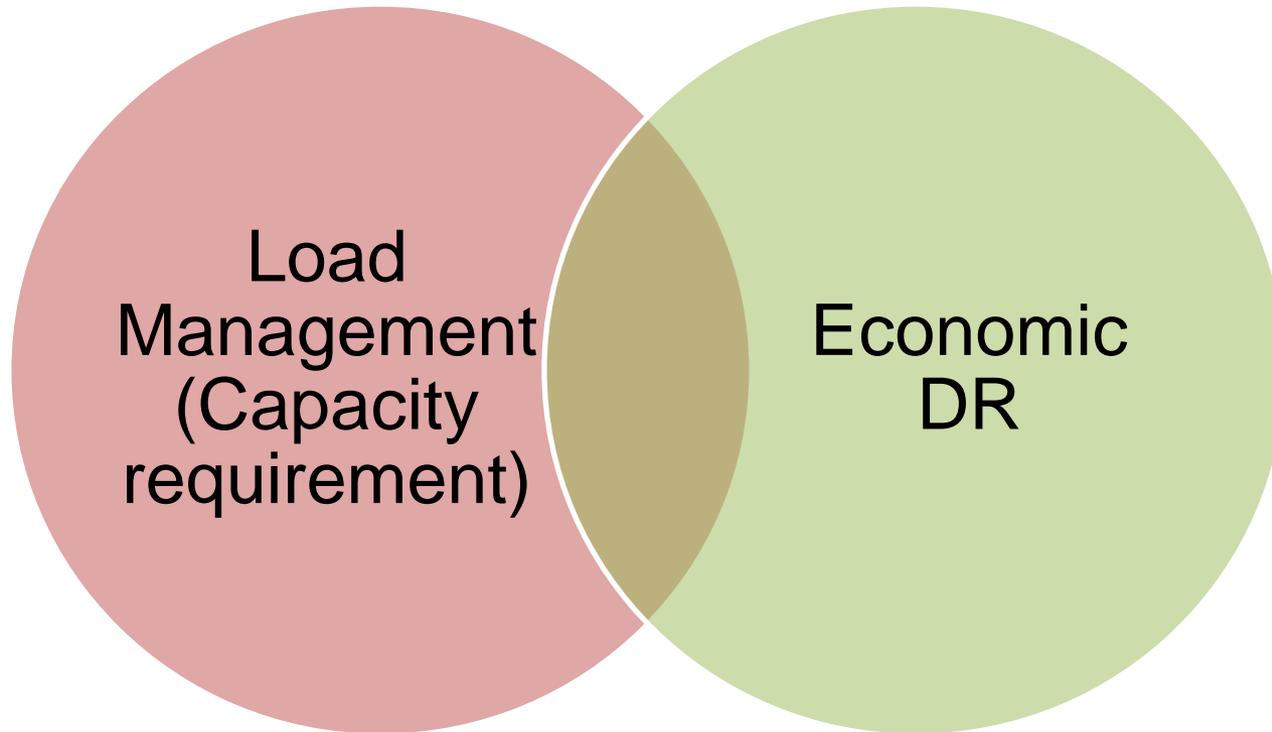


Demand Response energy settlements





Load Management = Pre-Emergency DR + Emergency DR

- Load Reduction = CBL – Load, scaled for line losses where default CBL is 3 Daytype (Weekday, Sat, Sun/Holiday) with SAA (calibrate forecast load shape to current load level)
 - Alternative CBL may be used if more accurate based on RRMSE test
 - If participates as Economic DR then use CBL from Economic DR registration

CBL is customer baseline which represents forecast of customer usage.

- Revenue
 - Load Reduction * LMP, adjusted for line losses
 - Eligible for make whole payment based shutdown cost and energy offer price.
 - Energy offer price caps may change based on Order 831 compliance filing.
- Cost Allocation
 - Real-time deviations from day-ahead net interchange that create a shorter real-time position.



Load Management energy settlement example

PJM pays LMP

– Resource is made whole to its offer value, which includes:

- Offer Price
- Shutdown costs

	HE 14	HE 15	HE 16	HE 17	HE 18	Total
Nominated MWs	10	10	10	10	10	
Actual Reduction (MW)	10	10	10	10	10	
Real-Time LMP (\$/MWh)	300	350	500	300	200	
Offer Price	\$1,100	\$1,100	\$1,100	\$1,100	\$1,100	
Load Response						
Emergency Credits	\$3,000	\$3,500	\$5,000	\$3,000	\$2,000	\$16,500
Emergency Offer	\$11,000	\$11,000	\$11,000	\$11,000	\$11,000	\$55,000

