

The role of pre-investment evaluation of agricultural biogas plants

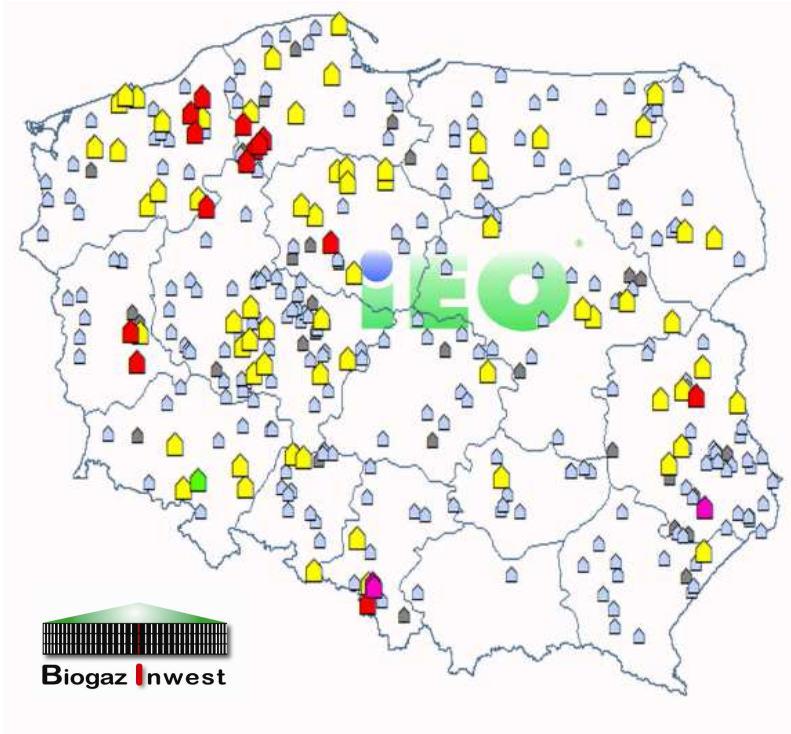


Anna Oniszk-Popławska









e c b r e c

How to trigger the market maturity in Poland for agricultural biogas?

