PJM Regional Transmission Expansion Plan (RTEP) Process

Nebiat Tesfa
Michael Herman
David Schoon
Nicolae Dumitriu
PJM Planning

IPSAC - May 29, 2026

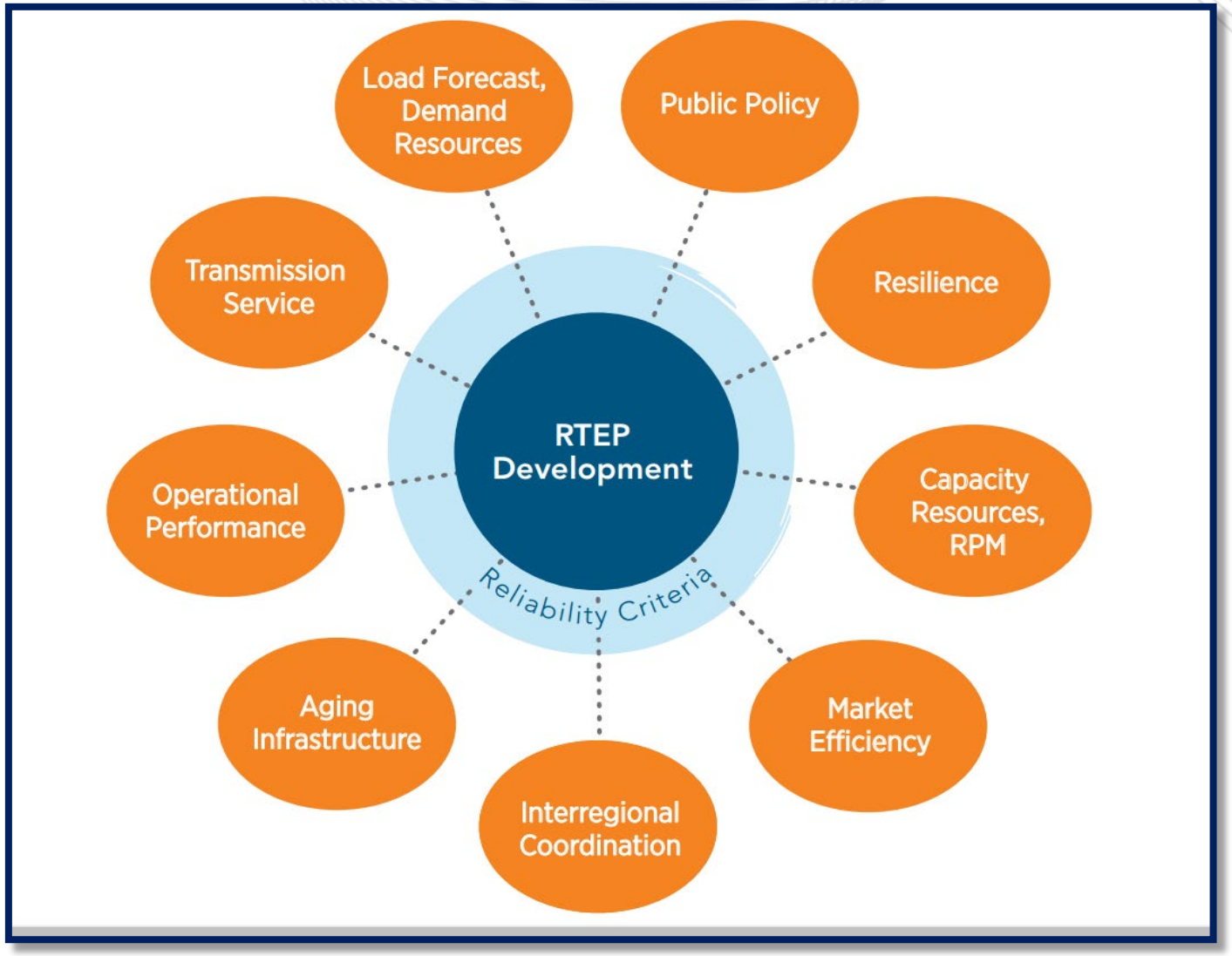
Outline

- 2026 RTEP Assumptions and Updates
- 2025 RTEP Window 1 Updates
- New Jersey State Agreement Approach Agreement Update
- Generation Deactivation Status Update
- PJM Long Term - 1920 Update
- PJM Market Efficiency Update

