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concept

Potential for using underground gas storage to store biomethane and CO_2

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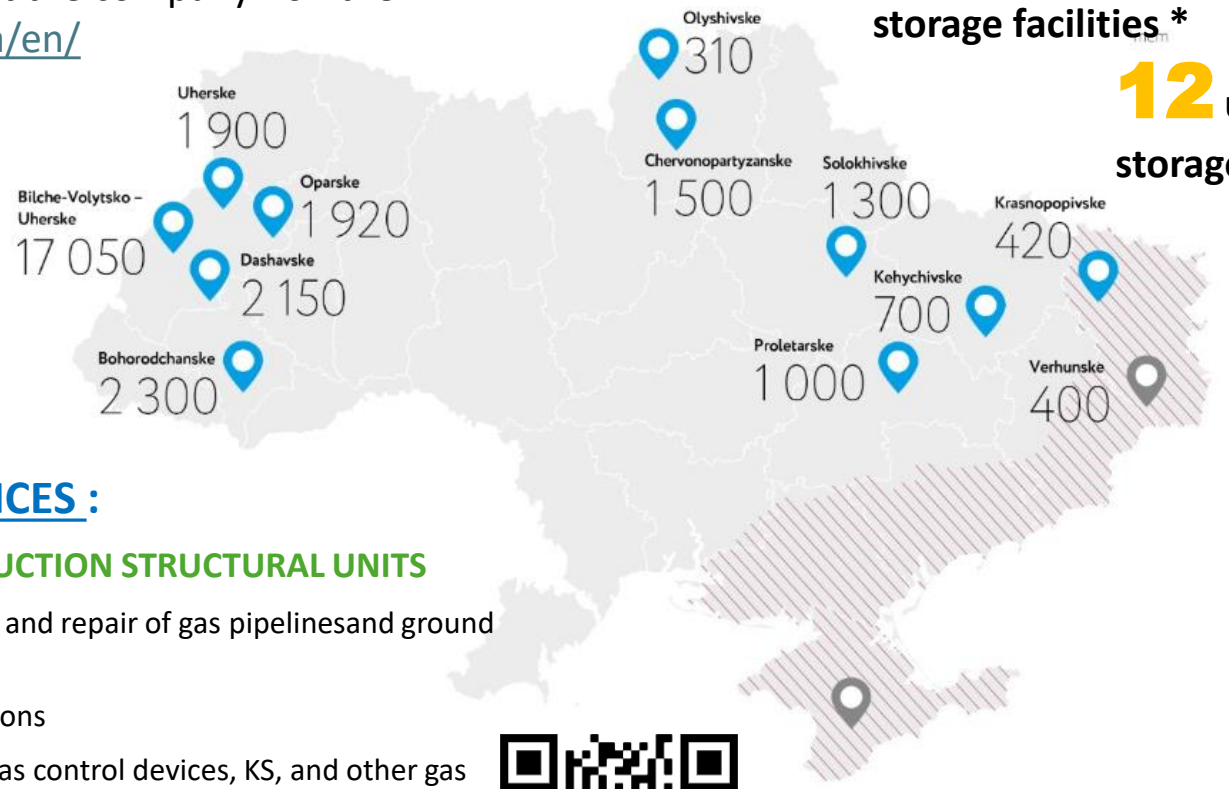
JSC "UKRTRANSGAZ" MAIN ACTIVITIES

JSC "Ukrtransgaz" - the operator of gas storage facilities in Ukraine, manages the Ukrainian underground gas storage system.

More information about the company - on the website : https://utg.ua/en/

In particular, the company provides gas storage for the needs of gas supply to frontline settlements in Dnipropetrovsk and Kharkiv regions.



GAS STORAGE :

30.95 *billion m³*

total capacity of underground storage facilities *

12 **underground storage facilities**

Ukraine is the **TOP-1** country in Europe and **TOP-3** in the world in terms of installed gas storage capacity

~29% **of the total capacity of EU underground storage facilities**

1 place — by volume of underground storage in Europe

28,3 billion cubic meters — the level of filling of underground storage facilities at the end of the pumping season 2020 is the highest in the last 10 years

10,0 billion cubic meters — historical maximum of gas reserves created by foreign companies in 2020

PROVISION OF SERVICES :

