



# POWERING THE FUTURE: UKRAINE'S HYDROGEN INITIATIVES

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2023

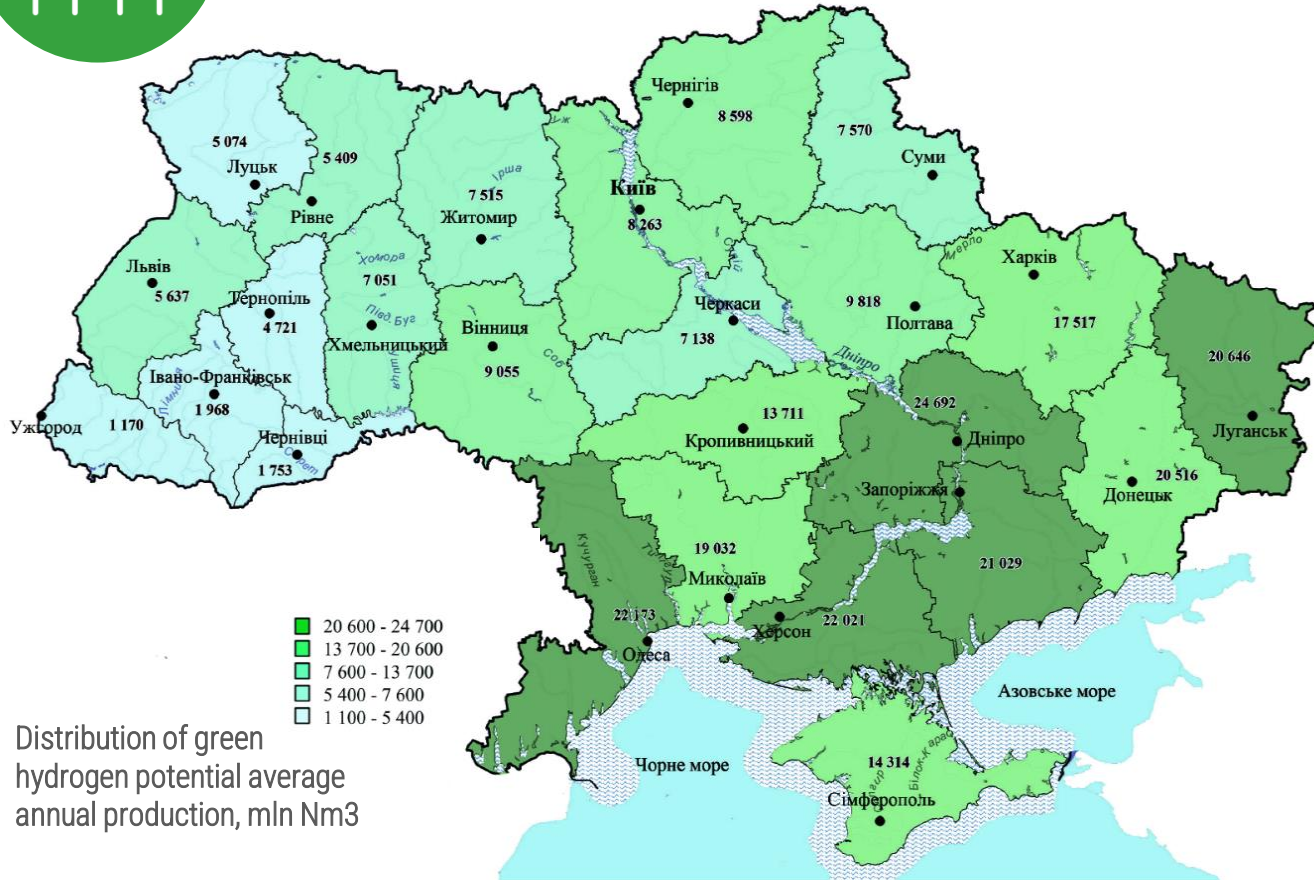




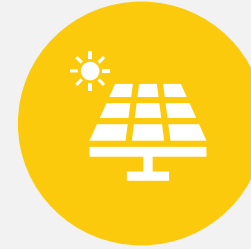
# RENEWABLE ENERGY POTENTIAL OF UKRAINE



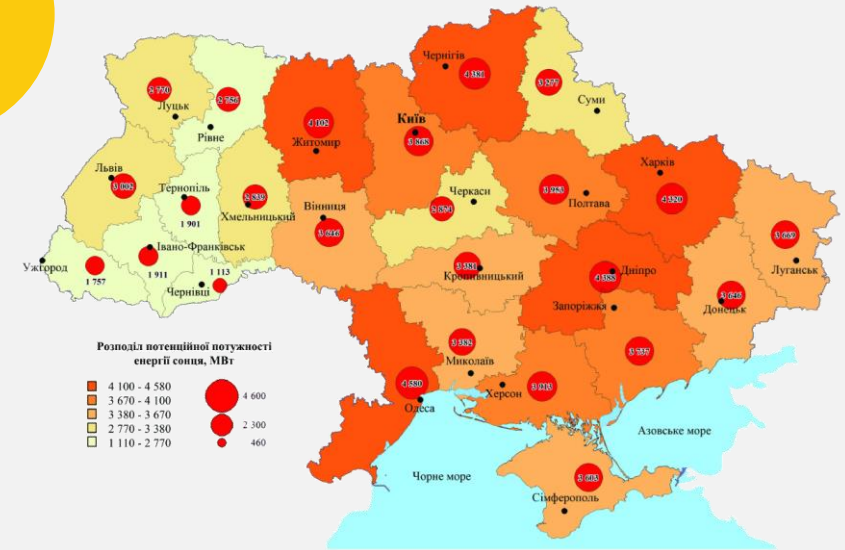
The total potential of average annual production of green hydrogen – 505 132 mln Nm<sup>3</sup> (44 957 thousand tons)



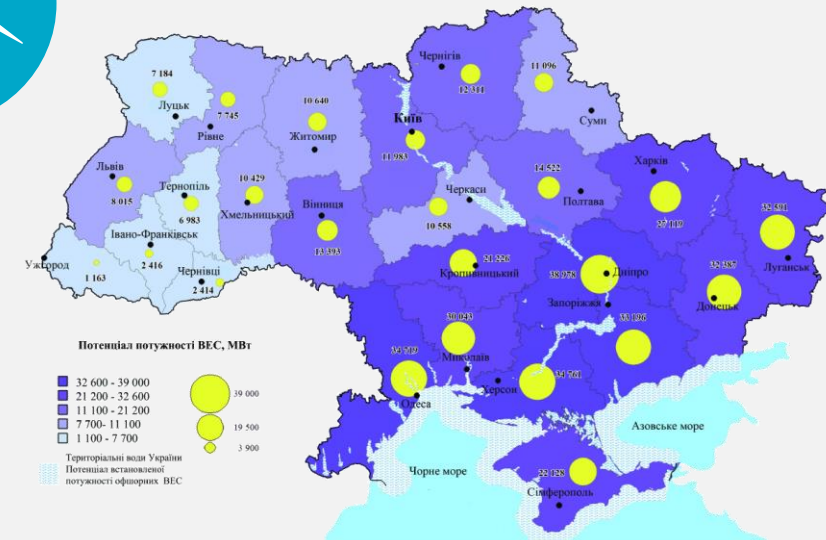
Distribution of green hydrogen potential average annual production, mln Nm<sup>3</sup>



The total potential of solar power plants – 83,000 MW



The total potential of wind power plants – 688 000 MW



# EU AND UKRAINE

## EU Green Deal



Ukraine is already making a contribution to the joint efforts to create a climate-neutral Europe in accordance with the Paris Agreement, the UN Sustainable Development Goals for 2030, and the Association Agreement between Ukraine and the EU.

## EU Hydrogen Strategy



The hydrogen strategy for a climate-neutral Europe, adopted on July 8th, 2020, designates Ukraine as a priority partner.

## Green Hydrogen for a European Green Deal. A 2x40 GW Initiative



Creation of 10 GW of new capacity to produce green hydrogen

## REPOWERUA



The Green Transformation and Decarbonization Plan of the national economy RePowerUA will be based on the experience of implementing the RePowerEU plan adopted by the European Commission.



