Energy Regulatory Office

# Biomethane in Distribution System

## Case Study by Poland

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# Biomethane Strategy

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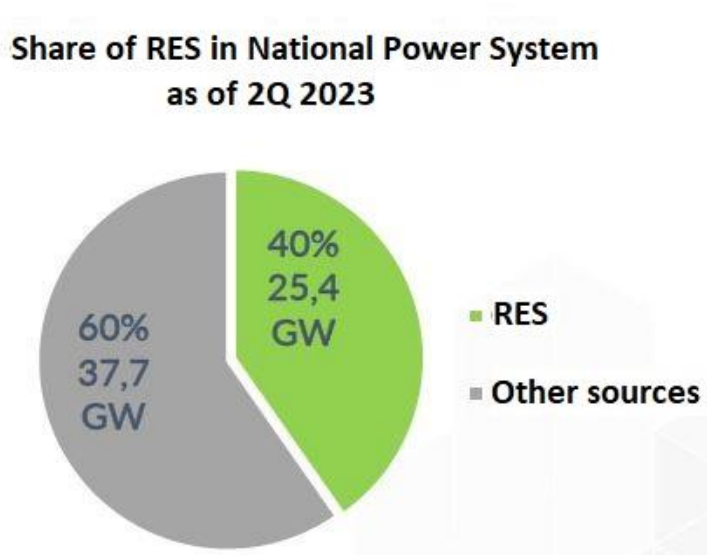
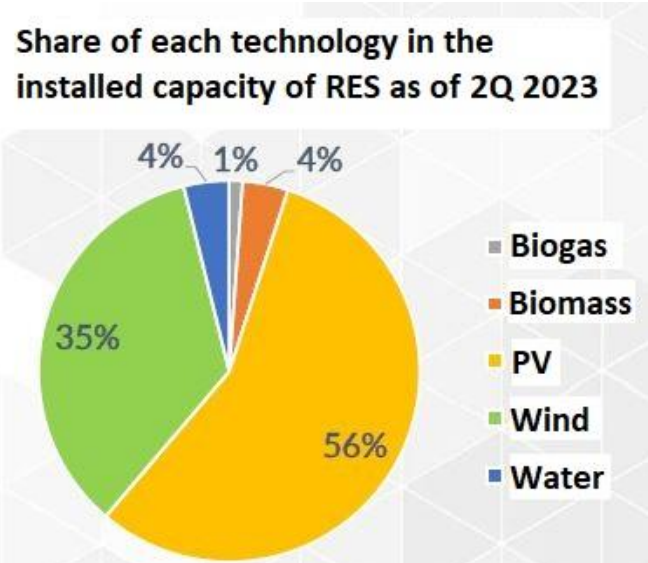
Strategic document **"Energy Policy of Poland until 2040"** - *Specific objective number 4 part B)*:

- *„The goal is to achieve the **capacity to transport a mixture containing approximately 10% of gases other than natural gas through gas networks** (decarbonised gases: biomethane, hydrogen) by 2030"*
- *„Actions should be done in **close cooperation between operators and producers** of these gases, so that both the technical parameters of the network and the quality of the gases are taken into account (…) It is necessary to undertake joint actions by the TSOg and TSOe resulting in **the optimisation of the operation of the electricity and gas system** so as to ensure conditions for fully effective cooperation between these sectors."*




Source: ERO based on Agency of Energy Market




Source: ERO based on Agency of Energy Market

# Biomethane Distribution

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Currently, no biomethane plant has been connected to the gas pipeline network. Biogas is burned in cogeneration installations and energy producers are able to recover costs - both through auctions and feed-in tariffs.

The potential for producing biogas (aprox. 55% methane content) based on resources of agricultural and food sector in Poland is estimated at **7.8 bcm/year** which is the equivalent of about **4.7 bcm/year in biomethane** (aprox. 95% methane)

According to **National Support Center for Agriculture** in first half of 2023 there was:

- 138 agricultural biogas plants in Poland with a total capacity of 135,726 MWe;
- 86 installations in landfills with a total capacity of 41,099 MWe;
- 97 installations in sewage treatment plants with a total capacity of 37,718 MWe;

Recent applications for connecting a biomethane plant to the gas network:

1) Transmission System Operator (Gaz-System S.A.) – recorded **28 applications**

2) Distribution System Operator (largest representative Polska Spółka Gazownictwa Sp. z o.o.) - recorded **136 applications**, of which 85 resulted in issuing connection conditions. Until now 4 connection agreements have been successfully concluded and according to plan first connection should take place not sooner than in September 2024.

According to forecasts, if projects are implemented, Operators expect approximately **4 bcm of biomethane per year** in the distribution network by 2030.

