

Economics of Energy Crops in Poland today and in the future

Ewa Ganko, EC BREC
Hakan Rosenqvist, IIIIEE

NoE Bioenergy final meeting, 2-3 November 2009, Brussels



Objectives

- ✦ Calculate indicative energy crop production costs
- ✦ Compare gross margins with food crops
- ✦ Analyze the structure of production costs
- ✦ Investigate the cost reductions due to
 - ✦ Scenario 1: Scale effect
 - ✦ Scenario 2: Combined scale effect and technology development over time



Energy crops

- ◆ Willow: perennial crop, 3-year rotation
- ◆ Miscanthus: perennial crop, 1-year rotation
- ◆ Triticale (whole crop): annual crop, 1-year rotation



Bioenergy NoE

Scenarios

- ◆ Base case: cultivation at small-scale (10,000 ha of energy crops in Poland) with production technology of today.
- ◆ Scenario 1: large-scale cultivation (plantation area in Poland exceeding 100,000 ha) with current production technology.
- ◆ Scenario 2: large-scale cultivation (plantation area in Poland exceeding 100,000 ha) with about 15-20 years of development of crops and cultivation methods at large scale.



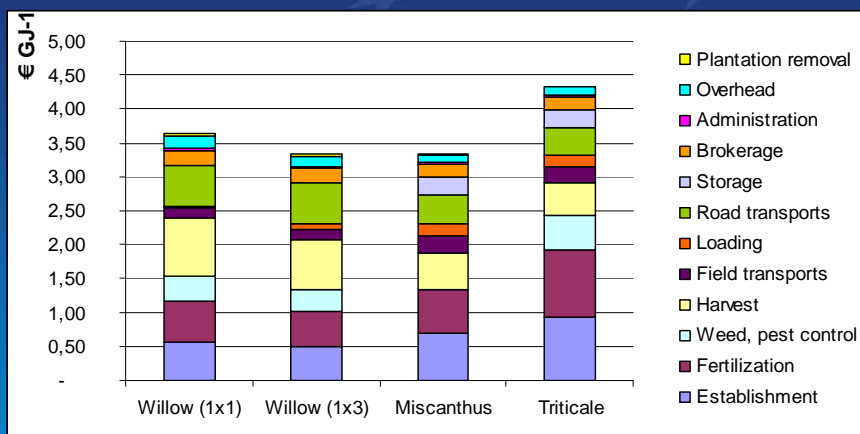
Bioenergy NoE

Base case plantation

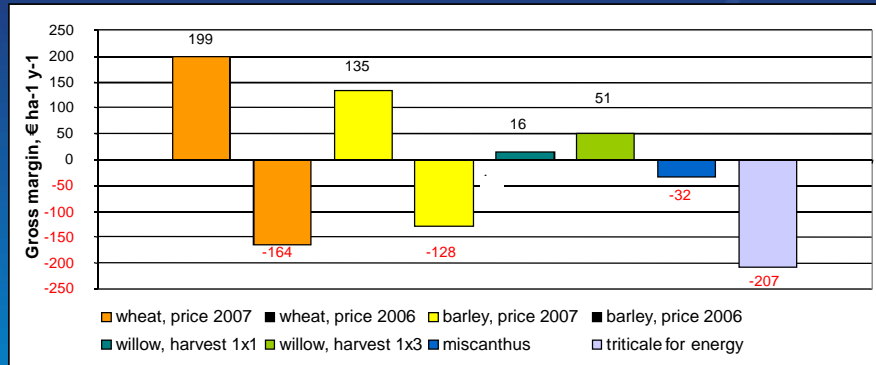
	Willow (harvesting 1x3)	Miscanthus (harvesting 1x1)	Triticale (harvesting 1x1)
Plantation lifespan	22 years	21 years	Annual crop
Plantation density	12,240	10,000	180 kg/ha
Yield, dry matter, t/ha*yr ⁻¹	9.0	14.0	11.0
Number of harvests	7	20	1
Storage	no storage	under roof	under roof
Road transport	30 km	30 km	30 km



