

# Prospects of Ukraine for the production, transportation and use of hydrogen

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## Priorities of Ukraine



“ *A long-term goal of Ukraine is to achieve a hydrogen neutrality. We will take efforts to achieve this goal as soon as possible.*

President of Ukraine Volodymyr Zelensky

International Climate Ambition Summit

December 12, 2020



“ *Opportunities are being created for a direct integration of Ukraine in the European Union through the formation of sectoral alliances. Dialogue at the highest political level resulted in the Ukraine's waiting for joining the Hydrogen Alliance in the near future.*

Deputy Prime Minister for the European and Euro-Atlantic Integration of Ukraine Olha Stefanishyna

Meeting of the interministerial group on the issues of coordination of climate change mitigation within the European Green Course initiative, January 19, 2021



“ *Renewable energy development is one of the 7 priorities of the Ukrainian diplomatic activity for 2021. We will take efforts to make Ukraine hold and strengthen the position in the area of renewable energy, in particular in a part of hydrogen energy*

Minister of Foreign Affairs of Ukraine Dmytro Kuleba

Concluding briefing, December 2020

# Perspectives for Ukraine

## Regulatory and legal provisions

### National Economic Strategy until 2030

On March 3, 2021, the Cabinet of Ministers of Ukraine approved [the National Economic Strategy until 2030](#) - fundamental document in which for the first time in the history of Ukraine the production and use of hydrogen as one of the means to achieve goals in the energy sector is enshrined at the state level.

### Energy Strategy of Ukraine until 2035

In accordance with the goals of [the Energy Strategy of Ukraine for the period until 2035](#) related to the capacity of wind farms and thermal power plants, the average annual production of "green" hydrogen may reach 5.5 billion nm<sup>3</sup>.





## Perspectives for Ukraine

### Hydrogen production potential

Ukraine has significant potential of **solar energy**, whereas Odessa, Kherson, Mykolaiv and Zaporizhzhia regions in terms of the presence and intensity of the sun can be compared with the central region of Italy. In the southern regions of Ukraine there is a system of water desalination, from which hydrogen will be obtained, and there are many lands that are not used for agriculture.



A capacity-development of **wind energy** of Ukraine ranks second place after the United Kingdom throughout the whole of Europe.

Ukraine is ready to undertake the implementation of any pilot project in terms of hydrogen energy development, taking into account 3 main components - the availability of water resources, the possibility of building renewable energy facilities and optimal logistics conditions (mode of transport and its availability).

Ukraine considers setting up industries on its territory that can produce the equipment and components needed for the hydrogen industry.

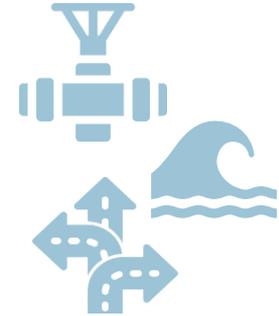
## Perspectives for Ukraine

### Hydrogen transportation potential

Developed gas transmission system

Potential of the Danube River (hydrogen transportation to at least 5 countries)

