

HYDROGEN: THE KEY TO DECARBONISING EUROPE?

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Environmental concerns are now consistently making front-page news. There is no question that global efforts to combat climate change need to be accelerated. The debate now remains as to how. Speaking at a climate summit in New York in September, UN Secretary General Antonio Guterres was stark in his remarks, warning that any temperature rise above 1.5 degrees will lead to major and irreversible damage to the global ecosystems. He has called on leaders from both the public and private sector to develop concrete actions in line with the goals established in the Paris Agreement in 2015, to keep the global temperature

rise this century well below 2 degrees Celsius above pre-industrial levels. In Europe, institutions and national governments have set clear objectives to guide environmental policies since the signing of this Agreement, considered a line in the sand for many citizens and substantiating the need for change. The European Union has further strengthened its climate targets via numerous initiatives. However; as both expert and general public concerns grow that current plans are not ambitious enough, what are the next steps for the public and private sector to unlock additional pathways to decarbonisation?

LOOKING BEYOND WIND & SOLAR

On the public side, the European Union is leading the fight against climate change by pushing the production of renewable energy sources and setting up various tools to support their uptake (e.g. public policies, long and short-term targets as well as incentives). Complementing this effort, the private sector is already providing solutions for electrification and the increased use of renewables. For example, the use of wind and solar power has grown considerably over the last years and they are widely accepted as key to supporting the energy transition and the decarbonisation of European economy in the long-term. However, to reach the Paris Agreement goals, wind and solar will not be enough and all available solutions need to be considered. They certainly won't be enough to reduce emissions from "hard-to-abate"

sectors which constitute 40% of global greenhouse gas emissions^[01]. To achieve deep decarbonisation of these sectors – including heavy transportation, freight, industrial processing and residential heating and cooling - innovative solutions will be needed^[02]. Some of these options are already market-ready, however, they often remain overlooked by policy-makers, the media and the general public. Such is the case of low carbon, which is produced with carbon capture and storage, and renewable hydrogen (i.e. decarbonised hydrogen)^[03].

- [01] *The Truth About Hydrogen*, Patrick Molloy and Leeann Baronett, Rocky Mountain Institute, September 2019
- [02] *Mission Possible – reaching net-zero carbon emissions from harder-to-abate sectors by mid-century*, Energy Transitions Commissions, November 2018
- [03] https://www.certifhy.eu/images/media/files/CertifHy_Presentation_short_final_lowres.pdf

DEALING WITH RENEWABLES INTERMITTENCY THROUGH ENERGY STORAGE

The fundamental challenge with renewable energy sources is their intermittency, as the weather is far from predictable or consistent. It is therefore essential to find a way to store the excess renewable energy produced during peak hours, in order to make best use of them in times when the electricity production from renewables is lower. Currently in many EU member states, production continues to be curtailed due to the inability of the power grid to adapt to the fluctuations of power supply at this stage. This is why power-to-hydrogen (or power-to-x) is such an interesting solution. Renewable energy that cannot be fed into the grid di-

rectly can be used to produce renewable hydrogen^[04]. This hydrogen can then be used directly to power hydrogen fuel cell vehicles, in residential heating or as feedstock for energy intensive industries, or stored for long periods of time to be converted back into electricity and used in times of lower renewable power generation. In fact, hydrogen is one of the most feasible solutions available for cost-effective long-term, large-scale storage of energy^[05]. Therefore, as the use of renewables grows, it can be expected that hydrogen energy storage systems will become more and more common.

THE EU'S POST-2020 ACTION PLAN

The European Commission increasing its focus on decarbonised hydrogen. In early October, the Commission has launched a new hydrogen European Cluster Collaboration Platform (IPCEI) in order to support cross-company and cross-border projects that will be exempt from EU state aid rules, allowing governments to give them as much financial support as they need^[06]. The objectives are clear: reaching environmental targets and supporting the industry while positioning Europe as a leader. “*Hydrogen can accelerate the energy transition and at the same time create huge economic opportunities for European industry,*” said Directorate-General for Internal Market, Industry, Entrepreneurship and SME’s Head of Unit Mark Nicklas. “*We do not have to catch up with the rest of the world as in other areas: we are in the lead.*”^[07]”

As next step, the European Union plans to table a so-called Decarbonisation Package in early 2021, in order to create amongst others, the appropriate regulatory framework for the growth and commercial use of decarbonised hydrogen. This package is expected to position decarbonised hydrogen and other gases as important vectors in the energy transition. Specifically, it should enable the combination of these

growing sectors with electricity. Also known as sector coupling, this approach seeks to increase the integration of energy end-use and supply sectors with one another, which remains one of the EU’s priorities. The much-awaited package should also develop a clear vision on the role of gas (natural and decarbonised gas) in the lead up to 2050: proposing specific targets and incentive schemes. Getting the right policies and financial schemes in place will be crucial for the industry, as it would send an important positive signal to those investing in these solutions. Large investments are in fact already being made, but the sector will only be able to scale up if legislation creates an attractive environment for continued private investment into large-scale deployment.

[04] <https://www.irena.org/publications/2019/Sep/Hydrogen-A-renewable-energy-perspective>

[05] *Hydrogen Scaling Up*, Hydrogen Council, December 2017

[06] <https://www.fch.europa.eu/event/hydrogen-climate-action-conference>

[07] *Europe aims to 'lead the world' on hydrogen*, Sonja van Renssen, ENDS Europe, 14 October 2019

DECARBONISATION LEADERSHIP REQUIRES MORE PUBLIC SUPPORT

Investment in deployment is not an isolated factor of success. The young generation of Europeans striking alongside Greta Thunberg are calling not just for change, but for a change they believe in. That is why getting public endorsement for the use of decarbonised hydrogen will be critical. The industry needs to recognise that a concerted effort is needed; investing in better understanding and engaging internationally^[08] is key to ultimately garner broad public and political support to further accelerate clean energy technologies' progress in Europe and further afield.

An opportunity to do so might just come sooner than expected with the preparation of the Tokyo Olympic Games in 2020. As one of the leaders in the hydrogen space, Japan is moving ahead and painting a real-world picture of just what a hydrogen-fuelled society could look like. The Japanese government has reserved a special fund to create the first-ever “hydrogen-powered” Games and show the world that the future is resolutely carbon-free, with hydrogen and other technologies working hand-in-hand. Will the Olympics be the key to a major shift in attitudes toward hydrogen? That is yet to be seen, but one thing is for sure – Europe and the world will be watching.

[08] *The Future of Hydrogen*, IEA, June 2019