# PLAN FOR THE RECOVERY OF UKRAINE

## PLAN OF TIMMERMANS

A proposed 10-point plan has been devised to guide the rebuilding of Ukraine with a focus on its renewables and nuclear potential, as well as its ability to become a major actor in the hydrogen space. A recovery plan can create the most modern and sustainable energy system in Europe.

- Renewable energy sources are of strategic importance
- Joining the EU Electrolysis Partnership
- Initiative of the Central European H2 Corridor
- Biomethane for direct use or for hydrogen production



9-10.01.2023



## MEMORANDUM OF UNDERSTANDING BETWEEN THE EU AND UKRAINE ON A STRATEGIC PARTNERSHIP ON BIOMETHANE, HYDROGEN AND OTHER SYNTHETIC GASES



According to the European Green Deal, during 2025-2030, hydrogen energy should become the main component of the EU's integrated energy system, and the capacity of electrolysis plants will increase.



For European countries, Ukraine is considered as a transit country for green hydrogen in the "Green Hydrogen for the European Green Deal 2x40 GW" strategy. By 2030, it is necessary to provide 80 GW of hydrogen production capacity using electrolysis technology, while 10 GW of green hydrogen production capacity will be created in Ukraine.



02.02.2023

**EC President Ursula von der Leyen said - "This will give Ukraine not only ecologically clean energy, but also improve energy security due to the decentralization of the energy system."**



# EUROPEAN HYDROGEN BACKBONE

## Corridor: East and South-East Europe

would connect high supply potential regions such as Romania, Greece, and Ukraine - leveraging vast land availability and highcapacity factors for solar and wind, as well as would deliver hydrogen to off-takers in Central Europe and Germany.

## TRANSPORTATION POTENTIAL OF UKRAINE

- Developed gas transmission system
- Potential of the Danube River (hydrogen transportation to at least 5 countries)
- At least 20 road connections

### 2040

#### Pipelines

- Repurposed
- New
- - Import / Export
- - Subsea

#### Demand per sector

- 40 / 30 / 20 / 10 / 1 TWh
- Efuels production
- Industrial energy
- Industrial feedstock
- Power

#### Supply in MWh/km<sup>2</sup>

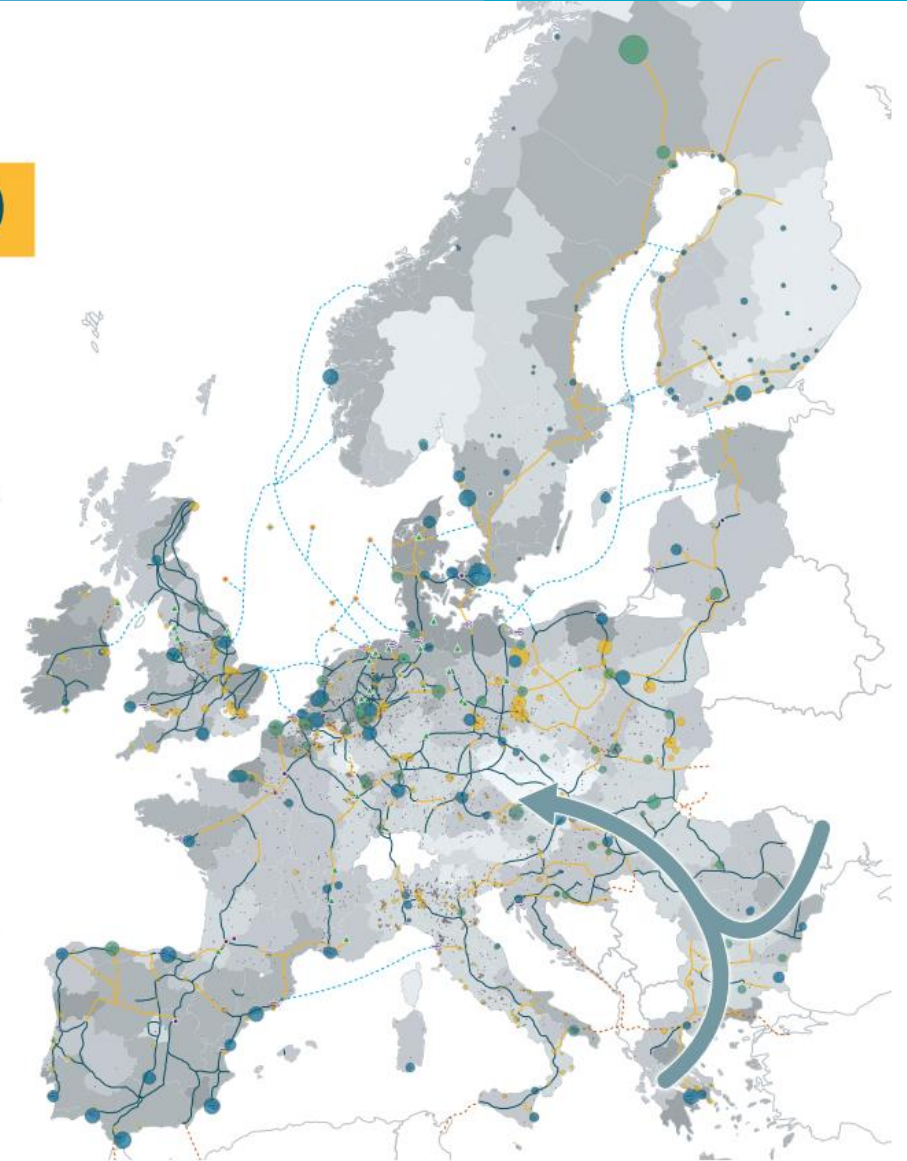
- < 1
- 1 - 25
- 25 - 100
- 100 - 250
- 250 - 500
- > 500

