



Review of 2024 RTEP Assumptions

Transmission Expansion Advisory Committee
January 9, 2024

- 2024 RTEP
 - TPL-001-5
 - PJM criteria
 - TO 715 Criteria
- Modeling
 - MOD-032 (GOs and TOs)
 - <http://pjm.com/planning/rtep-development/powerflow-cases/mod-032.aspx>
 - Siemens PSS®MOD - Model On Demand (TOs)
 - PJM.com Planning Center Online Tool (Gen Model) – GOs

- November 2023: Establish 2024 RTEP base case modeling assumptions
- November 2023 to March 2024: 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 2024: 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/July 2024
 - Open competitive proposal window
 - Post modeling assumptions changes and corrections for and begin mid-year retool of 2024 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 2025 RTEP.
- July/August 2024
 - Close competitive proposal window
 - Finalize mid-year retool
- September to December 2024: Evaluate proposals
- October 2024 to February 2025: Review and Approve proposals

- Load Flow Modeling
 - Power flow models for outside world load, capacity, and topology will be based on the following 2023 Series MMWG power flow cases
 - 2028 SUM MMWG outside world for 2024 Series 2029 SUM RTEP, 2027SUM RTEP
 - 2028 LL MMWG outside world for 2024 Series 2029 LL RTEP
 - 2028 WIN MMWG outside world for 2024 Series 2029 WIN RTEP, 2027 WIN RTEP
 - 2025 SUM MMWG outside world for 2024 Series 2025 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 December 2023 PJM Board of Manager approvals as well as all anticipated February 2024 PJM Board approvals
 - Include all Supplemental Projects included in 2023 Local Plan

- Firm Commitments
 - Long term firm transmission service consistent with those coordinated between PJM and other Planning Coordinators during the 2023 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

- 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.

- **Summer Peak Load**
 - Summer Peak Load will be modeled consistent with the 2024 PJM Load Forecast Report (or most updated load forecast)
 - The final 2024 PJM Load Forecast Report released in December 2023
- **Winter Peak Load**
 - Winter Peak Load will be modeled consistent with the 2024 PJM Load Forecast Report
- **Light Load**
 - Modeled at 50% of the Peak Load forecast per M14B
 - The Light Load Reliability Criteria case will be modeled consistent with the procedure defined in M14B
- **Load Management, where applicable, will be modeled consistent with the 2024 Load Forecast Report**
 - Used in LDA under study in load deliverability analysis

- All existing generation expected to be in service for the year being studied will be modeled.
- Future generation with a signed Interconnection Service Agreement (ISA)*, or that cleared in the 2024/25 BRA, will be modeled along with any associated network upgrades.
 - Generation with a signed ISA will contribute to and be allowed to back-off problems.
 - *Following the implementation of the Interconnection Process Reform – Terminology will be updated from ISA to Generation Interconnection Agreement (GIA), which will include Interconnection Construction Terms and Conditions.
- Generation with a System Facility study will be modeled consistent with the procedures noted in Manual 14B, is not expected to be required to meet target generation levels through the near-term planning horizon, and therefore will not be considered in the near-term RTEP analysis.
- Additional generation information (i.e. machine lists) will be posted to the TEAC page.
- NJ OSW capacity stage consideration (accounting for ISDs)

- 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 an queue project

- PJM/NYISO Interface
 - B & C cables will be modeled out of service consistent with 2023 RTEP
- Linden VFT
 - Modeled at 330 MW
- HTP
 - Modeled at 0 MW

- OSW
 - Capacity modeling (consideration of staging: 5 year vs. 8 year)
 - Reinforcements (consideration of staging: 5 year vs. 8 year)
- Data Center Load
 - 2024 Load Forecast includes AEP, APS and Dominion data center load projections
 - Potential inclusion of supplemental project upgrades, which are not in 2023 local plan

- The NJ offshore wind injection will be modeled similar to the 2023 RTEP.
 - Capacity staging will be taken into account in 5 and 8 year cases
- The required upgrades/transmission overlay identified through the NJ SAA window will be modeled.
 - Transmission staging will be taken into account in 5 and 8 year cases

- **2024 RTEP 2029 near-term base case:** Not consider generation and transmission changes beyond 2029 that may mask reliability issues in the five year horizon.

