State of the Art and Prospects of biomethane Development in Ukraine

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UABIO members

We thank the powerful companies and experts who joined the Association!

12 years

8 individuals

60 companies

20+ experts

Biogas/biomethane development in Ukraine (2024/2025)

Parameter	Biogas	Biomethane
Installed capacity, MWe	**140** (33 MW for LFG)	**41 mill m^3/year**
Number of plants	**~ 85** (33 for LFG)	**4**
Natural gas grid (GTS)	33 400 km, 1390 gas distribution stations	
Gas refilling stations for CNG	~ 300 units (90,000 vehicles were running on CNG in 2005)	

- The individual projects ranged from **125 kW_e** to **26 MW_e** installed capacity.
- **The first biomethane project** was constructed in April 2023 on the basis of an existing biogas plant
- **First biomethane** is imported in EU in February 2025
- **A wide range** of industries and different types **of feedstock**






Biomethane projects planned for launch in Ukraine in 2024/2025

N	Company	Location region	Capacity, Mm^3/year	Connection	Sustainability certificate	Start up, year
1	Hals Agro LLC	Chernihiv	3.0	GDS	ISCC	2023
2	VITAGRO group of companies	Khmelnytskyi	3.0	GDS	ISCC	2024
3	MHP	Dnipropetrovsk	11.0	GDS	ISCC	2025
4	MHP	Vinnytsia	24.0	Bio-LNG	ISCC	2025
5	Hals Agro LLC	Kyiv	3.0	GDS		2025
6	"YUM LIQUID GAS" LLC	Vinnytsia	11.0	Bio-LNG		2025
7	Theofipol Energy Company LLC	Khmelnytskyi	56.0	GTS	ISCC	2025
	TOTAL		111.0			

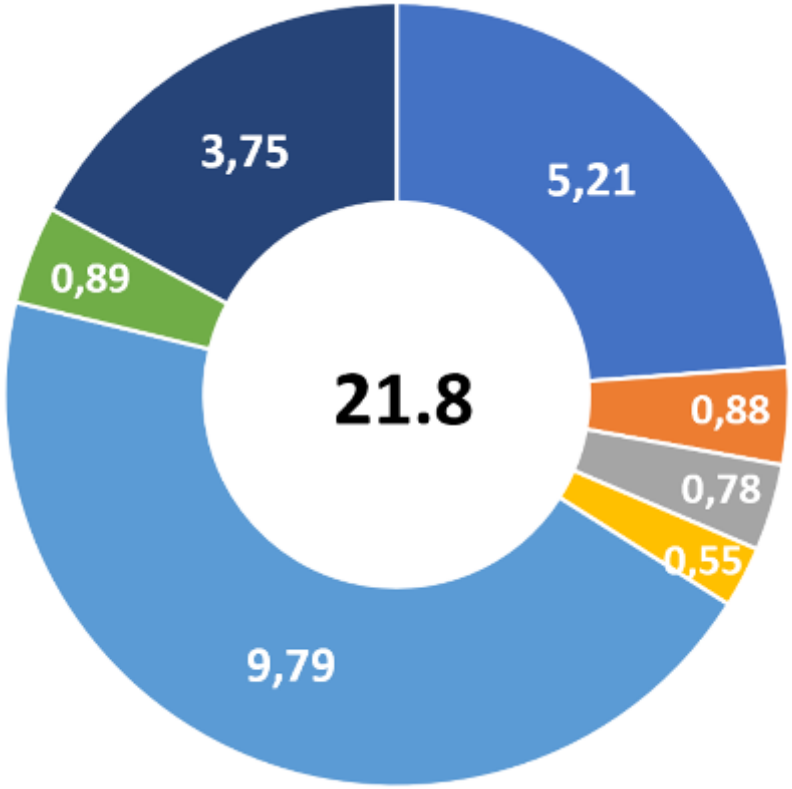
GDS – Gas Distribution System
GTS – Gas Transmission System

Why in Ukraine?