4 BRANCHES AND 2 PRODUCTION STRUCTURAL UNITS

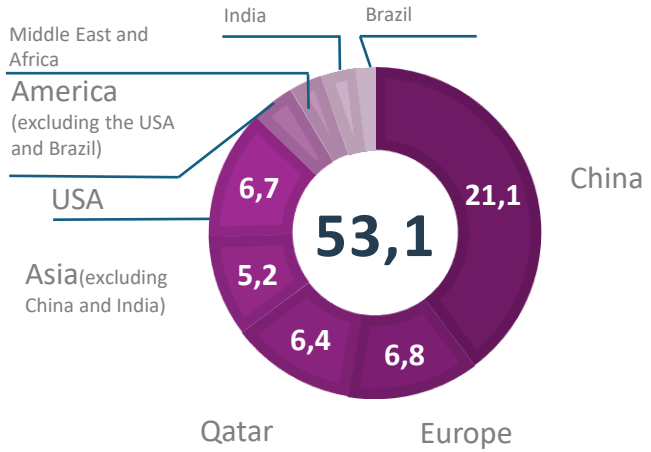
- Construction, reconstruction and repair of gas pipelinesand ground equipment
- Conducting expert examinations
- Repair and maintenance of gas control devices, KS, and other gas equipment
- Gas metering automation

* **Underground gas storage (UGS)** is an artificial gas deposit created in water-saturated strata or produced gas fields for the purpose of storing gas and regulating uneven gas consumption in the summer and winter periods of the year.

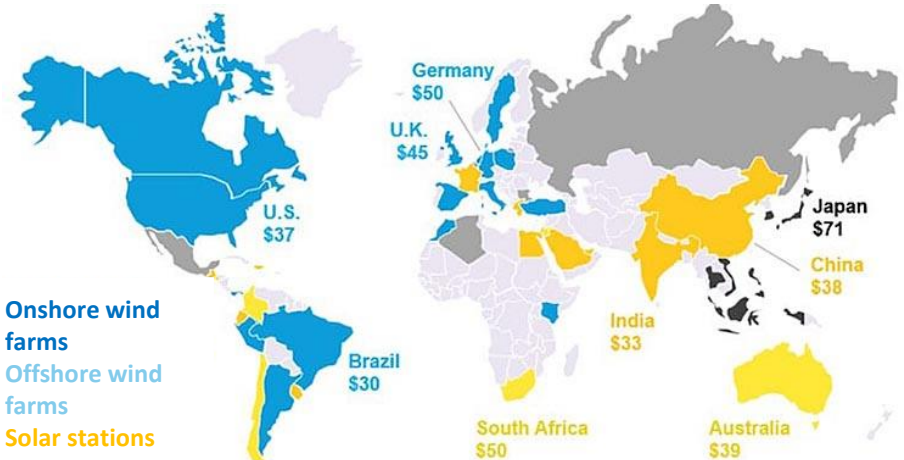
INVESTMENTS IN THE "GREEN" GENERATION

WORLD LEADERS IN THE OIL AND GAS MARKET

Green generation capacity built by oil and gas companies in 2024, *GW*



Investments of oil and gas companies in "green" generation, 2020-24, *billion USD*



Construction of "green" generation capacities in 2024 by oil and gas companies

4 216 MBт	ENGIE Group
3 896 MBт	Nebras Power Q.S.C.
1 418 MBт	Royal Dutch Shell Plc
806 MBт	Chevron
610 MBт	British Petroleum Plc
486 MBт	Repsol SA
210 MBт	Total

DECARBONIZATION STRATEGY

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GOAL:

Facilitate UA energy transition by **reducing a carbon footprint** of production activities and providing access to **storage of modern energy sources** in a technologically **sound, economically attractive and environmentally** acceptable way

Strategic goals:

1

Production activities: Decarbonization

Replacing fossil fuels with alternative energy sources

Improving production energy efficiency

Achievement indicator:

- Reducing greenhouse gas emissions
- Lower costs for electricity, production losses gas & other fuels
- Saving of fuel & energy resources
- Additional profit (sale of electricity to the grid)
- Strengthening the Company image

2

New low-carbon activities: Development

Storage of alternative fuels, CO2 sequestration

Providing services to producers of alternative fuels

Achievement indicator:

- Increasing profitability of activities
- Optimizing production activities
- Optimizing a service portfolio
- Strengthening the Company image
- Reducing greenhouse gas emissions

