Capacity as a Commodity

A framework for a new capacity market paradigm that enables customer choice

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Forward:

AWEA is a supporter of technology neutral competitive market-based approaches and consumer choice. This concept paper is offered as food for thought to add to the discourse on how to adapt capacity markets to account for the changing energy mix driven by consumer (either individually or as reflected in state policies) choice and their increasing desire for clean energy, and is not meant to be taken as a policy position. The framework presents a potential competitive consumer choice model, but any region desiring to adopt such a framework would need to work out the implementation details that would likely be unique to the needs of that particular region.

Introduction

PJM introduced its current capacity market model, the Reliability Pricing Model (RPM), over 15 years ago. The original RPM construct was the product of extensive negotiations with stakeholders and included features such as an exemption in the form of a Fixed Resource Requirement (FRR), an alternative created specifically to allow a large utility to manage their own internal capacity requirement. The RPM model has been a source of constant discord which has resulted in continuous changes being applied to the original construct, creating price volatility and both economic and regulatory uncertainty. This paper lays out a framework for a new capacity market paradigm that would facilitate a more stable capacity procurement construct.

From IRPs to RPM

The traditional resource adequacy regime still in practice throughout a large part of the country consists of utilities conducting Integrated Resource Plans (IRP) that examine their forecasted electricity demand for the future and planning out the capacity needed to meet that demand. The integrated utility then builds and/or procures such capacity as needed, sometimes with the concomitant transmission. When many of the PJM states deregulated and transitioned from this traditional model towards using wholesale competitive markets to satisfy their energy needs, the integrated planning function was essentially lost. At the same time, states retain jurisdiction over and responsibility for environmental, public health and a host of other areas that are connected either directly or indirectly to the state's energy resource portfolio.

Though it could be argued that RPM has performed adequately in *procuring sufficient* capacity in PJM, it does not function well with respect to planning for states' *desired capacity*. PJM states have increasingly made clear their desires to manage their own resource mix, but the states' diminished resource planning function has led to increasing conflict between state mandates for certain types of capacity and the centralized RPM construct.

Another issue with the RPM is that in the auction, all MWs that clear are homogenous and undifferentiable. Due to certain aspects of the current RPM construct, such as "capacity performance" (which requires year-round deliverability) and the Minimum Offer Price Rule (the MOPR, which at present, artificially reprices capacity bids receiving a "State subsidy"), some states' preferred portfolios for energy and capacity have diverged significantly from the capacity that actually clears the RPM auction. The RPM paradigm has purchased fossil fuel resources for states with strong clean energy mandates and, under the MOPR, will continue to do so, while potentially blocking many clean energy resources from clearing the auction. The end result is that consumers often pay twice for capacity.

Additionally, customers are increasingly looking to purchase their full requirements for energy and capacity from clean energy resources. Large Commercial and Industrial (C&I) customers can and do negotiate contracts for energy and Renewable Energy Credits (RECs) produced in the energy markets This procurement also sometimes includes capacity in various forms. The commoditization of the capacity component may help simplify these contractual arrangements and make capacity a tradable product, while helping resolve (or at least minimize) these customers having to pay twice for capacity. C&I customers will be able to procure capacity that aligns with their real-time energy goals.

A Framework for the Future

A potential path forward is to split the capacity planning/resource adequacy function from the capacity procurement function. This can be achieved by re-envisioning capacity as a commodity, and the RPM as a pure procurement mechanism. The framework presented in this paper outlines how this could be achieved, and how it would allow states and customers to exercise their prerogatives as to the source of capacity, while still retaining the efficiency of a 13-state market. It involves the creation of a new product, the Capacity Credit (CC). Modeled on the REC, a CC would be worth at least 0.1 MW of capacity. Like RECs, the CCs would be a commodity that could then be sold as a separate product.

PJM currently tracks RECs through the Generation Attributes Tracking System (GATS). A similar system could be set up to track CCs, the Capacity Attributes Tracking System (CATS). Each CC in CATS would be tagged with all relevant information – resource of origination, resource type (wind, solar, gas, etc.), and location. Load could then purchase the CCs of their choice for the year of their choice and CATS would tag that CC as the capacity being credited to that load and then retired for that year. This includes the C&I customers that are currently signing agreements for energy and RECs. These customers could also agree to purchase all or part of a resource's CCs.

In addition to direct purchases, a secondary market could grow out of this construct, similar to the secondary market for RECs. CCs would require some different features than RECs, such as an expiration date set at the end of the delivery year for which they are created. Additionally, each CC would be tied geographically to its zone so market participants would be able to trade CCs on the secondary markets knowing in which PJM zone that capacity resides. CCs could contain whatever attribute is desired in a capacity resource as determined by the prevailing resource adequacy construct. For example, each CC could contain a seasonal component if needed.

After all CCs are tagged through the CATS system, PJM could run a Residual Reliability Auction (RRA) to procure any remaining capacity needed to meet reliability objectives. PJM would have all the information needed in CATS to determine which resources' capacity can be assigned to which load-serving entity, and how many MWs. PJM could reduce each load-serving entity's RRA requirement by the amount they have acquired in CCs, and run a reliability model to determine how much more is needed (and in which zones) to maintain system reliability. The fact that CATS can show PJM the zone/location of the CC as well as the associated load will enable this analysis to occur. The RRA could hold true to zonal capacity requirements.

