

Combined gas and power optimization

Short-term scheduling of a combined natural gas and electric power system may be formulated as a two-stage optimization model and solved using mixed integer stochastic programming [1]. More stages could be considered and approached using the multi-stage stochastic programming. Benders decomposition [2] may be used to solve a nonlinear optimization problem.

A related problem is integration of the natural gas and electricity networks in terms of power and gas optimal dispatch [3]. A mathematical model of the problem may be formulated as a minimization of the integrated gas-electricity system operation cost with constraints involving the power system and natural gas pipeline equations and capacities. The problem may be solved using a hybrid approach combining evolutionary strategies and Interior point method.

Another related problem is tri-/multi-generation [4]. Various models exist optimizing energy cost, annual costs, CO2 emissions. Optimization methods include linear programming, branch and bound, evolutionary algorithms for single- and multi-objective optimization.

References

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Contributors:

Dr Fabrizio Lacalandra, QuanTek