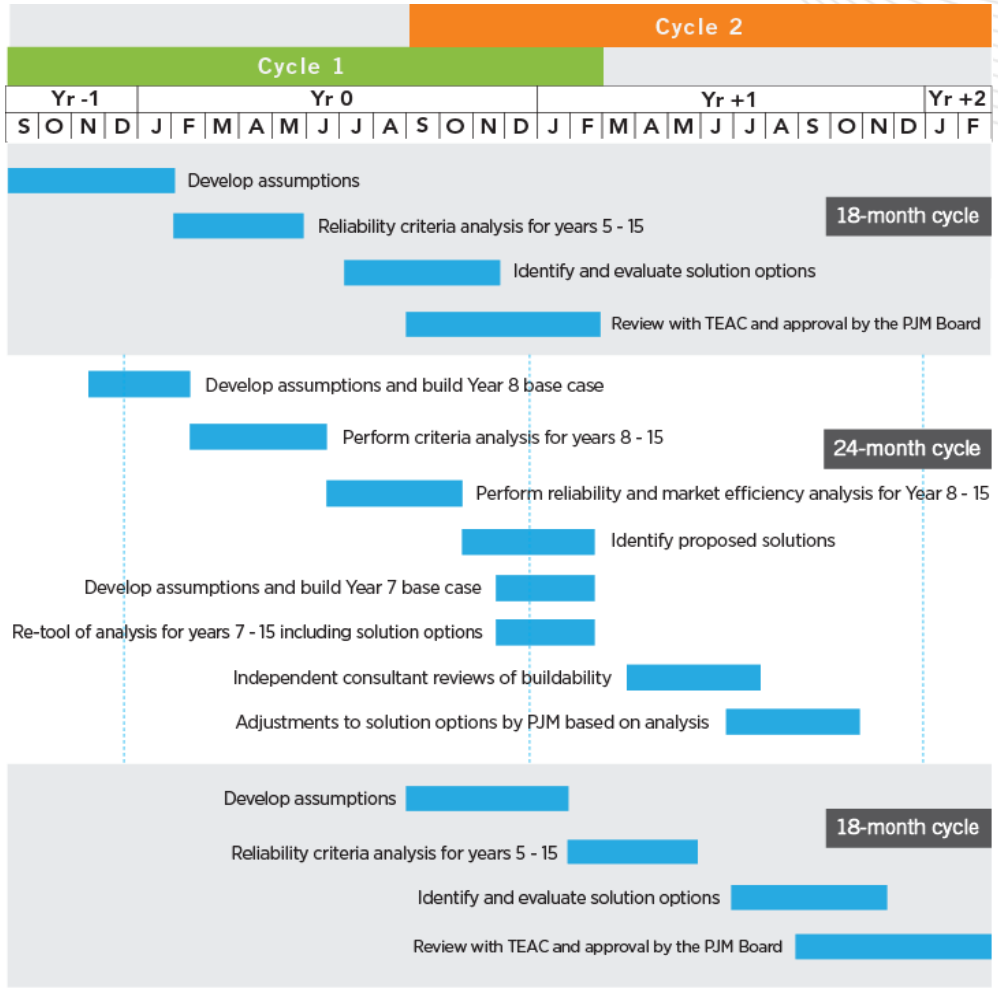
PJM Planning Links

- Planning Committee (PC)
  - http://www.pjm.com/committees-and-groups/committees/pc.aspx
- Transmission Expansion Advisory Committee (TEAC)
  - http://www.pjm.com/committees-and-groups/committees/teac.aspx
- Interregional Planning
  - http://www.pjm.com/planning/interregional-planning.aspx
- Services and Requests
  - http://www.pjm.com/planning/services-requests.aspx
- RTEP Development
  - http://www.pjm.com/planning/rtep-development.aspx
- Manual 14B
  - http://www.pjm.com/-/media/documents/manuals/m14b.ashx

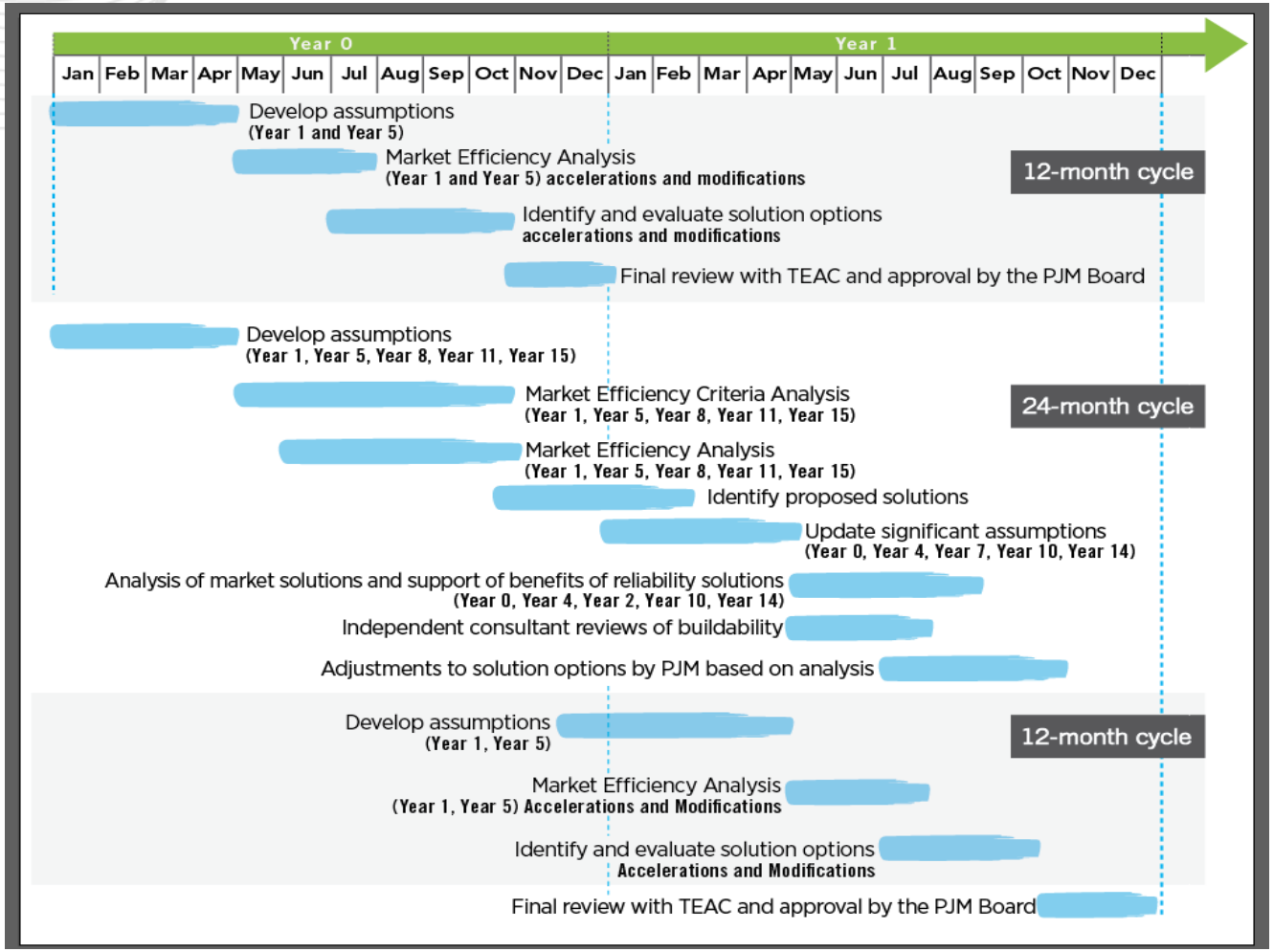
System Expansion Drivers



PJM's 2-year Reliability



PJM's 2-year Market Efficiency



2026 RTEP Assumptions and Updates

2026 RTEP Assumptions

- PJM annually presents the assumptions at the beginning of each year.
- Follow the link below for details of the 2026 RTEP Assumptions presentation.

