



Capacity Performance Demand Response

Proposal to the Seasonal Capacity Resources Sr. Task Force

July 11, 2016

The Problem

Planning Perspective

We have no accurate way to measure the capacity value of winter DR, so we must use a conservative approach.

Load/DR Perspective

Capacity Performance DR measurement rules result in loads paying for service they are not taking.

Both are correct

Demand Response is undervalued in Capacity Performance because of inconsistencies of an annual market with seasonal cost allocation.

Our proposal attempts to resolve this within the Capacity Performance framework.

Capacity Value of DR: Planning View

Demand Response has capacity value when it lowers load below planners' expectations

The planning process determines how much generation is needed to meet unrestricted load in each LDA.

Since DR displaces generation, the capacity value of a demand resource is the amount that we can be confident it will reduce load below this level.

“The defined value of a demand resource is its ability to reduce consumption from the level that contributed to the reliability requirement.”

-- Stu Bresler, comments for PJM at FERC tech. conf., July 29, 2011.

Measuring Summer Capacity Value

In the summer, PLC is a good approximation of planner's expectations.

The difficulty with this is that PJM plans at the LDA level and does not procure capacity for individual loads.

During the summer, PLC “is the best available proxy for the amount of capacity that PJM procures for the customer’s use on the peak day of the year.”* This makes FSL the best measure of how much summer DR is reducing zonal load from the planning peak.

“Permitting measurement and compliance by reference to anything other than an end-use customer’s PLC makes no sense.”

-- PJM, April 7 2011 filing in ER11-3322

*FERC, Order Conditionally Accepting Filing After Technical Conference. 137 FERC ¶ 61,108 at 66.

Measuring Winter Capacity Value

Annual DR does not play well with summer-only capacity cost allocation

There is no equivalent of PLC for the winter, and PJM has no visibility into how much capacity each end use customer is using in the winter. This leaves no accurate way to measure the capacity value of DR outside of the summer peak season.

CBL was chosen as a conservative alternative “for reasons of simplicity” and “because real-time energy load reductions are an appropriate basis...under the pay-for-performance paradigm...”

“Accordingly, in the absence of a non-summer equivalent of PLC, an alternative measure of non-summer performance is required.”

-- Answer of PJM Interconnection, ER15-623, February 13, 2015.

Capacity DR: Load and CSP Perspective

Demand Response is how customers avoid paying capacity charges on interruptible load

When an end use customer commits to a Firm Service Level, they are committing to only use that amount of capacity. DR payments are the method by which the customer's capacity bill is adjusted to reflect the actual firm service they take.

“End use customers that sell Demand Resources in the PJM Capacity Market are selling interruptibility. The PJM Load Management Program provides a mechanism for end use customers to avoid paying the Capacity Market clearing price for a defined amount of capacity which they would otherwise pay for and have a right to use, in return for agreeing to not use capacity when it is needed by customers who have paid for the capacity. This is a logical, reasonable and valuable product.”

*-- Comments of the Independent Market Monitor for PJM,
ER11-3322, April 28, 2011.*

The Problem with CBL

CBL has no relationship with the amount of capacity a customer buys or should be able to avoid buying.

