



## Large industrial and small biogas plants

*Potential and perspectives*



**Pierre Haider**  
Polish Biogas Association - PBA

# Polish Biogas Association – PBA

- Founded in 2007
- Located in Bytów, Pomorskie
- Targets and activities:
  - support establishment of biogas market in Poland
  - support activities of stakeholders in biogas sector
  - support foreign actors in Polish market
  - create transparent information flow
  - create platform of know-how and science
  - develop quality standards
  - education
  - develop biogas competence centre including installation for demonstration and education



# European Biogas Association – EBA



- Founded in 2009 – Brussels, Belgium
- The following non-profit organizations are members of EBA:

- \* ADBA - The Anaerobic Digestion and Biogas Association (UK)
- \* ATEE Club Biogaz (France)
- \* Austrian Compost & Biogas Association (AG Kompost & Biogas, Austria)
- \* Czech Biogas Association (Česká bioplynová asociace, Czech Republic)
- \* Eden - Energie Développement Environnement (France)
- \* Estonian Biogas Association (Eesti Biogaasi Assotsiatsioon MTÜ)
- \* German Biogas Association (Fachverband Biogas, Germany)
- \* German Society for sustainable Biogas and Bioenergy Utilisation (FNBB, Germany)
- \* Hungarian Biogas Association (Magyar Biogáz Egyesület, Hungary)
- \* Italian Biogas Association (Consorzio Italiano Biogas, Italy)
- \* Latvian Biogas Association (Latvijas biogāzes asociācija, Latvia)
- \* Lithuanian Biogas Association (Bioduju Asociacija, Lithuania)
- \* Luxembourg Biogas Association (Biogasvereeningung, Luxembourg)
- \* Méthéor – Association pour la Méthanisation Écologique des déchets (France)
- \* Polish Biogas Association (Polskie Stowarzyszenie Biogazu, Poland)
- \* Romanian Biogas Association (Asociația Română Pentru Biogaz, Romania)
- \* Spanish Biogas Association (Asociación Española de Biogás, Spain)
- \* Swedish Biogas Association (Svenska Biogasföreningen, Sweden)
- \* Swiss Biogas Forum (Biogas Forum Schweiz, Switzerland)
- \* UK Renewable Energy Association – Biogas Group (UK)





# Large and small biogas plants

- Potential and perspectives in Poland from German point of view
- Definition of term **Biogas Plant**

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## 1. Sewage Plant



## 2. Landfill Installation



## 3. Agricultural Biogas Plant



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## 1. Sewage Plant



**46 installations**

## 2. Landfill Installation



**73 installations**

## 3. Agricultural Biogas Plant



**6 installations**

# Large and small biogas plants

- Potential and perspectives in Poland from German point of view
- Definition of term **Biogas Plant**
- Installation for anaerobic digestion of all kind of organic matters to produce biogas for energetic use.

- Substrates:

- energetic plants
- agricultural products (grain, beets, straw)
- manure (pig, cow, poultry)
- organic waste:
  - industrial origin (slaughterhouse, dairy industry, fish waste, food industry, alcohol production)
  - municipal organic waste
  - other organic waste (restaurants, supermarkets)

