



Market Efficiency Update

Transmission Expansion Advisory Committee
January 10, 2019

2018/19 Long Term Window

- Posted Market Efficiency Retooled Base Case (database date 12-26-2018)
 - <http://www.pjm.com/planning/rtep-development/market-efficiency.aspx>
 - Market Efficiency Base Case files for all study years (PROMOD 11.1.13 XML format)
 - Access requires CEII confirmation(PJM and MISO), and PROMOD vendor confirmation
 - Posted updated PROMOD files: outage library (.lib), PROMOD Event files (.eve)
- Other files
 - Updated congestion results (simulated years 2023 and 2026)
 - Updated procedure for running PROMOD simulations
- List of eligible congestion drivers did not change
 - <https://www.pjm.com/planning/competitive-planning-process.aspx>
 - Posted updated congestion values for eligible congestion drivers (see Appendix B)



Market Efficiency Modeling Data – December Update (Cont'd)

- Updated Generator Retirements

Unit(s)	Zone	Nameplate (MW)	Deactivation Date
Eastlake 6	ATSI	24	6/1/2021
Bruce Mansfield 1-2	ATSI	1,660	2/5/2019
Bruce Mansfield 3	ATSI	830	6/1/2021
Sammis Diesel	ATSI	13	6/1/2021
Sammis 5-7	ATSI	1,491	6/1/2021
Kimberly Clark	PECO	9.4	08/01/2019
Monmouth NUG Landfill	JCPL	6.7	5/31/2019

- Network upgrades resulted from the reliability analysis of above retirements



Market Efficiency Modeling Data – December Update (Cont'd)

- Other topology updates
 - Replacement of Glebe – Station C Project (b2443, Dominion - PEPCO)
 - Correction to Face Rock-Five Forks Supplemental Project (s1154/s1630, PPL/BGE)
 - Corrected network upgrade for FSA unit AA2-182 Sunbury #2
- MISO corrections
 - ITC rating corrections Monroe – Brownstone - Wayne 345 kV region
 - Correction to MISO Demand Profile (Detroit Edison)
- Removed queue units that have withdrawn since case built
- Event file changes due to retirements and topology updates

- PJM zonal peak and energy forecast from 2019 Load Forecast Report

2019 PJM Peak Load and Energy Forecast

Load	2019	2023	2026	2029	2033
Peak (MW)	151,358	152,854	154,494	156,689	158,900
Energy (GWh)	801,724	813,283	823,826	836,489	847,956

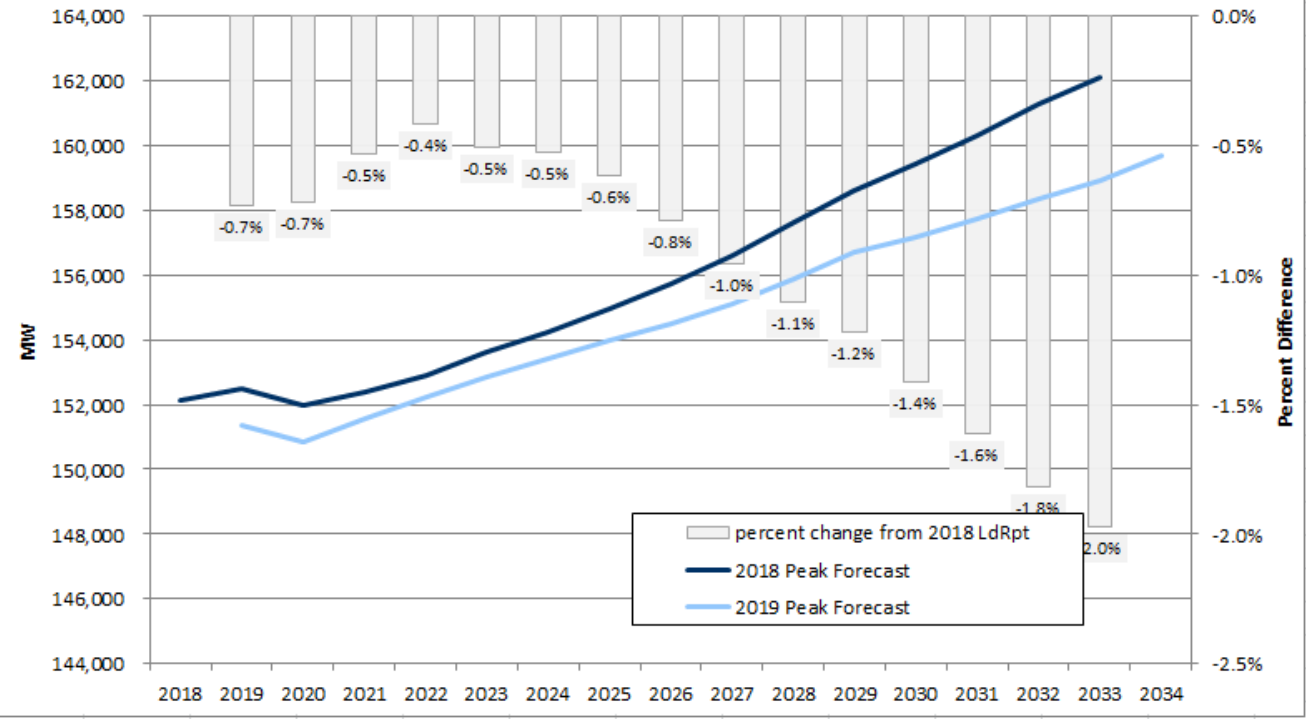
Notes:

1. Peak and energy values from PJM Load Forecast Report Table B-1 and Table E-1, respectively.
2. Model inputs are at the zonal level, to the extent zonal load shapes create different diversity - modeled PJM peak load may vary.

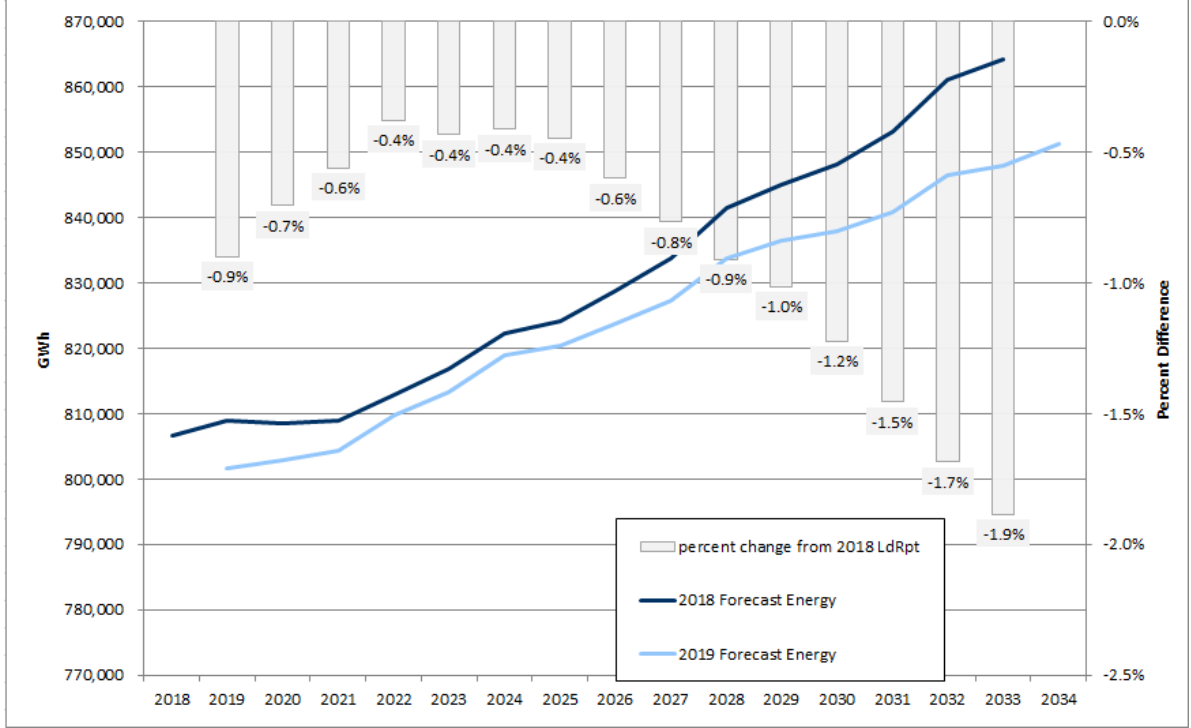


Peak and Energy Forecast Comparison 2019 vs. 2018

PJM RTO Peak Forecast



PJM RTO Energy Forecast



- Model zonal demand resources consistent with Table B-7 of the 2019 Load Forecast Report.