- **2024 RTEP 2032 long-term base case:** Consider approved generation and transmission changes projected to be in service in the 15 year horizon.



Capacity Factors For Wind & Solar Base Case Dispatch As Percent of Maximum Facility Output

MAAC	Summer CF*	Winter CF	Light Load CF
Solar Fixed	45%	5%	51%
Solar Tracking	62%	5%	54%
Onshore Wind	14%	36%	26%
Offshore Wind	35%	55%	46%

PJM West	Summer CF*	Winter CF	Light Load CF
Solar Fixed	51%	5%	52%
Solar Tracking	68%	5%	55%
Onshore Wind	18%	39%	32%
Offshore Wind	N/A	N/A	N/A

DOM	Summer CF*	Winter CF	Light Load CF
Solar Fixed	53%	5%	58%
Solar Tracking	62%	5%	58%
Onshore Wind	21%	40%	32%
Offshore Wind	34%	58%	49%

* Use lower of CIR or Capacity Factor (CF)



Wind & Solar Harmer Dispatch As Percent of Maximum Facility Output

MAAC	Summer**	Winter	Light Load
Solar Fixed (P80%)	65%	*	*
Solar Tracking (P80%)	86%	*	*
Onshore Wind (P90%)	34%	67%	60%
Offshore Wind (P80%)	70%	96%	88%

PJM West	Summer**	Winter	LL
Solar Fixed (P80%)	73%	*	*
Solar Tracking (P80%)	86%	*	*
Onshore Wind (P90%)	47%	78%	75%
Offshore Wind (P80%)	N/A	N/A	N/A

DOM	Summer**	Winter	LL
Solar Fixed (P80%)	75%	*	*
Solar Tracking (P80%)	79%	*	*
Onshore Wind (P90%)	46%	77%	70%
Offshore Wind (P80%)	69%	97%	92%

* Not applicable

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



Wind & Solar Helper Dispatch As Percent of Maximum Facility Output

MAAC	Summer P20%	Winter P20%	Light Load (P20%)
Solar Fixed	27%	0%	23%
Solar Tracking	38%	0%	23%
Onshore Wind	0%	13%	5%
Offshore Wind	0%	14%	7%

PJM West	Summer P20%	Winter P20%	Light Load (P20%)
Solar Fixed	31%	0%	22%
Solar Tracking	49%	0%	28%
Onshore Wind	0%	11%	5%
Offshore Wind	N/A	N/A	N/A

DOM	Summer P20%	Winter P20%	Light Load (P20%)
Solar Fixed	33%	0%	33%
Solar Tracking	45%	0%	31%
Onshore Wind	0%	16%	7%
Offshore Wind	0%	15%	8%

- Generic EEFORd values developed for 2029 RTEP base case (Will provide in Feb. TEAC)
- Capacity weighted by fuel type (Will provide 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, a year 8 (2032) base case will be developed and evaluated as needed as part of the 2024 RTEP
- The year 8 case will be based on the 2029 Summer case that will be developed as part of this year's 2024 RTEP
- Purpose: To identify and develop longer lead time transmission upgrades in coordination with LTRTP
- In 2024:
 - PJM is pursuing Manual revisions to change the 24 month RTEP to 36 month RTEP
 - Once the Manual Revisions are adopted, PJM will begin assumptions and model building discussions for year 8 and year 15 cases to support LTRTP

- 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 PEPSCO
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
EKPC	Eastern Kentucky Power Cooperative
Cleveland	Cleveland Area

Stakeholders feedback received by PJM through the LTRTP consultation process will be considered. Final selected scenarios will be shared with stakeholders in upcoming TEAC meetings.

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2024 RTEP Assumptions



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1	1/4/2024	<ul style="list-style-type: none"><li>• Original slides posted