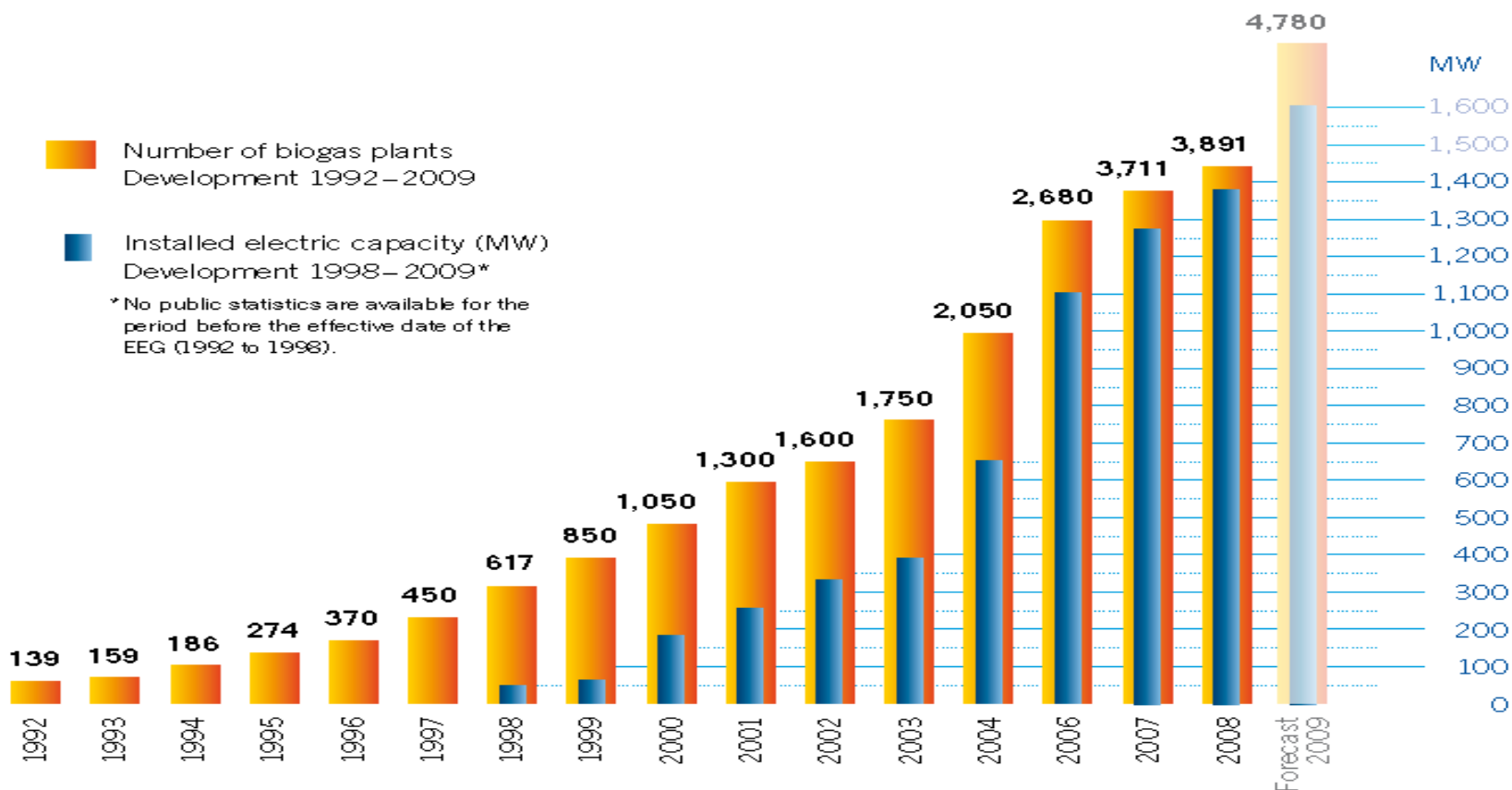
## 3. Agricultural Biogas Plant



# Large and small biogas