https://www.pjm.com/-/media/DotCom/committees-groups/committees/teac/2026/20260106/20260106-item-08---2026-rtep-assumptions.pdf

https://www.pjm.com/-/media/DotCom/committees-groups/committees/teac/2026/20260203/20260203-item-14---2026-rtep-assumption-update.pdf

https://www.pjm.com/-/media/DotCom/committees-groups/committees/teac/2026/20260310/20260310-item-10---2026-rtep-assumption-update.pdf

https://www.pjm.com/-/media/DotCom/committees-groups/committees/teac/2026/20260407/20260407-item-10---2026-rtep-assumption-update.pdf

https://www.pjm.com/-/media/DotCom/committees-groups/committees/teac/2026/20260508/20260508-item-11---2026-rtep-assumption-update.pdf

FERC 1000 Process

- As per the PJM Operating Agreement, a proposal window will be conducted for all reliability needs that are not Immediate Need reliability upgrades or are otherwise ineligible to go through the window process.
- FERC 1000 implementation will be similar to the Previous years RTEP.
  - Advance notice and posting of potential violations
  - Advance notice of window openings
  - Window administration

Expected Timeline

- **July 2026** (**targeting early July 2026**)
  - Open competitive proposal window
- **August/September 2026**
  - Close competitive proposal window
  - Finalize mid-year retool as needed
- **September to November 2026**: Evaluate proposals
- **October 2026 to February 2027**: Review (TEAC) and Approve proposals (PJM Board)

2025 RTEP Window 1 Updates

Baseline Reliability Projects

2025 Reliability Window 1 Needs

Mid-Atlantic Region Needs:

- Mid-Atlantic area experiencing violation on the West to East and South to North 500 kV lines
  - The violations are driven by:
    - Increase in transfer to Mid-Atlantic attributed from load increase mainly in PPL zone (approximately 5G), and the increase in future generation capacity in the South and West of PJM.
    - Delay of the NJOSW combined with the additional PPL load (~3.5GWs - not included in the 2025 load forecast) further increased the need for transfer to Mid-Atlantic region.
    - Several 230kV facilities overloaded in PPL zone in the five year out case, and these issues worsened in the 2032 analysis.
    - Additional overloads are identified in 2032 as the load continue to grow.

Dominion/South Region Needs:

- The Dominion area is experiencing multiple 500kV violations along its primary South - North corridor in 2032.
  - Violations are predominantly being driven by:
    - Additional generation added in the south that is flowing to the load centers in northern VA (NOVA).
    - Increases in load with a heavier concentration in the NOVA area.
    - Further increases in PJM load overall – currently, an increase in data center load external to Dominion (PPL zone).
  - These needs require long-lead, backbone enhancements requiring more than 5 years to develop.

PJM West Region Needs:

- Load increase in Columbus and at Melissa area
  - PJM is experiencing load growth in Central Ohio, part of ATSI territory causing multiple thermal and voltage violations under various contingencies. These violations spread through several reliability analyses affecting neighboring TOs such as AEP, DEOK and Dayton.
  - AEP Columbus area, there are two major backbone (765/345 kV) EHV sources that currently serve the load pocket. Multiple thermal overloads are showing in the area. Various contingency pairs cause the wide-spread local system voltage issues which are expected to worsen with forecasted load increase beyond five years.
- Increase in Regional flows towards Eastern and Southern PJM Regions as a result of future generation development in the PJM West.

2025 Reliability Window 1 Proposals

- 2025 Window 1 opened on June 18, 2025 and closed on August 18 , 2025.
- The 2025 Window 1 was conducted to address Reliability violations identified for the year of 2030 to 2032 RTEP studies.
- For this Window, PJM sought technical solutions, also called proposals, to resolve potential reliability criteria violations on facilities identified in accordance with all applicable planning criteria (PJM, NERC, SERC, RFC, and Local Transmission Owner criteria).
  - 134 total proposals submitted from 19 entities (includes combined/portfolio proposals)
    - 57 Greenfields
    - 77 Upgrades
  - Proposal Cost Estimates: Approximates range from $1.65 M to $6,730 M
  - 90 proposals with cost containment (Some hard-capped)
  - Grid Enhancing Technologies:
    - HVDC: 5 proposals
    - Advanced Conductors: 5 proposals

2025 Reliability Window 1 Proposals

Mid-Atlantic Region Cluster Solution:

- **Six projects proposed to address the Mid-Atlantic Regional Needs with a cost ranging from $1.5B – $3.2B**
  - Two proposals recommend variations of 765 kV development from Kammer to Juniata in the PPL Transmission Zone
  - Four proposals recommend variants of Keystone - Susquehanna area 500 kV development

