Transmission Expansion Advisory Committee (TEAC) Recommendations to the PJM Board

PJM Staff White Paper

PJM Interconnection
December 2023

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I. Executive Summary

On October 3, 2023, the PJM Board of Managers approved changes to the Regional Transmission Expansion Plan (RTEP), totaling a net increase of $0.69 million for baseline projects to resolve baseline reliability criteria violations and address changes to existing projects.

Since then, PJM has identified new baseline reliability criteria violations, and the transmission system enhancements needed to solve them, at an estimated cost of $5,142.98 million. Scope changes to existing projects will result in a net decrease of $32.17 million, and cancellation of existing projects will result in a net decrease of $24.96 million. This yields an overall RTEP net increase of $5,085.85 million, for which PJM recommended Board approval. PJM is also providing the annual update of RTEP generation and merchant transmission network upgrades in this white paper. PJM has identified $179.58 million in new network upgrades. Additionally, $41.45 million in previously identified network upgrades will be cancelled as a result of updates to analysis performed for project withdrawals in the New Services Queue. This yields an overall RTEP net increase of $138.13 million, for which PJM recommended Board approval. Altogether, the changes result in an overall RTEP net increase of approximately $5,223.98 million. With these changes, RTEP projects will total approximately $48,258.8 million since the first Board approvals in 2000.

PJM sought Reliability and Security Committee consideration and full Board approval of the RTEP baseline projects summarized in this white paper. On December 11, 2023, the Board approved the addition of RTEP baseline projects as well as other changes to the RTEP as summarized in this paper.

II. Baseline Project Recommendations

A key dimension of PJM's RTEP process is baseline reliability evaluation, which is necessary before subsequent interconnection requests can be analyzed. Baseline analysis identifies system violations to reliability criteria and standards, determines the potential to improve the market efficiency and operational performance of the system, and incorporates any public policy requirements. PJM then develops transmission system enhancements to solve identified violations and reviews them with stakeholders through the Transmission Expansion Advisory Committee (TEAC) and subregional RTEP committees prior to submitting its recommendation to the Board. Baseline transmission enhancement costs are allocated to PJM responsible customers.

III. Baseline Reliability Projects Summary

A complete listing of all recommended projects and their associated cost allocations is included in Attachment A (allocations to a single zone) and Attachment B (allocations to multiple zones).

- Baseline project b3800 – 2022 RTEP Window 3 Recommended Solution: $5,142.98 million

A detailed description of the above project that PJM recommended to the Board is detailed in the 2022 RTEP Window 3 Reliability Analysis Report and the 2022 RTEP Window 3 Constructability & Financial Analysis Report.

IV. Changes to Previously Approved Projects

Scope/Cost Changes

The following scope/cost modifications were recommended:

NJ Offshore Wind State Agreement Approach (SAA) Project: b3737.47

The recommended solution for 2022 Window 3 includes the scope change to expand the North Delta 500 kV substation to a four bay breaker and half configuration, which will allow for the termination of six 500 kV lines and one 500/230 kV transformer. The original estimate cost for the Transource-proposed North Delta substation was $76.27 million, and the new expanded scope will be approximately $104.1 million.

The net cost increase for the New Jersey SAA project is $27.83 million.

Brandon Shores Deactivation Project: b3780

The recommended solution for 2022 Window 3 includes the scope change to the immediate need project stemming from the Brandon Shores deactivation request. The revised scope modifies the planned North Delta 500/230 kV substation, which will cut into Peach Bottom-Delta/Calpine 500 kV line. This scope of work is related to the above b3737.47 project scope from the NJ OSW SAA project, as the b3780 deactivation project initially proposed the construction of a 500/230 kV West Cooper substation (b3780.3) in lieu of the North Delta substation. The recommended solution cancels the b3780.3 West Cooper substation scope, resulting in a net decrease of $60 million.

- All of the scope/cost changes described in this section yield a net RTEP decrease of $32.17 million.

Cancellations

The following scope/cost modifications were recommended:

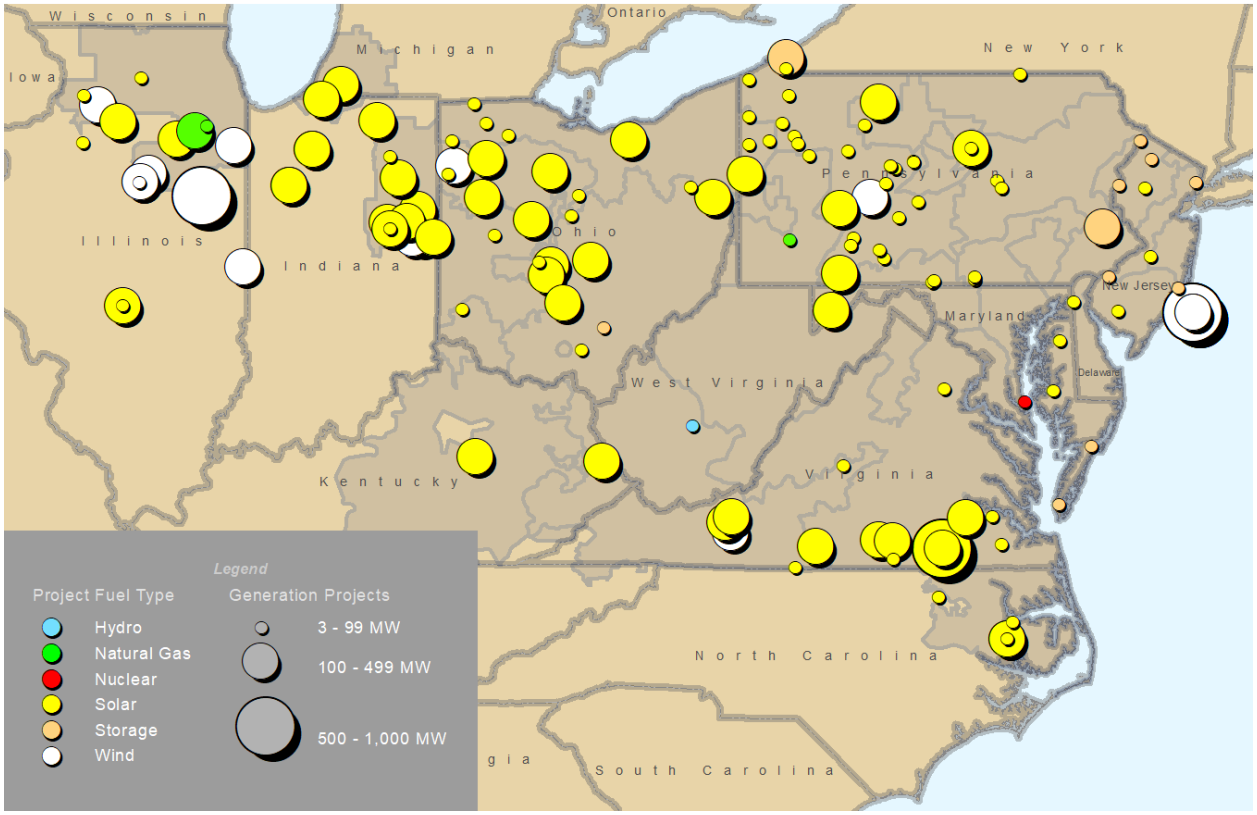
- Project b3768 (rebuild/reconductor the Germantown-Lincoln 115 kV line) is no longer required with the recommended 2022 Window 3 solution and yields a net decrease of $17.36 million.
- Project b3247 (Dominion portion of Doubs-Goose Creek 500 kV rebuild for End of Life “EOL”) is no longer required as the recommended 2022 Window 3 solution replaces this scope of work, and yields a net decrease of $7.6 million.
    - Note: The related supplemental project s2386, which includes the FirstEnergy (APS) portion of the Doubs-Goose Creek 500 kV EOL rebuild, is being converted to a baseline and is included in the recommended 2022 Window 3 solution.
- All of the cancellations described in this section yield a net RTEP decrease of $24.96 million.

V. Interconnection Queue Projects

Throughout 2023, PJM has continued to study new service customer requests that are submitted into our interconnection queue. These studies evaluate the impact of the new service request and include an evaluation of new generation interconnections, increases in generation at existing stations, long-term firm transmission service requests and merchant transmission interconnection requests.

These studies were last reviewed with the Board Reliability Committee in December of 2022. Since that time, PJM has completed 151 System Impact Studies, and 166 service requests have withdrawn. New projects with signed ISAs, project scope changes and project cancellations have resulted in a net increase of $138.13 million for network upgrades. The map below shows the locations of the new units associated with the completed interconnection System Impact Studies along with the fuel type and relative size. A listing of the projects with recently completed impact studies is provided in Attachment C to this white paper. A listing of the network upgrades associated with these projects is shown in Attachment D to this report. The cost for the network upgrades associated with these interconnection projects is the responsibility of the developer.

Map 1. Completed Interconnection System Impact Studies



VI. Review by the Transmission Expansion Advisory Committee (TEAC)

Project needs and recommended solutions as discussed in this report were reviewed with stakeholders during 2023, most recently at the October 31, 2023, and December 5, 2023, TEAC meetings. Written comments were requested to be submitted to PJM to communicate any concerns with project recommendations. All correspondence addressed to the PJM Board are available at the Board communications page[1].

VII. Cost Allocation

Cost allocations for recommended projects are shown in Attachment A (for allocation to a single zone) and Attachment B (for allocation to multiple zones).

Cost allocations are calculated in accordance with Schedule 12 of the Open Access Transmission Tariff (Tariff). Baseline reliability project allocations are calculated using a distribution factor methodology that allocates cost to the load zones that contribute to the loading on the new facility. The allocations will be filed at FERC no later than 30 days following approval by the Board.

VIII. Board Approval

The PJM Reliability and Security Committee is requested to endorse the additions and changes to the RTEP proposed in this white paper and to recommend to the full Board for approval the new projects and changes to the existing RTEP projects as detailed in this white paper. On December 11, 2023, the Board approved the addition of RTEP baseline projects as well as other changes to the RTEP as summarized in this paper.