- Ukraine has **the largest area of agricultural land** in Europe and, accordingly, one of the best agricultural feedstock potential for biomethane production
- Ukraine can offer **the cheapest raw materials** for biomethane production and compete with any country in the biomethane market.
- Ukraine has a **developed system of gas networks** (GTS and GDS).
- The **structure of agricultural enterprises** is favorable for producing biomethane (big share of large and medium-sized enterprises).
- The possibility of exporting biomethane to the premium EU market, which has adopted ambitious plans for producing biomethane (REPowerEU): **35 bcm/year in 2030**.
- Potentially, in mid-term prospect, Ukraine can **provide up to 20%** of EU needs till 2050.

Biogas/biomethane production potential in Ukraine

BIOGAS/BIOMETHANE, billion m^3 CH_4/year20	
Biogas from animal waste	0,9
Biogas from harvest residues of agricultural crops	5,2
Biogas from by-products of the food processing industry	0,7
Biogas from municipal solid waste (MSW)	0,5
Biogas from municipal waste water treatment plants	0,1
Energy crops: biogas from corn silage (from 1 million hectares)	3,8
Biogas from cover crops (20% of arable land)	9,8
Biogas from biomass obtained by thermal gasification (10%)	1,0
TOTAL BIOGAS/BIOMETHANE, billion m3 CH4/year	21,8



Ukraine has the highest biomethane potential among the EU countries

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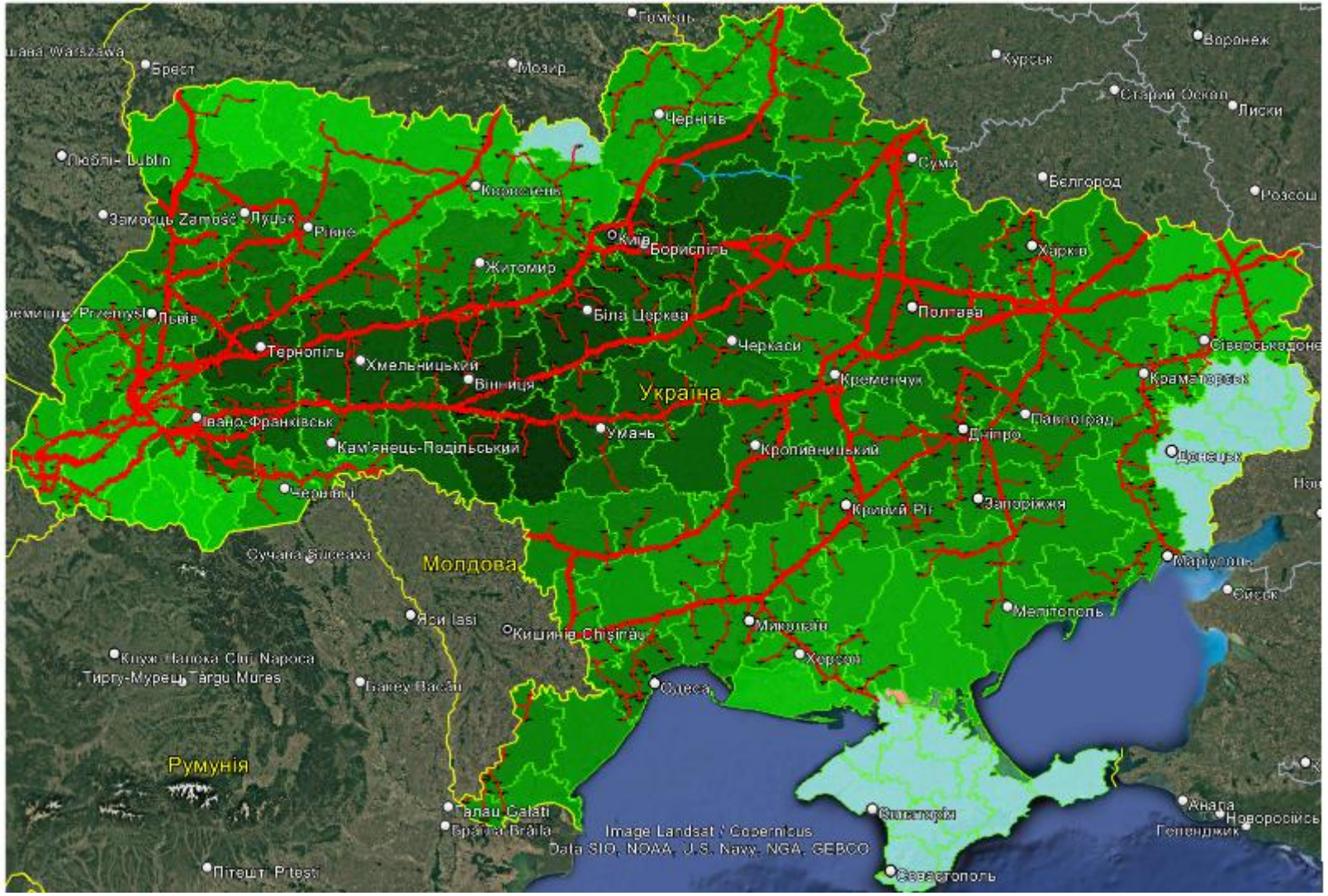
Structure of Ukrainian GTS and biomethane potential