At least 20 road connections

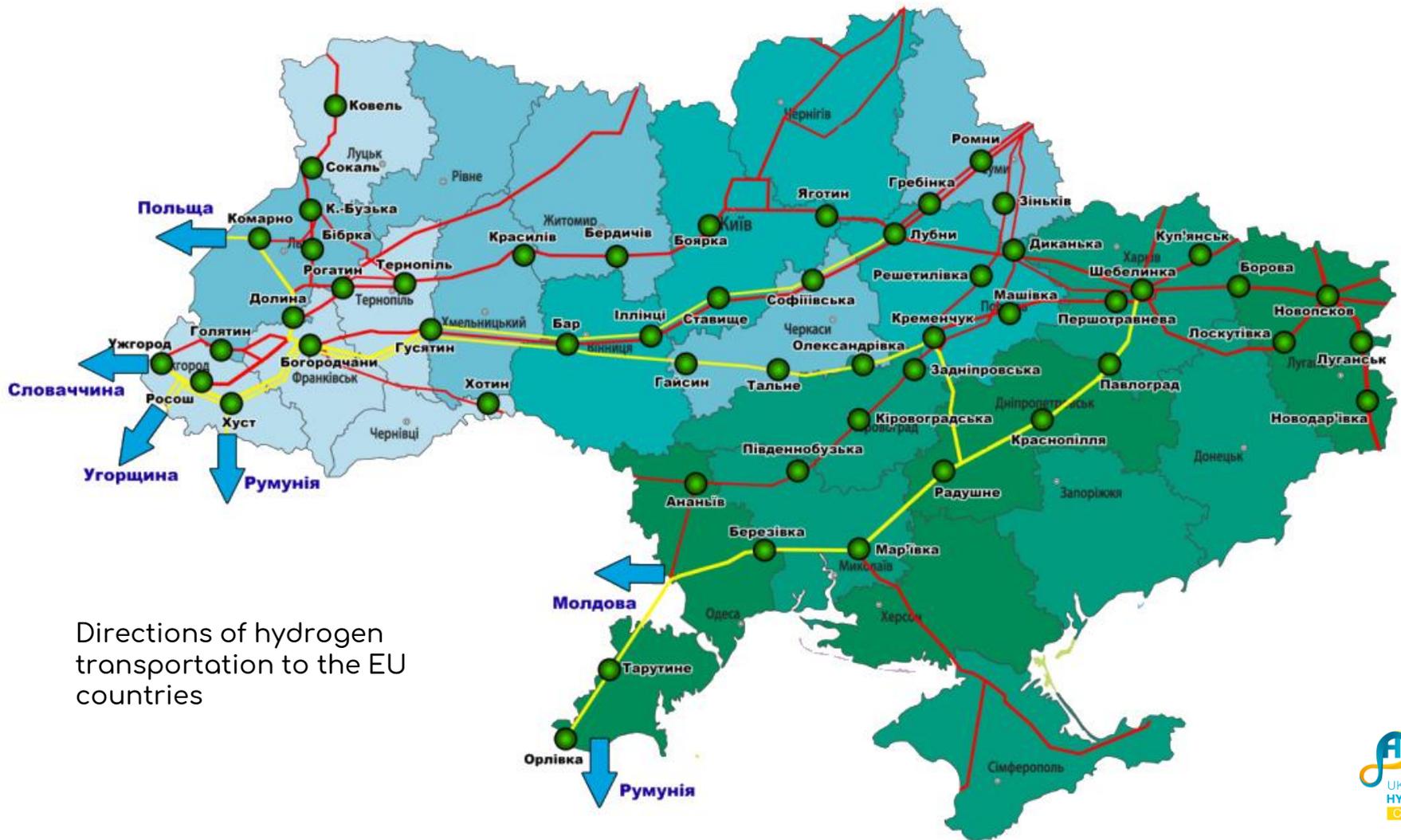


In this regard, there is active communication on hydrogen transportation with some EU countries and countries of the Danube region.

July 8, 2020 – adoption of the [European Hydrogen Strategy](#), where Ukraine has a status of a strategic partner in implementing a strategy and supplying a cutting-edge energy source to the European market.

