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Climate change



Product & process



Customer demand,
fighting climate change



Funding, regulatory environment,
lack of skilled workforce



External partners (research
institutes/academia, start-
ups, large companies...)



Across industry, transport, etc



Depending on cross-sectoral
demand, public funding



Public funding needed to boost
green hydrogen generation

A new vector for a decarbonised Europe

The electrification of the economy – of transport, heat and industry – is a huge challenge and a massive opportunity. It involves the wide scale deployment of renewables, grids and energy storage – all of which are essential if the EU is to make a success of energy transition. Accelerating Europe's energy transition is not only necessary to mitigate the climate crisis, but will also play a key role in improving energy security and the competitiveness of our industries. Moreover, it will help create sustainable jobs throughout the value chain.

However, not all sectors are easy to electrify. For technological reasons, this is particularly difficult for energy-intensive industry and heavy transport. Here one solution lies in using hydrogen.

Currently, the majority of hydrogen production worldwide is based on the steam methane reforming process (75%) and on coal gasification (25%), in both cases emitting CO₂ (approximately 10 kg of CO₂/ kg of H₂ produced) and requiring significant amounts of primary energy.

We at Iberdrola believe that we can do better than that. In fact, for us the answer is green hydrogen that is produced using renewable electricity. If this becomes common practice, and as the International Energy Agency points out, this would save 830 million tonnes of CO₂ per year as compared to when this gas is produced by fossil fuels. Those savings are equivalent to the emissions of a country like Germany.

Greening hydrogen

Obtaining hydrogen by electrolysis of water from renewable energies is not only feasible, but relatively easy to achieve, due to the abundance of water in nature and the unlimited capacity of renewable energies.

To make this a reality in Europe, Iberdrola is now pioneering the largest green hydrogen plant for industrial use in Europe, located in Puertollano, Spain, with an investment of EUR 150 million. This innovative initiative will create up to 1,000 jobs and avoid emissions of 48,000 tCO₂/year.

The plant consists of a 100 MW solar photovoltaic plant, a lithium-ion battery system of 20 MWh and one of the largest electrolysers in the world (20 MW). The solar plant features several technological innovations:

First, bifacial panels allow for higher production by having two light-sensitive surfaces and provide a longer lifetime. Second, cluster inverters improve yields and allow greater use of the surface area. Third, an energy storage system makes the plant more manageable, as the battery system (with a power of 5 MW) has a storage capacity of 20 MWh.

Iberdrola is also driving the green hydrogen value chain with this project. Thus, one of the main successes of this project has been the strong collaboration between 60 partner companies and institutions throughout the value chain, including research institutes/academia, start-ups, large companies...

internally, our innovation team brought together the renewables business and the green hydrogen unit, which was recently created at Iberdrola.

Our plant is part of an ecosystem with a larger innovation mission: Europe's first large-scale experiment in green ammonia generation. We will produce green hydrogen for Fertiberia's ammonia factory in Puertollano, one of the EU's most efficient ammonia factories – with a production capacity of more than 200,000 t/year. As a result, the plant's natural gas needs will be reduced by more than 10%.

In the future, the waste heat produced as a result of the electrolysis process could be used to provide hot water and residential heating to the town of Puertollano through a heat network that Iberdrola is already promoting in the town.

An important milestone was reached when the project was recognised as an Important Project of Common European Interest (IPCEI).

Our next project, for which we have been awarded a ten-year contract, is to build and operate a green hydrogen plant to fuel buses be used by Transports Metropolitans de Barcelona (TMB) buses and other fleets and industries.

All in all, Iberdrola already has more than 60 green hydrogen projects in its portfolio in eight countries, including Spain, the United Kingdom, Brazil and the United States. We are responding to the electrification and decarbonisation needs of sectors such as industry (steel, ammonia and methanol) and heavy transport (aviation, trucks, etc.).

Where policymakers can make a difference

As you can see, industry is ambitious to play its part in the green transition. But we need a supportive environment for innovation to bear fruit.

To carry out projects without loss of time, policymakers should take the following measures: adoption of a definition of renewable hydrogen; simplification and homogenisation of administrative procedures; speeding up permitting for renewables and also for renewable hydrogen installations; and adoption of the most ambitious binding targets for boosting renewable hydrogen and fuel derivatives in hard-to-electrify industry and transport.

To promote the development of the technology and roll it out across the EU, public incentives, both economic and regulatory, are key to supporting projects that respond to a real demand and with immediate industrial application (production of ammonia, green methanol, replacing fossil fuels in high temperature process...), ensuring fast and simplified access to support and financing instruments.

To scale up spread of the technology across Europe we need a skilled workforce, i.e. professionals trained and qualified in this technological area.

The US Inflation Reduction Act shows that, with political will, the right incentives for innovation and scale-up can be set. And that there are clear lessons for Europe if we want to remain leaders in green innovation.