#### Storages

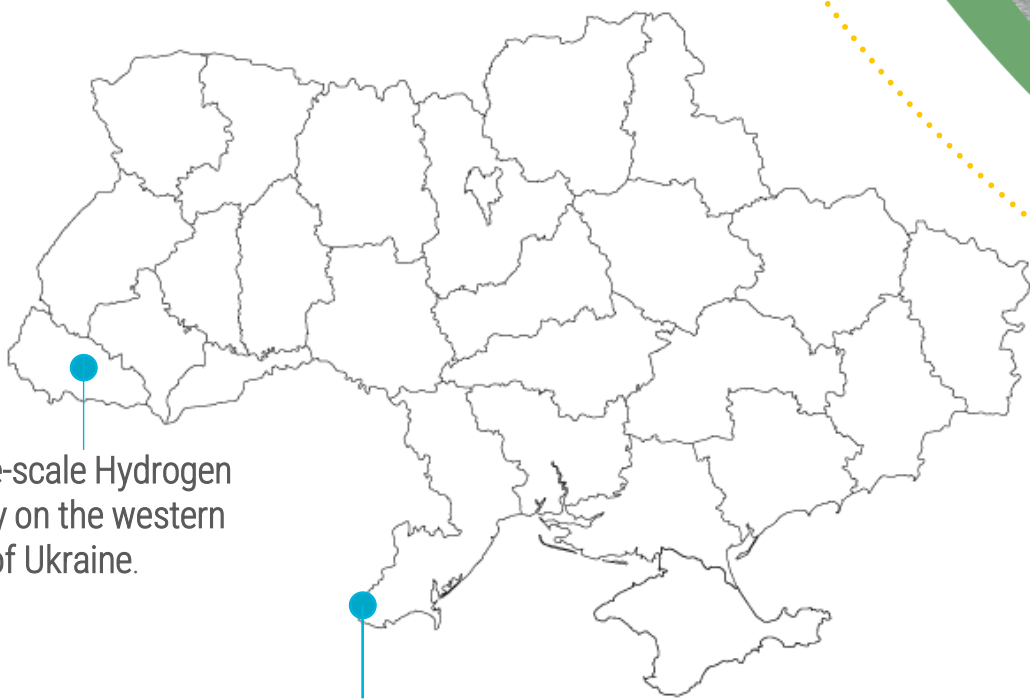
- ▲ Salt cavern
- ▲ Aquifer
- ▲ Depleted field
- Rock cavern

#### Other items

- ⊕ Existing or planned gas-import-terminal
- Energy island for H<sub>2</sub> production



# HYDROGEN VALLEYS



Large-scale Hydrogen Valley on the western part of Ukraine.

