



RESEARCH PAPER

Evaluation of energy indices in the production of biochar using vacuum pyrolyser from wheat straw and coconut shell

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Abstract : A well known fact that the exclusively produced surplus crop residue has the potential to yield useful energy and it can be used as the renewable energy source to reduce the conventional energy demand. The present study deals with the feasibility of energy conversion in the production of activated biochar using vacuum pyrolyser from wheat straw and coconut shell. The biomass of 5 kg was fed into the reactor to produce the activated biochar at operational temperature of 500 °C. The Series of steps involved in the production of activated biochar was observed and studied. The individual energy consumption of each utility was evaluated and the energy saving opportunities was pointed out. While energy indices were also computed based on the input and output energy involved in the production. The average amount of the biochar produced during the auditing was found to be 1.525 kg from wheat straw and 1.775 kg from coconut shell. The input and output energy was resulted as 112.796 MJ and 66.597 MJ for wheat straw, 126.051 MJ and 79.975 MJ for coconut shell biochar production, respectively. Based on the results obtained the energy indices were computed and the use of vacuum pyrolyser in the production of activated biochar was found feasible for the efficient energy conversion.

Key Words : Activated biochar, Vacuum pyrolyser, Wheat straw, Coconut shell, Energy input, Energy output, Energy indices

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