FACTSHEET

Challenges in biogas sector (Sweden, Poland and Ukraine)

Project "Biogas Partnership: co-creating a pathway to boost biogas solutions in the Baltic Sea Region"

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What similarities and differences are there in the biogas/biomethane sector development in Sweden, Poland and Ukraine?

Sweden, Poland and Ukraine have both similarities and differences in barriers for biogas/biomethane sector development (Table 1). There is different situation in policy regulation for biomethane production and use.

Table 1. Overview of challenges in biogas sector development

Challenges/barriers	Sweden	Poland	Ukraine
Policy and Regulation	○ Policy Fragmentation. ○ Short-term incentives. ○ Complex regulation.	• Weak policy framework. • Regulatory barriers for biomethane use. • Bureaucracy barriers.	✓ Policy challenges. ✓ Regulatory barriers. ✓ Bureaucracy barriers.
Market and Economics	○ Limited profitability. ○ High production costs. ○ Market competition.	• Unsure financial support for biogas and biomethane production and use. • Market competition.	✓ High initial investment and capital costs. ✓ Market competition and energy prices. ✓ Financing and investment risks.
Technological and Infrastructure	○ Infrastructure (gas grid) limitations. ○ Site selection challenges ○ Production potential.	• Lack of modernisation of gas and electricity grids and infrastructure. • Technical barriers for gas grid.	✓ Infrastructure for grid injection and distribution. ✓ Logistical and supply chain Issues.
Social and Cultural	○ Social acceptance of private gas vehicles due to legal and financial regulations.	• Low public awareness. • Low level of knowledge about biogas production.	✓ Public perception. ✓ Social acceptance.

Sweden has a long experience in the use of biomethane as vehicle fuel with appropriate financial incentives that have been changes during the time (production support premium, investment support (up to approx. 45-65 %) for all types of investments or measures that leads to high greenhouse gas (GHG) emission reductions (2015-2028), the former (2018-2022) bonus for purchasing new low emission cars, climate purchase premium for heavy duty vehicles (HDVs) and working machines). However, the biogas production support is subject to annual Governmental budgets and its political certainty is not guaranteed long term that is the same for other countries. The lack of a biogas registry/Guarantees of Origin (GO) system in Sweden is an increasing problem – particularly for cross border trade. Potential lack of local biomethane demand in Sweden with limited gas grid infrastructure will be a challenge for many biomethane producers. Liquefaction to liquid biogas (LBG) will be key to reaching potential large gas users in industry, long haul heavy road transport or maritime transport in the future[1].

Poland and Ukraine have developed gas grid unlike Sweden. Therefore, regulatory policies and directions for biomethane market development differ. There are regulatory

[1] Biomethane in Sweden – market overview and policies. Linus Klackenberg, Swedish Gas Association. 2024-03-27.

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and bureaucracy barriers as well as technological and logistical challenges for biomethane use in national gas grids and export for cross border trade. Inconsistent or inadequate government policies, subsidies, and incentives may hinder investment.

Amendment to the Act on Renewable Energy Sources (RES Act) - Conditioning of biomethane in Poland is aiming at removing legal and technical barriers to facilitate the connection of biomethane to the grid. Poland has an ongoing regulatory process with auction system to create predictable investment conditions for the biomethane sector and to stimulate market development and increase biomethane production in Poland. Auction system will be applied for biomethane installations above 1 MW. There are two-size auction baskets, with the first auction in late 2026[2].

Law of Ukraine "On Amendments of some Laws of Ukraine regarding the development of biomethane production" (2021) establishes the biomethane register and the GO system for biomethane in Ukraine. Law of Ukraine "On state support of investment projects with significant investments in Ukraine" (2023) establishes financial incentives for projects on biomethane production with total investments of more than 12 million Euro. Ukraine is facing at development of the state support instruments: investment support; GHG emission mandates/quota, goals for renewable energy and advance biofuel; carbon tax/price, other tax incentives (excise duty, VAT, depreciation); regulatory and financial support[3].

2. What are the barriers in Poland/Ukraine to implement best practices in biogas from Sweden?

Nordic Biogas Model (NBM) implemented in Sweden is urban waste-based biogas system where biogas is upgraded to biomethane and used as transport fuel and the digestate applied as biofertilizer on farmland (Figure 1). The NBM has three functions, namely, renewable transport fuel production, waste management service, and biofertilizer production. NBM can be used for treating both solid organic waste and wastewater[4].

Biogas and biomethane in Sweden is mainly produced by various organic wastes and residues, such as sewage sludge (29 %), organic household waste - food waste (21 %), manure (11 %), waste from food industries and slaughterhouses. Most of the biogas are produced in co-digestion plants (50 %) in 133 wastewater treatment plants (31 %).

