



# Market Efficiency Update

Transmission Expansion Advisory Committee  
February 07, 2019

# 2018/19 Long Term Window Update



# 2018-2019 24-Month Market Efficiency Cycle

- Long term proposal window: Nov 2<sup>nd</sup> 2018 – March 1<sup>st</sup> 2019
- Mid-cycle update of major assumptions: Jan 2019 – Apr 2019
  - Demand forecast, Fuel prices, Generation expansion, Network topology, etc.
  - Only updating the most significant changes, not full update
- Analysis of proposed solutions: May 2019 - Oct 2019
  - Independent consultant review of cost and ability to build
  - Review of analysis with TEAC: Jun 2019 - Nov 2019
- Determination of final projects: Dec 2019
  - Final review with TEAC and Board approval
  - Projects may be approved earlier if analysis and review complete

- 2019 Load Forecast Update (see Appendix A for details)
  - update based on the 2019 PJM Load Forecast Report
  - includes updated Zonal Peak and Zonal Energy forecasts
- OVEC Integration in PJM
  - New OVEC zone, OVEC load forecast, OVEC hourly profile added to the PROMOD model
  - OVEC zone included in the PJM pool
  - OVEC generating units, OVEC buses assigned to the OVEC zone
  - OVEC synthetic hourly load profile consistent with the other PJM zones
- Updated PROMOD files to be posted by Friday, Feb 8<sup>th</sup>

- Items due at close of 120-day window
  - Completed RTEP Proposal Template
    - Include both an overall project cost and detailed cost of each component
    - Any cost cap or cost containment mechanisms
  - All analytical files needed for technical analysis & market efficiency simulation, e.g.
    - Include all PSS/E files, contingency files, one line diagrams, etc.
    - Include all PROMOD modeling files and event file changes
  - Include all results of simulations (PSSE and PROMOD)
  - Detailed substation and route diagrams. Show transmission topology and all breakers
  - All other documents as requested in the problem statement document
    - <https://www.pjm.com/-/media/planning/rtep-dev/expand-plan-process/ferc-order-1000/rtep-proposal-windows/2018-2019-long-term-rtep-window-1-problem-statement-v2.ashx?la=en>
- Per PJM-MISO JOA, Interregional Proposals must
  - Address at least one identified issue in both regions
  - Be submitted to both PJM and MISO Regional Windows

- Proposal Submittal Template
  - <https://www.pjm.com/planning/competitive-planning-process.aspx>
- Proposal Submittal Instructions
  - <https://www.pjm.com/-/media/planning/rtep-dev/expan-plan-process/ferc-order-1000/rtep-proposal-windows/axway-user-instructions.ashx?la=en>
- Completing the Proposal Submittal Form
  - [https://videos.pjm.com/media/PJM+Competitive+Transmission+Project+Proposal+Template+Tutorial/1\\_o44u3xfj](https://videos.pjm.com/media/PJM+Competitive+Transmission+Project+Proposal+Template+Tutorial/1_o44u3xfj)
- Market Efficiency Proposal Submission Tutorial
  - see Appendix C for slides deck
  - [https://videos.pjm.com/media/1\\_rnse27px](https://videos.pjm.com/media/1_rnse27px)
- Window Related Questions
  - Window related questions should be posted to the PJM Planning Community

Step	Timeline
Long Term Proposal Window	November 2 <sup>nd</sup> 2018 – March 1 <sup>st</sup> 2019
Base Case Mid-Cycle Update	March – May 2019
Analysis of Proposed Solutions	May – October 2019
Final TEAC Review and Board Approval	November – December 2019

