REPORT

THE AGRICULTURAL BIOGAS PLANTS IN POLAND

Prepared by:

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1 SUMMARY

The analysis of the existing biogas plants in Poland indicates that the majority of them function in the direct vicinity of large animal farms or industrial plants, that is, close to the source of substrates. Currently there are 45 agricultural biogas plants in Poland with total electric capacity of 54 MW. The average installed electric capacity of the existing agricultural biogas plants is 1.2 MWe. Only three plants have the installed capacity of less than 0.5 MW. Generally it can be said that in the current investment environment in Poland the desired capacity of biogas plans is limited: from the bottom by economic calculations, and from the top by the availability of substrates and/or possibility of connecting to electrical grid. Optimal electric capacity of a biogas plant is 0.5 – 1.6 MWe – projects with such capacity are most effective financially and logistically (substrate supply and digestate utilization).

In 2013 Polish biogas plants produced:

- 112.43 milion m³ of agricultural biogas,
- 227.98 GWh of electricity,
- 249.08 GWh of heat.

The present report was compiled on the basis of widely available documents and information. This report provides information as of March, 2014.

2 DEVELOPMENT OF AGRICULTURAL BIOGAS POWER PLANTS MARKET IN POLAND

The development of biogas market in Poland is strongly connected with legal determinants. The first attempts to introduce biogas into Polish power industry on a large scale took place in 2001. It was then assumed in The Strategy of Development of Renewable Energetics that in 2010 in Poland biogas plants would have reached 30 MW of installed capacity and the production of electric energy from agricultural biogas would have amounted to 120 GWh a year. Now it is known to us that these, in fact not really unreasonable, assumptions were not achieved [1]. However, first steps towards identifying the obstacles and barriers to progress of this sector of renewable energetics. In 2005 the Evaluation of the Strategy of Development of Renewable Energetics and the “Directions of Development of Energetic Use of Biogas with a Suggestion of Action” was written. It was an expert opinion made to an order from the Department of Environment that was supposed to evaluate the current state of development of renewable energetics in Poland. In this document the barriers to development
of agricultural biogas plants were analyzed and described, and the ways to overcome them were indicated. These theories, however, did not translate into practice. In 2005 the “green certificate” system came into effect. It supported the development of renewable sources of energy. In the same year the first agricultural biogas plant in Poland was built – the project was carried out by Poldanor S.A. in Pawłówko (Przechlewo district) [1].

The breakthrough came not until 2008, when Innovative Energetics – Energy Agriculture (IE-EA) programme was inaugurated with its famous slogan “biogas plants in all districts.” In May, 2009, Ministry of Agriculture and Rural Development presented the assumptions of Agricultural Biogas Plants Development Programme, which, according to the department, were supposed to be a base for the IE-EA programme and to create favourable conditions for exploitation of agricultural energy potential. Ministry of Economy in cooperation with Ministry of Agriculture and Rural Development drew up a document called Directions of Agricultural Biogas Plants Development from 2010 to 2020 (DABPD), which was accepted by Council of Ministers on 15 July 2010. The implementation of DABPD is a priority of the fifth chapter of Energy policy in Poland until 2030 (Development of renewable sources of energy, including biofuel) [1].
The National Action Plan Concerning Energy from Renewable Sources (NAP) introduces a way in which Poland could attain the domestic target of market share for energy from renewable sources (15.5 % until 2020 in general and 19 % in energy market). The document also considers a high potential for biogas (agriculture biogas, landfill gas, sewage sludge biogas) development in Poland. According to the NAP in 2020 in Polish biogas plants will have reached 980 MW of total installed electric capacity [1].

The NAP assumed that in 2013 total installed electric capacity of biogas plants would reach 140 MW. According to data of Agricultural Market Agency (ARR) in 2013 there are installed electric capacity of 230 MW. The aim for 2013 has therefore been accomplished, but what definitely will be needed in the next years is a much faster increase in capacity. Agricultural biogas plants currently constitute only about 30 % of installed capacity of all biogas plants, but the potential for further development of landfill biogas or sewage sludge biogas plants are limited. Therefore the nearest future will probably bring the
fastest increase in number of facilities and in total installed capacity as far as agricultural biogas power plants are concerned [1].

4 RAW MATERIALS USED IN AGRICULTURAL BIOGAS IN POLAND

Essentially the most common substrates currently used in Polish installations is corn silage and other plants (32 installations), manure (20 installations) and distillers/waste from the distillery (10 installation). The common use of these substrates is mostly due to their high availability, ease of transport, cost of acquisition and ownership by the installation of appropriate technology, which allows the production of biogas with a specific type of material [2]. List of substrates used in Polish biogas Plants is presented in table 1.

Table 1. List of raw materials used for the production of agricultural biogas in 2011-2013.

<table>
<thead>
<tr>
<th>Type of raw material used to produce agricultural biogas</th>
<th>The amount of raw materials consumed in the production of agricultural biogas (in tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2011</td>
</tr>
<tr>
<td>1 Liquid Manure</td>
<td>265 960.79</td>
</tr>
<tr>
<td>2 Distillery slop</td>
<td>30 465.11</td>
</tr>
<tr>
<td>3 Corn silage</td>
<td>108 876.14</td>
</tr>
<tr>
<td>4 Residues from fruit and vegetables</td>
<td>10 984.35</td>
</tr>
<tr>
<td>5 Pulp</td>
<td>6 922.45</td>
</tr>
<tr>
<td>6 Pig manure</td>
<td>11 640.53</td>
</tr>
<tr>
<td>7 Whey</td>
<td>1 933.00</td>
</tr>
<tr>
<td>8 Potato pulp</td>
<td>7 258.49</td>
</tr>
<tr>
<td>9 Poultry manure</td>
<td>0.00</td>
</tr>
<tr>
<td>10 Glycerine</td>
<td>0.00</td>
</tr>
<tr>
<td>11 Slaughter waste</td>
<td>0.00</td>
</tr>
<tr>
<td>12 Residues from the processing of plant products</td>
<td>0.00</td>
</tr>
<tr>
<td>13 Fatty waste</td>
<td>285.65</td>
</tr>
<tr>
<td>14 Waste protein-fatty</td>
<td>0.00</td>
</tr>
<tr>
<td>15 Waste plant</td>
<td>0.00</td>
</tr>
<tr>
<td>16 Fodder</td>
<td>0.00</td>
</tr>
<tr>
<td>17 Grass silage</td>
<td>7 217.10</td>
</tr>
<tr>
<td>18 Lees</td>
<td>0.00</td>
</tr>
<tr>
<td>19 Liquid wheat</td>
<td>0.00</td>
</tr>
<tr>
<td>20 Waste chocolate</td>
<td>0.00</td>
</tr>
<tr>
<td>21 Protein deposits</td>
<td>0.00</td>
</tr>
<tr>
<td>22 Straw</td>
<td>0.00</td>
</tr>
<tr>
<td>23 Fatty sludge plant</td>
<td>0.00</td>
</tr>
<tr>
<td>24 Sludges protein-fatty</td>
<td>0.00</td>
</tr>
<tr>
<td>25 Waste from food processing</td>
<td>0.00</td>
</tr>
<tr>
<td>26 Cereal silage</td>
<td>5 973.80</td>
</tr>
</tbody>
</table>

Source: Agricultural Market Agency (ARR); 11 of March 2014 [2].
5 EXISTING BIOGAS PLANTS IN POLAND

Currently there are 45 agricultural biogas plants in Poland with total electric capacity of 54 MW [3]. It was in 2008 that the development of agricultural power plants in Poland speeded up, supported by a positive attitude of the government and by emerging possibilities of financing; it is worth stressing, though, that the first agricultural biogas plant in the country was launched just after Poland joined the EU – in 2005. It was the same year that the system of so called green certificates was initiated. This system is the foundation of Polish renewable energy sources support system. The first biogas facility was located in Pawłówko, next to a pig farm that belonged to Poldanor S.A., an agricultural company with Danish capital founded in 1994 [4].

The analysis of the existing biogas plants in Poland indicates that the majority of them function in the direct vicinity of large animal farms or industrial plants, that is, close to the source of substrates. Such a solution significantly simplifies substrate supply logistics, as well as minimizes transport costs (it is possible to install pipelines or conveyor belts). It is of particular importance when it comes to substrates of relatively low biogas production efficiency (substrates that give low amount of biogas from a ton of fresh mass), e.g. slurry or whey.

The average installed electric capacity of the existing agricultural biogas plants is 1.2 MWe. Only three plants have the installed capacity of less than 0.5 MW (in Niedoradz, Sławkowo and Kujanki), which results from economic calculations. What is more profitable currently is construction of biogas plants with higher installed capacity, under condition that, of course, there is sufficient amount of substrates available in a given location. Out of existing plants, 8 (in Koczała, Liszkowo, Kojepnica, Boleszyn, Zalesie, Rypin, Darżyno and Strzelin) have installed capacity of about 2 MW. Generally it can be said that in the current investment environment in Poland the desired capacity of biogas plans is limited: from the bottom by economic calculations, and from the top by the availability of substrates and/or possibility of connecting to electrical grid. Optimal electric capacity of a biogas plant is 0.5-1.6 MWe – projects with such capacity are most effective financially and logistically (substrate supply and digestate utilization) [1].

The following table 2 presents data on the production of biogas, electricity and heat from agricultural biogas in years 2011 – 2013 [1].
Table 2. Production of agricultural biogas, electricity and heat from agricultural biogas in years 2011 – 2013.

<table>
<thead>
<tr>
<th>Years</th>
<th>Number of agricultural biogas produced [million m$^3$]</th>
<th>The amount of electricity generated from agricultural biogas [GWh]</th>
<th>The amount of heat generated from agricultural biogas [GWh]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>36.65</td>
<td>73.43</td>
<td>82.63</td>
</tr>
<tr>
<td>2012</td>
<td>73.15</td>
<td>141.80</td>
<td>160.13</td>
</tr>
<tr>
<td>2013</td>
<td>112.43</td>
<td>227.98</td>
<td>249.08</td>
</tr>
</tbody>
</table>


From 1 January 2011, the President of the Agricultural Market Agency is a body registrar energy companies involved in the production of agricultural biogas. Entities entered into this register are required to submit quarterly reports containing information on:

a. the quantities and types of materials used in the manufacture of agricultural biogas or to generate electricity from agricultural biogas,

b. the quantities of agricultural biogas produced, detailing the amount of agricultural biogas introduced into the gas distribution network, used to generate electricity in a split arrangement or cogeneration or used in any other way,

c. the amount of heat and electricity produced from agricultural biogas in a split arrangement or cogeneration.