[2] Polish biogas sector development: drivers and barriers. Presentation is available at https://liu.se/en/research/biopart/biopart-project-tackles-regional-challenges-during-virtual-webinar

[3] Challenges and drivers for Ukrainian biogas sector development. Presentation is available at https://liu.se/en/research/biopart/biopart-project-tackles-regional-challenges-during-virtual-webinar

[4] Lindfors A. et al. (2022). The Nordic biogas model: Conceptualization, societal effects, and policy recommendations. Available at: https://doi.org/10.1016/j.cacint.2022.100083.

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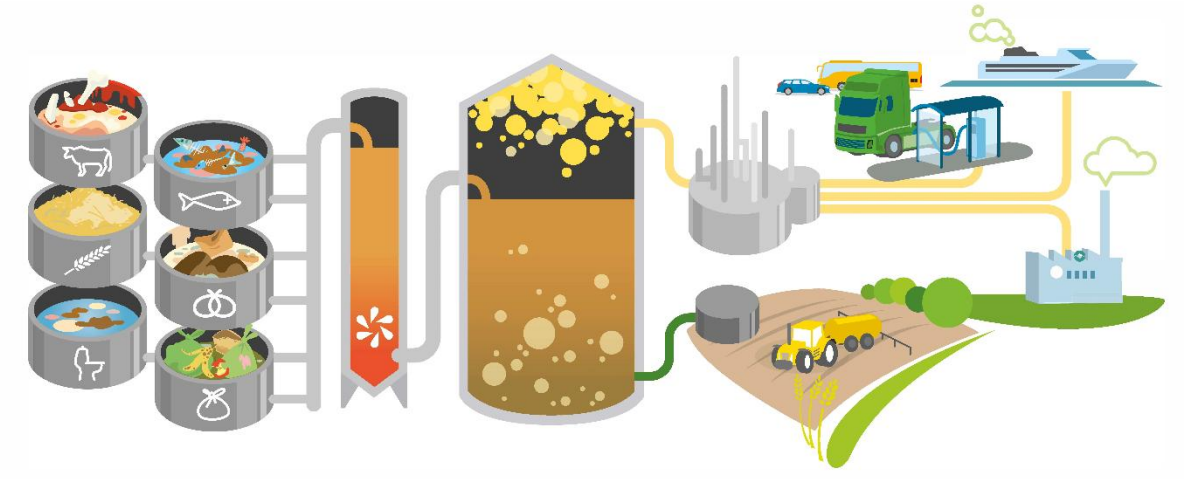

Fig. 1. Nordic Biogas Model concept[5]

Sweden has established regulatory system for municipal waste separation and collection and using of organic fraction as substrate for biogas production. Municipalities must provide systems for separation and collection of organic waste from households from 2024. The national goal of collecting and recycling of nutrients and with energy recovery (digestion) from 40% of all organic waste from households, commercial kitchens, grocery stores and restaurants was reached in 2022[6].

Poland and Ukraine are focusing on agricultural biogas plants due to the available substrates (manure and agricultural residues). Therefore, regulatory barriers connected to anaerobic treatment of household waste and sewage sludge will rise due to lack of experience. Regulatory policy will cover not only substrate issues, but also digestate valorization as biofertilizer and biomethane use on transport. Different legislation policies, financial instruments, technological and infrastructural improvements as well as projects aimed at increasing public awareness and social acceptance should be implemented.

3. How can the results of this project influence biogas policy or legislation?

We are planning to produce policy brief based on results of project activities aiming at policy recommendations for biogas solutions boosting. The proposed recommendations will be based on deep analysis of the current situation, potential and challenges in national sector development and focused on how to overcome existing barriers for biogas/biomethane production.

[5] Biogas Solutions Research Center, Sweden (https://www.biogasresearchcenter.se/en).

[6] Biomethane in Sweden – market overview and policies. Linus Klackenberg, Swedish Gas Association. 2024-03-27.

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SWEDEN

1. Who does fund biogas production support incentives in Sweden? Are these subsidies provided by the Swedish government, EU programs, or other sources?

The subsidies for biogas production in Sweden come from multiple sources, including the Swedish government, EU programs, and other funding mechanisms.

Swedish Government Support includes:

- *CO_2 and energy tax exemptions for biogas used as motor fuel or for heating;*
- *Manure-based biogas support;*
- *Swedish Energy Agency is responsible for administration of biomethane and liquefied biogas support;*
- *High CO_2 and energy taxes on fossil fuels.*

Some examples of EU funding and programs: EU State Aid Approvals; EU Grants (Horizon Europe, LIFE Program, Innovation Fund); Common Agricultural Policy (CAP) Funds.

Other Funding Sources are presented at local or sector level mostly, for example, regional & municipal support, private and industry investments, and Nordic Energy Research.