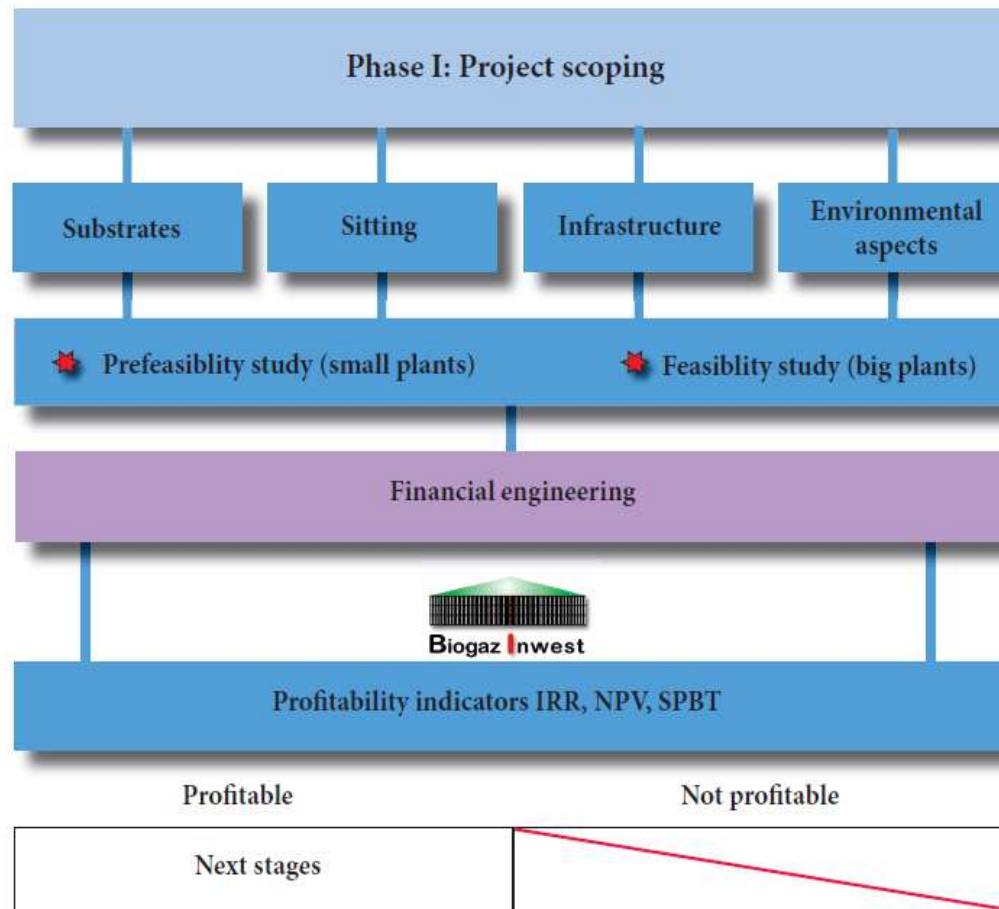


Immature market:

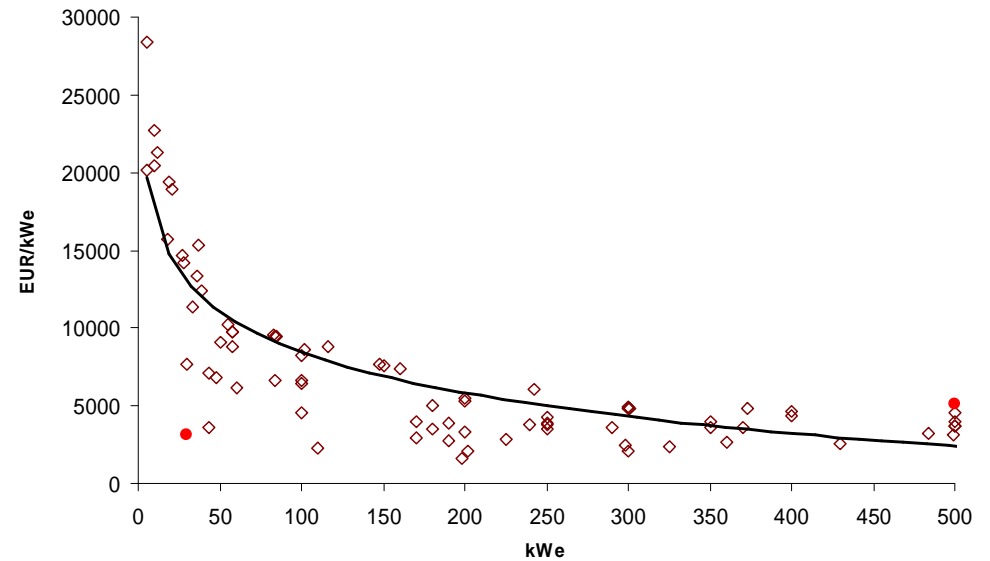
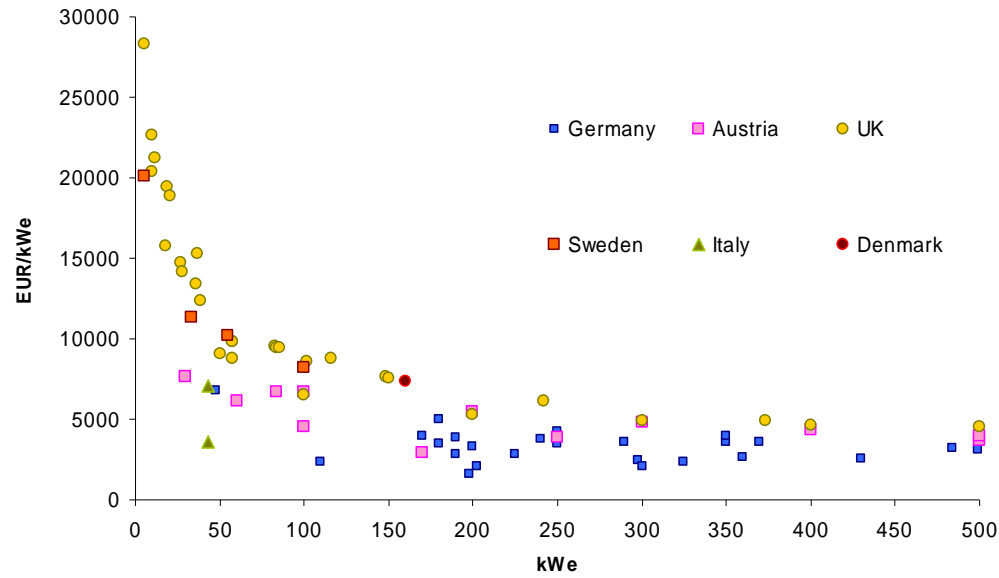
- know-how import (from Germany)!
- lack of domestic companies in building/construction
- higher investment risks!
- higher investment costs!

