

New Concepts for Renewable Resources AD Plants with Power-Heat Coupling and Special External Hydrolysis Units.

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Increasing energy costs generated by increasing expenses for fossil resources forced a strong use of renewable energy sources in Germany. It is accompanied by several national support initiatives as the German “Renewable Energy Act”. One of the most important kinds of power generation occurs by anaerobic digestion plants due to the high availability of biomass as the basic resource. Biomass anaerobic digestion (AD) plants generate both, heat and power. The heat can not be used in the most cases due to the large distances to consumers. It is difficult to erect an AD plant close to consumers of heat due to its specific characteristics as heavy truck traffic and odours. One possible solution may be the construction of a “mother” biogas plant outside inhabited areas equipped with one or more external hydrolysis units to prepare the material for the anaerobic digestion in the “daughter” biogas plant erected close to possible consumers, e.g. in industrial estates. Furthermore, it is important to increase the efficiency of biogas plants due to rising biomass prices. The advantage of this concept is the fact, that not the heat has to be transported that is expensive and generates great losses, but the fuel.

Actually such a plant is under construction in Lower Bavaria and will start its operation in the beginning of the year 2006. The plant will possess an electrical power capacity of 500 kW and can be extended to 1MW by its modular construction. The plant will treat organic fertilizer as duck dung and renewable resources as several silages (e.g. from corn). It is equipped with four hydrolysis units, two are intended for the hydrolysis of own material used in the plant and two will be used for the hydrolysis of materials for the digestion in the daughter plant(s). This service will be paid by the daughter biogas plant. The plant possesses four 1200m³ concrete digesters and two 1200m³ storage digesters. Results of the starting up phase and behaviour of the hydrolysis units will be existent after 3 months of operation. The paper will deal with constructional and equipment matters as well as with the operational behaviour of these plants for decentralised energy production. First analysis campaigns will be conducted during the start up phase to assess the quality of the hydrolysis step.