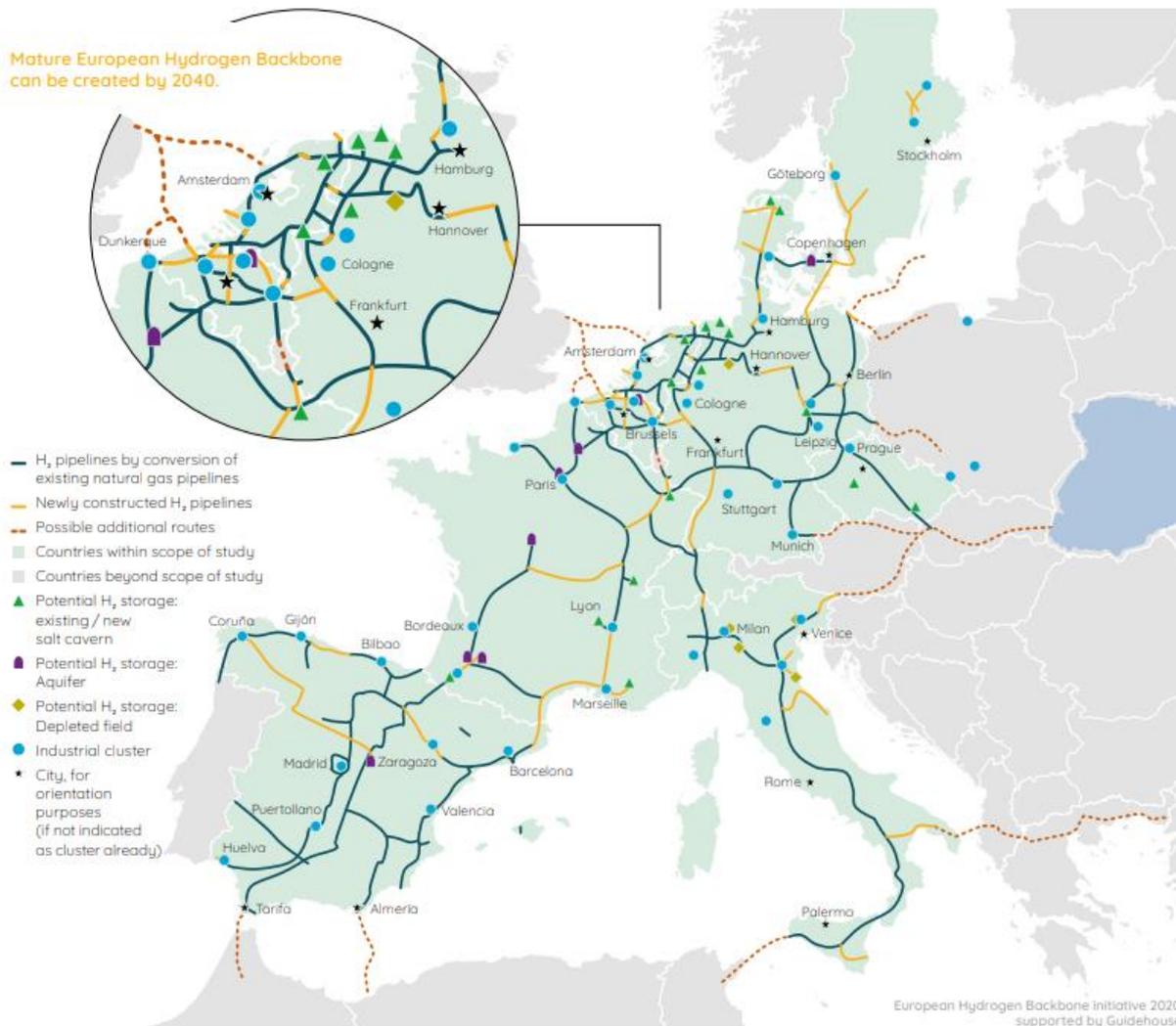


Ukraine, in cooperation with the World Bank, is launching a [study on the possibilities of usage of the gas transmission system](#) for hydrogen transportation and the preparation of [pilot projects](#) for the production and transportation of hydrogen.



Directions of hydrogen transportation to the EU countries

Mature European Hydrogen Backbone can be created by 2040.



2040

European Hydrogen Highway

A Pan-EU Hydrogen Backbone, stretching into all directions with a length of almost 23, 000 km.

# Energy Association Ukrainian Hydrogen Council

Founded on February 8, 2018

The first unique hydrogen energy association in Ukraine engaged in the development of green hydrogen energy as an integral part of production and supply of alternative energy sources, as well as the dissemination of hydrogen technologies in various sectors of industry and business with the purpose of improving energy efficiency.



## Key idea

Next industrial revolution: continued development of renewable energy and the most effective energy transmission

## Contacts



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## Energy Association Ukrainian Hydrogen Council

is the first association from a non-EU country to obtain associate membership in the industry energy agency within the European Commission — Hydrogen Europe.

Study and analysis of the body of legislation of the EU concerning hydrogen and the projects, on which the EU created the basis for hydrogen attack and revolution.



## Jointly held international conferences:

- 2018 First International New Energy Forum  
"Wind & Hydrogen"  
Kyiv, Ukraine
- 2018 EU-Ukraine Renewable Energy  
Investment Forum  
Kyiv, Ukraine
- 2019 Europe's Largest Industrial exhibition  
"Hydrogen + Fuel Cells"  
Hannover, Germany
- 2019 29-th Annual Economic Forum  
Krynica-Zdrój, Poland

## Main achievements



The UHC has completed the **Energy Potential Atlas** demonstrating the full Ukrainian green hydrogen production potential in all regions.

In April 2019, the UHC has presented the **road map of Ukraine's hydrogen energy** at Europe's largest industrial exhibition "Hydrogen + Fuel Cells" in Hanover. The document was supported by the European hydrogen associations and international experts.



