Sustainable potential of renewable energy recovery from biogenic waste sources: A case study of Nigeria

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Biogenic waste energy sources in atmospherically unconfined sites emit dangerous chemical substances under the stimulus of spontaneous biochemical reactions. The chemical substances, in most cases escape freely into the atmosphere in uncontrollable circumstances thereby inducing intensification of global warming potential and consequently causing the depletion of the ozone layer. However, it is a no doubt fact that the gas (methane) emitted from the biogenic constituents of waste materials is a useful source of energy for power generation. In addition, the mechanisms for capturing bioenergy gas from wastes are suitable approaches to the prevention of environmental pollution due to greenhouse gas (GHG) emissions. Consequently, this study offers the estimation of emissions of bioenergy gas from different wastes in Nigeria. A mathematical approach developed by the Intergovernmental Panel on Climate Change (IPCC) is used for the estimation. The research explores the data from the Food and Agricultural Organization (FAO) of the United Nations and field survey data from the Federal Ministry of Environment. The results obtained from the energy analysis of the biogas indicate that bioenergy from wastes have the potential to increase the current level of electricity generation by means of decentralized biogas power plants installed in the areas where the wastes are generated. The study also presented an approach for capturing and optimization of biogas for techno-economic benefits in the Nigeria among other developing countries.

Biography

Mohammed Yekini Suberu has expertise in renewable energy, power engineering, sustainable development, energy storage systems, power electronic interface, smart grid technology, renewable energy financing and policy and distributed energy generation. He has won several awards of academic excellence as best paper presentation, best postgraduate student and young energy research.

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