Existing biogas plants in Poland are presented on Figure 1, Table 3 and in Appendix 1 to this report.
Figure 1. Existing biogas plants in Poland.
### Table 3. Existing biogas plants in Poland.

<table>
<thead>
<tr>
<th></th>
<th>Ag. biogas plant in Koczała</th>
<th>16. Ag. biogas plant in Uhnin</th>
<th>31. Ag. biogas plant in Łęguty</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Ag. biogas plant in Pawłówko</td>
<td>17. Ag. biogas plant in Konopnica</td>
<td>32. Ag. biogas plant in Orchówek</td>
</tr>
<tr>
<td>3</td>
<td>Ag. biogas plant in Płaszczyna</td>
<td>18. Ag. biogas plant in Melno</td>
<td>33. Ag. biogas plant in Darżyno</td>
</tr>
<tr>
<td>4</td>
<td>Ag. biogas plant in Naclaw</td>
<td>19. Ag. biogas plant in Piaski</td>
<td>34. Ag. biogas plant in Sobawiny near Opoczno</td>
</tr>
<tr>
<td>5</td>
<td>Ag. biogas plant in Świeleno</td>
<td>20. Ag. biogas plant in Zbiersk - Cukrownia</td>
<td>35. Ag. biogas plant in Byszewo</td>
</tr>
<tr>
<td>6</td>
<td>Ag. biogas plant in Uniechów</td>
<td>21. Ag. biogas plant in Boleszyn</td>
<td>36. Ag. biogas plant in Przemysław</td>
</tr>
<tr>
<td>7</td>
<td>Ag. biogas plant in Giżyno</td>
<td>22. Ag. biogas plant in Klępsk</td>
<td>37. Ag. biogas plant in Lębork</td>
</tr>
<tr>
<td>8</td>
<td>Ag. biogas plant in Kujanki</td>
<td>23. Ag. biogas plant in Szklarka Myślniewska</td>
<td>38. Ag. biogas plant in Glinojeck</td>
</tr>
<tr>
<td>9</td>
<td>Ag. biogas plant in Niedoradz</td>
<td>24. Ag. biogas plant in Piekoszów</td>
<td>39. Ag. biogas plant in Borzęciczki</td>
</tr>
<tr>
<td>10</td>
<td>Ag. biogas plant in Kalsk</td>
<td>25. Ag. biogas plant in Zalesie</td>
<td>40. Ag. biogas plant in Ślawkowo</td>
</tr>
<tr>
<td>11</td>
<td>Ag. biogas plant in Liszkowo</td>
<td>26. Ag. biogas plant in Strzelin</td>
<td>41. Ag. biogas plant in Giże</td>
</tr>
<tr>
<td>12</td>
<td>Ag. biogas plant in Skrzatusz</td>
<td>27. Ag. biogas plant in Koczergi near Parczew</td>
<td>42. Ag. biogas plant in Tragamin near Malborka</td>
</tr>
<tr>
<td>13</td>
<td>Ag. biogas plant in Grzmiąca</td>
<td>28. Ag. biogas plant in Zaścianki</td>
<td>43. Ag. biogas plant in Ryboły</td>
</tr>
<tr>
<td>14</td>
<td>Ag. biogas plant in Świdnica</td>
<td>29. Ag. biogas plant in Bielany Wrocławskie</td>
<td>44. Ag. biogas plant in Łagiewniki</td>
</tr>
<tr>
<td>15</td>
<td>Ag biogas plant in Łany Wielkie</td>
<td>30. Ag. biogas plant in Rypin</td>
<td>45. Ag. biogas plant in Działyń</td>
</tr>
</tbody>
</table>
6 DETAILED DESCRIPTION OF BIOGAS PLANTS IN POLAND

Each biogas plant has a different, personalized design, adapted to the different composition of the feed material. Biogas plant mostly consists of:

- Tanks for biomass,
- Fermentation tanks,
- Tanks for fermented substances,
- Cogeneration system (gas engine + electric generator) producing electricity and heat, installed in the building of a technical or container,
- Sanitary, safety, electrical, including control systems that integrate all components.

In the reservoir of raw material, otherwise referred to as the preliminary storage tank, are mixed together animal excrement and organic waste, which are thus fed into the fermentation chamber. Fermentation chamber (known as a bioreactor) is the heart of biogas plant, because there is a process of fermentation of organic material and production of biogas. The fermentation chamber should meet certain basic assumptions, to ensure the proper conduct of the process. Its walls must be gas and fluid proof, and thanks to good thermal insulation to prevent heat loss and temperature extremes.

To fermentation process was efficient, fermentation tank should be equipped with a stirring system. These are generally mechanical stirrer placed inside the chamber, or the hydraulic pump disposed outside or inside the chamber. In order to ensure optimal fermentation process inside the fermenter there must be a uniform temperature. We have to take into account that each type of bacteria involved in the metabolic processes needs a different temperature. If the desired temperature ranges are exceeded, may be inhibited or even damage the bacteria.

There are three temperature ranges in which the fermentation process takes place:

- Psychrophilic (at 10 - 25 °C)
- Mesophilic (at 32 - 42 °C)
- Thermophilic (at 50 - 55 °C).

Selection process temperature depends on the individual parameters of biogas plant, but biogas production is only viable mesophilic and thermophilic in the temperature range.

Detailed description of existing biogas plants in Poland is presented below.
### 1. Agricultural biogas plant in Koczała

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>2126 kWe</th>
<th>Owner of the plant:</th>
<th>Poldanor S.A.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>2206 kWt</td>
<td>Opening date:</td>
<td>15 April 2009</td>
</tr>
</tbody>
</table>

#### Location:

- **Town/village:** Koczała
- **District:** Koczała
- **County:** Człuchów
- **Province:** Pomorskie

#### Project description (main facilities):  
- Two-chamber pre-storage tank with capacity 4,000 m³
- Component storage tank with capacity 615 m³
- Mixing tank with capacity 352 m³
- 3 fermenters with capacity 9 030 m³
- 2 post-fermentation tanks with capacity 7 980 m³
- Component storage area
- Service building
- Transformer station
- Pumping station

#### Input materials:
- Liquid manure feedstock – 55 000 tonnes per year
- Corn silage feedstock – 25 000 tonnes per year
- Glycerine feedstock – 10 000 tonnes per year
- Total capacity of fermentation chambers 9 000 m³
- 2 power and heat units with a total electric power of 2126 kW and thermal power of 2206 kW
- Gas furnace with a thermal power of 1900 kW

#### Annual output of the plant:
- Biogas: approx. 8 212 500 m³/year
- Electricity: approx. 16 761 384 kWh/year
- Heat: approx. 17 392 104 kWh/year
### 2. Agricultural biogas plant in Pawłówko

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>946 kWe</th>
<th>Owner of the plant:</th>
<th>Poldanor S.A.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>1101 kWt</td>
<td>Opening date:</td>
<td>June 9, 2005</td>
</tr>
</tbody>
</table>

**Location:**
- Town/village: Pawłówko
- District: Chojnice
- County: Chojnice
- Province: Pomorskie

**Project description (main facilities):**
- Raw material reception station
- Primary tank with pumping station
- 2 digestion tanks
- Technical facility with hygienisation unit
- Post-digestion tank

**Input materials:**
- Liquid manure input – 29 000 tons/year
- Maize silage input – 5 500 tons/year
- Slaughter waste input – 3 000 tons/year
- Glycerine input – 1 000 tons/year
- Total capacity of digestion chambers – 1500 m³
- 2 combined heating and power stations with the electric power of 230 kW and 495 kW
- Gas boiler with the thermal power of 350 kW

**Annual output if the biogas plant:**
- Biogas: approx. 3 802 655 m³/year
- Electricity: approx. 7 458 260 kWh/year
- Heat: approx. 8 680 284 kWh/year
### 3. Agricultural biogas plant in Płaszczyca

<table>
<thead>
<tr>
<th>Electrical capacity: 625 kWe</th>
<th>Owner of the plant: Poldanor S.A.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity: 680 kWt</td>
<td>Opening date: April 21, 2008</td>
</tr>
</tbody>
</table>

**Location:**
- Town/village: Płaszczyca
- District: Przechlewo
- County: Człóchów
- Province: Pomorskie

**Project description (main facilities):**
- 2 primary tanks with the capacity of 300 m³
- Component tank with the capacity of 300 m³
- Digestion tank with the capacity of 1500 m³
- Post-digestion tank with the capacity of 2000 m³
- Technical facility
- Technical shelter
- Fire-fighting tank

**Input materials:**
- Liquid manure input – 18 500 tons/year
- Maize silage input – 3 700 tons/year
- Plant waste input – 1 000 tons/year
- Herbal product processing waste input – 500 tons/year
- Combined heating and power station with the electric power of 625 kW and thermal power of 692 kW
- Heating boiler with the thermal power of 600 kW.

