

Comparison of bio-ethanol and biogas: Net energy ratio, total yield, and greenhouse gas emissions

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Liquid and gaseous biofuels can have a significant impact on the reduction of fossil transportation fuels and thus make a large contribution to reducing global CO_2 emissions. Examples for these biofuels include ethanol produced from sugarcane, sweet sorghum, corn, switchgrass, and other energy crops, but also biogas/methane produced from the same energy crops or algae culture. However, it is of fundamental importance to consider all fossil fuel based inputs into the biofuel production in a life-cycle analysis. In addition, we need to optimize the total yield of biofuels per area of energy crops in order to minimize the conflict of fuel versus food, we need to reduce the use of artificial fertilizers as much as possible, and we need to minimize the net emissions of greenhouse gas.