BIOMETHANE GENERATION POTENTIAL

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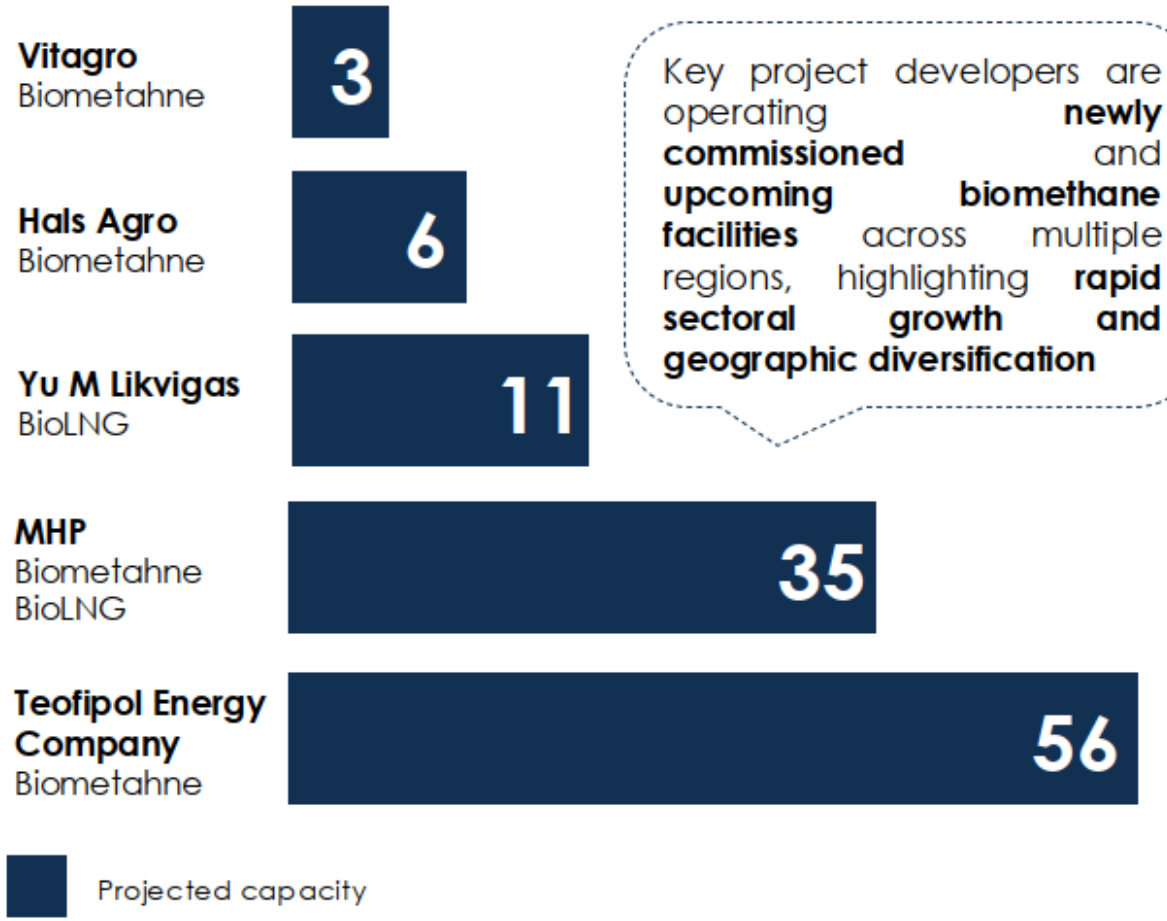
Biomethane plants in operation or ready to be launched and what will be produced



Key project developers are operating **newly commissioned** and **upcoming biomethane facilities** across multiple regions, highlighting **rapid sectoral growth and geographic diversification**

Key takeaways on current Ukraine's biomethane market

1. Ukraine's **biomethane sector** is in its **infancy**, with first operational projects producing **up to 50 million m³/year** of biomethane
2. Ukraine aims to commission at least **5** additional biomethane **plants** in 2025, raising annual capacity to **over 100 million m³**
3. In 2024, Ukraine produced its **inaugural million m³** of biomethane, marking a **key proof-of-concept** for the sector
4. By 2050, Ukraine could supply **up to 20 billion m³/year** of biomethane—approximately **20%** of current **EU biomethane demand**
5. The EU's **REPowerEU** plan to reduce **dependence** on **Russian gas** significantly boosts demand for Ukrainian biomethane and creates **export incentives**