# Appendix A

## Market Efficiency Load Forecast Update (2019 PJM Load Forecast Report)



- 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

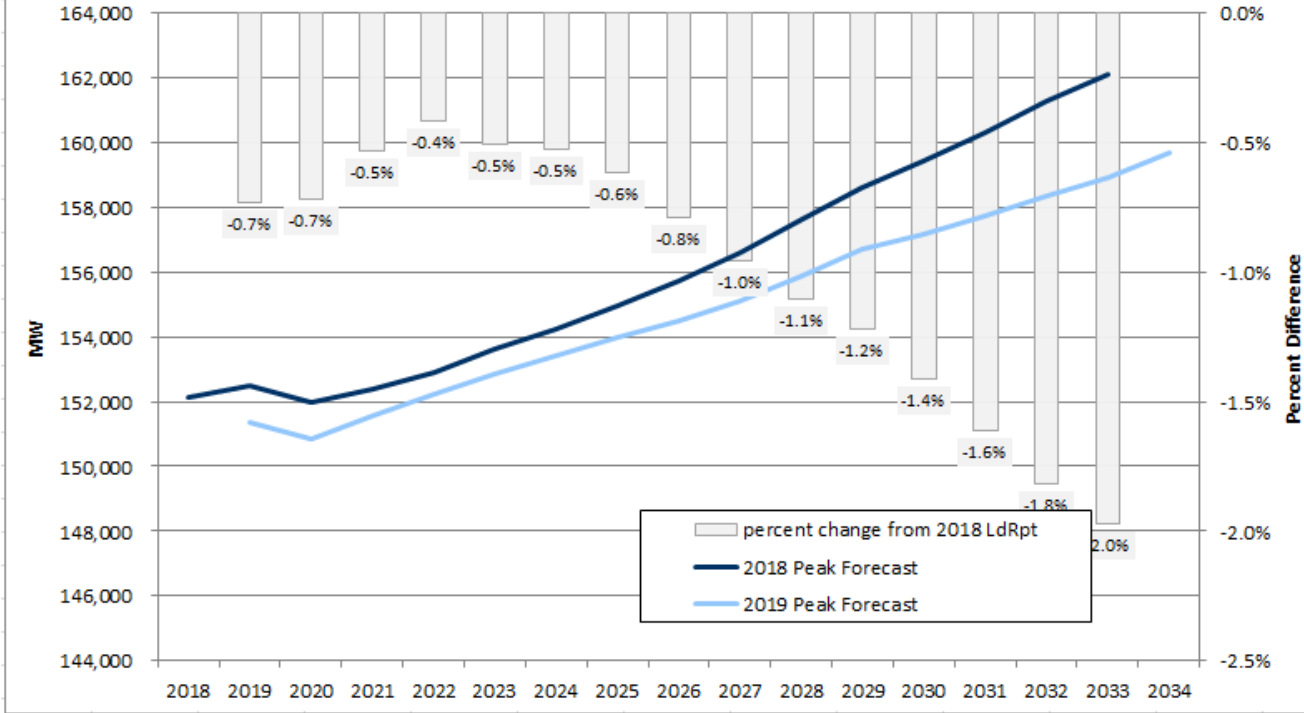
Notes:

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.

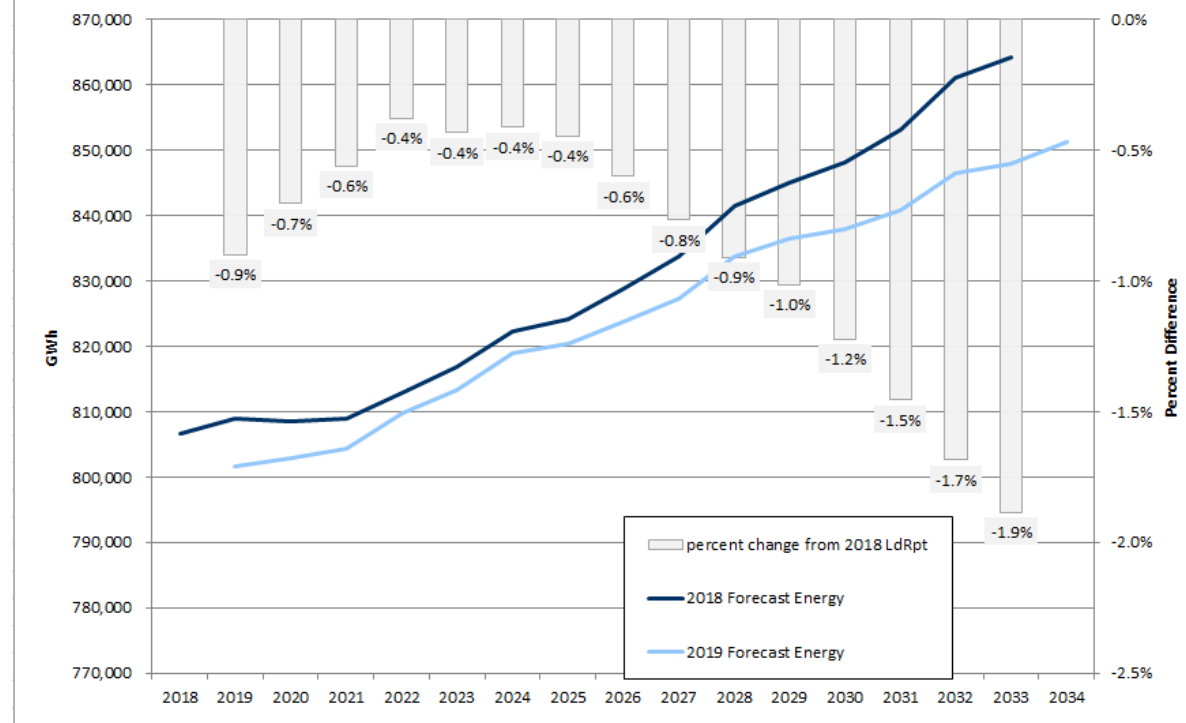
\* Load Forecast PROMOD modeling file to be posted by Friday, Feb 8<sup>th</sup>

