

Natural Gas Purchase Commitment for Short Term Contracts under Take-Or-Pay Constraint and Demand Uncertainty

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Abstract

Take-or-pay constraints are usually forced between the seller and buyer in bilateral, short-term and long-term natural gas contracts. In Turkey, the procurement, distribution, price determination, and wholesale are managed by the BOTAS. Any independent natural gas consumer, distributor and wholesale supplier have to make an annual contract with BOTAS in which they have to commit minimum and maximum hourly, daily, monthly and total amount of natural to consume. If the minimum annual commitment is not reached, the consumer has to pay for the deficit. If the maximum is exceeded, it is possible to get no natural gas or to have it with a more expensive price. The demand for the natural gas is uncertain and depends on the factors such as temperature, economic growth, price, and population. In this research, a probabilistic model is developed for the a natural gas costumer who has a take-or-pay constraint, demand and price uncertainty and has to determine the amount of natural gas he needs to commit for each time period. The historical natural gas demand is used to build the probabilistic demand for each month. A case study is developed and the results are presented.