

Convex combinatorial auction of pipeline network capacities

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We propose a mechanism for the allocation of pipeline capacities, assuming that the demand side participants do have subjective evaluation of various network routes. The proposed mechanism is based on the concept of bidding for route-quantity pairs. Each participant defines a limited number of routes and places multiple bids, corresponding to various quantities, on each of these routes. The proposed mechanism assigns a convex combination of the submitted bids to each participant, thus its called convex combinatorial auction. The capacity payments in the proposed model are determined according to the Vickrey–Clarke–Groves principle. We compare the efficiency of the proposed algorithm in terms with a simplified model of the method currently used for long-term pipeline capacity allocation in the EU (ascending clock auction of pipelines) via simulation, according to various measures, such as resulting utility of players, utilization of network capacities and total income of the auctioneer.