[1] https://www.pjm.com/about-pjm/who-we-are/pjm-board/public-disclosures

Attachment A – Reliability Project Single-Zone Allocations

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required IS Date
b3800.9	Rebuild the existing Hunterstown-Carroll 115/138 kV Corridor as Double Circuit using 230 kV construction standards. New circuit will be operated at 230 kV. Existing circuit to remain at 115/138 kV.	$0.00	APS	N/A, upgrade ID is for tracking only, no cost	6/1/2027
b3800.10	Rebuild the Germantown-Lincoln 115 kV line for 230 kV double circuit construction.	$30.10	ME	ME (100.00%)	6/1/2027
b3800.11	Rebuild the Hunterstown-Lincoln 115 kV line for 230 kV double circuit construction.	$11.48	ME	ME (100.00%)	6/1/2027
b3800.12	Rebuild the Germantown-Carroll 138 kV line for 230 kV double circuit construction (MAIT).	$12.16	ME	ME (100.00%)	6/1/2027
b3800.19	Reconductor Lincoln-Orrtanna 115 kV line.	$10.98	ME	ME (100.00%)	6/1/2027
b3800.20	Fayetteville-Grand Point 138 kV – Replace line trap at Grand Point 138 kV.	$0.40	APS	APS (100.00%)	6/1/2027
b3800.21	Reid-Ringgold 138 kV – Replace line trap, substation conductor, breaker, relaying and CTs at Ringgold.	$3.80	APS	APS (100.00%)	6/1/2027
b3800.22	Install DTT relaying at Straban substation.	$0.67	ME	ME (100.00%)	6/1/2027
b3800.23	Revise Relay Settings at Lincoln substation.	$0.31	ME	ME (100.00%)	6/1/2027
b3800.24	Revise Relay Settings at Germantown substation.	$0.47	ME	ME (100.00%)	6/1/2027
b3800.25	Taneytown substation terminal upgrade.	$0.53	APS	APS (100.00%)	6/1/2027
b3800.26	Build High Ridge 500 kV substation - Three bay breaker and half configuration.	$0.00	BGE	N/A, upgrade ID is for tracking only, no cost	6/1/2027
b3800.109	Termination work for two 500/138 kV transformer at Woodside 500 kV substation	$1.35	NEET	APS (100.00%)	6/1/2027
b3800.110	Two 500/138 kV transformers at Woodside 500 kV substation.	$33.68	NEET	APS (100.00%)	6/1/2027
b3800.111	Construct the Woodside-Stonewall 138 kV No. 1 line.	$6.28	APS	APS (100.00%)	6/1/2027
b3800.112	Construct the Woodside-Stonewall 138 kV No. 2 line.	$6.31	APS	APS (100.00%)	6/1/2027
b3800.114	Stonewall 138 kV substation two 138kV breaker expansion.	$8.30	APS	APS (100.00%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required IS Date
b3800.125	Rebuild the Doubs-Dickerson 230 kV line. This will be underbuilt on the new Doubs-Goose Creek 500 kV line. APS Portion	$13.04	APS	PEPCO (100.00%)	6/1/2027
b3800.126	Rebuild the Doubs-Aqueduct 230 kV line. This will be underbuilt on the new Doubs-Aspen 500 kV line. APS Portion	$11.35	APS	PEPCO (100.00%)	6/1/2027
b3800.127	Rebuild the Dickerson-Aqueduct 230 kV line. This will be underbuilt on the new Doubs-Aspen 500 kV line. APS Portion	$6.80	APS	PEPCO (100.00%)	6/1/2027
b3800.201	Install two 500-230 kV transformer banks at Golden substation.	$70.00	Dominion	Dominion (100.00%)	6/1/2027
b3800.203	Install a 2nd 500-230 kV 1440MVA transformer at Mars substation.	$42.19	Dominion	Dominion (100.00%)	6/1/2027
b3800.204	Reconductor 0.5 mile section of 230 kV line No. 2150 Golden-Paragon Park Circuit 1 to achieve a summer rating of 1573 MVA.	$1.44	Dominion	Dominion (100.00%)	6/1/2027
b3800.205	Reconductor 0.5 mile section of 230 kV line No. 2081 Golden-Paragon Park Circuit 2 to achieve a summer rating of 1573 MVA.	$1.44	Dominion	Dominion (100.00%)	6/1/2027
b3800.206	Upgrade Paragon Park substation line conductors to 4000A continuous current rating for 230 kV lines No. 2081 & line No. 2150.	$0.09	Dominion	Dominion (100.00%)	6/1/2027
b3800.207	Reconductor 230 kV line No. 2207 Paragon Park-Beco to achieve a summer rating of 1573 MVA.	$3.36	Dominion	Dominion (100.00%)	6/1/2027
b3800.208	Upgrade Paragon Park substation conductor and line leads to 4000A continuous current rating for 230 kV line No. 2207.	$0.10	Dominion	Dominion (100.00%)	6/1/2027
b3800.209	Upgrade BECO substation equipment to 4000A continuous current rating for 230 kV line No. 2207.	$1.86	Dominion	Dominion (100.00%)	6/1/2027
b3800.210	Build a new 230 kV line from Mars-Lockridge on 500/230 kV double circuit structures to achieve a summer rating of 1573 MVA. Install 230 kV equipment at Mars and Lockridge.	$57.95	Dominion	Dominion (100.00%)	6/1/2027
b3800.211	Build a new 230 kV line from Lockridge-Golden on 500/230 kV double circuit structures to achieve a summer rating of 1573 MVA. Install 230 kV equipment at Golden and Lockridge.	$56.93	Dominion	Dominion (100.00%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required IS Date
b3800.215	Cut 230 kV line No. 2150 Sterling Park-Paragon Park Circuit 1 into Golden substation and install 230 kV equipment at Golden. Upgrade relay settings at Golden substation for upgrading 230 kV line No. 2150 to 4000A continuous current rating.	$57.62	Dominion	Dominion (100.00%)	6/1/2027
b3800.216	Cut 230 kV line No. 2081 Sterling Park-Paragon Park Circuit 2 into Golden substation and install 230 kV equipment at Golden. Upgrade relay settings at Golden substation for upgrading 230 kV line No. 2081 to 4000A continuous current rating.	$57.62	Dominion	Dominion (100.00%)	6/1/2027
b3800.218	Build a new 230 kV line from Sycolin Creek-Golden on 500/230 kV double circuit structures to achieve a summer rating of 1573 MVA. Install 230 kV equipment at Golden and Sycolin Creek.	$69.84	Dominion	Dominion (100.00%)	6/1/2027
b3800.219	Replace 7 overdutied 230 kV breakers at Beaumeade substation with 80 kA breakers.	$3.03	Dominion	Dominion (100.00%)	6/1/2027
b3800.220	Replace 4 overdutied 230 kV breakers at BECO substation with 80 kA breakers.	$1.81	Dominion	Dominion (100.00%)	6/1/2027
b3800.221	Replace 4 overdutied 230 kV breakers at Belmont substation with 80 kA breakers.	$1.90	Dominion	Dominion (100.00%)	6/1/2027
b3800.222	Replace 1 overdutied 230 kV breaker at Discovery substation with 80 kA breaker.	$0.49	Dominion	Dominion (100.00%)	6/1/2027
b3800.223	Replace 1 overdutied 230 kV breaker at Pleasant View substation with 80 kA breaker.	$0.51	Dominion	Dominion (100.00%)	6/1/2027
b3800.224	Replace 2 overdutied 230 kV breakers at Shellhorn substation with 80 kA breakers.	$0.93	Dominion	Dominion (100.00%)	6/1/2027
b3800.226	Change 230 kV lines No. 2081 and 2150 at Paragon Park substation destination to Golden substation and upgrade line protection relays	$0.30	Dominion	Dominion (100.00%)	6/1/2027
b3800.227	Change 230 kV lines No. 2081 and 2150 at Sterling Park substation destination to Golden substation and upgrade line protection relays.	$0.30	Dominion	Dominion (100.00%)	6/1/2027
b3800.228	Reconductor 1.47 miles of 230 kV circuits 2081 and 2150 from Sterling Park to Golden substation. Upgrade terminal equipment at Sterling Park to 4000A continuous current.	$7.97	Dominion	Dominion (100.00%)	6/1/2027
b3800.229	Reconductor 0.67 miles of 230 kV circuits 2194 and 9231 from Davis Drive to Sterling Park substation. Terminal equipment at remote end substations will be installed or upgraded to 4000A continuous current rating to support new conductor ratings.	$5.53	Dominion	Dominion (100.00%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required IS Date
b3800.230	Reset relays at Breezy Knoll for the revised current rating of 230 kV line No. 2098 Pleasant View-Hamilton.	$0.02	Dominion	Dominion (100.00%)	6/1/2027
b3800.231	Reset relays at Dry Mill for the revised current rating of 230 kV line No. 2098 Pleasant View-Hamilton.	$0.02	Dominion	Dominion (100.00%)	6/1/2027
b3800.232	Reset relays at Hamilton for the revised current rating of 230 kV line No. 2098 Pleasant View-Hamilton.	$0.01	Dominion	Dominion (100.00%)	6/1/2027
b3800.233	Upgrade equipment to 4000A continuous current rating at Pleasant View substation in support of 230 .kV line No. 2098 wreck and rebuild. Replace circuit breakers 274T2098 & 2098T2180 and associated disconnect switches, breaker leads, bus, and line risers to accommodate 4000A rating.	$1.81	Dominion	Dominion (100.00%)	6/1/2027
b3800.234	Wreck and rebuild approximately one mile of 230 kV line No. 2098 between Pleasant View and structure 2098/9, where line No. 2098 turn towards Hamilton substation.	$3.44	Dominion	Dominion (100.00%)	6/1/2027
b3800.235	Replace 5 overdutied 230 kV breakers at Loudoun substation with 80 kA breakers.	$2.32	Dominion	Dominion (100.00%)	6/1/2027
b3800.236	Replace 2 overdutied 500 kV breakers at Ox substation with 63kA breakers.	$2.51	Dominion	Dominion (100.00%)	6/1/2027
b3800.237	Replace 1 overdutied 500 kV breaker at Pleasant View substation with a 63kA breaker.	$1.29	Dominion	Dominion (100.00%)	6/1/2027
b3800.300	Rebuild 230 kV line No. 2135 Hollymeade Junction-Cash's Corner using double-circuit capable 500/230 kV poles. New conductor has a summer rating of 1573 MVA. (The 500 kV circuit will not be wired as part of this project).	$32.45	Dominion	Dominion (100.00%)	6/1/2027
b3800.301	Rebuild 230 kV line No. 2135 Cash's Corner-Gordonsville using double-circuit capable 500/230 kV poles. New conductor has a summer rating of 1573 MVA. (The 500 kV circuit will not be wired as part of this project).	$21.51	Dominion	Dominion (100.00%)	6/1/2027
b3800.302	Upgrade Cash's Corner switches 213576 and 213579 and line leads to 4000A continuous current rating of 230 kV line No. 2135.	$0.51	Dominion	Dominion (100.00%)	6/1/2027
b3800.303	Upgrade Gordonsville substation line leads to 4000A continuous current rating of 230 kV line No. 2135.	$0.08	Dominion	Dominion (100.00%)	6/1/2027
b3800.304	Upgrade Hollymeade substation switch 213549 and line leads to 4000A continuous current rating of 230 kV line No. 2135.	$0.30	Dominion	Dominion (100.00%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required IS Date
b3800.305	Install one (1) 300 MVAR Static synchronous Compensator (STATCOM) & associated equipment at Beaumeade substation.	$43.57	Dominion	Dominion (100.00%)	6/1/2027
b3800.308	Install one (1) 230 kV, 150MVAr Shunt Capacitor Bank & associated equipment at Mars substation.	$5.26	Dominion	Dominion (100.00%)	6/1/2027
b3800.309	Install one (1) 230 kV, 150MVAr Shunt Capacitor Bank & associated equipment at Wishing Star substation.	$6.09	Dominion	Dominion (100.00%)	6/1/2027
b3800.316	Rebuild approximately 6.17 miles of 230 kV line No. 2030 Gainesville-Mint Springs to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 1573 MVA.	$13.98	Dominion	Dominion (100.00%)	6/1/2027
b3800.317	Rebuild approximately 1.58 miles of 230 kV line No. 2030 Mint Springs-Loudoun to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 1573 MVA.	$3.59	Dominion	Dominion (100.00%)	6/1/2027
b3800.318	Rebuild approximately 4.2 miles of 230 kV line No. 2045 Loudoun-North Star to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 1573 MVA.	$14.52	Dominion	Dominion (100.00%)	6/1/2027
b3800.319	Rebuild approximately 0.88 miles of 230 kV line No. 2045 North Star-Brambleton to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 1573 MVA.	$3.04	Dominion	Dominion (100.00%)	6/1/2027
b3800.320	Rebuild approximately 1.22 miles of 230 kV line No. 2227 Brambleton-Racefield to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 1573 MVA.	$4.36	Dominion	Dominion (100.00%)	6/1/2027
b3800.321	Rebuild approximately 3.69 miles of 230 kV line No. 2094 Racefield-Loudoun to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 1573 MVA.	$13.20	Dominion	Dominion (100.00%)	6/1/2027
b3800.322	Rebuild approximately 9.16 miles of 230 kV line No. 2101 Bristers-Nokesville to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 1573 MVA.	$12.99	Dominion	Dominion (100.00%)	6/1/2027
b3800.323	Rebuild approximately 2.89 miles of 230 kV line No. 2101 Nokesville-Vint Hill TP to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 1573 MVA.	$4.10	Dominion	Dominion (100.00%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required IS Date
b3800.324	Rebuild approximately 0.33 miles of 230 kV line No. 2101 Vint Hill TP-Vint Hill to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 1573 MVA.	$0.47	Dominion	Dominion (100.00%)	6/1/2027
b3800.325	Rebuild approximately 3.32 miles of 230 kV line No. 2114 Rollins Ford-Vint Hill to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 1573 MVA.	$4.35	Dominion	Dominion (100.00%)	6/1/2027
b3800.326	Rebuild approximately 10.09 miles of 230 kV line No. 2114 Vint Hill-Elk Run to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 1573 MVA.	$13.21	Dominion	Dominion (100.00%)	6/1/2027
b3800.327	Rebuild approximately 4.43 miles of 230 kV line No. 2140 Heathcote-Catharpin to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 1573 MVA.	$10.64	Dominion	Dominion (100.00%)	6/1/2027
b3800.328	Rebuild approximately 2.88 miles of 230 kV line No. 2140 Catharpin-Loudoun to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 1573 MVA.	$6.92	Dominion	Dominion (100.00%)	6/1/2027
b3800.329	Rebuild approximately 0.25 miles of 230 kV line No. 2151 Railroad DP-Gainesville to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 1573 MVA.	$4.39	Dominion	Dominion (100.00%)	6/1/2027
b3800.330	Rebuild approximately 4.14 miles of 230 kV line No. 2163 Vint Hill-Liberty to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 1573 MVA.	$17.56	Dominion	Dominion (100.00%)	6/1/2027
b3800.331	Rebuild approximately 0.48 miles of line No. 2176 Heathcote-Gainesville to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 1573 MVA.	$8.78	Dominion	Dominion (100.00%)	6/1/2027
b3800.332	Rebuild approximately 1.11 miles of line No. 2222 Rollins Ford-Gainesville to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 1573 MVA.	$13.17	Dominion	Dominion (100.00%)	6/1/2027
b3800.333	Rebuild approximately 1.65 miles of line No. 183 Bristers-Ox to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 1573 MVA.	$8.78	Dominion	Dominion (100.00%)	6/1/2027
b3800.334	Replace 4 overdutied 230 kV breakers at Loudoun substation with 80 kA breakers.	$1.72	Dominion	Dominion (100.00%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required IS Date
b3800.335	Replace 1 overdutied 500 kV breaker at Ox substation with a 63kA breaker.	$1.29	Dominion	Dominion (100.00%)	6/1/2027
b3800.337	Upgrade and install equipment at Brambleton substation to support the new conductor termination. All terminal equipment for 230 kV lines No. 2045 & No. 2094 to be rated for 4000A continuous current rating.	$4.65	Dominion	Dominion (100.00%)	6/1/2027
b3800.338	Revise relay settings at Dawkins Branch.	$0.02	Dominion	Dominion (100.00%)	6/1/2027
b3800.339	Upgrade and install equipment at Gainesville substation to support the new conductor termination. All terminal equipment for 230 kV line No. 2030 to be rated for 4000A continuous current rating.	$3.71	Dominion	Dominion (100.00%)	6/1/2027
b3800.340	Revise relay settings at Heathcote.	$0.02	Dominion	Dominion (100.00%)	6/1/2027
b3800.341	Upgrade and install equipment at Loudoun substation for 230 kV line No. 2094 Loudoun-Racefield to be rated for 4000A continuous current rating.	$2.50	Dominion	Dominion (100.00%)	6/1/2027
b3800.343	Upgrade and install equipment at Loudoun substation for 230 kV line No. 2030 Loudoun-Mint Springs to be rated for 4000A continuous current rating.	$1.00	Dominion	Dominion (100.00%)	6/1/2027
b3800.342	Upgrade and install equipment at Loudoun substation for 230 kV line No. 2045 Loudoun-North Star to be rated for 4000A continuous current rating.	$2.50	Dominion	Dominion (100.00%)	6/1/2027
b3800.345	Revise relay settings at Mint Springs.	$0.03	Dominion	Dominion (100.00%)	6/1/2027
b3800.347	Revise relay settings at North Star.	$0.03	Dominion	Dominion (100.00%)	6/1/2027
b3800.348	Revise relay settings at Racefield.	$0.03	Dominion	Dominion (100.00%)	6/1/2027
b3800.349	Revise relay settings at Railroad.	$0.02	Dominion	Dominion (100.00%)	6/1/2027
b3800.351	Update relay settings at Vint Hill for 230 kV line No. 2101 Vint Hill-Bristers.	$0.03	Dominion	Dominion (100.00%)	6/1/2027
b3800.352	Update relay settings at Vint Hill for 230 kV line No. 2163 Vint Hill-Liberty.	$0.03	Dominion	Dominion (100.00%)	6/1/2027
b3800.355	Revise relay settings at Youngs Branch.	$0.02	Dominion	Dominion (100.00%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required IS Date
b3800.358	Replace single unit Locks 230/115 kV 168MVA transformer TX No. 7 with new single unit transformer with a rating of 224 MVA. Lead lines at the 115 kV level will be upgraded to 2000A.	$7.14	Dominion	Dominion (100.00%)	6/1/2027
b3800.359	Wreck and rebuild line No. 2090 Ladysmith CT-Summit D.P. segment as a double circuit 230 kV line to achieve a summer rating of 1573 MVA. Only one circuit will be wired at this stage. Upgrade circuit breaker leads, switches and line leads at Ladysmith CT to 4000A	$36.50	Dominion	Dominion (100.00%)	6/1/2027
b3800.360	Rebuild 230 kV line No. 2054 Charlottesville-Proffit DP using double-circuit capable 500/230 kV poles. (The 500 kV circuit will not be wired as part of this project).	$70.14	Dominion	Dominion (100.00%)	6/1/2027
b3800.361	Rebuild 230 kV line No. 233 Charlottesville-Hydraulic Rd-Barracks Road-Crozet-Dooms.	$54.54	Dominion	Dominion (100.00%)	6/1/2027
b3800.362	Rebuild 230 kV line No. 291 segment from Charlottesville-Barracks Road.	$22.50	Dominion	Dominion (100.00%)	6/1/2027
b3800.363	Rebuild 230 kV line No. 291 segment from Barracks Road-Crozet.	$20.81	Dominion	Dominion (100.00%)	6/1/2027
b3800.364	Rebuild 230 kV line No. 291 segment Crozet-Dooms.	$11.23	Dominion	Dominion (100.00%)	6/1/2027
b3800.365	Hollymeade substation Relay Revision for 230 kV line No. 2054 Charlottesville-Hollymeade.	$0.01	Dominion	Dominion (100.00%)	6/1/2027
b3800.366	Upgrade the terminal equipment at Charlottesville to 4000A for 230 kV line No. 2054 (Charlottesville-Hollymeade).	$0.97	Dominion	Dominion (100.00%)	6/1/2027
b3800.367	Proffit DP substation Relay Revision for 230 kV line No. 2054 Charlottesville-Hollymeade	$0.02	Dominion	Dominion (100.00%)	6/1/2027
b3800.368	Barracks Rd substation Relay Reset to accommodate the rebuilt line 230 kV lines No. 233 and No. 291.	$0.03	Dominion	Dominion (100.00%)	6/1/2027
b3800.369	Crozet substation Relay Reset to accommodate the rebuilt line 230 kV lines No. 233 and No. 291.	$0.03	Dominion	Dominion (100.00%)	6/1/2027
b3800.370	Charlottesville substation Terminal Equipment Upgrade for 230 kV lines No. 233 & No. 291 Rebuild.	$1.50	Dominion	Dominion (100.00%)	6/1/2027
b3800.371	Upgrade Hydraulic Rd substation Equipment for 230 kV line No. 233 & No. 291 Rebuild.	$0.65	Dominion	Dominion (100.00%)	6/1/2027
b3800.372	Dooms substation Terminal Equipment Upgrade for 230 kV line No. 233 & No. 291 Rebuild.	$1.06	Dominion	Dominion (100.00%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required IS Date
b3800.373	Wreck and rebuild approximately 7.14 miles of 230 kV line No. 256 from St. Johns to structure 256/108 to achieve a summer rating of 1573 MVA. line switch 25666 at St. Johns to be upgraded to 4000A.	$21.75	Dominion	Dominion (100.00%)	6/1/2028
b3800.374	Reconductor approximately 5.30 miles of 230 kV line No. 256 from Ladysmith CT to structure 256/107 to achieve a summer rating of 1573 MVA. Terminal equipment at remote end substations will be upgraded to 4000A.	$16.14	Dominion	Dominion (100.00%)	6/1/2028
b3800.401	Replace Ashburn 230 kV breaker SC432 with a breaker rated 63 kA.	$0.79	Dominion	Dominion (100.00%)	6/1/2027
b3800.402	Replace Beaumeade 230 kV breaker 227T2152 with a breaker rated 80 kA.	$2.31	Dominion	Dominion (100.00%)	6/1/2027
b3800.403	Replace BECO 230 kV breakers 215012 and H12T2150 with breakers rated 63kA.	$4.21	Dominion	Dominion (100.00%)	6/1/2027
b3800.404	Replace Belmont 230 kV breaker 227T2180 with a breaker rated 80 kA.	$2.24	Dominion	Dominion (100.00%)	6/1/2027
b3800.405	Replace Brambleton 230 kV breakers 20102, 20602, 204502, 209402, 201T2045, 206T2094 with breakers rated 80 kA.	$9.38	Dominion	Dominion (100.00%)	6/1/2027
b3800.406	Replace Gainesville 230 kV breaker 216192 with a breaker rated 80 kA.	$3.11	Dominion	Dominion (100.00%)	6/1/2027
b3800.407	Replace Loudoun 230 kV breakers 204552, 217352 with breakers rated 80 kA.	$5.57	Dominion	Dominion (100.00%)	6/1/2027
b3800.408	Replace Ox 230 kV breakers 22042, 24342, 24842, 220T2063, 243T2097, 248T2013, H342 with breakers rated 80 kA.	$9.02	Dominion	Dominion (100.00%)	6/1/2027
b3800.409	Replace Paragon Park 230 kV breakers 208132, 215032, 2081T2206, 2150T2207 with breakers rated 80 kA.	$4.96	Dominion	Dominion (100.00%)	6/1/2027
b3800.410	Replace Reston 230 kV breaker 264T2015 with a breaker rated 63 kA.	$0.79	Dominion	Dominion (100.00%)	6/1/2027
b3800.411	Replace Stonewater 230 kV breakers 20662-1, 20662-2, 217862-1, 217862-2 with breakers rated 80 kA.	$4.95	Dominion	Dominion (100.00%)	6/1/2027
b3800.412	Replace Waxpool 230 kV breakers 214922-5, 214922-6, 216622-5, 216622-6 with breakers rated 63 kA.	$2.93	Dominion	Dominion (100.00%)	6/1/2027
b3800.413	Replace Double Toll Gate 138 kV breaker MDT 138 OCB with a breaker rated 40 kA.	$3.00	APS	APS (100.00%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required IS Date
b3800.414	Replace Doubs 500 kV breaker DL-55 522LIN with a breaker rated 60 kA.	$10.01	APS	APS (100.00%)	6/1/2027

