

Review of 2025 RTEP Assumptions

Transmission Expansion Advisory Committee

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2025 RTEP Assumptions

- 2025 RTEP
 - TPL-001-5
 - PJM Planning Criteria
 - TO form 715 Planning Criteria
- Modeling
 - MOD-032 (GOs and TOs)
 - <u>http://pjm.com/planning/rtep-development/powerflow-cases/mod-032.aspx</u>
 - Siemens PSS[®]MOD Model On Demand (TOs)
 - PJM.com Planning Center Online Tool (Gen Model) GOs

Expected Timeline

- **November 2024**: Establish 2025 RTEP base case modeling assumptions
- November 2024 to March 2025: Build base cases and perform initial case review. During this period;
 - New modeling and other basic assumption changes may be considered if PJM determines they may have a significant impact on the near-term RTEP baseline studies.
 - Corrections to the analytical files will be accepted.
- March to June 2025: Perform RTEP baseline studies.
 - No new modeling or other basic assumption changes anticipated
 - Corrections to the analytical files will only be accepted if they have a widespread impact or will likely impact one or more identified violations.



June 2025 (targeting early June 2025)

- Open competitive proposal window
- Post modeling assumptions changes and corrections for and begin mid-year retool of 2025 RTEP baseline analysis if required
 - Accounts for major new modeling assumption changes and corrections not previously considered.
 - Basic assumptions such as planning criteria and ratings methodology that changed after February will not be considered until the 2026 RTEP.
- July/August 2025
 - Close competitive proposal window
 - Finalize mid-year retool
- August to November 2024: Evaluate proposals
- October 2025 to February 2026: Review (TEAC) and Approve proposals (PJM Board)



- **⊅**∕pjm
 - Load Flow Modeling
 - Power flow models for outside world load, capacity, and topology will be based on the following 2024 Series MMWG power flow cases
 - 2029 SUM MMWG outside world for 2025 Series 2030 SUM RTEP, 2028 SUM RTEP
 - 2029 LL MMWG outside world for 2025 Series 2030 LL RTEP
 - 2029 WIN MMWG outside world for 2025 Series 2030 WIN RTEP, 2028 WIN RTEP
 - 2026 SUM MMWG outside world for 2025 Series 2026 SUM RTEP
 - PJM to work with neighbors to identify any updates to topology/corrections
 - PJM topology for all cases sourced from Model On Demand
 - Include all PJM Board approved upgrades through the Q1 2025 PJM Board of Manager approvals.
 - Include all Supplemental Projects included in 2024 Local Plan
 - In order to avoid development of redundant reinforcements, all reinforcements from earlier RTEPs will be modeled based on required in service date.



2025 RTEP Assumptions

- Firm Commitments
 - Long term firm transmission service consistent with those coordinated between PJM and other Planning Coordinators during the 2024 Series MMWG development
- Outage Rates
 - Generation outage rates will be based on the most recent Reserve Requirement Study (RRS) performed by PJM
 - Generation outage rates for future PJM units will be estimated based on class average rates



- **J**pjm
 - At a minimum, all PJM bulk electric system facilities, all tie lines to neighboring systems and all lower voltage facilities operated by PJM will be monitored.
 - At a minimum, contingency analysis will include all bulk electric system facilities, all tie lines to neighboring systems and all lower voltage facilities operated by PJM.
 - Thermal and voltage limits will be consistent with those used in operations and those specified in the Form 715 planning criteria. In all cases, the more conservative value will be used.



2025 RTEP Load Modeling

- Summer Peak Load
 - Summer Peak Load will be modeled consistent with the 2025 PJM Load Forecast Report (or most updated load forecast)
- Winter Peak Load
 - Winter Peak Load will be modeled consistent with the 2025 PJM Load Forecast Report
- Light Load
 - The Light Load Reliability Criteria case will be modeled consistent with the procedure defined in M14B
- Demand Side Load Management, where applicable, will be modeled consistent with the 2025 Load Forecast Report
 - Used in LDA under study in load deliverability analysis



2025 RTEP Generation Assumptions

- All existing generation expected to remain in service for the year being studied will be modeled.
- Future generation with signed Interconnection Service Agreement (ISA) or Generation Interconnection Agreement (GIA), or that cleared in the 2024/25 BRA, will be modeled along with any associated network upgrades.
 - Generation with a signed ISA/GIA will contribute to and be allowed to back-off problems.
- Off Shore Wind
 - Capacity and Reinforcements modeling (consideration of staging: 5 year vs. 7 year)
- If needed, additional generation (pre-GIA stage or with a suspended status) may be modeled consistent with the procedures noted in Manual 14B.



- Generation that has officially notified PJM of deactivation will be modeled offline in RTEP base cases for all study years after the intended deactivation date
- RTEP baseline upgrades associated with generation deactivations will be modeled
- Retired units Capacity Interconnection Rights are maintained in RTEP base cases for 1 year after deactivation at which point they will be removed unless claimed by a queued interconnection project



PSEG/NY Interface

- PJM/NYISO Interface
 - B & C cables will be modeled out of service consistent with 2024 RTEP
- Linden VFT
 - Modeled at 330 MW (Towards NY)
- HTP (HVDC link)
 - Modeled at 0 MW Schedule

(Preliminary) - Capacity Factors For Wind & Solar Base Case Dispatch As Percent of Maximum Facility Output

MAAC	Summer CF*	Winter CF	Light Load CF
Solar Fixed	46%	5%	51%
Solar Tracking	64%	5%	53%
Onshore Wind	15%	38%	27%
Offshore Wind	36%	55%	46%

PJM West	Summer CF*	Winter CF	Light Load CF
Solar Fixed	61%	5%	56%
Solar Tracking	62%	5%	51%
Onshore Wind	19%	42%	34%
Offshore Wind	N/A	N/A	N/A

DOM	Summer CF*	Winter CF	Light Load CF
Solar Fixed	50%	5%	54%
Solar Tracking	63%	5%	58%
Onshore Wind	21%	40%	32%
Offshore Wind	34%	58%	49%

* Use lower of CIR or Capacity Factor (CF)

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(Preliminary) - Wind & Solar Harmer Dispatch As Percent of Maximum Facility Output

MAAC	Summer**	Winter	Light Load
Solar Fixed (P80%)	65%	*	*
Solar Tracking (P80%)	85%	*	*
Onshore Wind (P90%)	37%	71%	64%
Offshore Wind (P80%)	71%	95%	88%

PJM West	Summer**	Winter	LL
Solar Fixed (P80%)	81%	*	*
Solar Tracking (P80%)	79%	*	*
Onshore Wind (P90%)	51%	84%	80%
Offshore Wind (P80%)	N/A	N/A	N/A

DOM	Summer**	Winter	LL
Solar Fixed (P80%)	69%	*	*
Solar Tracking (P80%)	79%	*	*
Onshore Wind (P90%)	47%	77%	70%
Offshore Wind (P80%)	71%	97%	92%

* Not applicable

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****CIR** level will be used for summer, single contingency testing



(Preliminary) - Wind & Solar Helper Dispatch As Percent of Maximum Facility Output

MAAC	Summer P20%	Winter P20%	Light Load (P20%)
Solar Fixed	28%	0%	23%
Solar Tracking	41%	0%	24%
Onshore Wind	0%	14%	5%
Offshore Wind	0%	14%	7%

PJM West	Summer P20%	Winter P20%	Light Load (P20%)
Solar Fixed	41%	0%	26%
Solar Tracking	46%	0%	25%
Onshore Wind	0%	12%	5%
Offshore Wind	N/A	N/A	N/A

DOM	Summer P20%	Winter P20%	Light Load (P20%)
Solar Fixed	33%	0%	29%
Solar Tracking	46%	0%	32%
Onshore Wind	0%	16%	7%
Offshore Wind	0%	15%	9%



Generator Deliverability: Generic EEFORds

- Generic EEFORd value developed for 2025 RTEP base case (Will be provided in Feb. TEAC)
- Capacity weighted by fuel type (Will be provided in Feb. TEAC)
 - Each unit within a given generator class is assigned the average EEFORd for that class



• As part of the 24-month RTEP cycle, <u>a year 7 (2032) base case will be</u> <u>developed and evaluated part of the 2025 RTEP</u>

- The year 7 case will be based on the 2029 Summer case that was originally developed part of the 2024 RTEP
 - Purpose: To identify and develop longer lead transmission upgrades and right size near-term upgrades with longer term needs.



FERC 1000 Process

 Per the PJM Operating Agreement, a proposal window will be conducted for all reliability needs that are not designated as Immediate Need reliability upgrades or are otherwise ineligible to go through the window process.

- FERC 1000 implementation will follow;
 - Advance notice and posting of potential violations
 - Advance notice of window openings
 - Window administration



Locational Deliverability Areas (LDAs)

- Includes the existing 27 LDAs
- Total of 27 LDAs
 - All 27 to be evaluated as part of the 2024 RTEP

LDA	Description	
EMAAC	Global area - PJM 500, JCPL, PECO, PSEG, AE, DPL, RECO	
SWMAAC	Global area - BGE and PEPCO	
MAAC	Global area - PJM 500, Penelec, Meted, JCPL, PPL, PECO, PSEG, BGE, Pepco, AE, DPL, UGI, RECO	
PPL	PPL & UGI	
PJM WEST	APS, AEP, Dayton, DUQ, Comed, ATSI, DEO&K, EKPC, Cleveland, OVEC	
WMAAC	PJM 500, Penelec, Meted, PPL, UGI	
PENELEC	Pennsylvania Electric	
METED	Metropolitan Edison	
JCPL	Jersey Central Power and Light	
PECO	PECO	
PSEG	Public Service Electric and Gas	
BGE	Baltimore Gas and Electric	
PEPCO	Potomac Electric Power Company	
AE	Atlantic City Electric	
DPL	Delmarva Power and Light	
DPLSOUTH	Southern Portion of DPL	
PSNORTH	Northern Portion of PSEG	
VAP	Dominion Virginia Power	
APS	Allegheny Power	
AEP	American Electric Power	
DAYTON	Dayton Power and Light	
DLCO	Duquesne Light Company	
Comed	Commonwealth Edison	
ATSI	American Transmission Systems, Incorporated	
DEO&K	Duke Energy Ohio and Kentucky	
ЕКРС	Eastern Kentucky Power Cooperative	
Cleveland	Cleveland Area	



2025 Scenario Analysis

• PJM will account for the PJM States (ISAC) input towards the development of the 2025 RTEP Scenarios. More details to follow in upcoming TEAC meetings.



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2025 RTEP Assumptions

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Revision History

Version No.	Date	Description
1	1/2/2025	Original slides posted