

## Recommendations for national policy in Poland to increase biogas production

To increase biogas production in Poland, a strategic approach should be adopted that focuses on optimising existing resources, removing legislative, organisational and financial barriers and increasing public awareness.

### **Recommendation. Strengthen the policy and regulatory framework for biogas and biomethane production.**

The lack of a stable energy policy and a long-term strategy for renewable energy development creates uncertainty for stakeholders in the biogas production sector. The lack of specific targets for biogas and biomethane in energy policy does not encourage investors to develop production due to the lack of prospective interest from policymakers. National targets for biogas and biomethane production and use are needed to support the decarbonisation of the economy and improve energy security. At the same time, greater integration of the opportunities offered by biogas production and use into national plans for waste management, greenhouse gas reduction and the circular economy is needed.

In energy policy, more emphasis should be placed on the decentralisation of energy production, including the development of clusters, energy cooperatives and citizen energy communities, which should aim to achieve energy self-sufficiency.

Clear and stable regulations, including financial incentives, are also needed.

Problems related to the location of biogas plants (agricultural and non-agricultural) also arise from the spatial planning system. There is a need for the formulation and implementation of appropriate legal regulations regarding permissible, reasonable distances of biogas plant locations from human habitation. Regulating the distance of investments can contribute to changing attitudes.

### **Recommendation. Ensure financial support for the production and use of biogas and biomethane.**

It is necessary to continue providing subsidies and grants for biogas projects, both for municipal and agricultural biogas and biomethane plants. Existing facilities for biogas plant construction are aimed at the agricultural sector, but the ambitious goals facing the municipal sector (the need to increase the level of separate collection and recovery of biodegradable waste and to move towards energy neutrality of wastewater treatment plants) require that adequate support is provided to the municipal sector as well.

The criteria for awarding funding to the sector should take into account the specificities of the substrates and processes, in particular the opportunities offered by co-digestion, i.e. the joint digestion of different substrates (e.g. sewage sludge with biodegradable waste from the agri-food industry) and the issues of using the heat generated in cogeneration.

An economic barrier to the development of larger biogas and, in the future, biomethane plants is the limited access to support schemes. An analysis of feed-in tariffs (FIT, FIP) for biogas energy from sludge and municipal waste is needed. Modifying the FIT/FIP system to promote biogas production from sludge and municipal waste could effectively encourage the development of this segment of the biogas market in Poland while contributing to environmental and climate protection, waste management and

sustainable development goals. Consideration should be given to the introduction of additional bonuses for the use of waste that is difficult to treat or requires advanced biogas treatment technologies, as well as the provision of longer feed-in tariffs and market bonuses (e.g. 20-25 years), which would increase investor certainty and enable better long-term planning. The auction system also needs to be modified towards greater flexibility and transparency on the one hand and stability and predictability on the other.

Given the problems of biogas acceptability in the gas distribution system and the problems of the electricity grid in accepting electricity from RES, projects involving the production and use of biomethane should be supported. Given the opportunities offered by the use of biogenic carbon dioxide (released during biogas purification) as a raw material in many industrial applications, support should also be provided for projects in this area.

Biogas and biomethane production can also be influenced by the biogas and biomethane guarantee of origin system, which is not sufficiently developed in the country. The extension of the guarantee of origin system for biogas and biomethane in Poland came into effect on 1 January 2024. Having a certificate confirms that a company producing biomethane is pursuing a development strategy that takes into account environmental, social and governance criteria (ESG from: Environmental, Social and Governance). The lack of a certification process prevents biomethane from being recognised as environmentally friendly and meeting ESG objectives. In Poland, there is currently only one voluntary certification system KZR INiG (Sustainability Criteria System of the Oil and Gas Institute). Due to the increased interest from companies in the energy and heating sector, it is necessary to develop systems and streamline procedures for verifying applications and issuing guarantees of origin. Developing the market for guarantees of origin for biogas and biomethane can contribute to the transformation of the economy by, among other things, supporting a faster decarbonisation of the heating sector.

There is also a need for regular evaluation of the effectiveness of support to review and update it and make the necessary changes to adapt it to changing market conditions and technological advances.

#### **Recommendation. Optimise resource use.**

The development of biogas infrastructure makes it possible to manage agricultural biomass and municipal, agricultural and industrial waste more efficiently by converting them into biogas. This not only increases the level of waste recovery and recycling but also reduces greenhouse gas emissions. The digestate, which is one of the products of the fermentation process, can be used as an organic fertiliser reducing the amount of synthetic fertilisers used and favouring the implementation of sustainable agricultural practices. It is necessary to promote and support the integration of the waste management system into the biogas production system (use of agricultural biomass, in particular, manure and slurry, and biodegradable waste from industry and the municipal sector as raw materials for biogas production). To this end, it is essential to promote and support cooperation between public and private sector actors at all stages of the fermentation process: substrate supply, biogas production and use of fermentation products.

