

Agricultural biogas market in Poland '2012 and prospect for 2020

The official documents state that in Poland, in the next decade the agricultural biogas plants will develop dynamically and are supposed to become a very significant player on the power market. The governmental document "Directions of agricultural biogas plants development in Poland" elaborated in 2009 assumes that to 2020 in every Polish rural community at least one biogas plant will be built. The agricultural biogas is supposed to grow dynamically from the current 17 plants (2011) to 2,000 in the year 2020. According to the National Renewable Action Plan (NREAP 2011) the expected installed biogas capacity in Poland is going to grow from the 67 MWe in 2009 to 328 MWe in 2015 and 900 MWe in 2020.

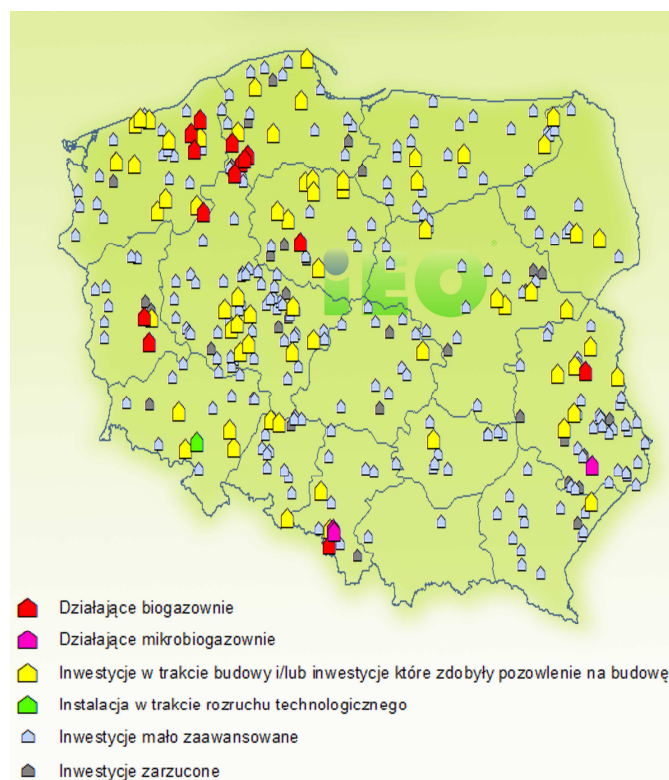


Fig. 1 Database of biogas investments in Poland in 2011

Investors and developers have rushed for the new investments (currently some 300 projects are under preparation), even despite the fact that in 2011 only 17 such projects were in operation (half of them belong to Poldanor - a food producer).

In Poland there are some 100 investors and developers, 30 technology providers (mainly from Germany and Austria, where this technology is strongest) and some 70 equipment distributors. However, the Polish market is not well prepared for the uptake of such high number of new agricultural biogas plants. Those who take the most risk are the developers (it can happen that they will find no buyer for their projects identified) and small investors (who believed that it is a very profitable business and invested their time or financial resources). The positive policy of the state does not automatically translate into success of investors if the technical, economic and regulatory risks are undermined.

Potential for development

Technical potential

In Poland, similarly as in Germany, the biggest potential for agricultural biogas production belongs to energy crops. In Germany the technical potential of 236 PJ is equivalent to 2 million hectares. The required agricultural area is assumed to be used in 10% for energy plantations, which means that 1,4 million hectares can be designated for energy crops. The experts estimate that out of this available potential for energy crops only 0,3 million hectares can be used for biogas dedicated projects.

Table 1 Comparison of economic potential for biogas plants for Poland and Germany in PJ

Technical potential	Poland	Germany
Animal waste	30	96,5
Industrial organic waste of agricultural origin	7	9,3
Energy plants	166	236

Source: Analysis of RES potentials for the Ministry of Regional Development, 2011

Market potential to 2020

In Germany, which has a mature market of 30 years development history, the installed agricultural biogas plants capacity in 2011 amounted to 2,6 GW_e¹. In 2020 Poland will celebrate 15 years of its policy support for agricultural biogas plants, and the installed capacities are expected to reach 0,9 GW_e.