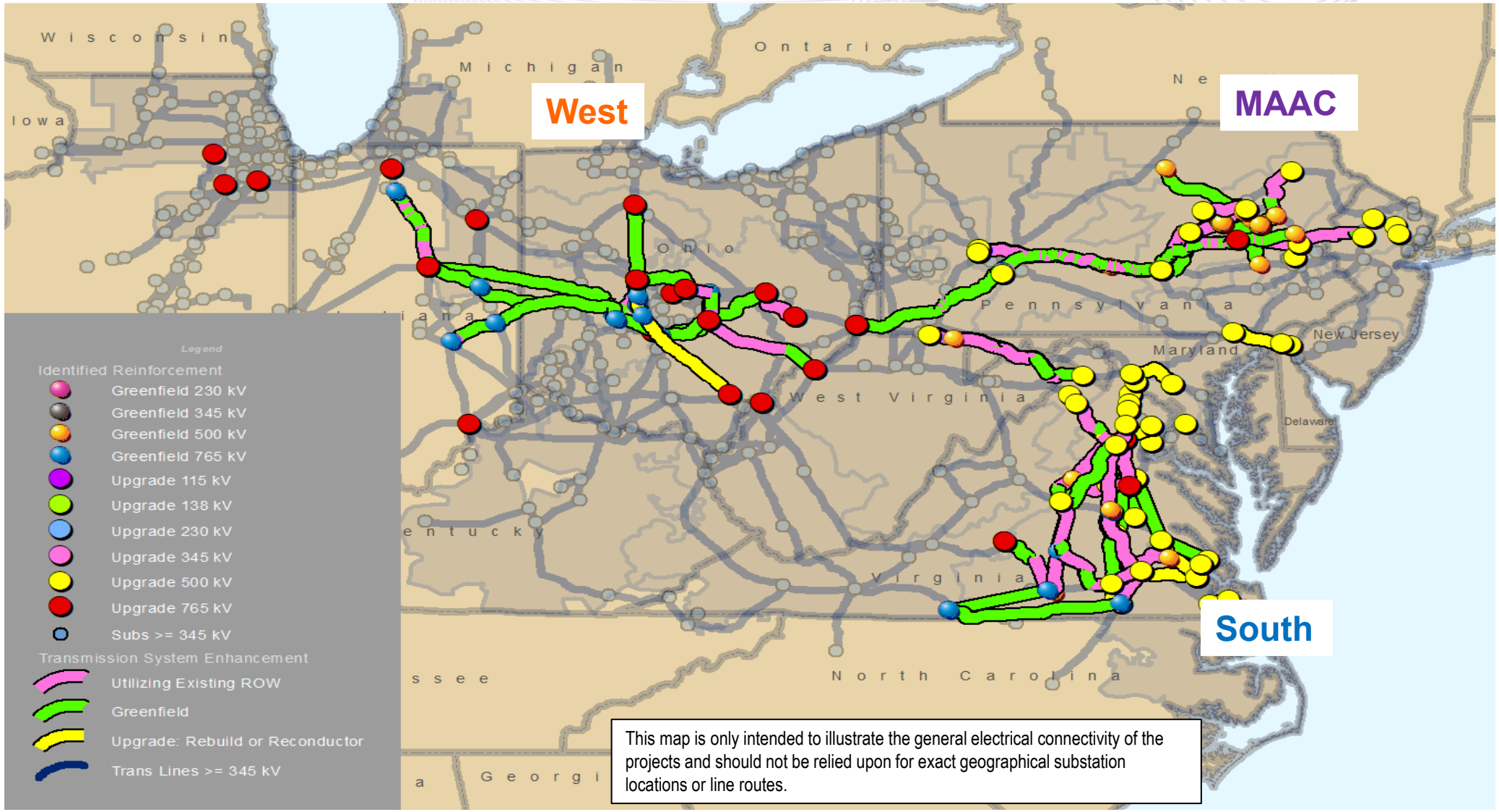
Dominion/South Region Cluster Solution:

- **Twelve projects proposed to address the Dominion Regional Needs with a cost ranging from $2B - $5B**
  - Four proposals recommend variation of 500 kV HVDC development from Heritage in Southern Dominion to Mosby in Northern Dominion, as well as 500 kV AC lines
  - Six proposals recommend variations of 765 kV development from Southwest/South Dominion to Northern Dominion area
  - Two proposals recommend variation of 500 kV development from South Dominion to Northern Dominion area

PJM West Region Cluster Solution:

- **Eleven projects proposed to address the PJM West Regional Needs with a cost ranging from $121M to $3.3B**
  - One project recommend 765 kV development in the AEP and sounding area
  - Two projects recommend 345 kV development in the AEP and ATSI area
  - Nine proposals recommend variation of 765kV and 345 kV development in the AEP and sounding area

Proposals By Clusters (only 765 & 500 kV proposals shown)



2025 Reliability Window 1 Selected Proposals

PJM Completed Evaluating the Proposed projects and selected the final Solutions:

Regional Backbone Transmission approved projects:

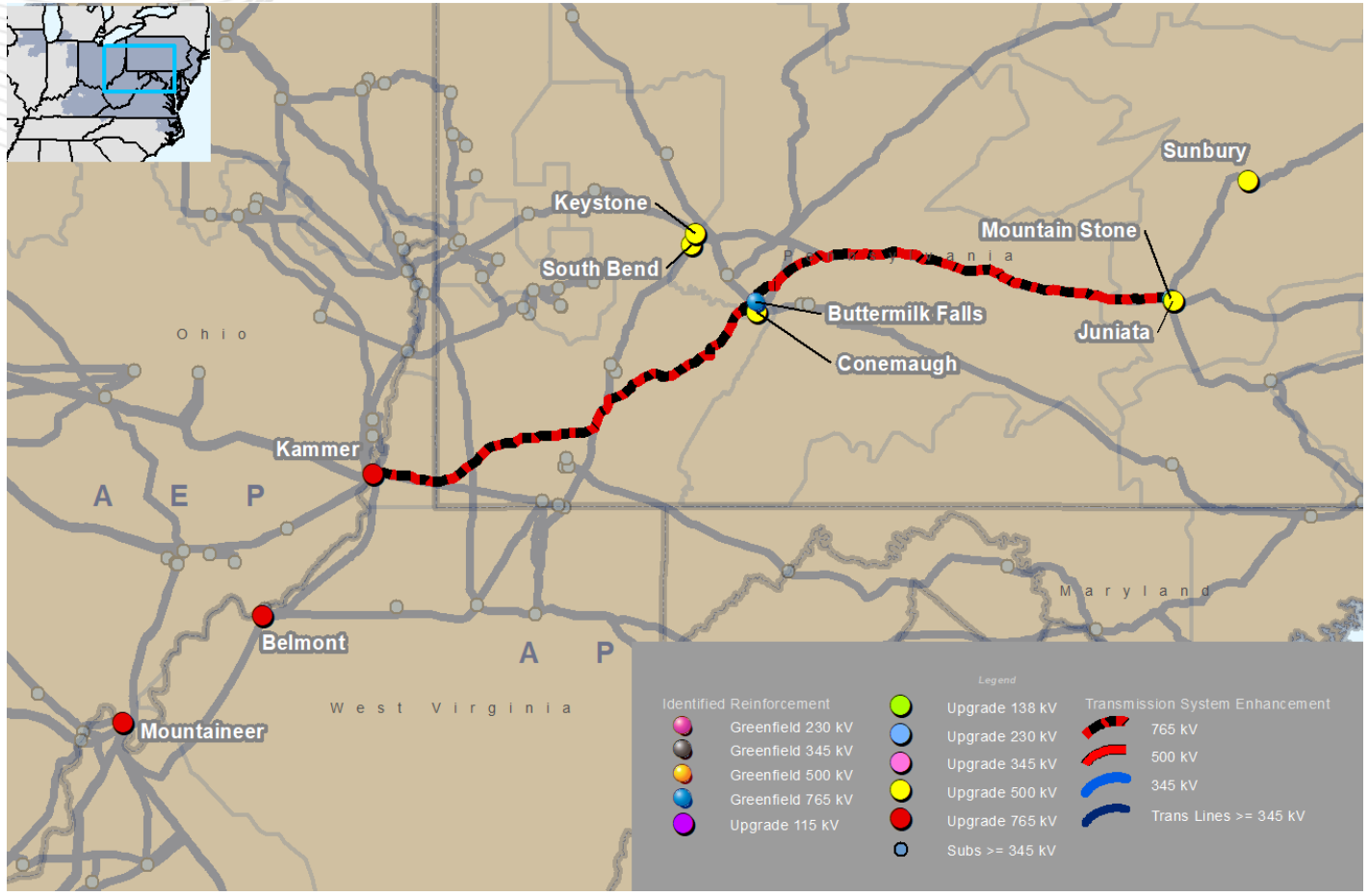
- New 765 kV line from Kammer to Butter Milk to Juniata
  - Consists of building ~ 222 Milles of 765 kV transmission line, - 2 - 765/500 kV substations
- New 500 kV HVDC line from Heritage – Mosby
  - Consists of building ~ 185 miles of new bipolar +/- 525kV HVDC link, new Voltage Source Converter (VSC) HVDC station at Heritage substation and a new Voltage Source Converter (VSC) HVDC station at Mosby substation
- Rebuilding several 500 kV transmission lines and 1 - New 765/500kV Switching Station in Dominion
- New 765 kV line from Greentown – Teddy –Marysville and Guernsey – Conesville - West Millersport - Adkins
  - Consists of building ~ 291 Milles of 765 kV transmission line
- New 345 kV DCT from Teddy – Beatty AND Teddy - Cole single circuit 345 kV
  - Consists of building ~ 74 Milles of 345 kV transmission line
- In addition to the backbone projects listed above, more than 100 projects are approved to address the local violations
- Total approved Projects ~ **$11,691B**

