Biogas energy potential From waste in Sudan

Urban and Rural case studies

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Abstract

In April 2018 Sudan suffered a crude oil products crisis, where people queued overnight just to fuel Cars, and fill gas pipes for cooking [1]. The problem evolved to scarcity in transportation and a decreased efficiency in Public services. The most impact was in the Urban area. On the other hand, in the Rural settlement, the main utility for cooking is burning biomass in the form of Coal, and fuelwood. about 92 % of total fuelwood and charcoal supplies of Sudan is consumed yearly for cooking purposes. Sudan is rich of Livestock and Agricultural resources, and the potential daily generation of waste is more than eleven thousand ton of biodegradable domestic waste, about 102,02 ton of sewage sludge, and above 2000 tons of slaughter waste. This research is estimating the biogas energy potential from the anaerobic digestion of different waste sources in Sudan. The waste sources are fecal waste, organic solid waste (OSW), Animal manure, and slaughter waste. Urban, and rural cases in Sudan were analyzed. Data was collected, and a waste management concept is suggested to each case. Feedstock generation quantities was estimated, then products were evaluated, and finally the Economic feasibility was checked. After analyzing each case individually, biogas potential in Sudan was generalized. The annual, energy potential of biogas in Sudan, from the previously mentioned waste sources, is 7.5 *109 [m3/year]. The other product is digestate, which can be used as an agricultural fertilizer, additionally social, and environmental benefits are discussed, as well as possible challenges and overcoming measures.

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