

SCALING UP CLEAN HYDROGEN IN THE NEXT 10 YEARS

Hydrogen Energy Ministerial in September 2019 results in Global Action Agenda

The key message of the IEA G20 report on The Future of Hydrogen was crystal clear. There is a huge potential role for **clean hydrogen** in the energy transition, in particular to help decarbonize the **hard-to-abate sectors** like industry and heavy-duty transport as well as provide seasonal storage. But if we want to realize this potential we need to tackle the challenge of **bringing down the cost** by **scaling up** deployment in the next 10 years. To make this happen, the IEA recommends countries to focus on industrial ports and related logistical transport flows, utilize the existing gas grid and promote international trade. The Hydrogen Energy Ministerial Meeting last month in Tokyo saw an **unprecedented momentum** of 30 countries and over 600 high-level participants from companies, research institutes and international organisations. The Japanese presidency rose to the challenge and produced an ambitious **Global Action Agenda** on clean hydrogen. The main pillars of this agenda consist of investing in the build-up of international hydrogen supply chains, expanding the use of hydrogen in various sectors (sector integration) and promoting mobility across applications by setting **aspirational goals** such as 10 million hydrogen powered systems and 10.000 hydrogen refueling stations in 10 years ("Ten, Ten, Ten"). Implementing this target would significantly scale up hydrogen in mobility. It was considered too early to agree on aspirational targets for applications in other fields than mobility at the global level.

Moving forward in different regions

The Global Action Agenda is designed to guide further actions in the participating countries. The **IEA Secretariat** stands ready to assist countries in designing appropriate policies, e.g. through the Hydrogen Initiative of the **Clean Energy Ministerial (CEM)**. The **International Partnership for Fuel Cells and Hydrogen in the Economy (IPHE)** will help us achieve common codes, standards and regulations (e.g. on safety) that support trade and the emerging global hydrogen market.

In the **Asian-Pacific region** we can see the beginning of a global clean hydrogen market evolving. Japan and Korea have formulated clear long-term hydrogen strategies focused on a phased scaling-up. They are moving forward fast, with China already catching up. As Japan signals a need for large scale imports of clean hydrogen, Australia, New Zealand, Brunei and Middle Eastern countries are contemplating the build up of new clean hydrogen export industries.

What are the consequences of this for **Europe**? No less than 25 of the 28 EU member states have so far embraced the objective of climate neutrality in 2050. The incoming EC has declared that it wants Europe to become the first zero emission continent. All the serious energy scenarios demonstrate that the EU's ambitions can only be achieved by a significant role for clean hydrogen. Even in the most optimistic scenarios for electrification, green electrons may be able to cover half of final energy consumption at most. That still leaves the other half that will need to be decarbonized by **greening of the molecules**, i.e. by biogas and clean hydrogen (in some shape or form).

Since last year, the momentum on clean hydrogen is increasing rapidly. **Pilot projects on blue and green hydrogen** in industry, transport, heating and storage are mushrooming across Europe. The IEA estimates that there are about 3 GW of green hydrogen (electrolysis) projects under way to test new applications of hydrogen. An increasing number of countries and regions are working on **hydrogen strategies**. Against this background, the new EC has a unique opportunity to set out an ambitious clean hydrogen strategy that can help achieve the climate targets, while at the same time **create new jobs and growth** in the clean energy sector because European companies are already part of the manufacturing industry of clean hydrogen. A recent study illustrates that in the Netherlands alone we already see a dynamic sector of 260+ companies active in the hydrogen technology value chain.

How Europe can lead in clean hydrogen

The new EC can launch a pro-active **clean hydrogen strategy** that boosts the energy transition by greening molecules on the back of the **huge offshore wind potential** and using the existing gas grid to create a backbone hydrogen infrastructure, while at the same time creating new jobs and green growth. The key components of such a strategy include the following. First, the EU should set a **higher objective** than its proportional share in the '10,10,10' global mobility target of the Tokyo Global Action Agenda. This should help achieve EU corridors that allow for smooth cross-border traffic flows for hydrogen vehicles (cars, trucks and ships). The hydrogen mobility target in the Netherlands' Climate Agreement is already roughly three times higher than our proportional share in the Tokyo target.

Second, the EU should extend the clean hydrogen space beyond mobility and stimulate sector integration. One powerful way to do that is introducing into the upcoming gas legislation package **an obligation for member states to replace 10% of gas consumption in 2030 by clean hydrogen** as a first milestone in a pathway towards decarbonized gas (or a higher percentage if it preferable to include biogas into the equation). There would be many advantages to such a policy, but the main attraction in my view lies in a strong demand-pull that can help kick-start the clean hydrogen market. In addition, an obligatory quatum of clean hydrogen will significantly boost the **bankability** of clean hydrogen projects according to what I have heard from the financial community. This could help achieve around 40 GW electrolyser capacity in the EU by 2030. The **EIB** should also be explicitly tasked to work with commercial banks in Europe to finance an accelerated scale-up of the deployment of clean hydrogen wherever feasible.

Third, the EU should keep the **regulation** of the nascent clean hydrogen market in step with its evolution. As one EU expert put it aptly, 'we should avoid regulating the traffic before there are even cars on the road'. It may be tempting to directly bring clean hydrogen entirely under the natural gas legislation, but not necessarily appropriate. Certainly in the next 10 years we should allow for a more **flexible approach** that allows room for experiments and sandboxes while the market develops. In all cases, general competition policy will remain applicable including on abuse of dominant market positions.

Fourth, the EU should establish **common harmonized European standards** that facilitate the creation of a single clean hydrogen market with seamless cross-border trade. In particular, common high safety standards are key and a common methodology for guarantees of origin, on the basis of the promising EU Initiative **CertifHY**. A well functioning EU certificates market with clearly defined certificates for green and low-carbon hydrogen is very important. Even more so, if this EU model can be extended to the Asia-Pacific region (Japan, Australia).

Fifth, the EU should strongly encourage that the **tax system** in EU member states helps the penetration of clean hydrogen. At the very minimum, there is an urgent need to **avoid double taxation** by not treating conversion of power-to-hydrogen as end-use energy consumption.

Sixth, the EU should participate fully in the **Mission Innovation Initiative** to help double the global R&D effort in the clean hydrogen space. An important EU programme like the **Fuel Cells & Hydrogen Joint Undertaking** can bolster the EU's technological lead in e.g. electrolysis, if properly funded.

The Netherlands meanwhile is in the process of designing an adequate national innovation & support scheme for clean hydrogen as announced in the recently published Climate Agreement, in close consultation with stakeholders. A national hydrogen strategy will be published before the end of the year. At the same time, we have embarked on an international hydrogen strategy, ranging from active participation in multilateral organisations (IEA/CEM, IPHE) and cooperation with key global players (like Japan) to cooperation in the framework of the EU, the Pentilateral Energy Forum, the North Sea countries and our neighbors Germany and Belgium.

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