

## ECONOMIC COMPARISON OF BIOGAS PLANTS UNDER THE NEW HUNGARIAN PRICE CONDITIONS

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Our aim was to tease out profitable scales of agricultural biogas plants with their electrical capacity on the basis of the present Hungarian regulation. According to this, in our study we compared the profitability of three running German biogas plants with different electricity production scales (100, 300 and 500 kW). In our calculations we used Hungarian prices in order to depict the Hungarian situation.

The known investment and running costs enable a full economic comparison. The new Hungarian Electricity Law grants an average delivery price of 24 HUF/kWh (approx. 9 cent €) produced from renewable sources (wind, solar energy, geothermal energy, water power, biogas, etc.). This price is guaranteed only till the end of the year 2010 (then the regulation will be reviewed). It does not make sure the long term planning of the investments. However, the profitability of the biogas plants does not depend only on the guaranteed delivery price: the cost of the feed material is a determinative factor as well. As a result of this biogas plants that utilize only agricultural products in small scale are not profitable due to high feed material costs. On the contrary, biogas plants with waste treatment that use feed material like animal offal, carcass, can be profitable, because they earn money by their waste treatment services. Thus, for them feed materials do not cost but earn money. The study also examines the way of electricity generation. The granted delivery price has different classes, depending on the time of day (there are peak and non-peak prices). Every biogas plant was divided into two different production types regarding their generation period: There was a full time, 24-hour operating CHP plant and one which operates only during peak periods, i.e. 21 hours a day. Applying dynamic economic efficiency indices, like IRR, MIRR and NPV, we came to the overarching result that biogas plants with an electrical capacity over 500 kW are profitable in Hungary. The smaller plants with an electrical capacity of 100 and 300 kW - due to the high investment costs and smaller yearly income - are not lucrative. Furthermore, the part-time operation of biogas plants is less profitable than that of full-time operated plants. The reason is that although relative incomes are much higher in part time operation, additive investments (bigger generators and gas tanks) overcompensate this advantage. We also conducted sensitivity analyses regarding state investment subsidisation and CO<sub>2</sub> trading. With a 25% of state support of the investment costs, which should not be repaid, small-scale biogas plants are not economical, but the biggest plant makes a higher profit. With CO<sub>2</sub> trading the 300 kW biogas plant is as lucrative as the 500 kW plant regardless any financial support. As a conclusion we can underline that the structure of the granted delivery price of electricity is not suitable to offer a chance to smaller biogas plants to operate profitably, and pushes economic incentives into the direction of building rather huge biogas plants. And this type of incentive does not contribute to the solution of problems like overproduction of goods and a structural turn in the agriculture. To make small-scale biogas plants also profitable, the Hungarian Electricity Law should be more structured and support the agricultural biomass production for energetic uses with a regressive bonus, based on the plant's electric capacity (like in Germany or in Austria). Also a better defined „biomass list” would be necessary, to prevent rent seeking of higher subvention.