2. Does the level of production support depend on the type or composition of substrates used for biogas production or not?

Production support for upgrading biogas to biomethane doesn't depend on the type of substrate. Production of manure-based biogas has special additional support according to production support scheme for biogas and biomethane that is administrated by Swedish Energy Agency.

3. Is the support of around 60€/MWh shown directed to biomethane producers or to its consumers?

The support is aimed at companies or economic activities that produce biogas from manure and/or produce biogas that are upgraded to biomethane in gaseous or liquid form.

4. 0.027 EUR is very low for biomethane or biogas project

Here we are talking about production support only (meaning those numbers), but there are also another types of support for biogas plants like climate investment support (that leads to GHG emissions reduction).

5. What is market price of biomethane in Sweden?

The CNG price at the filling station of as today ranges from 1,79€ to 2,96 € per kg (depending on the location across Sweden).

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POLAND

1. What is the eligibility of landfill gas-based biogas for the Feed-in Tariff (FiT) in Poland? Are there any specific conditions or exclusions under the FiT scheme that would impact landfill gas-based biogas?

Landfill gas-based biogas producers can benefit at 538 PLN/MWh as for biogas other than agricultural biogas.

2. Do you think that there is a chance for a regulatory change in Poland, so that biogas plants have priority to connect to the power grid?

Yes, it should be an auction for CC for CHP biogas starting from 2026.

3. Are there planned regulatory or technical changes in Poland for current grid injection requirements for biomethane that could eliminate or reduce the need for propane blending to meet gas quality standards?

This legislation is already in Parliament, and this should be passed in March-April 2025.

4. What is done locally and at government level to improve public opinion from neighboring communities (air pollution, unpleasant smells from feedstock, too many trucks in the area, etc.) stopping construction of biogas sites in Poland?

Not too much. Public consultations are to be governed by investors and developers (study tours, workshops, local authorities' engagement).

5. Could you please share a link where we can find the draft law amending the RES act on bioCH_4 auctions in Poland?

This draft law is under consideration at Government Legislative Process and available via link: https://legislacja.rcl.gov.pl/projekt/12389803/katalog/13082918#13082918.

6. Which type of biomethane projects will be included to the first auction in late 2026 in Poland?

Auction system is for biomethane installations above 1 MW.

7. How is the usage/offset of digestate impacting the development of biogas plants in Poland? Driver or Barrier?

That big issue related to feedstock - farmers are much more convinced to digestate that to conventional fertilizers, but now everywhere. This is as issue in some locations in feedstock contracts with the farmers.

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UKRAINE

1. What are perspectives for biogas development in Ukraine?

Biogas and biomethane production play a huge role in Ukraine's economy and energy sector. Ukraine has the biggest biomethane production potential in Europe. According to the assumption of Bioenergy Association of Ukraine this potential is equal to 21.8 billion cubic meters per year. The Ministry of Energy of Ukraine is actively working to improve the positions of the biomethane and biogas markets.

- *National Energy and Climate Action Plan until 2030 (promotes the production of biomethane, 100 million cubic meters per year).*
- *National Renewable Energy Action Plan until 2030 (provides the implementation of renewable gases in Ukraine, with a total amount of biogas and biomethane up to 22 million cubic meters per year).*

2. What problems do biomethane producers in Ukraine face?

According to Bioenergy Association of Ukraine data biomethane producers in Ukraine face several challenges hindering the industry's growth: high initial investment and capital costs; financing and investment risks; market competition and energy prices; policy and regulatory challenges; infrastructure for grid injection and distribution; logistical and supply chain issues; public perception and social acceptance; impact of ongoing war conflict.

3. Who does build biomethane plants in Ukraine? Are those companies from Ukrainian market or another?

In Ukraine, biomethane production is primarily driven by domestic agro-industrial companies. Some examples:

- *The first biomethane plant in Ukraine, Hals Agro company (Chernihiv reg.), started operation in April 2023. Feedstock: manure, sugar beet pulp, corn silage*
- *VITAGRO Group of companies has begun exporting Ukrainian biomethane to the European Union. The group's biomethane plant, which was built between 2022 and 2024, started production in September 2024.*

4. Considering very fertile soils for agriculture in Ukraine, is there a concern for using digestate as fertilizer?

Despite fertile soils in Ukraine there is a need for agricultural soils fertilization, therefore digestate has a big potential for mineral fertilizers substitution according to recent research results. The regulatory landscape in Ukraine has evolved to support the use of digestate as a fertilizer, aligning with European practices and promoting sustainable agriculture. Ongoing efforts to establish quality standards and certification processes are essential to fully integrate digestate into Ukrainian agricultural systems, enhancing soil fertility and contributing to environmental sustainability.

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