



FOCUS ON HYDROGEN: BELGIAN ENERGY INDUSTRY IN THE STARTING BLOCKS

In this briefing we set out the latest developments on hydrogen in Belgium in anticipation of a national strategy on hydrogen later this year.

KEY DEVELOPMENTS

Over the last few months, several EU Member States have published national strategies promoting the use of clean hydrogen. These initiatives complement the EU's increasing focus on hydrogen to achieve a carbon neutral society by 2050, a key objective underpinning its Green Deal and recent Recovery Plan for Europe. We are now eagerly waiting for the Belgian Federal Government to take similar steps.

In the meantime, a few important developments for the hydrogen market in Belgium have taken place, including:

- regional policy initiatives in Flanders
- Federal Government plans as part of COVID-recovery
- final report of the "Hydrogen Import Coalition", a strategic collaboration between DEME, ENGIE, Exmar, Fluxys, Port of Antwerp, Port of Zeebrugge and WaterstofNet.

Each of these is discussed in more detail below.

BACKGROUND

Hydrogen in Belgium's energy landscape

Europe currently consumes far more energy than it produces and is expected to keep this negative energy balance in the future. Belgium is no exception, as a small country whose economy is partially fuelled by strong industrial clusters that are very energy-demanding, particularly in the Flanders Region (Antwerp, Zeebrugge, Ghent, etc.). The envisaged phase-out of Belgian nuclear power plants will also weigh heavily in the balance. Nearly half of Belgium's energy production is currently generated by its seven nuclear reactors still in operation.

To realise net zero carbon emissions by 2050, Belgium must therefore redouble its efforts and adopt a clear and viable strategy to produce, import and promote the efficient use of renewable energy. Domestic production, imports and efficient use of energy all present major challenges for Belgium's energy policy.

Key issues

- Clear market trend and policy commitments favouring green hydrogen pilot projects in Belgium
- Federal hydrogen strategy eagerly awaited following COVID-related recovery support
- New study confirming feasibility by 2030 of large-scale wind and solar energy importing by means of hydrogen carriers
- Regulatory framework should primarily encourage the scaling-up of hydrogen pilot projects and address existing competitive disadvantages compared to conventional, fossil fuel-based alternatives

Domestic energy production and import strategy

Domestic production capabilities – particularly given Belgium's relatively small coastal area – are not unlimited. Although the upcoming second wave of new offshore wind farms is hoped to double Belgium's offshore wind capacity from 2 to 4 GW, these efforts will be insufficient to achieve carbon neutrality according to the Belgian electricity TSO Elia.

For this reason, Belgium is actively establishing interconnections with neighbouring countries such as the UK (NemoLink) and Germany (ALEGrO), and Belgium recently announced a partnership with Denmark to establish a 500-kilometre offshore interconnection with Danish offshore wind farms by 2030.

The intermittent nature of renewables is a related challenge for Belgium's energy mix and import strategy. To ensure security of supply, including at times when domestic wind or solar production is at its lowest, renewable energy must be obtained from other regions. In addition to electricity interconnections, there is thus a clear need for flexible electricity transport and storage solutions.

Energy consumption

Another challenge for Belgium's energy policy comes from its industrial clusters, having processes that are difficult to electrify. Even where certain industrial applications and means of transport (e.g. aeroplanes or ships) can be electrified, they require such a level of autonomy and power that conventional electrochemical cells (e.g. batteries) are not adequate.

Role of hydrogen

Clean hydrogen has the potential of addressing these challenges in terms of storage, transport and high-density power generation. Electricity converted into hydrogen via electrolysis can be stored at large scale (whether in liquid or gaseous form) at times when production exceeds demand. In addition, the transport of hydrogen as liquid or gas can be achieved over very long distances by ship or via pipeline networks. Finally, the energy density of a liquid fuel largely outmatches stored electrical energy.

The Hydrogen Import Coalition's final report – published in January 2021 – (see below) highlights that, from a technical point of view, several hydrogen carriers are conceivable. Clean hydrogen can be combined, among others, with nitrogen (to form ammonium) or with carbon (to form methanol or methane). These molecules not only facilitate transport, but can also be used as feedstock by many Belgian companies active in the chemical industries.

A holistic Belgian hydrogen strategy is expected to be announced in 2021. In the meantime, The Hydrogen Import Coalition's report has been warmly received by key officials. Notably, Prime Minister Alexander De Croo commented that:

"Hydrogen will play a decisive role in the energy transition and in making our industry sustainable. This study provides essential new insights for the further roll-out of a hydrogen economy and the further reduction of CO2 emissions. The next step is to develop a long-term strategy for importing hydrogen."

It is also notable that both the Flemish and Walloon regions have decided to devote a significant part of the budget of their post-coronavirus recovery plan to promote clean hydrogen as a sustainable alternative energy source. Flemish Minister of Innovation Hilde Crevits has announced an investment of

more than EUR 125 million in clean hydrogen projects, whereas Wallonia intends to invest more than EUR 160 million in the deployment of a Walloon hydrogen industry.

Finally, the Hydrogen Import Coalition is very keen to deepen its analysis as to how Belgium's main international ports (Antwerp and Zeebrugge) could receive future hydrogen carriers.

FLEMISH POLICY SUPPORT

The Flanders Region has very clearly expressed its objective to become the European frontrunner in the development of hydrogen. Flanders wants to achieve this goal primarily through its port facilities, which are already involved in several hydrogen-related projects (for more detail, see our client briefing, [*The Potential of Clean Hydrogen: European and Belgian Opportunities*](#)).