plants

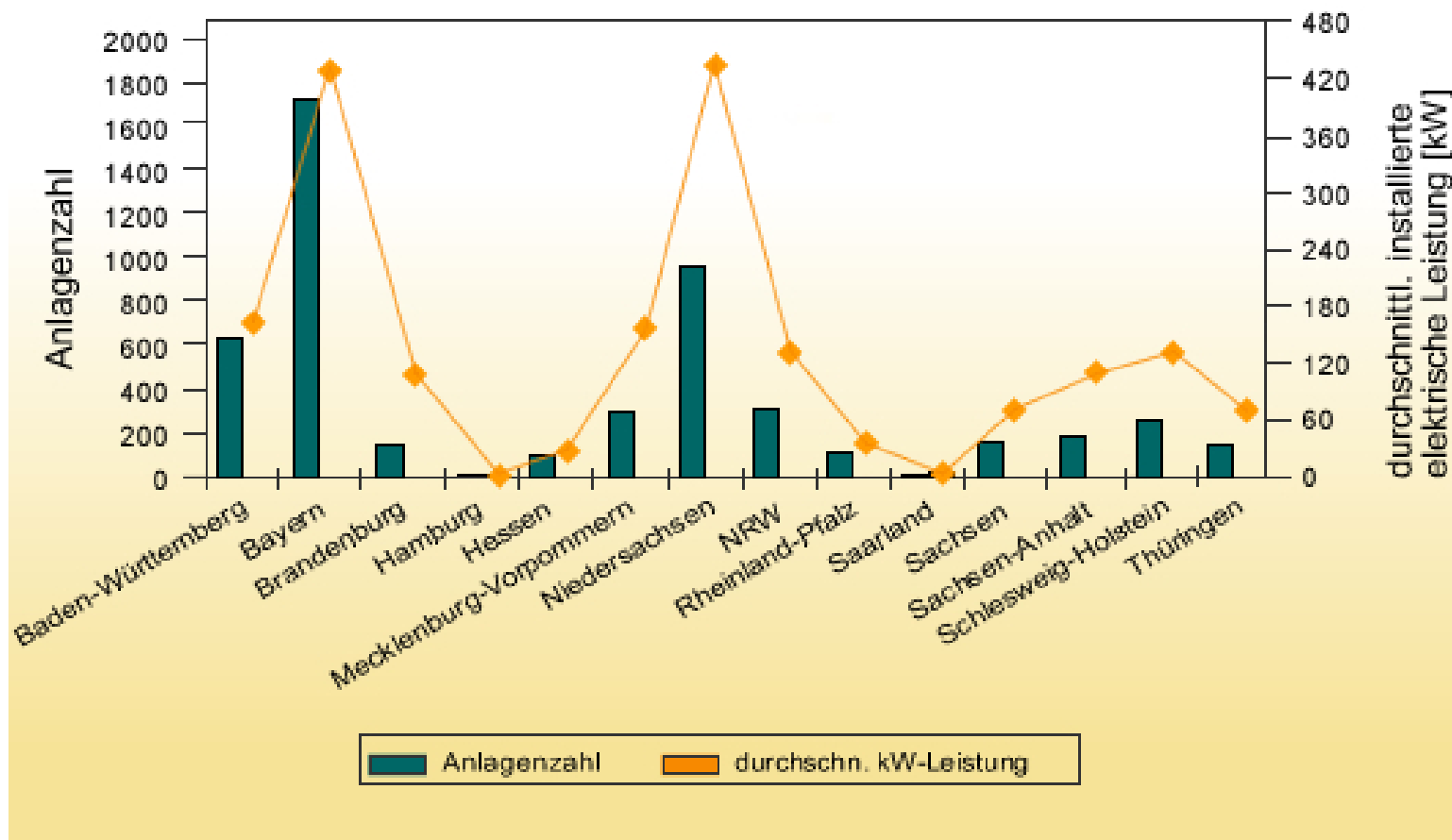
- Development of German biogas market since 1992

## Number of biogas plants & installed electric capacity in Germany



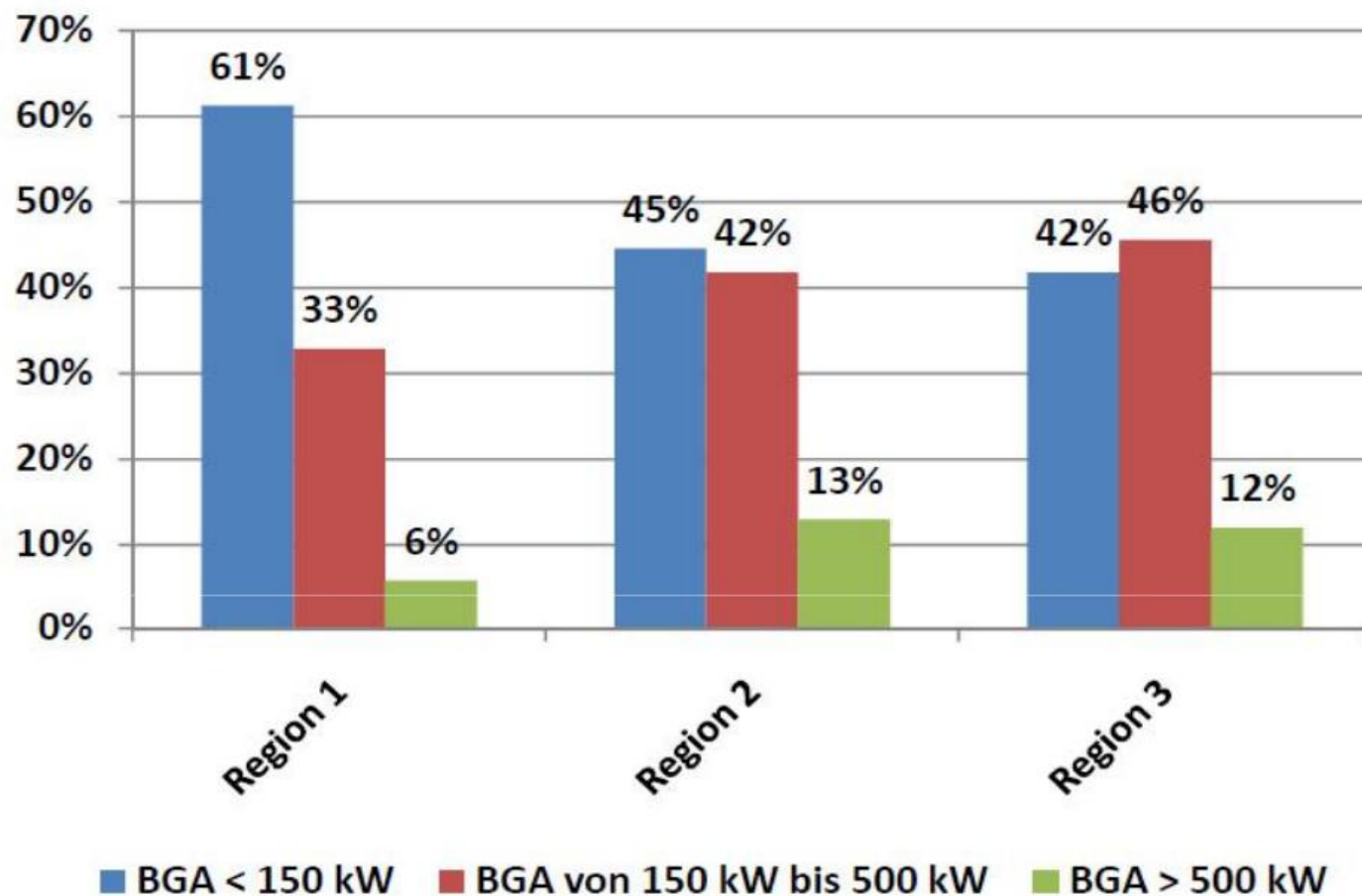
# Large and small biogas plants

- Size of installations in Germany



# Large and small biogas plants

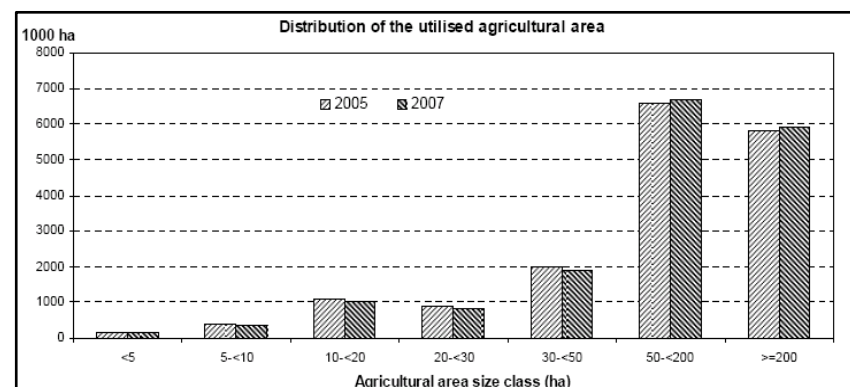
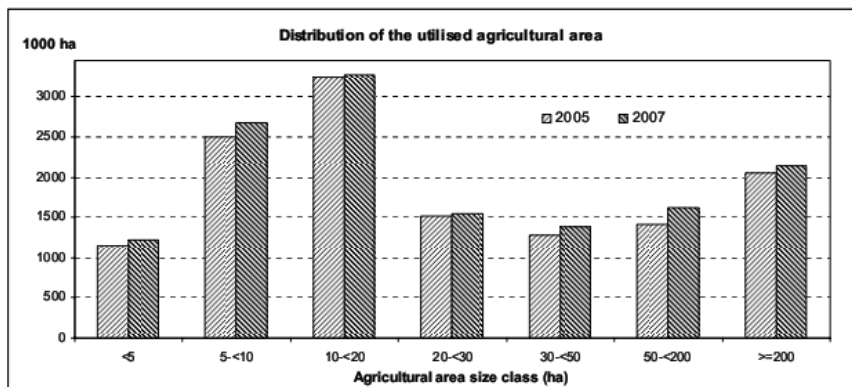
- Potential - Estimation for state of Bavaria – next 10 Years



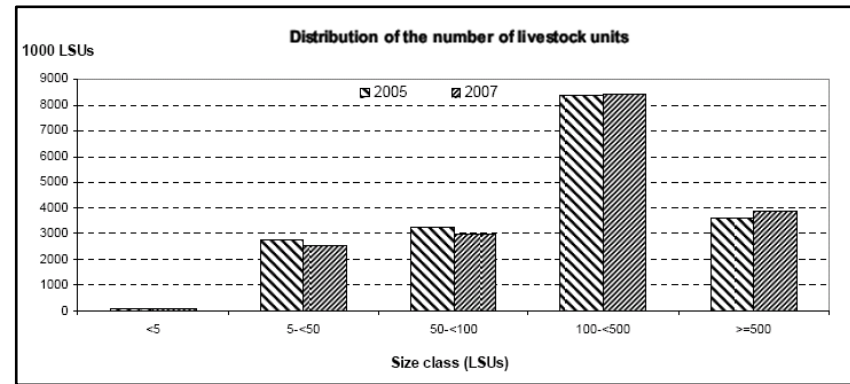
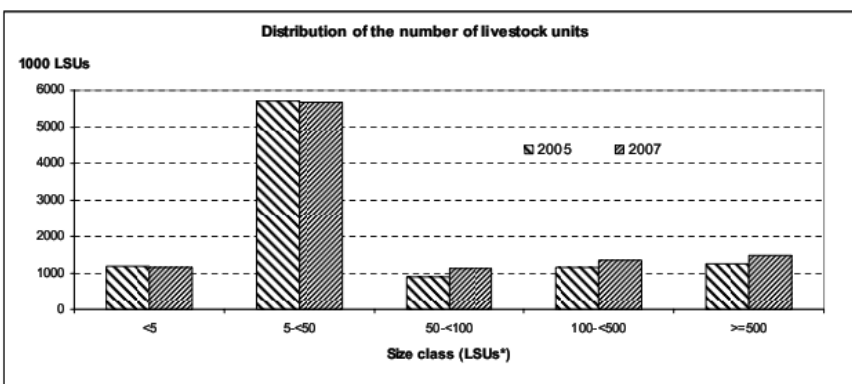
# Large and small biogas plants