136 reorganized districts of Ukraine

- District's biomethane potential is up to 707 mcm CH4/year
- Average district's biomethane potential equals 182 mcm CH4/year
- Almost half of the potential concentrated in western and central regions as Vinnytsya, Kyivska, Dnipropetrovska, Poltavska, Kirovohradska
- All regions of Ukraine with the greatest potential for biomethane production are quite well covered by GTS infrastructure

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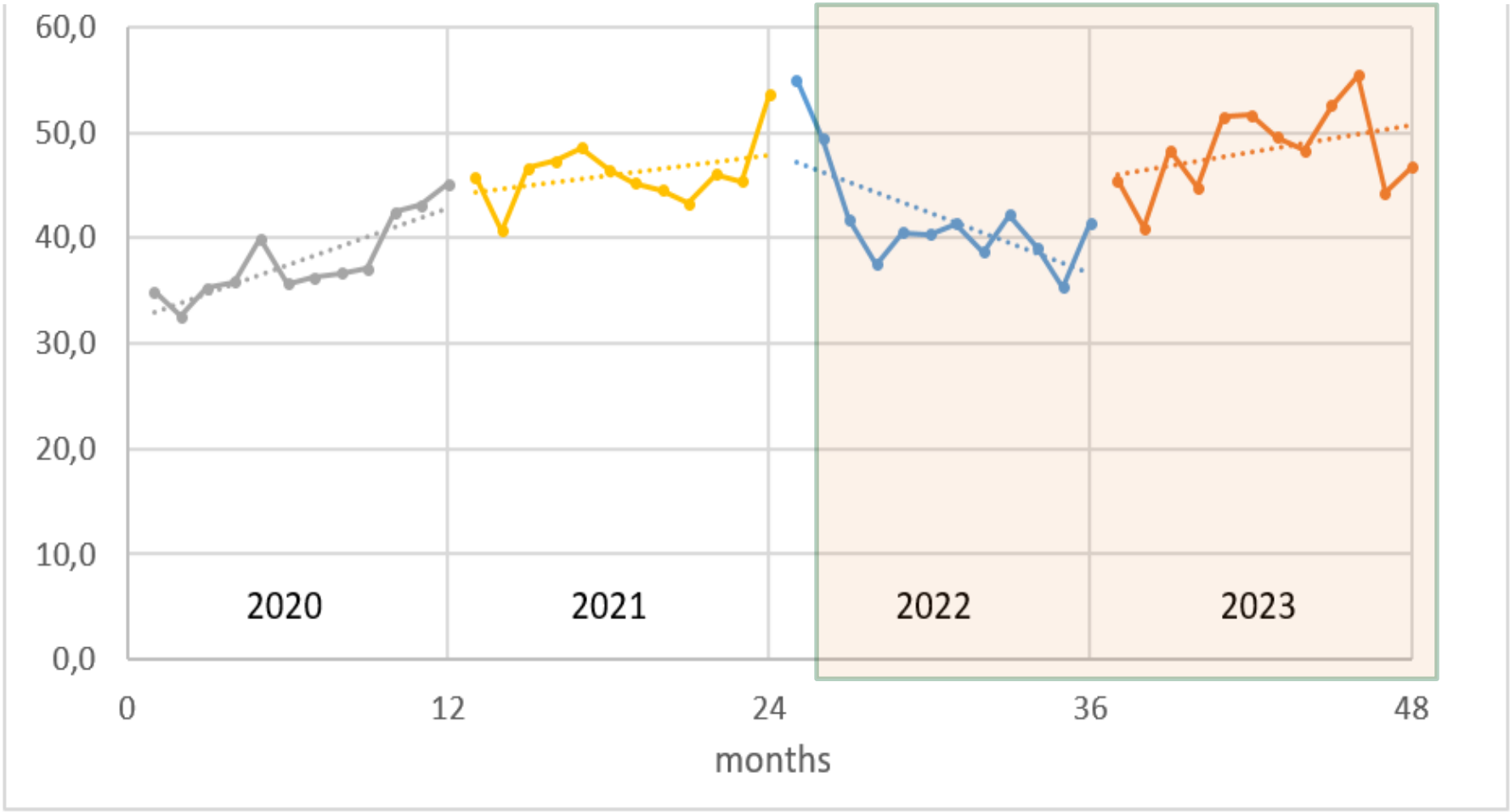
Power production from biogas in Ukraine in 2020-2023, GWh/month



