

ABSTRACT

Exergoeconomic Analysis of a Cogeneration System for a Building Complex

Solange Marshall

Exergoeconomics is an analytical tool used to evaluate and optimise the design and performance of energy systems. This tool combines principles drawn from the science of thermodynamics with conventional concepts of engineering economics. This report focuses on the use of such a tool for the study of a proposed cogeneration system for a University Medical Sciences Complex.

Two options, a thermal match cogeneration system and an electrical match cogeneration system with auxiliary firing, were examined. The "true" system inefficiencies of both systems were identified and evaluated. The evaluation showed that the estimated cost per unit of exergy of the electrical match cogeneration system with auxiliary firing and the thermal match cogeneration system were 16.56\$/GJ and 10.84\$/GJ respectively. The latter proved that the thermal match cogeneration system is the more feasible option.

Keywords: Solange Marshall; Exergoeconomics; Exergy analysis.