The Flemish government has decided to invest in the entire hydrogen value chain from production, transport, and storage to end-use applications. It aims to enhance both the research agenda in the field and the existing industrial ecosystem around hydrogen. Additionally, Flanders wants to stimulate the demand for hydrogen technologies, for instance through future Important Projects of Common European Interest ("IPCEIs").

Flemish policy support has an intrinsic international feature. Given the limited area and limited solar and wind supply that it can accommodate, the densely populated Flanders Region is dependent on the import of renewable energies to produce clean hydrogen or the import of clean hydrogen itself. With this in mind, the Flemish regional government is keen to establish partnerships with neighbouring regions, mainly in The Netherlands and Germany.

Finally, the Flemish government wants to tackle regulatory bottlenecks preventing the efficient development of hydrogen. In that respect, it is planning further consultations with public and private stakeholders. One existing constraint is the current Flemish system of guarantees of origin, which does not enable cross-border recognition of such guarantees. This is a barrier to the cross-border trade in, and import of, clean hydrogen.

FEDERAL GOVERNMENT COVID-RECOVERY PLANS

The Federal Government has given a prominent place to clean hydrogen in its federal recovery plan, which is being put in place in addition to the Walloon and Flemish regional recovery plans.

Of the EUR 1.25 billion federal recovery plan, the federal government has announced its intention to dedicate EUR 100 million to a multifunctional energy island off the Belgian coast. This island would not only allow the transmission grid operator Elia to connect the second wave offshore windfarms to the Belgian onshore grid, but relevant stakeholders might also explore other uses. These could include the possibility of producing hydrogen from the excess wind energy generated by the second wave of wind farms.

HYDROGEN IMPORT COALITION REPORT

The Hydrogen Import Coalition was established in November 2019, when DEME, ENGIE, Exmar, Fluxys, Port of Antwerp, Port of Zeebrugge and WaterstofNet decided to join forces to conduct a joint study of the entire hydrogen import and transport chain. The aim of this study is to form a bridge towards future pilot projects.

In its final report outlining the results of this joint study, the Hydrogen Import Coalition takes a resolutely positive view of the future of clean hydrogen in

Belgium and predicts that shipping wind and solar energy to Europe through a hydrogen carrier will be economically and technically feasible by 2030.

It also suggests a few avenues that could further encourage clean hydrogen's development.

Use of hydrogen carriers

First, the report clearly recommends the use of hydrogen carriers to allow easy transport of hydrogen over long distances. As transport costs are much lower than production costs, the report concludes that it is more advantageous to produce energy in regions where the energy supply is abundant and less costly. Liquid Organic Hydrogen Carriers are particularly recommended. Moreover, the report finds that the gradual shift away from fossil fuels in Belgium will generate a significant demand for alternative power sources, especially when coupled with Belgium's envisaged phase-out of nuclear power by 2025.

Regulatory framework

From a regulatory perspective, the report does not identify any immediate showstoppers. However, to establish a level-playing field with fossil fuels (which remain widely available at relatively low prices) various options are explored. Notably, carbon contracts for differences and other taxation-based incentives aimed at bridging the cost gap between green hydrogen and conventional, grey alternatives. In addition, the report underlines the importance of an EU-wide Guarantee of Origin scheme to facilitate the cross-border trade in imported green molecules akin to the existing systems for green gas certification within the EU.

Public-private funding

Finally, the Hydrogen Import Coalition recognises that a drastic scaling up via public-private funding is essential to reduce costs to competitive levels. In this respect, we have reported earlier ourselves that we find market players increasingly keen to bolster clean hydrogen's business case and bankability prospects through a progressive scaling up of electrolysis technology and creation of strategic collaborations aimed at creating value across the entire hydrogen value chain. (For instance, see our client briefings: [Focus on Hydrogen: five key energy trends in Europe](#) and [Focus on Hydrogen: A Clean Energy Solution for Aviation?](#))

In our experience, a comprehensive contract risk management strategy from the outset can effectively improve a pilot project's bankability by mitigating technology-related risks and overcoming cashflow uncertainties. For example, we already see that project developers are requesting availability guarantees and contractors are making analogies with other sectors using different technologies (including oil and gas processing plants, gas turbine plants, offshore/onshore wind and solar) to accommodate such requests. We expect that this trend in favour of bankability-driven contract risk mitigation tools to continue throughout 2021 as further pilot projects are presented to the Belgian market.

CONCLUSION

To complement these various private sector pilot projects and the wide – but fragmented – policy support for clean hydrogen as part of Belgium's recent COVID-related recovery plans, a holistic policy framework at the federal level is eagerly awaited. This initiative should primarily aim at creating a clear strategy to facilitate a drastic scaling up of clean hydrogen and to bridge the

cost gap with conventional, fossil fuel-based alternatives. Doing so will be important, as clean hydrogen has clear potential to address the major challenges in terms of transport, storage and high-density power generation associated with Belgium's energy transition.

ABOUT

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

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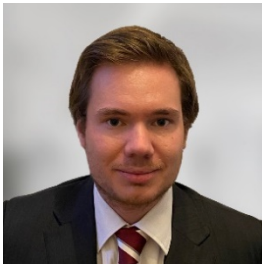
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HYDROGEN LEADS



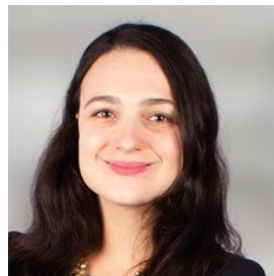
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