Large-scale Hydrogen Valley in Odesa region



Next Generation EU to create new European Hydrogen Valleys  
Aim to have 50 H<sub>2</sub> valleys by 2025 under construction in Europe -  
two Hydrogen valleys are located on the territory of Ukraine.

# RENEWABLE HYDROGEN PROJECT IN ODESA REGION



Electrolyser capacity: 100MW

Solar: 120MW

Wind: 80MW

Period of construction: 24 months

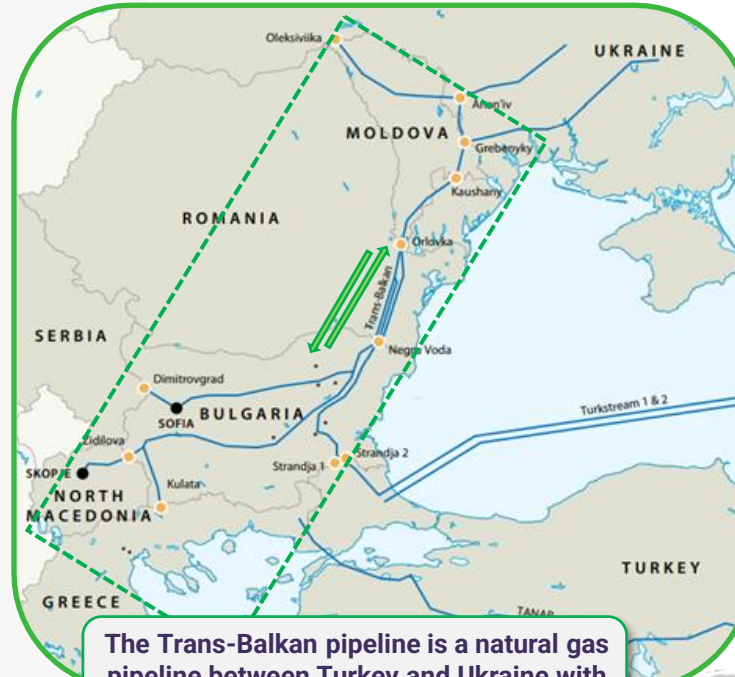
**Lead developer** Hydrogen Ukraine LLC

**Location** Reni, Odesa region, Ukraine

**Description** Constructing a renewable hydrogen plant aiming for an initial electrolysis capacity of 100 MW, dedicated to producing renewable electricity and green hydrogen for domestic needs and export to EU countries

