

concept

**Potential for using
underground gas storage
to store biomethane and
CO₂**



Dr. Stanislav Ignatiev (Станіслав Ігнат'єв)

PhD, Prof. Dr.-Ing. habil



Head of the Department of Scientific and Technical Supervision of the Operation and Development of UGS of the Branch "R&D Institute of Gas Transportation" of JSC "Ukrtransgaz"

Professor of the National University "Yuriy Kondratyuk Poltava Polytechnic"

Honorary Professor of the European Institute of Secondary Education

Chairman of the Board of the Ukrainian Renewable Energy Association

ihnatiev-se@utg.ua
+38 (066) 131 15 04



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 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 pipelines and ground equipment
- Conducting expert examinations
- Repair and maintenance of gas control devices, KS, and other gas equipment
- Gas metering automation

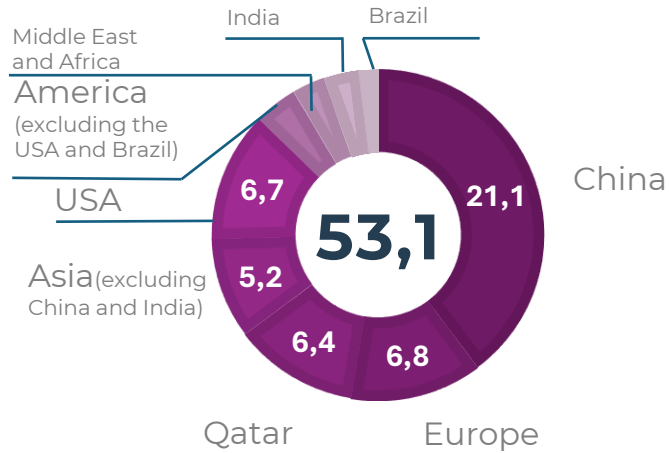


* **Underground gas storage (UGS)** is an artificial gas deposit created in water-saturated strata or produced gas fields for the purpose of storing gas and regulating uneven gas consumption in the summer and winter periods of the year.

INVESTMENTS IN THE "GREEN" GENERATION

WORLD LEADERS IN THE OIL AND GAS MARKET

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



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

4 216 MBT

ENGIE Group



3 896 MBT

Nebras Power Q.S.C.