# Development Challenges

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**Existing development challenges in biomethane distribution:**

- expensive process of purifying biogas to biomethane quality - injecting the produced gas into the network requires meeting a number of high quality and technological requirements specified in the regulations - Instructions for the Operation of the Distribution/Transmission Network (IRiESD, IRiESP,);
- a challenge related to the network's absorption capacity - most biogas plants in Poland are located in places where either the development of the distribution network is not significantly advanced (rural areas), or there are no customers with sufficiently high demand in a given area. It is necessary to look for solutions that will allow the produced biomethane to be injected in places where the needs of customers are greater.
- challenges related to significant seasonal fluctuations in gas demand in Poland - biogas production is a continuous process that cannot be easily interrupted and restarted. Producer can inject several times less gas in summer than in winter, if there are no industrial customers nearby.
- limitations of a legal and administrative nature - legal regulations existing from 2015 regarding support for renewable energy sources in practice, did not stimulated the development of biomethane projects. Although it has been possible to introduce purified agricultural biogas into distribution gas networks for several years, to date no such installation has started operating in the country. The above-mentioned limitations and barriers introduce a significant level of uncertainty for this type of investment and make it difficult to obtain financing and make a final investment decision.
- negative social perception of this type of installation as an odour emitter, largely due to the lack of awareness of local communities.

# Biomethane Legislation

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Recent legal regulations facilitating activities in the field of biomethane:

**Act of August 17, 2023 amending the Act on Renewable Energy Sources and certain other acts** (Journal of Laws 2023, item 1762 as amended)

- introduction of the definition of biomethane and changes to the Energy Law regarding the definition of „gaseous fuel" *biomethane - gas obtained from biogas, agricultural biogas or renewable hydrogen, subjected to a purification process, introduced into the gas network or transported in compressed or liquefied form by means of transport other than gas networks, or used to refuel motor vehicles without the need to transport it;*
- defining the rules for conducting business activities in the field of producing biogas or biomethane from biogas and establishing a „Register of Biogas Producers";
- adjusting the scope of activity of energy cooperatives to include the possibility of producing biomethane;
- introducing guarantees of origin for biomethane;

**Act of July 13, 2023 on facilitating the preparation and implementation of investments in the field of agricultural biogas plants, as well as their operation** (Journal of Laws 2023, item 1597 as amended)

- regulations enabling acceleration of the building process;
- facilitating the issuance of conditions for connecting agricultural biogas plants to the network;
- exemption from the obligation to change the intended use of land;
- special procedures for locating biogas plants;
- exemption of certain, safe types of biomass from restrictive waste regulations;
- easier use of the digestate product as fertilizer;

# Development Support

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**„Energy for the countryside”** is a governmental program to support development and increase the use of renewable energy sources in rural areas. Support, in the form of a loan or subsidy, is addressed to:

1) individual farmers;
2) agricultural energy cooperatives;
3) and energy cooperatives composed of enterprises.

**Types of activities covered by the program**: hydroelectric power plants, installations producing energy from agricultural biogas under high-efficiency cogeneration, wind installations and photovoltaic installations.

1) In case of individual farmer - cogeneration installations producing energy from agricultural biogas with an electrical output above 10 kW and not more than 1 MW and a thermal output above 30 kW and not more than 3 MW;
2) In case of „energy cooperative” - with an electrical output above 10 kW and not more than 10 MW and a thermal output above 30 kW and not more than 30 MW.

**Possible support intensity:** Subsidy up to 45% of qualified costs, and/or loan up to 100% of qualified costs.

Support mechanisms are coordinated by The National Fund for Environmental Protection and Water Management. More information's available: *https://www.gov.pl/web/nfosigw-en/modernisation-fund*

# Pilot Projects


Pilot projects currently underway seems to be heading towards **biomethane liquefaction installations** which may prove to be a alternative to connecting the installation to the transmission or distribution network.

Investment of this kind is being implemented by *ORLEN Południe Sp. z o.o* . in Głąbowo (Ryn county, Warmian-Masurian province). Company acquired a agricultural biogas plant with a capacity of 1 MWe, which was initiated in 2021 and decided to expand the installation towards a biomethane plant with a gross capacity of approximately 4.6 MWe. The installation should enable the production of over 7 mcm of biomethane per year, which will then be converted into bioLNG. The fuel will be delivered from the plant to customers in cryogenic tank trucks.

Orlen Group is planning to transform also three biogas plants that are already owned by the company into biomethane plants. The installations are located in the following towns: Konopnica, Wojny-Wawrzyńce and Jeżewo.

# THANK YOU
# FOR YOUR ATTENTION!

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