

Integrating Energy Efficiency into the Capacity Market – End-users without Interval Meters

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Draft Proposal – No Hourly Meters

- 100 kW minimum size
- Aggregation in same capacity zone
 - LDA granularity
- Flexibility to be a DR or ILR type resource
- PJM approved M&V protocols
 - Include stipulated savings tables
- Special clearing rules
 - Link measure life to auction clearing life?
 - Allow up to five year lock-in at BRA price?
- Payment based on performance
 - Summer only
 - Year round

Draft Proposal –No Hourly Meters

Draft Proposal Element	Current RPM rules	RPM rule change	Tariff change
100 kw min	X		
Aggregates by Transmission Zone	X		
DR or ILR	X		
M&V approval		X (500 MW pilot/DLC precedent)	
Assurance of multiple years	X ILR annual re-up for life of resource	New Entry Pricing for Planned Generation	X
Summer only	X		
Year round		X (DR factor/IRM study)	

Hypothetical for Analysis

- 10 Mega Stores are located in the JCP&L zone in EMAAC
- None of the Mega Stores has an hourly interval meter
- Each store has a PLC of .25 MW (total is 2.5 MW for the 10 stores)
- Assume the Final RPM Zonal Scaling Factor (Final ZSF) for JCP&L for the entire 2008/2009 Planning Year is 1.03679
- Forecast Pool Requirement (FPR) for 2008/2009 Planning Year = 1.0796
- Mega Stores' CSP reports the EMAAC clearing price from the April, 2007 transitional Base Residual Auction for the 2007/2008 Planning Year
- Each Mega Stores plans Energy Efficient replacements of air-conditioning (50kw/10 year useful life), of refrigerators (25kw/10 year useful life), and of lighting (25kw/5 year useful life) (total per store is .1MW) (total for 10 stores is 1 MW)
- Mega Stores' CSP submits to PJM an engineering study that supports the kw value of the planned equipment replacements
- PJM approves the M&V filing (with values supported by an engineering study or other acceptable estimate)
- Mega Stores' 1 MW bid in the July, 2007 transitional BRA for the 2008/2009 Planning Year clears
- Mega Stores executes the contract for Energy Efficiency 9/1/07
- Equipment replacement completed for all 10 Mega Stores 10/1/07

Analysis Under Current RPM Rules

- **1 MW of Energy Efficiency (EE) does not qualify as a Load Management resource because it is not dispatchable during an emergency**
- **The end-use sites don't have interval meters so these customers can't show that their loads did not exceed a Firm Service Level of 1.5 MW**
- **The PLC ticket of .25MW for each Mega Store is not based on the 5 Coincident Peak hours of the site but rather on a load profile for the customer class (scaled by summer consumption?)**
- **May need a new Load Management category for EE**
- **Absent the EDC making a special exception, the PLC ticket of each Mega Store would not be adjusted to reflect the EE**
- **Note that the EE begins receiving Energy Market value immediately**

Mega Stores 2008/2009 Planning Year Capacity Payments – Impact of No Solution

- Capacity obligation for 2008: 2.5MW PLC
X 1.03679 Final ZSF X 1.0796 FPR =
2.80MW
- 2.80MW X \$143.51 X 365 days =
\$146,667.95

Mega Stores 2008/2009 Planning Year Capacity Payments – ILR Solution

- Requires a change in the facts: no bid in the BRA in July of 2007; rather certification of the resource as ILR
- Add back the 1 MW to the PLC for the 2009/10 Planning Year since the useful life of all three measures exceeds 2 years
- The annual certification and add back for the EE measures would continue for the useful life of the measures and/or until the measures became the norm for the customer class and were captured and factored into the PLC ticket of the customer class
- Note that the DR factor arguably would not apply to the refrigeration and lighting measures that are available year round --- a new factor may need to be developed by PJM for these resources

Financial Impact on Mega Stores of ILR Solution

- Total cost of capacity of \$146,667.95 is reduced by \$53,954.30 to \$92,713.65
- $1\text{MW} \times .957 \text{ DR Factor} \times 1.0796 \text{ FPR} = 1.03 \text{ MW of ILR}$
- $1.03 \text{ MW} \times \$143.51 \times 365 \text{ days} = \$53,954.30$

Mega Stores 2008/2009 Planning Year Capacity Payments – DR Solution

- The 1MW bid submitted by Mega Stores' CSP cleared the July transitional BRA for the 2008/2009 Planning Year and the 1MW value of the EE measures was approved by PJM based on the engineering study submitted by the CSP
- Add back the 1MW to the PLC for the 2009/10 Planning Year since the useful life of all three measures exceeds 2 years
- The annual add back for the EE measures would continue for the useful life of the measures and/or until the measures became the norm for the customer class, and were captured and factored into the PLC ticket for the customer class
- Note that the DR factor arguably would not apply to the refrigeration and lighting measures that are available year round --- a new factor may need to be developed by PJM for these resources

Financial Impact on Mega Stores of DR Solution

- Total cost of capacity of \$146,667.95 is reduced by \$55,939.90 to \$90,728.05
- $1\text{MW} \times .957 \text{ DR Factor} \times 1.0796 \text{ FPR} = 1.03\text{MW}$ of DR
- $1.03 \text{ MW} \times \$148.80 \times 365 \text{ days} = \$55,939.90$

Mega Stores 2008/2009 Planning Year Capacity Payments – EDC Solution

- EDC confirms the EE installations on 10/1/07
- EDC reduces Mega Stores PLC tickets for 6/1/08 by a total of 1MW from 2.5MW to 1.5MW
- EDC reduces Mega Stores transmission ticket for 6/1/08 by 1 MW from 2.5MW to 1.5MW
- The EDC's other customers would need to pick up the charges associated with the 1 MW reduction of Mega Stores PLC because the Zonal Load Obligation is fixed

Financial Impact on Mega Stores of EDC Solution

- Capacity obligation for 2008/2009: 1.5MW
PLC X 1.03679 Final ZSF X 1.0796 FPR =
1.68MW
- 1.68MW X \$143.51 X 365 days =
\$88,001.50
- Total cost of capacity = \$88,001.50

Comparison of Capacity Cost Impacts on Mega Stores

- No solution = \$146,667.95
- ILR solution = \$92,713.65 (EE resources certified in March of 2008)
- DR solution = \$90,728.05 (EE resources bid in the July 2007 Base Residual Auction)
- EDC solution = \$88,001.50 (EDC reduces the PLC for 6/1/08 even though the reductions did not take place during the summer of 2007)

Additional Steps Required

- Clear understanding that the resolutions shift costs among customers as capacity obligations change, but reinforce and enable investment decisions predicated on RPM auction prices
- Still need to develop:
 - General Measurement and Verification rules
 - Process for review and approval of specific values for measures when there is no hourly meter
 - Process for determining when EE measures are the new norm (aka market transformation) for the customer class (AMI may overtake the need for this process for some EDCs)

Resource changes over time

- Stipulated savings values can change with improved measurement and verification techniques
- Market transformation may disqualify a measure from “efficient” to normal
 - Changes in technology may lower costs, making efficient products the norm
 - Changes to codes and regulations may make reductions automatic (e.g. appliance standards and building practices)