

Integrated biomass power plant and storage for peak load management

Abstract :

This paper presents a simulation based linear programming model of a biomass power plant integrated with energy storage (ES) system for peak load demand management. The integrated biomass power plant using biomass bubbling fluidized bed technology (BBFB) with ES is then compared to a biomass power plant without ES. The results revealed that the integrated BBFB with ES can significantly increase the economics of the system from a total deficit of \$195528 (without ES) to a total profit of \$227072.70 (with ES) over a 20. years period. The optimum size of BBFB power plant is 140. kW, while the capacity of NaS battery is 257 kWh with a maximum discharge rate (power) of 107.0. kW.