PJM Regional Transmission Expansion Planning (RTEP) Process

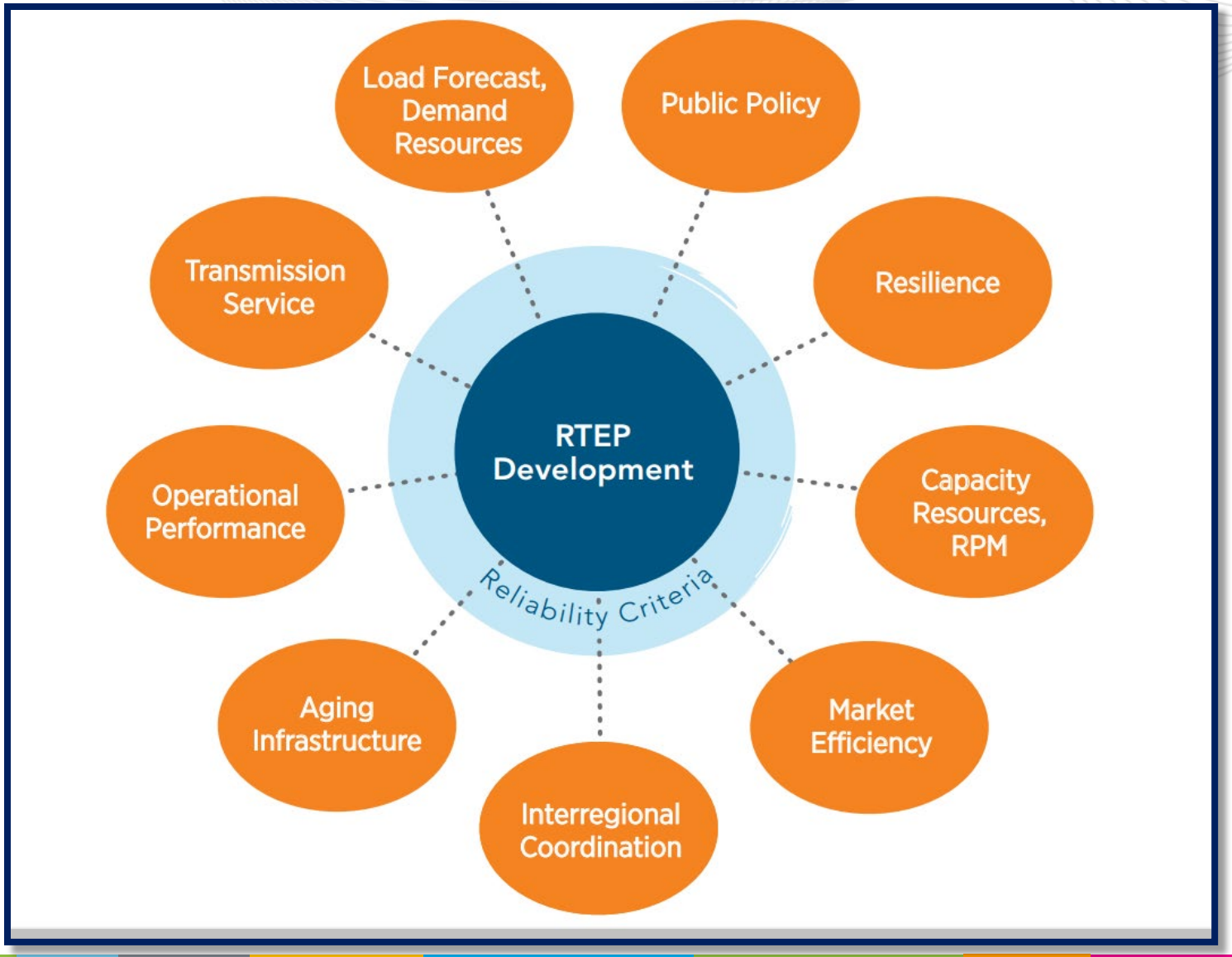
Nebiat Tesfa, Transmission Planning

IPSAC May 15, 2022

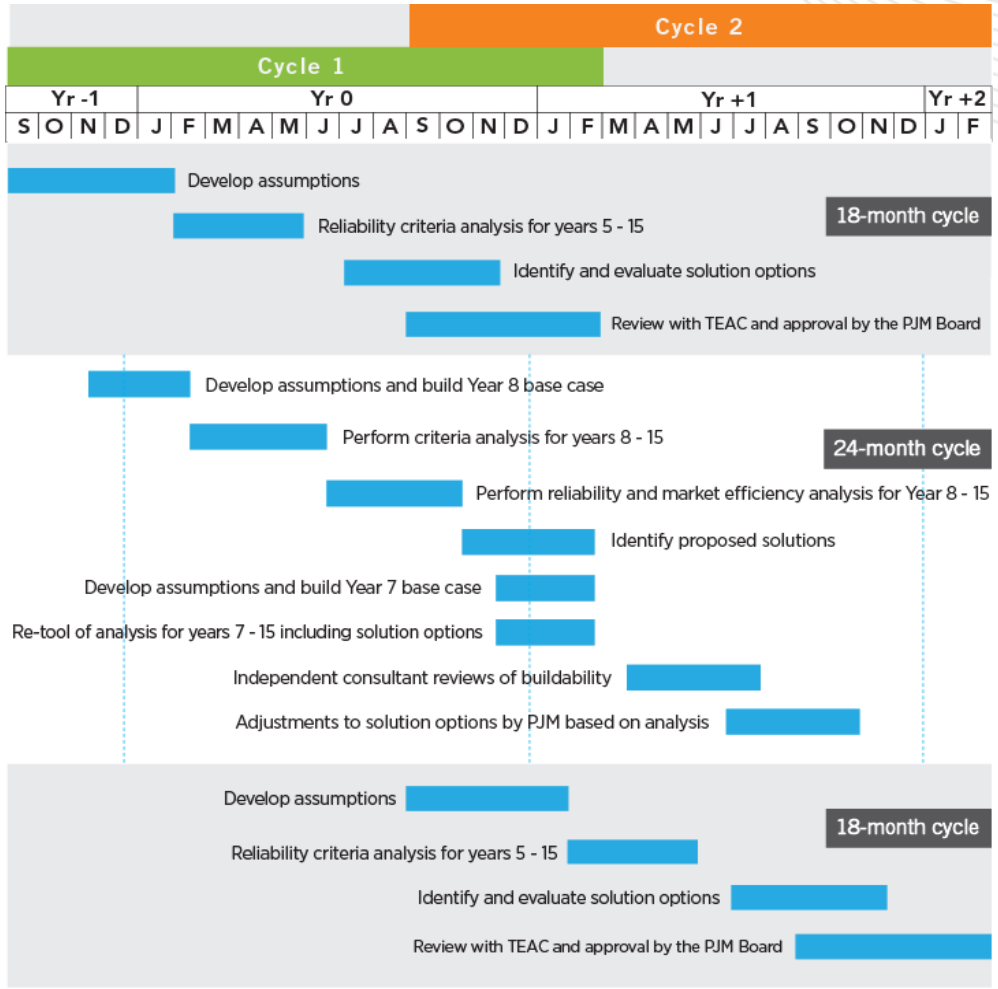
PJM Planning Links

- 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

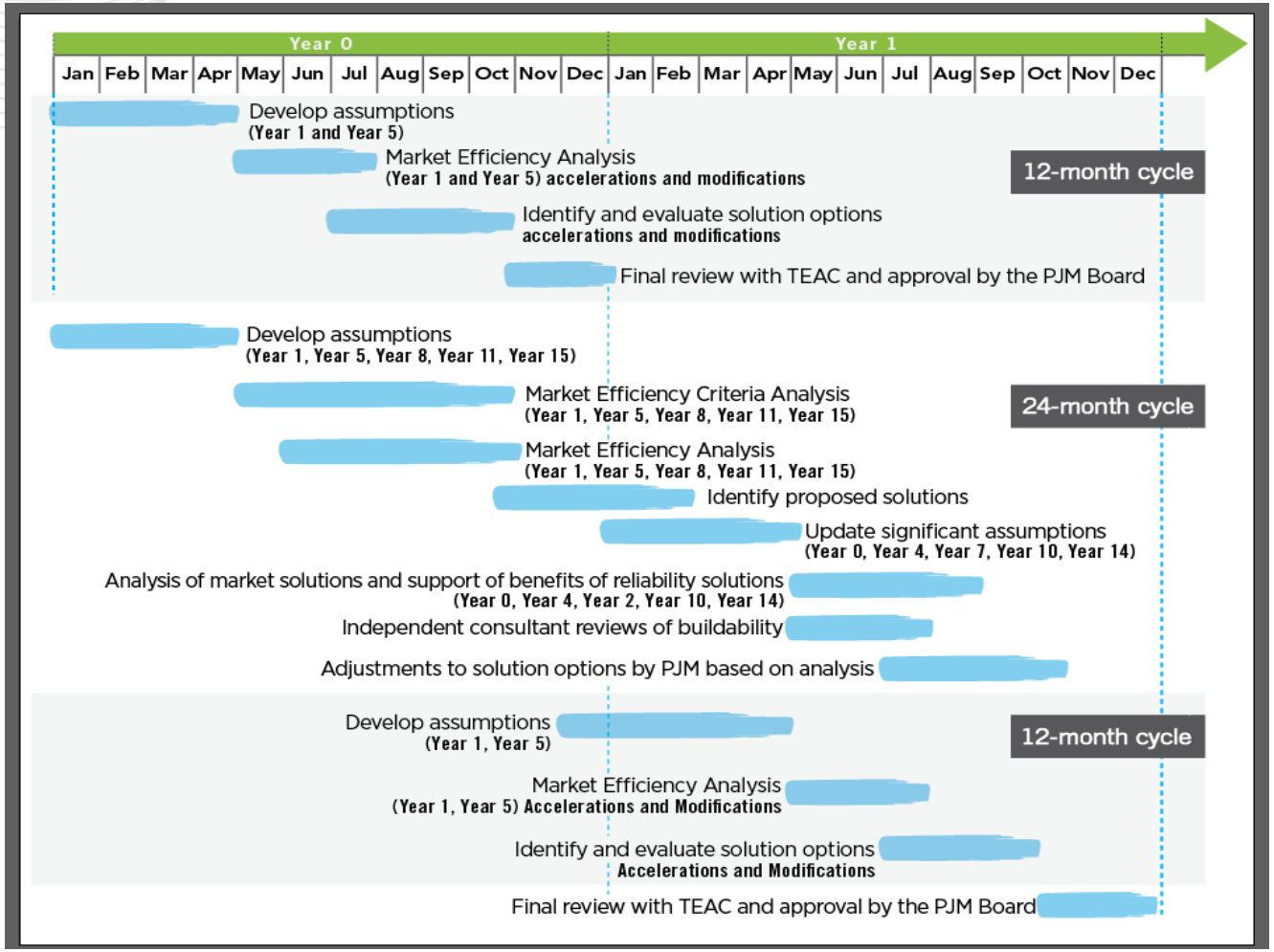
System Expansion Drivers



PJM's 2-year Reliability



PJM's 2-year Market Efficiency



2022 RTEP Assumptions

2022 RTEP Assumptions

- PJM annually presents the assumptions at the beginning of each year. See the link below for details of the presentation.

