

PJM/MISO Cost Allocation for Economic Upgrades



**Wilmington, DE
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- Status of Filing for Cross-Border Cost Allocation for Reliability Upgrades
- PJM / MISO Economic Processes
- Cross-Border Cost Allocation for Economic Upgrades

Status of Filing for Cross-Border Cost Allocation for Reliability Upgrades



Previous Economic Planning Process

- Significant amount of information was provided to the market including congestion (by facility in increments of hourly, monthly, yearly), limiting element and cost estimate to replace limiting element
- PJM's economic planning process was based on historical real time congestion and used off-line day ahead market simulation tool to project impact of future upgrades on congestion.
- Result – many upgrades identified to resolve reliability problems were found to also resolve historically congested facilities. Only one facility was identified as cost justified to upgrade through the economic planning process.



New Economic Planning Process – Market Efficiency

- Significant amount of information will still be provided to the market including congestion (by facility in increments of hourly, monthly, yearly), limiting element and cost estimate to replace limiting element
- PJM's market efficiency analysis will use a market simulation tool to evaluate projected congestion in future years. Many sensitivities to the assumptions used in the analysis will be simulated.
- PJM Tariff changes have been filed with FERC.

Economic metrics

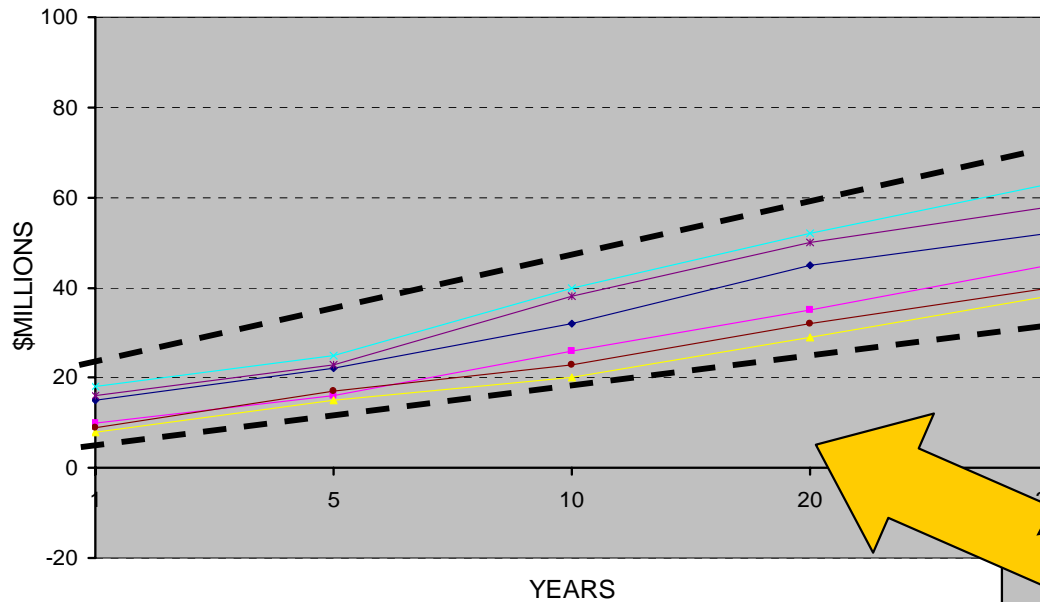
- Benefits of transmission upgrades will be quantified to include changes in:
 - Zonal load payments
 - Total load payments
 - Total production cost
 - Total generator revenue
 - Secondary Benefits
 - Total transmission system losses
 - Total capacity payments
 - Total FTR credits
 - Zonal FTR credits

Scenario analysis

- Load forecast
- Fuel cost
- Generation additions/retirements
- Impact of environmental issues
- Cost/benefit based on Net Present Value over 10, 20 and 30 years