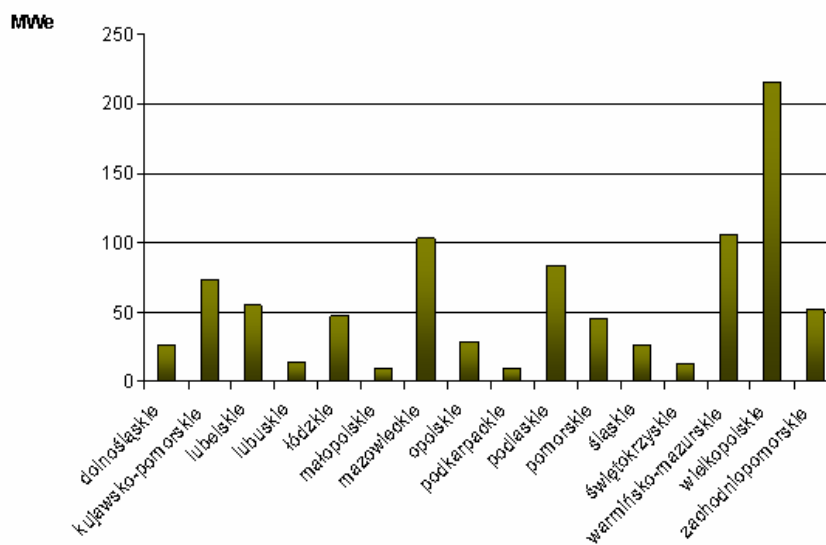


Fig. 2 Biogas market potential breakdown into regions

¹ Claudius da Costa Gomez 2011 da Costa Gomez. 2011.

Investment environment

The so far agricultural biogas plants investment experience in Poland is not abundant. The pioneering company Poldanor (food and meat producer in the north-western Poland) owns 7 agricultural biogas plants, with further expansion plans. It builds, finances and operates its own investments. Other agricultural biogas plants are realized with the assistance of technology providers. In Germany the experience in the realization of agricultural biogas plants is rich and well described. Out of 6800 plants in operation a few hundreds have been carefully monitored.

According to the assumptions of the National Renewable Energy Action Plan for Poland, the real potential market of agricultural biogas to be implemented by 2020, is 908 MW. In Poland during period 2014-2020, will be invested 2,3 bln EUR including 350 mln EUR for biogas.

The typical biogas plants realized in Germany are of smaller capacity (on average 500 kWe), compared to those planned/realised in Poland (however, the average size of the realised projects dropped from 1,5 MWe in 2009 to 0,9 MWe in 2011). Both in Poland and in Germany there is a tendency for the specific investment costs per kWe installed to drop with the plant's. For the same power capacities, the specific investment costs in Poland are still 20-30% higher than in Germany. This might be due to the higher investment risks involved (including the currency conversion risk). With the maturing of the market the average specific investment costs have dropped from 18-20 MPLN (4,5-5 MEur) per MWe in 2009 to 14-15 (3,5-4 MEur) MPLN per MWe in 2011.

In Poland the market price for maize silage (most popular energy crop in agricultural biogas plants) varies between 100 and 130 PLN/t. The cost for the slurry can be assumed from zero (own substrate) to 25 PLN/t. Many framers located close to the German border signed long term (20 years) contracts for the delivery of energy crops to German biogas plants.

Agricultural biogas plants have own income from the sale of products generated by it such as electricity, heat and digestate as fertilizer. Such products should be precisely listed and multiplied by the specific income values. The later are neither market average prices or negotiated with potential contractors. Such prices are negotiated bilaterally with either energy distributor for electricity, local farmers for the uptake of the digestate as fertiliser, and local district heating operators for produced heat. Prices indicated below are average market prices.

Table 1. Specific income items for agricultural biogas plant in Poland.

	Income
Electricity	197 PLN/MWh
Green certificates (RES)	255 PLN/MWh
Yellow certificates (cogeneration) only until 2012	124 PLN/MWh
Purple certificates (cogeneration)	56 PLN/MWh
Heat	20-25 PLN/GJ
Digestate as fertiliser	0-20 PLN/t

The main sellable product of a agricultural biogas plants is green electricity. The support system of biogas projects in Poland is based on the quota system and tradable certificates (green) of origin for RES and high efficiency cogeneration (yellow or purple). The total support (electricity price + green certificates + cogeneration certificates can amount up to 598 PLN/MWh (153 EUR/MWh), for plants below 1 MWe, and 532 PLN/MWh (137 EUR/MWh) for plants above 1 MWe. However, the calculation is more complicated due to price fluctuations on the market and no long term guarantee to sell (green certificates only to 2019). However, the support system will be changed with the new RES Act, currently the new draft is under the procedure of public evaluation. Role of economic evaluation in the investment's planning

Pleas contact us in case:

- you need market information
- you need assistance in the pre-investment phase: feasibility and opportunity studies
- you would like to enter the Polish market with your equipment
- you need legal and technical assistance along the investment process
- you need the monitoring assistance of the functioning plant

Our references

Guidelines

Guidelines for investors in agricultural biogas plants. 2011. Ordered by the Ministry of Economy.

Guidelines for investors in agricultural microbiogas plants. 2011. Ordered by the Institute for Eco- development.

Market studies

Biogas investments data base 2011.

Analysis of support schemes for microbiogas plants. 2011. Ordered by the Ministry of Economy.

Analysis of RES potentials in regions for the 2014-2020 financing perspective. 2011. Ordered by the Ministry of Regional Development.

Analysis of the RES equipment market. 2010. Ordered by the Ministry of Economy.

Feasibility studies (chosen)

Koczała biogas plant for Poldanor.

Orchówek biogas plant for PGE energy distributor

RD

EU Agrobiogas FP6

Medagascar IEE.

BiogazInwest – investment support tool.

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