



Market Efficiency Update

Nick Dumitriu

Sr. Lead Engineer, Market Simulation

Transmission Expansion Advisory Committee

August 4, 2020

2019 Historical Market Congestion

- Congestion values from PJM State of the Market – 2019, Table 11-31
 - https://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2019/2019-som-pjm-sec11.pdf
- Total market congestion for 2019 was about \$583.3 million
- Top 25 constraints account for about 54.6% of total congestion in 2019
 - Some of 2019 congestion due to outages
 - Future RTEP projects may alleviate some of the constraints



Top 25 Congestion Causing Constraints in 2019

Rank	Constraint	Type	Location	Total Congestion*	% of Total*	Comment
1	Conastone - Peach Bottom 500 kV	Line	500	111	19.0%	RTEP project(s) expected to reduce congestion
2	Conastone	Other	500	18.6	3.2%	RTEP project(s) expected to reduce congestion
3	Tanners Creek - Miami Fort 345 kV	Flowgate	MISO	17.6	3.0%	RTEP project(s) expected to reduce congestion
4	Coolspring - Milford 230 kV	Line	DPL	15.7	2.7%	
5	Graceton - Safe Harbor 230 kV	Line	BGE	14.9	2.6%	RTEP project(s) expected to reduce congestion
6	AP South	Interface	500	14.5	2.5%	RTEP project(s) expected to reduce congestion
7	Wescosville 500/138 kV	Transformer	PPL	14.1	2.4%	Outage Contribution
8	Siegfried 230/138 kV	Transformer	PPL	14.1	2.4%	
9	Face Rock 69 kV	Other	PPL	13.4	2.3%	
10	Roxana - Praxair 138 kV	Flowgate	MISO	-12.8**	-2.2%	RTEP project(s) expected to reduce congestion/ Outage Contribution

*Data from 2019 State of Market Report, Table 11-31

** Negative value due to balancing congestion



Top 25 Congestion Causing Constraints in 2019

Rank	Constraint	Type	Location	Total Congestion*	% of Total*	Comment
11	East	Interface	500	12.4	2.1%	
12	Bagley - Graceton 230 kV	Line	BGE	10.5	1.8%	RTEP project(s) expected to reduce congestion
13	Conastone - Northwest 230 kV	Line	BGE	10.2	1.7%	RTEP project(s) expected to reduce congestion
14	Cedar Creek - Red Lion 230 kV	Line	DPL	9.5	1.6%	
15	Nottingham 230 kV	Other	PECO	9.5	1.6%	RTEP project(s) expected to reduce congestion
16	Palisades - Argenta 345 kV	Flowgate	MISO	9.1	1.6%	Outage Contribution
17	PA Central	Interface	500	8.8	1.5%	Interface expected use to control voltage contingencies during transmission outages
18	Pleasant View - Ashburn 230 kV	Line	DOM	8.4	1.4%	RTEP project(s) expected to reduce congestion/ Outage Contribution
19	CPL - DOM	Interface	500	7.8	1.3%	Interface expected use to control voltage contingencies during transmission outages
20	Tanners Creek - Miami Fort 345 kV	Line	AEP	-6.3**	-1.1%	RTEP project(s) expected to reduce congestion

*Data from 2019 State of Market Report, Table 11-31

** Negative value due to balancing congestion



Top 25 Congestion Causing Constraints in 2019

Rank	Constraint	Type	Location	Total Congestion*	% of Total*	Comment
21	Gardners - Texas Eastern 115 kV	Line	Met-Ed	6.3	1.1%	RTEP project(s) expected to reduce congestion
22	Greentown 765/138 KV	Flowgate	MISO	-6.1**	-1.1%	Outage Contribution
23	Harwood - Susquehanna 230 kV	Line	PPL	6.1	1.0%	
24	Smithton - Yukon 138 kV	Line	APS	6	1.0%	RTEP project(s) expected to reduce congestion
25	East Towanda - Hillside 230 kV	Line	PENELEC	5.5	1.0%	

