

# REGIONAL BIOMASS PROJECT IN SOUTHERN POLAND

## JOINT INITIATIVE OF KRAKOW UNIVERSITIES

Adam Gula, Dorota Oblakowska and Artur Wyrwa

Faculty of Fuels and Energy, AGH-University of Science and Technology  
al Mickiewicza 30, 30-059 Kraków, Poland  
tel. +48 12 617 3428, e-mail: [gula@agh.edu.pl](mailto:gula@agh.edu.pl), [doblak@agh.edu.pl](mailto:doblak@agh.edu.pl)

In August 2000 the Polish government adopted the “Development Strategy of Renewable Energy Sector”, which sets goals of deriving 7.5% of primary energy from Renewable Energy Sources (RES) by 2010 and 14% by 2020 [1]. If these targets are to be achieved, biomass will have to play the dominant role: according to one of the scenarios, the share of biomass in RES in Poland will constitute almost 85% as far as heating and electricity production are concerned [2]. Apart from fulfilling Poland’s Kyoto commitment, and meeting the EU targets, the growth of the biomass-for-energy sector is a very positive development also for the social and economic reasons. With insufficient demand for domestic nutrition crops and decreasing exports, about 2 million hectares of agricultural land are not used at present [3]. Additionally, the per capita area of farmland is almost four times higher than in EU. In this situation the energy plantations provide a very attractive alternative to create jobs and provide the very needed income for farmers.

At present one observes an explosion of interest in planting the fast growing willow (*salix viminalis*) for direct combustion in boilers or production of pellets or briquettes. Given the local agro-technical conditions this needs not to be an optimum solution - there are other plants that often can give more final energy yield or financial revenue per hectare. A systemic approach to the problem is lacking and there is practically no co-ordination of actions and initiatives, which are mostly undertaken *ad hoc*, while they should be based on scientifically grounded data and research. This, however, requires adequately trained specialists, which are too few to meet the needs; notably:

- the ambitious targets set for “green electricity” [4] which have already created practically unlimited demand for wood chips of *salix viminalis*

- the increasing demand for biomass for heating - particularly district heating – which is a significant and constantly growing demand for biomass. This may originate from the agricultural residues, particularly straw, other energy plantations, such as *topinambur*, *sida hermaphodita* or *miscantus giganteus*, as well as for forest wood waste or post-production wood residues.
- The targets set for the fractional shares of liquid biofuels for motor vehicles which have already led to enormous interest among farmers and investors in planting crops for ethanol production and rape for biodiesel, as well as created a huge controversy concerning the state policy in this area [5].

Considering these circumstances four Krakow Universities (Jagiellonian University, AGH University of Science and Technology, Krakow Polytechnic and the Krakow Agricultural University) decided to undertake a common effort to provide scientifically based information for investors, utilities or local administrations to enable them make optimal decisions to maximize parameters of their interest, such as return on capital, GHG emission reduction or job creation. Such information is needed also to optimally use public financial resources in supporting the biomass-for-energy projects.

The project has both research and demonstration components. It comprises the whole chain of processes: selecting the plants, planting, harvesting, storing, processing, combustion, up to treating the final combustion products. There are further ramifications: Apart from combustion in a solid form, the harvested biomass can also be processed into liquid fuel or gasified. Therefore, the project covers a broad spectrum of scientific research: biotechnology, genetic engineering botanic, agriculture, boiler and combustion engineering and chemistry. At present, 32 research teams joined the programme. A map of research plans, equipment and human resources has been made to avoid doubling of efforts and costs.

One of the first steps is to meet the urgent need for providing the basic information and initial guidance for people interested in using biomass for heating instead of coal, oil or gas. They can hardly decide to invest without seeing how the installation may look like and how it is operated. For this purpose an actual demonstration facility is needed, especially of small and medium size heating installations in the range ca. 30 - 500 kW, typical for individual investors (mostly farmers) or municipal administrators. To fill this gap creation of an Education-Demonstration-Research Centre is one of the first elements of the common initiative [6]. The boilers in the range 30-100 will be

located at the University of Agriculture, while the bigger ones (up to 1 MW) at AGH. Installation of the first demonstration boiler is in progress at AGH. It is financed by the grant from AGH and supported by the GEF project POL/01/G35/A/1G/99 „Integrated Approach to Wood Waste Use for Space Heating in Poland” [7], which was designed by the Krakow Centre of the Polish Foundation for Energy Efficiency and the Faculty of Fuels and Energy of AGH. Further steps include development of the particular specialised laboratories. Apart from the own Universities’ means, support is sought for from the EU funds. <sup>1</sup>

## References

- [1] G. Wisniewski, *Development Strategy of Renewable Energy Sector*, Proc. VII Polish-Danish Workshop “Biomass for Energy”, Starbienino, 7-10 Dec. 2000, Ed. P. Kowalik, Gdansk Tech. Univ., p. 195.
- [2] A. Gula, A.Wyrwa, *Poland-Country Report*, proceedings of the CTI Capacity Building Seminar, Tutzing, September 2003.
- [3] A. Wyrwa, M. Kubicka, A. Figórski, E. Gula, *Energy Plantations*, Proceedings of the International Conference: “Biomasa-zdroj cistej energie”, Zilina-Slovakia, October 2003 p. 99-108.
- [4] Ministry of Economic Affairs, *An Ordinance on Feed-in Obligation for Electricity and Heat from Renewable Energy Sources, as well as electricity from Cogeneration*, OJ 2003 No 104 item 971.
- [5] A.Gula, A.Wyrwa, W.Chadysz, *Zig-Zags on the Polish Biofuel Act*, to be publ. in Energy and Environment
- [6] A. Guła, M. Filipowicz, A. Wyrwa, A. Figórski, E. Guła, *A Plan to Establish a Biomass-for-Energy Education and Demonstration Centre at AGH University of Science and Technology in Krakow*, Starbienino, 25-30 June 2003., Ed. P. Kowalik, Gdansk Tech. Univ., p. 25-30
- [7] A. Figórski, M. Filipowicz, A. Gula, E. Gula, *Integrated Approach to Wood Waste Use for Space Heating*, Proceedings of the Int. Conf. “Biomasa-zdroj cistej energie”, Zilina-Slovakia, October 2003 p. 95-98.

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