

EKPC Local Planning Assumptions for 2027 Planning Cycle

December 2026

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EKPC Project Identification Process

- EKPC develops three different categories of projects:
  - **Baseline projects** are projects that address planning criteria violations which originate from internal analysis and/or PJM RTEP analysis.
  - **Network upgrade projects** are developed in conjunction with PJM to provide facilities for connection of new generation facilities and/or upgrades in output of existing generation facilities.
  - **Supplemental projects** are not covered by baseline analysis and address the following drivers:
    - Equipment Material Condition, Performance and Risk
    - Operational Flexibility and Efficiency
    - Customer Service
    - Infrastructure Resilience
    - Other

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EKPC Baseline Planning Criteria

- EKPC plans its system to meet:
  - NERC TPL Reliability Standards
  - SERC regional criteria
  - PJM planning criteria
  - EKPC transmission planning criteria
- EKPC planning criteria for both BES and non-BES facilities is similar to Table 1 of the existing NERC TPL Standards in most respects
  - Primary difference -- EKPC considers the loss of a line, transformer, or generator in conjunction with the loss of a generator to be a single-contingency (P1) event subject to the performance requirements for P1 events.
  - EKPC planning criteria are posted at http://www.pjm.com/planning/planning-criteria/to-planning-criteria.aspx

EKPC Baseline Planning Methodology & Assumptions

- EKPC will share its baseline assessment results with PJM, and will work with PJM to analyze and validate results.
- EKPC generally uses a 15-year baseline planning horizon, but will expand the planning horizon to 20 years as appropriate and necessary for specific areas of its system.
- EKPC will either interpolate or extrapolate power flow results from these models to determine specific timing of needs.

EKPC Baseline Planning Methodology & Assumptions (cont.)

- EKPC jointly develops internal base cases with LGE/KU for EKPC baseline project planning studies
  - EKPC and LGE/KU have 57 free-flowing interconnections
  - EKPC has 58 distribution delivery points connected to the LGE/KU system (800+ MW at peak)
  - LGE/KU has 14 distribution delivery points connected to the EKPC system (~100 MW at peak)
  - System topology is based on the 2025 MMWG modeling efforts extended to include both the EKPC and LGE/KU respective area topology updates since the creation of the MMWG models.
    - All EKPC known future baseline and supplemental projects are modeled as in-service in the appropriate year.
- EKPC considers external contingencies from neighboring systems (AEP, DEOK, LGE/KU, and TVA) in addition to all internal EKPC contingencies in its baseline project planning

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EKPC Baseline Planning Methodology & Assumptions

- For the 2027 planning cycle, EKPC utilizes the following power flow models for assessment of EKPC's Form 715 criteria violations:
  - 2028, 2031, 2036, 2041, 2046 summer peak (50% load probability)
  - 2028/29, 2031/32, 2036/37, 2041/42, 2046/47 winter peak (50% load probability)
  - 2028, 2031, 2036, 2041, 2046 summer extreme (10% load probability)
  - 2028/29, 2031/32, 2036/37, 2041/42, 2046/47 winter extreme (10% load probability)

- All power-flow models, analysis files, and results can be provided to interested stakeholders via PJM's CEII process.

EKPC Baseline Planning Methodology & Assumptions (cont.)

- EKPC uses the following load forecast assumptions/methodology:
  - EKPC uses substation load forecasts developed internally using a top-down approach
    - Start with overall EKPC system forecast developed by EKPC Load Forecasting department approved by EKPC's Board of Directors. For the 2027 planning cycle, the load forecast was approved in 2024.
    - The overall EKPC system forecast is segmented by the EKPC Load Forecasting department among the 16 EKPC distribution cooperatives based on a variety of factors including historical load and anticipated growth in residential, commercial, and industrial builds, etc.
    - EKPC Transmission Planning then allocates each distribution cooperative forecast among the delivery points for that distribution cooperative using historical load data.
      - Individual substation forecasts are modified as necessary based on known or likely added customer demand.

EKPC Baseline Planning Methodology & Assumptions (cont.)

- EKPC baseline planning models use two sets of forecast probabilities
  - 50/50 probability for summer and winter (equal probability of actual load being above or below the forecast)
  - 90/10 probability for summer and winter (10% probability of actual load reaching the forecast)

- Modeled power factor at each substation is based on the substation's previous year actual power factor at summer peak (for summer models) and winter peak (for winter models).

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EKPC Baseline Planning Methodology & Assumptions (cont.)

- EKPC uses the following generation assumptions:
  - EKPC generators are dispatched as needed to meet EKPC load based on economic merit order.
  - The Laurel Dam and Greenup hydroelectric facilities are connected to the EKPC transmission system, and are therefore modeled as generation within the EKPC zone.
    - For baseline planning studies, EKPC assumes the Laurel Dam generation is online.
      - Historical data has shown that the facility generates during peak-load conditions, and therefore a reasonable likelihood that generation will be available.
    - For baseline planning studies, EKPC assumes the Greenup Hydro generation is at half output and non-scalable.
      - Rationale for this assumption is this unit is run of river and the uncertain nature of the water level that controls the units output.

