EVALUATION OF RICE HUSKS FOR ELECTRICITY GENERATION IN A VERY SMALL POWER PLANT IN ROI-ET PROVINCE

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ABSTRACT

This research aims to study the quantitative potential of rice husk biomass, as well as analyze and assess the utilization and production of rice husks in Roi-Et Province. There are two hypotheses: 1) The quantity of rice husks is sufficient for electricity production in the pilot study (2011) of a very small power plant (VSPP) in Roi-Et Province and 2) the long-term potential production of paddy and rice husk biomass volume in Roi-Et Province is insufficient for the demand. Purposive sampling was conducted with 3 rice mill groups producing rice husk biomass for the power plant in Roi-Et Province. The first group consisted of 568 rice mills with 1-9 tons/day of rice husk biomass producing capacity. The second group consisted of 19 rice mills with 10-80 tons/day of rice husk biomass producing capacity. The third group consisted of 12 rice mills with 81-1,650 tons/day of rice husk biomass producing capacity. The result of the pilot study (2011) of a biomass power plant (Sri Saeng Dao Bio-power plant) with a capacity of 9.0 MW found that the power plant required 250 tons/day of rice husk biomass.Three rice mills with rice husk biomass producing capacities of 387.5 tons/day provided raw material to the power plant. Therefore, the percentage of rice husk biomass utilization was 64.51 % of producing capacity. This is in agreement with the first hypothesis. In 2011, four VSPPs in Roi Et Province needed 1,000 tons/day of rice husk biomass. The results of the study on the second and the third rice mill group found that they can produce 1,095 tons/day of rice husk biomass. So,the rice husk biomass utilization percentage was 91.32 % of rice husk biomass production. It can be concluded that in 2011 the total rice husk biomass production can support the establishment of four VSPPs with capacities of ≤ 10 MW only. For the first rice mill group,the research showed that rice mills were scattered over the study area. The results of spatial data analysis for rice husk biomass collection,using radiuses of 5, 10, 15, and 20 km by Arc GIS 9.3.1 found,that the total rice husk biomass was 740.25 tons/day. This counted the reserved raw material that was not used for generating electricity. The assessment of the long-term potential production of paddy volume and rice husk biomass in Roi-Et Province was conducted by collecting paddy production statistics within the last 5 years (2007-2011). It was found that average paddy production was 980,347.89 tons/year for an average rice husk biomass of 245,086.97 tons/year. The total demand of rice husk biomass of four VSPPs was 365,000 tons/year. Therefore, it can be concluded that the outcome of study confirms the second hypothesis. The recommendations from this study are that rice husk biomass supply chain management should be established for raw material shortage prevention,and rice husk biomass prices should be controlled,and Adder's extension period should be provided by the government due to the risk of raw material shortage.

KEY WORDS: EVALUATION/BIOMASS/RICE HUSK

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