2019 PJM Demand Resource Forecast

	2019	2023	2026	2029	2033
Demand Resource (MW)	8,154	9,198	9,315	9,433	9,593

Step	Timeline
Long Term Proposal Window	November 2018 – February 2019
Base Case Mid-Cycle Update	February – May 2019
Analysis of Proposed Solutions	March – November 2019
Final TEAC Review and Board Approval	November – December 2019



2018 Reevaluation Approved Market Efficiency Projects

- Applied to market efficiency projects approved during the 2014/15 and 2016/17 RTEP Windows
- Analysis Status (see Appendix A for details)
 - 11 projects already in service or under construction
 - 7 projects completed reevaluation and passed

Appendix A

2018 Reevaluation Results



Projects In Service or Under Construction

PJM Window Project ID	Baseline#	Type	Area	Constraint	Status	Last Updated Date	Description
201415_1-2B	b2691	Upgrade	ME/PPL	Brunner Island to Yorkana 230 kV	IS	11/06/2017	Reconductor three spans limiting Brunner Island - Yorkana 230 kV line, add 1 breaker to Brunner Island switchyard, upgrade associated terminal equipment
201415_1-4J	b2698	Upgrade	AEP	Jacksons Ferry to Cloverdale 765 KV	IS	10/31/2018	Replace relays at Cloverdale and Jackson's Ferry substations
201415_1-10B	b2693	Upgrade	COMED	Wayne to South Elgin 138 kV	IS	11/01/2018	Replace L7915 B phase line trap at Wayne substation
201415_1-10D	b2728	Upgrade	COMED	Loretto to Wilton 345 kV (RPM)	IS	05/21/2018	Mitigate sag limitations on Loretto - Wilton Center 345 kV Line and replace station conductor at Wilton Center
201415_1-12A	b2689.1-3	Upgrade	DUQ	Dravosburg to West Mifflin 138 kV	IS	1: 05/02/2018 2: 10/31/2018 3: 01/22/2018	Reconductor ~7 miles of the Woodville - Peters 138 kV circuit. Reconfigure West Mifflin-USS Clairton 138 kV circuit. Upgrade terminal equipment
201415_1-13E	b2695	Upgrade	DPL	Worcester to Ocean Pines (I) 69 kV	IS	04/04/2018	Rebuild Worcester - Ocean Pine 69 kV ckt. 1
201415_1-18G	b2688.1-3	Upgrade	APS	Taneytown to Carroll 138 kV	1: UC 2,3: IS	1: 09/25/2018 2: 06/07/2018 3: 06/07/2018	Upgrade terminal equipment on the Lincoln - Carroll 115/138kV path.
201415_1-2A	b2690	Upgrade	PPL/BGE	Safe Harbor to Graceton 230 kV	UC	10/17/2018	Reconductor two spans of the Graceton - Safe Harbor 230 kV transmission line
201415_1-18I	b2696	Upgrade	APS/ATSI	Krendale to Shanor Manor 138 kV	UC	10/31/2018	Upgrade 138 kV substation equipment at Butler, Shanor Manor and Krendale substations

IS – In Service
UC – Under Construction



Projects In Service or Under Construction (Cont'd)

PJM Window Project ID	Baseline#	Type	Area	Constraint	Status	Last Updated Date	Description
201415_1-10J	b2692.1-2	Upgrade	COMED	Cordova to Nelson 345 kV	UC	06/01/2019	Replace station equipment at Nelson, ESS H-471 and Quad Cities Upgrade conductor ratings of Cordova - Nelson, Quad Cities - ESS H-471 and ESS H-471 - Nelson 345 kV lines and mitigating sag limitations
201617_1-3A	b2930 (RPM) AC1-223	Upgrade	COMED	E. Frankfort to University Park 345 kV	Work Completed	06/10/2021	Upgrade capacity on E. Frankfort-University Park 345kV

