MMU Proposal on Price Responsive Demand (PRD)

MRC

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Introduction

- **Key distinctions between MMU and PJM Proposals:**
  - **Price setting in emergency conditions**
  - **Initiation of mandatory curtailment**
  - **Ratio of peak load/forecast adjustments to Maximum Emergency Service Level for M&V**
  - **Retail rate contract eligibility**
  - **Balancing Operating Reserve deviation exemptions**

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Overview

- **Summary of MMU proposed modifications to Price Responsive Demand (PRD) business rules:**

    1. **PRD should be modeled as a price taker and required to reduce in any instance when if not for PRD, an emergency event would be called. (This means that PRD load would be required to interrupt prior to max emergency generation)**

    2. **PRD business rules should place specific, minimum requirements on the relationship between retail rates and wholesale nodal prices:**
        - **When nodal LMP is > $120, the retail rate must be at least 80 percent of nodal LMP**

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Overview

- **Issues that require further consideration and refinement prior to filing:**

  3. **Proposed actual/forecast load adjustment to Maximum Emergency Service Level (MESL) in compliance calculations inconsistent with traditional Firm Service Level (FSL) approach.**

  4. **Balancing Operating Reserve (BOR) deviation charge exemptions should be limited, to the extent possible, to estimated PRD values using submitted PRD curves and nodal deviation calculations**

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Emergency Event

- **PJM proposal requires all PRD to be curtailed when an emergency event is declared regardless of price level and submitted PRD curves**

- **Real-Time LMP will be set by PRD curves even though customer is required to be off the system**

  - **Creates a disconnect between actual system conditions and the wholesale price signal**

  - **Results in a higher LMP than would occur if PRD reduced load to avoid capacity obligation independent of program (e.g. if DR participant)**

  - **Does not consider scenarios in which customer or LSE has incentive to drive up price**

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MMU Position

- **Capacity is procured with a reserve margin to prevent reserve shortages and emergency events for a given future delivery year**

- **PRD customers' reductions are subtracted from the load forecast such that neither capacity nor reserves are procured for PRD load**

- **The subtraction of PRD load from load forecast reduces the demand for capacity, reduces RPM clearing price and displaces generating capacity**

- **PRD should be called to avoid and relieve emergency events**

- **Price levels should reflect the absence of PRD consumption when called to avoid emergencies and throughout emergency events**

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MMU Position

- **Under normal system conditions, PRD is not obligated to reduce but to make real time consumption decisions based on LMP. No penalties should be assessed unless PRD is required to interrupt to avoid emergency conditions.**

- **PRD represents a forward agreement by customers to forgo consumption during system stress, regardless of their economic real time demand schedule.**

- **Energy Only price responsive customers can and do affect price in emergency situations, which is appropriate since capacity is procured for these customers**

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Rate Contract Eligibility

- **PJM proposes that Price Responsive Demand (PRD) be bid into the energy market daily, and asserts that it will respond economically and provide value to the system outside of an emergency event**

  - **No penalties are assessed by PJM outside of an emergency event as PRD should by definition face higher prices for consumption when LMP rises.**

- **The extent to which this is true depends on the nature of the link between eligible retail rates and wholesale price signals**

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Current Business Rules

- **PJM proposed criteria:**
  - **"served under a dynamic retail rate structure that can change on an hourly basis, that is linked to or based upon a PJM real-time LMP trigger at an electrical substation location… that results in predictable response to varying wholesale electricity prices"**

- **PJM proposed criteria are not adequate to establish the required link between retail and wholesale prices**

- **Under PJM proposed criteria, the following is eligible:**
  - **$20/MWh when nodal LMP is <=$999/MWh**
  - **$21/MWh when nodal LMP is >=$1,000/MWh**

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Discussion

- **Level of response is dependent upon the strength of linkage between wholesale price and retail price.**

- **Failure to adequately specify the linkage between wholesale and retail prices will result in "capacity only" type product, e.g. DR.**

- **For PRD, price signal should be directly proportional to and within a percentage threshold of nodal wholesale price signal**
  - **Ideal retail price equals nodal wholesale price**
  - **Any modifications should closely approximate this ideal**

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MMU Proposal

- **Specify minimum conditions for qualifying linkage between wholesale and retail prices:**
  - **Nodal LMP ($/MWh) threshold above which there must be dynamic and proportional changes in retail price**
  - **Floor percentage (%) of LMP that retail price must reflect when LMP is above first threshold**
  - **For example: when nodal LMP is > $ "X"/MWh, retail rate must be "Y" percent of nodal LMP**
- **MMU suggest target of 5 percent of hours:**
  - **When nodal LMP is greater than $120/MWh, the retail rate must be at least 80 percent of nodal LMP.**
  - **This allows for, but does not require, fixed rates at lower price levels**

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Adjustment to MESL

- **PJM proposes adjustment to Maximum Emergency Service Level (MESL) by the ratio of actual load to forecast, to account for higher load levels than forecasted**

- **Inconsistent with traditional FSL approach to Measurement and Verification in which commitment is to reduce to a certain value regardless of actual to forecast ratio**