**Recommendation. Continue the expansion and modernisation of gas and electricity grids and infrastructure.**

The limited capacity of transmission grids to accept electricity, the poor state of the electricity infrastructure, and the long waiting time to receive conditions for connection to the OSD grid inhibit investment in biogas plants. The uneven availability of the gas grid in the country, combined with the high cost of adapting biogas parameters to those required by the grids also present technological and financial challenges. In addition, many problems are encountered with the use of surplus heat produced by biogas plants during the cogeneration process.

The development and modernisation of transmission networks and infrastructure are essential for the effective integration of biogas into the national electricity and gas grid. Priority should be given to the development and expansion of local electricity distribution networks and gas distribution networks that would connect biogas plants to nearby consumers, including domestic, agricultural and industrial households. Investment in biogas and transmission infrastructure at the local level supports the development of local energy sources, which in turn strengthens the energy independence of regions and contributes to the stability of supply at local and national levels. Solutions in which the local production and use of biogas or produced electricity and heat are integrated should be promoted.

In areas without a local gas grid, the solution should be to convert biogas into compressed biogas (CBG) or liquefied biogas (LBG) and transport it to collection points, which requires the development of appropriate infrastructure. The production of transport fuels from biogas will involve the need to develop vehicle refuelling infrastructure.

**Recommendation. Support for research and development.**

Support is needed for research and development in the optimisation of methane fermentation processes, including the use of a variety of substrates and their co-fermentation, and the optimisation of the use of fermentation products - biogas and digestate.

Priority should be given to funding research and development of biogas technologies optimised for small-scale, decentralised production, as well as technologies for purifying and upgrading biogas to biomethane and the possibility of using biogenic carbon dioxide.

Research into the creation and optimisation of local energy systems based on local resources should also be supported.

**Recommendation. Increase public awareness and level of knowledge about biogas production.**

There is a need for extensive information campaigns targeting the general public on the environmental and economic benefits of biogas production, highlighting its role in reducing greenhouse gas emissions, reducing energy costs and increasing energy security.

It is necessary to provide advisory support to investors, including representatives of local governments, cooperatives and energy clusters, to increase their knowledge of the possibilities of biogas production using local resources and the benefits of cooperation in this field.

It is necessary to provide specialised training for technicians, engineers and biogas plant operators to ensure that they are suitably qualified to manage and optimise biogas and biomethane production

processes. It is also necessary to include biogas and biomethane production issues in curricula and the national vocational qualification system.

#### **Recommendation. Ensuring the use of the digestate.**

A major problem is the lengthy procedure for obtaining certificates for the biogas plant-generated digestate, which would allow its use in agriculture as a soil conditioner or certified fertiliser. There is a need to ensure the efficient use of the digestate, which would allow the nutrient cycle to be closed. There is a need to ensure the quality of the digestate products by promoting national and international certifications (e.g. ECN-QAS, BSI PAS110) and streamlining the process of obtaining the opinions necessary for licensing by the Ministries of Agriculture and Rural Development.

#### **Recommendation. Monitoring and evaluation of biogas production efficiency.**

Effective monitoring and evaluation of biogas production efficiency at the national level require the development and implementation of an integrated system covering aspects of biogas production, distribution and use. The system should allow for the systematic collection of data on biogas production, energy efficiency, substrate consumption, amount of digestate produced, greenhouse gas emissions and financial performance in one place. The use of the digestate, including its use as fertiliser, should also be monitored to assess the implementation of a circular economy.

A system of Key Performance Indicators (KPIs) should be developed for monitoring purposes, including production-related indicators (e.g. volume of biogas produced, energy efficiency, methane content of biogas), economic indicators (e.g. production cost per m<sup>3</sup> of biogas, return on investment, financial efficiency) and environmental indicators (e.g. greenhouse gas emission reduction, volume of organic waste processed, quality of digestate).

Analysis of the collected data would enable identification of trends, challenges and opportunities for optimisation of biogas production processes and comparisons of the efficiency of individual biogas plants against a national and international background. The results of the analyses would be used to make decisions on financial, legislative and regulatory support.

The results of the monitoring should be published regularly in the form of publicly available reports. The reports should include information on progress in biogas production, challenges and achievements at the national level.

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