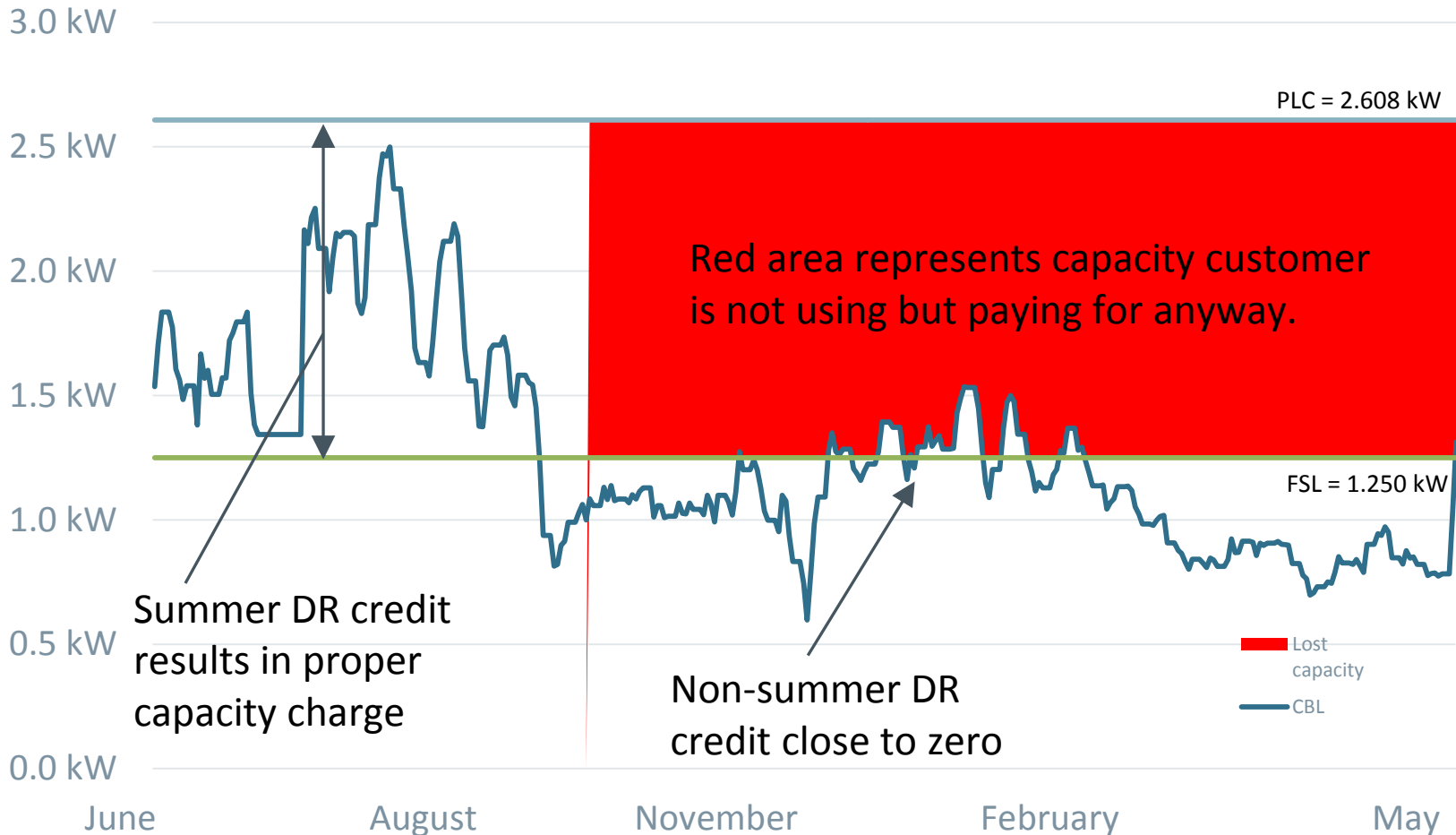
Winter baselines generally result in curtailment values that are less than the difference between a customer's PLC and FSL.

This results in the customer's net capacity bill being more than their FSL. Demand Response customers end up paying for capacity they do not use.

This excess payment is unavoidable: even a customer, or an entire LSE, who commits to drop entirely off the system whenever needed by setting a zero FSL will still end up paying capacity charges.

Residential Example

Once Base Capacity is gone, customers will be forced to buy their PLC, whether they need it or not



Aggregation is a partial solution at best

Combining resources can cover over the measurement problems, but only partially and with a cost

Using a CBL, aggregation of multiple DR sites still runs into the problem that there just isn't enough load in the winter.

- Under CP, significant amounts of winter capacity does not serve load: it either covers for outages or is simply excess.
- This means that no matter how creatively CSPs aggregate customers, they will never be able to fully offset the costs of the capacity they are not using.