- Farm structure comparison

## Poland



## Germany



\*LSUs = Livestock Unit

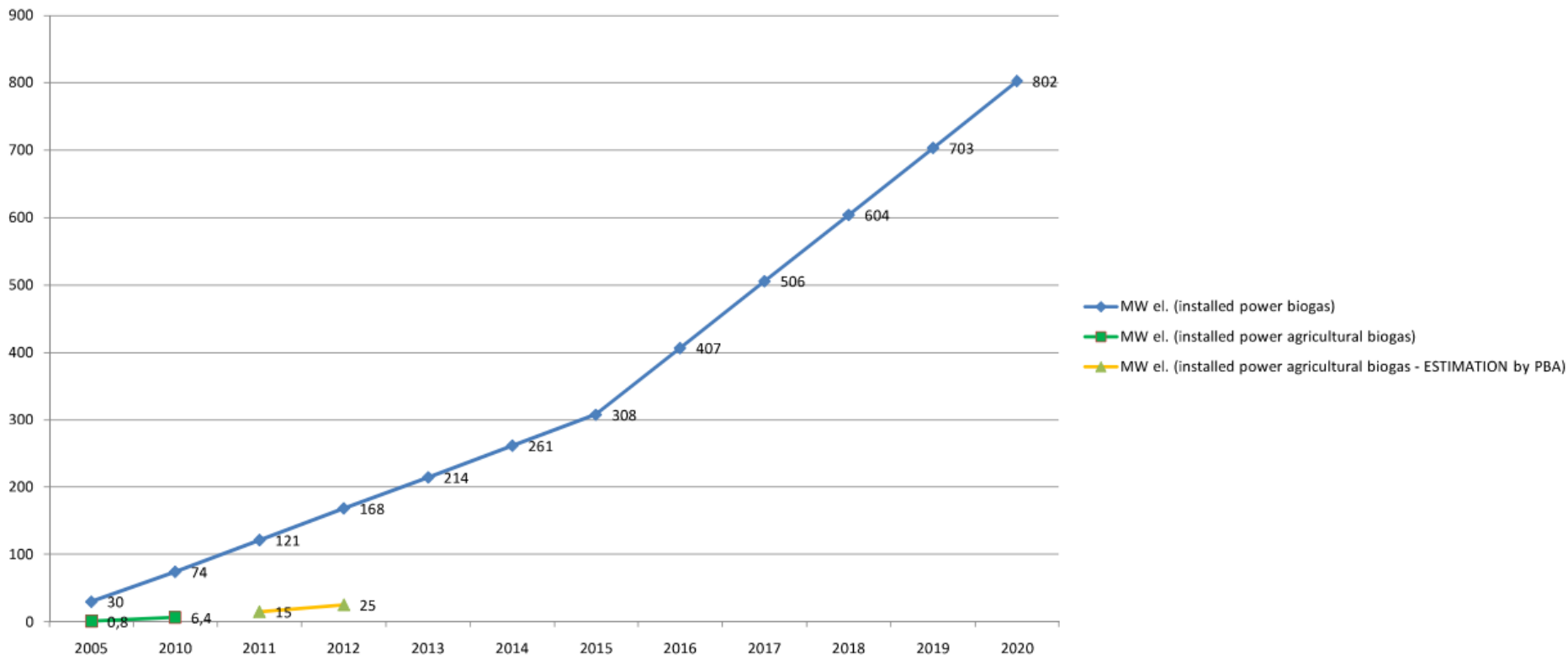
# Potential of Polish Biogas Market

- Comparison to Germany as a reference (worldwide leader in Biogas Application):  
without landfill and sewage

	<b>GERMANY</b>	<b>POLAND</b>
<b>Inhabitants in Mio.</b>	<b>82,1</b>	<b>38,1</b>
<b>Surface in km<sup>2</sup></b>	<b>357.100</b>	<b>312.700</b>
<b>Arable Land in Mio. ha</b>	<b>11,9</b>	<b>10,7</b>
<b>Theoretical potential from plants in MW</b>	<b>22.500</b>	<b>20.200</b>
<b>Theoretical potential from org. waste in MW</b>	<b>1.750</b>	<b>1.375</b>
<b>Installed Power in MW (2009)</b>	<b>1.600</b>	<b>&lt; 6</b>

# NREAP Poland 2020

According to EU Directive 2009/28/EC



# Large and small biogas plants

- German compensation system – depending on size of installation

	<b>GERMANY</b>	<b>POLAND</b>
<b>Maximum compensation per MWh in EUR (&lt;=150 kW)</b>	<b>307,6</b>	<b>approx. 135,0</b>
<b>Feed-in tariffs</b>	<b>yes</b>	<b>no</b>
<b>Price guarantees</b>	<b>20 years</b>	<b>no</b>
<b>Direct subsidies on investment</b>	<b>yes</b>	<b>yes</b>

