Prospects for bioenergy use in Ghana using Long-range Energy Alternatives Planning model

As Ghana's economy grows, the choice of future energy paths and policies in the coming years will have a significant influence on its energy security. A Renewable Energy Act approved in 2011 seeks to encourage the influx of renewable energy sources in Ghana's energy mix. The new legal framework combined with increasing demand for energy has created an opportunity for dramatic changes in the way energy is generated in Ghana. However, the impending changes and their implication remain uncertain. This paper examines the extent to which future energy scenarios in Ghana could rely on energy from biomass sources, through the production of biogas, liquid biofuels and electricity. Analysis was based on moderate and high use of bioenergy for transportation, electricity generation and residential fuel using the LEAP (Long-range Energy Alternatives Planning) model. Results obtained indicate that introducing bioenergy to the energy mix could reduce GHG (greenhouse gas) emissions by about 6 million tonnes CO2e by 2030, equivalent to a 14% reduction in a business-as-usual scenario. This paper advocates the use of second generation ethanol for transport, to the extent that it is economically exploitable. Resorting to first generation ethanol would require the allocation of over 580,000 ha of agricultural land for ethanol production. © 2015 Elsevier Ltd. All rights reserved.

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