Poznań University of Life Sciences
Uniwersytet Przyrodniczy w Poznaniu

Polish national potential of biogas and biomethane production

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BioPart kick-off meeting
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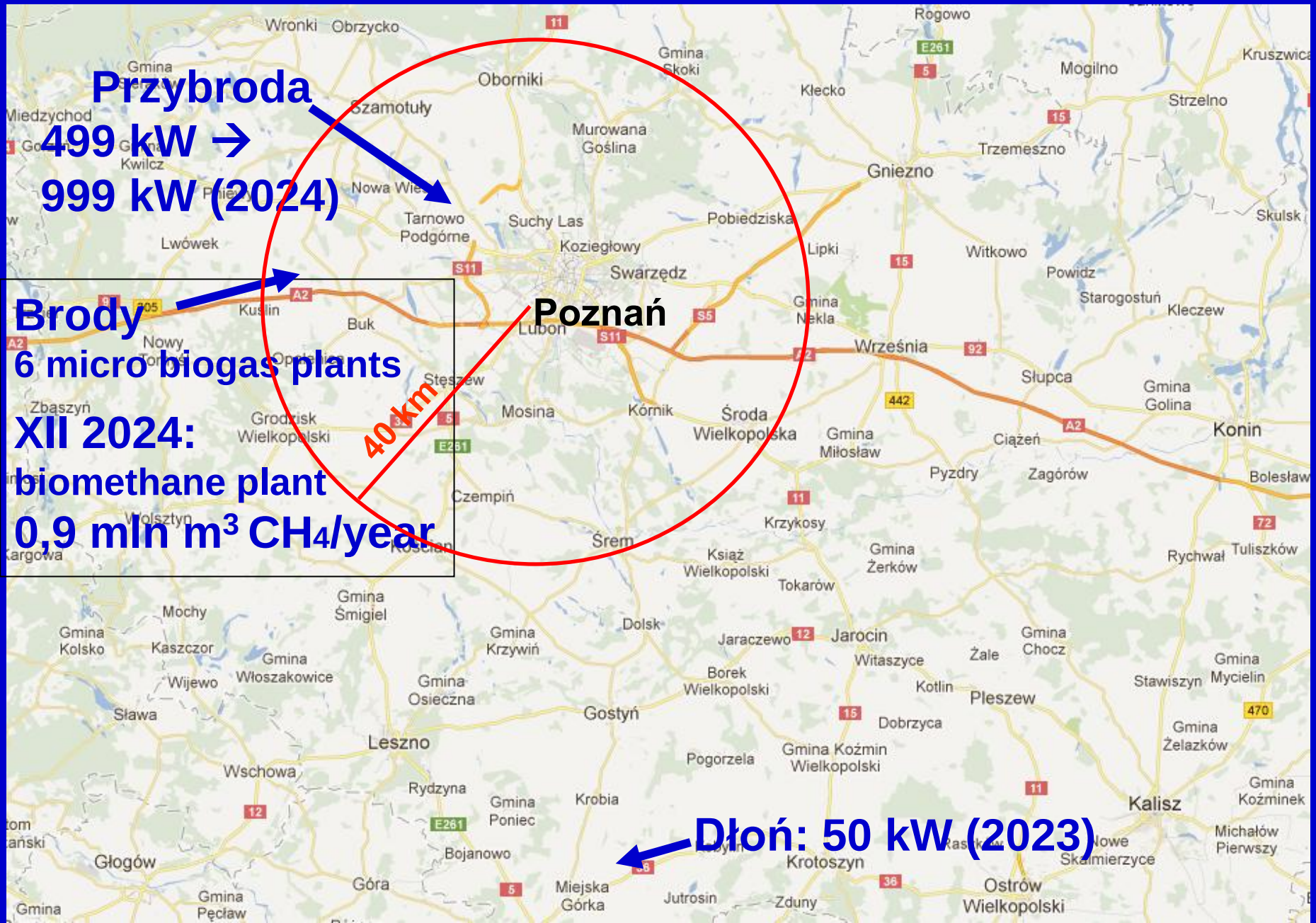
Poznan University of Life Sciences (PULS) actual situation



Biogas plants in Brody farm:

- Exploitation of 6 microbiogas plants (eq. 15 kW each) built with the National Centre for Research and Development (PULS as strategic partner);

- Construction of 1st biomethane plant in Poland (end of 2023).