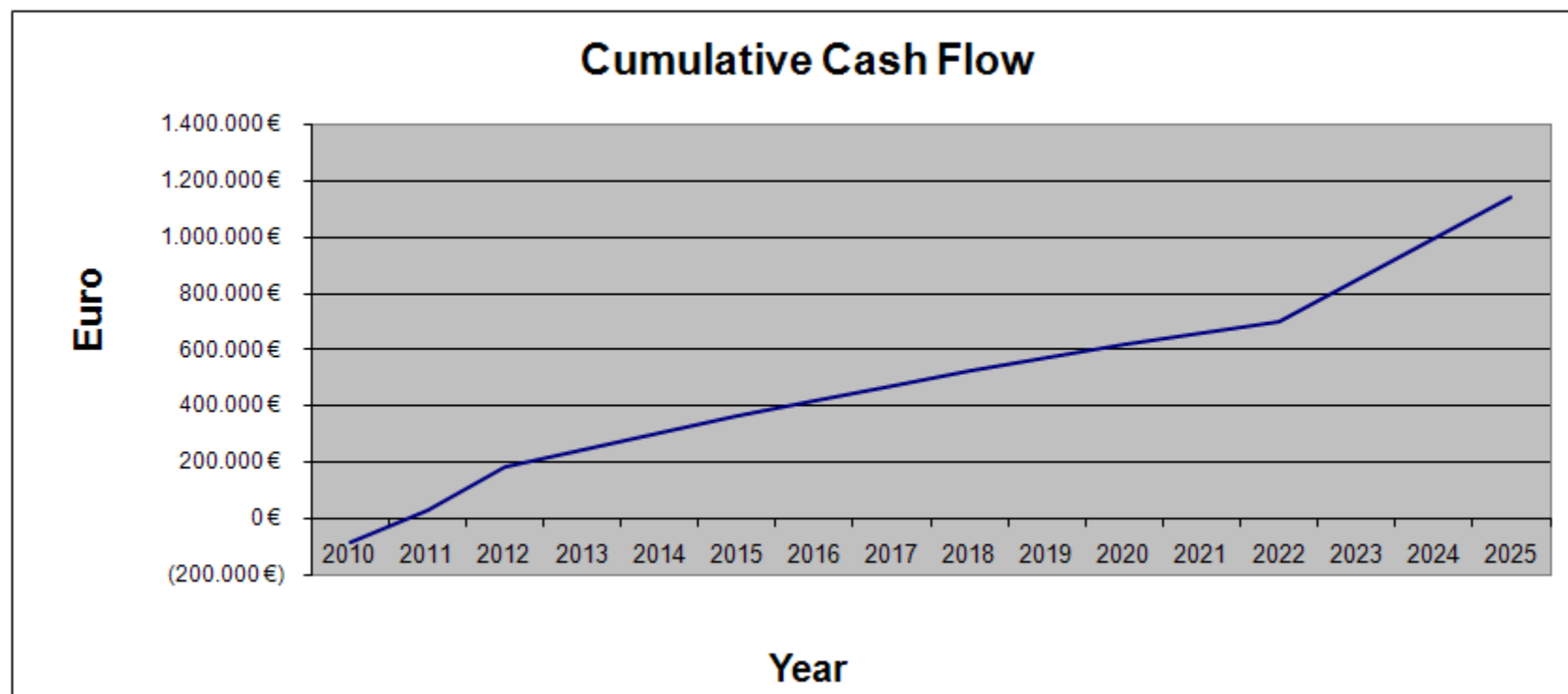
# Large and small biogas plants

- German compensation system – depending on size of installation

		<=150 kW	<=500 kW	<= 5 MW
1.	<b>Basic compensation</b>	11.67 Cent <b>(+ 1 Cent)</b>	9.18 Cent (unchanged)	8.25 Cent (unchanged)
2.	<b>Clean air – bonus - new</b>	Old plants	1.0 Cent	
		New plants	1.0 Cent	
3.	<b>Renewable primary products bonus</b>	7 Cent <b>(+ 1 Cent)</b>	7 Cent <b>(+ 1 Cent)</b>	4 (unchanged)
4.	<b>Landscape work bonus - new</b>	2 Cent	2 Cent	
5.	<b>Bonus for the use of manure -new</b>	4 Cent	1 Cent	
6.	<b>Bonus for innovative technologies (without Gasinjection)</b>	2 Cent (unchanged)	2 Cent (unchanged)	2 Cent (unchanged)
7.	<b>Bonus for innovative technologies</b> (Gasinjection)	New plants	Depending on the size of the gas treatment 1/2 Cent	
		Old plants	2 Cent	
8.	<b>Combined heat and power-bonus</b>	0/2/3 Cent	0/2/3 Cent	0/2/3 Cent

# Large and small biogas plants

- Example: Cash Flow of German biogas plant 150 kW
  - Total investment: 720.000 EUR
  - Manure, Corn silage, Grain, Grass silage



# Large and small biogas plants

- Considerations:
  - Currently very high initial cost for project development
  - Long period of development of large projects
  - Distance of transport – logistics etc.
  - Activate fallow land
  - Public campaign is necessary in order to increase acceptance of biogas

# Large and small biogas plants

- Public acceptance / concern of citizens towards projects – Protest?

**20 MW**



**250 kW**



## Résumé / Conclusions

- huge potential for small installations in Poland
- projects (locations) of large scale are limited
- both types are needed, depending on project and substrate sources
- small installations is the only chance to achieve NREAP on time
- conditions in Poland need to be adjusted in favor of small installations
- use experience and learn from other markets



**Thank you for your attention!**

Invitation for upcoming POLEKO 23.-26.11.2010

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