



Market Efficiency Update

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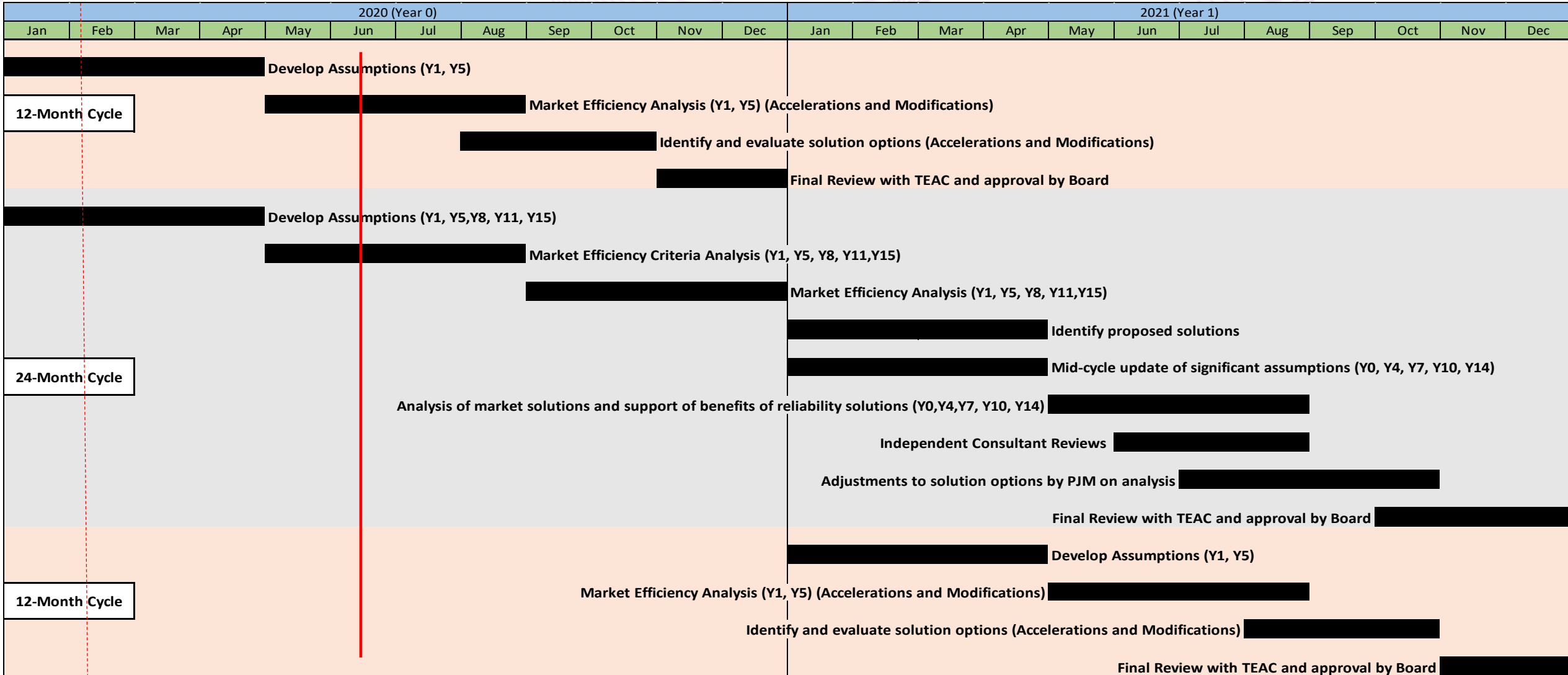
Transmission Expansion Advisory Committee

June 2, 2020

2020/2021 Long Term Window



2020/2021 Market Efficiency Cycle



Step	Timeline
Develop PJM Assumptions	January – April 2020
Current step => Build/Update PROMOD Model	May - August 2020
Post Preliminary Market Efficiency Base Case	August 2020
Post Whitepaper Input Assumptions	September 2020
Interregional Data Update	September – October 2020
Identify Eligible Congestion Drivers	September – November 2020
Post Sensitivity Scenarios	November 2020
Post Window Materials: Problem Statement, Eligible Congestion Drivers, Modeling Data	December 2020

Step	Timeline
Open Long - Term Window	January 2021 - April 2021
Mid-Cycle Update	January – April 2021
Analysis of Proposed Solutions	May - September 2021
Independent Cost/Constructability Review	June – August 2021
TEAC Reviews: 1 st and 2 nd reads	October – November 2021
PJM Board approval of selected solutions	December 2021

- Study Years
 - 2021, 2025, 2028, 2031, and 2035
- PROMOD database
 - Spring 2020 Data Release from ABB
 - Fuel/Emissions price forecasts from ABB, May 2020 update
 - Load forecast from PJM 2020 Load Forecast Report
 - 2025 Summer Peak load flow case from 2020 RTEP series
 - PJM topology includes all RTEP upgrades approved through February 2020
 - Generation Expansion consistent with the machine list included in the 2025 RTEP Powerflow
- Simulations performed using PROMOD IV v11 engine

- Load Forecast
- Demand Resources Forecast
- Generation Expansion Plan
- Transmission Constraints
- Financial Parameters
 - Carrying Charge rate and Discount rate
- Fuel and Emissions Price Forecast

- 2025 PJM topology is based on the 2025 Summer Peak planning case from 2020 RTEP series
 - Winter ratings consistent with the 2025 Winter Peak planning case
- PJM topology includes all RTEP upgrades approved through February 2020
- External world representation will be updated as necessary based on data exchange with neighboring entities

- PJM zonal peak and energy forecast from 2020 Load Forecast Report

PJM Peak Load and Energy Forecast

Load Forecast	2021	2025	2028	2031	2035
Peak (MW)	149,616	153,315	156,014	157,637	159,868
Energy (GWh)	789,236	817,966	834,225	843,471	857,016

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.*

- Model zonal demand resources consistent with Table B-7 of the 2020 Load Forecast Report

PJM Demand Resource Forecast

	2021	2025	2028	2031	2035
Demand Resource (MW)	8,955	9,172	9,293	9,405	9,494

- Market Efficiency Base Case Generation Expansion Plan includes all existing and ISA (Interconnection Service Agreement) level generators
 - Generators with Interim ISA and Suspended ISA status are not included
- Machine list posted at March TEAC
 - <https://www.pjm.com/-/media/committees-groups/committees/teac/2020/20200310/20200310-teac-info-only-2020-rtep-machine-list.ashx>
- Announced retirements are modeled

- Thermal constraints based on
 - NERC book of flowgates
 - Planning study results for monitored facilities and monitored/contingency pair facilities
 - Historical PJM congestion events
 - M2M flowgates
- Voltage Constraints
 - PJM reactive interface limits
 - MW limits based on historical values and voltage stability analysis
 - RTEP upgrades impact future reactive interface limits

- Discount rate and levelized Carrying Charge rate are developed using information contained in TO Formula Rate sheets (Attachment H) [1]
 - Discount rate based on weighted average after-tax embedded cost of capital
 - Levelized annual carrying charge rate based on weighted average levelized plant carrying charge rate
- Updated values for the financial parameters to be posted before the opening of the 2020/21 Long-Term Window
- Carrying Charge rate calculation details can be found on the Transmission Cost Information Center page
 - <http://www.pjm.com/planning/rtep-upgrades-status/cost-allocation-view.aspx>

[1] <http://www.pjm.com/markets-and-operations/billing-settlements-and-credit/formula-rates.aspx>

- V1 – 5/27/2019 – Original slides posted