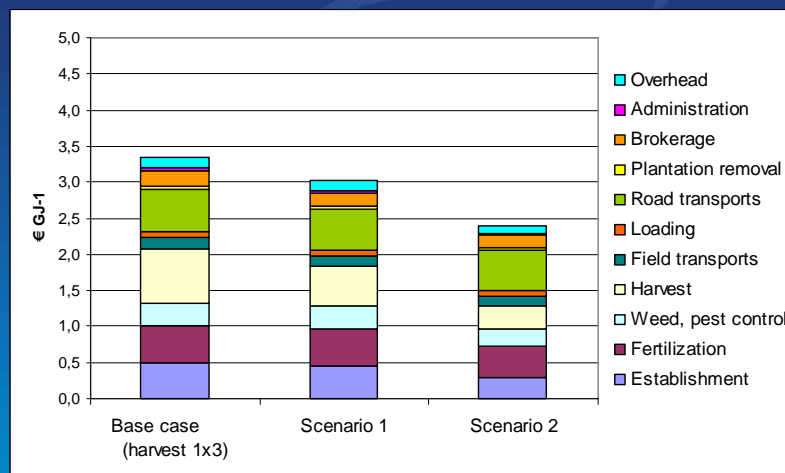
Production costs – base case



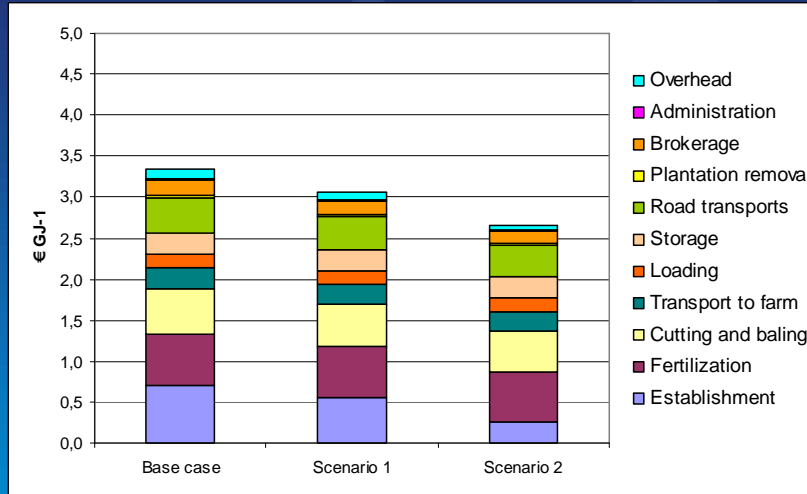
Competitiveness with food crops



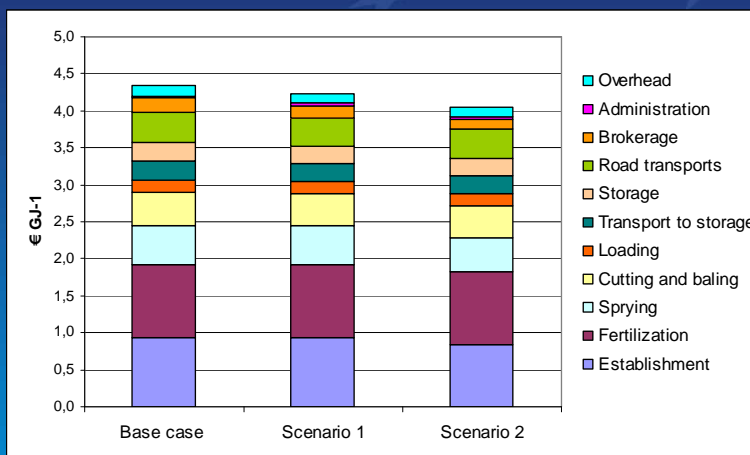
Willow – production costs



Miscanthus – production costs



Triticale – production costs



Conclusions

- ✦ Production costs are largest for annual crops (triticale), the lowest for woody crops (willow)
- ✦ With assumed biomass prices applied, willow is profitable while miscanthus and triticale generate loss.
- ✦ The volatility of cereal market prices was found to markedly affect the competitiveness of energy crops when compared to cereals cultivated for grain.



Bioenergy NoE

Conclusions

- ✦ For the first farmers to cultivate perennial energy crops, the costs are high.
- ✦ There are large opportunities for production cost reduction due to the economics of scale and technology development – the largest for willow, the least for triticale.
- ✦ To achieve the potential cost reductions, an active development support is desired during the early stages of the industry.



Bioenergy NoE

Thank you for your attention!

eganko@ipieo.pl

hakan.rosenqvist@post.utfors.se



Bioenergy NoE