18th GAS FORUM

Energy Community

UKRAINIAN GAS MARKET 2030: metanization, innovation, decarbonization and decentralization

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GLOBAL 100% RE UKRAINE

MHP

Vienna, Austria
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UKRAINE: ENERGY LESSONS FROM THE PAST

The price of energy dependence of Ukraine 1991-2022

- ! The average import of energy resources is **$10-15 billion** annually
- ! Import of natural gas is more than **$100 billion** (equals >50% of GDP-2021)
- ! Natural gas consumption in 2021 - **29 billion m^3**
  - **20 billion m^3** – own production
  - **10 billion m^3** – import
- ! Loss of domestic investment resource for development
- ! Energy war against Europe
- ! War against Ukraine

UKRAINE: ENERGY CHALLENGES FOR THE FUTURE

Ukraine has significant agro-industrial potential for growing and processing agricultural products

Biomethane production (potential)

$BioCH_4$ *(G1)* + $BioCH_4$ *(G2)* = 21,8 bln m^3 / year

BIOGAS / BIOMETHANE, BLN M^3/YEAR	2050
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 solid household waste	0,5
Biogas from sewage sludge (municipal treatment plants)	0,1
Energy plants: biogas from corn silage (from 1 million hectares)	3,8
Biogas from cover crops (20% of arable land)	9,8
Biogas from BM obtained by thermal gasification (10%)	1,0
BIOGAS / BIOMETHAN, total	**21,8**

CHALLENGE OR CHANCE 1: CO_2

BIOMETHANE PRODUCTION (CH_4)

21,8 bln m³/year

→

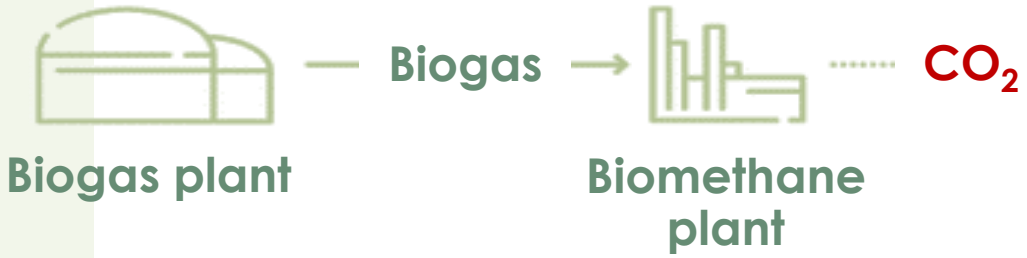
CARBON DIOXIDE PRODUCTION (CO_2)