Sources: European Biogas Association, Forbes, UABIO, DataDriven Analaysis

BIOMETHANE GENERATION POTENTIAL

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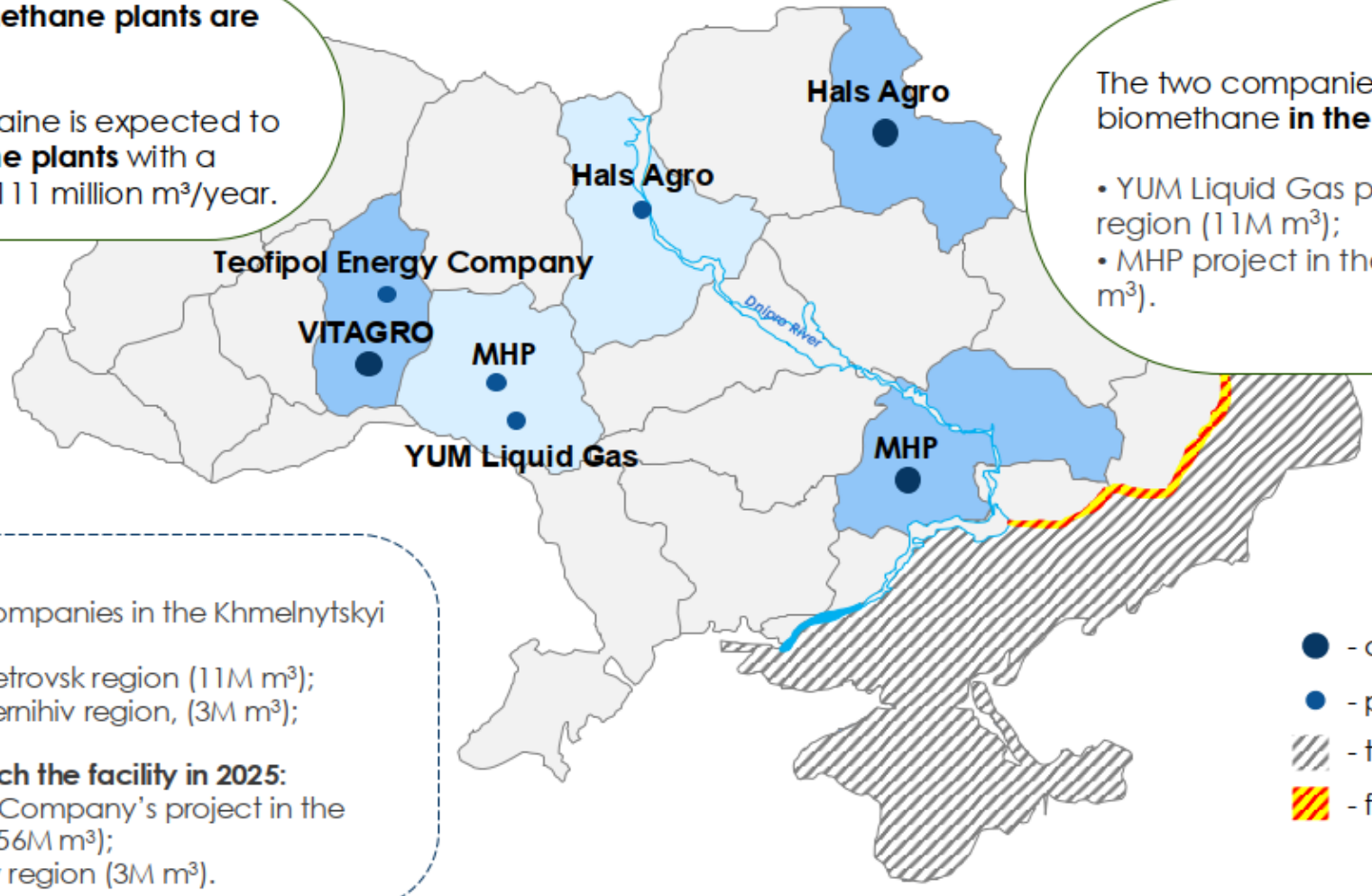
As of May 2025, **3 biomethane plants are operational** in Ukraine.

By the end of 2025, Ukraine is expected to have **seven biomethane plants** with a total capacity of over 111 million m³/year.



The two companies aim to produce biomethane **in the form of Bio-LNG**:

- YUM Liquid Gas project in the Vinnytsia region (11M m³);
- MHP project in the Vinnytsia region (24M m³).