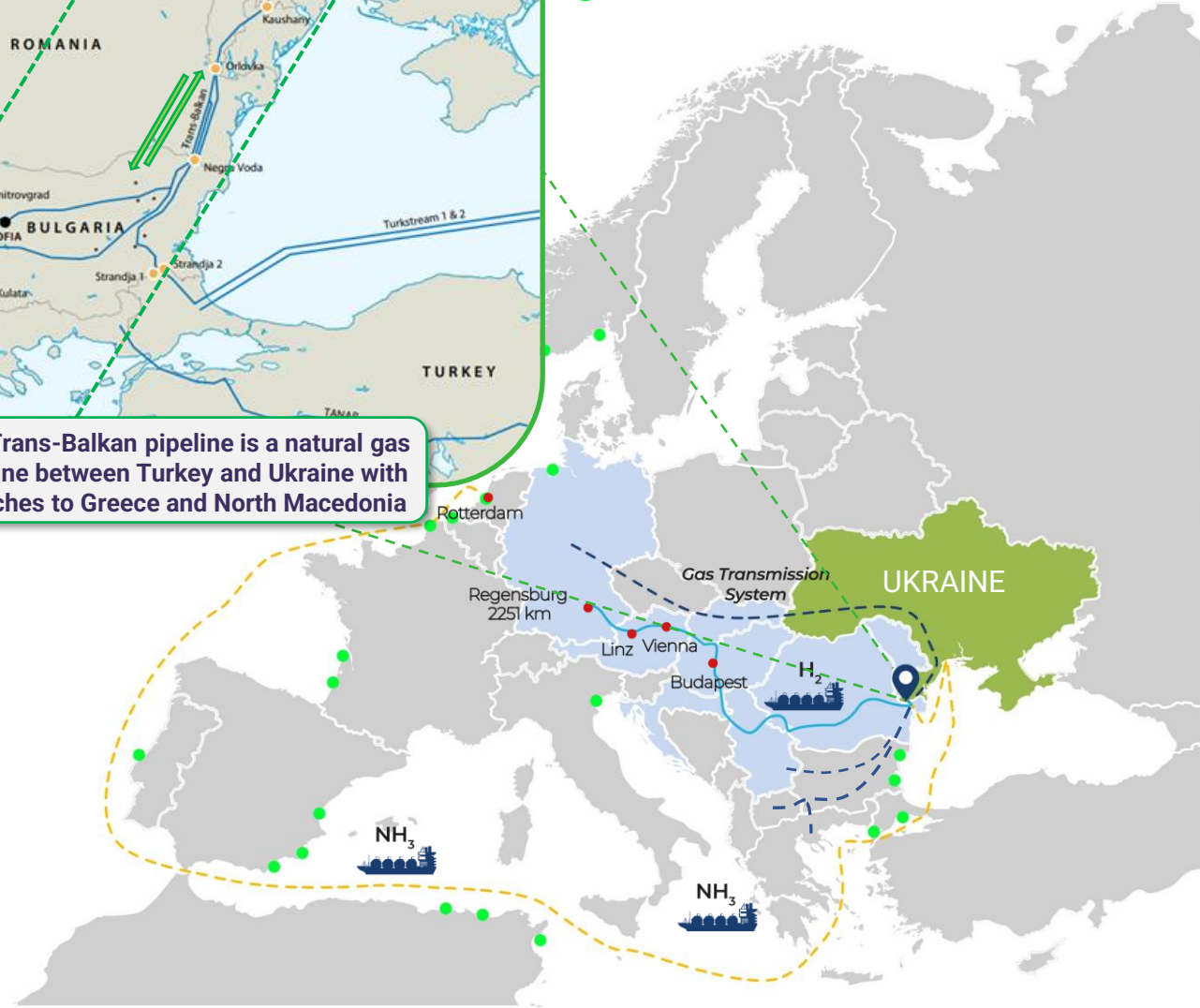
**Advantages** Abundant water resources, optimal PV and wind power configuration  
H2 production is strategically located near the EU border

**Scalability** 100 MW of electrolysis by 2025  
200 MW electrolysis by 2027,  
3,000 MW electrolysis by 2035



The Trans-Balkan pipeline is a natural gas pipeline between Turkey and Ukraine with branches to Greece and North Macedonia

● - Ammonia terminals



[The first Ukrainian project on the Global Hydrogen Valley Platform](#)

Certified by the Mission Innovation and Clean Hydrogen Partnership on May 8, 2023



# CENTRAL EUROPEAN HYDROGEN CORRIDOR

**14 Nov. 2022:**

The 4 gas transmission operators present their study results on the feasibility to transport hydrogen from Ukraine to Germany.

Countries:	UA, SK, CZ, DE
Capacity:	120 GWh per day, 1.3 million tonnes per year
Length:	1225 kilometers
Investment:	1000 – 1500 million EUR*
Transport cost:	0,10 – 0,15 EUR/kg/1000
Implementation:	2030