**Annual output of the plant:**
- Biogas: approx. 2 299 500 m³/year
- Electricity: approx. 4 927 500 kWh/year
- Heat: approx. 5 361 120 kWh/year
### 4. Agricultural biogas plant in Nacław

<table>
<thead>
<tr>
<th><strong>Electrical capacity:</strong></th>
<th>625 kWe</th>
<th><strong>Owner of the plant:</strong></th>
<th>Poldanor S.A.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal capacity:</strong></td>
<td>686 kWt</td>
<td><strong>Opening date:</strong></td>
<td>7 June, 2010</td>
</tr>
</tbody>
</table>

**Location:**

- **Town/village:** Nacław
- **District:** Polanów
- **County:** Koszalin
- **Province:** Zachodniopomorskie

**Project description (main facilities):**

- Component storage area with a feeder, with total area 288 m²
- Component storage tank no. 1 with capacity 32 m³
- Component storage tank no. 2 with capacity 32 m³
- Pre-storage tank with capacity 1 000 m³
- Fermenter with capacity 1 250 m³
- Post-fermentation tank with capacity 2 000 m³
- Service building
- Service shed with mixing tank
- Cogeneration unit with a power of 625 kWe and 680 kWt
- Heat furnace with a power of 690 kW
- Emergency cooler
- Two-chamber tank for pre-fermented liquid manure – 2 x 10 000 m³

**Input materials:**

- Liquid manure feedstock – 20 000 tonnes per year
- Corn silage feedstock – 13 800 tonnes per year
- Glycerine feedstock – 4 700 tonnes per year (optional)

**Annual output of the plant:**

- Biogas – approx. 2 299 500 m³/year
- Electricity – approx. 4 927 500 kWh/year
- Heat – approx. 5 408 424 kWh/year
5. Agricultural biogas plant in Świelino

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>625 kWe</th>
<th>Owner of the plant:</th>
<th>Poldanor S.A.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>686 kWt</td>
<td>Opening date:</td>
<td>15 November, 2010</td>
</tr>
</tbody>
</table>

Location:
- Town/village: Świelino
- District: Bobolice
- County: Koszalin
- Province: Zachodniopomorskie

Project description (main facilities):
- Component storage area
- Pre-storage tank with capacity 962 m³
- Component storage tank with capacity 962 m³
- Fermenter with capacity 3 990 m³
- Post-fermentation tank with capacity 2 490 m³
- Service building
- Pumping station
- Biogas purification system
- Cooler
- Transformer station
- Power generator with power of 625 kWe and 686 kWt
- Heat furnace with power of 701 kW

Input materials:
- Liquid manure feedstock – 11 000 tonnes per year
- Corn silage feedstock – 14 000 tonnes per year
- Glycerine feedstock – 4 000 tonnes per year (optional)

Annual output of the plant:
- Biogas – approx. 2 299 500 m³/year
- Electricity – approx. 4 927 500 kWh/year
- Heat – approx. 5 408 424 kWh/year
### 6. Agricultural biogas plant in Uniechówek

<table>
<thead>
<tr>
<th>Electrical capacity: 1063 kWe</th>
<th>Owner of the plant: Poldanor S.A.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity: 1081 kWt</td>
<td>Opening date: 18 April, 2011</td>
</tr>
</tbody>
</table>

#### Location:
- **Town/village:** Uniechówek
- **District:** Debrzno
- **County:** Człuchów
- **Province:** Pomorskie

#### Project description (main facilities):
- Component storage area
- Pre-storage tank with capacity 1,464 m³
- Component storage tank with capacity 962 m³
- Fermenter no. 1 with capacity 3,990 m³
- Fermenter no. 2 with capacity 3,884 m³
- Post-fermentation tank with capacity 2,490 m³
- Service building
- Pumping station
- Biogas purification system
- Cooler
- Transformer station
- Power generator with a capacity of 1,063 kWe and 1,081 kWt
- Heat furnace with a power of 1,200 kW

#### Input materials:
- Liquid manure feedstock: approx. 36,500 tonnes per year
- Corn silage feedstock: approx. 17,520 tonnes per year

#### Annual output of the plant:
- Biogas: approx. 4,100,200 m³/year
- Electricity: approx. 8,380,700 kWh/year
- Heat: approx. 8,522,604 kWh/year
## 7. Agricultural biogas plant in Giżyno

<table>
<thead>
<tr>
<th><strong>Electrical capacity</strong></th>
<th>1063 kWe</th>
<th><strong>Owner of the plant</strong></th>
<th>Poldanor S.A.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal capacity</strong></td>
<td>1081 kWt.</td>
<td><strong>Opening date</strong></td>
<td>23 September, 2011</td>
</tr>
</tbody>
</table>

**Location:**
- **Town/village:** Giżyno  
- **District:** Kalisz Pomorski  
- **County:** Drawski  
- **Province:** Zachodniopomorskie

**Project description (main facilities):**
- Component storage area
- Pre-storage tank with capacity 1 464 m³
- Component storage tank with capacity 962 m³
- Fermenter no. 1 with capacity 3 990 m³
- Fermenter no. 2 with capacity 3 884 m³
- Post-fermentation tank with capacity 2 490 m³
- Service building
- Pumping station
- Biogas purification system
- Cooler
- Transformer station
- Power generator with a capacity of 1 063 kWe and 1 081 kWt
- Heat furnace with a power of 1 200 kW

**Input materials:**
- Liquid manure feedstock: approx. 36 500 tonnes per year
- Corn silage feedstock: approx. 17 520 tonnes per year

**Annual output of the plant:**
- Biogas: approx. 4 100 200 m³/year
- Electricity: approx. 8 380 000 kWh/year
- Heat: approx. 8 520 000 kWh/year
## 8. Agricultural biogas plant in Kujanki

<table>
<thead>
<tr>
<th><strong>Electrical capacity:</strong></th>
<th>330 kWe</th>
<th><strong>Owner of the plant:</strong></th>
<th>Poldanor S.A.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal capacity:</strong></td>
<td>342 kWt</td>
<td><strong>Opening date:</strong></td>
<td>2 October 2008</td>
</tr>
</tbody>
</table>

**Location:**
- **Town/village:** Kujanki
- **District:** Człuchów
- **County:** Człuchów
- **Province:** Pomorskie

**Project description (main facilities):**
The agricultural biogas plant in Kujanki produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit.

**Input materials:**
- Liquid manure feedstock
- Glycerine

**Annual output of the plant:**
- Biogas: approx. 1,124,470 m³/year
- Electricity: approx. 2,602,000 kWh/year
- Heat: approx. 2,696,000 kWh/year
9. Agricultural biogas plant in Niedoradz

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>252 kWe</th>
<th>Owner of the plant:</th>
<th>Biogas Agri Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>291 kWt</td>
<td>Opening date:</td>
<td>2009</td>
</tr>
</tbody>
</table>

**Location:**
- Town/village: Niedoradz
- District: Otyń
- County: Nowosolski
- Province: Lubuskie

**Project description (main facilities):**
The agricultural biogas plant in Niedoradz produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. Biogas plant is located at the large-scale pig farm. The input material is composed of liquid pig manure mixed with supplementary components: poultry and corn silage. Technology provider in Niedoradz is BD Agro Renewables, and the owner of a biogas plant is Biogas Agri Sp. z o.o.

**Input materials:**
- Pig and poultry manure feedstock
- Corn silage

**Annual output of the plant:**
- Biogas: approx. 631 000 m³/year
- Electricity: approx. 1 300 000 kWh/year
- Heat: approx. 1 500 000 kWh/year
## 10. Agricultural biogas plant in Kalsk

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>1140 kWe</th>
<th>Owner of the plant:</th>
<th>Gospodarstwo Rolne in Buków Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>1060 kWt.</td>
<td>Opening date:</td>
<td>2010</td>
</tr>
</tbody>
</table>

### Location:
- **Town/village:** Kalsk near Sulechów
- **District:** Sulechów
- **County:** Zielona Góra
- **Province:** Lubuskie

### Project description (main facilities):
The agricultural biogas plant in Kalsk produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The electricity (92%) is sold to the power company and the remainder (8%) is consumed by the plant. The heat generated is used to heat the local dryer. The owner of a biogas plant is Gospodarstwo Rolne in Buków Sp. z o.o.

### Input materials:
- Pig and poultry manure feedstock
- Corn silage

### Annual output of the plant:
- **Biogas:** approx. 5 000 000 m³/year
- **Electricity:** approx. 9 000 000 kWh/year
- **Heat:** approx. 12 500 000 kWh/year
### 11. Agricultural biogas plant in Liszkowo

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>2126 kWe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>1198 kWt</td>
</tr>
<tr>
<td>Owner of the plant:</td>
<td>ENEA - Elektrownie Wodne Sp. z o.o.</td>
</tr>
<tr>
<td>Opening date:</td>
<td>2009</td>
</tr>
</tbody>
</table>

**Location:**
- **Town/village:** Liszkowo
- **District:** Rojewo
- **County:** Inowrocław
- **Province:** Kujawsko-pomorskie

![Map of Poland showing location of Liszkowo](image)

**Project description (main facilities):**

The agricultural biogas plant in Liszkowo produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The input material is composed of plant substrates, mainly corn silage and others plant wastes in smaller quantities. Additional is used distillery slop. The biogas plant was built by Agrogaz Sp. z o.o., then sold to energy company ENEA. Currently, the owner of the plant is the company ENEA - Elektrownie Wodne Sp. z o.o.

The Liszkowo biogas plant is composed of the following facilities:
- Fermenters with capacity 12 000 m³
- 2 power generator Jenbacher MC 320 with a capacity of 2.1 MW

**Input materials:**
- Corn silage
- Plant wastes
- Distillery slop

**Annual output of the plant:**
- Biogas: approx. 7 400 000 m³/year
- Electricity: approx. 14 400 000 kWh/year
- Heat: approx. 8 100 000 kWh/year
12. Agricultural biogas plant in Skrzatusz

<table>
<thead>
<tr>
<th><strong>Electrical capacity:</strong></th>
<th>526 kWe</th>
<th><strong>Owner of the plant:</strong></th>
<th>Biogaz Zeneris Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal capacity:</strong></td>
<td>505 kWt</td>
<td><strong>Opening date:</strong></td>
<td>March, 2011</td>
</tr>
</tbody>
</table>

**Location:**
- **Town/village:** Skatusz
- **District:** Szydłowo
- **County:** Pilsk
- **Province:** Wielkopolskie

**Project description (main facilities):**
The agricultural biogas plant in Skrzatusz produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The input material is composed of distillery slop mixed with supplementary components: potato pulp, corn silage, slaughter waste input and by-products from the production of carrot juice. The electricity is sold to the power company, and 200 kW of thermal energy in the form of steam provides a local distillery.

