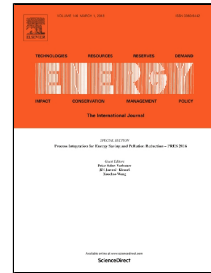


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# A practical model for energy dispatch in cogeneration plants

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## Abstract

This paper focuses on the development of a dispatch model for cogeneration systems in industrial plants. The proposed model schedules thermal and electrical outputs of the cogeneration units by minimizing total operating costs in the plant while satisfying operational constraints. The work presents a practical model that depends on easily available data in the industrial environment, i.e., efficiency data available from equipment manufacturers or machine tests. The power to heat ratio is modeled using equipment efficiency data that depends on the cogeneration unit output. This approach allows to represent feasibility regions and supplementary firings without complex thermodynamic relations that require additional data. In order to illustrate the application of the model in real systems, a potassium production plant in Brazil is studied. This case study involves two cogeneration units with supplementary firings and a boiler. Results indicate that the model allows obtaining a dispatch strategy with reduced operating costs when compared with the traditional planning used by plant operators. Three scenarios are simulated and cost savings obtained with the optimised strategy vary between 2.0% and 4.0%, when compared with the corresponding unplanned strategy.

*Keywords: cogeneration cost model; combined heat and power; economic dispatch; power to heat ratio*

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