Residual Metered Load Pricing Overview

Market Settlements Subcommittee

September 22, 2014
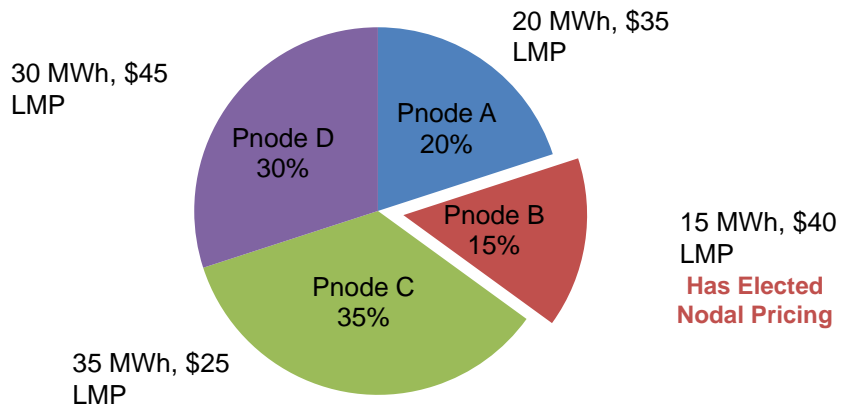
- Residual Zone (Residual Metered Load Aggregates)
  - An aggregate containing all load buses in the fully metered EDC territory, minus all load that has been designated to be priced at a specific non-zonal (or nodal) location

- 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
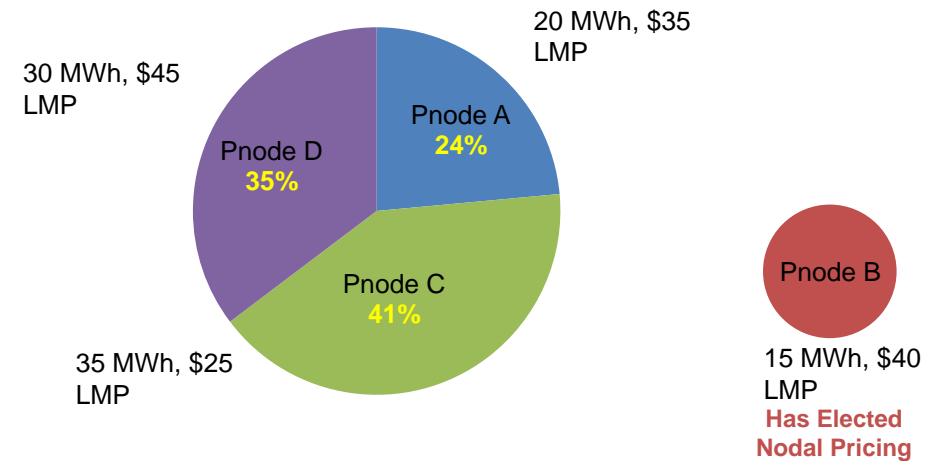
    - No opt out provisions

Physical Zone Definition

30 MWh, $45 LMP

20 MWh, $35 LMP

Pnode D 30%

Pnode A 20%

Pnode B 15%

Pnode C 35%

15 MWh, $40 LMP
Has Elected Nodal Pricing

35 MWh, $25 LMP

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

Residual Zone Definition

30 MWh, $45 LMP

20 MWh, $35 LMP

Pnode D **35%**

Pnode A **24%**

Pnode C **41%**

Pnode B

35 MWh, $25 LMP

15 MWh, $40 LMP
Has Elected Nodal Pricing

Total Zone Load Charges: $ 3525
Residual Metered Load LMP: $ 34.41

- 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 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

- 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.

- 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
  - DA: http://www.pjm.com/markets-and-operations/energy/day-ahead/lmpda.aspx
  - Preliminary RT: http://www.pjm.com/markets-and-operations/energy/real-time/lmp.aspx
  - Final RT: http://www.pjm.com/markets-and-operations/energy/real-time/monthlylmp.aspx
- 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 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)
- Manual 11 – Energy & Ancillary Services Market Operations
  - 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.

Pnode	MWh	LMP	Total Zone Load Charges	Zonal Distribution	Weighted Physical Zone LMP	Residual Distribution	Weighted Residual LMP
A	20	35	$ 700	20%	$ 7.00	23.5%	$ 8.22
B	15	40	$ 600	15%	$ 6.00		$ -
C	35	25	$ 875	35%	$ 8.75	41.2%	$ 10.30
D	30	45	$ 1,350	30%	$ 13.50	35.3%	$ 15.89
Total	100		$ 3,525	100%	$ 35.25	100%	$ 34.41

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

Residual Metered Load Aggregate Pricing Settlements

Pnode	Original MWh	LMP	Total Zone Load Charges	Residual Metered Load Agg Distribution	Weighted Residual Metered Load Agg LMP		Net MWh after reconciliation	Revised Residual Metered Load Agg Distribution	Revised Weighted Residual Metered Load Agg LMP	
A	20	35	$ 700	23.5%	$	8.22	20	23.26%	$	8.14
B	15	40	$ 600		$	-	14 (nodal) 1 (residual)	1.16%	$	0.46
C	35	25	$ 875	41.2%	$	10.30	35	40.7%	$	10.18
D	30	45	$ 1,350	35.3%	$	15.89	30	34.88%	$	15.70
Total	100		$ 3,525	100%	$	34.41	100	100%	$	34.48

	Original Settlement	Reconciliation Settlement	Net Settlement
Nodal Load	15 MWh load priced at Pnode B 15 MW * $40 = $600	1 MWh less load priced at Pnode B -1 MWh * $40 = ($40)	14 MWh * $40 = $560 $600 + ($40) = $560
Remaining Load	Remaining 85 MWh load priced at residual metered load agggregate 85 MW * $34.41 = $2925	1 MWh more load priced at residual metered load aggregate 1MWh * $34.48 = $34.48 85 MWh original load priced at difference between new/original residual metered load aggregate price 85MWh * ($34.48 - $34.41) = $5.52 $34.48 + $5.52 = $40	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 $3525 - $600 – $2925= $0	Residual EDC and/or POLR load pays difference 1 MWh + -1 MWh = 0 MWh $40 + ($40) = $0	

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