Attachment B – Reliability Project Multi-Zone Allocations

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.1	Build New Otter Creek 500 kV (Collinsville) - (switching station -Two bay three breaker configuration).	$32.76	PPL	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (13.16%) / BGE (0.71%) / Dominion (74.28%) / DPL (0.36%) / PECO (0.68%) / PEPCO (10.59%) / PPL (0.22%)	6/1/2027
b3800.2	Break the existing TMI-Peach Bottom 500 kV line and reterminate into adjacent Otter Creek 500 kV Switchyard.	$7.03	ME	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (13.16%) / BGE (0.71%) / Dominion (74.28%) / DPL (0.36%) / PECO (0.68%) / PEPCO (10.59%) / PPL (0.22%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.3	New Otter Creek (Collinsville) to Doubs 500 kV line (Otter Creek 500 kV - MD Border). Rebuild and expand existing ~12 miles of Otter Creek-Conastone 230 kV line to become a double-circuit 500 and 230 kV lines.	$83.30	PPL	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (13.16%) / BGE (0.71%) / Dominion (74.28%) / DPL (0.36%) / PECO (0.68%) / PEPCO (10.59%) / PPL (0.22%)	6/1/2027
b3800.4	New Otter Creek to Doubs 500 kV line (MD Border-PSEG Demarcation Point). Rebuild and expand existing ~1.6 miles of Otter Creek-Conastone 230 kV line to become a double-circuit 500 and 230 kV lines.	$11.11	BGE	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (13.16%) / BGE (0.79%) / Dominion (74.28%) / DPL (0.41%) / PECO (0.77%) / PEPCO (10.59%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.5	Peach Bottom-TMI 500 kV - Replace terminal equipment at Peach Bottom.	$0.00	PECO	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: AEC (6.40%) / BGE (20.32%) / DPL (9.76%) / JCPL (17.57%) / Neptune (1.73%) / PECO (6.33%) / PEPCO (7.48%) / PSEG (29.15%) / RE (1.26%)	6/1/2027
b3800.6	Peach Bottom-TMI 500 kV - Replace terminal equipment at TMI.	$0.00	ME	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (7.41%) / BGE (15.50%) / Dominion (45.08%) / DPL (2.46%) / JCPL (0.80%) / ME (0.34%) / Neptune (0.09%) / PECO (10.72%) / PEPCO (15.72%) / PPL (0.43%) / PSEG (1.39%) / RE (0.06%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.7	Construct 38 miles of 500 kV overhead AC line between the Conastone vicinity and the Doubs substations (BGE zone portion).	$213.20	PSEG	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (13.16%) / BGE (0.79%) / Dominion (74.28%) / DPL (0.41%) / PECO (0.77%) / PEPCO (10.59%)	6/1/2027
b3800.8	Reconfigure Doubs 500 kV station and upgrade terminal equipment to terminate new line.	$57.50	APS	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (13.16%) / BGE (0.79%) / Dominion (74.28%) / DPL (0.41%) / PECO (0.77%) / PEPCO (10.59%)	6/1/2027
b3800.13	Rebuild the Germantown-Carroll 138 kV line to 230 kV double circuit construction (APS-PE Section).	$47.31	APS	APS (82.49%) / ME (17.51%)	6/1/2027
b3800.14	Construct New 230 kV Hunterstown-Carroll line (MAIT section).	$17.37	ME	APS (99.86%) / ME (0.14%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.15	Construct New 230 kV Hunterstown-Carroll line (APS-PE Section).	$6.71	APS	APS (99.86%) / ME (0.14%)	6/1/2027
b3800.16	Expand Carroll 230 kV substation to ring bus.	$7.62	APS	APS (99.86%) / ME (0.14%)	6/1/2027
b3800.17	Network upgrade at Caroll substation.	$0.43	APS	APS (99.86%) / ME (0.14%)	6/1/2027
b3800.18	Add a new 230 kV Breaker at the Hunterstown 230 kV substation for the new Hunterstown-Carroll 230 kV termination.	$2.31	ME	APS (99.86%) / ME (0.14%)	6/1/2027
b3800.27	High Ridge 500 kV substation (cut into Brighton-Waugh Chapel 500 kV line) - Waugh Chapel side.	$33.67	BGE	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: BGE (70.66%) / PEPCO (29.34%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.28	High Ridge 500 kV substation (cut into Brighton-Waugh Chapel 500 kV line) -Brighton side.	$33.67	BGE	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (0.68%) / BGE (97.41%) / Dominion (1.91%)	6/1/2027
b3800.29	High Ridge termination for the North Delta-High Ridge 500 kV line.	$33.67	BGE	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: BGE (2.58%) / Dominion (59.28%) / DPL (0.02%) / PEPCO (28.48%) / PSEG (9.24%) / RE (0.40%)	6/1/2027
b3800.30	High Ridge - Install two 500/230 kV transformers.	$22.11	BGE	BGE (62.75%) / PEPCO (37.25%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.31	Build new North Delta-High Ridge 500 kV line.	$13.36	PECO	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: Dominion (60.85%) / DPL (0.01%) / PECO (0.01%) / PEPCO (29.24%) / PSEG (9.48%) / RE (0.41%)	6/1/2027
b3800.32	Build new North Delta-High Ridge 500 kV line. (~59 miles).	$407.11	BGE	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: BGE (2.58%) / Dominion (59.28%) / DPL (0.02%) / PEPCO (28.48%) / PSEG (9.24%) / RE (0.40%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.33	Replace terminal equipment limitations at Brighton 500 kV - on the existing Brighton-Waugh Chapel 500 kV (5053) or new Brighton-High Ridge 500 kV.	$4.13	PEPCO	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (0.68%) / BGE (86.77%) / Dominion (1.91%) / PEPCO (10.64%)	6/1/2027
b3800.34	Rebuild 5012 (existing Peach Bottom-Conastone) (new Graceton-Conastone) 500 kV line on single circuit structures within existing ROW and cut into North Delta 500 kV and Gracetone 500 kV stations.	$70.00	BGE	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: BGE (12.36%) / Dominion (24.57%) / DPL (25.17%) / JCPL (7.90%) / Neptune (0.88%) / PENELEC (1.60%) / PEPCO (12.32%) / PSEG (14.57%) / RE (0.63%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.35	Rebuild 5012 (existing Peach Bottom-Conastone) (new North Delta-Graceton PECO) 500 kV line on single circuit structures within existing ROW and cut into North Delta 500 kV and Gracetone 500 kV stations.	$29.86	PECO	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: BGE (49.42%) / Dominion (31.22%) / DPL (0.01%) / JCPL (0.01%) / PECO (3.75%) / PEPCO (15.57%) / PSEG (0.02%)	6/1/2027
b3800.36	Rebuild 5012 (existing Peach Bottom-Conastone) (new North Delta-Graceton BGE) 500 kV line on single circuit structures within existing ROW and cut into North Delta 500 kV and Gracetone 500 kV stations.	$10.44	BGE	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: BGE (51.35%) / Dominion (32.44%) / DPL (0.01%) / JCPL (0.01%) / PEPCO (16.17%) / PSEG (0.02%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.37	Replace terminal equipment limitations at Conastone 500 kV - on the (existing Peach Bottom-Conastone) or (new Graceton-Conastone) 500 kV line.	$4.93	BGE	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: BGE (12.36%) / Dominion (24.57%) / DPL (25.17%) / JCPL (7.90%) / Neptune (0.88%) / PENELEC (1.60%) / PEPCO (12.32%) / PSEG (14.57%) / RE (0.63%)	6/1/2027
b3800.38	Chalk Point-Cheltanham 500 kV (5073) - Replace relay at Chalk Point 500 kV.	$0.34	PEPCO	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: BGE (39.75%) / Dominion (59.03%) / PEPCO (1.22%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.39	Red Lion-Hope Creek 500 kV - Replace terminal equipment at Red Lion.	$4.00	DPL	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: AEC (0.02%) / BGE (22.89%) / Dominion (48.61%) / DPL (9.46%) / JCPL (0.03%) / PEPCO (18.96%) / PSEG (0.03%)	6/1/2027
b3800.40	Conastone-Brighton 500 kV (5011 circuit) - Replace terminal equipment limitations at Brighton 500 kV.	$4.13	PEPCO	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: BGE (9.65%) / Dominion (63.04%) / DPL (0.02%) / PEPCO (27.29%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.41	Conastone-Brighton 500 kV (5011 circuit) - Replace terminal equipment limitations at Conastone 500 kV.	$7.16	BGE	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: BGE (9.65%) / Dominion (63.04%) / DPL (0.02%) / PEPCO (27.29%)	6/1/2027
b3800.42	Peach Bottom North bus upgrade - Replace 11 – Instances of strain bus conductor used for breaker drops or CT drops, 7 – 500 kV disconnect switches, 7 – Free Standing CTs, 1 – 500 kV breaker, 2 – Breaker relays or meters.	$2.70	PECO	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: BGE (62.82%) / DPL (7.25%) / JCPL (0.09%) / Neptune (0.01%) / PECO (0.01%) / PEPCO (29.63%) / PSEG (0.18%) / RE (0.01%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.43	Construct 31.5 miles of 500 kV overhead AC line between the Conastone vicinity and the Doubs substations (APS zone portion).	$176.80	PSEG	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (13.16%) / BGE (0.79%) / Dominion (74.28%) / DPL (0.41%) / PECO (0.77%) / PEPCO (10.59%)	6/1/2027
b3800.44	North Delta termination for the North Delta-High Ridge 500 line (PECO work).	$3.40	PECO	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: Dominion (60.85%) / DPL (0.01%) / PECO (0.01%) / PEPCO (29.24%) / PSEG (9.48%) / RE (0.41%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.45	North Delta 500 kV termination for the Rock Springs 500 kV line (5034/5014 line) (PECO work).	$10.20	PECO	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: AEC (17.65%) / BGE (4.43%) / Dominion (9.87%) / DPL (22.25%) / JCPL (3.16%) / Neptune (0.36%) / PECO (2.98%) / PENELEC (0.44%) / PEPCO (3.80%) / PPL (5.99%) / PSEG (27.86%) / RE (1.21%)	6/1/2027
b3800.46	North Delta 500 kV termination for the new Peach Bottom-North Delta 500 kV line (PECO work).	$2.60	PECO	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: AEC (11.03%) / BGE (37.40%) / DPL (22.91%) / PEPCO (28.66%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.47	Build new Peach Bottom South-North Delta 500 kV line – cut in to Peach Bottom tie No. 1 and extending line to North Delta (~1.25 miles new ROW).	$5.50	PECO	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: AEC (11.03%) / BGE (37.40%) / DPL (22.91%) / PEPCO (28.66%)	6/1/2027
b3800.48	North Delta termination for the North Delta-High Ridge 500 line (Transource work).	$0.96	Transource	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: Dominion (60.85%) / DPL (0.01%) / PECO (0.01%) / PEPCO (29.24%) / PSEG (9.48%) / RE (0.41%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.49	North Delta 500 kV termination for the Calpine generator (Calpine/Transource work).	$4.05	Transource	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: PECO (100.00%)	6/1/2027
b3800.50	North Delta 500 kV termination for the Rock Springs 500 kV line (5034/5014 line) (Transource work).	$0.49	Transource	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: AEC (17.65%) / BGE (4.43%) / Dominion (9.87%) / DPL (22.25%) / JCPL (3.16%) / Neptune (0.36%) / PECO (2.98%) / PENELEC (0.44%) / PEPCO (3.80%) / PPL (5.99%) / PSEG (27.86%) / RE (1.21%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.51	North Delta 500 kV termination for the new Peach Bottom-North Delta 500 kV line (Transource work).	$0.29	Transource	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: AEC (11.03%) / BGE (37.40%) / DPL (22.91%) / PEPCO (28.66%)	6/1/2027
b3800.100	Establish a new 500 kV breaker position for the low-side of the existing 765/500 kV transformer at Cloverdale Station. The new position will be between two new 500 kV circuit breakers located in a new breaker string, electrically converting the 500 kV yard to "double-bus double-breaker" configuration.	$11.59	AEP	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: AEP (100.00%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.101	502 Junction substation two 500 kV circuit breaker expansion.	$30.60	APS	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (25.59%) / BGE (9.79%) / Dominion (51.94%) / PEPCO (12.68%)	6/1/2027
b3800.102	New 500 kV line from existing 502 Junction substation to Woodside 500 KV substation (bypass Black Oak) NEET Portion.	$315.64	NEET	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (25.59%) / BGE (9.79%) / Dominion (51.94%) / PEPCO (12.68%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.103	Rebuild ~16 miles of the Gore-Stonewall 138 kV line with 500 kV overbuild (502 Jct to Woodside 500 kV line section).	$151.72	APS	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (25.59%) / BGE (9.79%) / Dominion (51.94%) / PEPCO (12.68%)	6/1/2027
b3800.104	Rebuild ~15 miles of the Stonewall-Millville 138 kV line with 500 kV overbuild (502 Jct to Woodside 500 kV line section).	$136.93	APS	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (9.18%) / BGE (7.21%) / Dominion (72.52%) / PEPCO (11.09%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.105	Rebuild ~6 miles of the Millville-Doubs 138 kV line with 500 kV overbuild (502 Jct to Woodside 500 kV line section).	$52.35	APS	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (9.18%) / BGE (7.21%) / Dominion (72.52%) / PEPCO (11.09%)	6/1/2027