**Main facilities:**
- Pre-storage tank with capacity 402 m³
- Fermenter with capacity 3 041 m³
- Post-fermentation tank with capacity 1 061 m³
- Service building
- Pumping station

**Input materials:**
- Distillery slop – 43 tons/day
- Potato pulp – 15 tons/day
- Corn silage – 15 tons/day
- Slaughter waste input 5.5 tons/day
- Products from the production of carrot juice – 7 tons/day

**Annual output of the plant:**
- **Biogas:** approx. 2 102 400 m³/year
- **Electricity:** approx. 4 607 760 kWh/year
- **Heat:** approx. 4 423 800 kWh/year
### 13. Agricultural biogas plant in Grzmiąca

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>1600 kWe</th>
<th>Owner of the plant:</th>
<th>Eko-Energia Grzmiąca Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>1600 kWt</td>
<td>Opening date:</td>
<td>26 January, 2011</td>
</tr>
</tbody>
</table>

**Location:**
- Town/village: Grzmiąca
- District: Grzmiąca
- County: Szczecinecki
- Province: Zachodniopomorskie

**Project description (main facilities):**

The agricultural biogas plant in Grzmiąca produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The heat produced from the biogas is used to heat public buildings - schools, sports hall, health center and residential areas. The owner of the plant is Eko-Energia Grzmiąca Sp. z o.o.

Main facilities:
- 2 x pre-storage tank with capacity 59 m³
- 3 x fermenter with capacity 2 945 m³
- Post-fermentation tank with capacity 4 825 m³
- Service building
- Pumping station

**Input materials:**
- Pig and poultry manure
- Corn and grass silage
- Raw materials from the processing industry – distillery slop, potato pulp and used cooking oil

**Annual output of the plant:**
- Biogas: approx. 7 000 000 m³/year
- Electricity: approx. 13 500 000 kWh/year
- Heat: approx. 14 500 000 kWh/year
### 14. Agricultural biogas plant in Świdnica

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>900 kWe</th>
<th>Owner of the plant:</th>
<th>BIO-WAT Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>1100 kWt</td>
<td>Opening date:</td>
<td>2011</td>
</tr>
</tbody>
</table>

**Location:**
- Town/village: Świdnica
- District: Świdnica
- County: Świdnica
- Province: Dolnośląskie

**Project description (main facilities):**
The agricultural biogas plant in Świdnica produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit.

**Input materials:**
- Corn and grass silage
- Beet leaves

**Annual output of the plant:**
- Biogas: approx. 4 000 000 m³/year
- Electricity: approx. 7 200 000 kWh/year
- Heat: approx. 8 800 000 kWh/year
## 15. Agricultural biogas plant in Łany Wielkie

<table>
<thead>
<tr>
<th><strong>Electrical capacity:</strong></th>
<th>526 kWe</th>
<th><strong>Owner of the plant:</strong></th>
<th>BIO-BUT Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal capacity:</strong></td>
<td>540 kWt</td>
<td><strong>Opening date:</strong></td>
<td>29 November, 2011</td>
</tr>
<tr>
<td><strong>Location:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Town/village: Łany Wielkie</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>District: Sośnicowice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>County: Gliwice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Province: Śląskie</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Project description (main facilities):

The agricultural biogas plant in Łany Wielkie produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The biogas plant is working with a distillery located in the neighborhood. The biogas plant receives waste in the form of distillery slopes and supplying generated thermal energy to distillery. The owner of the plant is BIO-BUT Sp. z o.o.

Main facilities:
- Pre-storage tank with capacity 950 m³
- Fermenter with capacity 5 440 m³
- Service building
- Pumping station

### Input materials:

- Distillery slop – 18 250 tones/year
- Corn silage – 1 054 tons/year
- Manure – 14 600 tones/year

### Annual output of the plant:

- Biogas: approx. 2 470 915 m³/year
- Electricity: approx. 4 471 000 kWh/year
- Heat: approx. 4 625 000 kWh/year
### 16. Agricultural biogas plant in Uhnin

<table>
<thead>
<tr>
<th><strong>Electrical capacity:</strong></th>
<th>1200 kWe</th>
<th><strong>Owner of the plant:</strong></th>
<th>Bioelektrownia Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal capacity:</strong></td>
<td>1160 kWt</td>
<td><strong>Opening date:</strong></td>
<td>29 September, 2011</td>
</tr>
</tbody>
</table>

**Location:**
- Town/village: Uhnin
- District: Dębowa Kłoda
- County: Parczew
- Province: Lubelskie

**Project description (main facilities):**
The agricultural biogas plant in Uhnin produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The biogas plant cover annual demand for energy of about 19 thousand people, residents of the municipality and town Parczew and municipality Dębowa Kłoda. The owner of the plant is Bioelektrownia Sp. z o.o.

**Input materials:**
- Corn, grass and rye silage
- Distillery slop
- Potato pulp

**Annual output of the plant:**
- Biogas: approx. 4 500 000 m³/year
- Electricity: approx. 10 000 000 kWh/year
- Heat: approx. 9 600 000 kWh/year
### 17. Agricultural biogas plant in Konopnica

<table>
<thead>
<tr>
<th><strong>Electrical capacity:</strong></th>
<th>1998 kWe</th>
<th><strong>Owner of the plant:</strong></th>
<th>Bioenergy Project Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal capacity:</strong></td>
<td>2128 kWt</td>
<td><strong>Opening date:</strong></td>
<td>June, 2012</td>
</tr>
</tbody>
</table>

**Location:**
- **Town/village:** Konopnica
- **District:** Rawa Mazowiecka
- **County:** Rawski
- **Province:** Łódzkie

**Project description (main facilities):**
The agricultural biogas plant in Konopnica produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The electricity is partly sold to the power company. The thermal energy is used for own needs, but most of it is supplied by district heating to the city of Rawa Mazowiecka and the surrounding industrial plants. The owner of the plant is Bioenergy Project Sp. z o.o.

**Input materials:**
- Corn and grass silage

**Annual output of the plant:**
- Biogas: approx. 9 353 755 m³/year
- Electricity: approx. 17 083 000 kWh/year
- Heat: approx. 18 194 000 kWh/year
## 18. Agricultural biogas plant in Mełno

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>1600 kWe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner of the plant:</td>
<td>Allter power Sp. z o.o.</td>
</tr>
<tr>
<td>Thermal capacity:</td>
<td>1800 kWt</td>
</tr>
<tr>
<td>Opening date:</td>
<td>2012</td>
</tr>
</tbody>
</table>

### Location:
- Town/village: Mełno
- District: Gruta
- County: Grudziądz
- Province: Kujawsko-pomorskie

### Project description (main facilities):
The agricultural biogas plant in Mełno produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. Installation was established in the former sugar factory in Mełno, together with the biogas plant was built a distillery. Distillers is the substrate used in the biogas plant and the heat generated during combustion is used to generate steam for the distillery. The biogas plant in Mełno is the first in Poland where the biogas is produced in a process of a thermophilic fermentation - fermentation tank temperature reaches 55°C. The owner of the plant is Allter power Sp. z o.o.

### Input materials:
- Distillery slop

### Annual output of the plant:
- Biogas: approx. 6 200 000 m³/year
- Electricity: approx. 12 800 000 kWh/year
- Heat: approx. 14 400 000 kWh/year
19. Agricultural biogas plant in Piaski

<table>
<thead>
<tr>
<th><strong>Electrical capacity:</strong></th>
<th>999 kWe</th>
<th><strong>Owner of the plant:</strong></th>
<th>Wikana Bioenergia Sp. J.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal capacity:</strong></td>
<td>1039 kWt</td>
<td><strong>Opening date:</strong></td>
<td>7 October, 2011</td>
</tr>
</tbody>
</table>

**Location:**

- **Town/village:** Piaski
- **District:** Piaski
- **County:** Świdnica
- **Province:** Lubelskie

**Project description (main facilities):**
The agricultural biogas plant in Piaski produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The substrates are supplied from local dairy and the surrounding farms. The owner of the plant is Wikana Bioenergia Sp. j.

**Input materials:**
- Corn silage
- Whey
- Manure

**Annual output of the plant:**
- **Biogas:** approx. 4 250 000 m³/year
- **Electricity:** approx. 8 000 000 kWh/year
- **Heat:** approx. 9 600 000 kWh/year
## 20. Agricultural biogas plant in Zbiersk - Cukrownia

<table>
<thead>
<tr>
<th><strong>Electrical capacity:</strong></th>
<th>1600 kWe</th>
<th><strong>Owner of the plant:</strong></th>
<th>AWW Wawrzyniak Sp. J.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal capacity:</strong></td>
<td>1620 kWt</td>
<td><strong>Opening date:</strong></td>
<td>2012</td>
</tr>
</tbody>
</table>

### Location:
- **Town/village:** Zbiersk
- **District:** Stawiszyn
- **County:** Kalisz
- **Province:** Wielkopolskie

### Project description (main facilities):
The agricultural biogas plant in Zbiersk produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The owner of the plant is AWW Wawrzyniak Sp. J.

### Input materials:
- Distillery slop

### Annual output of the plant:
- Biogas: approx. 4,176,558 m³/year
- Electricity: approx. 12,800,000 kWh/year
- Heat: approx. 12,960,000 kWh/year
## 21. Agricultural biogas plant in Boleszyn

<table>
<thead>
<tr>
<th><strong>Electrical capacity:</strong></th>
<th>2000 kWe</th>
<th><strong>Owner of the plant:</strong></th>
<th>Biogal Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal capacity:</strong></td>
<td>2020 kWt</td>
<td><strong>Opening date:</strong></td>
<td>May, 2012</td>
</tr>
</tbody>
</table>

**Location:**
- **Town/village:** Boleszyn
- **District:** Grodzicno
- **County:** Nowomiejski
- **Province:** Warmińsko-mazurskie

**Project description (main facilities):**
The agricultural biogas plant in Boleszyn produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit.
The owner of the plant is Biogal Sp. z o.o.

**Input materials:**
- Corn silage
- Manure
- Distillery slop
- Whey

**Annual output of the plant:**
- Biogas: approx. 7 840 000 m³/year
- Electricity: approx. 15 200 000 kWh/year
- Heat: approx. 15 360 000 kWh/year
### 22. Agricultural biogas plant in Klępsk

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>1000 kWe</th>
<th>Owner of the plant:</th>
<th>Gospodarstwo Rolne Kargowa – Klępsk Ryszard Maj.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>1400 kWt</td>
<td>Opening date:</td>
<td>2012</td>
</tr>
</tbody>
</table>

#### Location:
- Town/village: Klępsk
- District: Sulechów
- County: Zielona Góra
- Province: Lubuskie

#### Project description (main facilities):
The agricultural biogas plant in Klępsk produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The owner of the plant is Gospodarstwo Rolne Kargowa – Klępsk Ryszard Maj.

