EU Hydrogen Strategy

Equinor's contribution

Equinor welcomes the European Green Deal and supports the European Commission in its efforts to position the energy transition at the heart of the post-pandemic recovery plan. We have already brought down our CO_2 emissions in the oil and gas production process to industry-leading levels, and we continue to develop oil, gas, wind and solar energy in more than 30 countries worldwide. In February 2020 we presented our new Climate Roadmap, with the ambitions of i) reducing the net carbon intensity (from initial production to final consumption) of energy produced by at least 50% by 2050, ii) growing renewable energy capacity tenfold by 2026, iii) strengthening our industry-leading position in carbon-efficient production with the aim of reaching carbon neutral global operations by 2030. Equinor's climate commitments are set out in our Climate Roadmap.

As a major European energy supplier, Equinor is determined to contribute to cost-efficient decarbonisation of the EU's energy system. Our broad portfolio of offshore and floating offshore wind, carbon capture and storage (CCS) and clean hydrogen projects offers scalable long-term decarbonisation solutions.

A European Hydrogen Strategy

Equinor shares the Commission's views on the relevance of clean hydrogen (encompassing both decarbonised, i.e. CCS-enabled, and renewables-based hydrogen) in the EU's future low carbon energy systems and welcomes the efforts to introduce a comprehensive pan-European Hydrogen Strategy. To reach the EU's long-term decarbonisation targets, low-carbon hydrogen and carbon negative processes must be utilised at scale, especially in hard-to-abate sectors, such as building heating (15% of total EU CO2e emissions in 2017), heavy transport including trucks, buses, maritime and aviation (9%), iron and steel (4%), chemicals (3%) and power generation (26%).

Scaling up hydrogen is a large opportunity for European economies. A switch to hydrogen will 'futureproof' European industry and create growth in sectors such as energy production, energy infrastructure, equipment for hydrogen production and distribution, equipment for hydrogen use (e.g. fuel cells, boilers) and specialised materials – industries in which Europe already has a significant footprint. In 2019, the FCH JU estimated that the EU hydrogen industry could provide employment for about 1.0 million highly skilled workers by 2030, reaching 5.4 million by 2050. The export potential in 2030 is estimated to reach EUR 70 billion according to the FCH JU.

Low-carbon hydrogen should be adopted at scale, and fast. The technology is mature and ready to be deployed, and the sooner these projects are introduced, the bigger the positive impact on the remaining carbon budget. Introducing a comprehensive policy and project support framework for clean hydrogen projects is pivotal to such deployment and to kickstart a timely development of production, transport, storage and end-use infrastructure across Europe. A common European Hydrogen Strategy will play a central role in guiding member state and private sector investments to mainstream the uptake of clean hydrogen in the EU's energy sector.

The EU's industrial sector is one of the most promising places for kickstarting large-scale deployment of hydrogen technologies and should as such play a central role in the EU's Hydrogen Strategy. Emissions from energy-intensive industries have not reduced by as much as in the power sector[1], largely due to a lack of viable

[1] In 2019 – a year of high EU ETS price, industrial heat emissions fell by 5% and industrial emissions by 1,8% while a 13.9% contraction was seen in power sector emissions.

decarbonisation alternatives. Europe's industrial sector – including steel, chemical, and cement production activities – is however well positioned for scalable hydrogen projects that could facilitate deep decarbonisation and rapid uptake of large volumes of clean hydrogen. Industrial activities are often located in clusters, which benefit from shared infrastructure, thereby enabling reduced individual project costs for the first large-scale hydrogen deployment projects. Furthermore, the roll-out of industrial hydrogen projects can contribute to gradual hydrogen interconnection development across the European regions through hydrogen pipelines, maritime transport solutions or other.

As an example, the H2M clean hydrogen project (Figure *1*) aims to convert the Magnum power station in the Netherlands to combust hydrogen in place of natural gas. In further stages, the project aims to contribute to a larger regional hydrogen market by supplying hydrogen for other uses (including transport and heating). This example illustrates how the roll-out of first industrial hydrogen projects can contribute to gradual hydrogen interconnection development across the European regions through hydrogen pipelines, maritime transport solutions or other.

