

# OSSERVATORIO ESG

Andrea Gasperini  
Head of Sustainability Aiaf

Sonia Artuso  
Financial Analyst CESGA, CIIA, CEFA

date 22 July 2020 n.124  
<https://www.aiaf.it/aiaf-sostenibile-1-1>

[andrea.gasperini@aiaf.it](mailto:andrea.gasperini@aiaf.it)  
[sonia.artuso@aiaf.it](mailto:sonia.artuso@aiaf.it)



Hydrogen offers a solution to decarbonise industrial processes and economic sectors where reducing carbon emissions is both urgent and hard to achieve. All this makes hydrogen strategic to support the EU's commitment to reach carbon neutrality by 2050 and for the global effort to implement the Paris Agreement while working towards zero pollution.

## A HYDROGEN STRATEGY FOR A CLIMATE-NEUTRAL EUROPE

Europe's transition to a decarbonized energy system is underway and the Intergovernmental Panel on Climate Change (IPCC) confirms that the world needs to limit climate change to 2°C to reduce the likelihood of extreme weather events and significant biodiversity losses. It also emphasizes that emissions need to be reduced with far more urgency than previously anticipated, in order to limit temperature increase to 1.5° C net-zero CO2 emissions at global level needs to be achieved around 2050.

The European Commission's 2018 Long-Term strategy, "[A Clean Planet for All](#)" highlights the critical role that hydrogen can and must play in achieving climate neutrality. Hydrogen is the first chemical element and the lightest element in the periodic table. It is a colorless, odorless and high flammable gas. It composes stars in the plasma state. Hydrogen is the most abundant chemical substance in the universe. On the Earth it is present in the state combined with other chemical element. Hydrogen derives its name from Greek words: *water* and *generate*. Hydrogen has long been used by the chemical industry as a feedstock in industrial processes. Its role is likely to become more prominent in a fully decarbonized energy system. To play this role, hydrogen will have to be produced by water electrolysis using carbon-free electricity or from natural gas steam reforming using Carbon Capture and Storage. (CCUS)

Hydrogen thus produced can then contribute to decarbonize various sectors: first, as storage in the power sector to accommodate for variable energy sources; second, as an energy carrier option used in heating, transport and industry and, finally, as a feedstock for industry such as steel, chemicals and e-fuels in those sectors that are most difficult to decarbonize.

### Hydrogen in The European Green Deal

In December 2019, the European Commission presented [The European Green Deal](#) as the new European Growth Strategy setting out a clear agenda to make Europe the first climate neutral continent in the world by 2050 and, to enhance, improve and preserve the EU's natural capital. This fundamental transformation of Europe's economy to a green and competitive economy requires fundamental changes and breakthrough technologies. The Green Deal identified clean hydrogen as a priority area where the EU needs climate and resource frontrunners to develop such technologies and commercial applications.

Recognizing the need for stronger coordination across the value chain, the [new Industrial Strategy](#) presented by the Commission in March 2020 announced a "[European Clean Hydrogen Alliance](#)" to bring together investors with governmental, institutional and industrial partners.

The European Clean Hydrogen Alliance will support the development of a clean and globally competitive hydrogen industry in Europe. Clean hydrogen technologies have the potential to achieve deep decarbonisation of some of Europe's most emitting industries, and play a key role in helping Europe to transition to a carbon neutral economy

The European commission will focus on unlocking investment in clean technologies and value chains, notably through the additional funding for [Horizon Europe](#) and the new Clean Hydrogen Strategy and Alliance will steer and coordinate the rapid upscaling of clean hydrogen production and use in Europe.

Across funding programmes outlined under the European Green Deal, hydrogen industry could benefit from extra support, especially from a number of instruments such as:

1. [The Strategic Investment Facility \(InvestEU\)](#): is the EU's proposed flagship investment programme to kick-start the European economy, building on the "Juncker Plan" and the European Fund for Strategic Investments

(EFSI). Among others projects will support the development of renewable energy and of alternative and synthetic fuels from renewable/carbon-neutral sources, energy and transport infrastructure modernisation, transport fleet renewal for cleaner mobility, energy savings, CCUS, decarbonisation of energy-intensive industries.

This support opportunity is therefore expected to be comprehensive as regards industry player types across hydrogen production, distribution, and end-uses. Concretely, this instrument belongs to those under the EU Recovery Plan that offer most potential for hydrogen development. The provided guarantee will enable participating stakeholders to profit from improved lending conditions to finance their projects.

