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Landschafts- und Umweltwirksamkeit der Biogasproduktion in Schleswig-Holstein

Environmental effects and landscape dynamics caused by biogas production at the example of Schleswig-Holstein (Northern Germany)

Summary: Among all current achievements of the German energy system transformation due to sustainable energy supply, energy consumption and climate protection, the fast extension of renewable energy use is often in conflict with the perceived aesthetical characteristics of landscapes and its natural goods and functions as well. Based on readily available statistical and geo-spatial data this paper analyses the spatio-temporal changes of selected landscape characteristics, such as the changes in land use patterns at municipality level, using time series data collected from statistical survey, and the changes in landscape structure at regional and sub-regional scales using landscape metrics indicators calculated from CORINE land cover data sets. Following an integrative approach, this article discusses the observable changes in land use, landscape structure and groundwater quality against the background of the political and economic driving forces at the example of Schleswig-Holstein (Northern Germany). This federal state is one of the main producers of electricity from biomass in Germany, which goes alongside with substantial changes in land use and environmental quality, especially in the traditional livestock and dairy farming regions in the northwest of Schleswig-Holstein. To mitigate and reduce the negative impacts of increased energetic biomass use, this paper also glances at strategies to monitor and to control the unwanted side effects of extended biomass production.

Keywords: renewable energies, biogas production, energy landscape, land use change, landscape metrics indices, groundwater quality – Erneuerbare Energien, Biogas, Energielandschaft, Landnutzungswandel, Landschaftsstrukturindikatoren, Grundwasserbelastung