b3800.106	Woodside 500 kV substation (Except terminations, Transformer, Cap Banks and Statcom).	$43.96	NEET	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (100.00%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.107	Line Termination cost at Woodside 500 kV for 502 Jct to Woodside 500 kV line.	$0.51	NEET	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (25.59%) / BGE (9.79%) / Dominion (51.94%) / PEPCO (12.68%)	6/1/2027
b3800.108	Line Termination cost at Woodside 500 kV for Woodside to Aspen 500 kV line.	$0.51	NEET	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (9.18%) / BGE (7.21%) / Dominion (72.52%) / PEPCO (11.09%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.113	Two 150 MVAR Cap banks and one +500/-300 MVAR STATCOM at Woodside 500 kV substation.	$44.22	NEET	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (100.00%)	6/1/2027
b3800.115	Line work for terminating Doubs to Bismark line for Doubs side for Woodside 500 kV substation. NEET Portion	$0.51	NEET	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (27.49%) / BGE (9.83%) / Dominion (53.78%) / PEPCO (8.90%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.116	Line work for terminating Doubs to Bismark line for Doubs side for Woodside 500 kV substation. FE Portion	$0.06	APS	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (27.49%) / BGE (9.83%) / Dominion (53.78%) / PEPCO (8.90%)	6/1/2027
b3800.117	Line work for terminating Doubs to Bismark line for Bismark side for Woodside 500 kV substation. NEET Portion	$0.51	NEET	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (21.09%) / BGE (6.55%) / Dominion (64.94%) / PEPCO (7.42%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.118	Line work for terminating Doubs to Bismark line into Woodside 500 kV substation. DOM Portion	$5.10	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (21.09%) / BGE (6.55%) / Dominion (64.94%) / PEPCO (7.42%)	6/1/2027
b3800.119	New 500 kV transmission line from Woodside substation to Aspen substation (in DOM zone). NEET Portion	$71.72	NEET	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (9.18%) / BGE (7.21%) / Dominion (72.52%) / PEPCO (11.09%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.120	Aspen substation work to terminate new NextEra 500 kV line. Include Aspen 500 kV subsation portion build.	$30.49	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (9.18%) / BGE (7.21%) / Dominion (72.52%) / PEPCO (11.09%)	6/1/2027
b3800.121	Kammer to 502 Junction 500 kV line: Conduct LIDAR Sag Study to assess SE rating and needed upgrades.	$0.10	AEP	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: AEP (21.66%) / APS (0.01%) / BGE (7.14%) / DEOK (0.01%) / Dominion (62.25%) / PEPCO (8.93%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.122	Rebuild 500 kV line No. 514 from Doubs-Goose Creek 500 kV line. The Doubs-Goose Creek 500 kV line will be rebuilt and the Doubs-Dickerson 230 kV will be relocated and underbuilt on the same structure. APS Portion	$103.27	APS	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (0.08%) / Dominion (99.90%) / PEPCO (0.02%)	6/1/2027
b3800.123	Doubs substation work - Re-terminate the rebuilt Doubs-Goose Creek 500 kV line in its existing bay, Terminate the new Doubs-Aspen 500 kV line in the open bay at Doubs, Replace three 500 kV breakers, Replace 500 kV terminal equipment including disconnect switches, CTs and substation conductor & Replace relaying. APS Portion	$31.70	APS	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (0.08%) / Dominion (99.90%) / PEPCO (0.02%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.124	New Doubs to Aspen 500 kV line - Aspen substation is not yet constructed but is a component in Dominion's proposal 2022-W3-692. The Doubs-Aqueduct and Aqueduct-Dickerson 230 kV lines will be rebuilt and attached on the same structures. APS Portion	$68.80	APS	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (0.09%) / Dominion (99.89%) / PEPCO (0.02%)	6/1/2027
b3800.200	Build a new 500 kV line from Aspen-Golden on 500/230 kV double circuit structures with substation upgrades at Aspen and Golden. New conductor to have a minimum summer normal rating of 4357MVA.	$176.02	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: Dominion (100.00%)	6/1/2027
b3800.202	Install (1) 500-230 kV transformer bank at Aspen substation.	$42.00	Dominion	Dominion (86.28%) / PEPCO (13.72%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.212	Build a new 500 kV line from Mars-Golden on 500/230 kV double circuit structures with substation upgrades at Golden and Mars. New conductor to have a monimum summer normal rating of 4357 MVA.	$228.04	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (99.96%) / Dominion (0.04%)	6/1/2027
b3800.213	Cut 500 kV line No. 558 Brambleton-Goose Creek into Aspen substation. Upgrade 500 kV terminal equipment at Aspen and Goose Creek to 5000A continuous rating current. At Goose Creek, replace circuit breakers 59582 and 55882, and associated disconnect switches, breaker leads, bus, and line risers to accommodate 5000A rating.	$50.12	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (99.39%) / Dominion (0.61%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.214	Build a new 500 kV line from Aspen-Goose Creek to achieve a summer rating of 4357 MVA. Install new 500 kV terminal equipment at Aspen.	$38.53	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (99.39%) / Dominion (0.61%)	6/1/2027
b3800.217	Build a new 230 kV line from Aspen-Sycolin Creek on 500/230 kV double circuit structures to achieve a summer rating of 1573 MVA. Install 230 kV equipment at Golden and Sycolin Creek.	$60.42	Dominion	Dominion (86.28%) / PEPCO (13.72%)	6/1/2027
b3800.225	Change 500 kV line No. 558 destination at Brambleton to Aspen substation and upgrade line protection relays.	$0.23	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (5.20%) / DL (0.46%) / Dominion (91.40%) / ME (0.59%) / PEPCO (2.35%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.238	Upgrade equipment to 4000A continuous current rating at Pleasant View substation in support of 230 kV line No. 203 rebuild. Replace circuit breakers 203T274 & L3T203 and associated disconnect switches, breaker leads, bus, and line risers to accommodate 4000A rating.	$1.81	Dominion	APS (8.09%) / BGE (8.25%) / Dominion (64.87%) / PEPCO (18.79%)	6/1/2027
b3800.239	Wreck and rebuild 230 kV line No. 203 between Pleasant View and structure 203/15 using double circuit 500/230 kV structures. The 500 kV line is from Aspen-Doubs.	$6.87	Dominion	APS (8.09%) / BGE (8.25%) / Dominion (64.87%) / PEPCO (18.79%)	6/1/2027
b3800.240	Build a new 500 kV line from Aspen-Doubs using double circuit 500/230 kV structures. The 230 kV line is from Pleasant View-structure 203/15. Install terminal equipment at Aspen for a 5000A line to Doubs (First Energy). This includes GIS breakers, GIS-to-AIS transition equipment, and metering CCVTs and CTs for the tie line.	$41.68	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (0.09%) / Dominion (99.89%) / PEPCO (0.02%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.241	Rebuild 500 kV line No. 514 from Goose Creek-Doubs using 500/230 kV double circiut structures. The new double circuit towers will accommodate 230 kV line No. 2098 between Pleasant View substation and structure 2098/9. Upgrade equipment at Goose Creek to 5000A continuous current rating in support of line No. 514 wreck and rebuild. Replace circuit breakers 514T595 & 51482 and associated disconnect switches, breaker leads, bus, and line risers to accommodate 5000A rating.	$16.11	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (0.08%) / Dominion (99.90%) / PEPCO (0.02%)	6/1/2027
b3800.242	Upgrading switches 20366M and 20369M and line leads to 4000A continuous current rating of 230 kV line No. 203 at Edwards Ferry substation	$0.51	Dominion	APS (11.45%) / BGE (14.14%) / Dominion (42.82%) / PEPCO (31.59%)	6/1/2027
b3800.243	Rebuild 7.26 miles of existing 230 kV circuit from Dickerson Station H to Ed's Ferry area to accommodate the new 500 kV circuit between Doubs and Aspen. (the 500 kV portion of the work)	$37.20	PEPCO	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (0.09%) / Dominion (99.89%) / PEPCO (0.02%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.244	Rebuild 7.26 miles of existing 230 kV circuit from Dickerson Station H to Ed's Ferry area to accommodate the new 500 kV circuit between Doubs and Aspen. (The 230 kV portion of the project)	$18.60	PEPCO	APS (9.78%) / BGE (12.07%) / Dominion (51.18%) / PEPCO (26.97%)	6/1/2027
b3800.245	Reconfigure Dickerson H 230 kV substation and upgrade terminal equipment.	$10.58	PEPCO	APS (9.78%) / BGE (12.07%) / Dominion (51.18%) / PEPCO (26.97%)	6/1/2027
b3800.306	Install one (1) 500 kV, 150 MVAr Shunt Capacitor Bank & associated equipment at Morrisville substation. This addition will require a control house expansion to accommodate for two new panels.	$3.63	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: Dominion (100.00%)	6/1/2027
b3800.307	Install one (1) 500 kV, 300 MVAR Static synchronous Compensator (STATCOM) & associated equipment at Mars substation.	$41.27	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: Dominion (100.00%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.310	Install one 500 kV, 293.8MVAr Shunt Capacitor Bank & associated equipment at Wishing Star substation.	$3.97	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: Dominion (100.00%)	6/1/2027
b3800.311	Rebuild 500 kV line No. 545 Bristers-Morrisville as a single circuit monopole line to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 4357 MVA.	$65.86	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: Dominion (91.07%) / PEPCO (8.93%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.312	Rebuild 500 kV line No. 569 Loudoun-Morrisville to accommodate the new 500 kV line in the existing right-of-way. New conductor to have a summer rating of 4357 MVA.	$175.62	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (11.72%) / Dominion (88.28%)	6/1/2027
b3800.313	Rebuild approximately 10.29 miles line segment of line No. 535 (Meadow Brook to Loudoun) to accommodate the new 500 kV line in the existing ROW.	$65.86	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (13.93%) / BGE (6.86%) / Dominion (70.92%) / PEPCO (8.29%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.314	Rebuild approximately 4.83 miles of 500 kV line No. 546 Mosby-Wishing Star to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 4357 MVA. Upgrade and install equipment at Mosby substation to upgrade terminal equipment to be rated for 5000A for 500 kV lines No. 546.	$49.79	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (41.98%) / Dominion (34.03%) / PEPCO (23.99%)	6/1/2027
b3800.315	Rebuild approximately 4.59 miles of 500 kV line No. 590 Mosby-Wishing Star to accommodate the new 500 kV line in the existing ROW. New conductor to have a summer rating of 4357 MVA. Upgrade and install equipment at Mosby substation to upgrade terminal equipment to be rated for 5000A for 500 kV lines No. 590.	$49.79	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (41.98%) / Dominion (34.03%) / PEPCO (23.99%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.336	Upgrade and install equipment at Bristers substation to support the new conductor 5000A rating for 500 kV line No. 545.	$5.72	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: Dominion (91.07%) / PEPCO (8.93%)	6/1/2027
b3800.344	Upgrade and install equipment at Loudoun substation to support the new conductor 5000A rating for 500 kV line No. 569 Loudoun-Morrisville.	$10.70	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (11.72%) / Dominion (88.28%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.346	Upgrade and install equipment at Morrisville substation to support the new 500 kV conductor termination. All terminal equipment to be rated for 5000 A for 500 kV line No. 545 & No. 569. Upgrade 500 kV bus 2 to 5000 A.	$17.54	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (11.72%) / Dominion (88.28%)	6/1/2027
b3800.350	Install terminal equipment at Vint Hill substation to support a 5000A line to Morrisville. Update relay settings for 230 kV lines No. 2101, No. 2163, and 500 kV line No. 535.	$23.64	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (9.79%) / Dominion (90.21%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.353	Update relay settings at Vint Hill for 500 kV line No. 535 Vint Hill-Loudoun.	$0.03	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (13.93%) / BGE (6.86%) / Dominion (70.92%) / PEPCO (8.29%)	6/1/2027
b3800.354	Install terminal equipment at Wishing Star substation to support a 5000A line to Vint Hill. Update relay settings for 500 kV lines No. 546 and No. 590.	$12.30	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (21.45%) / Dominion (78.55%)	6/1/2027