#### Input materials:
- Corn silage
- Pig manure

#### Annual output of the plant:
- Biogas: approx. 4 633 117 m³/year
- Electricity: approx. 8 147 000 kWh/year
- Heat: approx. 11 406 000 kWh/year
23. Agricultural biogas plant in Szklarka Myślniewska

<table>
<thead>
<tr>
<th>Electrical capacity: 660 kWe</th>
<th>Owner of the plant: P.P.H.U. “SERAFIN” Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity: 640 kWt</td>
<td>Opening date: 2012</td>
</tr>
</tbody>
</table>

**Location:**
- Town/village: Szklarka Myślniewska
- District: Ostrzeszów
- County: Ostrzeszów
- Province: Wielkopolskie

**Project description (main facilities):**
The agricultural biogas plant in Szklarka Myślniewska produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The owner of the plant is P.P.H.U. “SERAFIN” Sp. z o.o.

**Input materials:**
- Corn silage
- Pig manure

**Annual output of the plant:**
- Biogas: approx. 3 000 000 m³/year
- Electricity: approx. 5 493 000 kWh/year
- Heat: approx. 5 326 000 kWh/year
# 24. Agricultural biogas plant in Piekoszów

<table>
<thead>
<tr>
<th><strong>Electrical capacity:</strong></th>
<th>800 kWe</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Owner of the plant:</strong></td>
<td>Elektrociepłownia Bartos Sp. z o.o.</td>
</tr>
<tr>
<td><strong>Thermal capacity:</strong></td>
<td>855 kWt</td>
</tr>
<tr>
<td><strong>Opening date:</strong></td>
<td>July, 2012</td>
</tr>
</tbody>
</table>

**Location:**
- **Town/village:** Piekoszów
- **District:** Piekoszów
- **County:** Kielce
- **Province:** Świętokrzyskie

**Project description (main facilities):**

The agricultural biogas plant in Piekoszów produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The owner of the plant is Elektrociepłownia Bartos Sp. z o.o.

**Main facilities:**
- 3 x fermenter with capacity 1 526 m³
- 2 x post-fermentation tank with capacity 4 526 m³
- Service building
- Pumping station

**Input materials:**
- Corn silage
- Manure (all together 22 210 tons/year)

**Annual output of the plant:**
- Biogas: approx. 2 464 000 m³/year
- Electricity: approx. 6 200 000 kWh/year
- Heat: approx. 6 350 000 kWh/year
# 25. Agricultural biogas plant in Zalesie

<table>
<thead>
<tr>
<th><strong>Electrical capacity:</strong></th>
<th>2000 kWe</th>
<th><strong>Owner of the plant:</strong></th>
<th>Polskie Biogazownie “Energ Zalesie” Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal capacity:</strong></td>
<td>2016 kWt</td>
<td><strong>Opening date:</strong></td>
<td>10 October, 2012</td>
</tr>
</tbody>
</table>

**Location:**
- **Town/village:** Zalesie
- **District:** Domaszowice
- **County:** Namysłów
- **Province:** Opolskie

**Project description (main facilities):**
The agricultural biogas plant in Zalesie produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The biogas plant was established with a large pig farm Ferma-Pol. They produced about 70,000 m³ of liquid manure per year. The electricity is sold to the power company and thermal energy is used mainly for own needs.

**Main facilities:**
- Pre-storage tank with capacity 452 m³
- 2 x fermenter with capacity 3,147 m³
- Post-fermentation tank with capacity 4,823 m³
- Service building
- Pumping station

**Input materials:**
- Liquid manure
- Potato pulp

**Annual output of the plant:**
- Biogas: approx. 8,000,000 m³/year
- Electricity: approx. 17,520,000 kWh/year
- Heat: approx. 17,660,000 kWh/year
### 26. Agricultural biogas plant in Strzelin

<table>
<thead>
<tr>
<th><strong>Electrical capacity:</strong> 2000 kWe</th>
<th><strong>Owner of the plant:</strong> Südzucker Polska S.A.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal capacity:</strong> 2065 kWt</td>
<td><strong>Opening date:</strong> 2012</td>
</tr>
</tbody>
</table>

**Location:**
- **Town/village:** Strzelin
- **District:** Strzelin
- **County:** Strzelin
- **Province:** Dolnośląskie

**Project description (main facilities):**
The agricultural biogas plant in Zalesie produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The biogas plant was established at the sugar factory. Generated electricity cover sugar factory needs, and the rest is sold to the grid. The thermal energy is used for heating the sugar factory and sugar production process. The owner of the plant is Südzucker Polska S.A.

**Input materials:**
- Beet pulp

**Annual output of the plant:**
- Biogas: approx. 9 894 549 m³/year
- Electricity: approx. 17 520 000 kWh/year
- Heat: approx. 18 089 000 kWh/year


27. Agricultural biogas plant in Koczergi

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>1200 kWe</th>
<th>Owner of the plant:</th>
<th>DMG Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>1300 kWt</td>
<td>Opening date:</td>
<td>2013</td>
</tr>
</tbody>
</table>

Location:
- **Town/village:** Koczergi near Parczew
- **District:** Parczew
- **County:** Parczew
- **Province:** Lubelskie

Project description (main facilities):
The agricultural biogas plant in Koczergi produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The owner of the plant is DMG Sp. z o.o.

Input materials:
- Corn silage

Annual output of the plant:
- Biogas: approx. 4 300 000 m³/year
- Electricity: approx. 10 200 000 kWh/year
- Heat: approx. 11 050 000 kWh/year
### 28. Agricultural biogas plant in Zaścianki

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>1200 kWe</th>
<th>Owner of the plant:</th>
<th>BIO-POWER Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>1251 kWt</td>
<td>Opening date:</td>
<td>2013</td>
</tr>
</tbody>
</table>

**Location:**
- **Town/village:** Zaścianki
- **District:** Międzyrzec Podlaski
- **County:** Białośki
- **Province:** Lubelskie

**Project description (main facilities):**
The agricultural biogas plant in Zaścianki produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The owner of the plant is BIO-POWER Sp. z o.o.

**Input materials:**
- Corn silage

**Annual output of the plant:**
- Biogas: approx. 3 500 000 m³/year
- Electricity: approx. 9 000 000 kWh/year
- Heat: approx. 9 300 000 kWh/year
### 29. Agricultural biogas plant in Bielany Wrocławskie

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>526 kWe</th>
<th>Owner of the plant:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>581 kWt</td>
<td>Cargill Poland Sp. z o.o..</td>
</tr>
<tr>
<td>Opening date:</td>
<td>June, 2012</td>
<td></td>
</tr>
</tbody>
</table>

**Location:**
- **Town/village:** Bielany Wrocławskie
- **District:** Kobierzyce
- **County:** Wrocław
- **Province:** Dolnośląskie

**Project description (main facilities):**
The agricultural biogas plant in Bielany Wrocławskie produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. Biogas production is based on materials derived from wheat processing factory Cargill in Bielany Wrocławskie. Electricity and heat produced from biogas supply only factory, reducing a few percent of the energy consumption and gas in the factory (the heat from the cogeneration unit is used for gluten drying technologies). The owner of the plant is Cargill Poland Sp. z o.o.

**Input materials:**
- Wheat

**Annual output of the plant:**
- Biogas: approx. 1 300 000 m³/year
- Electricity: approx. 3 400 000 kWh/year
- Heat: approx. 3 750 000 kWh/year
### 30. Agricultural biogas plant in Rypin

<table>
<thead>
<tr>
<th><strong>Electrical capacity:</strong></th>
<th>1875 kWe</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal capacity:</strong></td>
<td>1780 kWt</td>
</tr>
<tr>
<td><strong>Owner of the plant:</strong></td>
<td>Biogazownia Rypin Sp. z o.o.</td>
</tr>
<tr>
<td><strong>Opening date:</strong></td>
<td>2013</td>
</tr>
</tbody>
</table>

**Location:**
- **Town/village:** Rypin
- **District:** Rypin
- **County:** Rypin
- **Province:** Kujawsko-pomorskie

**Project description (main facilities):**
The agricultural biogas plant in Rypin produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. This is the first biogas plant in Poland, built by a group of farmers. Its main input (substrate) is corn silage, harvested from the fields of farmers who are co-owners of the biogas plant. The second material is a slurry coming from the farms of those farmers.

**Main facilities:**
- Pre-storage tank with capacity 226 m³
- Pre-storage tank with capacity 519 m³
- 2 x fermenter with capacity 3165 m³
- 2 x post-fermentation tank with capacity 4945 m³
- Service building
- Pumping station

**Input materials:**
- Corn silage
- Slurry

**Annual output of the plant:**
- Biogas: approx. 6,811,090 m³/year
- Electricity: approx. 15,000,000 kWh/year
- Heat: approx. 14,240,000 kWh/year
31. Agricultural biogas plant in Łęguty

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>1200 kWe</th>
<th>Owner of the plant:</th>
<th>Minex-Invest Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>1220 kWt.</td>
<td>Opening date:</td>
<td>2012</td>
</tr>
</tbody>
</table>

**Location:**
- Town/village: Łęguty
- District: Gietrzwałd
- County: Olsztyn
- Province: Warmińsko-mazurskie

**Project description (main facilities):**
The agricultural biogas plant in Łęguty produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The owner of the plant is Minex-Invest Sp. z o.o.

**Main facilities:**
- 2 x pre-storage tank with capacity 180 m³
- 2 x pre-storage tank with capacity 340 m³
- 2 x fermenter with capacity 3 147 m³
- 2 x post-fermentation tank with capacity 3 147 m³
- Service building
- Pumping station

**Input materials:**
- Manure
- Corn silage
- Distillery slop
- Glycerine

**Annual output of the plant:**
- Biogas: approx. 4 561 200 m³/year
- Electricity: approx. 10 200 000 kWh/year
- Heat: approx. 10 370 000 kWh/year
### 32. Agricultural biogas plant in Orchówek

<table>
<thead>
<tr>
<th><strong>Electrical capacity:</strong></th>
<th>1063 kWe</th>
<th><strong>Owner of the plant:</strong></th>
<th>EKOENERGIA WKM Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal capacity:</strong></td>
<td>1299 kWt</td>
<td><strong>Opening date:</strong></td>
<td>2013</td>
</tr>
</tbody>
</table>

**Location:**
- Town/village: Orchówek
- District: Włodawa
- County: Włodawa
- Province: Lubelskie

**Project description (main facilities):**
The agricultural biogas plant in Orchówek produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit.
This is biogas plant working on the basis of wastes from the industry such as livestock manure, waste from sewage treatment plants, plant tissues, bagasse.
The owner of the plant is EKOENERGIA WKM Sp. z o.o.