- https://www.pjm.com/-/media/committees-groups/committees/teac/2022/20220111/20220111-item-05a-2022-rtep-assumptions-update.ashx

Queue Project NOT Included in 2022 Series RTEP Cases

- Queue projects with an FSA or ISA but are not included in 2022 Series RTEP cases
  - Y3-092 (MTX)
    - 1000 MW Capacity Transmission Injection Rights
    - 500 MW Firm Transmission Withdrawal Rights and 500 MW Non-Firm Transmission Withdrawal Rights

2022 RTEP Assumptions

- PJM/NYISO Interface
  - B & C cables will be modeled out of service consistent with 2021 RTEP
- Linden VFT
  - Modeled at 330 MW
- HTP
  - Modeled at 0 MW
- Transource 9A project
  - Not included in model

24 Month RTEP

- As part of the 24-month RTEP cycle, a year 8 (2030) base case will be developed and evaluated as needed as part of the 2022 RTEP
- The year 8 case will be based on the 2027 Summer case that will be developed as part of this year's 2022 RTEP
- Purpose: To identify and develop longer lead time transmission upgrades

FERC 1000 Process

- Similar to the 2021 RTEP and 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 2021 RTEP.
  - Advance notice and posting of potential violations
  - Advance notice of window openings
  - Window administration

