

# Network Procurement Auctions

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A large part of the public infrastructure, such as power systems, road and railway networks, water systems and others, is financed, built and/or operated by private-sector companies. There are wide variations in how to involve the private sector in infrastructure design. One method is public-private partnerships (PPP) whereas other methods are traditional procurement processes or competitive tender processes. The contracts are typically awarded via procurement auctions.

Although procurement auctions have been used as a mechanism for leveraging innovation and competition, they usually have unsatisfactory design features. First, many procurement processes do not allow bidders to propose different network configurations. The network configurations are predefined by the auctioneer. Second, the bidders are not allowed to submit bids on a group of network links (i.e. submit a “package” bid). This is a problem for two reasons: (1) one might ask if the predefined configuration is the optimal configuration; and (2) the bidders cannot gain from synergies between links. Offshore electricity transmission networks are a relevant application for procurement auctions and indeed illustrate the problem of not taking into account the synergies in building different network configurations.

We present a block (lot) structure and an auction design where bidders might propose and build different network configurations and where bidding for packages is a possibility. One interesting feature is that we need to reduce inefficiency and over-expensive configurations. Consequently, we use a regulator-predefined configuration as a possible network and therefore, as a cap on inefficiency and on overly expensive network suggestions (i.e. a feasible starting/reserve configuration). This prevents bidders, for example, from proposing expensive configurations by, for instance, proposing to build a network of links over a certain number of blocks, when the network can be built for less blocks.

We show that the package clock auction, as applied in telecoms spectrum auctions, can work well in the market for network designing provided that the links are divided up in blocks of equal financial size; likewise for the connection points.

Interestingly, our auction gives the bidders more options. It gives the bidders a reserve configuration, for example the regulator-predefined configuration, and if the market can see alternative or more cost efficient configurations, the auction also allows the bidders to propose these alternative configurations. The regulator-predefined configuration could be the optimal configuration, but our auction will show whether this is indeed the case. The market configuration allows this to be revealed.

We show that our set-up can provide the bidders and auctioneer the same security as auctioning a predefined configuration by having a reserve configuration. This provides confidence and a cap on costs/a maximum on the transfer values. The freedom to propose alternative configurations can only provide lower costs/transfer values. We show that it is possible to create a block structure together with a procurement auction that can bring the auction result closer to efficiency (i.e. the lots for sale end up in the hands of those who value them the most) and optimality (i.e. the total cost to the regulator of the winning bids is minimised).>

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