# 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

# Appendix B

## Eligible Congestion Drivers



# Eligible Congestion drivers

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)				
FG#	Constraint	FROM AREA	TO AREA	2023 Simulated Year	2026 Simulated Year	2023 Simulated Year	2026 Simulated Year	Line is Conductor Limited?	Comment	Potential Upgrades
ME-1	Hunterstown to Lincoln 115 kV	METED	METED	\$ 20.98	\$ 24.03	1756	1732	yes	Internal Flowgate	
ME-2	Monroe 1&2 to Wayne 345 kV	MISOE	MISOE	\$ 5.81	\$ 6.23	184	227	miso	M2M	
ME-3	He Hubbell to Sunman Weisburg 138 kV	MISOC	MISOC	\$ 1.80	\$ 1.91	76	69	miso	M2M	
ME-4	E Frankfort (R) to Goodings (R) 345 kV	COMED	COMED	\$ 0.38	\$ 1.11	51	127	no	M2M	
ME-5	Cumberland TR2 to Juniata Bus 1 230 kV	PLGRP	PLGRP	\$ 4.11	\$ 7.24	205	188	yes	Internal Flowgate	
ME-6	Marblehead North Bus 1 138/161	MISOC	MISOC	\$ 2.21	\$ 1.79	321	229	miso	M2M	A PJM/MISO TMEP has been proposed for this facility
ME-7	Bosserman to Trail Creek 138 kV	AEP	MISOE	\$ 3.99	\$ 5.10	145	198	Yes	M2M	



# Appendix C

## PJM Competitive Transmission Market Efficiency Proposal Submission Tutorial



# 2018/19 Long-Term Window 1 Screenshot

## Competitive Planning Process

The PJM competitive planning process implements FERC Order 1000. The process affords non-incumbent transmission developers an opportunity to participate in the regional planning and expansion of the PJM bulk electric system. By publishing a set of criteria violations and soliciting solutions from competing transmission developers, PJM and the FERC hope to encourage innovative, cost effective and timely solutions to the challenges of building and maintaining a highly reliable electric system.

PJM will announce in the [Transmission Expansion Advisory Committee \(TEAC\)](#) its intention to solicit competitive solutions to identified planning needs. The “windows” for submitting such solutions fit into three categories and follow the 18-month and 24-month planning cycles as described in Manual 14F: [Clean](#) [WEB](#) | [Clean](#) [PDF](#).

Planning Cycles	Standard Window Length	Required In-Service Date (Years)
Long-Term - considers reliability criteria violations, economic constraints, system conditions and public policy requirements	120 days	> 5
Short-Term - considers reliability criteria violations	60 days	3-5
Immediate-Need Reliability - considers reliability criteria violations	Shortened	< 3

While PJM endeavors to adhere to the standard length of the proposal windows, unique situations do arise. When adhering to the standard window length would be unnecessarily burdensome on the transmission developers, PJM may elect to modify the length of a proposal window. Any such changes will be made clear when the proposal window is announced.

**Current Windows**

2018/19 Long-Term RTEP Window 1

OPEN 11.2.2018 CLOSED 3.1.2019

### 2018/19 Long-Term Window 1

#### Problem Statement

[Analytical Files - V4](#) [EXE](#) (368 KB) - - requires additional access

[Without Analytical Files - V2](#) [PDF](#)

[Market Efficiency Economic Models](#) - - requires additional access and active license with Ventyx for PROMOD and nodal simulation data



[Training Video](#) | [User Guide](#) [PDF](#)

[Register for community](#)

### Access Window Information

RTEP planning cycle window & analytical data can be accessed in the windows sections of this page.

