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Stochastic programming models in energy

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Abstract

We give the reader a tour of good energy optimization models that explicitly deal with uncertainty. The uncertainty usually stems from unpredictability of demand and/or prices of energy, or from resource availability and prices. Since most energy investments or operations involve irreversible decisions, a stochastic programming approach is meaningful. Many of the models deal with electricity investments and operations, but some oil and gas applications are also presented. We consider both traditional cost minimization models and newer models that reflect industry deregulation processes. The oldest research precedes the development of linear programming, and most models within the market paradigm have not yet found their final form.

Key words: Stochastic programming, energy, regulated markets, deregulation, uncertainty, electricity, natural gas, oil.

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