EKPC Baseline Planning Methodology & Assumptions (cont.)

- EKPC will use the following solar generation assumptions for facilities that have executed GIA and KY Certificate to Construct:
  - Solar generating facilities connected to the EKPC transmission system will be modeled as generation within the EKPC zone.
    - For baseline planning studies, EKPC will model solar facilities without storage at 90% of the PJM-identified maximum facility output in the summer peak models and zero output in the winter peak models.
    - For baseline planning studies, EKPC will model solar facilities with storage at 100% of the PJM-identified maximum facility output for the solar and storage in the summer peak models and only the storage output in the winter peak models.
- EKPC will use the following behind the meter (BTM) generator assumptions:
  - BTM generation will not be explicitly modeled.
  - We do not net out BTM generation for the majority of the delivery points. Bromley EK is reduced by the generator actual output.

EKPC Baseline Planning Methodology & Assumptions (cont.)

- EKPC uses the generation dispatch scenarios below during annual planning analysis. These generation dispatch scenarios, when coupled with a contingency, are assumed to create the worst case power flow condition for the EKPC system.

Generation Outages with Replacement Generation Imported from **North** of EKPC's System	
Brown 3	Cooper 1&2
Cooper 3 CT&ST-1	Greenup Hydro
JK Smith 9&10	Laurel Dam
Liberty RICE 1-6	AC1-074/075
AD2-048	AE1-143
AE2-071/AF1-203	AE2-254
AE2-308	AE2-339
AF1-038	AF1-050
AF1-083	

Generation Outages with Replacement Generation Imported from **South** of EKPC's System	
Big Sandy	Brown 3
Cooper 1&2	Cooper 3 CT&ST-1
Ghent 2	Greenup Hydro
JK Smith 9&10	Laurel Dam
Liberty RICE 1-6	Mill Creek 4
Spurlock 2	Trimble 2
AC1-074/075	AD2-048
AE1-143	AE2-071/AF1-203
AE2-254	AE2-308
AE2-339	AF1-038
AF1-050	AF1-083

Supplemental Projects

- Supplemental Projects – EKPC supplemental projects are identified based on the following drivers:
  - Equipment Material Condition, Performance and Risk
  - Operational Flexibility and Efficiency
  - Customer Service
  - Infrastructure Resilience
  - Other

Supplemental Projects – Equipment Material Condition, Performance and Risk

- **Equipment Material Condition, Performance and Risk projects** are identified to address degraded equipment performance, material condition, obsolescence, equipment failure, safety and environmental impact.
- Project drivers include:
  - Safety
  - Transmission infrastructure replacements based on condition, obsolescence, or equipment that has reached its end of life
  - Environmental drivers
  - Other
- Inputs considered include:
  - Outage history, maintenance history, condition assessment reports, number of customers/amount of load/type of load at risk, current EKPC standards for design or equipment type, etc.

Supplemental Projects – Operational Flexibility and Efficiency

- **Operational Flexibility and Efficiency projects** are identified to optimize system configuration, equipment duty cycles, restoration capabilities and to minimize outages.
  - Project drivers include:
    - Enhancing system functionality, flexibility, or operability
    - Recurring real time equipment overloads and/or undervoltages
    - PCLLRW frequency
    - Number of outages and annual outage duration
    - Load exposure
    - Adding additional capacity/margin in the system for adequate performance during extreme load events and/or multiple simultaneous facility outages
  - Inputs considered include:
    - Number of customers/amount of load/type of load at risk, number of PCLLRWs, restrictions in ability to take maintenance outages, operational loading/voltage concerns, etc.

Supplemental Projects – Customer Service

- **Customer service projects** are identified to address customer outage exposure, equipment loading, load growth or to interconnect new customer load.
  - Project drivers include:
    - Member System Needs
      - Identified based on Member System requirements for service to end-use customers
    - SAIDI, CAIDI, number of outages and annual outage durations
    - New customer connections/modifications to existing customer connections
    - Economic development infrastructure needs
  - Inputs considered include:
    - Member system/customer input, ability to serve from existing system, outage history, etc.

Supplemental Projects – Infrastructure Resilience

- **Infrastructure Resilience projects** improve the system's ability to anticipate, absorb, adapt to, and/or rapidly recover from a potentially disruptive event, including severe weather, geo-magnetic disturbances or physical and cyber security challenges.
- Project drivers include:
  - Network existing radial facilities
  - Building new 69kV for future higher voltage conversion and eliminate 69kV in dense load pockets
  - Adding redundant facilities
  - Infrastructure hardening (additional physical/cyber security, replacement of equipment, etc.)
  - Limiting the number of taps/distribution substations between circuit breakers
- Inputs considered include:
  - Load exposure, long-term plan compatibility, outage history, type/amount of load at risk, environmental considerations, etc.

Supplemental Projects – Other

- These projects would address concerns not discussed in the other definitions.
- Project drivers include:
  - Industry recommendations
  - Technological pilot projects
  - Potential generation retirements
  - Other drivers not covered by other categories of Supplemental Projects

EKPC Project Cost Estimates

- The estimated project costs EKPC provides as part of the solution presentations are preliminary in nature and are based on the initial scope identified for the projects. These estimates are targeted to be (+/-) 50% of the actual project cost.