# RENEWABLE POWER-TO-HYDROGEN PRODUCTION

## 1st STAGE

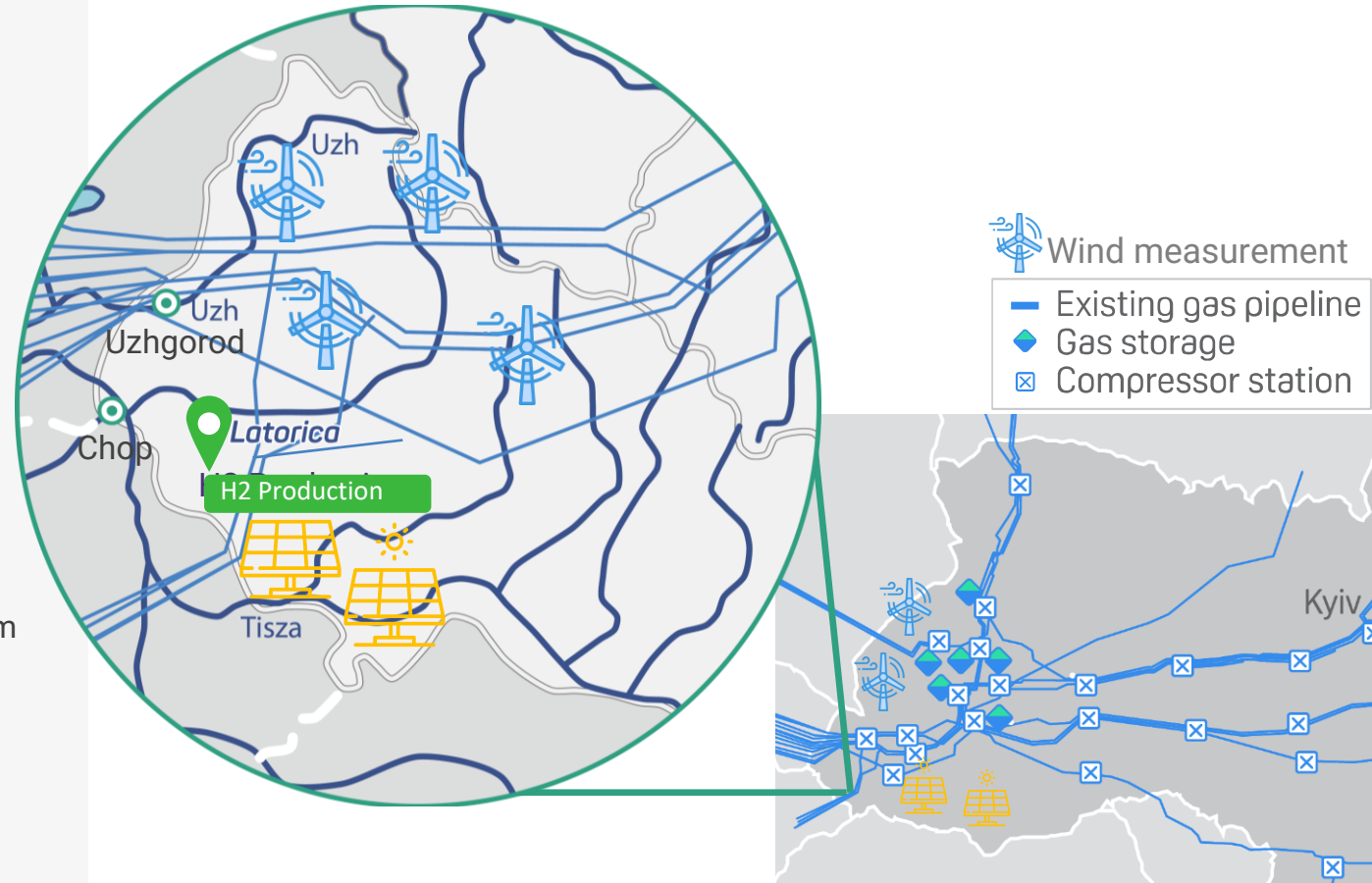
Electrolyser capacity: 100MW

Solar: 120MW

Wind: 80MW

Period of construction: 24 months

<b>Lead developer</b>	Hydrogen Ukraine LLC
<b>Location</b>	Zakarpattia, Ukraine
<b>Description</b>	Constructing a renewable hydrogen plant aiming for an initial electrolysis capacity of 100 MW, dedicated to producing renewable electricity and green H2 in Kosice, Slovakia.
<b>Land plot for production</b>	The land plot is registered (the total land area is 125 hectares).
<b>Existing energy infrastructure:</b>	<ul style="list-style-type: none"><li>• The gas pipeline of the Gas Transmission System Operator of Ukraine;</li><li>• High-voltage transmission line.</li></ul>
<b>H2 transportation</b>	by pipeline to Steel plant in Kosice, Slovakia.
<b>Advantages</b>	With abundant water resources, optimal PV, and wind power configuration H2 production is strategically located near the EU border
<b>Wind measurement</b>	Wind measurement in the North mountains of Zakarpattia has been started.





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**THANK YOU FOR  
ATTENTION!**  
**THE POWER OF FREEDOM**



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