MAAC Regional Cluster: Regional Solution

Mid-Atlantic Cluster Recommended Solution:

Construct one 765 kV line from Kammer - Juniata.

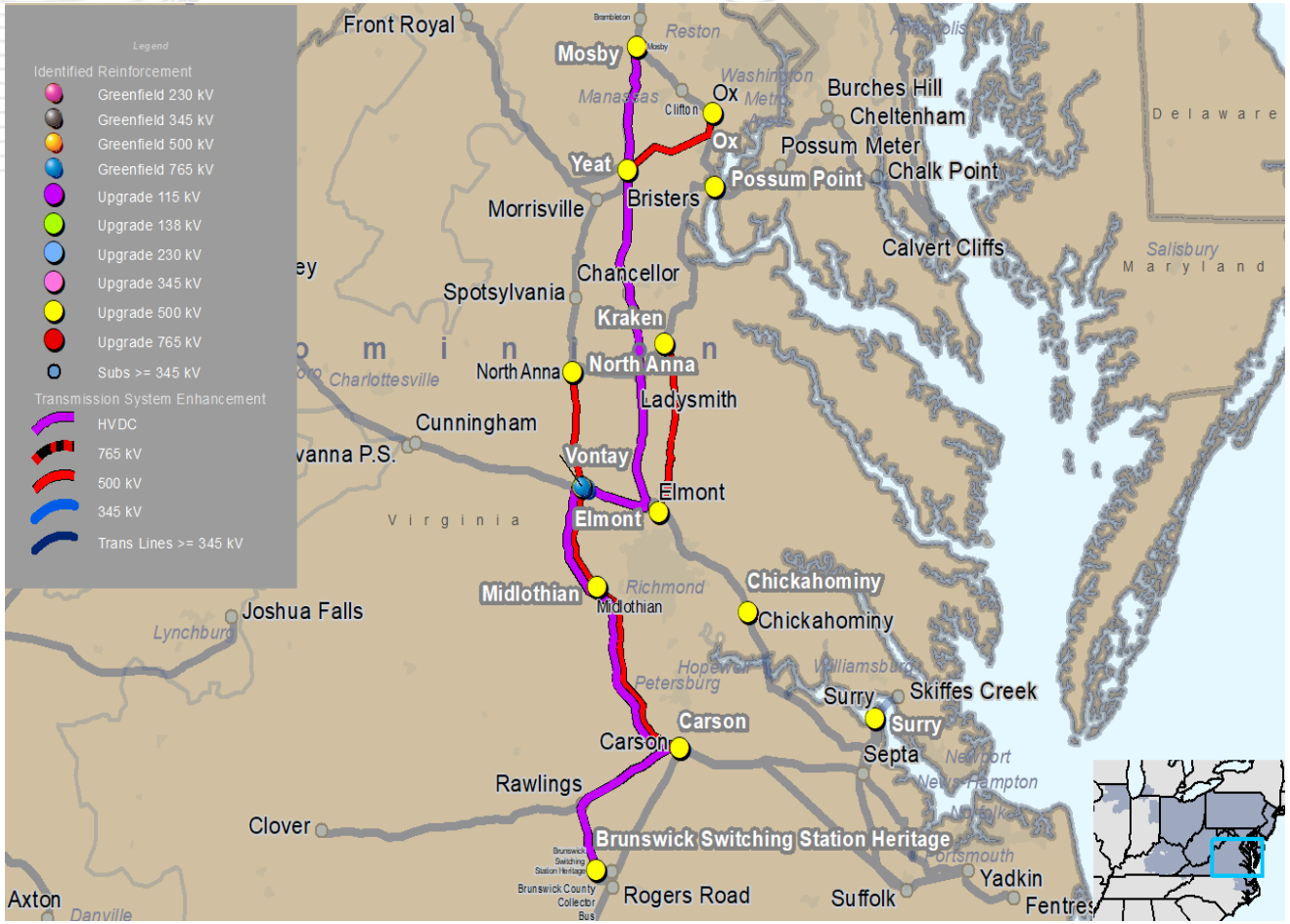
- The new line is 114 miles from Kammer to new 765/500 kV substation (Buttermilk Falls - loop into the Keystone - Conemaugh 500 kV)
- Continue for 108 miles to new 765/500 kV substation (Mountain Stone) and connect to Juniata 500 kV



South/Dominion Cluster Regional Solution

South/Dominion Cluster Recommended Solution:

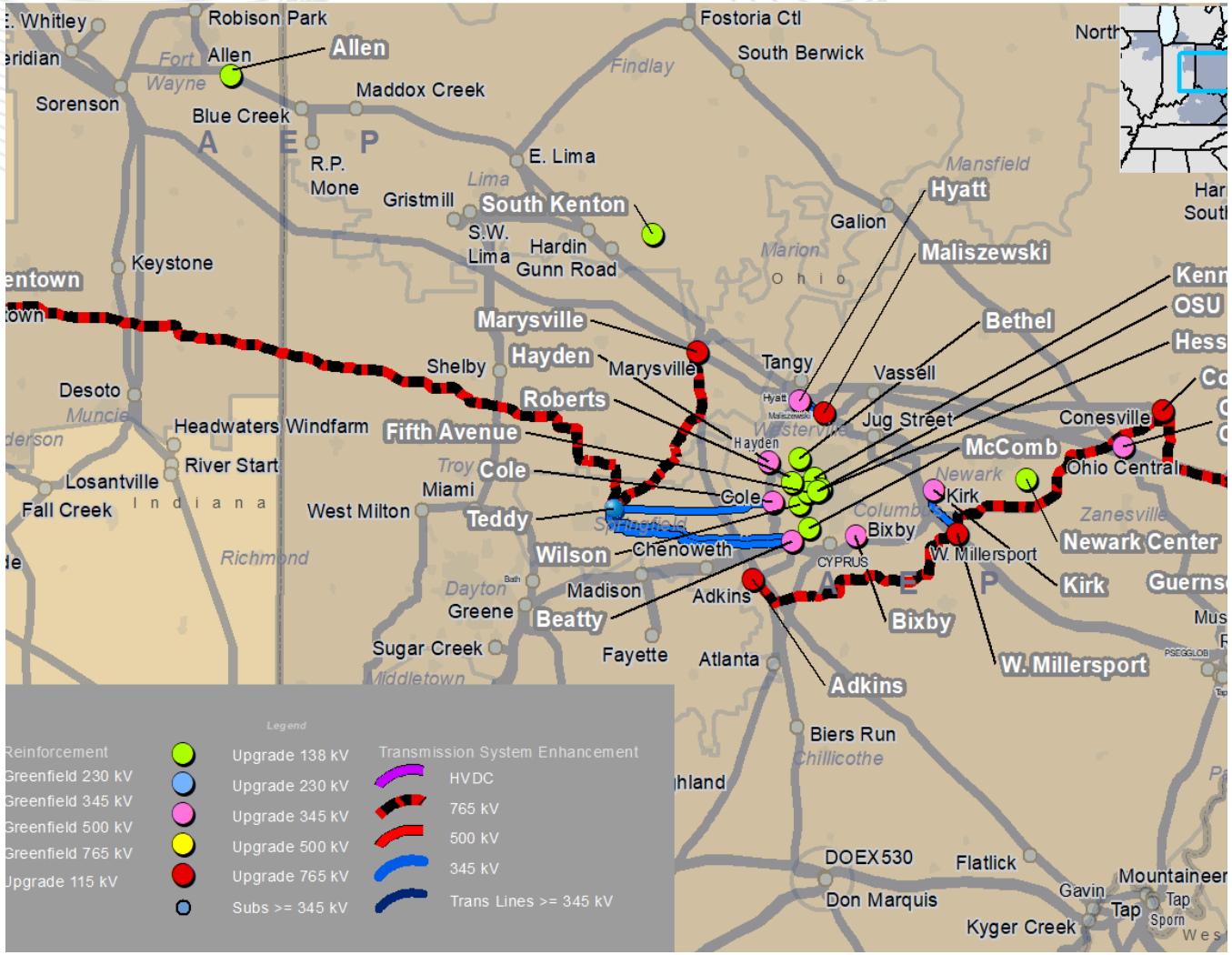
- Build New 500 kV HVDC line from Heritage – Mosby
  - Consists of building ~ 185 miles of new bipolar +/- 525kV HVDC link, new Voltage Source Converter (VSC) HVDC station at Heritage substation and a new Voltage Source Converter (VSC) HVDC station at Mosby substation
- Rebuilding several 500 kV transmission lines and 1 - New 765/500kV Switching Station in Dominion



PJM West Cluster Regional Solution

West/Dominion Cluster Recommended Solution:

- Construct one 765 kV line from Greentown – Teddy –Marysville
  - Consists of building ~ 172 miles of new 765kV
- Construct one 765 kV line from Guernsey – Conesville - West Millersport - Adkins 765kV
  - Consists of building ~ 119 miles of new 765kV
- Construct 345 kV transmission line from Teddy – Beatty
  - Consists of building ~ 32 miles of new DCT 345 kV
- Construct 345 kV transmission line from Teddy – Cole
  - Consists of building ~ 47 miles of new single circuit 345 kV



2025 RTEP Cost Summary

Category	Proposal Cost Estimate ($M)
In-Zone Related Total	**$2,301.10**
West Regional Cluster Solution	$2,768.00
MAAC Regional Cluster Solution	$1,789.39
South Regional Cluster Solution	$4,832.45
Regional Transfer Related Total	**$9,392.27**
2025 RTEP Total	**$11,690.94**

Termination of New Jersey State Agreement Approach Agreement

Background

BACKGROUND:

The PJM State Agreement Approach (SAA) process provides a formal mechanism pursuant to which one or more states can voluntarily agree to pay for their own public policy-driven transmission projects.

The State of New Jersey, through the NJ Board of Public Utilities (NJBPU), used the SAA process to effectuate NJ's state public policy requirement to generate 11,000 MW of electricity from offshore wind (OSW) by 2040, by:

- Building **transmission** to ensure the deliverability of the selected OSW generation
- Establishing an NJ BPU-administered OSW **generation** solicitation process, whereby the selected generation is studied through PJM's interconnection process

PJM and the NJBPU have reached agreement to terminate certain baseline projects

- Projects were selected pursuant to the PJM SAA process to support NJ's state goal of 7,500 MW of OSW generation by 2035

PJM filed the Mutual Termination Agreement with FERC on **April 23, 2026** and requested acceptance by **June 23, 2026**.

Mutual Termination Agreement

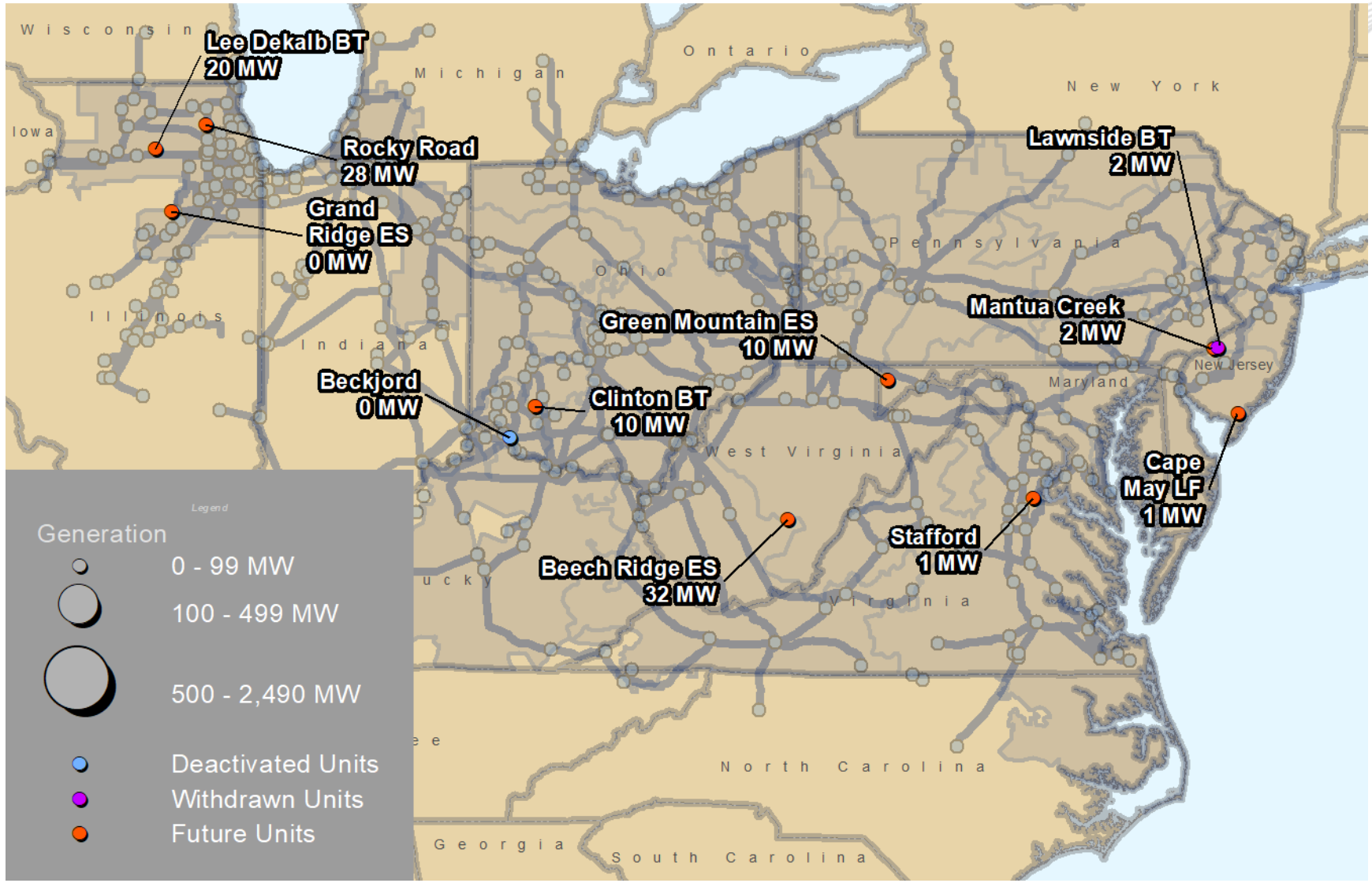
- PJM and NJBPU have reached an agreement to wind-down the NJ SAA Agreement via a Mutual Termination Agreement (MTA), through which:
  - Most of the SAA Projects will be terminated and removed from the RTEP; and
  - Six SAA Projects will remain in the RTEP
    - *These are projects that are (i) already completed, (ii) a Multi-Driver Project, and (iii) reflected in signed interconnection agreements or are otherwise relied upon by customers in the interconnection queue.*
- NJ customers will remain responsible for prudently-incurred costs associated with these projects under the FERC-accepted cost allocation methodology
- PJM staff will recommend to the PJM Board the immediate removal of Schedule 1 Projects from the RTEP upon FERC acceptance of the MTA

Relevant Dockets

- Mutual Termination Agreement – ER26-2294
- NJ BPU April 2026 Order

Generation Deactivation Notification Update (Between 11/1/2025 and 4/1/2026)

Map of Deactivations



Deactivation Status: Recently Announced

Unit(s)	Capacity (MW)	Fuel Type	Transmission Zone	Requested Deactivation Date	PJM Reliability Status
Cape May County LF 4	1	Gas	AECO	4/1/2027	Reliability analysis underway
Green Mountain Energy Storage	10	Battery	PENELEC	4/1/2027	Reliability analysis underway
Lee DeKalb 3 BT	20	Battery	COMED	4/1/2027	Reliability analysis underway
MANTUA CREEK 7 BT	2	Battery	PSEG	4/1/2027	Reliability analysis underway
STAFFORD 1 LF	1	Gas	DOM	4/1/2027	Reliability analysis underway
Rocky Road CT 33	28	Gas	COMED	4/1/2027	Reliability analysis underway
Grand Ridge Energy Storage	0	Battery	COMED	4/1/2027	Reliability analysis underway
Beech Ridge Energy Storage	32	Battery	APS	4/1/2027	Reliability analysis underway
Clinton Battery	10	Battery	DEOK	1/1/2027	Reliability analysis underway