Expected Timeline

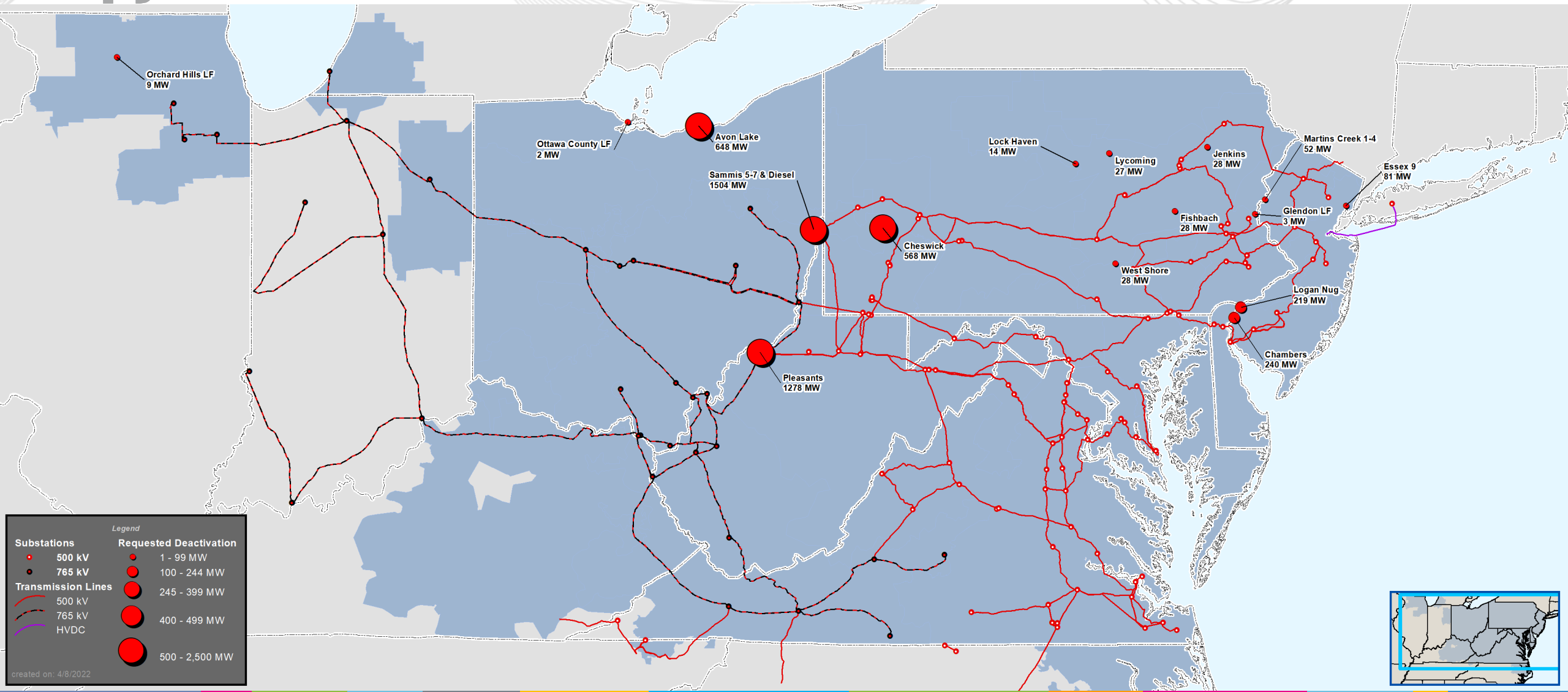
- June/July 2022
  - Open competitive proposal window
  - Post modeling assumptions changes and corrections for and begin mid-year retool of 2022 RTEP baseline analysis if required
    - Accounts for major new modeling assumption changes and corrections not previously considered.
    - Basic assumptions such as planning criteria and ratings methodology that changed after February will not be considered until the 2023 RTEP.
- July/August 2022
  - Close competitive proposal window
  - Finalize mid-year retool
- August to December 2022: Evaluate proposals
- October 2022 to February 2023: Approve proposals

Stakeholder Input and Information Items

- Input Requested:
  - Stakeholder suggestions for and input to 2022 alternative sensitivity studies and scenario analysis
- Information Items (Non-RTEP Scenarios Studied by PJM):
  - PJM participating in DOE Atlantic Offshore Wind Transmission study which may provide additional information for 2023 RTEP and beyond
  - PJM System Planning is working to outline a scope for looking at a low carbon future to discuss in RTEP scenario discussions later in 2022 or early 2023

Generation Deactivation Notification Update (Between 11/1/2021 and 4/1/2022)