**Main facilities:**
- Fermenter with capacity 3 500 m³
- Post-fermentation tank with capacity 4 300 m³
- Service building
- Pumping station

**Input materials:**
- Livestock manure
- Waste from sewage treatment plants
- Plant tissues
- Bagasse

**Annual output of the plant:**
- Biogas: approx. 3 500 000 m³/year
- Electricity: approx. 8 326 000 kWh/year
- Heat: approx. 9 394 000 kWh/year
### 33. Agricultural biogas plant in Darżyno

<table>
<thead>
<tr>
<th><strong>Electrical capacity:</strong></th>
<th>2400 kWe</th>
<th><strong>Owner of the plant:</strong></th>
<th>Nadmorskie Elektrownie Wiatrowe Darżyno Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal capacity:</strong></td>
<td>2448 kWt</td>
<td><strong>Opening date:</strong></td>
<td>2013</td>
</tr>
</tbody>
</table>

**Location:**
- **Town/village:** Darżno
- **District:** Potęgowo
- **County:** Słupsk
- **Province:** Pomorskie

**Project description (main facilities):**
The agricultural biogas plant in Darżyno produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The owner of the plant is Nadmorskie Elektrownie Wiatrowe Darżyno Sp. z o.o.

**Main facilities:**
- 2 x pre-storage tank with capacity 190 m³
- 2 x pre-storage tank with capacity 340 m³
- 4 x fermenter with capacity 4 400 m³
- 4 x post-fermentation tank with capacity 5 000 m³
- Service building
- Pumping station

**Input materials:**
- Waste from food industry
- Potato pulp
- Plant waste

**Annual output of the plant:**
- **Biogas:** approx. 7 700 000 m³/year
- **Electricity:** approx. 19 000 000 kWh/year
- **Heat:** approx. 19 500 000 kWh/year
34. Agricultural biogas plant in Sobawiny

<table>
<thead>
<tr>
<th>Electrical capacity: 500 kWe</th>
<th>Owner of the plant: Zakład Usługowo-Handlowy (ZUH) “Wojciechowski” Zdzisław Wojciechowski.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity: 646 kWt</td>
<td>Opening date: 11 September, 2013</td>
</tr>
</tbody>
</table>

**Location:**
- Town/village: Sobawiny near Opoczno
- District: Opoczno
- County: Opoczno
- Province: Łódzkie

**Project description (main facilities):**
The agricultural biogas plant in Sobawiny produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit.
The input material is composed of corn silage from their crops (belonging to the owner of the company ZUH Wojciechowski, who bought and leased for this purpose a total of 200 hectares of fields), and meat waste from the factory meat Wojciechowski.
The owner of the plant is Zakład Usługowo-Handlowy (ZUH) “Wojciechowski” Zdzisław Wojciechowski.

**Input materials:**
- Corn silage
- Waste form meat industry

**Annual output of the plant:**
- Biogas: approx. 1 883 314 m³/year
- Electricity: approx. 4 000 000 kWh/year
- Heat: approx. 5 168 000 kWh/year
### 35. Agricultural biogas plant in Byszewo

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>1165 kWe</th>
<th>Owner of the plant:</th>
<th>EL-KA Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>1201 kWt</td>
<td>Opening date:</td>
<td>2013</td>
</tr>
</tbody>
</table>

**Location:**
- Town/village: Byszewo
- District: Łobez
- County: Łobez
- Province: Zachodniopomorskie

**Project description (main facilities):**
The agricultural biogas plant in Byszewo produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit.
The owner of the plant is EL-KA Sp. z o.o.

**Main facilities:**
- Pre-storage tank with capacity 200 m³
- 2 x fermenter with capacity 2 077 m³
- Post-fermentation tank with capacity 2 556 m³
- 2 x final tank with capacity 2 455 m³
- Service building
- Pumping station

**Input materials:**
- Poultry manure
- Corn silage

**Annual output of the plant:**
- Biogas: approx. 4 400 000 m³/year
- Electricity: approx. 9 320 000 kWh/year
- Heat: approx. 9 608 000 kWh/year
### 36. Agricultural biogas plant in Przemysław

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>1600 kWe</th>
<th>Owner of the plant:</th>
<th>BIOGAZ Przemysław “Łąkrol” Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>1600 kWt</td>
<td>Opening date:</td>
<td>2 September, 2013</td>
</tr>
</tbody>
</table>

**Location:**
- Town/village: Przemysław
- District: Resko
- County: Łobez
- Province: Zachodniopomorskie

**Project description (main facilities):**

The agricultural biogas plant in Przemysław produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit.

**Main facilities:**
- 2 x pre-storage tank with capacity 154 m³
- 3 x fermenter with capacity 2 944 m³
- Fermenter no. 2 with capacity 2 600 m³
- Fermenter no. 3 with capacity 3 826 m³
- Post-fermentation tank with capacity 3 434 m³
- Final tank with capacity 4 625 m³
- Service building
- Pumping station

**Input materials:**
- Liquid manure
- Distillery slop
- Corn and grass silage
- Beet pulp

**Annual output of the plant:**
- Biogas: approx. 7 000 000 m³/year
- Electricity: approx. 13 500 000 kWh/year
- Heat: approx. 13 500 000 kWh/year
### 37. Agricultural biogas plant in Lębork

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>1200 kWe</th>
<th>Owner of the plant:</th>
<th>FARM FRITES POLAND S.A.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>1223 kWe</td>
<td>Opening date:</td>
<td>October 2013</td>
</tr>
</tbody>
</table>

**Location:**

- **Town/village:** Lębork
- **District:** Lębork
- **County:** Lębork
- **Province:** Pomorskie

**Project description (main facilities):**

The agricultural biogas plant in Lębork produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The owner of the plant is FARM FRITES POLAND S.A.

**Input materials:**

- Sludge from potato chips production

**Annual output of the plant:**

- Biogas: approx. 3 500 000 m³/year
- Electricity: approx. 9 328 000 kWh/year
- Heat: approx. 9 787 000 kWh/year
### 38. Agricultural biogas plant in Glinojeck

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>1560 kWe</th>
<th>Owner of the plant:</th>
<th>PFEIFER &amp; LANGEN GLINOJECK S.A.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>1653 kWt</td>
<td>Opening date:</td>
<td>2013</td>
</tr>
</tbody>
</table>

**Location:**
- **Town/village:** Zygmuntowo
- **District:** Glinojeck
- **County:** Ciechanów
- **Province:** Mazowieckie

**Project description (main facilities):**
The agricultural biogas plant in Glinojeck produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The owner of the plant is PFEIFER & LANGEN GLINOJECK S.A.

**Input materials:**
- Waste from sugar industry

**Annual output of the plant:**
- Biogas: approx. 7 305 840 m³/year
- Electricity: approx. 13 665 000 kWh/year
- Heat: approx. 14 480 000 kWh/year
39. Agricultural biogas plant in Borzęciczki

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>1200 kWe</th>
<th>Owner of the plant:</th>
<th>Elektrownia Biogazowa “Borzęciczki” Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>1320 kWt</td>
<td>Opening date:</td>
<td>2012</td>
</tr>
</tbody>
</table>

Location:
- Town/village: Borzęciczki
- District: Koźmin Wielkopolski
- County: Krotoszyn
- Province: Wielkopolskie

Project description (main facilities):
The agricultural biogas plant in Borzęciczki produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit.
The owner of the plant is Elektrownia Biogazowa “Borzęciczki” Sp. z o.o.

Main facilities:
- Pre-storage tank with capacity 283 m³
- Fermenter no. 1 with capacity 2 600 m³
- Fermenter no. 2 with capacity 2 600 m³
- Fermenter no. 3 with capacity 3 826 m³
- Post-fermentation tank with capacity 4 241 m³
- Post-fermentation tank with capacity 6 430 m³
- Service building
- Pumping station

Input materials:
- Manure

Annual output of the plant:
- Biogas: approx. 3 600 000 m³/year
- Electricity: approx. 7 694 000 kWh/year
- Heat: approx. 8 000 000 kWh/year
### 40. Agricultural biogas plant in Sławkowo

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>400 kWe</th>
<th>Owner of the plant:</th>
<th>Agro Bio Sp. z o.o</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>445 kWt</td>
<td>Opening date:</td>
<td>2013</td>
</tr>
</tbody>
</table>

#### Location:
- Town/village: Sławkowo
- District: Kętrzyn
- County: Kętrzyn
- Province: Warmińsko-mazurskie

#### Project description (main facilities):
The agricultural biogas plant in Sławkowo produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The owner of the plant is Agro Bio Sp. z o.o

#### Main facilities:
- Component storage area
- Fermenter
- Post-fermentation tank
- Service building

#### Input materials:
- Corn silage

#### Annual output of the plant:
- Biogas: approx. 1 680 000 m³/year
- Electricity: approx. 3 200 000 kWh/year
- Heat: approx. 3 560 000 kWh/year
# 41. Agricultural biogas plant in Giże

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>1063 kWe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner of the plant:</td>
<td>Eco-Progres Sp. z o.o.</td>
</tr>
<tr>
<td>Thermal capacity:</td>
<td>1104 kWt</td>
</tr>
<tr>
<td>Opening date:</td>
<td>2013</td>
</tr>
</tbody>
</table>

**Location:**
- Town/village: Giże
- District: Olecko
- County: Olecko
- Province: Warmińsko-mazurskie

**Project description (main facilities):**
The agricultural biogas plant in Giże produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The owner of the plant is Eco-Progres Sp. z o.o.

