Response to Public Consultation
Offshore Renewable Energy Strategy

About Hydrogen Europe

Hydrogen Europe is the European association representing the interest of the hydrogen and fuel cell industry and its stakeholders. We promote hydrogen as the enabler of a zero-emission society.

With more than 160 companies, 78 research organisations and 23 national associations as members, our association encompasses the entire value chain of the European hydrogen and fuel cell ecosystem collaborating in the Fuel Cell Hydrogen Joint Undertaking.

We are a Brussels-based association fostering knowledge and pushing for fact-based policymaking ensuring that the European regulatory framework enables the role of Hydrogen in our society.

For more information, please visit www.hydrogeneurope.eu.

Hydrogen Europe is the organisation representing the interests of the European hydrogen industry. It fully adheres to the European Union's target of carbon neutrality by 2050 and supports the European Commission's objectives to develop and integrate more renewable energy sources into the European energy mix. In this regard, offshore renewable energy offers tremendous potential which, if properly harnessed, can significantly contribute to the decarbonisation of the energy system. To do so, hydrogen and hydrogen technologies will play an important role in amplifying the potential of offshore energy. Furthermore, hydrogen and hydrogen technologies act as enablers of energy system integration, offering a mechanism to flexibly transfer energy across sectors, time and place.

Offshore renewable technologies, whether wind, tidal, wave energy, etc., need hydrogen to propel their development and tap into new markets – particularly the so called "hard to abate" sectors. Installed offshore renewable energy capacity could amount to 250 GW by 2050, the European Commission points out in its roadmap[1]. The potential offered by the synergies between hydrogen and offshore renewable technologies makes for an appealing business proposition. For instance, it provides wind energy players with an alternative value output for their wind power production. Indeed, hydrogen, a clean and versatile energy carrier, can act as a solution to store energy and avoid energy curtailments and electricity grid congestion. Power-to-Gas with hydrogen enables the storage of power in large volumes and over long time periods and, thereby, providing extra flexibility to the grid. Hydrogen, either as a fuel, intermediary product for other fuels (e.g. e-fuels), or feedstock, can also act as a sector coupling solution by linking energy production from offshore plants with energy end uses in demand hubs, notably in those sectors that are harder to decarbonise via electrification (i.e. high-temperature heat industry and heavy-duty mobility, including maritime and aviation). Via both those channels, hydrogen has the potential to play a major role in the effective integration of renewable energy into the energy system.

Within the context of the upcoming Offshore Renewable Strategy, hydrogen's ability to enhance power grid flexibility should especially be favoured and used as a lever to harvest the benefits of offshore renewable energy sources. Several models can be considered for the energy carrier to connect power generated from offshore to energy demand hubs onshore.

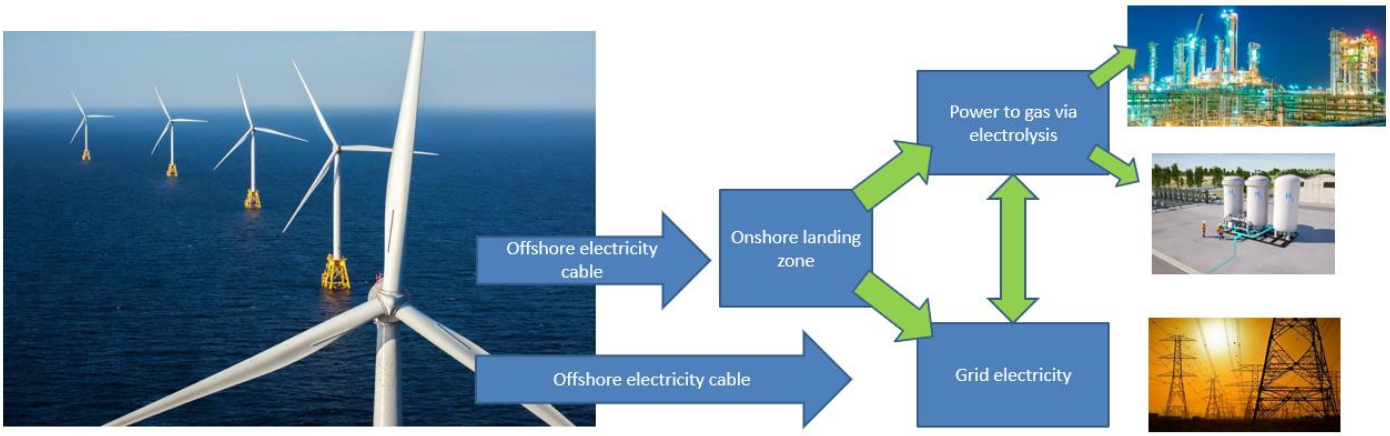
- In a first model ('onsite'), renewable electricity generation and electrolysis are at the same geographical location. Generated power from offshore feeds into the electrolyser and the power surplus, if any, can go onto the power grid. Power from the grid can also be imported into the electrolyser when the electricity