Biomethane plant in Brody experimental farm

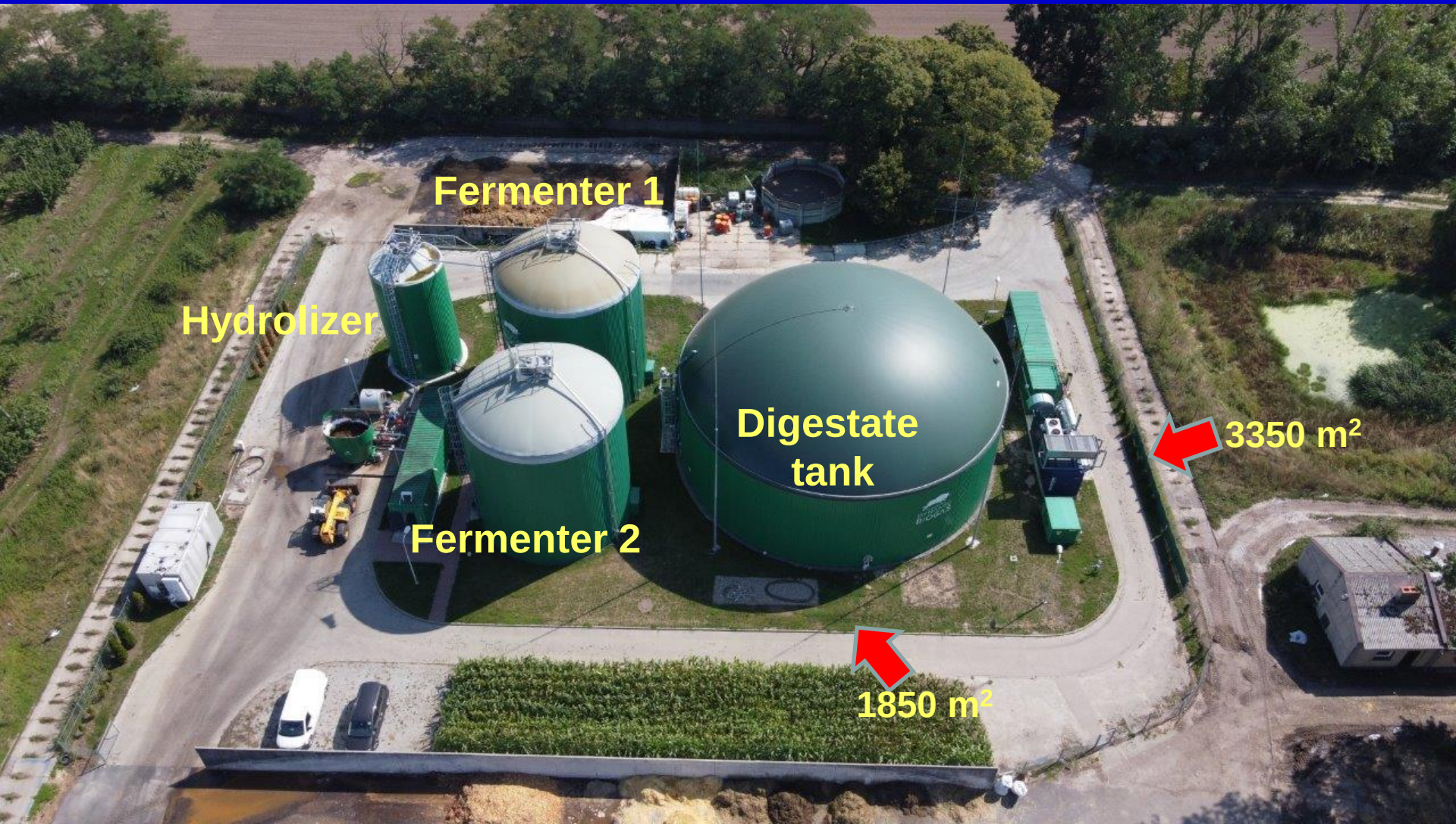
- Start of fermentation proces: Summer 2024;
- Capacity of production: 700,000 m^3 bioCH_4/a, 200 kW_e;
- Impossible to connect with local gas grid.

