PJM Cost/Benefit Analysis for Northeast RTO
Study Methodology

• PJM Study Methodology
  – "Snapshot" single year view
  – Northeast RTO vs. Three Individual Markets
  – Model assumes today's conditions and measures incremental effect of key assumptions

• Other Methodologies
  – Long-run methodology with future assumptions aggregated and inherent in the model
  – Multi-year view with aggregated assumptions
  – Multi-year focus

• Incremental analysis and aggregated analysis are complementary rather than contradictory
Technical Analysis Method

• Production Cost Analysis
• Hourly simulation for 1 year (8760 Hours)
• Full Transmission Model
• Security-constrained unit commitment and economic dispatch
• LMP-based market (PJM Market rules)
Quantification of Impact

- Generation Production Cost
- Load Payments (Based on Spot Purchases)
- Generation Revenues (Based on Spot Purchases)
Base Scenario Assumptions

- **Simulation Year** - 2001
- **Load Forecast Model** – 50/50 Load forecast for 2001 from NERC Electricity Supply and Demand Database (2000 release).
- **Generation Offer Data** – Based on estimates of generation marginal costs from Resource Data International (RDI) database (August 2000 release) for 2001.
- **Generation Outage Rates** – Includes both Maintenance outages and Forced outages based on historic analysis using NERC GADS data for the period 1993-1997.
- **Economic Transfers between control areas** – Economic transfers are based on average historic levels.
Base Scenario Assumptions

• **Generation Additions** – Includes generation additions that were scheduled for 2001 (1600 MW in PJM, 1500 MW in New England, 300 MW in New York City, 200 MW in Long Island)

• **Transmission Enhancements** – No transmission enhancements are modeled.

• **Phase Angle Regulator Operation** – PAR operation is not fully coordinated.
Scenario #1: Base Case Results

<table>
<thead>
<tr>
<th></th>
<th>Northeast RTO Total</th>
<th>Northeast RTO Change</th>
<th>PJM Change</th>
<th>New York Change</th>
<th>New England Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load Payments</td>
<td>$18,649</td>
<td>- $299</td>
<td>+ $71</td>
<td>- $432</td>
<td>+ $62</td>
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<tr>
<td>Generation Production Cost</td>
<td>$10,437</td>
<td>- $222</td>
<td>+ $252</td>
<td>- $640</td>
<td>+ $166</td>
</tr>
<tr>
<td>Generator Revenues</td>
<td>$17,279</td>
<td>- $259</td>
<td>+ $511</td>
<td>- $1,094</td>
<td>+ $324</td>
</tr>
</tbody>
</table>

Note: All values are in millions of dollars
Increased Generation unavailability

- Assume and additional amount of base load (economic) generation is unavailable for the entire year.
  - PJM - 2200 MW
  - New York - 1100 MW
  - New England - 900 MW
- This case can also be used to measure the affect of decreasing the availability of economic imports into the region from the North, West and South
## Scenario #2: Increased Generation Outage

<table>
<thead>
<tr>
<th></th>
<th>Northeast RTO Total</th>
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<th>PJM Change</th>
<th>New York Change</th>
<th>New England Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load Payments</td>
<td>$19,241</td>
<td>- $260</td>
<td>+ $329</td>
<td>- $912</td>
<td>+ $323</td>
</tr>
<tr>
<td>Generation Production Cost</td>
<td>$10,815</td>
<td>- $278</td>
<td>+ $362</td>
<td>- $960</td>
<td>+ $320</td>
</tr>
<tr>
<td>Generator Revenues</td>
<td>$17,871</td>
<td>- $54</td>
<td>+ $832</td>
<td>- $1,339</td>
<td>+ $453</td>
</tr>
</tbody>
</table>

Note: All values are in millions of dollars
Scenario #3 Assumptions

Increased Economic Imports

• Assume an additional amount of economic imports are available for the entire year.
  – 2000MW @ $15 / MWh
  – 2000 Mw @ $20/MWh

• This case can also be used to measure the affect of increasing generation availability in the region
### Scenario #3: Increased Economic Imports

<table>
<thead>
<tr>
<th></th>
<th>Northeast RTO Total</th>
<th>Northeast RTO Change</th>
<th>PJM Change</th>
<th>New York Change</th>
<th>New England Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load Payments</td>
<td>$17,429</td>
<td>- $1,769</td>
<td>- $562</td>
<td>- $1,443</td>
<td>+ $236</td>
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<tr>
<td>Generation Production Cost</td>
<td>$10,043</td>
<td>- $772</td>
<td>+ $175</td>
<td>- $1,280</td>
<td>+ $333</td>
</tr>
<tr>
<td>Generator Revenues</td>
<td>$15,892</td>
<td>- $2,034</td>
<td>- $119</td>
<td>- $2,160</td>
<td>+ $245</td>
</tr>
</tbody>
</table>

Note: All values are in millions of dollars
PJM Zonal LMP Values — Real Time Versus Simulation Results
Base Case — PSEG Zone
Year 2001

For Discussion Purposes Only