Top 25 Total			318.8	54.6%
All Other Constraints			264.6	45.4%
Total			583.3	100.0%

*Data from 2019 State of Market Report, Table 11-31

** Negative value due to balancing congestion

2020/2021 Long Term Window

- Long-Term Window schedule 2020 - 2021 presented at the June TEAC
 - <https://www.pjm.com/-/media/committees-groups/committees/teac/2020/20200602/20200602-item-02-market-efficiency-update.ashx>
- Market Efficiency input assumptions presented at TEAC meetings June through August
 - Market Efficiency Input Assumptions whitepaper to be posted with the materials for the September TEAC and presented to the Board for consideration at the October meeting
- Preliminary Market Efficiency Base Case to be posted by end of August (XML format)
 - XML files compatible with PROMOD 11.2
 - Stakeholders feedback due September 31st
- Final Base Case to be posted in December, before start of 2020/21 Long-Term Window

- Powerflow consistent with the 2020 RTEP Proposal Window 1
- Load Forecast based on PJM 2020 Load Forecast Report
- Demand Response consistent with the 2020 Load Forecast Report
- Fuel/Emissions Price Forecasts from ABB, Spring 2020 update
- Generation Expansion consistent with the machine list included in the Planning 2025 RTEP Powerflow
 - Includes existing and signed ISA (Interconnection Service Agreement) generators
- Financial parameters,, based on the Transmission Cost Information Center spreadsheet
 - Discount Rate: 7.37%
 - Levelized Annual Carrying Charge Rate: 11.82%

- MTF modeled as fixed forecast withdrawal/injection schedules input to the optimization engine
 - PJM side: MW withdrawals modeled as load forecasts
 - NYISO side: MW injections modeled as purchase transactions
- Schedules determined using typical usage profiles (3-years historical)
 - Peak Load/Purchase based on 3-years historical maximum hourly MW withdrawn
 - Normalized hourly profiles based on 3-years historical averages of similar hours

FIRM + Non-FIRM Withdrawal Rights

MW	VFT	Neptune	HTP
FTWR	0	685	0
NFTWR	330	105	673
Total	330	790	673

- PJM/NYISO Interface
 - B & C cables modeled out of service consistent with NYISO modeling
- Lake Erie Connector (Y3-092) modeling consistent with the 2020 RTEP Assumptions
 - <https://www.pjm.com/-/media/committees-groups/committees/teac/2020/20200204/20200204-2020-rtep-assumptions-update.ashx>

- Interregional updates:
 - Announced retirements
 - Generation expansion
 - Load forecast
- Finalize event file
 - TO feedback
 - PAT Analysis
 - M2M
- Finalize sensitivity cases

Step	Timeline
Post Preliminary Base Case	August 2020
Stakeholders Feedback	September 2020
Identify Congestion Drivers	October 2020
2020 Reevaluation Analysis	September – November 2020
2020 Acceleration Analysis	November – December 2020
Post Final Base Case and Target Congestion Drivers	December 2020
Long Term Proposal Window	January 2021 - April 2021
Analysis of Proposed Solutions	May – September 2021
TEAC Reviews and Board Approval	October - December 2021

Facilitator:
Sue Glatz,
Suzanne.Glatz@pjm.com

Secretary:
Ilyana Dropkin,
Ilyana.Dropkin@pjm.com

SME/Presenter:
Nick Dumitriu,
Nicolae.Dumitriu@pjm.com

Market Efficiency Update



Member Hotline

(610) 666 – 8980

(866) 400 – 8980

custsvc@pjm.com

- V1 – 7/28/2020 – Original slides posted
- V2 – 8/27/2020 – Added clarifying MTF modeling details on slide #10:
 - Load/Purchase model
 - Peaks based on 3-yrs historical max
 - Normalized hourly profiles based on 3-yrs historical averages