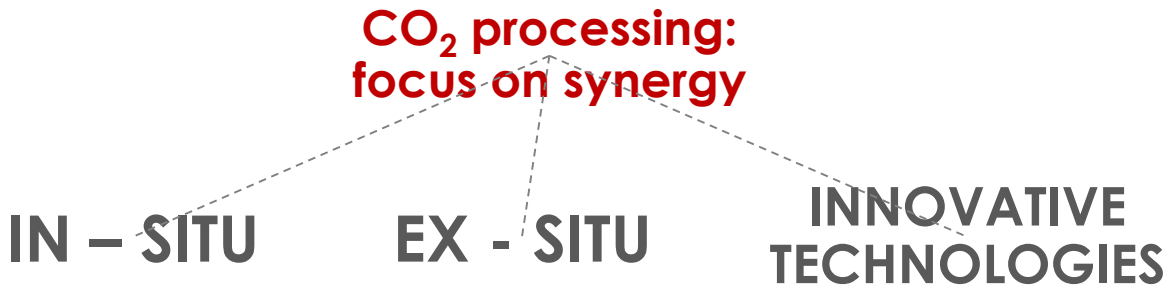
17,8 bln m³/year

$$4H_2 + CO_2 = CH_4 + H_2O$$

↓

Additional production of **E-BIOMETHANE** (CH_4):
+17,8 bln м³/year

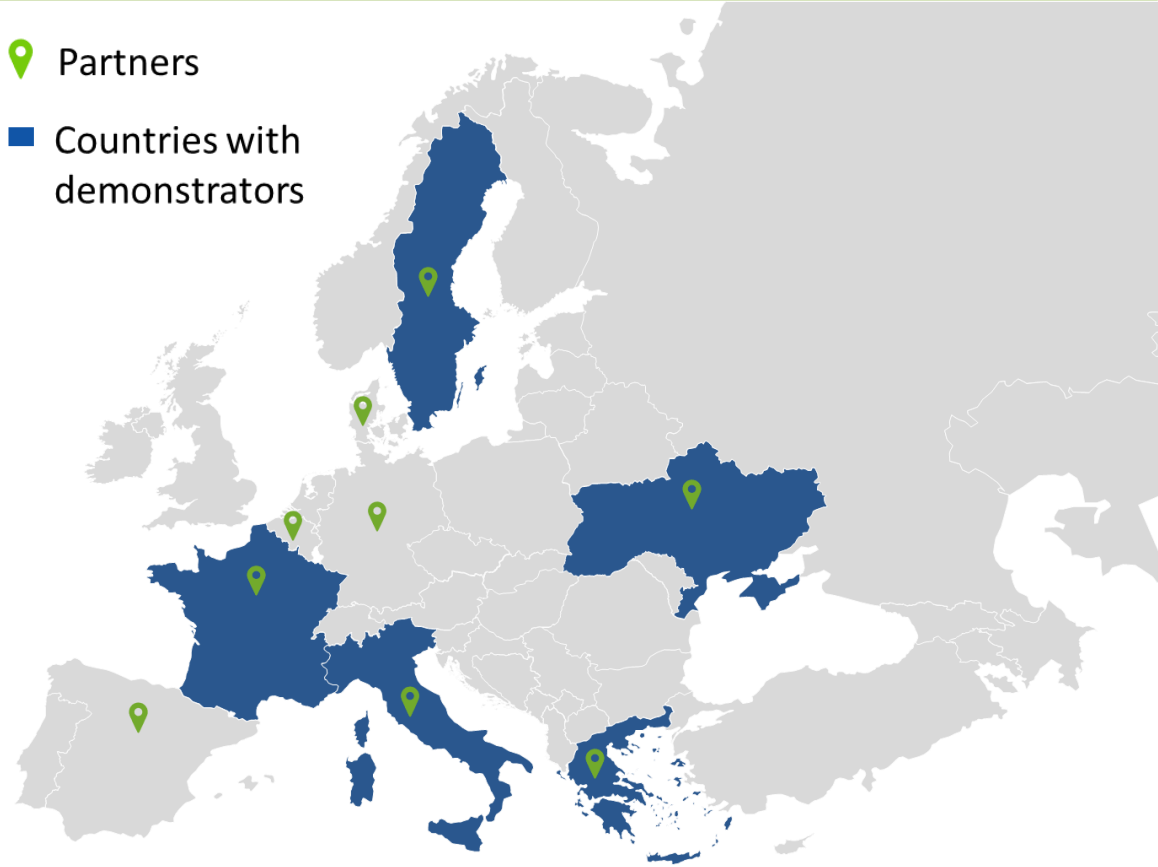




TOTAL PRODUCTION OF BIOMETHANE (CH_4):
39,6 BLN M³/YEAR

PROJECT IN A NUTSHELL

- BIOMETHAVERSE (HORIZON EUROPE): Demonstrating and Connecting Production Innovations in the **BIOMETHA**ne uni**VERSE**
- **October 2022 – March 2027**
- **22** partners in **9** countries
- **€ 9,871,773** of EC funding (70% of EU funding)
- To **diversify the technology** basis for biomethane production in Europe, to **increase cost-effectiveness**, and to contribute both to the **uptake of biomethane technologies** and to the priorities of the **SET Plan Action 8**.
- **Five innovative biomethane production pathways** in Europe: **France**, **Greece**, **Italy**, **Sweden**, and **UKRAINE**.



