Current state of biogas production in Poland

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Biogas production

Two definitions of biogas, currently in Polish law:

• **Biogas** - gas derived from biomass, in particular from the processing of plant, animal or vegetable waste, sewage treatment plants and landfills.

• **Agricultural biogas** – a gas derived from the process of methane fermentation of agricultural raw materials, agricultural products, liquid or solid manure, by-products or residues from the processing of products from agricultural or forest biomass.
Number of installations producing biogas

<table>
<thead>
<tr>
<th>Source of biogas</th>
<th>Number</th>
<th>Power [MW]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landfills</td>
<td>97</td>
<td>59,66</td>
</tr>
<tr>
<td>Wastewater treatment plants</td>
<td>79</td>
<td>42,31</td>
</tr>
<tr>
<td>Agricultural biogas plants</td>
<td>32</td>
<td>34,21</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>207</strong></td>
<td><strong>136,18</strong></td>
</tr>
</tbody>
</table>

Source: www.ure.gov.pl
## Agricultural biogas production

<table>
<thead>
<tr>
<th>Year</th>
<th>The amount of agricultural biogas produced [mln m³]</th>
<th>Quantity of electricity produced from agricultural biogas [GWh]</th>
<th>Quantity of produced from agricultural biogas [GWh]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>36,64</td>
<td>73,43</td>
<td>82,63</td>
</tr>
<tr>
<td>2012</td>
<td>73,14</td>
<td>141,79</td>
<td>158,64</td>
</tr>
</tbody>
</table>

Source: Agricultural Market Agency
Feedstock used in Polish biogas plants

- liqueur manure: 37%
- corn silage: 26%
- distillery residue: 15%
- residues from fruit and vegetables: 10%
- manure: 4%
- whey: 4%
- others: 3%

Source: Agricultural Market Agency
Quantity of feedstock in Polish biogas plants in 2012

Total quantity: 932 690 t/year

Source: Agricultural Market Agency
Number of biogas plants in Poland

NUMBER OF BIOGAS PLANTS WORKING: 32

NUMBER OF BIOGAS PLANTS UNDER CONSTRUCTION: 16
Biogas plants belonging to the company Poldanor

The company Poldanor rears pigs leading to large amounts of manure being produced as well as slurry. This led the company to look for efficient methods of disposal. The preferred and most cost-effective solution was to build a biogas plant at the farms.

Source: www.poldanor.pl
Located in Szewnia is the first biogas plant in the country which produces biogas for domestic homes. The plant has a capacity of 50Kg a day which is made up of agricultural crop or waste. It produces per hour about 1 m$^3$ of gas which is collected in a special tank.

Source: www.biznes.onet.pl
Biogas plant in Lany Wielkie

The plant works with a distillery located in the vicinity. The plant receives the distillery waste residues and uses them to give back the heat needed for the distillery process.

**Feedstock:**
- 40 Mg/24 h manure and liquide manure
- distillery residue
Biogas plant in Strzelin

The biogas plant is located next to a sugar factory. Biogas produced from the fermentation power cogeneration system with a capacity of 2,000 MW of electricity and 2,065 MW of thermal energy.

**Feedstock:** beet pulp

Source: www.strzelin.pl
The list of project of biogas plans co-funded by NFOŚiGW in 2013

<table>
<thead>
<tr>
<th>Biogazownia</th>
<th>MW Capacity</th>
<th>Amount (młn zł)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elektrownia Biogazowa Cychry</td>
<td></td>
<td>28</td>
</tr>
<tr>
<td>Biogazownia Chotków</td>
<td>1</td>
<td>11,5</td>
</tr>
<tr>
<td><strong>Biogazownie Małopolskie biogazownia w Olesnie</strong></td>
<td><strong>1</strong></td>
<td><strong>16,17</strong></td>
</tr>
<tr>
<td>Wikana Nieruchomości</td>
<td>1,1</td>
<td>14,23</td>
</tr>
<tr>
<td>Bio-Nik Elektra</td>
<td>0,999</td>
<td>13,08</td>
</tr>
<tr>
<td>DRP Biogaz</td>
<td>1</td>
<td>14,47</td>
</tr>
<tr>
<td>Biogaz Działyń</td>
<td>0,999</td>
<td>14,11</td>
</tr>
<tr>
<td>Biogaz Jarocin</td>
<td>0,8</td>
<td>15,06</td>
</tr>
<tr>
<td>Biozel biogazownia w Łagiewnikach</td>
<td>1,98</td>
<td>28,77</td>
</tr>
<tr>
<td>BLB biogazownia w Gorlicach</td>
<td>1</td>
<td>13,34</td>
</tr>
<tr>
<td>Biogazownia Starogard</td>
<td>1,2</td>
<td>20,35</td>
</tr>
<tr>
<td>Ek-Wind biogazownia w Koszalinie</td>
<td>0,5</td>
<td>10,28</td>
</tr>
<tr>
<td>Polska Grupa Biogazowa Darsków</td>
<td>0,9</td>
<td></td>
</tr>
<tr>
<td>Złocienicu</td>
<td>0,9</td>
<td></td>
</tr>
</tbody>
</table>
New national projects about biogas*:

- „BIOGAS PLANTS”
- „ABC Agricultural Biogas plants”
- "Biogas opportunity for agriculture and the environment”
- „Biogas deliberate choice”

*Projects are co-financed by the National Fund for Environmental Protection and Water Management
Biogas production: current and proposed regulations

- **Distinct preferences for agricultural biogas installations produced**
  - special financial instruments,
  - support tool (brown certificate) for grid injection,

- **Proposed bigger preferences for bio-renewable energy sources,**

- **Special support for „micro installations”:**
  - max. 100 kW of electrical power and 130kW of thermal power for installations based on **agricultural biogas,**
  - 40 kW of electrical power and 70 kW of thermal power or other renewable energy installations,

- **Removing the obligation of the network operators to purchase energy from renewable energy installations, other than „micro”.**
Complicated investment process: many requirements to fulfill, including environmental ones.

Local communities often distrust biogas plant operators connected with the fear of odours. This results in investors becoming reluctant.

Long term of investment process: about two years, in some cases longer…

Difficulty in allocating financial support,

yet:

There has been continuous improvement in these fields.
Biogas production perspectives

Great interest in the construction of *agricultural biogas plants*, especially *micro installations* (max. 100 kW),

Organic municipal wastes: there is an increasing need for disposal, yet a lack of effective collection methods.

Significant need for disposal of organic wastes from the food industry, (including meat processing plants & „utilizational” biogas plants),
Summary: barriers
non-agricultural biogas plants

• lack of a holistic view of the biogas markets, manifested by reducing the attractiveness of investment in production and use of biogas from non-agricultural substrates

• difficulties in obtaining real financial support, especially for the investment in installations based on biogas from non-agricultural substrates,

• lack of good, effective collection systems of municipal organic waste
Summary: barriers biogas production

- formal difficulties: legal, administrative and environmental which delay the initial investments,
- frequent changes and the complexity of regulations, generating increased investment risk long term,
- protest of the local community, mainly due to fear of odours
- scarcity of good and cheap installations of purification and enrichment (upgrading) of biogas, especially for mini and micro biogas plants
- difficulties with the use of post-fermentation waste in agriculture
- stagnation in Polish CNG market, mainly because of poorly developed filling stations network
Biogas production perspectives

- About 10 million tonnes of municipal waste per year, of which 30-50% is organic waste,

- Needs to reduce the mass of landfill of biodegradable municipal waste to 75% in 2010, 50% in 2013, and in 2020 to the level of 35% by weight of the waste produced in 1995,

- New regulation recently changed the powers of municipalities in waste management, including the possibility to regulate the fees, as of the beginning of this year,

- Needs of advanced collection systems:
  - logistic problems,
  - new job opportunities
Biogas to biomethane perspectives

- Poland is an agricultural country
- Supporting instruments fot grid injections for agricultural upgraded biogas(biomethane) – brown certificate,
- Great interest of farmers for agricultural biogas plants
- Transport companies looking for green fuel
In December 2013 the **first biogas plants in Malopolska** will be finished (Privat Company – BIOGAZOWNIE MALOPOLSKIE)
JMD the owner of "Biedronka" - pioneer of ecology in the Polish transport

Source

www.biomaster-project.eu
Current activities in BIOMASTER

- Monitoring of the situation on the market of biogas,
- Meetings with the local authority, local communities and experts
- Distribution of reports prepared by the BIOMASTER partners
- Participation in conferences
- An article **Biogas from waste - (bio) fuel for transport- barriers and perspectives** in the National Scientific Journal „CHEMIST” – MAY 2013
Thank you for your attention!

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