

Effect of energy policy on biomass-based power generation in Thailand

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Since Thailand is agricultural country, rice farming is the largest sector of agriculture in Thailand. For many years Thailand has been one of the world's top rice exporters with approximately 28 percent of the market share. Rice husk is residue by-product from rice milling process. In Thailand, rice husk contributes about 23% of the total rice production (4.6 from nearly 20 million tonnes a year). Instead of being dumped as waste or given for free to villagers or farmer, so far, rice husk has been used as fertilizer, chicken and duck farm's litter, fuel source for manufacturing processes such as rice mill, brick and charcoal making. Compared to the total amount of rice husk being used, its potentials have not been yet fully exploited, which is still the main problem for rice mills owner to decide on.

Recently, Thai government has made an energy policy to promote the use of biomass as fuel for generating electricity. At the beginning of the policy, rice husk is among the first choices due to its cheap price, small size and low moisture. Currently, data from investigation by interview and questionnaire, charcoal making from rice husk ash, special paper making and fuel source for manufacturing processes, paper mill, sugar mill, vegetable oil companies and electric power generation, are also use rice husk in their process. However using rice husk in some area in each region is inefficient way, for example, dispose as garbage, but in some area, rice husk is not enough for demand.

The specific aims of this study are: 1) to investigate reasons behind the price jump in order to identify desirable policy measures related to rice-husk utilization and 2) to investigate of the optimal rice husk utilization in each region of Thailand.

In 2006 (July), according to Thai government policy, there are 14 of rice husk and rice husk mixed with other biomass based power generation plant has synchronized power to the grid with the total capacity of 230.7 MW (both Small Power Producer (SPP) and Very Small Power Producer (VSPP)). The amount of rice husk that use for generating electricity is approximately 2.3 million tonnes per year (9800 tonnes per MW per year). An effect of the policy, results in high price of rice husk, compared to that before employing the policy. In addition, there are also several demands on rice husk in other industrial such as cement companies, sugar mill, vegetable oil companies, paper mills, charcoal and brick making. These two consequences thus make the price competition in rice husk very high. It may not be economically viable to transport rice husk from rice mill to utilization site that is far away from rice mill, due to its low energy density. On the other hand, the price of rice husk is high if the big consumers of rice husk such as power plants are close to the rice mill plant. In the past, the price of the rice husk was reported to be in the range of 50 - 150 baht per ton (US\$1.25-3.75 per ton) but nowadays the price in some area has, however, jumped suddenly and has reached around 1000 baht per ton (US\$25 per ton).

From the problem that mentioned above, price of rice husk should be appropriately controlled not by the market or owner of rice mill but by government. Moreover, rice husk utilization in each area in each region should be managed for the sake of using rice husk efficiently. This paper shows the effective control rule for supply and demand of rice husk and evaluation of rice husk utilization in each region of Thailand.