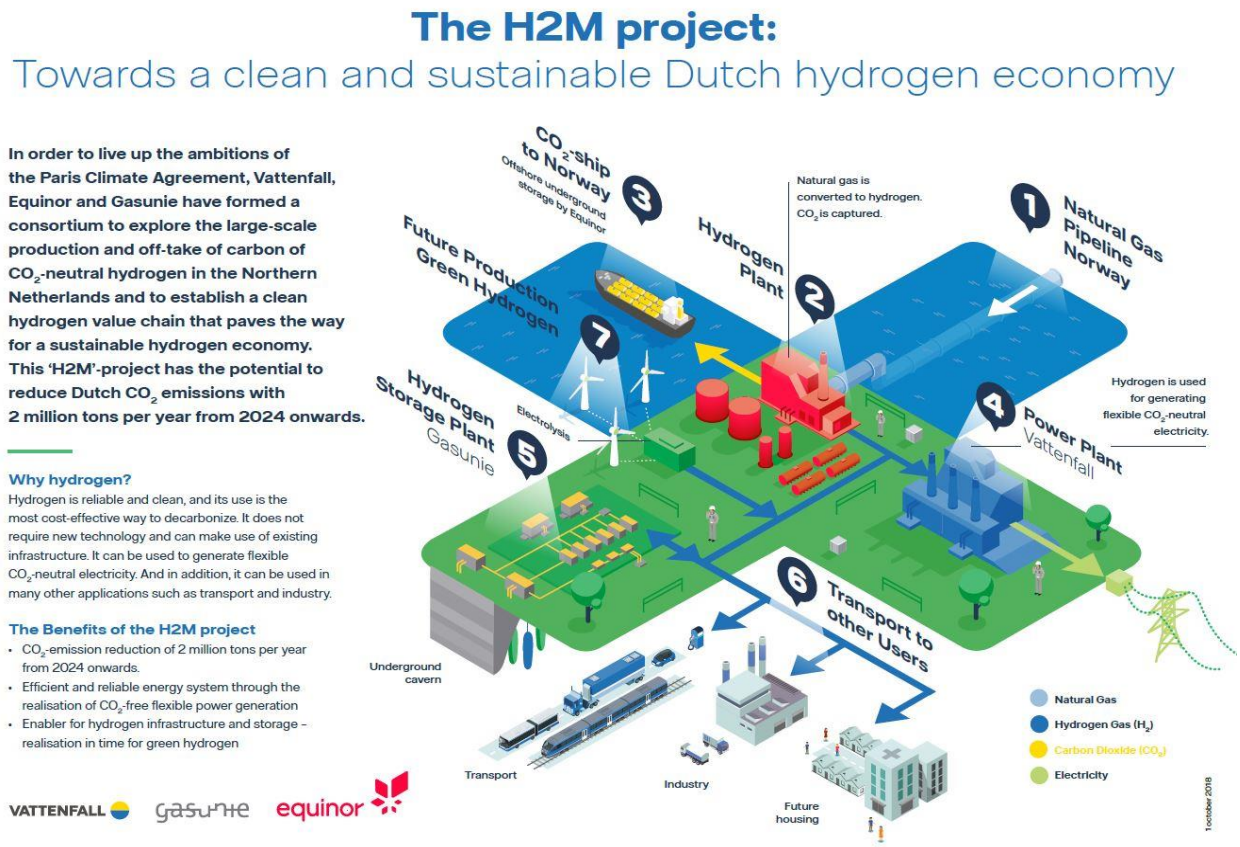

Figure 1 H2M project in the Netherlands

The role of decarbonised hydrogen

Mainstreaming clean hydrogen in line with the EU's 2030 and 2050 decarbonisation ambitions will require large quantities of hydrogen to be available in time for the first industrial-scale projects. **Availability and affordability of clean hydrogen are key requirements for Europe's industrial operators. This implies that realistic clean hydrogen production trajectories are crucial for the EU's industrial actors.** This can be illustrated through the H2morrow steel project, which is a consortium consisting of Equinor, OGE and thyssenkrupp Steel Europe (tkSE). Together, the companies are working on a joint feasibility study to use low carbon hydrogen to produce up to 7 million tonnes/year of clean steel in a 2025/30 perspective. The study partners have concluded that, at this stage,