1 418 MBT

Royal Dutch Shell Plc



806 MBT

Chevron



610 MBT

British Petroleum Plc



486 MBT

Repsol SA

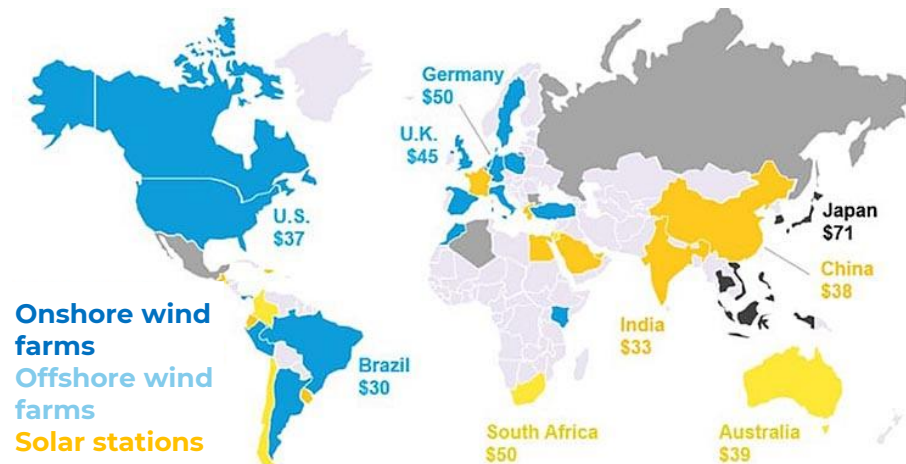


210 MBT

Total



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



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

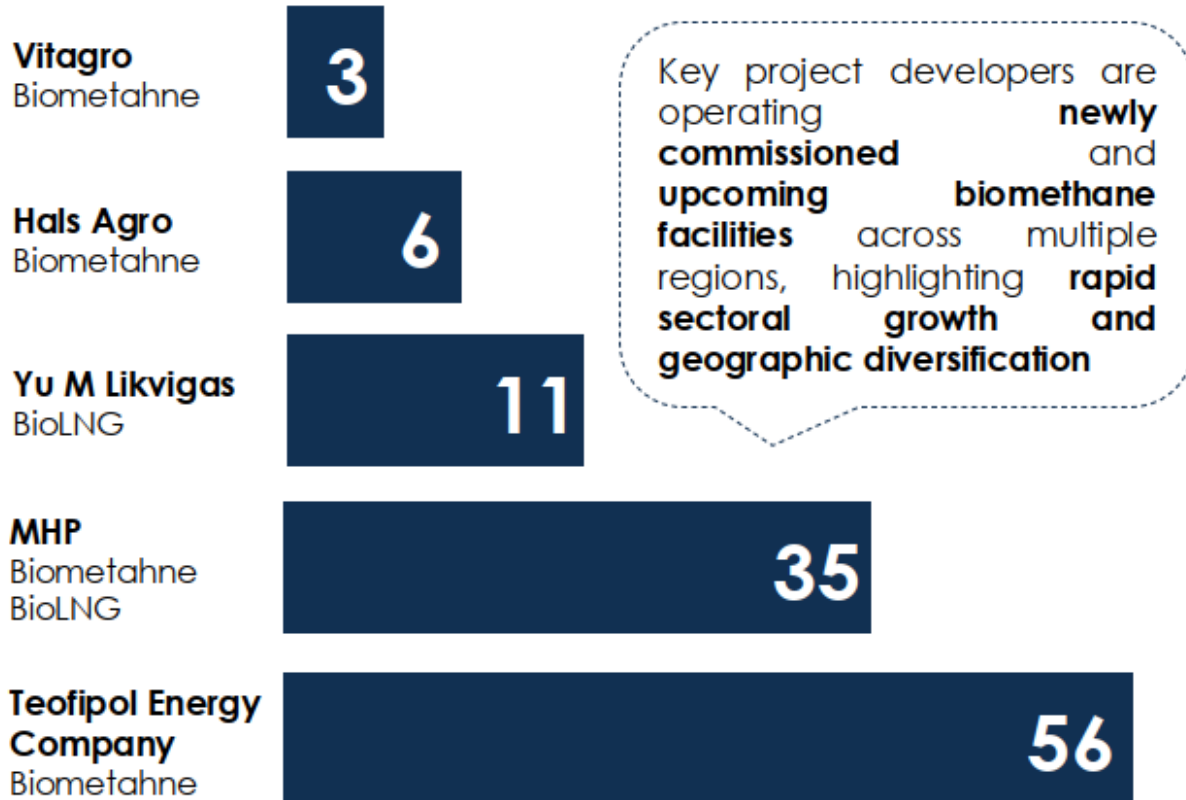
Providing services to producers of alternative fuels

Achievement indicator:

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

BIOMETHANE GENERATION POTENTIAL

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



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**

Projected capacity

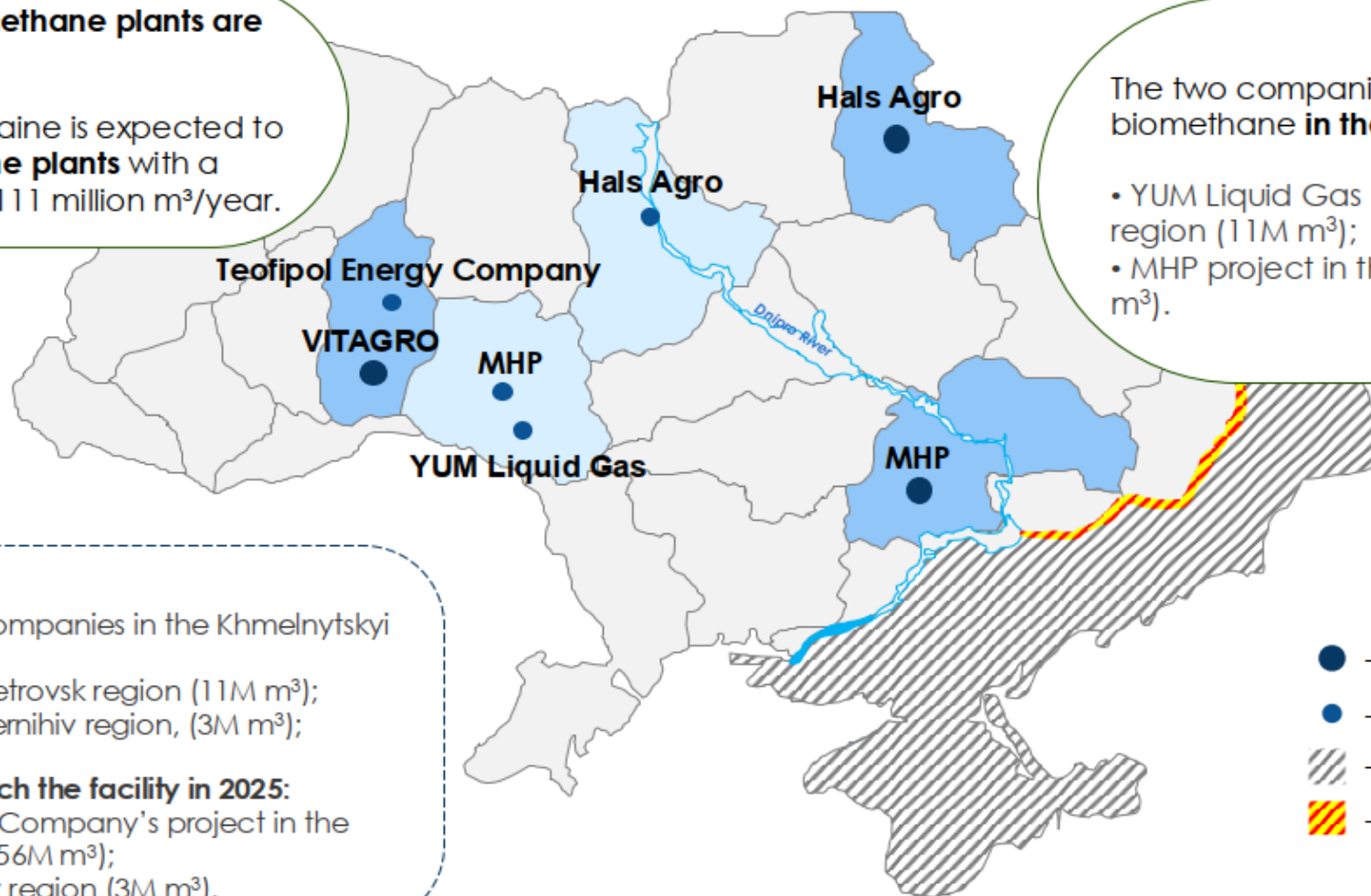
BIOMETHANE GENERATION POTENTIAL

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);

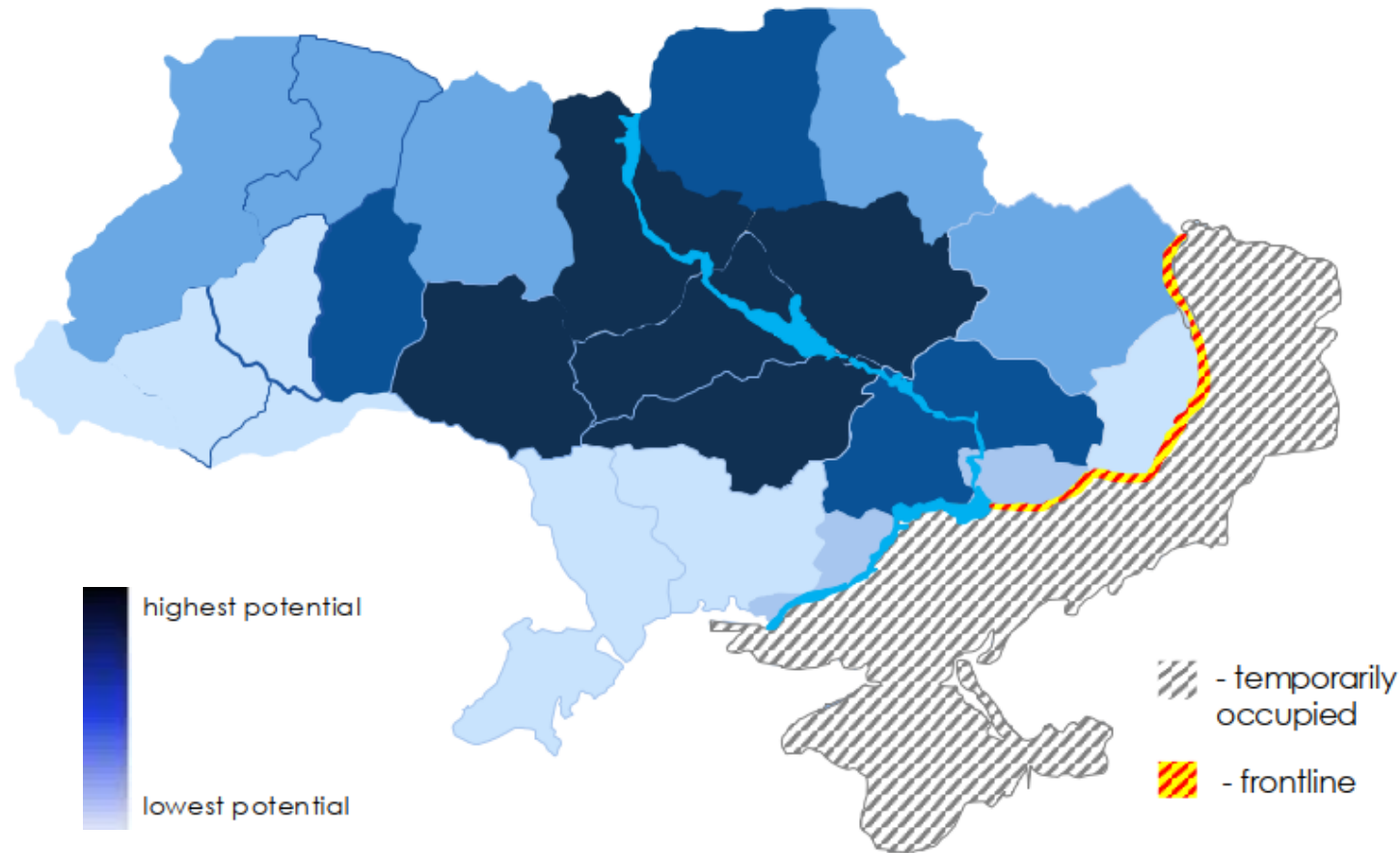
It is expected to launch the facility in 2025:

- The Teofipol Energy Company's project in the Khmelnytskyi region (56M m³);
- Hals Agro in the Kyiv region (3M m³).

- - operational plants
- - plants, expected to open
- ▨ - temporarily occupied
- ▨ - frontline

BIOMETHANE GENERATION POTENTIAL

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

Potential fluids	Name of the deposit	Geological characteristics				Gas reserves, million cubic meters	
		Porosity	Permeability, μm^2	Rock composition		Initial	Current
		Calculated / operational	Estimated /operational	Roof/underlying layer	Collector		
	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 ₁ k-J ₃	$0.1 \cdot 10^{-3} - 0.5 \cdot 10^{-3} - 0.8 \cdot 10^{-3}$	Gypsum-anhydrite/limestone-marl	Sandstone-siltstone/limestone	31398	513
CO ₂	Malygorozhanske	0.113-0.279	$321 \cdot 10^{-6} - 323 \cdot 10^{-3}$	Argilite/limestone-marl	Sandstone/siltstone	1073	2
Additional assessment required	Dubanevytske	0.133-0.219	$0.23 \cdot 10^{-3} - 1.79 \cdot 10^{-3}$	Mudstone/mudstone	Sandstone/siltstone	1477	1280
H ₂	Zaluzhanske	0.144-0.169	$0.028 \cdot 10^{-3} - 0.92 \cdot 10^{-3}$	Mudstone/mudstone	Sandstone/siltstone	9598	4903
H ₂	Pynyanske	0.07-0.185	$0.16 \cdot 10^{-3} - 1.05 \cdot 10^{-3}$	Mudstone/mudstone	Sandstone/siltstone	10077	1172
H ₂	Bytkiv-Babchynske	0.091-0.1	$0.1 \cdot 10^{-3} - 47.6 \cdot 10^{-3}$	Mudstone/mudstone	Sandstone/siltstone	46749	3468
Additional assessment required	Kosivske	0.18-0.198	$0.02 \cdot 10^{-3} - 1.235 \cdot 10^{-3}$	Mudstone/mudstone	Sandstone/siltstone	591	90
Additional assessment required	Kadobnyanske	0.094 - 0.37	$0.15 \cdot 10^{-3} - 0.93 \cdot 10^{-3}$	Mudstone/mudstone	Sandstone/siltstone	1504,2	491

PARTICIPATION IN THE PROJECT H2EU+Store



— Existing gas pipelines*
 — Pipelines converted to H₂ transport*

*schematic illustration

ІНІЦІАТОРИ

УЧАСНИКИ ПРОЕКТУ

ПРИХИЛЬНИКИ

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 H₂
- Stage 2 - (2031 - 2040): 500 000 t/year H₂ to 2040.
- Stage 3 - (2041 - 2050): 1 млн t/year H₂ to 2050.

Thank you for your attention and support!



Joint-Stock Company "Ukrtransgaz"

+38 (044) 461-20-97

forletter@utg.ua

www.utg.ua