Biogas plant in Przybroda farm: 0.5 MW → 1 MW (2024)

One of the most advanced biogas plant in the World

Surface for biogas plant: 1850 m^2, Total surface of parcel: 3350 m^2

Substrates: manure from 200 cows, agricultural biomass



The actual state: linear (24 h/day) production of electric energy and heat (cold production for fruits freezer and ORC system planned probably since 2025)

2025?

Cold for fuit warehouse

Przybroda village

Heat

Electric grid

Electric energy

Biogas substrates availability: potential in Poland

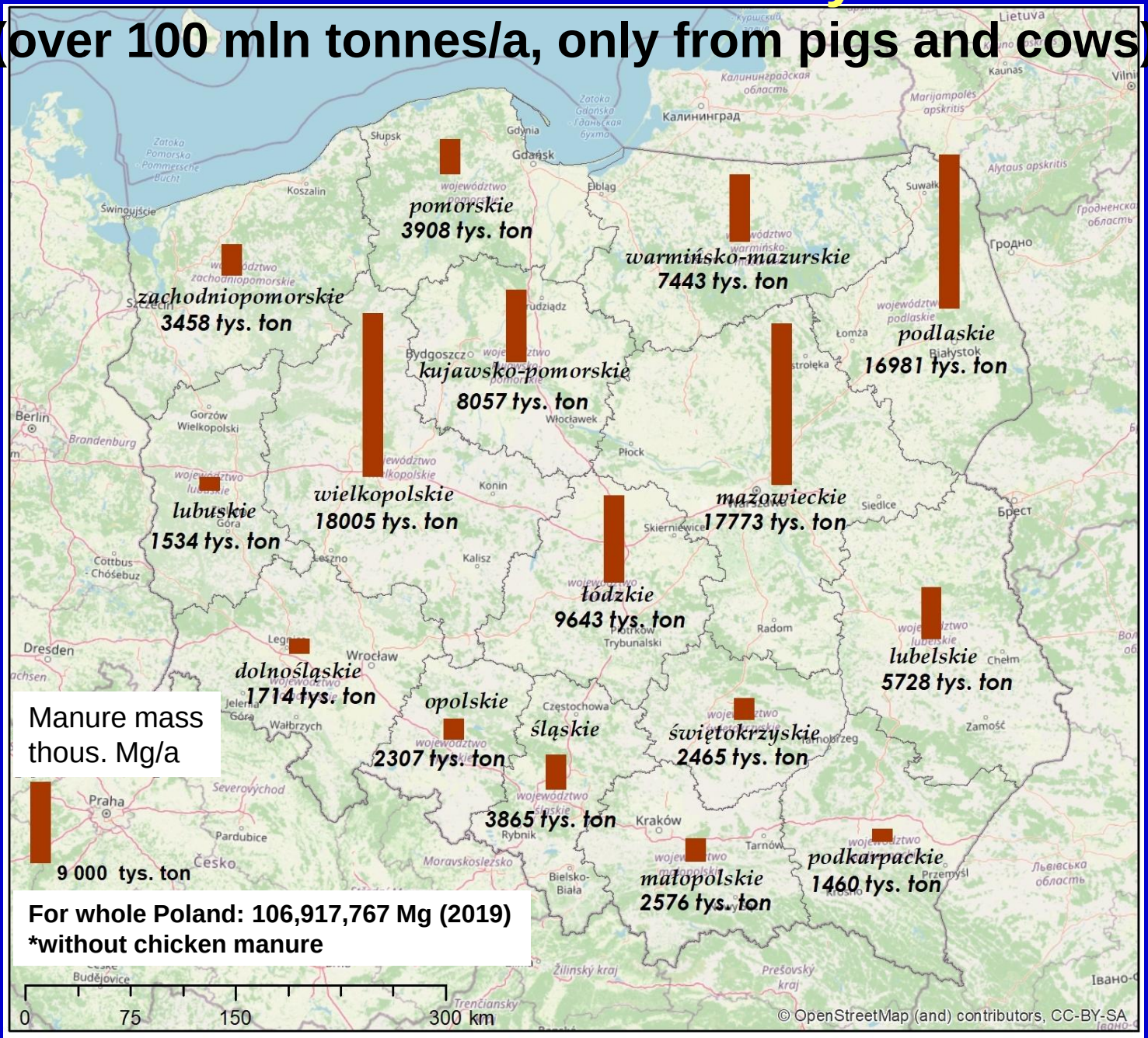
Ecotechnologies Laboratory (PULS)