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3800.356	Build a new 500 kV line from Vint Hill to Wishing Star. The line will be supported on single circuit monopoles. New conductor to have a summer rating of 4357 MVA. Line length is approximately 16.59 miles.	$87.81	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (21.45%) / Dominion (78.55%)	6/1/2027
b3800.357	Build a new 500 kV line from Morrisville to Vint Hill. New conductor to have a summer rating of 4357 MVA. Line length is approximately 19.71 miles.	$101.89	Dominion	Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: APS (9.79%) / Dominion (90.21%)	6/1/2027

Attachment C – Reliability Project Multi-Driver Cost Allocations

Upgrade ID	Description	Cost Estimate ($M)	TO	Cost Responsibility	Required In-Service Date
b3737.47	Build New North Delta 500 kV substation (four bay breaker and half configuration) - the substation will include 12 - 500 kV breakers and one 500/230 kV transformer, will allow the termination of six - 500 kV lines.	104.1	Transource	Public Policy Driver: (73.27%) AEC (13.55%) / JCPL (31.74%) / PSEG (52.60%) / RE (2.11%) Reliability Driver: (26.73%) Load-Ratio Share Allocation: AEC (1.65%) / AEP (13.68%) / APS (5.76%) / ATSI (8.04%) / BGE (4.11%) / ComEd (13.39%) / Dayton (2.12%) / DEOK (3.25%) / DL (1.71%) / Dominion (13.32%) / DPL (2.60%) / EKPC (1.89%) / JCPL (3.86%) / ME (1.90%) / NEPTUNE (0.42%) / OVEC (0.08%) / PECO (5.40%) / PENELEC (1.78%) / PEPCO (3.67%) / PPL (4.72%) / PSEG (6.39%) / RE (0.26%) DFAX Allocation: PECO (100.00%)	6/1/2029

Figure 1. Project Cost by Cluster

Figure 2. Project Cost by Designated Entity

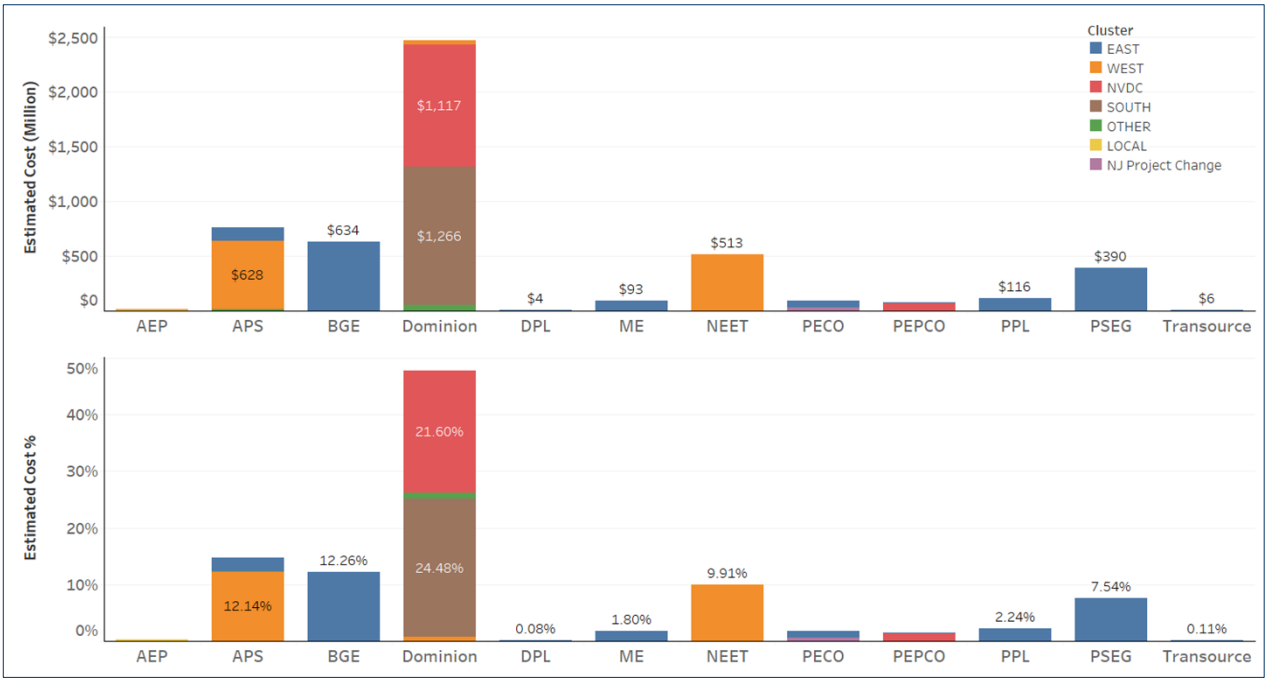
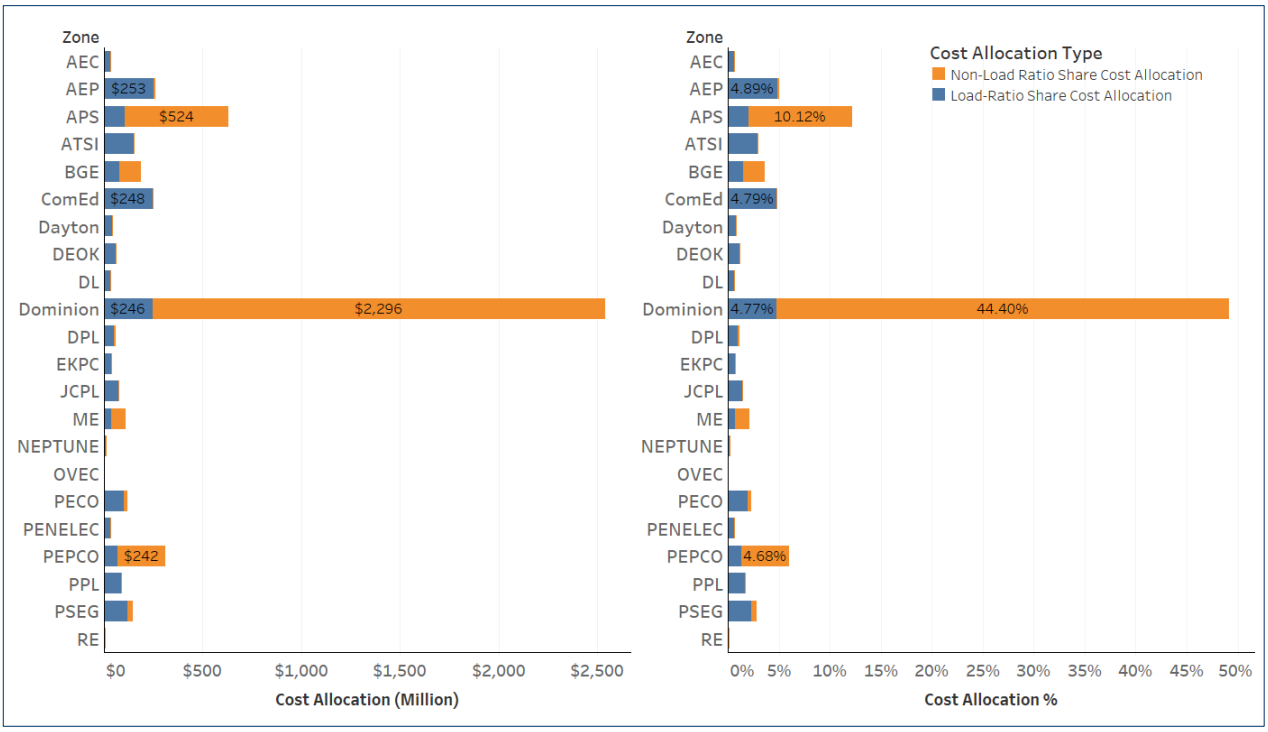


Figure 3. Cost Allocation by Zone



Attachment D – Interconnection Queue Projects With System Impact Study Reports Issued

Generation Interconnection Requests

Queue Position	Transmission Owner	Fuel Type	MW Energy	MW Capacity
AD1-013	ComEd	Solar	40	15.4
AD1-031	ComEd	Solar	70	26.6
AD1-039	ComEd	Natural Gas	102.7	93
AD1-056	Dominion	Solar	60	38.9
AD1-057	Dominion	Solar	33	21.7
AD1-074	Dominion	Solar	300	198.8
AD1-075	Dominion	Solar	75	49.7
AD1-076	Dominion	Solar	109	72.2
AD1-098	ComEd	Solar	100	57.8
AD1-100	ComEd	Wind	850	150
AD1-102	AEP	Wind	180.01	23.4
AD2-008	Dominion	Solar	52.1	16.4
AD2-033	Dominion	Solar	130	78
AD2-038	ComEd	Wind	150	26.4
AD2-046	Dominion	Solar	80	54.8
AD2-047	ComEd	Wind	200	34
AD2-063	Dominion	Solar	149.5	89.7
AD2-066	ComEd	Solar	116	69.6
AD2-077	PPL	Storage	150	100
AD2-100	ComEd	Solar	210	126
AD2-131	ComEd	Solar	50	8.3
AD2-134	ComEd	Wind	105.9	21.2
AD2-162	AEP	Solar	110	73.81
AD2-178	AEP	Solar	120	72
AD2-179	AEP	Solar	100	60
AD2-194	ComEd	Natural Gas	60	120
AD2-214	ComEd	Solar	68	40.8
AE1-001	BGE	Nuclear	28.1	7.1
AE1-068	Dominion	Solar	500	322.1
AE1-069	Dominion	Solar	400	254.5
AE1-093	AEP	Storage	42	42
AE1-107	DPL	Solar	53.1	31
AE1-113	ComEd	Wind	300	66
AE1-149	Dominion	Solar	100	60
AE1-163	ComEd	Wind	350	49
AE1-170	AEP	Solar	150	63

Queue Position	Transmission Owner	Fuel Type	MW Energy	MW Capacity
AE1-207	AEP	Solar	160	67.2
AE1-208	AEP	Solar	130	55
AE1-209	AEP	Wind	100	13
AE1-210	AEP	Wind	100	13
AE1-227	AEP	Solar	49.5	30.69
AE1-240	AEC	Solar	49.7	29
AE1-245	AEP	Wind	150	19.5
AE1-250	AEP	Solar	150	90
AE2-020	AEC	Offshore Wind	604.8	106.44
AE2-021	AEC	Offshore Wind	604.8	106.44
AE2-022	AEC	Offshore Wind	300	52.8
AE2-024	JCPL	Offshore Wind	882	155.23
AE2-025	JCPL	Offshore Wind	445.2	78.36
AE2-034	Dominion	Solar	60	42
AE2-047	AEP	Solar	50	32.4
AE2-072	AEP	Solar	150	90
AE2-089	AEP	Solar	155	93
AE2-113	PENELEC	Solar	120	61.9
AE2-137	APS	Natural Gas	84	87
AE2-160	AEP	Hydro	51	30
AE2-166	AEP	Solar	90	54
AE2-169	AEP	Solar	33	33
AE2-172	AEP	Storage	40	40
AE2-194	ATSI	Solar	145	84
AE2-195	AEP	Solar	19.7	9
AE2-214	AEP	Solar	200	120
AE2-219	AEP	Solar	100	42
AE2-236	AEP	Solar	55	38.5
AE2-255	ComEd	Wind	100	25
AE2-262	APS	Solar	83.6	50
AE2-263	APS	Solar	78.38	47
AE2-264	PENELEC	Solar	80	48
AE2-267	DEOK	Solar	49	28.6
AE2-281	ComEd	Wind	50	7
AE2-298	AEP	Solar	49.9	29.9
AE2-299	PENELEC	Storage	160	32
AE2-302	AEP	Solar	49.9	29.94
AE2-308	EKPC	Solar; Storage	150	110
AE2-316	APS	Solar	90	41.2
AE2-322	AEP	Solar	60	40.3
AE2-323	AEP	Solar	100	67.1

Queue Position	Transmission Owner	Fuel Type	MW Energy	MW Capacity
AF1-017	Dominion	Solar	20	7.6
AF1-019	JCPL	Storage	20	0
AF1-029	AEP	Solar	25	15
AF1-064	ATSI	Solar	50	33.4
AF1-078	Dayton	Solar	45	18.9
AF1-086	PENELEC	Wind	109.9	20.54
AF1-092	AEP	Solar; Storage	150	115
AF1-094	PENELEC	Solar	20	12
AF1-098	PENELEC	Solar	80	48
AF1-104	PENELEC	Solar; Storage	20	20
AF1-120	ATSI	Solar	40	26.6
AF1-122	ATSI	Solar	64	26.88
AF1-130	AEP	Solar	190	133.9
AF1-134	PENELEC	Solar	20	12
AF1-143	PENELEC	Solar	100	60
AF1-153	APS	Solar	20	12
AF1-158	AEP	Solar; Storage	150	90
AF1-164	AEP	Solar	300	195
AF1-167	APS	Solar	13.515	8.109
AF1-202	AEP	Wind	200	34
AF1-204	AEP	Wind	255	63.75
AF1-205	AMPT	Solar	40	24
AF1-207	AEP	Solar	180	34
AF1-215	AEP	Solar	300	180
AF1-216	PPL	Solar	143.11	85.87
AF1-223	AEP	Solar	150	90
AF1-225	APS	Solar	20	8.4
AF1-227	AEP	Solar	325	195
AF1-228	AEP	Solar	155	93
AF1-229	AEP	Solar	120	72
AF1-254	APS	Solar	20	12
AF1-272	PENELEC	Solar	110	66
AF1-279	ATSI	Solar; Storage	150	90
AF1-286	PENELEC	Solar	13.6	5
AF1-325	JCPL	Storage	20	0
AF2-001	PENELEC	Solar	20	12
AF2-002	PENELEC	Solar	10	6
AF2-021	AEC	Storage	20	8
AF2-024	AEC	Storage	24	9.6
AF2-039	PENELEC	Solar	13.5	8.1

Queue Position	Transmission Owner	Fuel Type	MW Energy	MW Capacity
AF2-055	ODEC	Storage; Solar	45	27
AF2-061	DPL	Storage	40	40
AF2-078	AEP	Solar; Storage	200	120
AF2-088	PENELEC	Solar	6.5	3.9
AF2-092	PENELEC	Solar	12	7.2
AF2-102	ME	Solar	3	1.8
AF2-119	Dominion	Solar	80	48
AF2-121	PENELEC	Solar	20	12
AF2-122	AEP	Solar	107.7	64.62
AF2-123	ATSI	Solar	49	20.58
AF2-129	ATSI	Solar	20	12
AF2-134	AEP	Solar	100	60
AF2-145	PPL	Solar	51	30.6
AF2-150	ATSI	Solar	88	36.96
AF2-165	PENELEC	Solar	20	12
AF2-166	PENELEC	Solar	20	12
AF2-175	ME	Solar	3	1.8
AF2-221	PENELEC	Solar	15	6.3
AF2-254	JCPL	Solar	10	4.2
AF2-313	DPL	Solar	19.9	12.7
AF2-322	ATSI	Solar	199.67	119.802
AF2-325	DPL	Solar; Storage	10	4.2
AF2-356	APS	Solar	175	105
AF2-416	PSEG	Storage	10	10
AG1-041	PENELEC	Solar	12	7.2
AG1-191	JCPL	Solar	15.4	6.5
AG1-193	PENELEC	Solar	20	12
AG1-252	ATSI	Solar	3.875	2.3
AG1-259	PPL	Solar	15.9	6.7
AG1-260	PPL	Solar	15.9	6.7
AG1-262	PPL	Storage	85	40
AG1-293	APS	Solar	7.5	4.9
AG1-301	PENELEC	Solar	20	12
AG1-478	ComEd	Solar; Storage	19.9	15.9

Attachment E – Interconnection Network Upgrades

Upgrade ID	Description	Cost Estimate ($M)	Required In-Service Date
n4106	Replace two Switches at the Clifty Creek 345 kV station.	$0.41	10/31/2023
n4106.3	Jefferson-Clifty 345 kV line sag study remediation is one location of grading to remediate clearance location of concern in span 1 to 2. Latest Facility Study: Extend one Tower on the Jefferson-Clifty Creek (IKEC) 345 kV Circuit.	$0.41	12/31/2022
n5769.5	Replace four Dumont switches on the Stillwell-Dumont 345 kV line.	$2.40	6/1/2020
n5769.6	Adjust Dumont relay trip limit settings on the Stillwell-Dumont 345 kV line.	$0.60	6/1/2020
n5783	Reconductor the AC1-078 Tap-London 138 kV line.	$3.91	6/1/2020
n5806	Relay Modification Work to Accommodate AD1-037.	$0.03	5/1/2019
n5833	Mitigate the sag on the 17ST John-St John 345 kV line.	$3.80	6/1/2021
n5834	Mitigate the sag on the St John-Green Acre 345 kV line.	$3.80	6/1/2021
n5867	Cut the East-Springfield-Tangy 138 kV line and terminate the line inside the proposed AD2-163 ring bus in an in-out configuration at East Springfield-Tangy 138 kV line.	$0.37	12/1/2021
n5868	Adjust remote, relaying and metering settings and replace 138 kV wave trap, line tuner and coax at Tangy 138 kV substation.	$0.12	12/1/2021
n5869	Adjust remote, relaying and metering settings and replace 138 kV wave trap, line tuner and coax. Also replace line and carrier relaying at East Springfield 138 kV substation.	$0.27	12/1/2021
n5879	Rebuild the 6705 Sharptown-AD2-088 TAP 69 kV line.	$5.93	6/1/2020
n5880	Rebuild the 6705 AD2-088 TAP-Laurel 69 kV line	$5.09	6/1/2020
n5886	Install one span of Attachment Facility line from the Point of Interconnection (POI) to the tap point at or near MAIT structure No. 838-175 of the Lyons-Moselem 69 kV line.	$0.21	4/1/2020
n5887	Install two switches at the tap point at or near MAIT structure No. 838-175 of the Lyons-Moselem 69 kV line.	$0.42	4/1/2020
n5888	Estimated installation of 700 MHz radio system (70% penetration of FE territory) at AD2-115 to support the SCADA switch installations. Assumed SCADA work is included in this cost.	$0.05	4/1/2020
n6078	Substation – Design, install and test/commission Multiprotocol Label Switching (MPLS) Equipment for SCADA transport. Install fiber from AD2-158 to backbone for communication transport. SCADA work at Millville and Double Toll Gate substations to support wave trap & relay installations. Estimated one in-sub fiber run from AD2-158 substation control house to Interconnection Customer built fiber run to support communications and control to generator site.	$0.67	9/1/2020
n6079	Project Management, Environmental, Forestry, Real Estate and Right of Way at AD2-158 interconnection substation.	$1.34	9/1/2020
n6080	Double Toll Gate-Millville 138 kV Line – Cut the Double Toll Gate 138 kV line and install line loop to the new AD2-158 Wheatland 138 kV Interconnection substation.	$0.75	9/1/2020

Upgrade ID	Description	Cost Estimate ($M)	Required In-Service Date
n6081	Double Toll Gate 138 kV substation – Upgrade carrier and line relaying and wave trap.	$0.55	9/1/2020
n6082	Millville 138 kV substation – Upgrade carrier relaying and wave trap.	$0.36	9/1/2020
n6134	Build a new three breaker 230 kV ring bus cutting the Clover-Sedge Hill 230 kV line.	$6.12	9/2/2019
n6135	Install new structures to cut and loop the line into AD1-087 switching station.	$1.28	9/2/2019
n6136	Protection and communication work to support interconnection of new AD1- 087 generator.	$0.16	9/2/2019
n6197.1	Uprate CT associated with Barren Co-Horsecave Jct 69 kV line.	$0.00	6/1/2022
n6197.2	Upgrade jumpers at Barren Co associated with Barren Co-Horsecave Jct 69 kV line.	$0.01	6/1/2022
n6198.2	Uprate high side and two lowside CTs associated with Barren Co 161/69 kV Auto to a minimum of 230 MVA summer LTE.	$0.00	6/1/2022
n6220	Install a second, back-to-back breaker between existing line positions No. 254 and No. 2141 at the Lakeview substation.	$1.96	12/31/2017
n6232	Upgrade the existing 500 MCM Cu bus jumpers to 750 MCM Cu. New rating after the upgrade will be 148 MVA.	$0.25	12/31/2023
n6235	Build a three-breaker ring bus at the new AC1-043 substation.	$5.47	10/2/2019
n6237	Modify protection and communication work to support interconnection of new AC1-105 generator.	$0.18	10/2/2019
n6239	Install metering and overhead conductors from the POI to the interconnection switching substation AC2-088/AD1-136.	$0.42	6/30/2020
n6274	Install an Attachment facility line from the AC1-074 interconnection substation to the first structure located outside of the switchyard. Also, install revenue metering.	$0.35	6/1/2019
n6275	Install a new loop-in tap line will be constructed from EKPC's existing Jacksonville to Renaker 138 kV transmission line to the new switching station.	$0.52	6/1/2019
n6279.2	Perform a sag study on the Desoto-Jay 138 kV line.	$0.05	12/31/2022
n6285	Modify breaker failure scheme to incorporate "A-Contact" logic to 138 kV blue bus to reduce total clearing times at TSS111 Electric Junction to 9 cycles for fault on 345/138 kV transformer 81.	$0.14	8/28/2023
n6331	Modify protection and communication work to support interconnection of new AC1-222 generator.	$0.18	1/31/2019
n6332	Build new structures to cut and loop the line No. 1016 into AC1-222 115 kV substation.	$0.68	1/31/2019
n6333	Build a three breaker 115 kV substation at the AC1-222 facility.	$5.10	1/31/2019
n6355	Modify protection and communication work to support interconnection of new AC1-221 generator.	$0.07	9/30/2018
n6356	Build new structures to cut and loop the line No. 1016 into AC1-221 230 kV substation.	$0.61	9/30/2018
n6357	Build a three breaker 230 kV substation at the AC1-221 facility.	$5.80	9/30/2018

Upgrade ID	Description	Cost Estimate ($M)	Required In-Service Date
n6383	A Sag Study will be required on the 20 miles section of ACSR ~ 477 ~ 26/7 ~ HAWK conductor section 2 line to mitigate the overload. New Ratings after the sag study S/N: 185MVA S/E: 257MVA. Depending on the sag study results, cost for this upgrade is expected to be between $80,000 (no remediation required just sag study) and $30 million (complete line reconductor/rebuild required).	$0.08	10/1/2024
n6457.1	The sag study was completed under AE1-130 project and determined that no violations occur on this line when operating at Maximum Operating Temperature. No work required on the circuit at this time.	$0.00	9/1/2024
n6463.2	Upgrade bus and jumpers associated with Boone 138 kV bus using 2- 500 MCM 37 CU conductor or equivalent on the Boone Co-Longbranch 138 kV line.	$0.17	6/1/2022
n6463.5	Boone Co-Longbranch 138 kV line: Replace the 750 MCM copper substation bus and jumpers at the Longbranch substation with bundled 500 MCM copper or equivalent equipment.	$0.19	1/31/2022
n6476	Perform a sag study on the 11.7-mile single circuit line between Fostoria Central and South Berwick.	$0.07	6/1/2022
n6494	Increase the maximum operating temperature of the 266 MCM ACSR conductor in the Edmonton/JB Galloway Jct-Knob Lick 69 kV line section to 176 degrees F (5.7 miles).	$0.31	12/31/2023
n6494.1	Increase MOT (maximum operating temperature) of 266 MCM ACSR conductor to 212 degrees on the EDM-JBGAL J-Knob Lick 69 kV line.	$0.29	12/31/2022
n6526.2	Sag Study will be required on ACSR ~ 954 ~ 45/7, 18.3 miles line between South Berwick and Galion. The cost is expected to be 73,200. New Ratings after sag study: S/N: 1409 MVA S/E: 1887 MVA. Rebuild/Reconductor cost: $ 36.6 million.	$0.73	9/25/2024
n6538.1	Replace five substation conductor 2156 ACSR 84/19 Std at E Lima.	$0.50	6/1/2023
n6538.2	Sag study is required on four-mile single circuit line between Fremont Center and Fremont with 1033 ACSR. The cost is expected to be around $20,000.The Rating after the sag study S/N: 1409MVA S/E: 1887MVA. Rebuild/Reconductor cost : $8 million.	$0.02	6/1/2023
n6538.3	Replace substation conductor 2870 MCM ACSR at E Lima.	$0.10	12/1/2022
n6632	New 138 kV substation with a three-position ring bus for AB2-036 interconnection.	$5.44	8/31/2024
n6634.10	Telecom upgrades at Highland 138 kV	$0.01	2/16/2017
n6634.11	Warren 138 kV station: Replace the wave trap on the feeder to Clinton County 138 kV station and make necessary relay settings changes.	$0.12	2/16/2017
n6634.12	Clinton County 138 kV station: Replace the wave trap on the high side of TB1.	$0.10	2/16/2017
n6634.6	Install 138 kV Revenue Meter, generator lead transmission line span from the new Spickard 138 kV station to the Point of Interconnection, and extend dual fiber-optic from the Point of Interconnection to the new Spickard 138 kV station control house.	$0.57	2/16/2017

Upgrade ID	Description	Cost Estimate ($M)	Required In-Service Date
n6634.7	Install new Spickard 138 kV three-breaker ring bus station along the Hillsboro-Clinton County 138 kV line, installation of associated protection and control equipment, line risers, switches, jumpers and supervisory control and data acquisition (SCADA) equipment.	$4.92	2/16/2017
n6634.8	Modify Hillsboro-Clinton County 138 kV T-Line and Fiber Cut In for AC2- 061 interconnection.	$0.96	2/16/2017
n6634.9	Upgrade line protection and fiber connectivity at Hillsboro 138 kV station for AC2-061 interconnection.	$0.28	2/16/2017
n6648	Build a three breaker 115 kV substation at the AC1-143 facility.	$5.30	6/30/2018
n6649	Build new structures to cut and loop the transmission line into AC1-143 115 kV substation.	$1.80	6/30/2018
n6650	Modify protection and communication work to support interconnection of new AC1-143 generator.	$0.15	6/30/2018
n6688	Attachment Facilities: Construct 69 kV Tap line, MOLBAB Switch, Poles, structure and foundations for AE1-226 interconnection.	$0.84	9/30/2020
n6689	Modifications to the Face Rock-Kinzer 69 kV line to tie in the AE1-226 Attachment Facilities.	$0.09	9/30/2020
n6690	Relay Modification Scope of Work at Face Rock substation.	$0.20	9/30/2020
n6759.1	Perform a sag study on the Deaborn-Pierce 345 kV line	$0.13	12/31/2021
n6764	Build a three breaker 115 kV substation at the AE1-084 facility.	$5.60	11/30/2020
n6765	Build new structures to cut and loop the transmission line into AE1-084 115 kV substation.	$0.80	11/30/2020
n6766	Modify protection and communication work to support interconnection of new AE1-084 generator.	$0.27	11/30/2020
n6770	Build a three breaker 230 kV substation at the AC2-165 facility.	$6.30	10/1/2019
n6771	Build new structures to cut and loop the transmission line into the Powhatan 230 kV substation.	$1.00	10/1/2019
n6772	Modify protection and communication work to support interconnection of new Powhatan generator.	$0.19	10/1/2019
n6929	Construct new substation for AF2-349 interconnection.	$15.00	12/26/2022
n6930	Cut circuit and loop into new AF2-349 substation.	$3.70	12/26/2022
n6931	Install communications equipment at new AF2-349 substation.	$2.90	12/26/2022
n6932	Update relays at Cherry Valley TSS 156 for AF2-349 interconnection.	$0.19	12/26/2022
n6933	Update relays at Silver Lake TSS 138 for AF2-349 interconnection.	$0.19	12/26/2022
n7267	Extend the Burlington 26 kV P-120 circuit to the Point of Interconnection (POI) and install revenue grade metering.	$0.34	12/28/2022
n7279	Old Chapel 138 kV substation – Modify substation nameplates and high-voltage circuit diagram.	$0.06	9/1/2020
n7280	Exit Span and 1st Structure to Gen Lead Line at Adam 138 kV.	$0.59	4/16/2016
n7281	Extend fiber-optic cables from the point of transition into the Adams 138 kV control house.	$0.12	4/16/2016

Upgrade ID	Description	Cost Estimate ($M)	Required In-Service Date
n7289	Expand the Lockwood Road 138 kV substation: Install two additional 138 kV circuit breakers. Installation of associated protection and control equipment, 138 kV line risers and SCADA.	$1.60	9/28/2017
n7297	Install one New 138 kV Circuit Breaker, Associated Equipment, Update Protective Relay Settings at the Kirk 138 kV station.	$1.00	2/28/2020
n7298	Install three Dead End Structures, three Spans of Conductor, OPGW and Alumoweld Shield Wires from the Kirk 138 kV station to the Point of Interconnection.	$1.65	2/28/2020
n7299	Install Revenue Metering at Kirk 138 substation.	$0.31	2/28/2020
n7300	Install two Fiber-Optic Cable Paths from the Kirk 138 kV station to the Fiber-Optic Cable Points of Interconnection.	$0.27	2/28/2020
n7349	Engineering and construction oversight for a new three-breaker ring bus on the Greene-Clark 138 kV line for the AD1-140 interconnection. Includes review of drawings, nameplates and relay settings for FirstEnergy standards. Includes Project Management, Environmental and Right of Way.	$0.72	5/29/2020
n7350	AD1-140 Supervisory Control and Data Acquisition (SCADA): Design, install and test/commission Multiprotocol Label Switching (MPLS) equipment for SCADA transport.	$0.20	5/29/2020
n7351	Fiber Communication: ADSS fiber run from AD1-140 Interconnection Switchyard control house to Greene-East Springfield line fiber and to developer built fiber run to support communications and control to the generator site.	$0.08	5/29/2020
n7352	AD1-140 Clark-Green 138 kV Line Loop: Loop the Clark-Greene 138 kV circuit into the new AD1-140 Interconnection Switchyard. The proposed location of the new ring bus is near structure No. 5604. Includes project management, environmental, forestry, real estate and right-of-way.	$0.41	5/29/2020
n7353	Clark 138 kV substation: Install two 138 kV wave traps and tuners. Update Relay Settings.	$0.13	5/29/2020
n7384	Install 345 kV metering at the Marysville 345 kV station. Construct line from the Marysville 345 kV station to the Point of Interconnection. Install dual fiber telecommunications from the Marysville 345 kV station to the Customer Facility collector station.	$1.46	3/20/2018
n7385	Modify and expand the existing Marysville 345 kV station including one 345 kV circuit breaker installation.	$1.27	3/20/2018
n7422	Construct line No. 2 between Morrisville substation and AE1-044 Transition station.	$1.71	11/2/2020
n7433	Construct a new three circuit breaker 345 kV station, Chenoweth, physically configured and operated as a ring bus	$10.47	6/1/2022
n7434	Install 345 kV Revenue Meter, Generator lead first span exiting the POI station, including the first structure outside the fence at the new AE2-148 switching station	$1.60	6/1/2022
n7435	Install a cut in at Beatty Road-Greene 345 kV.	$1.43	6/1/2022
n7436	Upgrade line protection and controls at the Beatty Road 345 kV station.	$0.60	6/1/2022
n7449	Install new 345 kV three-breaker ring bus station along the Olive-Reynolds 345 kV line.	$0.35	5/31/2021

Upgrade ID	Description	Cost Estimate ($M)	Required In-Service Date
n7450	Install three Structures, two Spans of Conductor, Connect Ora Ora 345 kV station to Existing Transmission Circuit	$1.19	5/31/2021
n7451	Replace Protective Relays at Olive 345 kV station.	$0.61	5/31/2021
n7469	Install 345 kV metering at the Gunn Road 345 kV station. Construct line from the Gunn Road 345 kV station to the Point of Interconnection. Install dual fiber telecommunications from the Gunn Road 345 kV station to the Customer Facility collector station.	$1.44	9/30/2019
n7475	Install a new 138 kV circuit breaker, physical structures, protection and control equipment, communications equipment and associated facilities at the Eldean 138 kV substation.	$0.85	12/31/2021
n7492	Install 138 kV metering at the Inez 138 kV station. Construct generator lead transmission line from the Inez 138 kV station to the Point of Interconnection. Install dual fiber telecommunications from the Inez 138 kV station to the Customer Facility collector station.	$0.88	9/18/2019
n7493	Expand Inez 138 kV station, including the addition of a new string and two 138 kV circuit breakers, installation of associated protection and control equipment, 138 kV line risers, switches, jumpers and supervisory control and data acquisition (SCADA) equipment.	$1.53	9/18/2019
n7751	Replace 1600A Switches at Sorenson 345 kV.	$0.10	12/31/2021
n7753	Upgrade circuit breaker and associated Current Transformers and Switches from 2000A to 3000A at Mt. Pleasant substation	$0.40	12/31/2021
n7754.1	Replace 5 substation conductor 2000 AAC 91 Str. at Danville2 138 kV station.	$0.00	11/30/2022
n7754.2	Replace 3 Sub conductor 2000 AAC 91 Str. at East Danville 138 kV station.	$0.00	11/30/2022
n7847	EKPC to install necessary equipment (a 69 kV isolation switch structure and associated switch, plus interconnection metering, fiber-optic connection and telecommunications equipment, circuit breaker and associated switches, and relay panel) at the new Eighty Eight 69 kV Switching station to accept the IC generator lead line/bus.	$1.03	2/14/2019
n7848	Construct a new 69 kV switching station built to 161 kV standards (Eighty Eight Switching) to facilitate connection of the Glover Creek Solar generation project	$3.74	12/31/2022
n7849	Construct facilities (~175 feet) to loop the existing Patton Road Junction-Summer Shade 69 kV line section into the new Eighty Eight Switching substation.	$0.56	12/31/2022
n7850	Modify relay settings at Fox Hollow substation for existing line to Eighty Eight Switching station.	$0.05	12/31/2022
n7851	Modify relay settings at Summer Shade substation for existing line to Eighty Eight Switching substation	$0.05	12/31/2022
n7852	install OPGW in the Summer Shade-Eighty Eight 69 kV line section (1.7 miles).	$0.50	12/31/2022
n7853.1	Re-arrange line No. 1012 to loop into and out of the new three breaker AD2- 063 115 kV switching station. A new three-breaker ring bus substation will be installed between structures 2068/446 and 2068/447.	$1.20	12/31/2024

Upgrade ID	Description	Cost Estimate ($M)	Required In-Service Date
n7853.2	Build a three breaker AD1-152 230 kV switching station.	$7.60	12/31/2024
n7853.3	Remote protection and communications work at Clover 230 kV substation.	$0.06	12/31/2024
n7853.4	Remote drawing work at Sedge Hill 230 kV substation.	$0.02	12/31/2024
n7965	Millville-Old Chapel 138 kV Line: Loop the Millville-Old Chapel 138 kV line into new AE2-226 interconnection substation.	$1.02	12/1/2022
n7966	Double Toll Gate 138 kV: Adjust relay settings and update drawings and nameplates.	$0.05	12/1/2022
n7967	Old Chapel 138 kV: Modify SCADA RTU and update drawings and nameplates.	$0.05	12/1/2022
n7968	Wheatland 138 kV (AD2-158 Interconnect): Upgrade relaying as needed to accommodate the new AE2-226 generation queue project interconnection of 99 MW MFO.	$0.36	12/1/2022
n7969	AE2-226 Interconnect: Construct new Kabletown 138 kV substation as a 3- breaker ring bus looping in and out the Old Chapel-Millville 138 kV line.	$6.88	12/1/2022
n7970	Kabletown 138 kV substation Fiber Installation: Install fiber from Kabletown substation to AD2-158 Interconnection for communication transport.	$0.16	12/1/2022
n7971	SCADA/Fiber Communication: Design, install and test/commission MPLS Equipment at Kabletown 138 kV for SCADA transport.	$0.25	12/1/2022
n7991	Install 69 kV Revenue Meter, generator lead transmission line span from the new 69 kV station to the Point of Interconnection, including the first structure outside the new 69 kV station, and extend fiber-optic from the Point of Interconnection to the new 69 kV station control house.	$0.69	10/31/2016
n7992	Expand the Platter Creek 69 kV station, including the addition of one 69 kV circuit breaker, installation of associated protection and control equipment, 69 kV line risers, and supervisory control and data acquisition (SCADA) equipment.	$0.68	10/31/2016
n8004	Install new 138 kV three-breaker ring bus station along the Grandview- Clifftop 138 kV line, installation of associated protection and control equipment, 138 kV line risers, and supervisory control and data acquisition (SCADA) equipment.	$3.88	9/25/2018
n8005	Modify Grandview-Clifftop 138 kV T-Line Cut In.	$1.22	9/25/2018
n8006	Upgrade line protection and controls at the Grandview 138 kV station	$0.30	9/25/2018
n8018	AE2-256 substation 230 kV: Design, install and test/commission MPLS Equipment for SCADA transport.	$0.29	6/30/2022
n8019	North Lebanon substation 230 kV: Replace CVT & line/carrier Relaying	$0.67	6/30/2022
n8020	Copperstone-North Lebanon 230 kV: Loop the 1094-1(Copperstone- North Lebanon) 230 kV line into a new substation, approximately 7.5 miles from the North Lebanon substation.	$2.33	6/30/2022
n8021	North Hershey-North Temple 230 kV: Install one steel pole strain structure on the existing North Hershey-North Temple 230 kV line to avoid clearance violations to new loop structures on the 1094-1 (Copperstone-North Lebanon) 230 kV line.	$1.04	6/30/2022
n8022	Copperstone substation (PPL 230 kV): Replace CVT & line/carrier Relaying.	$0.52	6/30/2022

Upgrade ID	Description	Cost Estimate ($M)	Required In-Service Date
n8029.1	Attachment facility line and Revenue Metering Installation at the new AF1- 202 345 kV switching station.	$1.08	12/31/2022
n8029.2	Construct a new three breaker 345 kV Switching station for AF1-202 interconnection.	$17.44	12/31/2022
n8029.3	Construct a new loop-in tap line at the Keyston-Desoto 345 kV line for AF1-202 interconnection.	$1.21	12/31/2022
n8029.4	Modify relay settings at Desoto 345 kV substation	$0.05	12/31/2021
n8031.1	New 138 kV switching station (Wapahani switching station) to interconnect AD1-128 customer facility.	$5.37	10/31/2021
n8031.2	Loop-in tap line to new AD1-128 switching station from College Corner-Desota 138 kV line.	$0.93	10/31/2021
n8035.1	Install 69 kV Revenue Meter, generator lead transmission line spans from the Buckskin 69 kV station to the Point of Interconnection, including the first two structures outside the Buckskin 69 kV station, and extend dual fiber-optic from the Point of Interconnection to the Buckskin 69 kV station control house.	$1.02	2/16/2017
n8035.2	Expand the Buckskin 69 kV station, including the addition of one 69 kV circuit breaker, installation of associated protection and control equipment, 69 kV line risers, and supervisory control and data acquisition (SCADA) equipment.	$0.71	2/16/2017
n8035.3	Buckskin-Highland 69 kV T-Line Re-termination. External station associated work, including two structures, including one double circuit structure.	$0.82	2/16/2017
n8059.1	Construct one 69 kV generator lead transmission line from the Steubenville 69 kV station to the Point of Interconnection, install 69 kV revenue meter, extend dual fiber-optic cable from the Point of Interconnection to the Steubenville 69 kV station control house. Expand the Steubenville 69 kV station, including the addition of one 69 kV circuit breaker, installation of associated protection and control equipment, line risers, switches, jumpers and SCADA.	$1.57	11/7/2017
n8059.2	Install one additional 69 kV circuit breaker on the 69 kV side of the Steubenville 138/69/12 kV autotransformer.	$0.37	11/7/2017
n8072.1	Design, install and test/commission MPLS Equipment for SCADA transport at the new AE2-345 substation.	$0.26	4/9/2019
n8072.2	SCADA/Fiber Communication: Install fiber from AE2-345 Interconnection to Hunterstown for relaying communication and MPLS transport.	$1.07	4/9/2019
n8072.3	Gardners-Hunterstown 115 kV Line Loop: Loop existing L991 Gardners-Hunterstown 115 kV line into the new three-breaker Ring Bus approximately 4.2 miles from the Hunterstown substation.	$0.77	4/9/2019
n8072.4	Gardeners 115 kV: Modify drawings, relay settings and nameplates for line name change.	$0.10	4/9/2019
n8072.5	Hunterstown 115 kV: Modify drawings, relay settings and nameplates for line name change.	$0.10	4/9/2019
n8072.6	AE2-345 option to build: FirstEnergy Work at new station built by developer (Security & Network).	$1.57	4/9/2019

Upgrade ID	Description	Cost Estimate ($M)	Required In-Service Date
n8075.1	Construct a new switching station (North Taylor County switching station) to interconnect AF1-083 customer facility.	$3.95	12/31/2022
n8075.2	Loop-in tap line to new AF1-083 switching station from Green County-Marion County 161 kV line.	$0.34	12/31/2022
n8075.3	Modify relay settings at Green County 161 kV substation.	$0.01	12/31/2022
n8075.4	Modify relay settings at Marion County 161 kV substation.	$0.01	12/31/2022
n8075.5	Install OPGW at Green County-North Taylor Switching station.	$0.90	12/31/2022
n8083.1	Construct a new Switching station for AF2-205 interconnection	$5.41	12/31/2022
n8083.2	Transmission line cut-in of Swingle 345 kV switching station & update remote end protection settings.	$0.71	12/31/2022
n8083.3	Install two fiber-optic connections at Swingle-Tatertown 345 kV transmission line.	$0.56	12/31/2022
n8097.1	AE2-001: Tap the existing Nittany-Zion 46 kV line and install 2 main line switches and 1 tap switch to interconnect queue project AE2-001. Tap and CTs/PTs mounted in the customer's station.	$0.16	6/30/2025
n8097.2	Nittany 46 kV: Replace Stone Junction 46 kV line relaying at Nittany for AE2-001 interconnection.	$0.26	6/30/2025
n8097.3	Pleasant Gap 46 kV: Replace Stone Junction 46 kV line relaying at Pleasant Gap for AE2-001 interconnection	$0.26	6/30/2025
n8097.4	Milesburg 46 kV: Replace Stone Junction 46 kV line relaying at Milesburg for AE2-001 interconnection.	$0.26	6/30/2025
n8098.1	East Fayette 138 kV: To connect the AE2-282 solar project with the Toledo Edison transmission system, a new line position will be established within the East Fayette 138 kV substation by adding a new 138 kV circuit breaker and related equipment. A circuit breaker, 3 CCVTs, 1 138 kV Tubular Steel H- frame Dead End, and a relaying panel will be installed to accommodate the new line terminal.	$1.03	9/15/2021
n8098.2	East Fayette 138 kV: Estimated SCADA work at East Fayette substation to support breaker installation, relay installation and updated relay setting. Estimated in-sub fiber run from East Fayette control house to developer ran fiber build for communications to AE2-282 Generator.	$0.06	9/15/2021
n8113	The Contingency driving this upgrade/overload is DVP_P7-1: LN 25-2034-A which is the tower failure of the Dominion 115 kV line No. 25 Trowbridge-Everett and 230 kV line No. 2034 who share a common tower. Dominion new proposal is to resolve the overload by splitting line No. 25 off of line No. 2034, which eliminate the tower contingency.	$4.74	12/31/2022
n8118	AE2-256 substation: Construct a new three-breaker ring bus on the 230 kV (1094) line between Copperstone and North Lebanon. Includes Project Management, Environmental, Forestry, Real Estate and Right of Way.	$6.14	6/30/2022
n8119	AE2-256 substation: Estimated in-sub fiber run to customer built fiber run outside AE2-256 substation. Estimated SCADA work at North Lebanon substation to support relay installation and updated relay settings.	$0.05	6/30/2022
n8151.1	The Hackettstown to Pohatcong 34.5 kV line will be tapped to accommodate the AF1-328 interconnect project. This tap will take place at	$0.44	8/31/2021

