

A number of industry players from various sectors, including oil and gas, electrolyser manufacturers, gas distribution networks and chemical manufacturers have also enthusiastically been developing pilot project proposals. One such example is the ambitious Zero Carbon Humber project (led by Drax, Equinor and National Grid Ventures), which aims to decarbonise the industrial cluster around the Humber region, through a combination of CCUS and low carbon hydrogen.

Hydrogen business models

Since 2017, the Government has been working on developing CCUS business models, the outcome of which is set out in the Government Response. However, as mentioned above, the Government Response has, for the first time, provided detail on how the Government also sees low carbon hydrogen playing a role in the economy, whether in combination with CCUS or derived from electrolysis. The Government has now committed to investigating hydrogen business models further.

Summary of hydrogen business models discussion

The Government set out the following key points in the Government Response:

- low carbon hydrogen (derived from electrolysis, methane reformation with CCUS, or biomass gasification with CCUS) is the lead option for decarbonising industry, and potentially has a role in power, transport and heating in the near term;
- it is committed to developing low carbon hydrogen alongside electricity and other decarbonised gases, including through the development of a business model for the at-scale deployment of hydrogen in the 2020s;
- focusing on production costs is likely to be the most effective approach to unlocking investment (although the demand side will also be explored);
- there is a need to undertake further research for an effective evaluation of potential hydrogen business models, which include a contract for difference, obligation, regulated asset base, direct grant, tax credit and end use options; and
- it is following international developments, noting recent work undertaken by the Netherlands and Germany in particular.

Next steps on hydrogen business models

The Government Response lays out the next steps on progressing the hydrogen business models, being:

- **2020 (end of)** – an update on initial assessment of business models to deploy low carbon hydrogen;
- **2021** – consultation on a preferred business model; and
- **2022** – finalisation of a hydrogen business model.

ENERGY WHITE PAPER

The Government has confirmed that its much awaited energy white paper (originally planned for 2019) will be published this autumn. While the specific contents of the energy white paper are not yet known, we understand that it will set out how the energy industry is going to achieve the UK's binding net zero target by 2050. In particular, it is expected that the white paper will go beyond the decarbonisation of power (i.e. renewable energy), and will seek to focus on, for example, the decarbonisation of heat as well as institutional changes to ensure a more whole system approach, i.e. moving away from looking at the electricity and gas sectors in silos.

Will hydrogen be included in the white paper?

Hydrogen is expected to feature prominently in the white paper, not least due to its potential to play a key role both in decarbonising heat and in a whole system approach to energy (especially with power to gas projects). However, given that Government has now committed to also delivering an update on the hydrogen business models by the end of 2020 (likely after the white paper), it is not clear how developed its thinking on hydrogen will be in the white paper.

Funding gap

While the economic report accompanying the Government Response describes in detail the various business models and regulatory mechanisms proposed to stimulate a hydrogen economy, there is no mention of any funding for such projects. To date, the UK Government has only committed approximately £28 million to the development of five demonstration phase hydrogen projects, which pales in comparison to the sums that other countries such as Germany (€7 billion) or even Australia (AU\$300 million) have committed to hydrogen projects. It is hoped that the white paper will include additional funding commitments that will be required to kick-start the UK hydrogen sector.

CCUS enabled hydrogen vs electrolysis

Despite the CCUS consultation focusing on hydrogen projects in combination with CCUS (either from methane, i.e. blue hydrogen, or from biomass), it will still be important to continue to support the nascent green hydrogen industry, given the UK's excellent domestic offshore wind resources and local electrolyser expertise.

It is understandable that Government may initially prioritise CCUS enabled hydrogen projects given the existing policy and funding commitment to CCUS (the Government has so far committed to investing at least £800m in CCUS projects). In addition, a recent Aurora Energy report makes the case that blue hydrogen is likely to play a bigger role than green hydrogen in the UK, at least until 2050. Reasons for this include the availability of easy to reach onshore

and offshore carbon storage sites, and the likely continued prominent role of natural gas in the UK electricity mix.

