Economic aspects of small biogas plants and financial support mechanisms in Poland

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Baltic Manure – turning manure problems into business opportunities
23th November 2011
Energy from slurry: agricultural biogas plants
Primary energy production from biogas
EU 2009 (ktoe)

Germany over 80% of agricultural biogas production in the EU

Should the support mechanisms applied in Germany be copied in Poland?
Does Poland require tailor made support policies for small biogas plants?
What is a microbiogas plant

Cogeneration Directive 2004/8/WE

micro-cogeneration - maximum capacity below 50 kWe;
small scale cogeneration - below 1 MWe;

But in reality the size of the microbiogas plant
is implicated by the support level treshold in a given country

<table>
<thead>
<tr>
<th>Country</th>
<th>Treshold for small</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>&lt;=150 kW</td>
</tr>
<tr>
<td></td>
<td>&lt;=75 kW</td>
</tr>
<tr>
<td>Austria</td>
<td>&lt;=250 kW</td>
</tr>
<tr>
<td>GB</td>
<td>&lt;=250 kW</td>
</tr>
<tr>
<td>France</td>
<td>&lt;=150kW</td>
</tr>
<tr>
<td>Slovenia</td>
<td>&lt;= 50 kW</td>
</tr>
<tr>
<td>Canada</td>
<td>&lt;=10 kW</td>
</tr>
</tbody>
</table>

RES Law
Proposal for new legislation in Poland:
no technological split-up

Mini 101-250 kWe
Mikro <100 kWe
Development of microbiogas plants in the EU

Germany over 80% of agricultural biogas production in the EU
Targeted farm size

Required agricultural area for an agricultural biogas plant depending on the size

- plant cultivation: 20% maize silage, 80% slurry
- plant cultivation: 50% maize silage, 50% slurry
- fertiliser: 50% maize silage, 50% slurry
- fertiliser: 20% maize silage, 80% slurry
- fertiliser: 100% slurry

Lubelskie voivodship
- 20 - 50 ha – 9,4 ‘000
- 50-100 ha – 1,2 ‘000
- > 100 ha 0,3 ‘000. average size 257 ha

Roadmap
- 1st biogas plants on farms > 100 ha, i.e. 110 kWe
- 2nd horizontally consolidated farms for biogas production

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Targeted farm size

Lubelskie voivodship
above 50 DJP -500 farms

Roadmap
1st biogas plants in farms above 100 LSU  i.e. 100 kWe
2 nd horizontally consolidated farms for biogas production

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Targeted farm size

Large scale of production farms (Census 2002)

Medium scale of production farms (Census 2002)

Number of projects submitted to PROW 311 Agricultural Fund

Source: ARiMR

Source: Michna W. IERIGZ
Investment costs

Relation between specific investment costs and the plant’s size

Logarithm curve, strong dependence for <100 kWe
Investment costs

Relation between specific investment costs and the plant’s size

EUR/kWe vs kWe

EU
Poland
Rentability

- Financial costs
- Operating costs
- Purchase and logistics of substrates
- Distribution of fertiliser
- Taxes, other fees
- Operation and maintenance
- Others

Costs < Income
Profitable investments

- Income
- Sale of electricity
- Sale of heat
- Sale of certificates
- Sale/own use of fertiliser
- Uptake of waste for utilisation
- Others

Costs > Income
Not profitable investment

! most sensitive elements for rentability

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Rentability - Income

Current system: unpredictable income
Difficult to handle for small investors (farmers)
Advantage for bigger projects

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**Rentability - Income**

„Colourful” support for green energy

<table>
<thead>
<tr>
<th>Certificate</th>
<th>green</th>
<th>yellow</th>
<th>purple</th>
<th>brown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>RES</td>
<td>cogeneration</td>
<td>cogeneration</td>
<td>Biomethane for grid injection</td>
</tr>
<tr>
<td>Predicted price PLN/MWh</td>
<td>&lt;275</td>
<td>&lt;129</td>
<td>&lt;59</td>
<td>&lt;275*</td>
</tr>
<tr>
<td>Prohibitions of common application</td>
<td>with brown</td>
<td>with purple</td>
<td>with yeallow</td>
<td>with green</td>
</tr>
</tbody>
</table>

Is the „rainbow” support really the best option for microbiogas plants?

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Price of substrate is crucial

Maize silage
Own production 100 PLN/t
Contracted up to 160 PLN/t
Rentability – legal proposal

Why FIT (feed-in tariffs) for micorbiogas – the shape of new RES Law

- This system has been tested and optimized several times (since 2001) by leading agricultural biogas-producing countries,
- a stable system that provides economic stability by ensuring an adequate level of energy sales in the 15-20-year period,
- Less complicated system for the small investors: it allows the owner of a biogas plant to overcome organizational barriers such as registration certificates of origin, price negotiations with the energy distributor,
- reduces the transaction costs of the sale of certificates of origin and thus optimizes the implementation of the system,
- The European Commission has clearly stated that FIT is not a form of public support, which was not clearly stated in the case of certificates of origin.
- Let’s use experience of others instead of inventing original systems.

What support option will be chosen by the Ministry of Economy in a new RES Law?
Rentability – legal proposal

Required FIT for IRR 16%

FIT in German EEG 2012 up to 75 kWe, 80% of slurry input

proposed level of support for FIT
up to 100 kWe: at 180 EUR / MWh (800 PLN / MWh)
101-250 kWe: at 160 EUR / MWh (700 PLN / MWh).

Additional subsidies, threshold up to 70 kWe
FIT in other countries

Is the proposed level of support too high or too low?
Summary

Acreage: UAA (1000 ha) in 2010

DE: 85’000
PL: 24’000

Breeding: cattle (1000 heads) in 2010

Should the support mechanisms applied in Germany be automatically copied?
Does Poland require tailor made support policies for small biogas plants?

Source: Eurostat

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• www.ieo.pl

Thank you for your attention!