Aggregation with other resource types brings its own problems:

- Load is already paying once for capacity; it is unattractive to have to buy the same capacity again simply to avoid paying for what they are not using.
- Revenue split between summer/winter resources will be based on market power rather than reliability value. There are likely to be more stranded summer assets than winter ones, enabling winter peaking resources to simply collect rents.

Customer right to not take service

The Case of the Missing Capacity

Living under a “must-buy” requirement, load that wishes to provide DR should expect roughly comparable treatment to other capacity market participants. But:

- Some of the capacity that a summer-peaking load pays for is taken, without compensation, and used to serve winter-peaking loads.
- Customer’s demand response capabilities are derated in order to provide free replacement capacity for generators that are on planned outages:

“any seasonal difference in demand is already accounted for in the planned outage schedules that PJM uses in calculating the IRM”

-- *Answer of PJM Interconnection*, ER15-623, February 13, 2015.

What happened?

The Case of the Missing Capacity

Early in the Capacity Performance docket, PJM acknowledged that summer cost allocation might not work perfectly with the year-round CP framework. That issue was deferred to stakeholder discussions, and stakeholders voted not to pursue the matter.

This has left us with a contradiction between CP product definitions and cost allocation: if we measure DR in the way that is consistent with cost allocation, we can't accurately measure its reliability value.

This problem has already been partially solved: the limits on summer limited DR, summer extended DR, and base capacity included methods to incorporate resources with unknown winter capacity value in the market.

Capacity Performance DR Proposal

Make M&V consistent with cost allocation; limit quantities to manage planning uncertainty

- Keep all the existing operational requirements for Capacity Performance DR (CPDR): full-year obligation, CP penalties, etc.
- Use FSL year-round to measure DR performance; this is the only method that is consistent with cost allocation and does not introduce arbitrary cross-subsidies.
- To accommodate the uncertainty around non-summer load's contribution to capacity needs:
 - Limit the amount of CPDR that can clear an RPM auction using the same methods as used for legacy products. This is not in any way because full year CPDR is a sub-annual product, but a necessary acknowledgement that stakeholders have declined to address winter cost allocation issues.
 - DR is only eligible for CP bonus payments on the amount that load drop exceeds UCAP obligations as measured using economic baselines.
- Modify some auction parameters to come closer to least-cost solutions (next slide)

CPDR Auction Changes

Technical RPM modifications

- Set the IRM and CPDR caps for a more cost effective balance between winter and summer LOLE.
 - We tentatively propose setting the values to allocate the 10% annual LOLE as 7% summer LOLE and 3% non-summer.
 - We also request that PJM provide analysis as to what the IRM and CPDR caps would be at different summer/non-summer LOLE targets.
- Current auction clearing undervalues constrained resources in constrained LDAs (e.g., Base DR in PEPCO). Such resources should never have a lower price than the same resource type in their parent LDA (Even after PEPCO binds, PEPCO Base DR is still a perfectly good SWMAAC resource and should clear as such.)
- Revisit the discussion of if auctions should clear using the original “minimum required quantities of some resource types” method or the revised “maximum allowed quantities of other resource types” method.
 - In plain English, once minimum reliability targets have been met, what resources should be allowed to provide additional MW?
 - If the marginal reliability value of winter capacity is very low, adding resources with summer value may be more cost-effective.

Closing Thoughts

Consistency Matters

“You can't simply arbitrarily redefine the product in order to say that it should be paid something, because it was providing some abstract value which can't be measured very well. We're operating within a market framework. These products are defined within markets and they have value which is defined by the markets, and we can't forget that.

The PLC is not just some amount of energy that was used a year ago; it's actually the determinant of how much you pay for capacity. Whether you like it or not, that is the fact about how the capacity market works and how the costs of paying for capacity are defined...

And on the question of CBL, I think it's fairly widely recognized that CBL is not always a great measure. I think that it's been demonstrated here. But even...even if CBL were perfect, even if it really were measuring contemporaneous reduction, there is still the issue that we discussed this morning; it's still not the definition of capacity...”

-- Dr. Joe Bowring, comments at FERC tech. conf., July 29, 2011.