

## Dataset of emissions factors to assess environmental fluxes of biogas units linked to pig farm

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Assessing the environmental performance of agricultural biogas production concerns several steps including inputs supplying and its storage, the flare and the digester with their losses, and the digestate management. Emissions occur during the all process and explain widely the environmental performances of the system. This study modelled environmental fluxes (N and C) of different contrasted biogas units associated with a pig farm: M1-small plant using only pig slurry (50 kW); M2-larger plant (200 kW) using slurry, maize silage and agro-industrial waste; and four other scenarios using both slurry and waste (200 kW) and implementing different digestate processing chains (M3-long distance transport, M4-composting, M5-drying belt, M6-biological treatment). Data used come from different sources as bibliography, experiments and surveys of commercial units. The input/output balance was established giving information on the nature of the emissions and their distribution on the chain. Nitrogen losses are less than 15-20% in most systems, mainly in the form of NH<sub>3</sub>. For the farm, due to nitrogen content of exogenous inputs, the amount of N to manage at field is mainly higher with biogas than without. System-level carbon losses are between 40% and 80% of input-input carbon, mainly in CO<sub>2</sub> form. The main step that leads to these losses is anaerobic digestion (especially the cogeneration stage). The inputs and digestate management play very little compared, except in the case of M4 and M6 with the composting. This emissions factor set is useful to identify the criteria of performance and their sensibility, for instance to percentage of losses.