Deactivation Status: Recently Deactivated

Unit(s)	Capacity (MW)	Fuel Type	Transmission Zone	Actual Deactivation Date	PJM Reliability Status
Beckjord Storage Unit 1	0	Battery	DEOK	3/5/2026	Analysis complete. No violations

Deactivation Status: Recently Withdrawn Deactivation Notices

Unit(s)	Capacity (MW)	Fuel Type	Transmission Zone	Date of Withdrawn Deactivation Request
Lawnside 14 BT	2	Battery	PSEG	12/3/2025

Long Term - 1920 Update

- PJM filed Order 1920 Compliance with FERC on Dec 12, 2025
- PJM TOs are required to file cost allocation by June 12, 2026
- PJM is developing a Capacity Expansion process to site generation in Long Term power flow models and is reviewing those assumptions with the PJM TEAC[1]
- PJM is developing all necessary process, tools and procedures to implement FERC 1920 and assist in developing Long Term assumptions

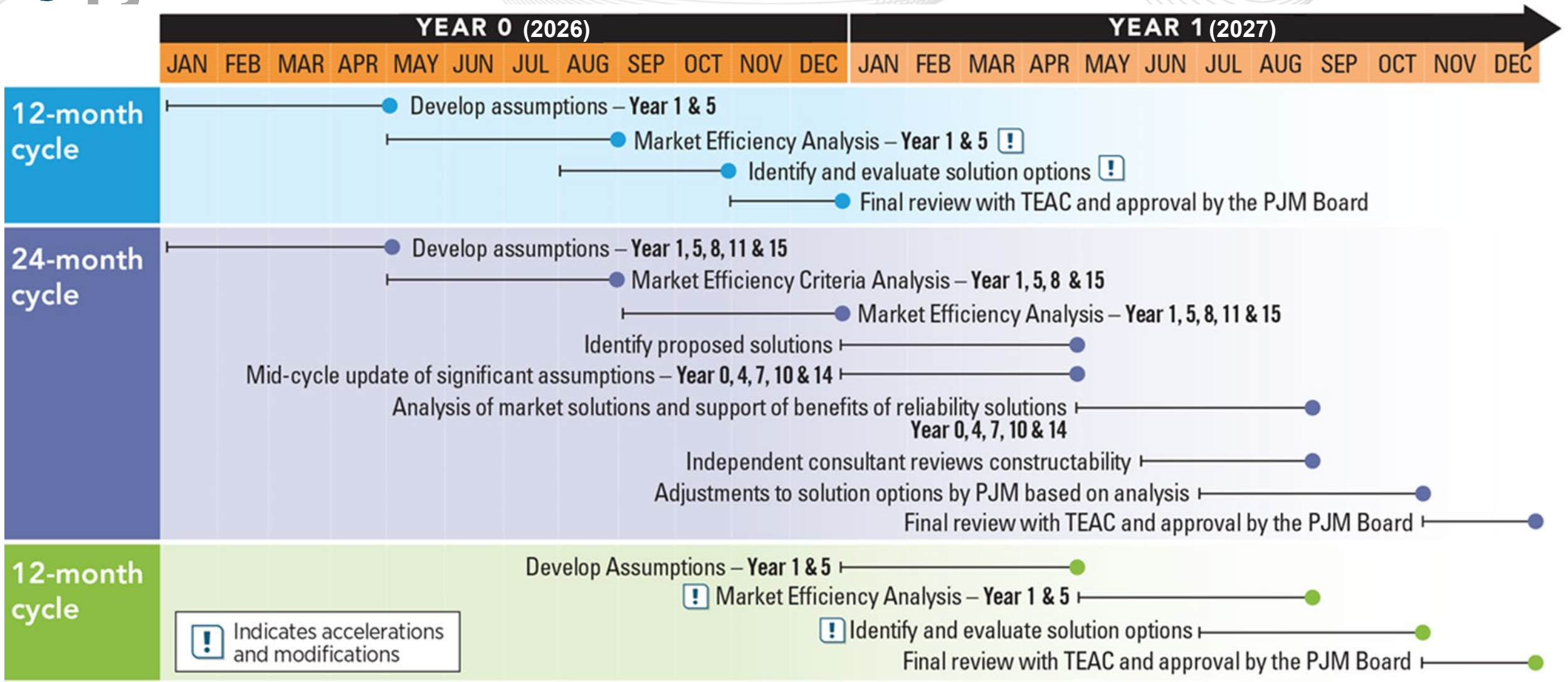
1 “5.8.2026 TEAC. Item 12 - 2026 RTEP - Capacity Expansion Scenarios for 8-year Case (2034)”

https://www.pjm.com/-/media/DotCom/committees-groups/committees/teac/2026/20260508/20260508-item-12---2026-rtep---capacity-expansion-scenarios-for-8-year-case-(2034).pdf

PJM Market Efficiency Update

2026/27 Market Efficiency Cycle

2026/27 Market Efficiency Timeline



2026/27 Market Efficiency Next Steps

Step	Target Date
Post Preliminary Base Case	July 2026
Stakeholders Feedback	August – October 2026
Identify Congestion Drivers	September – December 2026
Post Final Base Case and Target Congestion Drivers	January 2027
Long Term Proposal Window	January - May 2027
Analysis of Proposed Solutions	May – September 2027
TEAC Reviews and Board Approval	October - December 2027

2026/27 ME Cycle Assumptions Overview

- Study Years
  - 2027, 2031, 2034, 2037, and 2041.
- Model and Input Assumptions
  - Fall 2025 Data Release from Hitachi Energy.
    - Fuel/Emissions price forecasts from Hitachi Energy, Spring 2026 update.
  - Load forecast from PJM 2026 Load Forecast Report.
  - Topology will be based on the final 2031 and 2034 Summer Peak powerflows from the RTEP 2026 24-month cycle.
    - Will include all RTEP baseline projects identified during RTEP 2026 cycle.
  - Generation Expansion will be based on 2026 RTEP Generation Assumptions.
- Financial parameters Discount Rate and Carrying Charge, will be based on the Transmission Cost Planner.

Questions?