- **Product definitions have different implications:**
  - **Adjusted MESL approach will ensure proportional capacity charges to consumption ratio**
  - **Unadjusted MESL approach provides greater assurance of action taken and defined load in capacity event**

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Adjustment to MESL: Example

- ## Two identical LSEs in same zone, one with registered PRD

	LSE 1	LSE 2
Obligation (MW)	10	10
Registered PRD (MW)	2	0
Net Obligation	8	10
Final Capacity Price for DY ($/MW-Day)	$20	$20
Charges ($/MW-Year)	$200	$200
Credits ($/MW-Year)	$40	0
Net Payments ($/MW-Year)	**$160**	**$200**

- ## Actual peak load 25 percent higher than forecast:

Scenario 1: Adjusted MESL	LSE 1	LSE 2
Unrestricted Consumption (MW)	12.5	12.5
Adjusted MESL	10	NA
PRD reduction (MW)	2.5	NA
Capacity Consumption (MW)	10	12.5
Net Payments ($/MW-Year)	$160	$200
Effective Capacity Rate ($/MW-Day)	$16.00	$16.00

Scenario 2: Unadjusted MESL	LSE 1	LSE 2
Unrestricted Consumption (MW)	12.5	12.5
MESL	8	NA
PRD reduction (MW)	4.5	NA
Capacity Consumption (MW)	8	12.5
Net Payments ($/MW-Year)	$160	$200
Effective Capacity Rate ($/MW-Day)	$20.00	$16.00

Underlying Assumption

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Adjustment to MESL: RPM Implications

- **PJM proposal maintains a proportional relationship between obligation and usage between LSEs, under some assumptions.**

- **Unadjusted MESL provides a direct relationship between capacity obligation and usage.**
  - **In example, LSE 1 pays for 8 MW and reduces usage to exactly 8 MW**

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Adjustment to MESL: M&V Implications

- **Assumption of PJM approach is that fixed portion of PRD customer load will be higher than obligation by the same proportion that actual load is higher than forecast.**

    - **Is this a valid assumption?**
    - **Is it reasonable to assume that all load above MESL is curtailable?**

- **To the extent that is not true, PRD customers may be found compliant while taking little or no actions in real time.**

    - **In example, if LSE 1 were already operating at 10 MW, consistent with PLC obligation, it would be found compliant without reducing usage**

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Adjustment to MESL: Example 2

Scenario 1: Adjusted MESL	LSE 1	LSE 2
Net Obligation	8	10
Actual / Forecast Adjustment	1.25	
Unrestricted Consumption (MW)	10	12.5
Adjusted MESL	10	NA
PRD reduction (MW)	0	NA
Capacity Consumption (MW)	10	12.5
Net Payments ($/MW-Year)	$160	$200
Effective Capacity Rate ($/MW-Day)	$16.00	$16.00

Scenario 2: Unadjusted MESL	LSE 1	LSE 2
Net Obligation	8	10
Actual / Forecast Adjustment	1.25	
Unrestricted Consumption (MW)	10	12.5
MESL	8	NA
PRD reduction (MW)	2	NA
Capacity Consumption (MW)	8	12.5
Net Payments ($/MW-Year)	$160	$200
Effective Capacity Rate ($/MW-Day)	$20.00	$16.00

Unrestricted Load not proportionally higher than PLC

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Balancing Operating Reserve Deviations

- Issue: PRD is to be bid into Day-Ahead Market, but the retail rate of the end use customer must be tied to Real-Time LMP

- If PRD clears unreduced quantity in Day-Ahead, but Real-Time LMP is high enough to justify response, that response is subject to a Balancing Operating Reserve (BOR) Deviation charge

- PJM proposal exempts Load Serving Entities (LSEs) with PRD for deviations from Day-Ahead when Real-Time LMP is greater than Day-Ahead LMP

  - Intent of rule is to eliminate the disincentive to respond in real time when committed Day-Ahead

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Balancing Operating Reserve Deviations

- **PJM proposal does not estimate MW of PRD included in BOR MW deviations, but exempts all BOR deviation charges in any situation where PRD may have caused the deviation**

- **Without a limit on exemption, LSEs with PRD will see arbitrary exemptions and have an incentive to overbid Price Sensitive Demand (PSD) in Day-Ahead**

- **Exemption should be limited to the amount of PRD related MW deviation based on the differential between Day Ahead and Real-Time LMP at the pnode and the submitted PRD schedule**

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BOR Deviations: Example

- **Nodal Day-Ahead LMP is $25/MWh but Real-Time LMP is $30/MWh**

- **PRD is modeled at this node, and committed in Day Ahead for full bid at $25/MWh. Based on submitted PRD curve, price responsiveness starts at $50/MWh**

- **Under PJM proposed business rules, if load in real time less cleared fixed Day-Ahead Load is less than cleared Price Sensitive Demand (PSD), LSE will be exempt from BOR deviation charges**

- **Actual lower load in real-time is due to factors other than PRD**

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