Working facilities:
- Vitagro Group of Companies in the Khmelnytskyi region (3M m³);
- MHP in the Dnipropetrovsk region (11M m³);
- Hals Agro in the Chernihiv region, (3M m³);

It is expected to launch the facility in 2025:
- The Teofipol Energy Company's project in the Khmelnytskyi region (56M m³);
- Hals Agro in the Kyiv region (3M m³).

Sources: Ukraine Business News; DataDriven analysis

BIOMETHANE GENERATION POTENTIAL

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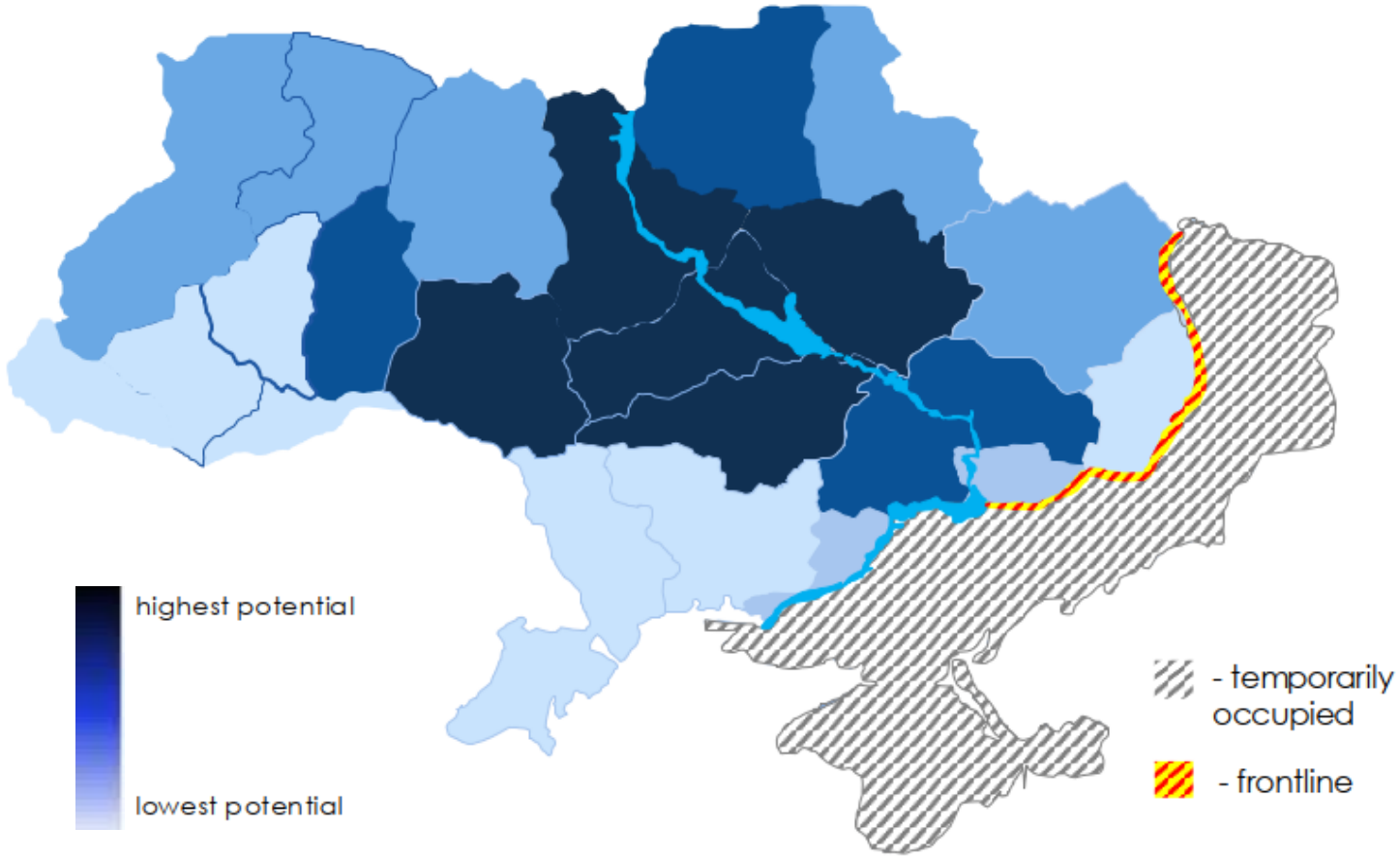
Feedstock production potential depending on the region



Vinnytsia, Poltava, and Kirovohrad regions have the highest availability of **agricultural residues** due to large-scale grain and sunflower production.

