Baltic Compact

Policy brief:

SUBSIDIES FOR BIOGAS SHOULD REQUIRE DOCUMENTATION FOR PRODUCED ENVIRONMENTAL SERVICES

Biogas production is potentially a very efficient technology to produce combined positive effects for the society on the environment, climate, renewable energy production and waste handling. Electricity produced from the slurry of one dairy cow, for instance, has the potential to sufficiently cover one person's electricity consumption[1] and heat[2] requirements, to ensure recycling of 40 kg nitrogen more[3] than with raw manure rather than losing it to the aquatic environment, to save the climate from about 2.3 ton of CO_2[4], and to increase the bio-security, for instance via reducing the number of pathogens[5].

No biogas production is profitable without subsidies, and it is reasonable for the society to subsidize biogas production to achieve the envisaged positive effects, simply because the biogas plant cannot capitalise most of these societal benefits.

However, the subsidisation of biogas energy does not secure these positive effects unless the **subsidies are conditioned the use of waste materials, such as livestock manure, as substrate biomass**. When producing biogas electricity for one person from maize silage, which is an energy crop, and the heat remains un-utilised, the greenhouse gas production is increased by 0.15 ton of CO_2[6] and N leaching by 5-15 kg N[7]. Additionally, the bio-security effect is zero because no waste is handled.

Individual planning of each and every biogas plant in order to decide the optimal technological configuration and size is a prerequisite for both economical and environmental success. The planning must take offspring in the available amounts and qualities of the substrates, secure an energy efficient operation, and secure the efficient use of the biogas produced; if it is used for electricity production via a CHP unit, it is very important to understand that the electrical efficiency is only about 40%, and that it is environmentally unacceptable to ventilate the surplus heat away.

These are some major conclusions from the recent finalised strategic Baltic Compass project, which had selected biogas production from livestock manure as one of four prioritised innovative agro-environmental technologies which deserve a wider use in the Baltic Sea Region.

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[1] www.lemvigbiogas.com

[2] 18 MWh per person per year or 0.2 MWh per m^2 per year (http://agro-technology-atlas.eu/)

[3] 30% increase in field effect of N in digested cattle slurry, and one dairy cow excretes 130 kg N per year. Birkmose et al, 2007.

[4] Biogas feasibility tool (http://agro-technology-atlas.eu/)

[5] State of biogas plants in European agriculture. Report to the EU Parliament. Birkmose et al, 2007.

[6] About 0.1 ha of maize silage is needed to produce the same amount of biogas as from the slurry from one dairy cow, the extra GHG reduction from the produced renewable energy is in the level of the GHG required to grow the maize, including fertilisers, pesticides, fuel, etc. The figure is calculated with the biogas feasibility tool at AgroTechnologyATLAS in combination with Plume et al. 2012 - http://llufb.llu.lv/conference/Renewable_energy_energy_efficiency/Latvia_Univ_Agriculture_REEE_conference_2012-139-144.

[7] Usual N balance of 50-150 kg per ha

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