Shutdown Costs = \$1000

Resources will be paid Daily Load Response Emergency Credits + Emergency Load Response Make Whole Credit

- Load Response Emergency Credits = \$16,500
- Emergency Load Response Make Whole Credit = Emer. Offer + Shutdown cost – Daily Load Response Emergency Credits
 - \$55,000 + \$1,000 - \$16,500 = \$39,500

- Revenue

- Load Reduction * LMP, adjusted for line losses
- Make Whole payment (based on lessor of offer volume and actual load reduction)
 - load reductions must be within +/- 20% of dispatch amount
 - compensation is based on offer price if offer price => NBT
 - Shutdown cost will not be paid if any hour in segment is outside 20% volume deviation
 - Shutdown cost is paid once for all contiguous hours
 - Segment make whole is sum of hourly make whole (ie: negative make whole will offset positive make whole)
- BOR charge applied to all deviations outside +/-20%

- Cost Allocation

- Market participants with real-time exports from PJM and LSE's within a zone where zonal LMP greater than or equal to the Net Benefits Test Price.

Load Reduction should represent actions taken based on wholesale market participation (not part of normal retail market operations)



Real Time Performance within 20%

Real Time Market Parameters	Values			
Net Benefits Price (\$/MWh)	35.00			
Real Time Offer (MW)	1.0			
Real Time Offer Price (\$/MWh)	90.00			
Shutdown Cost (\$)	100.00			
Minimum Down Time (Hours)	2.00			
Notification Time (Hour)	0.17			
Real Time Market Dispatch	HE 14	HE 15	HE 17	HE 18
RT Dispatched MWh	1.00	1.00	1.00	1.00
Real Time LMP (\$/MWh)	100.00	75.00	50.00	30.00
Real Time Market Performance	HE 14	HE 15	HE 17	HE 18
Real Time Reduction including Losses (MWh)	0.90	1.10	1.05	0.95
Settlements				
Balancing Load Response Credit = If RT LMP >= Net Benefits Price THEN RT Load Response MWh * RT LMP (\$) If RT LMP < Net Benefits Price THEN 0	\$90.00	\$82.50	\$52.50	\$0.00
Deviations (Calculated hourly)				
PJM Deviations = If RT Disp MWh * 0.8 > RT Reduction MWh > RT Disp MWh *1.2 then ABS(RT Reduction MWh - RT Disp MWh) else 0 (MWh)	0.00	0.00	0.00	0.00
East Deviations = If RT Disp MWh * 0.8 > RT Reduction MWh > RT Disp MWh *1.2 then ABS(RT Reduction MWh - RT Disp MWh) else 0 (MWh)	0.00	0.00	0.00	0.00
West Deviations = If RT Disp MWh * 0.8 > RT Reduction MWh > RT Disp MWh *1.2 then ABS(RT Reduction MWh - RT Disp MWh) else 0 (MWh)	0.00	0.00	0.00	0.00
RTO Bal Operating Reserve for Deviations Rate (\$/MWh)	2.983259	2.983259	2.983259	2.983259
East Bal Operating Reserve for Deviations Rate (\$/MWh)	2.450656	2.450656	2.450656	2.450656
West Bal Operating Reserve for Deviations Rate (\$/MWh)	0	0	0	0
RTO Balancing Operating Reserves Deviations Charges = Deviations * RTO Bal Rate (\$)	\$0.00	\$0.00	\$0.00	\$0.00
East Balancing Operating Reserves Deviations Charges = Deviations * East Bal Rate (\$)	\$0.00	\$0.00	\$0.00	\$0.00
West Balancing Operating Reserves Deviations Charges = Deviations * Westt Bal Rate (\$)	\$0.00	\$0.00	\$0.00	\$0.00
	Segment 1		Segment 2	
Make Whole	HE 14	HE 15	HE 17	HE 18
RT Load Response Bid = Lesser(Real Time Offer, Real Time Reduction) * Real Time Offer Price	\$81.00	\$90.00	\$90.00	\$85.50
Bal Sync Reserve Revenue Above Cost	\$5.00	\$5.00	\$0.00	\$0.00
RT Load Response Credits	\$90.00	\$82.50	\$52.50	\$0.00
Hourly BAL Operating Reserve For Load Response = (RT Load Response Bid - Bal Sync Reserves Revenue Above Cost - RT Load Response Credits)	-\$14.00	\$2.50	\$37.50	\$85.50
Segment Total Bal Operating Reserve for Load Response		-\$11.50		\$123.00
Shutdown Cost		100.00		100.00
Bal Operating Reserve for Load Response Credit = MAX(Segment Total Bal Operating Reserves for Load Response + Shutdown Cost,0)		\$88.50		\$223.00