2. [The Recovery and Resilience Facility](#): is the main tool for the EU recovery. It is broad by its scope and large by its allocated funding (Euro 560 billion, thereof a majority in the form of grants) and its aims is to support investments and reforms essential to a lasting recovery, to improve the economic and social resilience of Member States, and to sustain the green and digital transitions. Hydrogen technology is therefore eligible and can benefit from this scheme. Hydrogen projects are included in Member States' Recovery and Resilience Plans (RRPs) and that these get the Commission's approval.
3. *The reinforced [Just Transition Fund](#), where hydrogen projects would be eligible*: is a main mechanism of the European Green Deal and is dedicated to helping the most vulnerable sectors, Member States, and regions in the transition in order to 'leave no one behind'. The overarching goal of the Just Transition Mechanism (JTM) is to help EU Member States and regions whose economies are most carbon-dependent and vulnerable, and potentially most affected by the energy transition challenges, to steer their transition towards a climate-neutral economy. The various funding instruments are aimed at investing in the clean energy transition.
4. [REACT-EU](#): is an emergency temporary instrument that bridges the gap between short term 'safety-nets' and longer-term measures. The REACT-EU scheme bolsters cohesion policy via various supporting funds and it aims to help all economic sectors, "including for the much-affected tourism and culture sectors". Additional support will also serve to invest in the European Green Deal and digital transition. Financing will therefore be channeled also to support technologies laying the basis for a green recovery and enabling the green transition. Hydrogen fits the eligibility criteria and can contribute to reaching the objectives by both supporting the economy of less developed regions and helping them to meet decarbonization targets in line with

the National Energy and Climate Plans (NECPs) and the EU Green Deal.

5. [The European Agricultural Fund for Rural Development \(EAFRD\)](#): is the funding instrument of the EU's Common Agricultural Policy (CAP). The agricultural sector is encouraged to deliver on the green and low-carbon transition in line with the EU Green Deal. Considering the criteria set at national level, bio-fertilisers and cleanhydrogen-based fertilizers could benefit from a wide range of financial instruments available under the fund, from guarantees to direct grants.

### Hydrogen in the EU's Economic Recovery Plans

On 27 May, the European Commission, to ensure a sustainable, inclusive and fair recovery for all Member States, presented the proposal "[Europe's moment: Repair and Prepare for the Next Generation for a major EU Recovery Plan](#)". It consists of different instruments, some of which are under discussion in these days: the [Next Generation EU](#) fund and the 2021-2027 [long-term EU budget or Multiannual Financial Framework \(MFF\)](#). Worth a total Euro 750 billion and Euro 1.100 billion respectively, both will be part of the European Recovery Plans. A third of the total will have to be committed to transforming the EU in a low-carbon economy. Expenses that are not consistent with the Paris Agreement will not be approved, thus making the European effort the biggest green stimulus the world has ever seen at the moment. Hydrogen is featured as a key sector that should receive support under the recovery plans especially due to its ability to bolster the longer-term objectives of the European Union, such as the EU Green Deal's targets, climate-neutrality, and the EU's strategic autonomy.

The EU strategy for energy system integration will outline a vision to create a smarter, more integrated and optimised energy system, in which all sectors can fully contribute to decarbonisation.

### Hydrogen Strategy for a climate neutral Europe

In this context, the Commission adopted a new dedicated strategy on hydrogen in Europe, in parallel with the strategy on energy system integration, on 8 July 2020. It will bring together different strands of action: research and innovation, production, infrastructure and international dimension.

The [EU Hydrogen Strategy](#) will give a boost to clean hydrogen production in Europe. Hydrogen can be used as a feedstock, a fuel or an energy carrier and storage, and has many possible applications which would reduce greenhouse gas emissions across industry, transport, power and buildings sectors. The Commission's economic recovery plan Next Generation EU highlights hydrogen as

an investment priority to boost economic growth and resilience, create local jobs and consolidate the EU's global leadership.