Complete	Start-up	Under construction	In design	Deffered
14	2	64	234	34
  micro				

Triggering the market maturity for agricultural biogas- economic evaluation a decisive indicator



Economic evaluation- investment costs



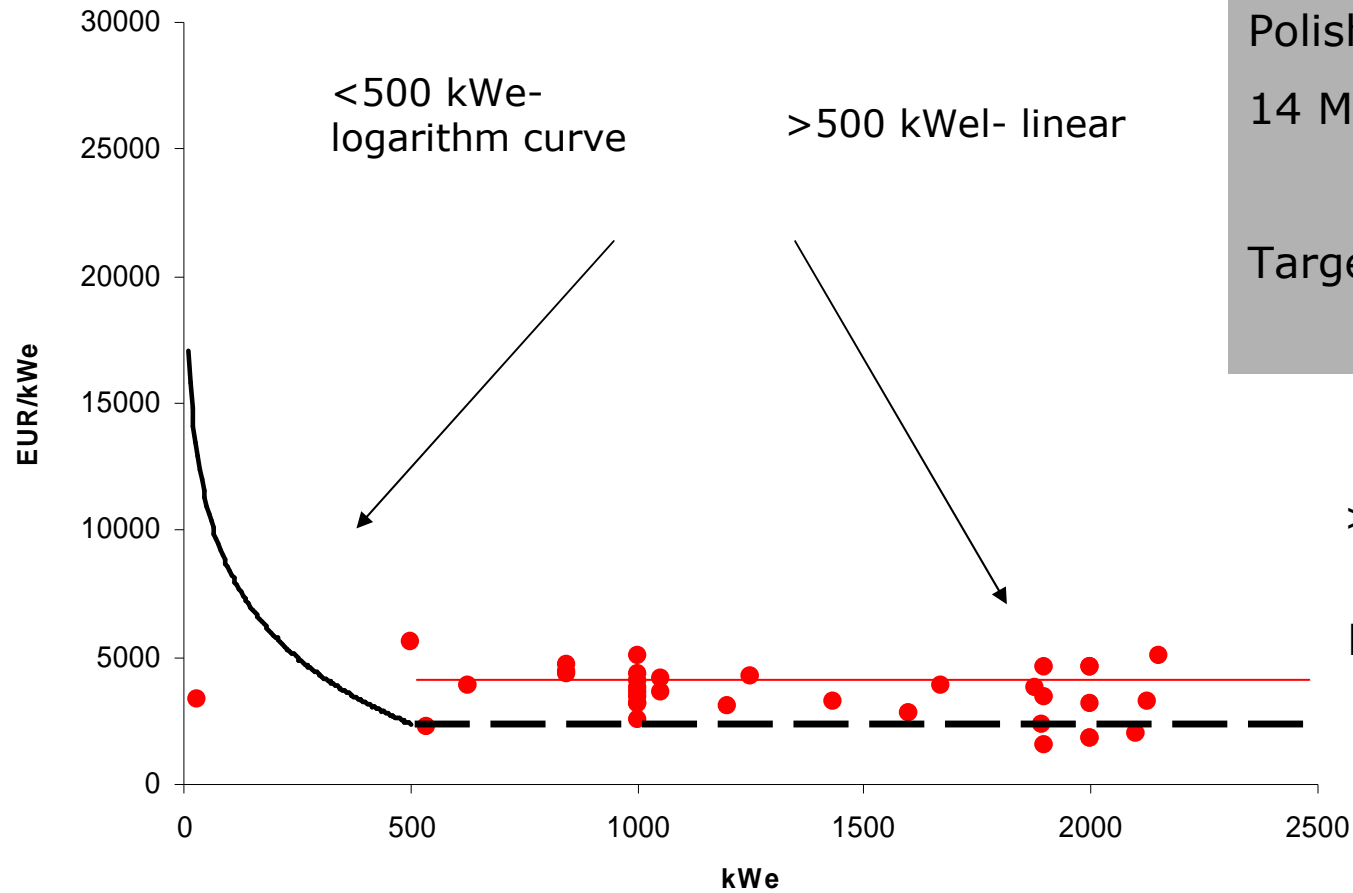
In EUR'2009: includes inflation rates from the start-up, currency conversion for 2009