**Main facilities:**
- Component storage area
- Pre-storage tank with capacity 190 m³
- Fermenter no. 1 with capacity 2 280 m³
- Fermenter no. 2 with capacity 2 280 m³
- Post-fermentation tank with capacity 4 241 m³
- Post-fermentation tank with capacity 4 825 m³
- Service building
- Pumping station

**Input materials:**
- Corn and grass silage
- Pig and poultry manure

**Annual output of the plant:**
- Biogas: approx. 4 240 000 m³/year
- Electricity: approx. 8 400 000 kWh/year
- Heat: approx. 8 832 000 kWh/year
# 42. Agricultural biogas plant in Tragamin

<table>
<thead>
<tr>
<th>Electrical capacity: 800 kWe</th>
<th>Owner of the plant: Ośrodek Hodowli Zarodowej “Gajewo” Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity: 798 kWt</td>
<td>Opening date: 2012</td>
</tr>
</tbody>
</table>

**Location:**
- Town/village: Tragamin near Malborka
- District: Malbork
- County: Malbork
- Province: Pomorskie

**Project description (main facilities):**
The agricultural biogas plant in Tragamin produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The owner of the plant is Ośrodek Hodowli Zarodowej “Gajewo” Sp. z o.o.

**Main facilities:**
- Component storage area
- Fermenter no. 1 with capacity 3760 m³
- Fermenter no. 2 with capacity 3760 m³
- Post-fermentation tank with capacity 2280 m³
- Final tank 8140 m³
- Transformer station
- 2 x power generator with a capacity of 400 kWe

**Input materials:**
- Corn silage
- Manure
- Waste from sugar industry

**Annual output of the plant:**
- Biogas: approx. 2880 000 m³/year
- Electricity: approx. 6660 000 kWh/year
- Heat: approx. 6640 000 kWh/year
# 43. Agricultural biogas plant in Ryboły

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>1000 kWe</th>
<th>Owner of the plant:</th>
<th>ADLER BIOGAZ Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>1006 kWt</td>
<td>Opening date:</td>
<td>2014</td>
</tr>
</tbody>
</table>

**Location:**
- Town/village: Ryboły
- District: Zabłudów
- County: Bialystok
- Province: Podlaskie

**Project description (main facilities):**
The agricultural biogas plant in Ryboły produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The owner of the plant is ADLER BIOGAZ Sp. z o.o.

**Input materials:**
- Pig and poultry manure
- Corn silage

**Annual output of the plant:**
- Biogas: approx. 4 380 000 m³/year
- Electricity: approx. 7 800 000 kWh/year
- Heat: approx. 7 847 000 kWh/year
44. Agricultural biogas plant in Łagiewniki

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>800 kWe</th>
<th>Owner of the plant:</th>
<th>Instytut Zarządzania i Samorządności Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>412 kWt</td>
<td>Opening date:</td>
<td>June, 2013</td>
</tr>
</tbody>
</table>

Location:
- Town/village: Łagiewniki
- District: Łagiewniki
- County: Dzierżoniowski
- Province: Dolnośląskie

Project description (main facilities):
The agricultural biogas plant in Łagiewniki produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit. The owner of the plant is Instytut Zarządzania i Samorządności Sp. z o.o.

Input materials:
- Corn silage

Annual output of the plant:
- Biogas: approx. 2 697 500 m³/year
- Electricity: approx. 6 017 500 kWh/year
- Heat: approx. 3 419 600 kWh/year
### 45. Agricultural biogas plant in Działyń

<table>
<thead>
<tr>
<th>Electrical capacity:</th>
<th>999 kWe</th>
<th>Owner of the plant:</th>
<th>Biogaz Działyń Sp. z o.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal capacity:</td>
<td>1014 kWt</td>
<td>Opening date:</td>
<td>December, 2013</td>
</tr>
</tbody>
</table>

**Location:**
- **Town/village:** Działyń
- **District:** Kłecko
- **County:** Gniezno
- **Province:** Wielkopolskie

**Project description (main facilities):**
The agricultural biogas plant in Działyń produces biogas and generates electricity and heat in the process of its combustion in a cogeneration unit.

**Main facilities:**
- Component storage area
- Fermenter no. 1 with capacity 3 040 m³
- Fermenter no. 2 with capacity 3 040 m³
- 2 x post-fermentation tank with capacity 5 650 m³
- Transformer station
- Power generator with a capacity of 400 kWe
- Power generator with a capacity of 599 kWe

**Input materials:**
- Pig and cattle manure
- Corn silage

**Annual output of the plant:**
- Biogas: approx. 3 712 000 m³/year
- Electricity: approx. 8 320 000 kWh/year
- Heat: approx. 8 440 000 kWh/year
7 LITERATURE

Widely available information was used in the present project’s compilation (from the companies’ websites, public information bulletins of offices, etc.).


8 APPENDIXES

Appendix 1. Existing biogas plants in Poland.
### The Agricultural Biogas Plants in Poland

#### Appendix 1. Existing biogas plants in Poland

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<tr>
<td>1</td>
<td>Koczała ul. Polna 3 77-220 Koczała woj. pomorskie</td>
<td>Poldanor S.A.</td>
<td>liquid manure, corn silage, glycerine</td>
<td>Mesophilic</td>
<td>8 212 500</td>
<td>2.126</td>
<td>2.206</td>
<td>16 761.384</td>
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<td>2</td>
<td>Pawłówko 77-320 Przechlewo woj. pomorskie</td>
<td>Poldanor S.A.</td>
<td>liquid manure, maize silage, slaughter waste, glycerine</td>
<td>Mesophilic</td>
<td>3 802 655</td>
<td>0.946</td>
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<td>7 458.260</td>
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<td>3</td>
<td>Płaszczyca 77-320 Przechlewo woj. pomorskie</td>
<td>Poldanor S.A.</td>
<td>liquid manure, maize silage, plant waste, herbal product processing waste</td>
<td>Mesophilic</td>
<td>2 299 500</td>
<td>0.625</td>
<td>0.680</td>
<td>4 927.500</td>
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<td>4</td>
<td>Nacław 14B 76-006 Nacław woj. Zachodnio-pomorskie</td>
<td>Poldanor S.A.</td>
<td>liquid manure, corn silage, glycerine</td>
<td>Mesophilic</td>
<td>2 299 500</td>
<td>0.625</td>
<td>0.686</td>
<td>4 927.500</td>
<td>5 408.424</td>
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<td>Świelenio 30 76-020 Bobolice woj. Zachodnio-pomorskie</td>
<td>Poldanor S.A.</td>
<td>liquid manure, corn silage, glycerine</td>
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<td>0.625</td>
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<td>Uniechówek 77-310 Debrzno woj. pomorskie</td>
<td>Poldanor S.A.</td>
<td>liquid manure, corn silage</td>
<td>Mesophilic</td>
<td>4 100 200</td>
<td>1.063</td>
<td>1.081</td>
<td>8 380.700</td>
<td>8 522.604</td>
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<td>7</td>
<td>Gżyno 78-540 Kalisz Pomorski woj. zachodnio-pomorskie</td>
<td>Poldanor S.A.</td>
<td>liquid manure, corn silage</td>
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<td>1.063</td>
<td>1.081</td>
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<td>Kujanki 77-300 Czuchów woj. pomorskie</td>
<td>Poldanor S.A.</td>
<td>liquid manure, glycerine</td>
<td>Mesophilic</td>
<td>1 124 470</td>
<td>0.330</td>
<td>0.342</td>
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<td>2 696.000</td>
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<td>9</td>
<td>Niedoradz 67-106 Otyń woj. lubuskie</td>
<td>Biogaz Agri Sp. z o.o.</td>
<td>pig and poultry manure, corn silage</td>
<td>Mesophilic</td>
<td>631 000</td>
<td>0.252</td>
<td>0.291</td>
<td>1 300.000</td>
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## Appendix 1. Existing biogas plants in Poland

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<td>Kalsk 69A 66-100 Sulechów woj. lubuskie</td>
<td>Gospodarstwo Rolne w Bukowie Sp. z o.o.</td>
<td>liquid manure, corn silage</td>
<td>Mesophilic</td>
<td>5 000 000</td>
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<td>11</td>
<td>Liszkowo 87-93 88-190 Złotniki Kujawskie woj. kujawsko-pomorskie</td>
<td>Elektrownie Wodne Sp. z o.o.</td>
<td>corn silage, plant waste, distillery slop</td>
<td>Mesophilic</td>
<td>7 400 000</td>
<td>2.126</td>
<td>1.198</td>
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<td>Skrzatusz 64-930 Szydłowo woj. wielkopolskie</td>
<td>Biogaz Zeneris Sp. z o.o.</td>
<td>corn silage, distillery slop, food waste, potato pulp</td>
<td>Mesophilic</td>
<td>2 102 400</td>
<td>0.526</td>
<td>0.505</td>
<td>4 607.760</td>
<td>4 423.800</td>
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<td>13</td>
<td>ul. Sportowa 5 78-450 Grzmiąca woj. zachodnio-pomorskie</td>
<td>Eko-Energia Grzmiąca Sp. z o.o.</td>
<td>pig and poultry manure, corn and grass silage, distillery slop</td>
<td>Mesophilic</td>
<td>7 000 000</td>
<td>1.600</td>
<td>1.600</td>
<td>13 500.000</td>
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<td>ul. Metalowców 22 58-100 Świdnica woj. dolnośląskie</td>
<td>BIO-WAT Sp. z o.o.</td>
<td>corn and grass silage, beet leaves</td>
<td>Mesophilic</td>
<td>4 000 000</td>
<td>0.900</td>
<td>1.100</td>
<td>7 200.000</td>
<td>8 800.000</td>
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<td>15</td>
<td>ul Łąbędzka 54, Lany Wielkie 44-153 Sośnicowice woj. śląskie</td>
<td>BIO-BUT Sp. z o.o.</td>
<td>distillery slop, corn silage, manure</td>
<td>Mesophilic</td>
<td>2 470 915</td>
<td>0.526</td>
<td>0.540</td>
<td>4 471.000</td>
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<td>16</td>
<td>Uhnin 141 21-211 Dębowa Łódka woj. lubelskie</td>
<td>Bioelektrownia Sp. z o.o.</td>
<td>corn silage, rye silage, grass silage, distillery slop, potato pulp</td>
<td>Mesophilic</td>
<td>4 500 000</td>
<td>1.200</td>
<td>1.160</td>
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<td>Konopnica 121 96-200 Rawa Mazowiecka woj. łódzkie</td>
<td>Bioenergy Project Sp. z o.o.</td>
<td>Corn silage, grass silage</td>
<td>Mesophilic</td>
<td>9 353 755</td>
<td>1.998</td>
<td>2.128</td>
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<td>18 194.000</td>
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<td>18</td>
<td>Melno 86-330 Melno woj. kujawsko-pomorskie</td>
<td>Allter Power Sp. z o.o.</td>
<td>distillery slop</td>
<td>Termophilic</td>
<td>6 200 000</td>
<td>1.600</td>
<td>1.800</td>
<td>12 800.000</td>
<td>14 400.000</td>
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### The Agricultural Biogas Plants in Poland