Retirements



Deactivation Status

Unit(s)	Fuel Type	Transmission Zone	Requested Deactivation Date	PJM Reliability Status
Pleasant Unit 1 & 2 (1278 MW)	Coal	APS	6/1/2023	Reliability analysis underway
Sammis Unit 5, 6, 7, & Diesel (1504 MW)	Coal	ATSI	6/1/2023	Reliability analysis underway
Chambers CCLP (240 MW)	Coal	ACE	5/31/2022	Reliability analysis complete. No violation identified
Logan (219 MW)	Biomass	ACE	5/31/2022	Reliability analysis complete. No violation identified

Deactivation Status

Unit(s)	Fuel Type	Transmission Zone	Requested Deactivation Date	PJM Reliability Status
Essex 9 (81 MW)	Natural Gas	PSEG	6/1/2022	Reliability analysis complete. No violation identified
Ottawa County Project (1.7 MW)	Methane	ATSI	5/31/2022	Reliability analysis complete. No violation identified
Martins Creek CT 1 & 2 & 3 (35 MW)	Oil	PPL	5/31/2023	Reliability analysis complete. No violation identified
Martins Creek CT 4 (17.3 MW)	Natural Gas	PPL	5/31/2023	Reliability analysis complete. No violation identified

Deactivation Status

Unit Name	Fuel Type	Transmission Zone	Actual Deactivation Date	PJM Reliability Status
Fishbach CT 1 & 2 (28 MW)	Oil	PPL	4/1/2022	Reliability analysis complete; no impacts identified
Jenkins CT 1 & 2 (27.6 MW)	Oil	PPL	4/1/2022	Reliability analysis complete; no impacts identified
Lock Haven CT 1 (14 MW)	Oil	PPL	4/1/2022	Reliability analysis complete; no impacts identified
West Shore CT 1 & 2 (28 MW)	Oil	PPL	4/1/2022	Reliability analysis complete; no impacts identified
Williamsport-Lycoming CT 1 & 2 (26.6 MW)	Oil	PPL	1/12/2021	Reliability analysis complete; no impacts identified
Avon Lake 9 &10 (648 MW)	Coal	FirstEnergy	3/31/2022	Reliability analysis complete and upgrades expected to be completed in time for unit to deactivate as scheduled.

Deactivation Status

Unit(s)	Fuel Type	Transmission Zone	Withdrawn Deactivation Date	PJM Reliability Status
Cheswick 1 (568 MW)	Coal	PPL	3/31/2022	Reliability analysis complete and upgrades expected to be completed in time for unit to deactivate as scheduled.
Orchard Hills LF (9.3 MW)	Methane	ComEd	3/31/2022	Reliability analysis complete; no impacts identified
Glendon LF (2.9 MW)	Methane	ME	12/15/2021	Reliability analysis complete; no impacts identified

Generation Deactivation link:
https://www.pjm.com/planning/services-requests/gen-deactivations

PJM Market Efficiency Update

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2020/21 Long-Term Window 1

2020/21 Long-Term Window 1 – Analysis Completed

- Cluster No. 1 (APS) - French's Mill to Junction 138 kV
  - Analysis completed: Proposal 756, terminal equipment upgrades at the French's Mill and Junction 138 kV substations, with a projected in-service date of 4/1/22, selected as the preferred solution.

- Cluster No. 2 (PECO) - Plymouth Meeting to Whitpain 230 kV
  - Analysis completed: Proposal 704, terminal equipment upgrades at the Plymouth Meeting and Whitpain 230 kV substations, with a projected in-service date of 6/1/25, selected as the preferred solution.

- Cluster No. 3 (PPL) - Juniata to Cumberland 230 kV
  - Analysis completed: Proposal 218, reconductor the Juniata-Cumberland 230 kV line, with a projected in-service date of 12/1/23, selected as the preferred solution.

