

Invitation to lecture series „Simulation Sciences“

Tuesday, May 27th, 2025, SWZ room 324 (C9), TU Clausthal, 2:00 pm

Jérôme De Boeck

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will talk about

Bidding problems in European deregulated electricity markets

Content of the lecture:

This talk considers a bidding problem in European deregulated electricity markets. The goal of this problem is to maximize the profit of a Generation Company (GC) by choosing the best possible bids to propose to a Market Operator (MO) whose task is to minimize the daily price of electricity for the retailers. This problem has many challenging features to consider, such as the unit commitment for the GC, a market-clearing system for the MO, and demands and production capacities subject to increasing uncertainty due to renewable energies. Most studies solve these problems separately to build the best possible bidding strategy through price-taker formulations. The focus of our studies of bidding problems is to combine the UC and MO problems in a price-maker formulation, integrating the market mechanism.

Two variants of a general bidding problem are considered: one focusing on integrating uncertainty and the other on integrating a complete unit commitment model. We present general observations of the structure of a bidding problem and specific observations for both problems. This leads us to two different solving methodologies: one based on dynamic programming and the other on a classical bi-level problem reformulation through KKT conditions.

The observations of both problems considered allow for a significant improvement in previous formulations presented in the literature regarding solution quality and solving times.

Guests are welcome.

The lecture will be held in this building:

**Simulation Science Center Clausthal-Göttingen
Building C9, Room 324
Arnold-Sommerfeld-Straße 6
38678 Clausthal-Zellerfeld**

