Residual Metered Load Pricing Overview

Market Settlements Subcommittee
September 22, 2014
Residual Metered Load Pricing Overview

- Residual Zone (Residual Metered Load Aggregates)
  - An aggregate containing all load buses in the fully metered EDC territory, minus all load that has been designated to be priced at a specific non-zonal (or nodal) location

- Residual Metered Load Pricing approved for implementation on 6/1/2015
  - Use of the residual metered load aggregate LMP rather than the physical zone LMP for pricing real-time load
    - All non-nodal load in the zone will be priced at the same pricing point
    - Nodal load will continue to be priced at the applicable nodal pricing point
    - No opt out provisions
Nodal Load Impacts on Physical Zone Price

**Physical Zone Definition**

- Pnode D: 30%
- Pnode B: 15%
- Pnode C: 35%
- Pnode A: 20%

30 MWh, $45 LMP
35 MWh, $25 LMP
20 MWh, $35 LMP

**Total Zone Load Charges:** $3525
**Physical Zone LMP:** $35.25

**Residual Zone Definition**

- Pnode D: 24%
- Pnode A: 35%
- Pnode C: 41%

15 MWh, $40 LMP
35 MWh, $25 LMP
20 MWh, $35 LMP

**Total Zone Load Charges:** $3525
**Residual Metered Load LMP:** $34.41
Residual Metered Load Aggregate Definitions

- **Day-ahead distribution factors** will default to the final real-time distribution factors for the residual metered load aggregate at 8:00 a.m. one week prior to the Operating Day
  - i.e., if next Operating Day is Monday, the default distribution is from 8:00 a.m. on Monday of the previous week.
  - Consistent with physical zones, the definition will apply to all hours in the day

- **Preliminary 5 min. real-time LMPs** will be calculated using same residual metered load distribution factors used for the Day-ahead market for the Operating Day

- **Final hourly real-time distribution factors** will be calculated using InSchedule-submitted nodal load MWh
Residual Metered Load Definitions for FTR Credit Target Allocation

- Residual Metered Load aggregate definitions used for ARR/FTR purposes are fixed for the planning period.

- Initial aggregate distribution for FTRs will be determined based on the contribution of each bus to the total residual load at the time of previous year’s PJM annual peak:
  - Consistent with the practice used to determine the physical zone distribution used for ARRs/FTRs.

- Initial distribution will be adjusted by any new nodal load requests:
  - LSEs moving to nodal load settlement are required to submit:
    - Peak load at time of PJM annual peak from the previous year
    - Aggregate definition distribution percentages
• InSchedule contracts for real-time load currently priced at non-nodal pricing points must use the Residual Metered Load Aggregate starting 6/1/2015
  – PJM will automatically terminate any affected contracts on 6/1/2015
  – EDCs/LSEs will be required to create new real-time load InSchedule contracts using the residual metered load aggregates effective 6/1/2015 and beyond
Impacts to DR and ARRs

- Demand Response settled and dispatched at applicable load pricing point
  - Participants must specify residual zone or nodal pricing point when registering demand response resources effective 6/1/2015

- ARRs default to sinking at the pricing point at which the load is settled, with an option to sink at the physical zone
  - Defaults to residual metered load aggregate with an option to pick the physical zone on an annual basis
  - Participants wishing to sink ARRs at the physical zone for the 2015/2016 Planning Period must notify the FTR Group (FTRGroup@pjm.com) no later than 11/1/2014.
Impact to Reconciliation Settlements

- Differences between Nodal Customers’ InSchedule Load (next day) and Reconciled Load (2 months later) may result in RT load distributions being slightly different than the original distributions.

- An adjusted distribution reconciliation rate will be used to reconcile all load priced at the residual metered load aggregate, including load with no reconciliation MWh
  - Only impacts load reconciliation for transmission congestion and transmission losses

- The adjusted distribution reconciliation rate will be posted publicly and reported in MSRS
• Residual Metered Load Prices are currently being calculated for informational purposes and are posted in a separate "residual" file

• Physical zone prices will continue to be calculated and published after 6/1/2015
• New Residual Metered Load Aggregate Pricing page on PJM.com
  – FAQ document
  – Overview presentation
  – Link to Issue Tracking
• Training sessions will be held in early 2015
Manual References

- **Manual 28** – Operating Agreement Accounting
  - Residual Metered Load calculation and Residual Metered Load Aggregate Definitions (Section 3)
  - Transmission Congestion Charge and Transmission Loss Charge Reconciliation (Section 8.3 and Section 9.3)
  - Default day-ahead definition for residual metered load aggregate (Section 2)
- **Manual 6** – ARR/FTR election language (Sections 3 and 4)
- MSRS and pjm.com settlements reports

- Others?
Appendix - Definitions and Examples
• **NODAL LOAD prices** are defined by weighting each load bus LMP by the *Nodal Load Distribution Factors* provided to PJM that represent each bus’ load contribution to the total nodal load.

