

Competitive Procurement and Internet-Based Auction: Electricity Capacity Option

Existing products to hedge procurement price risk are often thinly traded or not traded at all. An alternative is two Internet-based auctions that yield competitive price offers to a buyer of capacity options that are not actively traded at present.

Debra Lloyd, C.K. Woo, Michael Borden, Ron Warrington, and Carmen Baskette

Debra Lloyd is a Resource Planner in the City of Palo Alto, California.

She was Director of Research of Energy and Environmental Economics Inc. (E3), a San Francisco-based consulting firm specializing in engineering and energy economics. She has co-authored several papers on electricity deregulation and resource planning, and has an M.S. in Operations Research from Stanford University.

C.K. Woo is Senior Partner of E3. He has published extensively in public utility economics, applied microeconomics, and applied finance, and has a Ph.D. in Economics from the University of California at Davis.

Michael Borden is affiliated with E3. He specializes in applying auctions to help large electricity buyers reduce their procurement cost. He has an M.A. in Economics from UC Davis.

Ron Warrington is Senior Partner of E3. He specializes in procurement services and has an M.B.A. from Harvard University.

Carmen Baskette is Senior Consultant of E3. She specializes in alternative energy and resource planning, and has M.B.A. and M.S. degrees from the University of Michigan.

I. Introduction

Electricity deregulation has created wholesale spot power markets with potentially volatile prices, as observed in California and other parts of the U.S.¹ This price volatility motivates an electricity buyer (e.g., a municipal utility) to manage its electricity procurement cost risk using such hedge products as forward contracts and capacity options.² Least-cost procurement requires multiple and easily obtainable competitive price offers. However, only standardized 25 MW forward contracts for next-month

on-peak (e.g., 06:00–22:00, Monday–Saturday) delivery at major electricity hubs (e.g., Mid-Columbia in Washington and Palo Verde in Arizona) are actively traded at present.³ This article reports the results from two Internet-based auctions to show that such auctions can yield competitive price offers to a buyer of a capacity option that is not currently actively traded.

II. Auction Design

A buyer can purchase an inactive hedge product via

bilateral negotiations or a request for offers (RFO). However, bilateral negotiations are unlikely to yield the "best deal" for the buyer because "the value of negotiation skill is small relative to the value of additional competition."⁴ Similarly, competitive price offers may not emerge from an RFO that solicits binding sealed offers from sellers, as the process is a single-round sealed auction with known shortcomings, including conservative bidding by sellers and a non-transparent outcome.⁵

A more competitive and transparent alternative is an Internet-based multi-round auction whose design follows an Anglo-Dutch auction with a time extension feature to eliminate the strategic value of last-minute bidding by a "sniper" seller in an eBay-style auction.⁶ The auction design entails an independent auctioneer assisting the buyer to perform the following tasks prior to the auction date:

(a) Clearly define the non-price terms of the product to be procured;

(b) Set auction rules that govern offer submission, auction open- and close-time, and winner selection;

(c) Invite potential sellers to participate in the upcoming auction;

(d) Pre-qualify credit-worthy sellers who have responded to the invitation;

(e) Contractually bind the sellers to the price offers that they make during the auction; and

(f) Set a benchmark to gauge the price reasonableness of submitted bids.

Subject to the buyer's undisclosed price-reasonableness benchmark, the auction winner is the pre-qualified seller with lowest price offer.

On the auction date, the pre-qualified sellers participate in a three-round auction as follows:⁷

Round 1: Initial offering. All pre-qualified sellers are invited to

A time extension features eliminates the strategic value of last-minute bidding by a "sniper" seller in a eBay-style auction.

submit their initial anonymous offers on the auctioneer's auction Web site. The lowest prevailing offer is visible to all sellers to aid their assessment of the extent of price competition and inference of the product's market value. Sellers may revise their initial offers throughout Round 1. The revised offers are not required to beat the lowest prevailing offer; rather, they must only better the seller's own prior submission, so as to (a) keep the sellers' interest in the next round, and (b) produce a range of price offers that approximates what may result from an RFO. The lowest offer at the conclusion of Round 1 sets the

prevailing best offer to be posted at the beginning of Round 2.

Round 2: Open auction with possible extension time. In Round 2, a seller may choose not to submit a new price offer, in which case their lowest offer from Round 1 becomes their de facto Round 2 offer. Should the seller decide to submit a new price offer, the new offer must now beat the prevailing best offer. As in Round 1, the lowest prevailing offer is visible to all sellers, but the seller's identity remains anonymous to other sellers. The auctioneer updates and posts the prevailing best offer in real time as newly submitted valid offers arrive. A valid offer placed in the remaining five minutes of Round 2 automatically extends the round by another five minutes. Round 2 closes at the later of the scheduled time or after five minutes of no bidding activity. The auctioneer then identifies the two or three sellers with the lowest price offers as the finalists for Round 3.

Round 3: Final sealed auction. During a short intermission after Round 2, the auctioneer invites two to three finalists to submit their best and final sealed offers. Unobservable to other sellers, each seller's final sealed offer must improve upon its own lowest offer made in Round 2. In Round 3, a seller may choose not to submit a new offer and its lowest offer from Round 2 becomes its de facto Round 3 offer. As Round 3 creates the risk of losing, it mitigates potential collusion and induces further price-cutting.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات