Lackawanna - Siegfried - Drakestown 500 kV line project

General Information

Proposing entity name	Proprietary Information
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	Proprietary Information
Company proposal ID	Proprietary Information
PJM Proposal ID	922
Project title	Lackawanna - Siegfried - Drakestown 500 kV line project
Project description	Construct a new 500 kV line from Bay 2E in the Lackawanna 500 kV yard for 72.6 miles to a new Siegfried 500 kV Switchyard at the same location as the existing Siegfried 230/138 kV Substation. Utilize triple bundle 1590 ACSR with a rating of 3637 MVA SN, 4503 MVA SE, 4156 MVA WN, and 5022 MVA WE. At the existing Siegfried 230/138 kV Substation location, construct a new GIS 4 bay (7 bay full future expandability), double bus double breaker (DBDB) 500 kV switchyard that will be called Siegfried 500 kV Switchyard. Bifurcate the Susquehanna – Wescosville 500 kV line near the Siegfried 500 kV Switchyard and extend the lines into the new yard on a short double circuit of less than 1 mile. Convert the entire Siegfried - Martins Creek 230 kV # 1 line to 500 kV operation, which it is already designed to accommodate. This ~ 24.5 mile line conversion would ultimately represent the Pennsylvania portion of the Siegfried - Drakestown 500 kV line once combined with one of the two alternate proposals 2024-W1-546 or 2024-W1-900 to complete the 500 kV line to Drakestown in NJ. (Note that despite all ratings shown in this proposal being the intended final ratings for these upgrades, all 500 kV IDEVs provided to PJM by Proposer presently have Proposer standard 500 kV line ratings of 2707 MVA SN, 3112 MVA SE, 3207 MVA WN, and 3566 MVA WE in case equipment limitations are encountered during pursuit of this project that cause the anticipated ratings to be reduced. If standard ratings are exceeded during PJM assessment, Proposer would like to be made aware of 500 kV elements that must be held to proposed ratings.)
Email	Proprietary Information
Project in-service date	12/2032
Tie-line impact	Yes
Interregional project	No

Is the proposer offering a binding cap on capital costs?	Yes
Additional benefits	Proprietary Information

Project Components

1. Lackawanna 500 kV yard reconfiguration
2. Siegfried 500 kV Switchyard
3. Susquehanna - Wescosville 500 kV line taps into new Siegfried 500 kV yard
4. Lackawanna - Siegfried 500 kV line
5. Siegfried - Drakestown 500 kV line (PA segment)

Substation Upgrade Component

Component title	Lackawanna 500 kV yard reconfiguration
Project description	Proprietary Information
Substation name	Juniata 500/230 kV Substation
Substation zone	PPL
Substation upgrade scope	At Lackawanna, install one 500 kV dead-end structure, one 3000 A MOD and associated equipment in bay position 1E. Move the existing Lackawanna – Hopatcong 500 kV line to the new bay position 1E. Utilize triple bundle 1590 ACSR with a rating of 3637 MVA SN, 4503 MVA SE, 4156 MVA WN, and 5022 MVA WE for the line re-termination. Install dual 144 count OPGW if needed.

Transformer Information

None

New equipment description	One 500 kV dead-end structure One 3000 A MOD Associated equipment in bay position 1E Triple bundle 1590 ACSR down-comers for new line termination in bay position 1E Dual 144 count OPGW if necessary
Substation assumptions	Existing Lackawanna - Hopatcong 500 kV line will be shifted to bay position 1E to create a position for the new line that will not introduce the potential for a breaker failure that takes out two 500 kV lines.

Real-estate description	No station expansion required. Project anticipated to fit within existing fence line.
Construction responsibility	Proprietary Information
Benefits/Comments	Proprietary Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary Information
Permitting / routing / siting	Proprietary Information
ROW / land acquisition	Proprietary Information
Materials & equipment	Proprietary Information
Construction & commissioning	Proprietary Information
Construction management	Proprietary Information
Overheads & miscellaneous costs	Proprietary Information
Contingency	Proprietary Information
Total component cost	$4,516,250.00
Component cost (in-service year)	$5,645,055.13

Substation Upgrade Component

Component title	Siegfried 500 kV Switchyard
Project description	Proprietary Information
Substation name	Siegfried 500 kV Switchyard
Substation zone	PPL

Substation upgrade scope	Siegfried 500kV Switchyard: At the existing Siegfried 230/138 kV Substation location, construct a new GIS 4 bay, double bus double breaker (DBDB) 500 kV switchyard that will be called Siegfried 500 kV Switchyard. In the initial construction, four bays with two GIS circuit breakers each would be constructed. For the entire station, there will be a total of eight 4000 A GIS circuit breakers and sixteen 4000 A GIS MODs in the initial construction's design, with room in the full design to accommodate three future DBDB bays. All substation conductors and equipment will have a minimum rating of 3609 MVA SN, 4149 MVA SE, 4276 MVA WN, and 4755 MVA WE. For station service, install three PVTs on the North bus, and obtain 3 phase service from local distribution system or install three PVTs on the South bus. Install portable generator hook-up. Coordinate all relaying with Susquehanna, Lackawanna, Drakestown, and Wescosville. Terminate fiber into the new Siegfried control house.

Transformer Information

None

New equipment description	New GIS 4 bay, double bus double breaker (DBDB) 500 kV switchyard Eight 4000 A GIS circuit breakers Sixteen 4000 A GIS MODs All substation conductors and equipment will have a minimum rating of 3609 MVA SN, 4149 MVA SE, 4276 MVA WN, and 4755 MVA WE Three PVTs on the North bus Obtain 3 phase service from local distribution system or install three PVTs on the South bus Install portable generator hook-up Terminate fiber into the new Siegfried control house
Substation assumptions	Existing land owned by the Proposer is available next to existing Siegfried 230/138 kV Substation with a footprint that has been determined to be large enough to accommodate the proposed 500 kV GIS station described in this proposal.
Real-estate description	Existing land owned by the Proposer is available next to existing Siegfried 230/138 kV Substation with a footprint that has been determined to be large enough to accommodate the proposed 500 kV GIS station described in this proposal.
Construction responsibility	Proprietary Information
Benefits/Comments	Proprietary Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary Information
Permitting / routing / siting	Proprietary Information
ROW / land acquisition	Proprietary Information
Materials & equipment	Proprietary Information

Construction & commissioning	Proprietary Information
Construction management	Proprietary Information
Overheads & miscellaneous costs	Proprietary Information
Contingency	Proprietary Information
Total component cost	$81,000,000.00
Component cost (in-service year)	$101,245,383.94

Transmission Line Upgrade Component

Component title	Susquehanna - Wescosville 500 kV line taps into new Siegfried 500 kV yard
Project description	Proprietary Information
Impacted transmission line	Susquehanna - Wescosville 500 kV line
Point A	Susquehanna
Point B	Wescosville
Point C	
Terrain description	Immediately adjacent to Siegfried transmission yard. Mountainous terrain.
Existing Line Physical Characteristics	
Operating voltage	500
Conductor size and type	Double bundle 2493 ACAR 54/37 conductor
Hardware plan description	New hardware will be installed with the new facilities.
Tower line characteristics	New transmission poles will be installed.
Proposed Line Characteristics	

	Designed	Operating
Voltage (kV)	500.000000	500.000000

	Normal ratings	Emergency ratings
Summer (MVA)	3637.000000	4503.000000
Winter (MVA)	4156.000000	5022.000000
Conductor size and type	Triple bundle 1590 ACSR conductor	
Shield wire size and type	Dual 144 count OPGW	
Rebuild line length	Less than 1 mile	
Rebuild portion description	Susquehanna - Wescosville 500 kV line will be bifurcated and brought into the Siegfried 500 kV yard on DCT tower for less than 1 mile in distance.	
Right of way	No additional ROW required to accommodate this project.	
Construction responsibility	Proprietary Information	
Benefits/Comments	Proprietary Information	
Component Cost Details - In Current Year $		
Engineering & design	Proprietary Information	
Permitting / routing / siting	Proprietary Information	
ROW / land acquisition	Proprietary Information	
Materials & equipment	Proprietary Information	
Construction & commissioning	Proprietary Information	
Construction management	Proprietary Information	
Overheads & miscellaneous costs	Proprietary Information	
Contingency	Proprietary Information	
Total component cost	$9,871,250.00	
Component cost (in-service year)	$12,338,499.95	

Greenfield Transmission Line Component

Component title	Lackawanna - Siegfried 500 kV line	
Project description	Proprietary Information	
Point A	Lackawanna	
Point B	Siegfried	
Point C		
	Normal ratings	Emergency ratings
Summer (MVA)	3637.000000	4503.000000
Winter (MVA)	4156.000000	5022.000000
Conductor size and type	Triple bundle 1590 ACSR conductor	
Nominal voltage	AC	
Nominal voltage	500	
Line construction type	Overhead	
General route description	Heads southeast out of Lackawanna double circuit with the existing Lackawanna - Shickshinny 500 kV line up to the area of the Stanton Substation. Shortly after passing Stanton Substation, the route turns southwest and travels towards Acahela Substation, likely following existing 230 kV line routes. Continues south past the Acahela Substation and meets the Susquehanna - Wescosville 500 kV line near ~ 40.984392° -75.696014°. Continues double circuit with the Susquehanna - Wescosville 500 kV line to the point where the line passes directly by Siegfried Substation.	
Terrain description	Mountainous terrain. See attachment "LACK-SIEG-DRAK_Corridor_Fig 1_20240830.pdf".	
Right-of-way width by segment	200 ft ROW will be used for all segments.	
Electrical transmission infrastructure crossings	Acahela – Pocono 230 kV line, East Palmerton – Acahela 69 kV line, Harwood – Jenkins 69 kV # 1 and 2 lines, Jenkins – River 69 kV # 1 and 2 lines, Jenkins – Stanton 230 kV line, Mountain – Jenkins 230 kV line, Mountain – Stanton 230 kV line, Palooka – Acahela 230 kV line, Palooka – Jenkins 230 kV line, Stanton – Summit 230 kV # 3 and 4 lines, Stanton – Swoyersville – Exeter Tap 69 kV line, Summit – Lackawanna 230 kV # 1 and 2 lines	

Civil infrastructure/major waterway facility crossing plan	Appalachian Trail Route 209 Interstate 476 Interstate 80 Interstate 476 Interstate 81 Lackawanna River
Environmental impacts	The proposed project will traverse both Pennsylvania and northwestern New Jersey, requiring in-depth consultations with both states along with the National Park Service. For Pennsylvania, Proposer anticipates needing to apply for an Individual Permit in compliance with the National Pollutant Discharge Elimination System as administered by the Pennsylvania Department of Environmental Protection. Impacts to federal and state protected species typically associated with transmission development are anticipated, including time of year vegetation clearing restrictions for bat species along with potential presence/absence surveys for Bog Turtles in suitable wetland habitat. Cultural resource management activities will likely be comprised of historic architecture surveys to determine visual impacts to historic farmsteads and targeted, systemic shovel testing to determine the presence/absence of buried archaeological deposits in areas where new ground disturbing activities are required. A crossing of the Appalachian Trail is anticipated, which will trigger consultations with the National Park Service. This may include cultural resource surveys of the impacted section of trail, tribal consultations, and viewshed mitigation. New Jersey permits anticipated include an Individual Permit in compliance with the National Pollutant Discharge Elimination System as administered by the New Jersey Department of Environmental Protection. Compliance with New Jersey's Highlands Act will most likely be triggered with the current proposed scope. Impacts to federal and state protected species typically associated with transmission development are anticipated, including time of year vegetation clearing restrictions for bat species along with potential presence/absence surveys for Bog Turtles in suitable wetland habitat. Like Pennsylvania, Cultural resource management activities will likely be comprised of historic architecture surveys to determine visual impacts to historic farmsteads and targeted, systemic shovel testing to determine the presence/absence of buried archaeological deposits in areas where new ground disturbing activities are required. Municipal permits related to the development of a new switchyard will likely be needed based on final site location.
Tower characteristics	See illustrations of single circuit and double circuit towers for use in this project in attachment LACK-SIEG-DRAK-Structures.zip.
Construction responsibility	Proprietary Information
Benefits/Comments	Proprietary Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary Information
Permitting / routing / siting	Proprietary Information
ROW / land acquisition	Proprietary Information
Materials & equipment	Proprietary Information

Construction & commissioning	Proprietary Information
Construction management	Proprietary Information
Overheads & miscellaneous costs	Proprietary Information
Contingency	Proprietary Information
Total component cost	$466,077,542.48
Component cost (in-service year)	$582,570,367.08

Transmission Line Upgrade Component

Component title	Siegfried - Drakestown 500 kV line (PA segment)
Project description	Proprietary Information
Impacted transmission line	Siegfried - Martins Creek 230 kV # 1 line
Point A	Siegfried
Point B	Martins Creek
Point C	
Terrain description	Existing transmission corridor. Mountainous terrain.
Existing Line Physical Characteristics	
Operating voltage	230
Conductor size and type	Double bundle 2493 54/37 ACAR conductor
Hardware plan description	Hardware associated with the existing line will be inspected and reused.
Tower line characteristics	Single circuit 500 kV towers that are in good condition and part of our annual inspection and maintenance plan.

Proposed Line Characteristics

	Designed	Operating

Voltage (kV)	500.000000	500.000000
	Normal ratings	Emergency ratings
Summer (MVA)	2939.000000	3732.000000
Winter (MVA)	3618.000000	4423.000000
Conductor size and type	Double bundle 2493 54/37 ACAR conductor	
Shield wire size and type	Dual 144 count OPGW	
Rebuild line length	24.6 miles	
Rebuild portion description	Convert ~18.6 miles of the Siegfried - Martins Creek 230 kV # 1 line to 500 kV operation, which it is already designed to accommodate. Rebuild the remaining 6 miles of Siegfried - Martins Creek 230 kV # 1 line that is constructed at 230 kV design to 500 kV design standard. This ~ 24.6 mile line conversion represents the Pennsylvania portion of the Siegfried - Drakestown 500 kV line once combined with one of the two alternate proposals 2024-W1-546 or 2024-W1-900 to complete the 500 kV line to Drakestown in NJ. The existing Siegfried - Martins Creek line has, and would continue to have double bundle 2493 ACAR 54/37 conductor with ratings of 2939 MVA SN, 3732 MVA SE, 3618 MVA WN, and 4423 MVA WE.	
Right of way	Little or no new ROW will be required because the majority of this segment of the line will be a conversion of an existing line that is already constructed at 500 kV but presently operates at 230 kV.	
Construction responsibility	Proprietary Information	
Benefits/Comments	Proprietary Information	
Component Cost Details - In Current Year $		
Engineering & design	Proprietary Information	
Permitting / routing / siting	Proprietary Information	
ROW / land acquisition	Proprietary Information	
Materials & equipment	Proprietary Information	
Construction & commissioning	Proprietary Information	

Construction management	Proprietary Information
Overheads & miscellaneous costs	Proprietary Information
Contingency	Proprietary Information
Total component cost	$56,916,281.29
Component cost (in-service year)	$71,142,108.05

Congestion Drivers

None

Existing Flowgates

None

New Flowgates

Proprietary Information

Financial Information

Capital spend start date	01/2025
Construction start date	06/2029
Project Duration (In Months)	95

Cost Containment Commitment

Cost cap (in current year)	Proprietary Information
Cost cap (in-service year)	Proprietary Information

Components covered by cost containment

1. Lackawanna 500 kV yard reconfiguration - PPL
2. Siegfried 500 kV Switchyard - PPL
3. Susquehanna - Wescosville 500 kV line taps into new Siegfried 500 kV yard - PPL
4. Lackawanna - Siegfried 500 kV line - PPL
5. Siegfried - Drakestown 500 kV line (PA segment) - PPL

Cost elements covered by cost containment

Engineering & design	Yes
Permitting / routing / siting	No
ROW / land acquisition	No
Materials & equipment	No
Construction & commissioning	No
Construction management	Yes
Overheads & miscellaneous costs	No
Taxes	No
AFUDC	No
Escalation	No
Additional Information	Proprietary Information
Is the proposer offering a binding cap on ROE?	No
Is the proposer offering a Debt to Equity Ratio cap?	Proprietary Information

Additional Comments

None