Cost Benefit Analysis

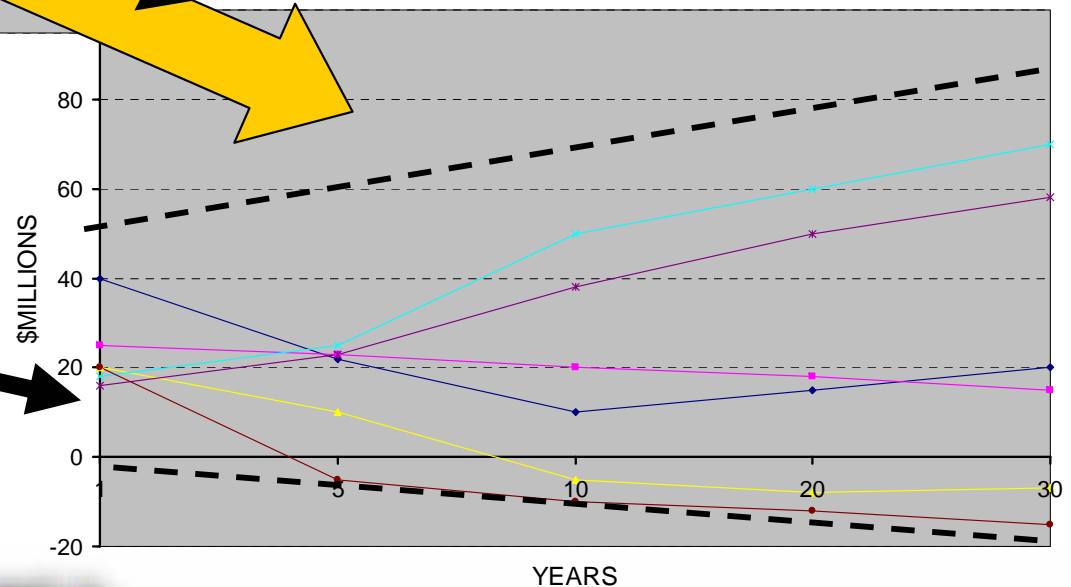
Project Benefits vs Time



A tight envelope around the sensitivity results leads to more certainty of forecast benefits

Most projects will be somewhere in-between

Project Benefits vs Time



Widely ranging sensitivity results lead to less certainty of forecast benefits



MISO Economic Planning Process



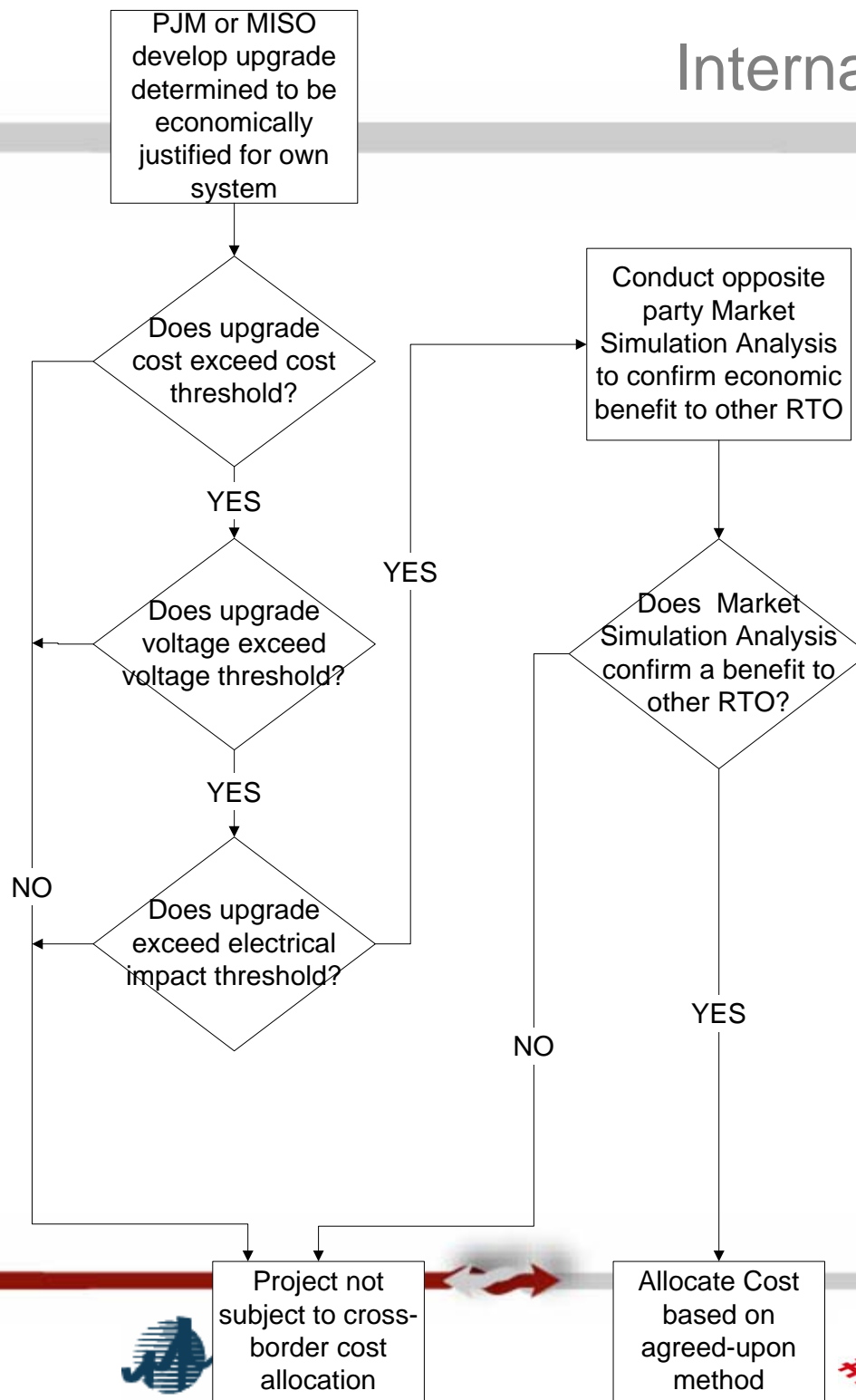
Cross-Border Cost Allocation for Economic Upgrades

- Project justified on economic criteria only
- All upgrades that are not reliability upgrades:
 - Upgrades that resolve issues other than violations of applicable reliability criteria
 - Upgrades above and beyond that required to resolve violations of applicable reliability criteria
- Reliability upgrades accelerated for economics

- Each RTO will develop economic upgrades based on its own filed methodology and metrics
- If RTO recommends an economic upgrade then the economic benefits to that RTO alone were enough to justify the project
- Does the other RTO also exceed internal thresholds/criteria for economic expansion and therefore potentially share in cost ?

- If the cross-border RTO does not recommend an economic upgrade then are the combined economic benefits to both RTOs enough to justify the project.
- The Coordinated System Planning effort could evaluate those economic upgrades that were marginal in either RTOs individual assessment.

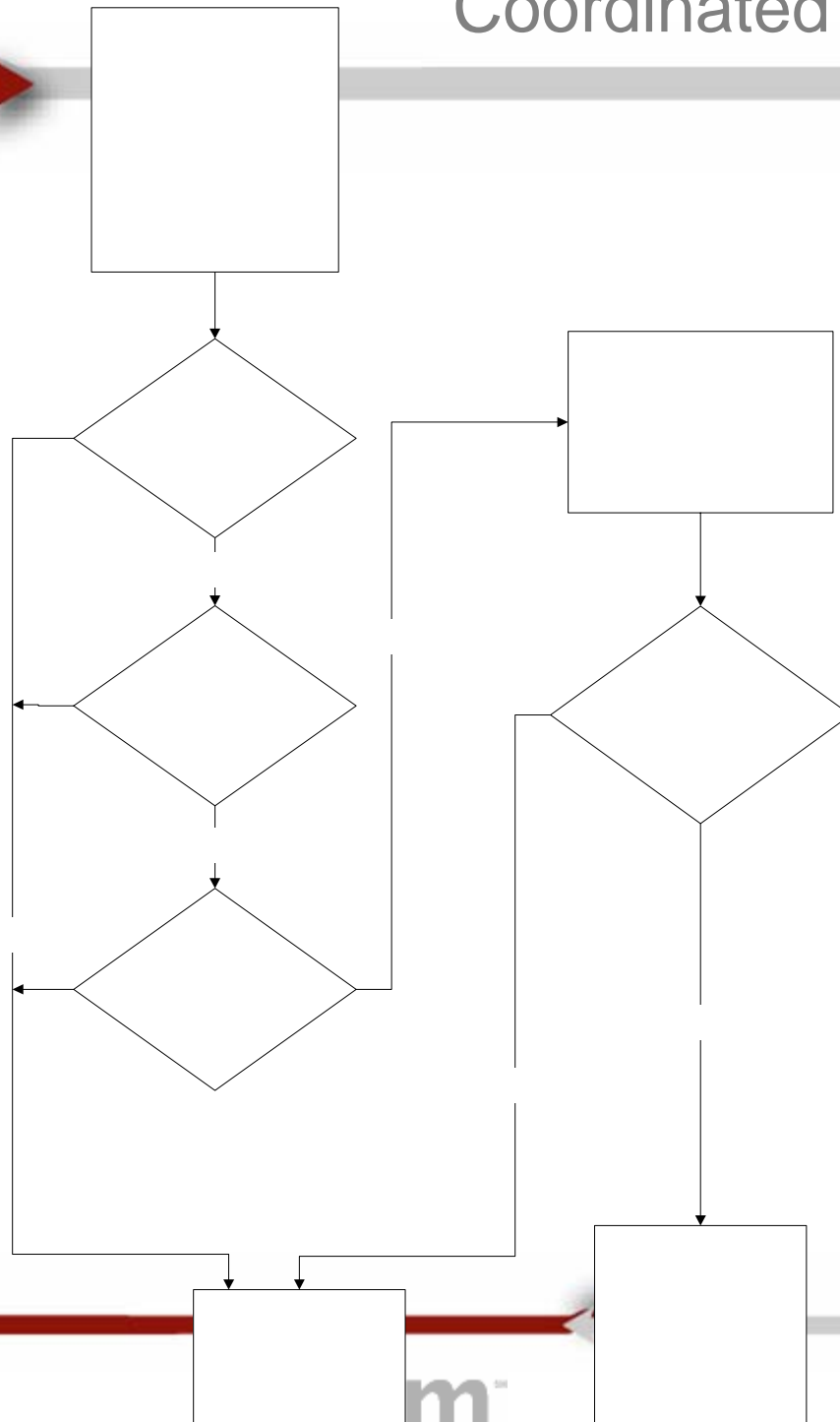
Internal RTO - Process Flow



Project not
subject to cross-
border cost
allocation

Allocate Cost
based on
agreed-upon
method





Midwest ISO
We manage power

Does upgrade
cost exceed cost



Threshold Alternatives

- No threshold – all economic projects subject to cross-border cost allocation
- Cost threshold – only projects with cost above some threshold subject to cross-border cost allocation
- Voltage threshold – only projects above some voltage threshold subject to cross-border cost allocation
- Electrical Impact threshold – only projects meeting some electrical impact threshold test subject to cross-border cost allocation
- Apply all three thresholds



Cost Threshold Alternatives

- \$1M, \$5M, \$10M, \$50M ??
- Other ??

Voltage Threshold Alternatives

- 500 kV and greater ??
- 345 kV and greater ??
- Other ??

Electrical Impact Threshold Alternatives

- RTO Load Impact
 - Measure each RTO's load impact on constrained facility or facilities.
 - If individual RTO load impact exceeds xx% of total RTO load impact then proceed with cost allocation process
 - RTO Load Impact can be measured for individual zones within each RTO or total RTO load
- Other ???

- Postage Stamp entire project cost
- Postage Stamp set % or dollar amount of each project and assign remainder based on estimate of beneficiary
- Allocate entire project based on estimate of beneficiaries
- Estimate of beneficiaries
 - Based on Market Simulation analysis results
 - Based on Exelon Net Interchange Method
 - Based on RTO Load Impact measurement
 - Others ????

Cost Allocation Principles - Economic

- Economic beneficiaries should pay
- Ideally, economic beneficiary determination should be on same basis as project economic justification
- Several factors make this ideal approach impractical
 - Each RTO will develop economic upgrades based on its own filed methodology, metrics, input assumptions and tools
 - metric used by one RTO may not be the metric used by the other RTO
 - This approach may require additional market simulation analysis beyond that required to justify the project, i.e. time/labor intensive
 - Finer granularity needed for cost allocation more sensitive to input assumptions than larger RTO benefits
 - Granular determination of benefits difficult and may vary greatly over the life of the project
- Justification is robust but keep allocation simple using more stable and repeatable method



Benefits of DFAX-based method

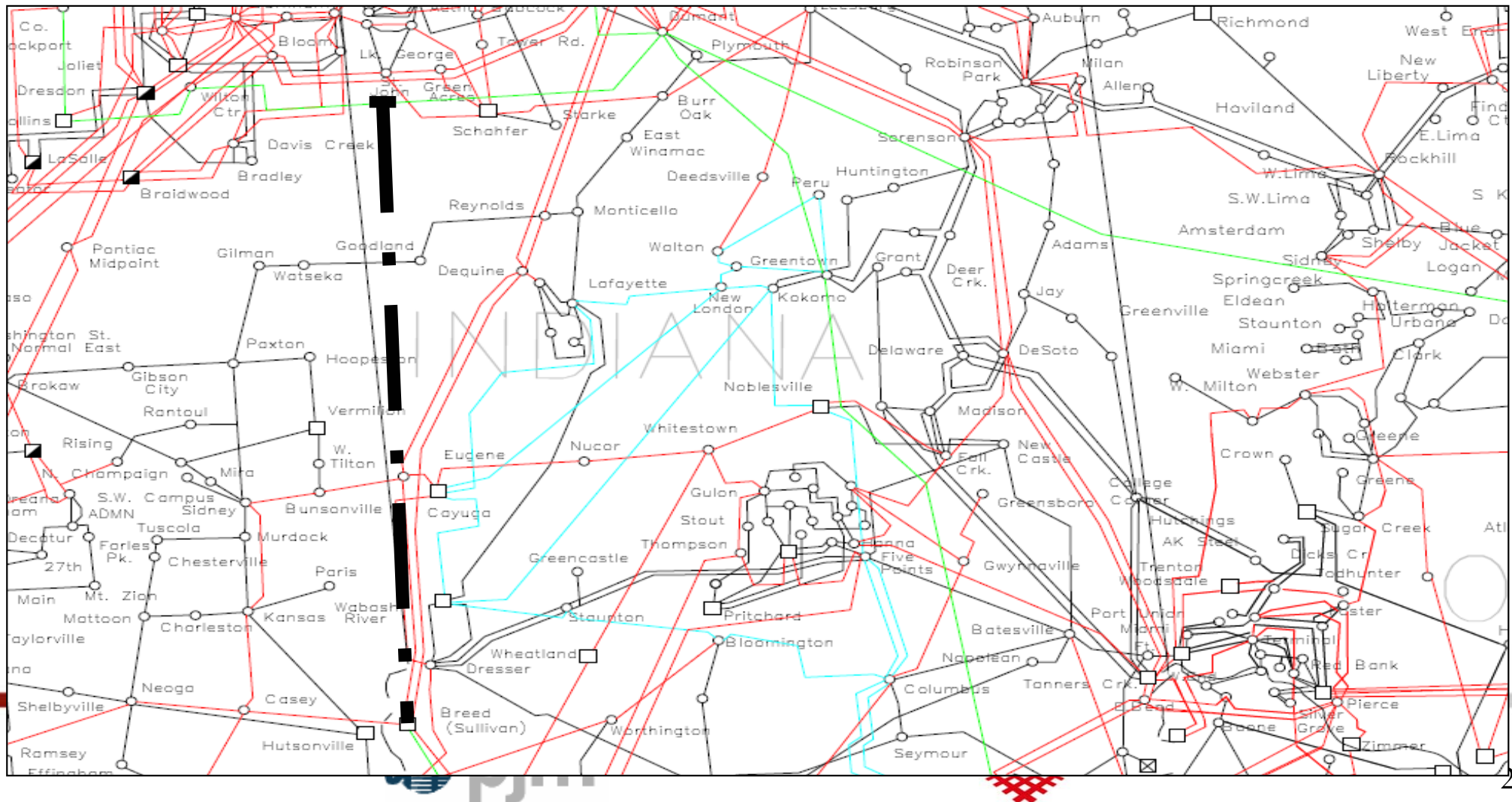
- Reasonable estimator of economic beneficiaries
 - The congestion component of LMP is directly related to DFAX
 - ARR/FTR calculation is also DFAX based
- Direct, repeatable, transparent
- Not based on multitude of input assumptions therefore less subject to time-consuming scrutiny
- More timely and transparent therefore loads given time and certainty needed to make other supply arrangements

Exelon's Proposal - Net Interchange Method

- Employ hourly net interchanges
- At a certain hour, if an upgrade increases the economy import to an RTO, add this amount to the annual import increase of this RTO. If an upgrade decreases the economy import to an RTO, do not add this amount to the annual import increase of this RTO.
- Allocate cost based on the relative annual import increases (MW-Hours) of an RTO due to the upgrade

Example Projects – AEP Project

**Tap in the middle of Wilton and Dumont 765kV line
and connect to Sullivan (765kV).**



Results: AEP Project

Savings		
Load Payment	(k\$)	%
MISO	22,314	35%
PJM	40,816	65%
Load LMP net of Congestion		
MISO	15,545	42%
PJM	21,682	58%
Adj. Prod. Cost		
MISO	4,676	87%
PJM	716	13%
DFAX Method		
MISO		65%
PJM		35%
Net Interchange		
MISO		39%
PJM		61%