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Prospects and Barriers for the Sustainable Use of Second Generation Biomass from the Palm Oil Industry. The case of Cameroon

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As of October 2014, 258.9 million hectares of agricultural land was being used for oilseed production. 5.5%, approximately 14.2 million hectares constituted land used for palm oil cultivation. With an estimated annual global production of 58.72 million tons in 2016, Palm oil has become the most important vegetable oil globally, greatly exceeding soybean, rapeseed and sunflower. It is the most efficient oilseed crop in the world, capable of producing up to ten times more oil than other leading oilseed crops per hectare. Annually, a hectare of mature palms could produce between 18 to 30 metric tons of fresh fruit bunches (FFB), 70-75% of which ends up as by-products or waste. Main by-products from the palm oil industry that could be used for their energetic values include the Palm Kernel shells, Empty fruit bunches, Palm oil Fiber, Oil palm trunks, Oil palm fronds and the Palm oil Mill Effluent (POME). On average a hectare of palm oil produces 15.8 tons of Palm kernel shells, empty fruit bunches, Palm oil Fibers and Oil palm fronds annually. Whereas at the end of it's economic life span a hectare of palm oil is capable of producing an estimated 82.32 tons of dry biomass including Oil palm trunks. Residues from the palm oil plantation have a net calorific value in the range of 15MJ/kg to 22MJ/kg, comparable to brown coal (Lignite) and bituminous coal with net heating values in the ranges of 10-19MJ/kg and 15-24MJ/kg respectively. Greenhouse gas emission estimates from the production of 1kg of palm oil ranges from 0.02 to 8.32kg CO2 equivalent, with land use change and fertilizer input being the most contributors to its emission potential. The open incineration of most of these residues as a waste management process not only leads to an increase in the emissions from the sector, but also the energy from these residues is lost. Unfortunately, bioenergy still constitutes as low as 10% (50EJ) of the total primary energy supply as of 2017. With the main challenges facing the development of bioenergy being low oil prices, food security and policy uncertainty, second-generation biomass is undoubtedly the silver bullet solution to accelerate bioenergy access to the total energy mix in the near future.

Biography

Bobbo Nfor Tansi is a PhD student at the Brandenburg Technical University Cottbus Germany. He is currently researching on "Analyzing the calorific and sustainability potential of Cameroonian palm oil residues for co firing in power plants. As a PhD student he has been assisting as a student lecturer at his university, offering courses in energy security and sustainability. Mr. Tansi has since May 2016, been teaching courses in wind energy at the faculty of engineering and technology of the university of Buea Cameroon as a visiting lecturer, He studied Geology and environmental sciences and Environmental Engineering at the University of Buea Cameroon and the Brandenburg Technical university Cottbus Germany respectively. Passionate about energy, his move towards renewable energy and energy generation has been a natural fit. In his free time he loves computer programming, swimming, bicycle riding, playing table, soccer, acting and board games such as chess and scrabble.

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