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Capacity Market Design

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Disclaimer

Any and all opinions expressed as part of this panel are solely mine and may or may not be in a agreement with my clients views in the past, present or future.

Capacity Market Definition

In PJM's history the capacity component has served various roles;

- Circa 1980's and early 1990's Capacity Costs were simply the fixed costs of generation plus a required rate of return that utilities negotiated on assets used to serve customers served under a franchise monopoly.
- When Some utilities were short a mechanism was created to transfer costs between them. This was the first fully regulated capacity market where one Pennsylvania Utility paid the other Pennsylvania utilities because it didn't have enough capacity to serve its load due to some "operational issues" with its generation.
- In 1999 a more transparent capacity market was developed in large part due to retail competition in Pennsylvania. This initial capacity product was initially discussed as a call option on power during times of system emergencies generally viewed as when prices were at $1000. The market was voluntary for buyers and sellers with penalties for LSEs not meeting the obligation.

Capacity Market Definition 2

During the early 2000s all capacity markets in the Northeast experimented with different models including;

- Eliminating Capacity (eventually rejected by FERC for ISO-NE)
- Capacity as an Operating Reserve (PJM West)
- Capacity as a means to reach NERC 1 in 10 year outage standard to a means of buying more\less depending on prices (demand curve)
- Capacity as a must offer requirement that could be capped (the first serious linking of energy revenues and capacity revenues)
- Capacity as a monthly or multi-monthly product (NYISO)
- Locational components to capacity (NYISO first than PJM)
- Capacity as a planning input and longer term commitment (PJM then ISO-NE)

Generation Revenue

At the end of the day a generation developer has to have the expectation of getting a return both on their fixed and variable costs. However, various elements can impact how much of a profit margin they need these include;

1. Risk taken on by generator
2. Opportunity for unexpectedly high\low returns from markets
3. Opportunity for bilateral agreements
4. Changes in how valuable a particular location is
5. Regulatory changes
6. Environmental Rule Changes

There are tradeoffs between Systems

Fully Regulated

A fully regulated system (which still exists within PJM for several utilities) allows for long term certainty of revenue recovery, low risk premiums for construction, greater perceived reliability value and better ability for integrated transmission and generation planning.

On the downside non-optimal generation build decisions are passed onto customers, incentives for cost management are lacking, not easily adaptable (what do you do with 7K MW of new DSR?),

There are tradeoffs between Systems

Energy Only

An energy only system including; allowing customers to choose to enter into longer term contracts or not. Generation investment decisions rest with the generation developer. More easily adaptable to changes in the market. Clearer locational price signals.

On the downside if load chooses not the hedge there will be more volatility, more risks are shifted to generation owners unless PPAs are entered into and during periods of surplus PPAs may be scarce. Political sustainability for continuous high spot market prices is dubious.

Capacity "Middle Path"

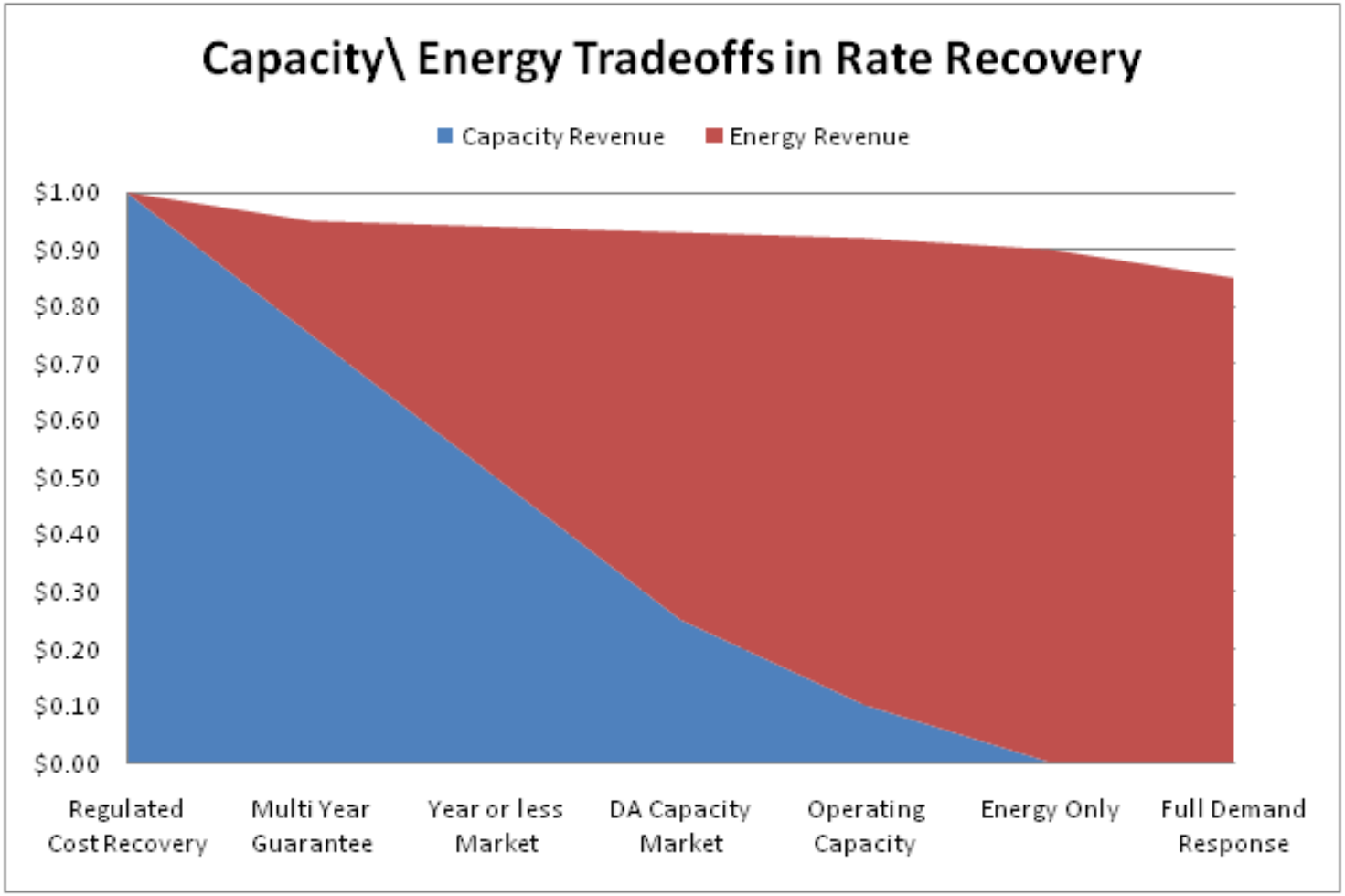
Mixed Market

Mixing the best of a regulated with the benefits of the spot market may in theory be better than either but in practice success has been elusive both for loads and generation developers. The current market while very comprehensive in its design has not made either party happy and in this case I don't think that is a sign of a good compromise.

Ideally, a capacity market would reduce risk compared to an energy only market but still link financial success to investment in the right resources that are in the right place, at the right time, and operated in the right manner.

In practice capacity price signals have fluctuated to a greater magnitude in the capacity markets than the underlying energy markets and locational premiums have seemed to be driven more by luck than by truly sending a market signal.

Where Are We On Capacity Continuum?



The chart is indicative of cost direction and not deterministic

Load Cost

At the end of the day in a non-fully regulated system Load can reduce overall long term cost in various ways including;

1. Consuming less (Energy Efficiency)
2. Commit to interrupting consumption during periods of relative generation scarcity (Demand Response)
3. Changing marginal generation unit (possibly from CT to CC)
4. Load shifting (Storage of Power - which changes the entire dynamics of the Electric System)

Tradeoffs – Some New Options

Technology may give some new trade-offs;

From the earliest incarnations of capacity to the most recent RPM, one of the critical assumptions is that individual customers demanded the same level of reliability.

If customers are willing to differentiate how much they are willing to pay for reliability and put a price on it AND if utilities can enforce customer curtailment performance there can be a major shift in the electric market including;

- Elimination or greatly reducing market power by including price bids from thousands of MWs of retail load.
- Rational pricing at costs above the marginal cost of generation set by load curtailment demand.
- Increased incentives for LSEs to hedge peak power demand both long term and in the DA market
- A more responsive system to changes in the economy, regulatory changes, or technology innovation.

QUESTIONS ???

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