UC – Under Construction



Reevaluations Completed

PJM Window Project ID	Baseline#	Type	Area	Constraint	BC Reevaluation 2018	Capital Cost (\$ million)	Reevaluation TEAC Date	Status	Projected ISD	Description
201415_1-4I	b2697.1-2	Upgrade	AEP	Fieldale to Thornton 138 kV	3.30	\$0.75	11/8/2018	EP	1: 06/01/2019 2: 12/31/2019	Mitigate violations identified by sag study to operate Fieldale-Thornton-Franklin 138 kV overhead line conductor at its max. operating temperature Replace terminal equipment at Danville and East Danville substations
201415_1-9A*	b2743.1-8, b2752.1-7	Greenfield	APS/BGE	AP-South	1.40*	\$372.23	9/13/2018	EP	11/01/2020	New double-circuit Rice – Ringgold 230 kV. New double-circuit Furnace Run - Conastone 230 kV. Reconductor Conastone – NWest 230 kV.
201415_1-11H	b2694	Upgrade	PECO	Peach Bottom 500 kV	1.76	\$9.70	11/8/2018	EP	06/01/2019	Increase ratings of Peach Bottom 500/230 kV transformer
Optimal Caps	b2729	Upgrade	DOM	AP-South	2.51	\$8.98	11/8/2018	EP	12/01/2019	New capacitor banks at Brambleton, Ashburn, Shelhorn and Liberty substations
201617_1-5E	B2992.1-4	Upgrade	BGE	Conastone - Graceton - Bagley 230 kV	9.18	\$39.65	10/11/2018	EP	06/01/2021	Reconductor the Conastone to Graceton 230 kV 2323 & 2324 circuits Add Bundle conductor on the Graceton-Bagley-Raphael Road 2305 & 2313 230kV circuits Reconductor Raphael Road - Northeast 2315 & 2337 circuits

EP – Engineering Procurement

* 9A Ratio updated based on Transource cost update from October 2018



Reevaluations Completed (Cont'd)

PJM Window Project ID	Baseline#	Type	Area	Constraint	BC Reevaluation 2018	Capital Cost (\$ million)	Reevaluation presented at TEAC Date	Status	Projected ISD	Description
201617_1A_R PM_DEOK	b2976 (RPM)	Upgrade	DEOK	Tanners Creek to Dearborn 345 kV	470.28	\$0.60	12/13/2018	EP	06/01/2021	Upgrade terminal equipment at Tanners Creek 345kV station. Upgrade 345kV Bus and Risers at Tanners Creek for the Dearborn circuit.
201617_1-3B	b2931 (RPM)	Upgrade	COMED	Pontiac to Brokaw 345 kV	22.89	\$5.62	1/10/2019	EP	06/01/2021	Upgrade substation equipment at Pontiac Midpoint station

EP – Engineering Procurement

Appendix B

2018/19 Window – Posted Eligible Congestion Drivers



2018/19 Window – Posted Eligible Congestion Drivers (updated 12/26/2018)

2018/19 RTEP Market Efficiency Window Eligible Congestion Drivers			ME Base Case with FSA units (Annual Congestion \$million)		ME Base Case with FSA units (Hours Binding)			
Constraint	FROM AREA	TO AREA	2023 Simulated Year	2026 Simulated Year	2023 Simulated Year	2026 Simulated Year	Comment	Potential Upgrades
Hunterstown to Lincoln 115 kV	METED	METED	\$ 20.98	\$ 24.03	1756	1732	Internal Flowgate	
Monroe 1&2 to Wayne 345 kV	MISOE	MISOE	\$ 5.81	\$ 6.23	184	227	M2M	
He Hubbell to Sunman Weisburg 138 kV	MISOC	MISOC	\$ 1.80	\$ 1.91	76	69	M2M	
E Frankfort (R) to Goodings (R) 345 kV	COMED	COMED	\$ 0.38	\$ 1.11	51	127	M2M	
Cumberland TR2 to Juniata Bus 1 230 kV	PLGRP	PLGRP	\$ 4.11	\$ 7.24	205	188	Internal Flowgate	
Marblehead North Bus 1 138/161	MISOC	MISOC	\$ 2.21	\$ 1.79	321	229	M2M	A PJM/MISO TMEP has been proposed for this facility
Bosserman to Trail Creek 138 kV	AEP	MISOE	\$ 3.99	\$ 5.10	145	198	M2M	

- Window Related Questions
 - Window related questions should be posted to the PJM Planning Community:
<https://pjm.force.com/planning/s/>

- Revision History
 - V1 – 01/07/2019 – Original Version Posted to PJM.com