only CCS-enabled hydrogen from natural gas will be able to guarantee sufficient and stable volumes needed for steel production. To put this in perspective, *Figure 2* shows that, as an alternative, enabling 2.1 GW capacity of renewables-based hydrogen to produce the same amount of steel would necessitate the installation of 7.7 GW of offshore wind capacity, which is roughly equal to the total existing offshore wind capacity in Germany. The project is consequently looking into developing 2.7 GW of clean hydrogen capacity using methane reforming with CCS. If policy and funding support were based on source of hydrogen rather than GHG emissions savings potential, large-scale industrial decarbonisation projects like H2morrow steel would be excluded, thereby weakening the potential for early ramp-up of clean steel production in Europe.

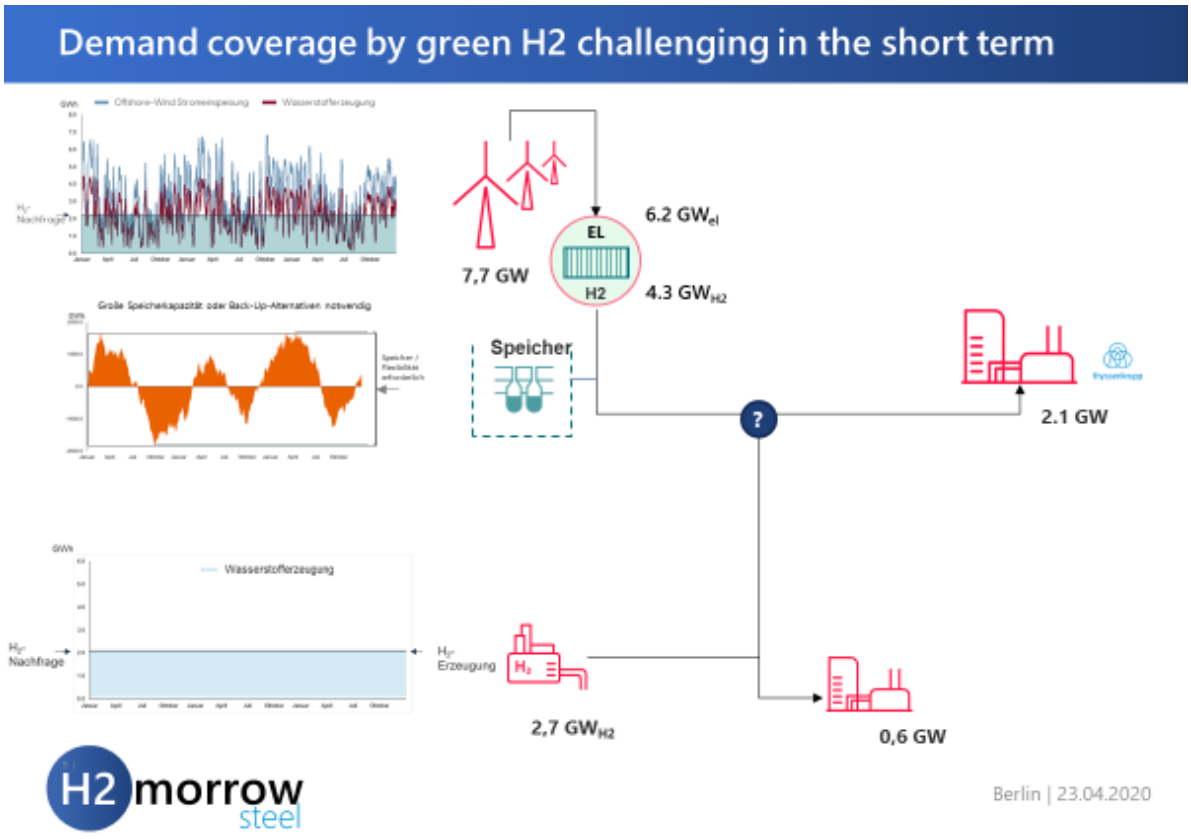

Figure 2 H2morrow Steel project in Germany

Blue hydrogen projects will not be realised without an enabling policy framework and substantial funding support, in particular during the scale-up phase. **Therefore, support mechanisms for clean hydrogen projects (in the form of contracts for difference or other) must not differentiate between the origin of hydrogen but rather reflect its decarbonisation potential, overall life-cycle emissions, and project investment needs.**

Policy recommendations

1. A **clean hydrogen definition** should be established on the basis of minimum GHG emission savings potential and be consistent throughout the EU legislation. Categorisation of different grades of clean hydrogen should be reflected on the basis of life-cycle GHG emissions rather than the origin of hydrogen.

