

Title Sizing of rice mill's cogeneration system
Author Wannee Ekasilp, Somchart Soponronnarit and Apichit Therdyothin
Citation Compiled Research and Technical Papers, KMUTT. 1999. p. 63-77.
Keywords rice; sizing

Abstract

Optimum size, the number of steam boilers for the cogeneration system of rice mills in Thailand were investigated. Mix-integer linear programming technique was used to examine the optimum configuration of each rice mill for maximum benefit. In this study, rice mills in Thailand were divided into two categories: white rice mills and par-boiled rice mills. Each has different electricity and heat demands according to their capacity. The computer program was used to calculate the size and number of steam boilers and steam turbines that could gain maximum benefit. From the assessment of return cost of investment when the conditions of husk fuel priced at 0 USS/ton, ash price of 80 USS/ton and the price of electricity bought by the Electricity Generating Authority of Thailand (EGAT) at 0.0348 USS/kWh and an operating period of 270 days/year, it was found that the benefits gained from white rice mills with the capacity of 124, 226, 336 and 560 tons/day were IRR 23, 26, 29 and 32%, respectively, while electricity generation cost was 0.0535 USS/kWh. For par-boiled rice mills with the capacity of 135,223 and 320 tons/day, the benefits were IRR 33, 46 and 46% respectively, while electricity generation approximate cost was 0.059 USS/kWh.