Power production from biogas is growing even during the war!

Expected prices on “pipeline” biomethane for Ukrainian producers according discussions with EU traders, Euro/MW*h (natural gas price + premium)

Carbon intensity of biomethane, **g CO2 eq/MJ**	-100	**110-120**
	-70	**106**
	-40	**98**
	-20	**90-95**
	0	**86**
	20	**81**
	40	There are no buyers for biomethane with carbon intensity more than 20 g CO2 eq/MJ
	60	

Possible ways for decrease of biomethane carbon intensity:

- Raw materials for biomethane production from Annex IX of RED II EU Directive “with bonus” (-100 g CO2 eq/MJ): caw and pig manure, chicken litter;
- Electricity for production process from renewable sources. For example, from biogas.
- Utilization and use of biogenic CO2.

Developed feasibility studies

Company	Agroco		Slobodyshe		AgroRos'	Demetra	Podillya		L_Ukrainka	
	#1		#2		#3	#4	#5		#6	
Project concept	CH_4+CO_2	CH_4	CH_4+CO_2	CH_4	CH_4+CO_2	CH_4+CO_2	CH_4	Bio-LNG	CH_4	Bio-LNG
Feedstock	Cattle manure with straw bedding and corn harvest residues		Cattle manure with straw bedding, waste straw, feed residues, corn harvest residues, cover crops, and whey		Chicken litter on straw pellets, pig manure, corn silage, cover crops, straw, grain residuals	chicken litter, corn and wheat straw, soybean straw pellets, grain residuals	cattle manure with straw bedding, feed residues from cattle feeding (feed waste) and sugar beet pulp (SBP)		cattle manure, bedding straw, baled or granulated straw, feed residues, grain elevator waste, green mass of amaranth/rye and green mass of winter triticale, corn silage	
Location	Cherkasy oblast		Zhytomyrska oblast		Cherkasy oblast	Rivnenska oblast	Vinnitska oblast		Volyn oblast	
Potential of CH4, mcm	**6,9**	**6,9**	**5,5 (3,7)**	**5,5 (3,7)**	**8,0**	**5,0**	**5.4**	**3930 t/a**	**6.4**	**4436 t/a**
CAPEX, M€	19,1	16.8	15,1	13,0	23,0	12,5	15.3-16.2	21.3	17.3-18.1	23.1
OPEX, M€/a	5,6	5,3	3,3	2,8	5,5	4,3	2.1-3.0	2.2	3.7	3.4
INCOME TOTAL, M€/a	9,3	7,1	8,1	6,0	14,4	7,5	5.5	7.3	8.8	9.0
INCOME 1 (CH4), M€/a	6,0	6,0	4,2	4,2	10,4	4,6	5.4	7.1	5.8	7.9
INCOME 2 (CO2), M€/a	2,2	-	2,1	-	3,7	1,9	–	–	2.1	–
Premium evaluation procedure	100 €/MWh × 30% BM from cattle manure + 50 €/MWh × the rest 70% BM] ≈ 65 €/MWh		100 €/MWh × 51% BM from cattle manure + 50 €/MWh × the rest 49% BM] ≈ 75 €/MWh		100 €/MWh × 50% BM from chicken litter and pig manure + 50 €/MWh × the rest 50% BM] ≈ 75 €/MWh	100 €/MWh × 9% BM from chicken litter + 50 €/MWh × the rest 91% BM] ≈ 55 €/MWh	-47 g $CO_{2\text{-eq}}$/MJ		-18.6 g $CO_{2\text{-eq}}$/MJ	
