

A possible price-free auction approach for two-sided markets: Motivation and properties

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Electricity spot market auctions are dominantly based on the the pay-as-clear principle: After the submission of demand and supply bids, a market clearing price is derived, according to which the bids are accepted/rejected and which serves as a basis for payoffs. The market clearing procedure is usually formulated as an optimization problem. Simple examples show that in the case of characteristic products of electricity markets (so called block orders), which originate from technological constraints, an equilibrium price does not always exists (resulting in so called paradoxically accepted/rejected bids). A scenario, where a further complicating issue arises in the framework of so called 'integrated markets', where energy and reserves are allocated and cleared at the same time. In such markets 'combined offers' are also present, which may be allocated as energy and as reserve as well.

A possible alternative for the pay-as-clear approach is the so called pay-as-bid approach, which also has its drawbacks.

In the current work, we propose an alternative two stage 'price-free' auction method: in the first step we optimize the social welfare, and in the second step we divide the surplus among the players belonging to the accepted bids, proportionally to the marginal contribution of the bid to the resulting social welfare. We try to get a first impression about the incentive-compatibility related properties of the proposed concept.