

Consulting Aug 25, 2020

Hydrogen—Fuel of the Future?

Expectations are high and the technologies are proven—is the hydrogen economy about to take off? The players still need to network and to establish their business models.



So what is still missing? What needs to happen to facilitate the final and sustainable breakthrough for the use of hydrogen? One answer to this question lies in linking the key players, which means everyone from the production, storage, and distribution sectors to manufacturers of hydrogen-powered vehicles and plants as well as commercial and private users. At the same time, a uniform and transparent price policy is still lacking, such as a central market as exists for electrical power. And on the technical side, the “green” percentage of this fuel source—the amount produced via electrolysis with renewable energy—needs to increase.

When these conditions are met, hydrogen can become widely established as a source of power for applications like fuel-cell heating systems and commercial vehicle drives. The chemical industry would find dependable customers for the substance, which often arises as a product of reactions. And by switching their blast furnaces from coal to hydrogen power, steel producers could substantially lower their costs and also reduce their environmental impact thanks to lower CO₂ emissions.

Japan as pioneer

The current situation, however, looks primed and ready. According to Christian Dittmer-Peters, a partner at Porsche Consulting, “There are three crucial factors: transparency on matters like the sources and available amounts of hydrogen, clear regulations on processes like handling gases, and—most importantly—a network for all the relevant players. Hydrogen can only be used on a widespread basis if a network can be established with appropriate business models. That includes not only the infrastructure and technical equipment but also completely new services.”

This is precisely the sticking point. Dittmer-Peters describes the current constellation as a standoff in which each member of the process chain is waiting for everyone else to make a move. “What’s needed right now is investment in hydrogen production and distribution, as well as in fuel stations and distribution centers. A lot of companies are ready. In order for participants to commit themselves and move forward, they have to connect with each other and develop viable long-term business models.”

Here, too, the chances for this development are now more favorable than ever. “There is an enormous amount of potential because of the many gaps in the value chain that still need to be filled,” explains Dittmer-Peters. For companies that are already established in today’s energy mix, such as those in the petrochemical industry, it is entirely unclear what roles they will be playing in the future. Will

they be producers, or suppliers, or perhaps primarily consumers? And what new partners or competitors will enter the picture?

Duisport: H2 infrastructure for inland ports

A very wide range of players is currently investing in concrete applications for hydrogen. Duisport, for example, is Germany's largest inland port and Europe's central logistics hub. Located at the Rhine, for the Duisburg port hydrogen is an important part of its sustainability strategy, which is why it is participating in the RH2INE joint venture (Rhine Hydrogen Integration Network of Excellence). "This project aims to introduce hydrogen-powered barges on the Rhine-Alpine corridor and set up a hydrogen infrastructure at ports along the Rhine by 2030," says Erich Staake, Duisport's CEO. The EU is investing half a million euros in studying the technological and regulatory requirements for hydrogen-powered shipping between Rotterdam and Genoa.

Hydrogen for steel production

The colors of hydrogen

Is hydrogen always hydrogen? It is a colorless gas. But the way it is produced can make a difference. A color system is used for categorization. Here are the three major types:

Green: produced from water by electrolysis using renewable energy, which makes it the only CO₂-neutral form.

Grey: produced from fossil fuels, which can make sense for a transitional period.

Blue: initially produced as grey hydrogen

At a glance: the benefits of hydrogen

The use of hydrogen creates real win-win situations along the process chain.

Energy industry: storage and need-based supply of electricity produced by wind, hydro, or solar power.

Infrastructure: new field of business, e.g., for ports, fuel stations, energy providers, and local suppliers.

Industry: ability to meet sustainability targets and reduce costs by avoiding sanctions and CO₂ taxes.

Transport and logistics: lower CO₂ and noise emissions, greater ranges due to compact storage capacities.

Info

Text first published in [Porsche Consulting Magazine](#).

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