Over 3500 different materials analysed as substrates for biogas production.

Batch culture
DIN 38414/S8
VDI 4630

Continuous fermentation

The most available substrate: farmyard manure (over 100 mln tonnes/a, only from pigs and cows)



Actually less than 0,1% manure is used in biogas plants

- Mechanical problems (straw is hard to be digested);
- Strong GHG emissions during manure storage.

Agri biomass and bio-waste (technical potential):

- over 90 million tonnes of manure and slurry (from over 130 mln tonnes produced);
- 8 million tonnes of cereal and rape straw (out of a total of over 30 mln tonnes produced annually);
- 4 million tonnes of maize straw (from over 6 mln tonnes produced);
- over 10 million tonnes of waste from food processing, sugar factories, slaughterhouses, dairies, distilleries, and refood, i.e., expired and rotted food);
- over 9 million tonnes of waste from the municipal sector (organic fraction of municipal waste, green waste, sewage sludge);
- over 1.5 mln ha of non-cultivated or degraded surface.

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- 8 million tonnes of cereal and rape straw (out of a total of over 30 mln tonnes produced annually);
- 4 million tonnes of maize straw (from over 6 mln tonnes produced);
- over 10 million tonnes of waste from food processing, sugar factories, slaughterhouses, dairies, distilleries, and refood, i.e., expired and rotted food);
- over 9 million tonnes of waste from the municipal sector (organic fraction of municipal waste, green waste, sewage sludge);
- over 1.5 mln ha of non-cultivated or degraded surface.

In total:

- Over 7.5 bm^3 of biomethane
- 3.6 GW electric power (5.8 GW in demand-driven installation)

(***our previsions base on equal development of biogas with co-generation and biomethane sectors in next 12 years, till 2035***)

Comparison of the biogas market in Poland and Germany

Parameter:	Germany	Poland
Number of agricultural biogas plants	> 9000	~180
Electric power installed	7 GW	0.17 GW
Main substrate used	silage	biowaste

Currently, there is a gigantic disproportion between the size of the German and Polish biogas market (almost 7000 MWe versus about 170 MWe currently in Poland);

However, Poland has a huge production potential, based primarily on biomass from agriculture and bio-waste from the agri-food industry;

Projected size of the Polish biogas market around 2035: 10-13 thousand installations with an average capacity of 0.5 MWe or several hundreds biomethane plants with much bigger size.

More information about Polish biogas market:

https://magazynbiomasa.pl/biogas-and-biomethane-in-poland-report-pobierz-za-darmo/

Thank you for your attention

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