

Optimization Model Analyses for Measuring the Effects of Introducing Diversified Power Generating Plants

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Abstract *In Japan Electric Enterprise Law was revised in 1995 aiming at building an efficient electric power supply system by introducing a competitive bidding system for new power resources, a yardstick system and a rationalized safety regulation system. This revision started to liberalize the wholesale power market, which had been monopolized for the previous 49 years by 10 general electric utilities. Thus the retail power market was liberalized by the Electric Enterprise Council in order to accelerate the efficiency of the electric power supply system. We try to measure the effects of introducing diversified power generating facilities (DPGF) such as diesel engine, gas turbine, fuel cell, MGT (micro gas turbine) and so on. We build a mathematical programming model in order to obtain an optimal introduction of such DPGFs into the market. Our optimization model aims at maximizing the total saving obtained from introducing new DPGFs at large demand customers such as hotels, schools, hospitals and so on. Numerical results obtained from applying the model to a Japanese power company are shown.*