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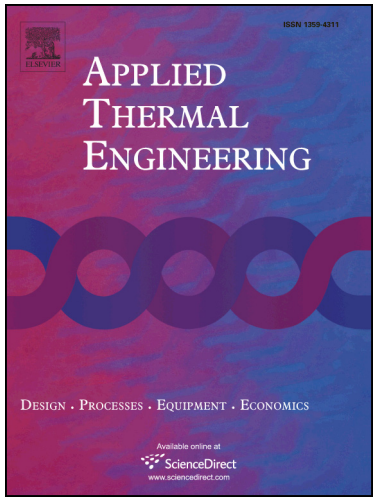

Operational Optimization in Simple Tri-generation Systems

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Operational Optimization in Simple Tri-generation Systems

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Abstract

Combined energy production systems are known to be more profitable than the traditional separate systems in which electricity and heat are generated or purchased separately. They are evolved to trigeneration systems to combine electricity, heat and cooling. In order to get the intended advantages of tri-generation systems, they should be operated in an optimal way. This paper proposes a simple linear programming model to minimize the total annual variable operation and maintenance costs of a generic tri-generation system. The optimization procedure is held by comparing four different prime mover alternatives for three different load conditions of an industrial facility. Results show that, tri-generation is more cost effective than the separate production for all studied scenarios, and the proposed model helps to determine the right operational strategy, and the right system design for any given demand profile.

Keywords: distributed generation, linear programming, operational optimization, tri-generation.

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