

Market Design and Competition:

***An Auction to Procure
Capacity in a Load Pocket***

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California, June 23, 2000. (Reliant owns generation in CA & PJM)

Reliant Trader 1: everybody thought it was really exciting that we were gonna play some market power.

...

Reliant Trader 2: We shut down all of our plants yesterday, for today and for tomorrow. ... we made all the money back and he thought that was the coolest strategy ever.

Unidentified Reliant Employee: you know I've got you on the speaker phone.

Reliant Trader 2: Oh, do you? I didn't even, I wasn't even around. I'm not even talking to you, bye.

...

Reliant Trader 1: we turned like about almost every plant off. It worked. Prices went back up. Made back about \$5 million.

The Situation Now in PJM:

- When the path into a small load pocket is congested, generation ownership can be too concentrated (e.g. $HHI > 8000$).
- When the path is congested, in-pocket generation must bid $MC + 10\%$.
- $Price = \max(\text{PJM price}, MC + 10\%)$.
- In-pocket generators earn more profit than identical PJM generators.

The Problem:

- Even though profits are higher than in PJM, in-pocket costs might be higher by even more. If so, no investment.
- Generators use a credible threat of exit + FERC to force PJM to solve “investment problem.” (In spite of excess capacity in all pockets.)
- Generators want “scarcity” prices set by the PJM. We want a competitive design.

Solution Under Consideration:

- Hold a capacity-subsidy auction—but only when needed. (We have a rule to prevent forced auctions.)
- Ten-year (??) contracts, with subsidies paid only if capacity is available.
- Require a “backstop” transmission bid from local utility.
- Full-requirement auction → existing generation can win. Stops withholding by retirement.

Design Considerations:

- Lumpiness problem: A non-marginal Line bid will lower energy cost relative to a Generator (peaker) bid.
- Risk: Some auction designs impose more risk on Line bids or on Generator bids.
- Market power: Some designs inhibit it in
 - the energy market.
 - the auction.

Design D0:

- Subsidy bids, \$b/MW. The lowest bids win.

Problems:

- A Line is financed by subsidy + a financial transmission right (FTR), and an FTR is very risky.
- Marginal investment evaluated correctly, but a big line causes FTR value $\rightarrow 0$.

Design D1: (better in “theory”)

- Subsidy bids, but PJM gives extra credit, to compensate for any decrease in FTR value, to a large line (or baseload plant).

Problem:

- Messy evaluation. Even if PJM calculated the unobservable change in FTR value correctly, losers would complain to FERC and FERC would get it wrong. But PJM would get it wrong first. Just too hard.

Design D2:

- Same as D0, but all winners must pay PJM $(P_{\text{pocket}} - P_{\text{PJM}}) \times \text{Capacity}$. (Full FTR.)

Benefits:

- **Marginal properties unchanged** since same expected cost imposed on all marginal bids.
- Large line benefits optimally from its reduction of the “Full FTR” cost. (**fixes lumpiness**)
- **Risk to line eliminated.**

Design D2 continued:

- The FTR requirement **eliminates market power** in the energy market.
- Also eliminates motive of incumbent monopolist to sell peaker capacity in the auction to increase future energy prices.

Problem:

- Peakers find Full FTRs very risky.
- If $MC > P_{\text{pocket}} > P_{\text{PJM}}$ they have no physical hedge and it's hard to buy one.

Design D3 (Peter Cramton's)

- Estimate needed amount of line (q_1) and peakers (q_2), then buy q_1 under D2 and q_2 under D0*. (D0* includes FTRs for prices above peaker MC.)

Problem:

- Choice of q_1/q_2 appears arbitrary. Similar problems to D1. (Actually it's no more arbitrary than other designs.)

Design D4:

- Same as D2 (Full FTR) except cap annual FTR payments at the amount of the subsidy. (Just cap bottom of FTR.)

Problems / Benefits:

- Worse than D3 on “lumpiness.” Probably worse controlling market power. Perhaps slightly worse on risk.
- Easier to implement, explain and sell. ♥