The CC system would allow PJM to continue to procure adequate levels of capacity in a competitive manner while also awarding states and market participants more autonomy to determine which attributes are most desirable for the capacity resources that serve their reliability needs. States could plan their resource mixes unhindered by the centralized procurement methodology without sacrificing reliability or the efficiency of being able to procure capacity from elsewhere in PJM. The resource adequacy regime would determine how many CCs each resource gets, and the reliability requirement would determine how much capacity is procured through RRA. Debates around how to measure resource adequacy can, and will, continue into the future as state mandates change, technologies evolve, and the resource mix transforms. Therefore, the methodology used to determine the allocation of CCs must remain flexible, without affecting the functioning of the procurement system.

A Role for States

Many states in the PJM region have strong and increasing clean energy mandates. Many of these mandates are based around RECs, which is a certificate based on one megawatt-hour of energy produced by a generator with a defined attribute (i.e., clean or renewable energy sources). Many proposed solutions to the current conflict between state mandates and capacity markets would require a reworking of how state Renewable Portfolio Standards (RPS) are set up in state law, making these changes challenging to implement in a multi-state market like PJM. By contrast, the CC/CATS system can fit neatly with the changing RPS goals in each state.

States that desire more control over their resource mix could include additive language to their RPS legislation that requires LSEs to acquire CCs in addition to RECs. Under current RPS regulations, LSEs typically need to purchase a certain percentage of their energy from clean or renewable energy resources, and in some states from specific resources such as nuclear, offshore wind, and solar. To operationalize the CC construct, state RPS mandates[1] could be adjusted to include a CC mandate. For example, an addition to the RPS mandates could direct LSEs to purchase 20% of their capacity requirement as renewable energy, 20% as nuclear CCs, and 10% as offshore wind CCs. An Alternative Compliance Payment (ACP), as currently exists for RECs, could also be created for CCs, and set at the level the state desires or tagged to the RPM/RRA (e.g., the rolling 5 year average price in the RPM/RRA plus an adder).

Synergies with Carbon Reduction Initiatives

This framework could be harmonized with a carbon emissions reduction goal, as a state could use CCs to manage the carbon intensity of their generation mix along with its ability to reliably serve customers. A state could craft a mandate for LSE's to purchase a set percentage of CCs from carbon free resources, either within the state or from a set area within the PJM region, such as from other states with carbon reduction goals. This, along with the RPS energy requirements, would give each state a way to measure the carbon emissions from the resources they are actually using. This would also minimize issues related to leakage and might make complicated border adjustments unnecessary.

A Basic Example

This section outlines a basic example of how this system could work. Starting with a 100 MW solar plant, PJM would utilize the existing resource adequacy methodology to calculate the number of CCs to assign to each plant, for example, 30 CCs, each worth 1 MW. The CCs would be input into the CATS system with all relevant attribute information, including that it is a solar CC in Zone A. The solar plant owner could sign a purchase agreement with a C&I customer for any combination of energy, RECs, and CCs. CATS would tag the CCs for each year of the contract as being attributed to that C&I customer. If the contract does not include the CCs, they are still registered in CATS and can be purchased by another customer.

When PJM runs an RRA, the information to assign those CCs to that C&I customer is in CATS, and that customer's capacity requirement is reduced by the appropriate amount. The RRA then competitively procures the residual need for the customer (or the applicable load-serving entity) based on the available CCs that have not been purchased for the delivery year. If the C&I customer is not the entity

[1] Most RPS mandates are set by legislation and so, in most states, an additional CC mandate would also need to be set legislatively.

with the capacity obligation, then this could be worked out through the settlement process between PJM to the load entity with the obligation and the C&I customer.

Principles and Concluding Thoughts

CATS is a market-based competitive framework that upholds state and customer choice, something that has been missing in capacity market constructs to date. The overarching principles embodied in the CATS systems are as follows:

- Allow states to advance public policies within competitive regional markets;
- Empower end-use customers to exercise consumer choice;
- Enhance transactability by providing transparent, long-term price signals to all market participants; and
- Minimize interventionist mitigation activity to police market participant behavior (i.e. moving beyond expansive MOPR).

While the capacity as a commodity framework could potentially work in any region, this concept paper references PJM, as the most pressing need is in the PJM region, where the implementation of the MOPR order is in direct opposition to state mandates regarding clean energy and carbon goals.

Consumer choice has been promoted for many years on the energy side of the coin, but almost totally missing on the capacity side. In deregulated states, often consumers are free to choose their energy supplier and to buy RECs but can still be faced with the requirement to pay capacity fees to resources not of their choosing. State RPS mandates, in both deregulated and traditionally regulated states, is also a reflection of consumer choice in that they represent the desires of the state's constituents. But these programs also have been directed only at energy. This framework would put customer choice squarely in the capacity market and allow those customers, either individually or through a state mandate, to choose their particular flavor of capacity, while enabling RTOs to meet their regulated mandate to uphold reliability.

This paper outlines a framework for the CC/CATS concept however, implementation details would need to be worked out on an individual RTO basis. There are multiple ways the CC/CATS framework could be implemented, and the end result would need to make sense for each particular region, so we do not attempt to define all of those details here.