CH4 price, €/MWh	35+65	35+65	35+75	37+75	37+75	37+55	100	1800 €/t	92	1800 €/t
CO2 price, €/t	278	-	278	-	278	278	–	–	225	225
NG grid connection	High pressure GTS (preliminary)		Low pressure GDS		High pressure GTS	High pressure GTS	GTS or GDS with reverse compressor	–	GTS or GDS with RC	–
IRR, %	**27**	**14**	**40**	**26**	**40**	**32**	**21-26**	**30**	**28-30**	**20.3**
DPP, years	5.9	11	4,1	6,0	5,0	6,1	6.4-8.0	5.6	5.6-5.2	7.7

UABIO's optimistic scenario of Ukrainian biomethane market (under removal of all barriers)

	2027	2030	2035	2040	2045	2050
Production of biomethane, bcm/y	0,25	1,00	2,1	4,5	9,5	20
Export of biomethane, bcm/y	0,13	0,50	1,05	2,25	4,8	10
Consumption in Ukraine, bcm/y	0,13	0,50	1,05	2,25	4,8	10
Number of biomethane plants, units	50	200	420	900	1900	4000
Necessary investments, billion €	0,5	2,0	4,2	9,0	19,0	40
Reduction of GHG emissions, mill t of CO2-eq./y	0,6	2,5	5,3	11,3	23,8	50
Created new jobs, thousand units	3,1	12,5	26,2	56,2	118,7	250

First Ukrainian Biomethane Plant (Hals Agro)

Location: biogas plant of Hals Agro company (Chernihiv reg.) Start of operation: **April 2023**

Production of **3 mill m^3 of CH_4/year** (eq. 1,3 MWel) on the base of existing biogas plant of **6,9 MWel**.

Feedstock: manure, sugar beet pulp, corn silage

Upgrading: membrane technology

Biomethane plant VITAGRO

Biomethane plant with a capacity of **3 mill m^3 CH_4/year**

The first stage of the complex is commissioned in **2024**

Location: Khmelnytskyi region

Maine parameters:

- Feedstock: pig manure, cattle manure, straw, corn silage
- Investments – 6 mill. Euro
- Upgrading: membrane technology
- Biomethane use: export

MHP biogas plants (poultry farms)

Poultry farm "Oril-Lider", Dnepropetrovsk region Production in 2017 – 42 mill heads (105,000 t/a)	**Poultry farm "Vinnitska",** Vinnytsya region Production in 2017 – 280,000 tons of chicken meat
Start of operation -2013 Installed power capacity – **5.7 MW** Digesters – 10x3500 m^3 Feedstock – chicken dung, wastewater Investment - 15 mill EUR Biomethane production – **11 Mm^3/year**	Start of operation -2017 Installed power capacity (1^{st} stage) – **12 MW** Digesters – 12x8200 m^3 Feedstock – chicken dung, wastewater, corn silage Investment (1^{st} stage) - 25 mill EUR Biomethane production is planned (with biomethanation)

Thank you for your attention!

Welcome to UABIO!

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