Co-funded by the European Union

DEMONSTRATION OF INNOVATIVE BIOMETHANE PATHWAYS

- **Design** and **implementation** of demonstration activities:
  - ✓ In-Situ and Ex-Situ Electro-methanogenesis (**EMG**) in France
  - ✓ Ex-Situ Thermochemical/catalytic Methanation (**ETM**) in Greece
  - ✓ Ex-Situ Biological Methanation (**EBM**) in Italy
  - ✓ Ex-Situ Syngas Biological Methanation (**ESB**) in Sweden
  - ✓ In-Situ Biological Methanation (**IBM**) in Ukraine
- **Wrap-up** of demonstration activities

"ORIL LEADER" Biogas Complex (5,5 MW)

Annual electricity generation – 42 GW*h

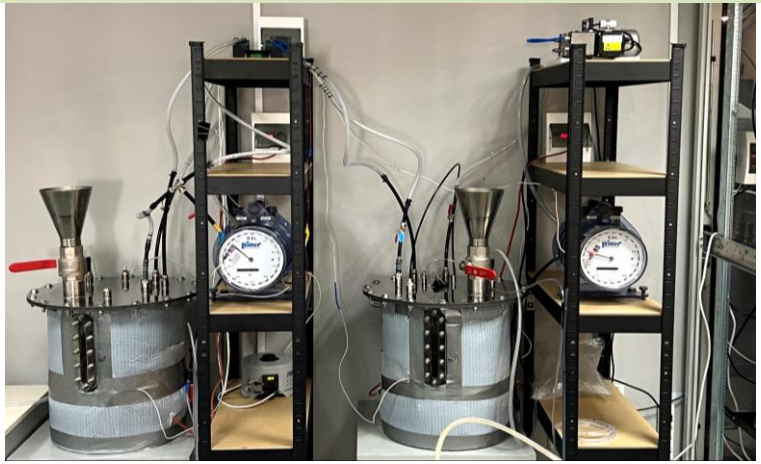
Co-funded by the European Union

LAB RESEARCH FOR INNOVATIVE BIOMETHANE PATHWAYS: MHP ECO ENERGY

Everyday challenges

MHP is moving forward despite the constant attacks on energy, infrastructure and civil objects to get the best result of the Project

However, the laboratory is functioning stable, with appropriate heating and ventilation – **reserve capacities were installed and stable energy supply was secured by:**



30 kW photovoltaic system

25 kWh energy storage system

Diesel generator

Electrolyzer

Co-funded by the European Union

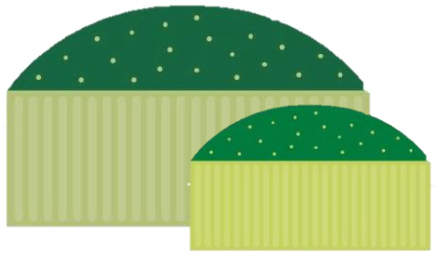
GOAL UA 2030: 1,8 BLN M^3

$BioCH_4$ *(G1)* + $BioCH_4$ *(G2)* + *E:CH4*

INPUT

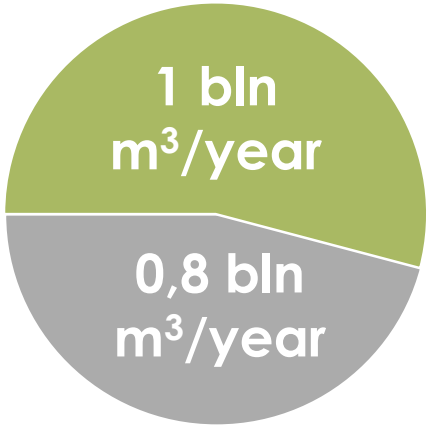
Organic waste

Plant biomass



40-50 Biogas plants

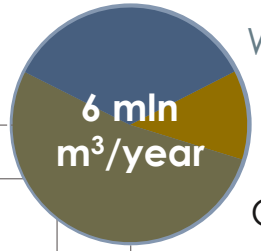
OUTPUT



CH4

CO2

200 000 ha



Water (2 bln m^3)

Solid (0,7 mln t)

Concentrate (3,3 mln t)

- *Production of H2*
- *Irrigation*
- *Additional water resource*

N (Nitrogen) **30 000 t**

P (Phosphor) **20 000 t**

K (Potassium) **20 000 t**

Organic fertilizers

CONDITIONS FOR FOR ACHIEVING 1,8 BLN M^3 OF BIOMETHANE PRODUCED ANNUALLY BY 2030

War finishing

Starting the rebuild and innovation stage of after-war development

Transparent market

including regulatory framework and stimulation incentives

Investment opportunities

Attractive conditions for investors and availability of resources

INVITATION

“8-th Ukrainian Gas and Power Forum:
New World Energy Architecture and Green Transition"

Kyiv, 25-26th October, 2023 Intercontinental Hotel
Hybrid mode (online+offline)

THANK YOU!