

Some math on the electricity market by a generalization of the Black-Scholes formula

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Abstract

Electricity is an interesting commodity for mathematicians to work on. In fact, the variety of financial and real options traded are far from being plain vanilla and, nevertheless, being most quite exotic, they have been priced with standard tools. No doubt, the literature is sparse and it's a growing subject.

One of the interesting options which, nowadays, exist in Europe is the different electricity prices between countries. If one has the ability to trade energy across countries, these electricity spreads are spread options. Since this possibility to trade is limited in time and capacity, the existing spread option is, somehow, unique.

Selling energy across countries implies offer and demand bids for electricity in each country, thus having positive probabilities of negative cashflows, by which the option to use transfer capacities cannot be priced with the Black-Scholes Formulas. In this work it's proposed a new way of pricing the daily electricity transfer capacity, where we take into account the traders daily operation (which has changed since [2]) and, therefore, all the inherent risks factors not included in the Black & Scholes world.

Keywords

Electricity market, Spread option, Conditional expectation.

References

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