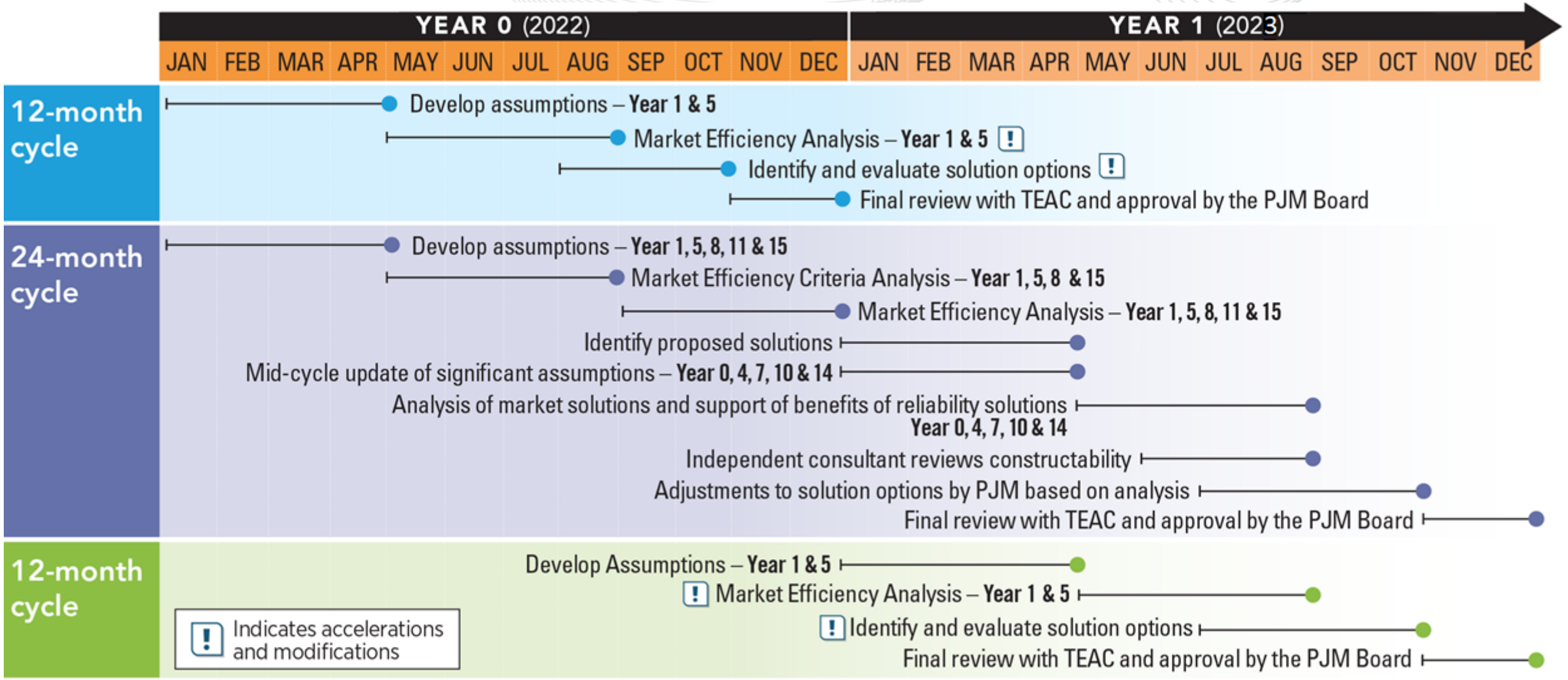
- Cluster No. 4 (DOM) - Charlottesville to Proffit 230 kV
  - Analysis completed: Proposal 651, series reactor on the Charlottesville-Proffit 230 kV line, with a projected in-service date of 6/1/23, selected as the preferred solution.

2020/21 Long-Term Window 1 – Proposals Approved by PJM Board

Proposal ID#	Proposal Baseline #	Project Description	Project Type	Transmission Owner	In-Service Date	Construction Cost ($MM)	B/C Ratio Metric	B/C Ratio	Percent Congestion Alleviated
218	b3698	Juniata-Cumberland 230kV Line Reconductor	Upgrade	PPL	12/1/2023	$9.00	Low voltage	11.28	100%
651	b3702	Charlottesville-Proffit 230kV Line Series Reactor	Upgrade	DOM	6/1/2023	$11.38	Low voltage	16.05	99.52%
704	b3697	Plymouth Meeting-Whitpain 230kV Terminal Upgrades	Upgrade	PECO	6/1/2025	$0.62	Low voltage	75.30	99.91%
756	b3701	French's Mill-Junction 138kV Terminal Upgrades	Upgrade	APS	4/1/2022	$0.77	Low voltage	119.03	100%

2022/23 Market Efficiency Cycle

2022/23 Market Efficiency Timeline



2022 Market Efficiency Assumptions

- Hitachi Energy PROMOD Database – Spring 2022.
- Powerflow consistent with the 2027 RTEP powerflow.
- Load Forecast and Demand Response based on PJM 2022 Load Forecast Report.
- Generation Expansion consistent with the machine list included in the Planning RTEP Powerflow.
- Fuel and Emissions Price forecasts provided by Hitachi Energy.
- Financial parameters Discount Rate and Carrying Charge, based on the Transmission Cost Information Center spreadsheet.