2. Clean hydrogen demand scenarios in the EU's energy mix by 2030 and 2050 should be reviewed and updated, in line with the EU's accelerated decarbonisation pathway. The 1.5TECH scenario under the In-Depth Analysis in support of the EU's Long-Term Strategy suggests that up to 80 Mtoe of clean hydrogen will be used in

the EU's energy system by 2050. Further elaborating on the scenarios for clean hydrogen is a first step towards assessing available technologies for scaling up hydrogen use in the mid- to long-term.

3. The first large scale clean hydrogen projects in Europe will need substantial **support mechanisms** to fill the investment gap, in the form of contracts for difference or other measures. It is crucial that such support mechanisms, both on the EU and national level, are based on the project's GHG emission reduction potential and investment needs, in line with the EU ETS Innovation Fund and potentially complementing it.

In addition, member states could be asked to **earmark a share of national EU ETS auction revenue** to fund clean hydrogen or decarbonisation projects aimed at industrial activities. The European Commission could establish better monitoring mechanisms to evaluate how efficiently the EU ETS revenue is spent.

Finally, the European Commission should **streamline the EU funds to enable large-scale clean hydrogen use** in the energy sector, including the Innovation and Modernisation Funds, Connecting Europe Facility, ERDF and Cohesion Fund as well as the Just Transition Fund. The ERDF and the Cohesion Fund are expected to contribute significantly to the clean energy transition along with the Just Transition Fund. However, the consistency between these funds should be reviewed. Specifically, Art. 6 of the final proposal for the Regulation on ERDF and on the Cohesion Fund (2018/0197(COD)) outlines that these funds could not be used for GHG emission reduction from energy-intensive industries, including power, steel, cement production, refining and other, as listed in Annex I of Directive 2003/87/EC. This provision could undermine the effective use of industrial decarbonisation funding by member states and we suggest it is reviewed.

4. The Hydrogen Strategy should establish a **coherent hydrogen policy framework in the EU**, including the New Industrial Strategy for Europe and the adjacent Clean Steel Initiative, the IPCEI and the EEAG, Horizon Europe and the adjacent Clean Hydrogen Alliance, the EU ETS, the Energy Sector Integration Strategy, sustainable mobility-related legislation as well as the TEN-E Regulation. **To ensure cost-efficiency of EU climate policies, it is crucial that policies and sectorial targets to promote clean hydrogen recognise clean hydrogen on the basis of its GHG emissions reduction potential and not the origin (whether renewable or fossil).** For instance, sectoral targets for transport as defined under the REDII currently do not include decarbonised (CCS-enabled) hydrogen. Provisions to include decarbonised hydrogen could be created in parallel legislation in order to support cost-efficient emissions reduction from transport, especially hard to decarbonise sectors like maritime and aviation. In the same vein, clean hydrogen initiatives under the IPCEI, EEAG or the Clean Hydrogen Alliance should be inclusive of both renewable and decarbonised hydrogen in order to maximise the cost-effectiveness of hydrogen deployment potential in Europe.

The TEN-E Regulation will prove pivotal for pan-European hydrogen infrastructure development. A revised TEN-E Regulation should focus on reinforcing the **long-term low carbon energy sector development planning** through better coordination of NECPs and TYNDPs, which implies increased cooperation between national governments, TSOs as well as the EU level, namely the ENTSO-E and ENTSO-G.

5. Demand-pull policies, including dedicated hydrogen targets or quota, tax and tax exemptions as well as public procurement, will prove crucial to engage the private sector in scaling up hydrogen development across Europe. It is important to note however, that guaranteeing adequate carbon pricing – through the EU ETS or other mechanisms – is pivotal for mainstreaming clean hydrogen use in the mid- to long-term.