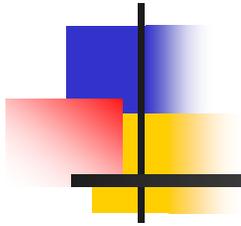


Removing Barriers for Participation in PJM DR Programs

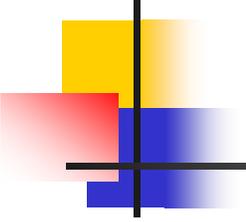


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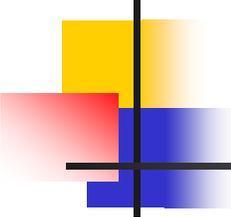
January 19, 2007



Overview

- Impact of Large Customers and Small C&I Customers
- Large Customers can transform reliability
- Small Customers are needed to transform daily economics
- Payback for Small Customer Participation
- Economics for Aggregators of Small Customers
- How PJM Programs are particularly well suited for Small Customer Economics





A Few Assertions

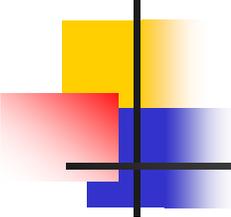
- Most programs focus on large users (10 MW or more).
- Fundamental changes in the grid and organization of the grid will occur when DR systematically includes a large number of customers – particularly customers that can reduce 1 MW or less.
- Smaller customers have unique needs. They do not have the magnitude of payments to justify day-to-day management of the electricity bill.



When the focus is on large customers

- Large accounts have big impacts
 - They can be 10%-20% of the regional load. So, if they have some flexibility, they can influence hourly regional consumption by 1%-2% with a major impact
- But, large customers:
 - Are big enough to devote staff to the issue
 - Have many opportunities that are resolved with electricity contract flexibility
 - Are always shopping. Successful new programs often cannibalize old ones.





Expectations are for more DR than Large Customers can Deliver

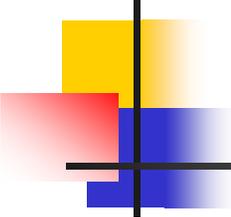
- 1%-2% load curtailment and/or load shift is a good start from Large Customers. Will have a significant impact on reliability.
- For most regions, customers of .5 to 5 MW will consume 40%-50% of the load
- We can dramatically extend DR impact by reaching the smaller C&I customer.
- A 5% price responsive load impact would transform the grid – not only for reliability but for daily economics



DR Economics for a 1 MW Customer

- Monthly electricity bill (at \$.10/kWh) is approximately \$50,000/month.
- So, the bill associated with reducing or moving 10% of consumption is \$5,000/month.
- The ballpark value to the grid of shifting 10% of this customer's consumption is on the order of a few thousand/month.

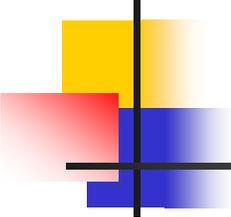




What a 1 MW Customer Needs to Justify the Effort to Save a Few Thousand a Month

- Regular Time/Effort: less than 15 minutes a week
- Training: Less than 2 hours initially, easy to update (internet based)
- Preferred Operation: Tell me when to do it, what to do, and preferably – do it for me.

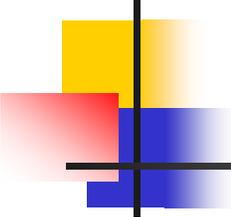




DR Economics for a 1 MW Customer for the Aggregator

- If the customer revenue is a few thousand a month, the aggregator revenue will be a few hundred a month
- Meter costs can easily consume the benefit
- If the aggregator specializes in meter equipment, he won't stay around for the DR program unless the monthly economics are right.
- Scale: The aggregator needs thousands of customers to justify the system development and implementation to make it easy for the customer





PJM Programs for the 1 MW Customer

- Have a large footprint. Aggregators can address a large audience
- Are the same throughout the PJM footprint. Aggregators can make investments with standardization.
- Therefore, a fundamental issue for the success of DR in PA is the removal of barriers for participation in PJM DR programs.