Economic evaluation- investment costs

EU Structural Funds,
mainly German projects:
16-18 M PLN/MWe

Polish equipment:
14 M PLN/MWe

Target: 10 M PLN/MWe



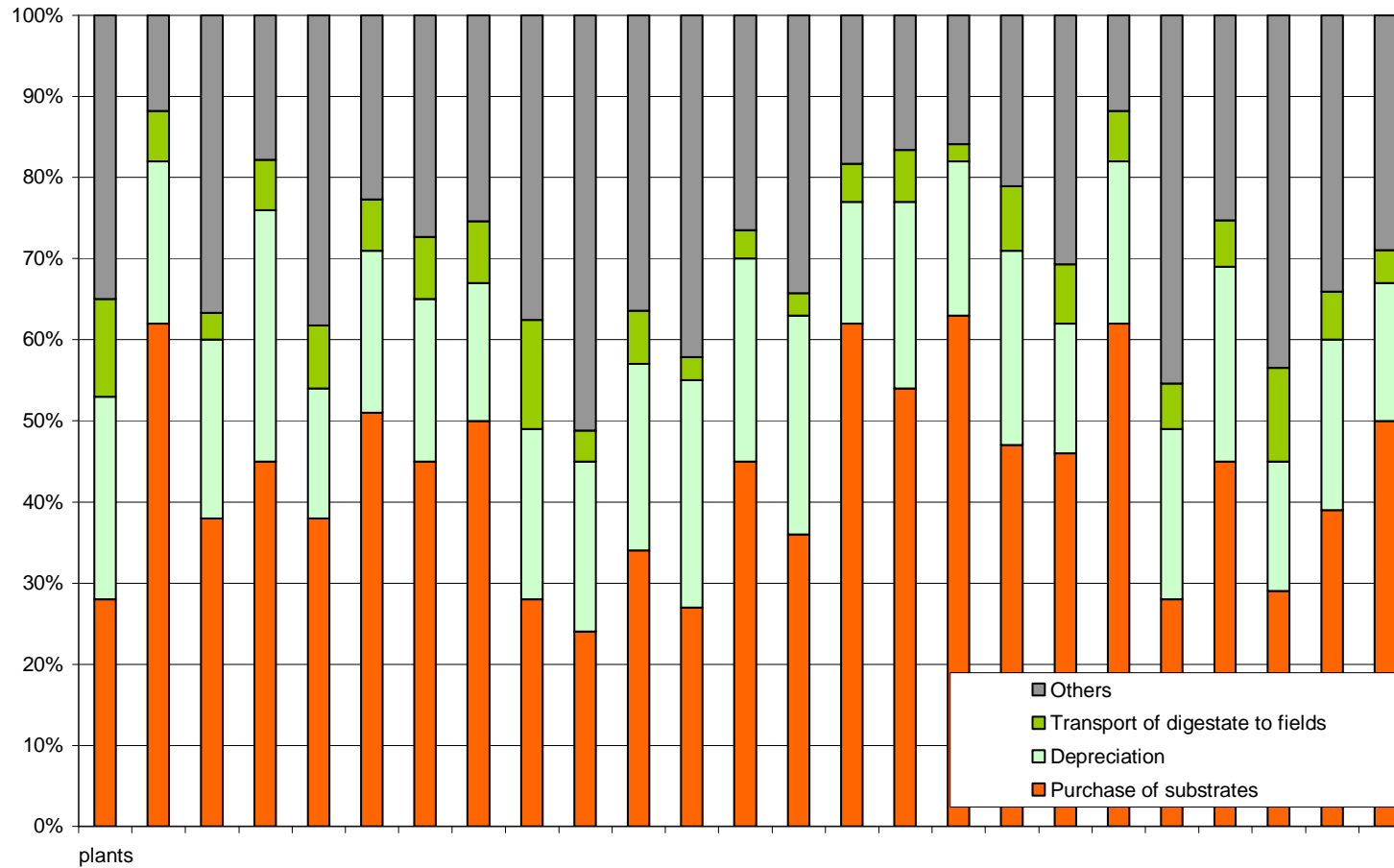
> 500 kWe

PL: 3700 EUR/kWe
EU: 2400 EUR/kWe



e c b r e c

Economic evaluation- operating costs



O&M, taxes, etc.

Transport to fields

20-40 PLN/ha

10% of investment costs

Energy crops
maize silage
120 PLN/t

Economic evaluation- sources of income

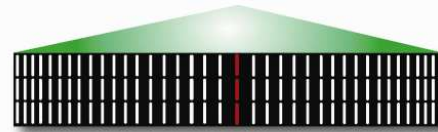
	Income
Electricity	197 PLN/MWh
Green certificates (RES)	255 PLN/MWh
Yellow certificates (cogeneration below 1 MWe)	124 PLN/MWh ¹
Purple certificates (cogeneration above 1 MWe)	56 PLN/MWh ²
Heat	20-25 PLN/GJ ²
Digestate as fertiliser	0-20 PLN/t

¹ Depends on the utilizable heat.

² Lower than the market price which is c. 40 PLN/GJ.

Economic evaluation- profitability indicators

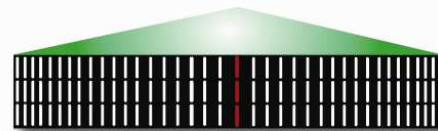
swine slurry 30,000 t/a
maize silage 15,000 t/a



ABP plant based on agricultural materials

power 0.86 MWeI
electricity 6.9 GWh/a

blood 2,000 t/a
fat separator waste 3,000 t/a
intestines and other body parts 500 t/a
meat screenings 2,000 t/a
kitchen waste 9,000 t/a
distiller's wash 20,000 t/a
dried chicken slurry 10,000 t/a



ABP plant based on industrial waste

power 1.81 MWeI
electricity 14.5 GWh/a

Indicator	ABP based on agricultural materials	ABP based on industrial waste
net present value NPV [M PLN]	3.3	8.3
internal rate of return IRR [%]	15	16
simple payback period SPBT [years]	7	7



e c b r e c

Conclusions



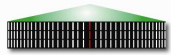
The findings of this study will be used to design support schemes for small biogas plants up to 150 kWel.



The technology costs in immature markets are higher due to higher investment risks.



Bigger investments = lower specific investment costs per 1 kWel installed.



Smaller investments need more support:

- Financial: traditional investment tools such as feasibility study cannot be recommended (costs!)- pre-feasibility study is an option
- higher level of support – investment costs (subsidies) and production (kWh of electricity produced).
- Organisational: the financial support schemes are not sufficient – organisational schemes are needed: demo investments, organisation of training structure, support for farmers in the pre-investment phase.



Thank you for your attention

contact: biogazinwest@ieo.pl