• **PHYSICAL ZONE prices** are defined by weighting each load bus LMP by that bus’ *State Estimated Load Contribution* to the total zonal load.

• **RESIDUAL METERED LOAD prices** are defined by weighting each load bus LMP by that bus’ *Residual Load Distribution Factor* calculated by PJM. Residual metered load is defined as all load buses in the fully metered EDC territory less all nodally priced load.
### Real-Time Load Settlement Examples

#### Settlements Today
- 15 MWh load priced nodally at Pnode B
  - 15 MW * $40 = $600

- Remaining 85 MWh load priced at physical zone
  - 85 MWh * $35.25 = $2996.25

- Residual EDC and/or POLR load pays difference
  - 100 MWh – 15 MWh – 85 MWh = 0 MWh
  - $3525 - $600 - $2996.25 = ($71.25)

#### Residual Metered Load Aggregate Pricing Implementation
- 15 MWh load priced nodally at Pnode B
  - 15 MW * $40 = $600

- Remaining 85 MWh load priced at residual metered load aggregate
  - 85 MW * $34.41 = $2925

- Residual EDC and/or POLR load pays difference
  - 100 MWh – 15 MWh – 85 MWh = 0 MWh
  - $3525 - $600 - $2925 = $0

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<table>
<thead>
<tr>
<th>Pnode</th>
<th>MWh</th>
<th>LMP</th>
<th>Total Zone Load Charges</th>
<th>Zonal Distribution</th>
<th>Weighted Physical Zone LMP</th>
<th>Residual Distribution</th>
<th>Weighted Residual LMP</th>
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<tr>
<td>A</td>
<td>20</td>
<td>35</td>
<td>$700</td>
<td>20% $700</td>
<td>20% $7.00</td>
<td>23.5% $8.22</td>
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<tr>
<td>B</td>
<td>15</td>
<td>40</td>
<td>$600</td>
<td>15% $600</td>
<td>15% $6.00</td>
<td>$7.00</td>
<td>$7.00</td>
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<tr>
<td>C</td>
<td>35</td>
<td>25</td>
<td>$875</td>
<td>35% $875</td>
<td>35% $8.75</td>
<td>41.2% $10.30</td>
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<tr>
<td>D</td>
<td>30</td>
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<tr>
<td>Total</td>
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<td>$3,525</td>
<td>100% $3,525</td>
<td>100% $3,525</td>
<td>100% $35.25</td>
<td>100% $34.41</td>
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### Residual Metered Load Aggregate Pricing Settlements

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<tr>
<th>Pnode</th>
<th>Original MWh</th>
<th>LMP</th>
<th>Total Zone Load Charges</th>
<th>Residual Metered Load Agg Distribution</th>
<th>Weighted Residual Metered Load Agg LMP</th>
<th>Net MWh after reconciliation</th>
<th>Revised Residual Metered Load Agg Distribution</th>
<th>Revised Weighted Residual Metered Load Agg LMP</th>
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<tr>
<td>A</td>
<td>20</td>
<td>35 $</td>
<td>700</td>
<td>23.5% $</td>
<td>8.22</td>
<td>20</td>
<td>23.26% $</td>
<td>8.14</td>
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<tr>
<td>B</td>
<td>15</td>
<td>40 $</td>
<td>600</td>
<td>$</td>
<td>-</td>
<td>14 (nodal)</td>
<td>1.16% $</td>
<td>0.46</td>
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<tr>
<td>C</td>
<td>35</td>
<td>25 $</td>
<td>875</td>
<td>41.2% $</td>
<td>10.30</td>
<td>35</td>
<td>40.7% $</td>
<td>10.18</td>
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<tr>
<td>D</td>
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<td>100</td>
<td>$ 3,525</td>
<td></td>
<td>100% $</td>
<td>34.41</td>
<td>100</td>
<td>100% $</td>
<td>34.48</td>
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</table>

#### Original Settlement
- Nodal Load: 15 MWh load priced at Pnode B
  - 15 MW * $40 = $600
- Remaining Load: Remaining 85 MWh load priced at residual metered load aggregate
  - 85 MW * $34.41 = $2925

#### Reconciliation Settlement
- Nodal Load: 1 MWh less load priced at Pnode B
  - 1 MWh * $40 = ($40)
- Remaining Load: 1 MWh more load priced at residual metered load aggregate
  - 1 MWh * $34.48 = $34.48

#### Net Settlement
- Nodal Load: 14 MWh * $40 = $560
  - $600 + ($40) = $560
- Remaining Load: 86 MWh * $34.48 = $2965
  - $2925 + $40 = $2965

### EDC / POLR Load
- Residual EDC and/or POLR load pays difference
  - 100 MWh – 15 MWh – 85 MWh = 0 MWh
    - 85 MWh * ($3525 - $600 - $2925) = $0

*Note: Unrounded distribution weightings and prices must be used to recalculate these settlements*