Regions such as **Lviv, Volyn, Zhytomyr, and Chernihiv** have dense livestock populations. This provides a steady supply of **animal manure** feedstock, especially for small-scale biogas units.

Kyiv, Kharkiv, Odesa, and Dnipro are top producers of **food and municipal waste**, ideal for centralized waste-to-gas projects.

Vinnytsia, Mykolaiv, and Zaporizhzhia host major food and beverage industries.
High-yield organic **industrial waste** from these regions is underutilized and ripe for circular economy models.

EVALUATION OF DEPLETED FIELDS
UGV for unconventional gas storage

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Potential fluids	Name of the deposit	Geological characteristics				Gas reserves,million cubic meters	
		Porosity	Permeability, μm2	Rock composition			
		Calculated / operational	Estimated /operational	Roof/underlying layer	Collector	Initial	Current
	1	5	6	7	8	10	11
Additional assessment required	Svydnytske (Svydnytska district)	0.094-0.154/ 0.125-0.155	$0.01 \cdot 10^{-3}$ - $0.3 \cdot 10^{-3}$	Mudstone/mudstone	Sandstone/siltstone	9148	1360
CO_2	Rudkivske	0.112-0.212 для НД-горизонтів; 0.084-0.195 для N_1k-J_3	$0.1 \cdot 10^{-3}$ 0.5·10-3 - 0.8·10-3	Gypsum-anhydrite/limestone-marl	Sandstone-siltstone/limestone	31398	513
CO_2	Malygorozhanske	0.113-0.279	321*10-6 - 323*10-3	Argilite/limestone-marl	Sandstone/siltstone	1073	2
Additional assessment required	Dubanevytske	0.133-0.219	0.23*10-3 - 1.79*10-3	Mudstone/mudstone	Sandstone/siltstone	1477	1280
H_2	Zaluzhanske	0.144-0.169	0.028*10-3 - 0.92*10-3	Mudstone/mudstone	Sandstone/siltstone	9598	4903
H_2	Pynyanske	0.07-0.185	0.16*10-3 - 1.05*10-3	Mudstone/mudstone	Sandstone/siltstone	10077	1172
H_2	Bytkiv-Babchynske	0.091-0.1	0.1*10-3 - 47.6*10-3	Mudstone/mudstone	Sandstone/siltstone	46749	3468
Additional assessment required	Kosivske	0.18-0.198	0.02*10-3 - 1.235*10-3	Mudstone/mudstone	Sandstone/siltstone	591	90
Additional assessment required	Kadobnyanske	0.094 - 0.37	0.15*10-3 - 0.93*10-3	Mudstone/mudstone	Sandstone/siltstone	1504,2	491

PARTICIPATION IN THE PROJECT H2EU+Store

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ІНІЦІАТОРИ

AUSTRIA AG

eco OPTIMA

УЧАСНИКИ ПРОЕКТУ

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ПРИХИЛЬНИКИ

UA TRANSMISSION SYSTEM OPERATOR

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PARTICIPATION IN THE PROJECT H2EU+Store

H2EU+Store is an international industrial partnership founded by RAG Austria AG to accelerate the growth of the green hydrogen market in Central Europe.

The initiative is structured as an integrated project that addresses the entire value chain (from production, transport and storage, including the consumer market) of the future hydrogen market.

Since renewable energy sources in the European Union are not sufficient to transform existing energy systems into climate-neutral ones, EU member states will have to import large volumes of hydrogen.

The international industrial partnership H2EU+Store consists of RAG Austria AG, Eco-Optima LLC, Bayerngas GmbH, bayernets GmbH, Open Grid Europe GmbH, Gas Connect Austria GmbH, Nafta, as and eustream, as.

The initiative is to be continuously expanded along the entire value chain in order to combine strengths and know-how for the desired hydrogen expansion.

In addition, the industry partnership concluded a Memorandum of Understanding with Ukrainian storage and transportation operators JSC Ukrtransgaz and the Gas Transmission System Operator of Ukraine.

PROJECT SCHEDULE

- Stage 1 - (2021 - 2030): 60 000 t/year H_2
- Stage 2 - (2031 - 2040): 500 000 t/year H_2 to 2040.
- Stage 3 - (2041 - 2050: 1 млн t/year H_2 to 2050.

Thank you for your attention and support!

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