[1] Wind Europe 2050 vision foresees 450GW

price is sufficiently low or when offshore renewable power capacity is not sufficient to supply the electrolyser. Since grid power – aside of offshore renewable power – runs into electrolysers in this model, a solid system of guarantee of origin would be required, to warrant for the renewable content of the grid electricity.

- In another setup, the 'upstream' model offers to make up for the issue of electricity Guarantees of origin. Based on a variation of the 'onsite' model, this setup does not foresee the import of electricity from the grid. This model is therefore especially effective when the installed offshore renewable capacity is significantly higher than that of the electrolyser, so that the latter can always be fully operational. Finally, like for the onsite case, surplus power from the offshore plant feeds into the grid.

In both options, 'landing zones', consisting in delimited areas where the power generated offshore lands onshore, could be considered. From there, it is then decided whether generated power should be injected into the grid or into an electrolyser. This possibility increases flexibility as it offers options to reduce the risk of congestion and burdening of the grid with large additional volumes from variable energy sources.



The Offshore Renewable Strategy offers the opportunity to think about how to bring energy from supply source to demand hubs. In this respect, using gas pipelines for hydrogen transport is a more cost-effective option than high-voltage power cables to transport energy. This should be especially fostered when offshore production plants are far from demands hubs since hydrogen transport via pipeline is even more cost-effective than electricity cables for long distances.

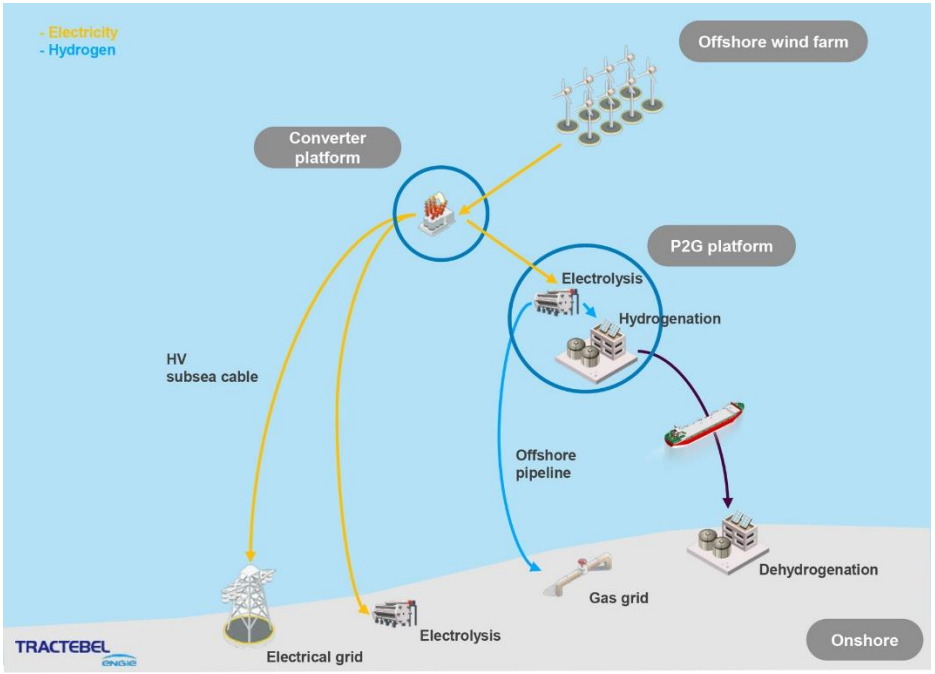
	Cable (BritNed)	Pipeline (BBL)
Capacity	1 GW	15 GW
Cost of construction	€ 500 mln	€ 500 mln
Volume (year)	8 TWh	120 TWh