#### Appendix 1. Existing biogas plants in Poland

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<td>19</td>
<td>ul. Zamojska 26C 21-050 Piaski woj. lubelskie</td>
<td>Wikana Bioenergia Sp. z o.o.</td>
<td>corn silage, whey, manure</td>
<td>Mesophilic</td>
<td>4 250 000</td>
<td>0.999</td>
<td>1.039</td>
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<td>Zbiersk Cukrownia 61 62-830 Zbiersk woj. wielkopolskie</td>
<td>AWW Wawrzyniak Sp.</td>
<td>distillery slop</td>
<td>Mesophilic</td>
<td>4 176 558</td>
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<td>1.620</td>
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<td>12 960.000</td>
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<td>Boleśzyn 7A 13-308 Mroczno woj. warmińsko-mazurskie</td>
<td>Biogal Sp. z o.o.</td>
<td>corn silage, manure, in season: distillery slop and whey</td>
<td>Mesophilic</td>
<td>7 840 000</td>
<td>2.000</td>
<td>2.020</td>
<td>15 200.000</td>
<td>15 360.000</td>
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<td>22</td>
<td>Klępsk 53 66-111 Nowe Kramsko woj. lubuskie</td>
<td>Gospodarstwo Rolne Kargowa - Klępsk Ryszard Maj</td>
<td>corn silage, pig manure</td>
<td>Mesophilic</td>
<td>4 633 117</td>
<td>1.000</td>
<td>1.400</td>
<td>8 147.000</td>
<td>11 406.000</td>
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<td>23</td>
<td>Szklarka Myślniewska 68A 63-500 Ostrzeszów woj. wielkopolskie</td>
<td>P.P.-H.-U. &quot;SERAFIN&quot; Sp. z o.o.</td>
<td>-</td>
<td>Mesophilic</td>
<td>3 000 000</td>
<td>0.660</td>
<td>0.640</td>
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<td>5 326.000</td>
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<td>24</td>
<td>ul. Czamowska 56C 26-065 Piekoszów woj. świętokrzyskie</td>
<td>Elektrociepłownia Bartos Sp. z o.o.</td>
<td>corn silage, manure</td>
<td>Mesophilic</td>
<td>2 464 000</td>
<td>0.800</td>
<td>0.855</td>
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<td>6 350.000</td>
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<td>25</td>
<td>ul. Osiedlowa 4, Zalesie 46-146 Domaszowice woj. opolskie</td>
<td>Polski Biogazownie &quot;Energy Zalesie&quot; Sp. z o.o.</td>
<td>liquid manure, potato pulp</td>
<td>Mesophilic</td>
<td>8 000 000</td>
<td>2.000</td>
<td>2.016</td>
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<td>ul. Ząbkowicka 53 57-100 Strzelin woj. dolnośląskie</td>
<td>Südzcuker Polska S.A.</td>
<td>beet pulp</td>
<td>Mesophilic</td>
<td>9 894 549</td>
<td>2.000</td>
<td>2.065</td>
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<td>18 089.000</td>
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<td>Koczeni 56B 21-200 Parczew woj. lubelskie</td>
<td>DMG Sp. z o.o.</td>
<td>Com silage</td>
<td>Mesophilic</td>
<td>4 300 000</td>
<td>1.200</td>
<td>1.300</td>
<td>10 200.000</td>
<td>11 050.000</td>
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<td>28</td>
<td>Zaścianki 86 21-560 Międzyrzec Podlaski woj. lubelskie</td>
<td>&quot;BIO-POWER&quot; Sp. z o.o.</td>
<td>-</td>
<td>Mesophilic</td>
<td>3 500 000</td>
<td>1.200</td>
<td>1.251</td>
<td>9 000.000</td>
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## The Agricultural Biogas Plants in Poland
### Appendix 1. Existing biogas plants in Poland

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<td>29</td>
<td>ul. Mac Millan 1 Bielany Wrocławskie 55-040 Kobierzyce woj. dolnośląskie</td>
<td>Cargill Poland Sp. z o.o.</td>
<td>wheat</td>
<td>Mesophilic</td>
<td>1 300 000</td>
<td>0.526</td>
<td>0.581</td>
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<td>Starorypin Prywatny 51 87-500 Rypin woj. kujawsko-pomorskie</td>
<td>Biogazownia Rypin Sp. z o.o.</td>
<td>corn silage, manure</td>
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<td>6 811 090</td>
<td>1.875</td>
<td>1.780</td>
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<td>Łęguty 15 11-036 Gietrzwałd woj. warmińsko-mazurskie</td>
<td>Minex-Invest Sp. z o.o.</td>
<td>corn silage, manure, distillery slop, glycerine</td>
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<td>4 561 200</td>
<td>1.200</td>
<td>1.220</td>
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<td>Orchówek ul. Garbarska 16 22-200 Włodawa woj. lubelskie</td>
<td>&quot;EKOENERGIA WKM&quot; Sp. z o.o.</td>
<td>waste form industry</td>
<td>Mesophilic</td>
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<td>1.063</td>
<td>1.299</td>
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<td>9 394.000</td>
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<td>33</td>
<td>Darżyno, działka Nr 244/6 obręb Darżyno 76-230 Potęgowo woj. pomorskie</td>
<td>Nadmorskie Elektrownie Wiatrowe Darżyno Sp. z o.o.</td>
<td>waste from food industry, potato pulp, plant waste</td>
<td>Mesophilic</td>
<td>7 700 000</td>
<td>2.400</td>
<td>2.448</td>
<td>19 000.000</td>
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<td>Opoczno, działki nr 34 i 35 obręb 4 Opoczno 26-300 Opoczno woj. łódzkie</td>
<td>Zakład Usługowo-Handlowy &quot;Wojciechowski&quot; Zdzisław Wojciechowski</td>
<td>corn silage, waste form meat industry</td>
<td>Mesophilic</td>
<td>1 883 314</td>
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<td>0.646</td>
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<td>Byszewo 17 73-150 Lębork woj. zachodniopomorskie</td>
<td>EL-KA Sp. z o.o.</td>
<td>corn silage, poultry manure</td>
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<td>4 400 000</td>
<td>1.165</td>
<td>1.201</td>
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<td>9 608.000</td>
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<td>36</td>
<td>dz. 27/2 Przemysław 72-315 Resko woj. zachodniopomorskie</td>
<td>BIOGAZ Przemysław &quot;Łąkot&quot; Sp. z o.o. sp. komandytowa</td>
<td>liquid manure, corn and grass silage, distillery slop, beet pulp</td>
<td>Mesophilic</td>
<td>7 000 000</td>
<td>1.600</td>
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<td>ul. Abrahama 13 84-300 Lębork woj. pomorskie</td>
<td>FARM FRITES POLAND S.A.</td>
<td>sludge from production</td>
<td>Mesophilic</td>
<td>3 500 000</td>
<td>1.200</td>
<td>1.223</td>
<td>9 328.000</td>
<td>9 787.000</td>
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## The Agricultural Biogas Plants in Poland

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<td>38</td>
<td>Zygmuntowo 38 06-450 Glinojeck woj. mazowieckie</td>
<td>PFEIFER &amp; LANGEN GLINOJECK S.A.</td>
<td>waste from sugar industry</td>
<td>Mesophilic</td>
<td>7 305 840</td>
<td>1.560</td>
<td>1.653</td>
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<td>Borzęcicyzki 29 63-720 Koźmin Wielkopolski woj. wielkopolskie</td>
<td>Elektrownia Biogazowa &quot;Borzęcicyzki&quot; Sp. z o.o.</td>
<td>manure</td>
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<td>Sławkowo 15 11-400 Kętrzyn woj. warmińsko-mazurskie</td>
<td>Agro Bio Sp. z o.o.</td>
<td>corn silage</td>
<td>Mesophilic</td>
<td>1 680 000</td>
<td>0.400</td>
<td>0.445</td>
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<td>Gîze 4 19-400 Olecko woj. warmińsko-mazurskie</td>
<td>&quot;Eco-Progres&quot; Sp. z o.o.</td>
<td>corn and grass silage, manure</td>
<td>Mesophilic</td>
<td>4 240 000</td>
<td>1.063</td>
<td>1.104</td>
<td>8 400.000</td>
<td>8 832.000</td>
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<td>Tragamin 82-200 Malbork woj. pomorskie</td>
<td>Ośrodek Hodowli Zarodowej &quot;Gajewo&quot; Sp. z o.o.</td>
<td>corn silage, manure, waste from sugar industry</td>
<td>Mesophilic</td>
<td>2 880 000</td>
<td>0.800</td>
<td>0.798</td>
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<td>Rybyły 1/1 16-060 Zabłudów woj. podlaskie</td>
<td>ADLER BIOGAZ Sp. z o.o.</td>
<td>corn silage, pig and poultry manure</td>
<td>Mesophilic</td>
<td>4 380 000</td>
<td>1.000</td>
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<td>ul. Lipowa 7A 58-210 Lągienniki woj. dolnośląskie</td>
<td>Instytut Zarządzania i Samorządnoci Sp. z o.o.</td>
<td>corn silage</td>
<td>Mesophilic</td>
<td>2 697 500</td>
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<td>Działąń 24, 62-271 Działąń woj. wielkopolskie</td>
<td>Biogaz Działąń Sp. z o.o.</td>
<td>pig and cattle manure, corn silage</td>
<td>Mesophilic</td>
<td>3 712 000</td>
<td>0.999</td>
<td>1.014</td>
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