Access to all other planning information can be requested through the [Critical Energy Infrastructure Information form](#). The [Non-Disclosure Agreement](#) must also be completed.

## Proposal Submissions

[Submit a Proposal](#)

[Pre-qualification for designated entity status](#) is required in order to submit proposals.

Diagram requests should follow the [FERC Form 715](#) request process.

### Instructions

- [Proposal Submittal Template](#) [XLS](#)
- [Proposal Submission Instructions](#) [PDF](#)

### Demonstration Videos

- [Completing the Proposal Submittal Form](#) [WEB](#)
- [Sending a Proposal to PJM](#) [WEB](#)

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- Sending a Proposal to PJM
  - [https://www.kaltura.com/index.php/extwidget/preview/partner\\_id/2223971/uiconf\\_id/37499081/entry\\_id/1\\_eq6jdpee/embed/auto?&flashvars\[streamerType\]=auto](https://www.kaltura.com/index.php/extwidget/preview/partner_id/2223971/uiconf_id/37499081/entry_id/1_eq6jdpee/embed/auto?&flashvars[streamerType]=auto)



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- Per PJM-MISO JOA, Interregional Proposals must
  - Address at least one identified issue in both regions
  - Be submitted to both PJM and MISO Regional Windows
- PJM and MISO will follow the effective JOA language when analyzing and recommending Interregional Proposals
- In the PJM Project Proposal Template
  - Check “Yes” for items 1.g., 1.q.i, and 1.q.ii on the Executive Summary tab

1.g.	Interregional project	Yes
1.q.i.	Interregional Cost Allocation Evaluation	Yes

- Eligible congestion drivers are selected to focus proposals on significant issues
  - Identified coincident with the opening of market efficiency proposal window
- Only proposals which address one or more of PJM identified congestion drivers will be evaluated
  - see PJM Manual 14F, 8.2.1.1 Eligible Congestion Drivers
- If the proposal does not substantially address a PJM identified congestion driver, or is otherwise substantially deficient or is seriously flawed, it will be rejected and the proposer will be notified

- On the “Overloaded Facilities” tab, table 2.a. the proposal should clearly identify the eligible congestion drivers addressed by the project

Facilities addressed by the proposed project									
Instructions: Identify the criteria violation(s) or system constraint(s) that the proposed project solves or mitigates.									
2.a.	FG #	Analysis Type	Bus #	Facility Name	To Bus #	To Bus Name	CKT	Voltage	Area

- The proposal should include in table 2.b any reliability criteria violations or shifted congestion that the proposed project causes or does not address

Facilities not addressed/caused by the proposed project									
Instructions: Identify the criteria violation(s) or system constraint(s) that the proposed project causes or does not address.									
2.b.	Unique Proposer Generated ID	Analysis Type	Bus #	Facility Name	To Bus #	To Bus Name	CKT	Voltage	Area

## PROMOD Files To Be Submitted (Recommended)

- PROMOD case(s) modeling the transmission enhancement (XML format)
  - Please indicate if cases should be added to the scenario in a specific order
- Event file updated with the project specific flowgates
  - It is recommended to provide the updated events added to the PJM posted event file (to allow for easy file comparison)
- Market Efficiency Analysis results:
  - N-1 contingency analysis used to identify new flowgates
  - B/C ratios from the base run
  - Congestion reports showing congestion decreases and shifted congestion
- Provide results from sensitivity simulations if available (see the next slide for sensitivity details)
- Reliability Analysis results

<b>Sensitivity</b>	<b>Range</b>
Load Sensitivity	Plus or Minus 2%
Gas Price Sensitivity	Plus or Minus 20% Henry Hub
No FSA Sensitivity	Remove all units with FSA or suspended ISA status

Note: PJM reserves right to add sensitivities as necessary.

- Revision History
  - V1 – 02/04/2019 – Original Version Posted to PJM.com
  - V2 – 02/07/2019 – slide 4, updated slide to match the data included in the PROMOD modeling files to be posted by Feb 8<sup>th</sup>
    - slide 6, added link to Market Efficiency Proposal Submission tutorial
    - slide 9, added note about posting the load forecast modeling files in February, rather than waiting for the mid-cycle update
    - slide 12, added Appendix B, Eligible Congestion Drivers
    - slide 14, added Appendix C, Market Efficiency Proposal Submission Tutorial