The UHC has performed the **research of possible options development as well as route schemes delivery of natural gas and hydrogen mixture** to EU countries using the main Ukrainian gas pipeline system.

Ukraine is included in the strategic document **"2x40 GW Green Hydrogen for the European Green Deal"**, in accordance with which 10 GW of new facilities are going to be created in Ukraine for production of a sustainable energy carrier.



Development of the **demonstration platform to study the hydrogen production from alternative sources** created jointly with the Institute of Renewable Energy under the National Academy of Sciences of Ukraine.

# International Hydrogen Project Initiative „H2EU + Store“ (IPCEI+ Project)



bayerngas

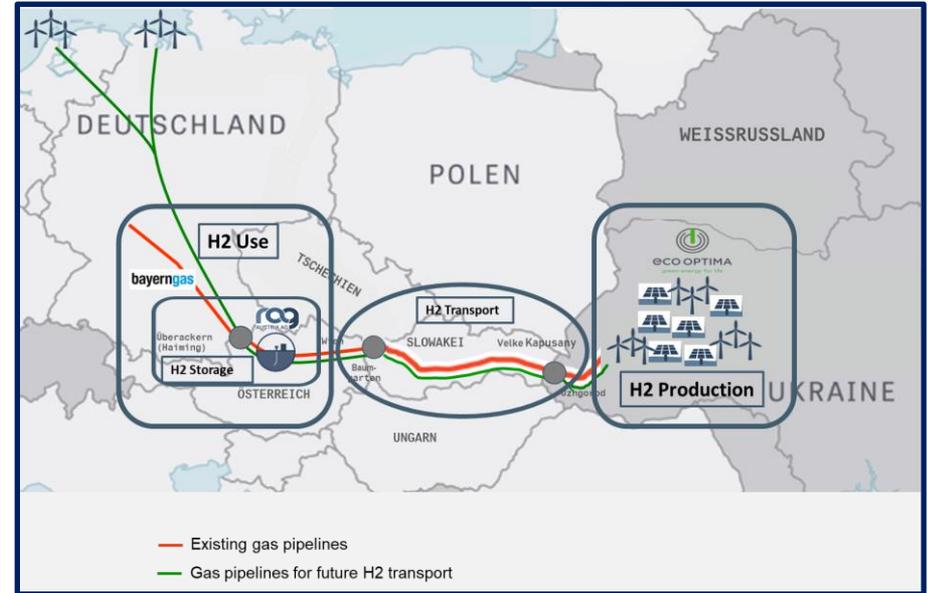


The “H2EU+Store” Initiative focuses on the complete supply chain of clean hydrogen:

- Hydrogen production in Western Ukraine
- Hydrogen transport to Austria/Bavaria
- Hydrogen storage in Austria/Bavaria and
- Hydrogen Customer Market in Austria/Germany

## Next Steps:

- 02/21 – 08/21: Feasibility study of the „H2EU+Store“ Initiative, in particular with regard to the hydrogen production potential in Western Ukraine
- Until 06/21: Final validation of applicable European and national subsidies
- 09/21: Decision on the incorporation of a special purpose company („H2EU GmbH“) to develop and implement the „H2EU+Store“ Initiative



Stage 1  
2021 – 2030

Stage 2  
2030 – 2040

Stage 3  
2040 – 2050



## Project of construction of a network of self-service charging stations and hydrogen filling stations or with a coffee shop



The project stipulates the construction of charging stations for electric vehicles (EV) and a pilot hydrogen filling station for fuel cell vehicles (FCV). The idea is in the creation of a network of filling stations, situated along inter-city routes and in big cities.

In total 23 filling stations are planned to be constructed.

The project stipulates the construction of solar power plants in inter-city areas for generating green electricity for charging vehicles.

# H2U Hydrogen Valley

## Investment project of 3000 Mwt electrolyzer plant construction with 5000 MWT renewable energy source in Bessarabia, Odessa region

The project goal is to create an energy cluster in the region focused on the production of electricity from renewable energy sources, the production of green hydrogen, and its export to the countries of the European Union.

The choice of the project implementation in the Southern Bessarabia is conditioned by the following factors:

- high potential for solar and wind activity
- available fresh water resources
- competitive logistics routes to the consumer
- developed infrastructure



Black Horse



Blue Danube

White dragon

The project implementation in South Bessarabia was stipulated by:

The potential to be connected to 3 IPCEI — Blue Danube, Black Horse and White dragon