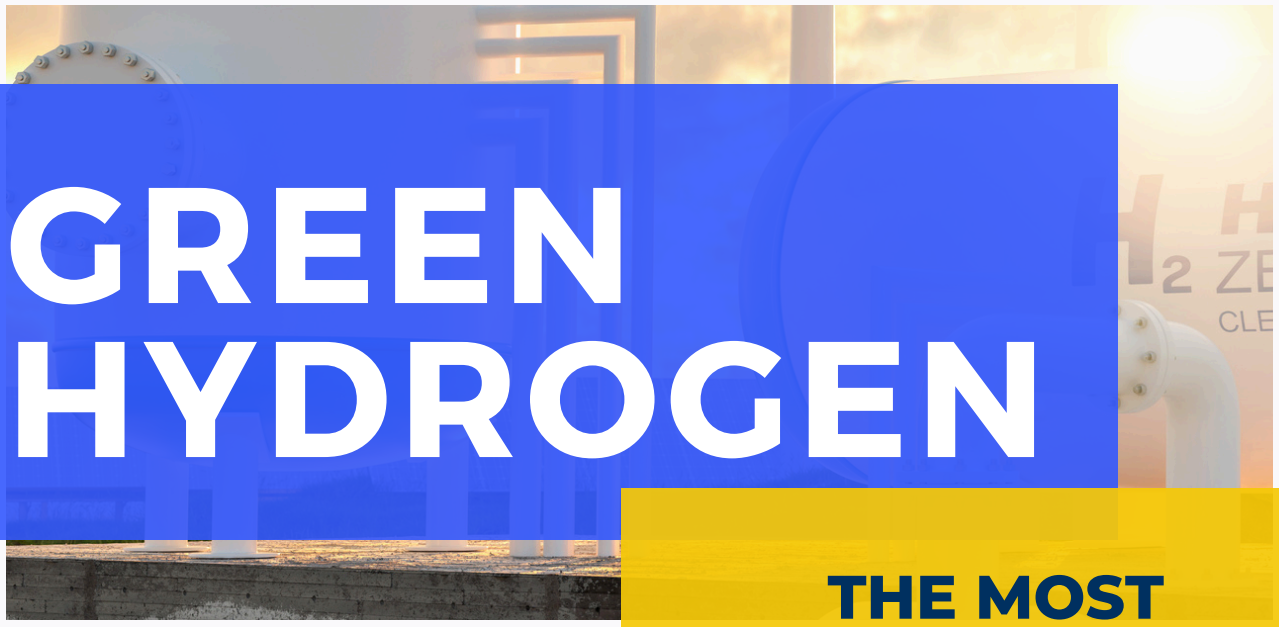

GREEN HYDROGEN

THE MOST ENVIRONMENTALLY FRIENDLY OPTION

Co-funded by the European Union

What is hydrogen and why is it important for the economy?

Hydrogen, a simple element with the chemical formula H2, plays an increasingly important and complex role in the global economy and in climate protection efforts. As a key resource of the future, hydrogen may revolutionize the sectors of energy, industry, and transport.

Hydrogen, produced through electrolysis using renewable energy, plays a significant role in the energy and climate transformation of European economies and is essential for achieving the goal of a zero-emission economy by 2050, in accordance with the European Green Deal.

The use of hydrogen as an energy carrier in the energy sector, as an alternative fuel in industry, as a substitute for natural gas, and as a raw material for the production of synthetic fuels, is a key element in promoting sustainable energy solutions.

Co-funded by the European Union

The role of hydrogen in achieving climate balance

In the context of the European Union's strategy, hydrogen is a key component of diverse activities, encompassing production, industry, market, and infrastructure. This strategy aims to develop technology and innovation to increase both the supply and demand for hydrogen. The European Commission emphasizes the importance of hydrogen in moving away from fossil fuels, particularly as an energy carrier for storage and transport, which is crucial given the increasing share of renewable energy.

The "colors" of hydrogen and their significance

Hydrogen production is not uniform and uses varies methods what results in different "colors" of hydrogen, from grey, through blue to green. Gray hydrogen, currently the most widespread, is primarily produced from natural gas reforming, which is associated with high CO2 emissions. Therefore, despite its dominance in production, it is increasingly seen as unsuitable in the context of decarbonization efforts and combating climate change. Blue hydrogen emerges as a compromise option between high CO2 emission hydrogen production and more ecological methods. It is produced similarly to gray hydrogen, but with the use of CCS technology (Carbon Capture and Storage), which allows for a significant reduction in CO2 emissions. Although the production of blue hydrogen still relies on fossil fuels itis more ecological approach. Green hydrogen, produced through the electrolysis of water using renewable energy, represents the most environmentally friendly form of hydrogen.

This production method is characterized by zero CO2 emissions and fully aligns with sustainable development principles. In the context of global decarbonization efforts, green hydrogen is increasingly desired and seen as a key element in a future energy economy. The "colors" of hydrogen not only symbolize different production methods but also reflect the impact of these methods on the environment and climate. The choice of hydrogen production method is crucial for the future of energy sector and achieving climate goals. While gray and blue hydrogen still play an important role in the economy, green hydrogen seems to be the best path for achieving a sustainable energy future.

Co-funded by the European Union

Low-emission hydrogen production technologies

The need for more environmentally friendly production of hydrogen leads to the emergence of innovative technologies such as electrolysis, steam reforming of biogas or biomass gasification.
For that reason the European Union plans to install electrolyzers with a total capacity of 6GW by 2026, producing one million tons of hydrogen from renewable energy sources. By 2030, electrolyzers with a total capacity of 40GW will support hydrogen energy production in European Union countries.

The role of hydrogen in the global economy

Green hydrogen is gaining importance in the global economy, not only as an energy resource but also through expanding its applications in the energy and transportation sectors, contributing to emission reduction and increased energy efficiency. The European Union places hydrogen at the center of its energy strategy, highlighting its fundamental importance for the global economy.

The article was prepared as part of the project "Professions and competences in the hydrogen sector", no. 2023-1-PL-01-KA220-VET-000159821.

Biblography:

- https://seshydrogen.com/9-kolorow-wodoru-poznaj-ich-znaczenie-zastosowanie-i-potencjal-wykorzystania/
- https://arp.pl/pl/jak-dzialamy/transformacja-energetyczna-/doliny-wodorowe/
- https://przemyslprzyszlosci.gov.pl/polskie-plany-wodorowe/
- https://www.cire.pl/artykuly/materialy-problemowe/179840-jak-napedzimy-gospodarke-wodorem-wszystko,-co-musisz-wiedziec-o-polskiej-strategii-wodorowej
- https://zielonagospodarka.pl/h2idea-tv-sd-polska-i-partnerzy-buduja-kompetencje-i-innowacje-w-gospodarce-wodorowej-12798
- https://www.fgreenlab.org/publikacje/strategie-rozwoju-gospodarki-wodorowej
- https://www.forum-ekonomiczne.pl/doliny-wodorowe-trampolina-do-ogolnoeuropejskiej-gospodarki-wodorowej/
- https://www.gov.pl/web/klimat/polska-strategia-wodorowa-do-roku-2030
- „Polska strategia wodorowa do roku 2030 z perspektywą do roku 2040", załącznik do uchwały nr 149 Rady Ministrów z dnia 2 listopada 2021 r. (poz. 1138), Warszawa, październik 2021 r.

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.