



Education on FERC Order No. 1920 Section III: Long-Term Regional Transmission Planning

Emmanuele Bobbio
Scenario Analysis & Special Studies

Special TEAC – Order 1920
August 27, 2024

- LTRTP Cycle and Scenario requirements
- Factor Categories
- Benefits
- Evaluation Process and Selection Criteria
- Coordination with Order No. 1000



Must Complete Cycle Within 3 Years

Can Select Additional Projects

Must Start New Cycle At Least Every 5 Years

- Designate point when cycle ends (no additional project can be selected)

- At least 3 scenarios
 - At least 20-year horizon (from LTRTP cycle start)
 - At least one extreme weather sensitivity per scenario
 - Scenarios must be plausible and diverse
 - *Plausible*: each scenario must be reasonably probable; the three scenarios collectively capture probable future outcomes
 - *Diverse*: represent a reasonable range of probable future outcomes
 - Use *best-available data*
 - Timely, developed using best practices, and diverse and expert perspectives
 - Declined to standardize inputs or establish accuracy standards
 - If using a base scenario, the base scenario must be the most probable

Required Factor Categories

1. Laws and regulations affecting future resource mix and demand
2. Laws and regulations on decarbonization and electrification
3. Integrated Resource Plans and expected supply obligations for LSEs
4. Trends in technology and fuel costs within and outside of the electricity supply industry, including shifts toward electrification of buildings and transportation
5. Retirements
6. Generation interconnection requests and withdrawals
7. Utility and corporate commitments and other public policy goals

1. Laws and regulations affecting future resource mix and demand
 - Includes local siting restrictions
2. Laws and Regulations on Decarbonization and Electrification
 - e.g., limits to generation carbon intensity and electrification in transportation and buildings
4. Trends in technology and fuel costs
 - Declined to require consideration of transmission facility cost trends
5. Retirements (likely resource retirements beyond those that have been publicly announced)
 - Order's examples, age-based retirements or using estimated revenue adequacy
6. Interconnection requests and withdrawals
 - Discretion, e.g. duplicative and speculative projects
7. Utility and Corporate commitments and other public policy goals
 - Includes Public Policy Objectives

- Outline in planning protocol **open and transparent process** providing states/stakeholders with meaningful opportunities to propose factors and give feedback on how to account for them
 - *Publish*: 1) list of factors 2) each factor's description 3) general explanation of how the factor is accounted for 4) discounting 5) list of factors not included
 - *Declined* to require explanation of discounting
- Discounting:
 - May not discount Factors in Categories One-Three
 - Can discount Factors in Categories Four-Seven provided Long-Term Scenario is plausible
- PJM ultimately decides what factors are likely to affect Long-Term Transmission Needs
- No obligation for PJM to independently identify Factors in Categories One-Three
 - Open and transparent process also for stakeholders to provide Factors for PJM's consideration

- Obtained by changing load, generation, generation outages, and transmission outages in the corresponding scenario
- Sensitivity can be conducted before or after solutions' identification
- Sensitivity can be used to calculate Benefit 6
 - Reduced loss of load, production cost savings, and increased Interregional Transfer Capability provided by Long-Term Regional Transmission facilities during extreme weather events and unexpected system conditions

Required Benefits

1. Avoided or deferred reliability transmission facilities and aging transmission infrastructure replacement
2. a) Reduced loss of load probability *or* b) Reduced planning reserve margin
3. Production Cost Savings
4. Reduced Transmission Energy Losses
5. Reduced Congestion Due to Transmission Outages
6. Mitigation of Extreme Weather Events and Unexpected System Conditions
7. Capacity Cost Benefits from Reduced Peak Energy Losses



Explanation of the Seven Enumerated Benefits (*interpretation*)

1. Avoided or deferred reliability transmission facilities and aging transmission infrastructure replacement
 - Avoided in-kind replacements; avoided or deferred lower kV investments; avoided or deferred future transmission investments; reduced re-builds
2. a) Reduced loss of load probability *OR* b) Reduced planning margins
 - a) Keep same capacity expansion and calculate economic value of reduced unserved energy with more robust transmission
 - b) Re-calculate capacity expansion with more robust transmission and quantify the reduction in generation/storage investments needed for 1-in-10
3. Standard measure of production cost savings from more robust transmission

4. Reduced Transmission Energy Losses

- More robust transmission reduces losses which can be quantified and valued using the avoided cost of producing that energy

5. Reduced Congestion Due to Transmission Outages

- Production cost impacts from transmission outages with and without the project/plan/portfolio