(Source: *Gasunie Presentation at International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE), 21 November 2017*

However, hydrogen will be able to play its bridging role with offshore renewables only if the appropriate transport and distribution infrastructure is there to allow for its deployment. In this respect, the Offshore Renewable Strategy needs to be thought of in consistency with the revisions of the TEN-E and TEN-T Regulations and the Ten-Year Network Development Plan (TYNDP). Besides, the industry's work on a European Hydrogen Backbone[2] network should be carefully taken into consideration, in line with the stepwise approach for hydrogen infrastructure development outlined in the European Commission's Hydrogen Strategy published on July 8th, 2020. The work to map out future infrastructure needs should also consider the exploitation of coastal salt caverns as energy storage capacities for offshore renewables production sites. This exercise should encourage the proximity of offshore plants and demand hubs too, such as high-heat industrial plants, where synergies improving the efficiency of the energy system could be harvested.

In this context, Important Projects of Common European Interest (IPCEIs) should be used as a lever to channel funding towards identified key infrastructure projects. Connecting Europe Facility (CEF) funding and the upcoming Renewed Sustainable Finance Strategy should bolster these initiatives further.

The maritime sector will also be a major enabling partner to materialise those synergies between offshore renewables and hydrogen. Namely, hydrogen produced offshore could be transported by ships to demand hubs such as ports. Hydrogen-fuelled ships will bring crew to offshore platforms and wind turbines (for maintenance). Besides, those platforms could become hydrogen hubs at sea supplying hydrogen to ships in transit. The Offshore Renewable Strategy and the upcoming legislative initiative on FuelEU Maritime – Green European Maritime Space should therefore be consistent too.



Renewable energy and hydrogen are the fundamental and interdependent building blocks to make the European energy system carbon neutral. Renewable power producers need hydrogen to grow their business models, and the hydrogen industry needs additional renewable energy capacities to scale up the technology, reduce costs, and multiply its uses. As such, the European Commission should consider EU auction tenders for renewable electricity-hydrogen production. Essentially, renewable energy and hydrogen industries are strategic partners to materialise the EU Hydrogen Strategy's target for a 40 GW electrolysis capacity by 2030 and to achieve the EU's updated 55%

[2] Gas for Climate, European Hydrogen Backbone, 2020. Accessible via: https://gasforclimate2050.eu/sdm_downloads/european-hydrogen-backbone/

greenhouse gas emission reduction target. The alignment of both strategies is crucial as offshore renewables will steer the development of renewable hydrogen planned for in the Hydrogen Strategy. Hydrogen is therefore a catalyst for Member States to go for offshore renewable energy. Indeed, thinking through an offshore renewable strategy in a systemic mindset should be about the creation of an ecosystem founded on advantageous synergies between renewable energies, such as wind and solar power, and hydrogen. This is why Hydrogen Europe advocates for the development of 'HydroGenewables'. Because offshore renewables cannot be thought of without the integration potential that hydrogen offers. Both should go hand in hand.

Besides, HydroGenewables represent an enabler to bring in countries in the race to renewables development, especially for those departing with more structural impediments to reach ambitious climate and energy targets. Such ecosystems indeed have the potential to build the bridge from fossil-fuel and carbon-intensive economies to renewables-based societies. The combination that offers HydroGenewables is also an effective means to increase energy security, with locally produced and storable energy. This matters even more for islands, that present both high potential for offshore renewables deployment and a more stringent need for energy security of supply due to fewer interconnections with the continent. Finally, HydroGenewables can facilitate, particularly on islands and carbon-intensive territories, the decarbonisation of natural gas grids as well as the adoption of clean energy solutions and their integration in end-uses such as industry and transport. HydroGenewables will, by the same token, help countries to make their transition towards carbon neutrality happen.

Putting HydroGenewables at the centre of the Offshore Renewable Strategy will not only allow to multiply the potential of offshore renewable energy. It will trigger the blossoming of offshore energy and hydrogen economies, with the creation of thousands of new jobs all along these value chains, as well as economic opportunities for coastal communities. Finally, offshore renewables can be a main contributor to the European Clean Hydrogen Alliance projects, as well as a crucial lever to materialise the 40-GW ambition of the European Commission's Hydrogen Strategy.