

PJM Proposal Walkthrough

Summer Only Demand Response Senior Task Force

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- Explain how parts of the PJM package would work using examples.
 - Shaving trigger points
 - Forecast impact
 - Market value

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- PJM will initially generate a new lower load forecast based on a modified load history that assumes perfect curtailment compliance back to 1998.
 - Program will be assumed to be enacted every time a predetermined Temperature-Humidity Index (THI) threshold is reached or exceeded.
 - Perfect curtailment assumption will be re-visited based on actual performance.
 - Capacity value would be reflected through a lower load forecast and thus a reduced Reliability Requirement



- Each peak shaving event will be 6 hours from HE14 to HE19 (*PJM Package*)
- Each peak shaving event will be triggered on non-holiday weekdays which have a max THI exceeding the *threshold*
- Peak shaving events can occur any day between May and October



Design Component 2c – Curtailment Triggers

- "THI threshold as determined by PJM"
 - Investigated several potential thresholds and settled on the following method
 - Consider all non-holiday weekdays back to 1998 (May to October)
 - Incrementing by 0.5 THI at a time, count the number of days exceeding the THI value
 - THI threshold is the first instance in which the median number of days per year exceeds 10
 - Different threshold methodologies would lead to different shaving frequency and inevitably different forecast outcomes







- Current: Forecast model uses unrestricted load
 - Manual 19: "Hourly metered load data are supplemented with estimated load drops..."
 - Shaving would reduce historical unrestricted load, which would lower the forecast through changing model coefficients
- Proposed: Modify forecast model to include shaving (or load management) as an independent variable
 - Not relying on shaving to get reflected in regression model parameters
 - Forecast values would be more consistent with expected operation
 - Can more easily reflect non-performance (Design Component 2b)



Walkthrough – Forecast Impact

- Step 1: Zone would identify future shaving amounts
 - PJM would take that amount as a share of the baseline forecast (no shaving) and would assume that amount (as a share of the weather normal peak) was in place historically on shaving days



BGE Example: Shaving Amount (MW) by Year by Percent of Baseline Forecast



As a Percent of Baseline Forecast



Walkthrough – Forecast Impact

- Step 2: PJM runs the forecast
 - Shaving will be assumed to be enacted every time the Temperature-Humidity Index (THI) threshold is reached or exceeded
 - In history: Determines model parameters
 - In forecast: Uses model parameters, and enacts shaving on all instances of the weather simulation that meet the criterion
 - Resulting forecast reflects the zone's shaving behavior

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Peak Forecast Impact as a Share of Shaving Amount by Zone and by Shaving Amount (Percent of Baseline)



2 4 6 8 10

As a Percent of Baseline Forecast



- Step 3: Capacity Market MW Valuation (Design Component 2e)
 - VRR curve is reflective of the reliability requirement, which depends on the load forecast and the monthly load profile.
 - Reliability Requirement = CETO + UCAP + DR
 - CETO: Capacity Emergency Transfer Objective
 - UCAP: Unforced Capacity
 - DR: Forecasted Demand Resources multiplied by the FPR (forecast pool requirement)
 - For sake of illustration, we will consider zones for which parameters were posted for the 2021/22 RPM BRA, and will assume a shaving amount of 6% of forecasted load.

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Example - Capacity Market Implications 2021/2022 Planning Parameters

PS	PEPCO	ATSI	COMED	BGE	PLGRP*	DAYTON	DEOK
5620	1550	6020	-640	4470	-850	2480	3110
11501	8073	15598	26112	7910	9974	3979	7557
	PS 5620 11501	PS PEPCO 5620 1550 11501 8073	Official I PS PEPCO ATSI 5620 1550 6020 11501 8073 15598	Official Posted PS PEPCO ATSI COMED 5620 1550 6020 -640 11501 8073 15598 26112	Official Posted PS PEPCO ATSI COMED BGE 5620 1550 6020 -640 4470 11501 8073 15598 26112 7910	Official Posted PS PEPCO ATSI COMED BGE PLGRP* 5620 1550 6020 -640 4470 -850 11501 8073 15598 26112 7910 9974	Official Posted PS PEPCO ATSI COMED BGE PLGRP* DAYTON 5620 1550 6020 -640 4470 -850 2480 11501 8073 15598 26112 7910 9974 3979

		With S	having at 6% of	f Baseline Foi	recast			
CETO	5460	1670	6260	90	4790	-400	2530	3050
Reliability								
Requirement	11022	7802	15153	25338	7634	9849	3866	7343
Shave Amount	562	367	745	1288	383	422	195	320
Rel Rqt								
Reduction as a								
Share of Shave								
Amount	85%	74%	60%	60%	72%	30%	58%	67%

* PLGRP results only included shaving in PL zone, not UGI



ATSI Example – Capacity Market Implications Variable Resource Requirement Curve





- How do we best account for existing peak shaving activity? Will entities provides us with their history?
- Is it necessary to account for shaving program weather sensitivity? If so, what would be the best way to do so?
 - Preceding analysis assumed the same MW shaving value within a year regardless of weather