Hydrogen Europe: Who we are

**Our Vision**
Hydrogen enabling a zero-emission society

**Our Mission**
We bring together diverse industry players, large companies and SMEs, who support the delivery of hydrogen and fuel cells technologies. We do this to enable the adoption of an abundant and reliable energy which efficiently fuels Europe’s low carbon economy.

**Number of members:**
+250 (companies + National Associations)
+90 Research organisations
“A different growth model is possible. I see the climate transition as a huge opportunity for the European economy...we have the technologies...just think of hydrogen...”

European Commission President Von der Leyen
@Business Europe Day, March 2020
• Publication dates of national hydrogen strategies across the world per country
• Japan, France and South Korea are pioneers in the adoption of hydrogen deployment strategies.
• In 2020, the publication of NHSs reached a peak.
Billions to be invested in hydrogen in the EU

EU governments propose hydrogen strategies with dedicated 2030 investment plans:

<table>
<thead>
<tr>
<th>Country</th>
<th>Amount</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>€ 7 bn</td>
<td>for hydrogen technology</td>
</tr>
<tr>
<td></td>
<td>€ 2 bn</td>
<td>for international cooperation</td>
</tr>
<tr>
<td>Spain</td>
<td>€ 8.9 bn</td>
<td>estimated mobilised investment</td>
</tr>
<tr>
<td>France</td>
<td>€ 5.7 bn</td>
<td>public support</td>
</tr>
<tr>
<td>France</td>
<td>€ 1.5 bn</td>
<td>for an IPCEI project</td>
</tr>
<tr>
<td>Portugal</td>
<td>€ 7 bn-€ 9 bn</td>
<td>estimated mobilised investment (public funds around €1bn)</td>
</tr>
<tr>
<td>Austria</td>
<td>€ 2 bn</td>
<td>Draft: public support by 2030 (€1bn by 2024)</td>
</tr>
<tr>
<td>Italy</td>
<td>€ 10 bn</td>
<td>Draft: estimated mobilised investment</td>
</tr>
</tbody>
</table>
Planned PtH projects amount to 53% of EU’s 2024 6 GW goal

Planned electrolyzer capacity by 2030 (MW)

- **Above 3,000 MW**
- **1,000 – 3,000 MW**
- **200 – 1,000 MW**
- **50 – 200 MW**
- **Up to 50 MW**
- **Existing project/s with undisclosed capacity**
- **Not included in the analysis**
- **No known projects**

XXXXXXXX MW Planned electrolyzer capacity

Data as of 22/02/2021

Comments

- **25 GW announced capacity by 2030***
  - 153 projects
  - 63% of EU’s 40 GW target
  - Capacity to produce 7.4 Mt of H2 annually***
- Annual capacity growth rate **80%**
- 3.1 GW by 2024
  - 53% compared to 6 GW EU target
- New PtH facilities are being announced regularly across Europe
- ~**€ 12.5 billion worth of investments in electrolyzer technology** by 2030

Notes: Displayed electrolyser capacities reflect projects that have an official starting date by 2030. There are numerous other projects with unknown starting dates that could be finished by 2030, but are not included in this analysis. These numbers also don’t reflect the HyDeal project that aims for 67 GW of electrolysis by 2030 alone.

Source: Hydrogen Europe
Low-carbon (Blue) hydrogen production by 2030

Data as of 22/03/2021

1. Acorn CCS / H2
2. Aramis (Blue H2 Den Helder)
3. H21 North of England
4. H2morrow
5. H-Vision
6. HyDemo
7. H2H Saltend
8. HyNet
9. H2 Magnum
10. Preem CCS
11. Adriatic Blue Project
12. Humber Zero
13. H2Teeside

Comments

- 12 out of 13 projects on the map will produce **5.9 million tons of low-carbon hydrogen per year by 2030***
  - 71% of the 2018 EEA hydrogen consumption (8.3 Mt)
  - Non-public projects* may add another 1.2 Mt by 2030
- **52 million tons of captured CO2 emissions** per year by 2030
  - ~Denmark’s 2018 total GHG emissions (CO2 equivalent)

Source: Hydrogen Europe, Eurostat

*Non-public projects*
Strategic topics and challenges for the H2 sector

“Efficiency”
- Complementing the “efficiency first” principle;
- Develop the principle of “system efficiency”.

“Additionality”
- Major stumbling block to renewable H2 production;
- Fight against extension of principle beyond transport/refineries.

“H2 infrastructure considerations”
- Gradual regulation of networks;
- Separate H2 legislation;
- Blending in the gas legislation;
- Pure H2 needs its own framework;
- Value of long-distance transport.

“Water consumption”

MYTH
Electrolysis uses vast amounts of water

FACT
Based on the atomic composition of water, 1 kg of hydrogen requires 2.5 kg of water. In the production of hydrogen, the reaction is the reverse of water’s decomposition, producing one molecule of hydrogen and one molecule of oxygen for every molecule of water.

Comparing water consumption for electrolysis with other energy uses, the water footprint of certain fossil-based pathways exceeds that of hydrogen. While electrolysis consumes more water than the production of green hydrogen per unit of energy, this means that one molecule of water would need to be supplied to each molecule of hydrogen. Therefore, it is crucial to ensure the efficient use of water resources to mitigate the potential environmental impacts of hydrogen production.
10 recommendations for the EU Hydrogen Strategy

1. Define an EU wide terminology for renewable and low carbon hydrogen together with a methodology to calculate life cycle greenhouse gas emissions in order to enable a functioning clean hydrogen economy.

2. Establish the principle of CO2 as the new “currency” of the energy system.

3. Promote and support hydrogen market stimulation programs including quotas/targets, dedicated programs and support schemes.

4. Enable a competitive hydrogen economy by clarifying the market design and supporting sectoral integration.

5. Revise the Trans-European Networks for Energy (TEN-E) Regulation to support the development and roll out of hydrogen networks.

6. Revise the directive for the Deployment of Alternative Fuels Infrastructure (DAFI) to boost the use of hydrogen in the mobility sector.

7. Support for a strong, effective and all-encompassing Clean Hydrogen for Europe Partnership.

8. Remove undue barriers to hydrogen production and hydrogen infrastructure.

9. Unlock hydrogen’s potential by leveraging innovative financial instruments.

10. Launch the Clean Hydrogen Alliance and establish hydrogen as a key element in global EU climate diplomacy and neighbourhood policy.
Thank you for your attention!

HYDROGEN EUROPE SECRETARIAT

Avenue de la Toison d’Or 56-60
BE-1060 Brussels

secretariat@hydrogeneurope.eu

+32 (0) 2 540 87 75

www.hydrogeneurope.eu