

A combinatorial auction approach for the co-allocation of electrical energy and reserves

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We define a combinatorial auction based framework which considers energy and reserve purchase offers and simultaneously prepares the allocation of energy production and reserves to power plants. We assume that power plants are submitting their bids as operation intervals, and for each such operation interval the maximal and minimal power production value, production cost and maximal available reserve amount for each type of reserve is given. Time is divided into macro-periods, which are further divided into micro-periods. Buying bids, regarding both energy and reserves, are defined on the level of micro-periods. The proposed algorithm does not explicitly allocate power generation and reserve values to the generators, only determines a potentially feasible pre-allocation, which may be used as a set of constraints in further dispatch methods.