Nevertheless, a number of players in the future hydrogen value chain are likely to want to see a range of technologies being supported.² In particular, it is recognised that blue hydrogen is a short to medium term solution, and in the long term electrolysis may be the main and most cost-effective method of producing low carbon hydrogen, even in the UK. In order to not fall behind in the green hydrogen space (the EU has committed to deploying 40GW of electrolyzers by 2030), it may be necessary for the UK Government to ensure that it develops and funds projects to establish a functioning green hydrogen value chain.

COMMENT

Many have compared where we are today in relation to hydrogen with the start of the renewable energy era, about 15 years ago. However, it is clear that hydrogen is a much more complex solution to deploy at scale given how it interacts with both the electricity and gas systems, and involves creating an entirely new demand base in different sectors. Careful thought will therefore need to be given to how each part of the low carbon value chain, from the producers to the transporters to the end-users, can be incentivised to deliver a cost-effective product.

Due to these complexities, it is vital to get the ball rolling with an agile approach on both pilot projects and regulatory design to ensure that a meaningful low carbon hydrogen industry exists by 2030.

Hydrogen's success is dependent on putting in place a well-aligned regulatory and investment framework to scale up these solutions and achieve cost-effective deep decarbonisation by 2050.

ABOUT

Focus on Hydrogen is a Clifford Chance briefing series covering hydrogen-related developments globally. 1.008 is the standard atomic mass of hydrogen.

For other hydrogen publications, please see our climate, sustainability, green finance and renewables page [here](#).

For hydrogen queries in other jurisdictions, please contact Anthony Giustini and Andreas Formosa (listed under Global contacts below).

² The successful Hydrogen Supply Phase 2 Competition projects include two green hydrogen projects (see [here](#)).

CONTACTS

UK



Nigel Howorth
Partner

T +44 20 7006 4076
E nigel.howorth@cliffordchance.com



John Wilkins
Partner

T +44 20 7006 2466
E john.wilkins@cliffordchance.com



James Pay
Partner

T +44 20 7006 2625 |
E james.pay@cliffordchance.com



Clare Burgess
Partner

T +44 20 7006 1727
E clare.burgess@cliffordchance.com



James Shepherd
Senior Associate

T +44 20 7006 4582
E james.shepherd@cliffordchance.com



Felicity Ward
Senior Associate

T +44 20 7006 4504
E felicity.ward@cliffordchance.com

GLOBAL



Kirsty Souter
Senior Associate

T +44 20 7006 4178
E kirsty.souter@cliffordchance.com



Anthony Giustini
Partner

T +33 (0)1 44 05 59 26
E anthony.giustini@cliffordchance.com



Andreas Formosa
Senior Associate

T +44 20 7006 4421
E andreas.formosa@cliffordchance.com

This publication does not necessarily deal with every important topic or cover every aspect of the topics with which it deals. It is not designed to provide legal or other advice.

www.cliffordchance.com

Clifford Chance, 10 Upper Bank Street,
London, E14 5JJ

© Clifford Chance 2020

Clifford Chance LLP is a limited liability partnership registered in England and Wales under number OC323571

Registered office: 10 Upper Bank Street,
London, E14 5JJ

We use the word 'partner' to refer to a member of Clifford Chance LLP, or an employee or consultant with equivalent standing and qualifications

If you do not wish to receive further information from Clifford Chance about events or legal developments which we believe may be of interest to you, please either send an email to nomorecontact@cliffordchance.com or by post at Clifford Chance LLP, 10 Upper Bank Street, Canary Wharf, London E14 5JJ

Abu Dhabi • Amsterdam • Barcelona • Beijing • Brussels • Bucharest • Casablanca • Dubai • Düsseldorf • Frankfurt • Hong Kong • Istanbul • London • Luxembourg • Madrid • Milan • Moscow • Munich • Newcastle • New York • Paris • Perth • Prague • Rome • São Paulo • Seoul • Shanghai • Singapore • Sydney • Tokyo • Warsaw • Washington, D.C.

Clifford Chance has a co-operation agreement with Abuhimed Alsheikh Alhagbani Law Firm in Riyadh.

Clifford Chance has a best friends relationship with Redcliffe Partners in Ukraine.