- These estimates are generally based on past actual costs of projects that are similar in nature and have not been refined at this point based on a more detailed engineering effort. EKPC includes appropriate levels of contingency in these estimates to account for the very early nature of these estimates, as well as uncertainties typically applicable to each specific type of transmission projects.

- EKPC continues to update and refine these cost estimates as projects progress beyond the initial stage, and these updated estimates are provided to PJM for posting on its Project Status & Cost Allocation page.

EKPC Project Approval Process

- EKPC has a Capital Management Committee (CMC) responsible for overseeing the transmission capital project development process.
  - Process starts with a problem to be addressed.
    - A solution can be approved immediately by the CMC without formation of an SME team of development of alternatives.
    - Otherwise, an SME team is established to develop solution alternatives to address the identified problem.
    - Each alternative is scored to determine the best holistic solution to recommend for CMC approval.
    - All alternatives considered and the recommended solution are presented to the CMC.
    - CMC decides whether to approve the recommended solution, an alternative solution, or to not address the problem with a project for a supplemental need.
  - All projects approved by the CMC move on for final approval at the appropriate EKPC management level (COO, CEO, and Board of Directors) based on project cost.



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EKPC Assumptions and Methodology – EOL Needs

SRRTEP- Western Committee Meeting

December 2026

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Attachment M3 Project Assumptions – EOL Needs

Attachment M3 EOL planning criteria - section (d) (1) (ii)

- Presented annually
  - Sub-regional RTEP assumptions meeting - section (c) (2)
  - Separately delineated
- Candidate EOL needs list
  - Identified by EOL planning process
  - Five-year projection
  - Submitted annually to PJM
  - Non-public, confidential, non-binding
  - EKPC is committed to the process

Attachment M3 Project Assumptions – EOL Needs

EOL Needs – (b) (5)

- TO deems asset to be near the end of is useful life
  - Population
    - Transmission lines 100kV and above
      - EKPC has 906 miles of line in this category
    - Transformers
      - Not connected to distribution
      - 100kV and above on high-side
      - EKPC has 45 large power transformers in this category

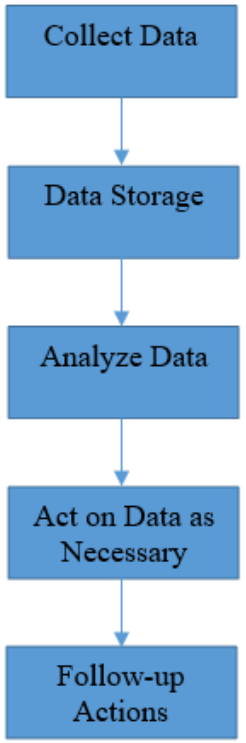
Attachment M3 EOL Methodology

EKPC EOL Methodology

- In-line with the Supplemental Project process
  - Equipment material condition, performance, and risk
    - Associated drivers as explained on slide 13
    - Subject to EKPC internal project process
    - EKPC is utilizing industry best practices to improve asset health strategies
- Starts with a prescribed data-set for each asset
- The asset population is ranked based on performance and condition
- Subject matter experts prioritize detailed assessment
- Asset assessment examples
  - On-site drone evaluations
  - Engineering studies
  - Conductor strength testing
  - Third party inspection and testing

Attachment M3 EOL Methodology

- EKPC acts on assessment findings
  - SME report review
  - Maintenance actions needed?
  - Follow up actions
    - PJM Attachment M3 process
      - Draft the five-year EOL candidate list
    - EKPC internal project process
      - Includes additional criticality factors
        - Risk-based prioritization.



Example – Asset EOL Candidate List

Data analysis

- Subject matter experts
  - A Score is generated from condition and performance data
    - Condition is weighted heavier as shown in the example below
    - Scores used for assessment prioritization
    - EOL candidates are determined from results of the detailed assessment of the asset
  - Confirm 5 year EOL candidate list

Factor	Weight Percentage
Condition	75
Performance	25

Example – Asset EOL Candidate List

Performance Data

- Outages in the last five years
- System studies

Condition Data Examples

- Transformers
  - Age factored into score
  - Dissolved gas analysis (DGA) history
    - (evidence of internal arcing or thermal fault)
  - Inspection and routine test data
    - Test results (power factor, partial discharge, infrared)
    - Visual inspections
    - Cooling system issues (fans, pumps, gauges)
  - On-site detailed condition assessments
  - DGA data acquired from laboratory sampling and on-line monitoring
    - Results can drive real time maintenance decisions

Example – Asset EOL Candidate List

Condition Data Examples

- Transmission Lines (regular patrols and detailed assessments as warranted)
  - Focused on >40 years old, but accelerated degradation may also occur
  - Structure Issues (rust, loose components, rot, woodpecker holes, cross arm issues)
  - Conductor (splice issues, steel core corrosion and pitting, vandalism, broken strands)
  - Insulators flashed or broken
  - Guy, ground and static wire condition



Questions and Discussion

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