The newly published EU hydrogen strategy opens a new era in the development of the low carbon economy expected to achieve climate neutrality and clean energy transition in Europe. The path towards a European hydrogen eco-system step by three step:

- a. From 2020 to 2024, the Commission's objective is to support the installation of at least 6 gigawatts of renewable hydrogen electrolyzers in the EU, in order to produce up to 1 million tons of renewable hydrogen.
- b. From 2025 to 2030, hydrogen needs to become an intrinsic part of Europe's integrated energy system, the Commission says, with at least 40 gigawatts of renewable hydrogen electrolyzers and the production of up to 10 million tons of renewable hydrogen in the EU.
- c. From 2030 to 2050, the aim is for renewable hydrogen technologies to reach maturity and be deployed at large scale across all hard-to-decarbonise sectors, such as chemicals and steelmaking.

### Conclusion from the European commission

Today, hydrogen represents a modest fraction of the global and EU energy mix and low-carbon hydrogen is not yet cost competitive compared to fossil-based hydrogen (natural gas and coal) resulting in the release of 70 to 100 million tonnes CO<sub>2</sub> annually in the EU. For hydrogen to contribute to climate neutrality it needs to achieve a far larger scale and its production must become fully decarbonised.

Renewable electricity is expected to decarbonise a large share of the EU energy consumption by 2050, but not all of it. Hydrogen has a strong potential to bridge some of this gap, as a vector for renewable energy storage, alongside batteries, and transport, ensuring back up for seasonal variations and connecting production locations to more distant demand centres. The share of hydrogen in Europe's energy mix is projected to grow from the current less than 2% to 13-14% by 2050.

Renewable hydrogen also offers a unique opportunity for research and innovation, maintaining and expanding Europe's technological leadership, and creating economic growth and jobs across the full value chain and across the Union.

In order to implement the ambition of the European Green Deal and building on the Commission's New Industrial Strategy for Europe and EU Recovery Plan, the Commission invites the Parliament, the Council, other EU institutions, social partners and all stakeholders to discuss how to leverage the potential of hydrogen to decarbonize European economy while making it more competitive, resilient and green.

### References – European commission

- A Clean Planet for all A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy", Brussels, 28.11.2018 COM(2018) 773 final.
- The European Green Deal, Brussels, 11.12.2019 COM(2019) 640 final.
- EU long-term budget 2021-2027: Commission Proposal May 2020".
- Horizon Europe - The next research and innovation framework programme.
- The pillars of Next Generation EU.
- What's next? The InvestEU Programme (2021-2027).
- Establishing the Just Transition Fund, Brussels, 14.1.2020 COM(2020) 22 final.
- Establishing a Recovery and Resilience Facility, Brussels, 28.5.2020 COM(2020) 408 final.
- European industrial strategy.
- Common agricultural policy funds.
- A EU Hydrogen Strategy, Roadmap, Ref. Ares(2020)2722353 - 26/05/2020.
- Europe's moment: Repair and Prepare for the Next Generation, Brussels, 27.5.2020 COM(2020) 456 final.
- A Hydrogen Strategy for a climate neutral Europe, factsheet 8 July 2020.
- A Hydrogen Strategy for a climate-neutral Europe, Brussels, 8.7.2020 COM(2020) 301 final.

### Other references

- **Fuel Cells and Hydrogen**, January 2019, "Hydrogen Roadmap Europe - A sustainable pathway for the european energy transition", [https://www.fch.europa.eu/sites/default/files/Hydrogen%20Roadmap%20Europe\\_Report.pdf](https://www.fch.europa.eu/sites/default/files/Hydrogen%20Roadmap%20Europe_Report.pdf)
- **IFPEN and SINTEF**, August 2019, "Hydrogen for Europe Final report of the pre-study", [https://www.sintef.no/globalassets/sintef-energi/hydrogen-for-europe/hydrogen-for-europe-pre-study-report-version-4\\_med-omslag-2019-08-23.pdf/](https://www.sintef.no/globalassets/sintef-energi/hydrogen-for-europe/hydrogen-for-europe-pre-study-report-version-4_med-omslag-2019-08-23.pdf/)
- **Hydrogen Europe**, May 2020, "Hydrogen in the EU's Economic Recovery Plans", [https://www.hydrogeneurope.eu/sites/default/files/Hydrogen%20Europe\\_EU%20Recovery%20Plan%20Analysis\\_FINAL.pdf](https://www.hydrogeneurope.eu/sites/default/files/Hydrogen%20Europe_EU%20Recovery%20Plan%20Analysis_FINAL.pdf)