6. Mitigation of Extreme Weather Events and Unexpected System Conditions

- Calculate change in production cost savings and the value of reduced unserved energy associated with increased transfers during system events
 - Extreme weather
 - Fuel availability or high fuel costs
 - Forecast errors
- Account for increased interregional transfer capability LTRT facilities
- (Note, the difference with benefit 2a is that traditionally resource adequacy assessments do not account for correlation across supply/demand variables)

7. Capacity Cost Benefits from Reduced Peak Energy Losses

- Less capacity needed for 1-in-10 with reduced losses (pairs with Benefit 4)

- Provide general description of measurement method in planning protocol
- Calculate benefits for at least 20 years from expected in-service date
- May not discount benefits based on certainty
- Can use both a project-by-project and portfolio approach within the same cycle
 - But should specify in planning protocol that portfolio approach can be used

- Requirements:
 1. Identify one or more LTRT Facilities that address LT Needs
 - Specify in planning protocol point when PJM accepts proposals
 2. Measure benefits & costs in addition to other qualitative and quantitative criteria
 3. Designate a point at which selection is made (within 3 years from cycle start)
 4. Provide sufficiently detailed determinations for selection or non-selection
 - Make methods transparent
- No requirement to select any projects
 - TP can impose requirement to select LTRT Facilities in certain circumstances
 - Must provide voluntary funding opportunities to Relevant State Entities and interconnection customers for facilities not meeting selection criteria

- Requirements (continued)
 - Must maximize benefits without over-building
 - Can use benefits minus costs, or benefit-to-cost ratio, or other
 - If using benefit-to-cost ratio, the threshold cannot be greater than 1.25-to-1.00
 - Can include other qualitative considerations
 - Cannot adopt an approach that selects only projects meeting selection criteria in every scenario
 - Require to consult with and seek support of Relevant State Entities for evaluation process, selection criteria, and voluntary funding opportunities
 - “[...] any state entity responsible for electric utility regulation or siting electric transmission facilities within the state or portion of a state located in the transmission planning region, including any state entity as may be designated for that purpose by the law of such state.” ¶1355

- Required reevaluation in certain circumstances, *and only these circumstances*:
 1. Development delays which raise reliability concerns
 2. Significant cost increases
 - Reevaluation only allowed in subsequent cycles following selection
 3. Changes in laws and regulations such that facility may fail selection criteria
 - In current cycle only if in-service date is in the second half of 20-year planning horizon
 - Otherwise only in subsequent cycles
- Specify in planning protocol criteria for 1-3
- Must designate a point after which no reevaluation

- Explain on compliance LTRTP interaction with other planning processes
 - LTRTP and Order No. 1000 can overlap and are likely to inform one another
 - Possible displacement of regional facilities from existing processes
- Modeling of Public Policy Requirements (PPRs) in LTRTP is sufficient for compliance with Order No. 1000 requirement to consider PPRs
- Can combine Order No. 1000 Near-Term and LTRTP processes into a single process (Order No. 1920 prevails in case of conflicting requirements)
- If a transmission facility is selected as part of one process, the cost allocation rules for that process apply

- Three scenarios and three extreme weather sensitivities
 - 20 year horizon
 - three year cycle (at most) repeated every five years (at least)
- Seven required Factor Categories
- Seven Benefits required for evaluation

Presenter:

Emmanuele Bobbio

Emmanuele.Bobbio@pjm.com

Education on FERC Order No. 1920 Section III: Long-Term Regional Transmission Planning



Member Hotline

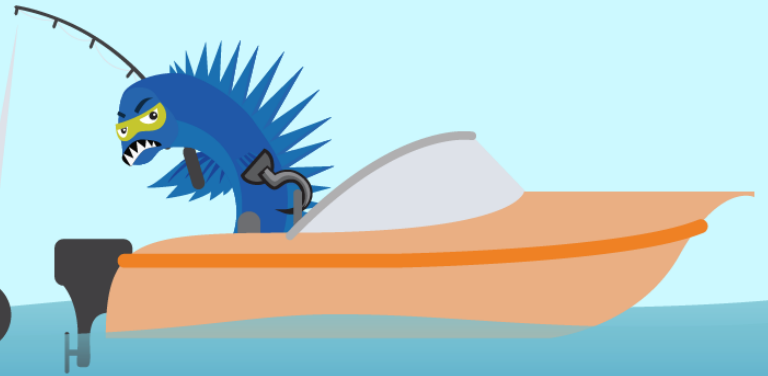
(610) 666-8980

(866) 400-8980

custsvc@pjm.com

**PROTECT THE
POWER GRID**

**THINK BEFORE
YOU CLICK!**



**BE ALERT TO
MALICIOUS PHISHING
EMAILS**



**Report suspicious email activity to PJM.
Call (610) 666-2244 or email it_ops_ctr_shift@pjm.com**