Upgrade ID	Description	Cost Estimate ($M)	Required In-Service Date
	a location that is approximately 1.25 miles from the Pohatcong substation and 1.50 miles from the Hackettstown substation.		
n8151.2	Relay settings will be revised for tap at Pohatcong 34.5 kV.	$0.04	8/31/2021
n8151.3	Adjust relay settings at AF1-328 substation.	$0.07	8/31/2021
n8157	Update 138 kV line relaying at the Bremo 138 kV station.	$0.18	9/12/2018
n8159.1	AF1-290 Mechanicstown Interconnection Sub: Design, install and test/commission MPLS Equipment for SCADA transport.	$0.25	11/15/2023
n8159.2	Fiber from AF1-290 Mechanicstown to Feagans Mill-Millville: Install fiber from Mechanicstown to backbone for communication transport.	$0.27	11/15/2023
n8159.3	Feagans Mill-Millville 138 kV Line Loop: Loop the Feagans Mill-Millville 138 kV into the new Mechanicstown substation.	$1.91	11/15/2023
n8159.4	Stonewall substation: Line Terminal Upgrade.	$0.66	11/15/2023
n8159.5	Feagans Mill substation: Modify drawings and nameplates for line name change.	$0.03	11/15/2023
n8159.6	Millville substation: Line Terminal Upgrade.	$0.62	11/15/2023
n8160.1	Tap the Y701 Cozy Lake (Franklin) 34.5 kV line to interconnect to the new AF1-325 customer substation.	$1.50	1/1/2026
n8160.2	Revise relay settings at Franklin 34.5 kV.	$0.05	1/1/2026
n8166.1	115 kV line to provide for the AF1-320 interconnection at the new Merrill Creek 115 kV substation.	$6.36	12/1/2022
n8166.2	Modify drawings, relay settings and nameplates for line name change at Flanders 115 kV.	$0.13	12/1/2022
n8166.3	Modify drawings, relay settings and nameplates for line name change at Drakestown 115 kV.	$0.13	12/1/2022
n8166.4	Replace one 115 kV wave trap, line tuner and coax for Gilbert line exit at Morris Park 115 kV.	$0.82	12/1/2022
n8166.5	Relay setting changes at Pequest River 115 kV.	$0.21	12/1/2022
n8166.6	Review drawings, nameplates and relay settings Gilbert 115 kV.	$0.15	12/1/2022
n8166.7	Merrill Creek substation: Install new three-breaker ring bus at Merrill Creek substation 115 kV.	$13.74	12/1/2022
n8166.8	SCADA/Fiber Communication: Install fiber from Merrill Creek to backbone for communication transport. Fiber backbone location is subject to change at Merrill Creek to Fiber Backbone. Design, install and test/commission MPLS Equipment for SCADA transport at Merrill Creek 115 kV.	$1.39	12/1/2022
n8166.9	SCADA/Fiber Communication: Design, install and test/commission MPLS Equipment for SCADA transport at Merrill Creek 115 kV.	$0.39	12/1/2022
n8187.1	Farmers Valley-Ridgway 115 kV Line Loop: Construct a loop from the Farmers Valley-Ridgway 115 kV line to the new substation, approximately 14.4 miles from Farmers Valley substation.	$1.69	12/31/2020
n8187.2	Ridgway substation 115 kV: Line terminal upgrade.	$0.19	12/31/2020
n8187.3	Farmers substation 115 kV: Line terminal upgrade.	$0.30	12/31/2020
n8187.4	Pierce Brook substation 115 kV: Line terminal upgrade.	$0.06	12/31/2020

Upgrade ID	Description	Cost Estimate ($M)	Required In-Service Date
n8188.1	Brookville-Squab Hollow 138 kV Line: Loop the Brookville-Squab Hollow 138 kV line into the new AE2-316 interconnection sub.	$1.58	12/31/2020
n8188.2	Brookville 138 kV: Install new relays and modify relay settings.	$0.24	12/31/2020
n8188.3	Armstrong 138 kV: Install anti-islanding transmitter.	$0.19	12/31/2020
n8188.4	Squab Hollow 138 kV: Install anti-islanding transmitter.	$0.21	12/31/2020
n8188.5	Install fiber from AE2-316 to Backbone for communication transport at AE2- 316 Direct Connect – Squab Solar.	$1.11	12/31/2020
n8188.6	SCADA/Fiber Communication: Design, install and test/commission MPLS Equipment for SCADA transport at AE2-316 interconnection substation.	$0.29	12/31/2020
n8193.1	Install fiber from AE2-344 interconnection substation to Edinboro South for communication transport.	$0.40	3/31/2026
n8193.10	Morgan Street substation 115 kV: Line Terminal Upgrade.	$0.59	3/31/2026
n8193.2	Design, install and test/commission MPLS Equipment for SCADA transport at AE2-344 interconnection substation.	$0.19	3/31/2026
n8193.3	Edinboro South-Morgan Street-Springboro 115 kV Line Loop: Loop from the MF1/MFS (Edinboro South-Morgan Street-Springboro) 115 kV line to the new AE2-344 interconnection substation.	$0.97	3/31/2026
n8193.4	Edinboro South 115 kV: Line Terminal Upgrade.	$0.55	3/31/2026
n8193.5	Wayne substation 115 kV: Line Terminal Upgrade.	$0.03	3/31/2026
n8193.6	Geneva substation 115 kV: Line Terminal Upgrade.	$0.53	3/31/2026
n8193.7	Erie West substation 115 kV: Line Terminal Upgrade.	$0.21	3/31/2026
n8193.8	Erie South substation 115 kV: Line Terminal Upgrade.	$0.21	3/31/2026
n8193.9	Springboro substation 115 kV: Line Terminal Upgrade.	$0.52	3/31/2026
n8198.1	Install (3) 34.5 kV load-break air switches with SCADA control on the Cookstown-New Lisbon (W75) 34.5 kV line approximately 0.3 miles from the Fort Dix W75 Tap and 3.1 miles from the Hanover Solar Tap (at structures 116 & 117).	$0.36	12/31/2020
n8198.2	Review Cookstown line relay settings as required for AF2-254 tap at New Lisbon 34.5 kV.	$0.04	12/31/2020
n8198.3	Review New Lisbon line relay settings as required for AF2-254 tap at Cookstown 34.5 kV.	$0.04	12/31/2020
n8206	Snyder: Extend the Snyder 69 kV bus. Install one 69 kV circuit breaker.	$0.87	10/31/2021
n8207.1	New SCADA switch at AF2-130 POI: Add new SCADA switch at the proposed tap point near pole No. 0C-37451 on the 34.5 kV Tionesta Jct./Crown distribution ckt No. 00519-51	$0.10	6/30/2023
n8207.2	AF2-130 Generation substation: Integrate customer protection and controls to the FE transmission system.	$0.08	6/30/2023
n8207.3	Crown substation: Installing 34.5 kV PT as well as SEL-351S.	$0.63	6/30/2023
n8207.4	Tionesta substation 34.5 kV: Revise relay settings.	$0.11	6/30/2023
n8210.1	Branchville to Holiday Lakes 34.5 kV line: The Branchville to Holiday Lakes 34.5 kV line will be tapped to accommodate the Customer Facility. This tap will take place at a location that is approximately 1.50 miles from the Holiday Lakes substation and 10 miles from the Branchville substation	$1.42	3/1/2021

Upgrade ID	Description	Cost Estimate ($M)	Required In-Service Date
n8210.2	Branchville substation 34.5 kV: Revise relay settings.	$0.05	3/1/2021
n8211.1	Albright-Cross School 138 kV Line: Loop in and out the Albright-Cross School AFA 138 kV line to new three-breaker ring bus at Swanton 138 kV substation.	$1.36	8/31/2025
n8211.2	Cross School 138 kV substation: Replace one 138 kV, 2000A, wave trap, line tuner and coax on Albright line exit with one 138 kV, 2000A wideband wave trap, line tuner and coax. Replace line relaying panel for the Swanton line terminal.	$1.38	8/31/2025
n8211.3	Albright 138kV substation: Replace one 138 kV, 2000A, wave trap, line tuner and coax on Cross School line exit with one 138 kV, 2000A wideband wave trap, line tuner and coax. Replace line relaying panel for the Swanton line terminal.	$1.81	8/31/2025
n8211.4	Dan's Rock substation 138 kV: Design, install and test/commission new licensed microwave link at Dan's Rock MW.	$0.19	8/31/2025
n8211.5	Design, install and test/commission MPLS Equipment for SCADA transport at Swanton 138 kV substation.	$0.66	8/31/2025
n8211.6	AF2-356 Interconnection substation (OTB): Install physical security camera system.	$1.80	8/31/2025
n8217.1	Groton substation 138 kV: Expand existing Groton ring bus to a four- breaker ring bus.	$1.64	12/31/2021
n8217.2	Hayes substation 138 kV: Modify relay setting.	$0.13	12/31/2021
n8217.3	West Fremont substation 138 kV: Revise relay settings.	$0.13	12/31/2021
n8221.1	Construct a new 69 kV three-breaker ring bus on the Cardington-Tangy 69 kV line.	$5.78	11/30/2022
n8221.2	Design, install and test/commission MPLS Equipment for SCADA transport on the Cardington-Tangy 69 kV line.	$0.26	11/30/2022
n8221.3	Loop the Cardington-Tangy 69 kV line to create the interconnection for the new AF1-122 three-breaker ring bus, approximately 1.1 miles from the Cardington substation. Install fiber from the new AF1-122 three-breaker ring bus to the Cardington substation.	$1.14	11/30/2022
n8221.4	Relay Settings Changes, Drawing Updates and Nameplates at Tangy 69 kV substation.	$0.06	11/30/2022
n8221.5	Upgrade line relaying at Cardington 69 kV substation.	$0.56	11/30/2022
n8312.1	Corry East-Four Mile 115 kV Line Loop: Loop the Corry East-Four Mile Junction 115 kV line into the new substation, approximately 7.7 miles from Four Mile Junction substation.	$0.96	8/30/2019
n8312.2	Warren substation 115 kV: Provide interconnection facilities for PJM AF1- 098.	$0.59	8/30/2019
n8312.3	Corry East substation 115 kV: Provide interconnection facilities for PJM AF1-098. Replace carrier equipment and relaying at Corry East.	$0.89	8/30/2019
n8312.4	Four Mile substation 115 kV: Provide interconnection facilities for PJM AF1- 098. Replace carrier equipment and relaying at Four Mile Junction.	$0.77	8/30/2019
n8312.5	Construct a new interconnection substation with 3-115 kV breakers in a ring bus configuration at Four Mile 115 kV substation.	$7.90	8/30/2019

Upgrade ID	Description	Cost Estimate ($M)	Required In-Service Date
n8312.6	Install fiber from AF1-098 to Four Mile Junction for communication transport at AF1-098.	$4.70	8/30/2019
n8312.7	Design, install and test/commission MPLS Equipment for SCADA transport at AF1-098	$0.29	8/30/2019
n8313.1	Install Tap Pole at Emlenton 34.5 kV.	$0.02	3/17/2020
n8313.2	Haynie 34.5 kV: Revise Relay Settings.	$0.27	3/17/2020
n8313.3	Emlenton 34.5 kV: Revise Relay Settings.	$0.27	3/17/2020
n8314.1	SCADA/Fiber Communication: Design, install and test/commission MPLS Equipment for SCADA transport at the new AF1-086 interconnection substation.	$0.21	9/20/2019
n8314.2	Install fiber from AF1-086 interconnection substation to ADSS Backbone for communication transport.	$1.26	9/20/2019
n8314.3	Garman-Shawville 115 kV Line Loop: Loop existing Garman Shawville 115 kV line into the new CPV Rogue's Wind interconnection substation.	$1.21	9/20/2019
n8314.4	Madera 115 kV: Modify drawings and nameplates for line name change.	$0.03	9/20/2019
n8314.5	Westover 115 kV: Modify drawings and nameplates for line name change.	$0.03	9/20/2019
n8314.6	Glory 115 kV: Line Terminal upgrade.	$0.39	9/20/2019
n8314.7	Shawville 115 kV: Line Terminal upgrade.	$0.57	9/20/2019
n8314.8	Garman 115 kV: Line Terminal upgrade.	$0.81	9/20/2019
n8319	Relocate the East Bend 345 kV line from the T bay to the R bay at the Tanners Creek 345 kV substation. This addresses the breaker failure contingency AEP_P4_No. 14920_05TANNER 345_T_SRT-A for the Tanners tie breaker failure.	$3.10	12/31/2021
n8327	Replace existing 23 kV Bedford relaying with one SEL-351S and install one SATEC meter.	$0.77	9/15/2022
n8337.1	Construct a new line exit out of the Galion substation by adding a new 138 kV breaker.	$2.14	12/31/2023
n8337.2	Modify Relay Settings Roberts 138 kV.	$0.10	12/31/2023
n8337.3	Modify Relay Settings at Cardington 138 kV.	$0.10	12/31/2023
n8337.4	Modify Relay Settings at Leaside 138 kV.	$0.10	12/31/2023
n8337.5	Modify Relay Settings at Ontario 138 kV.	$0.10	12/31/2023
n8359.1	Upgrade existing Sullivan 138 kV (previously named Napoleon Muni Northside) substation to a five-breaker ring bus substation.	$2.94	11/1/2022
n8359.2	Re-terminate the Midway-Sullivan 138 kV line into the expanded substation to support new generation interconnection.	$0.71	11/1/2022
n8359.3	Revise relay settings at Striker 138 kV substation.	$0.08	11/1/2022
n8359.4	Perform end to end testing and revising relay settings at Midway 138 kV substation.	$0.08	11/1/2022
n8359.5	Integrate upgrades to the Sullivan 138 kV substation to the FirstEnergy transmission system.	$0.08	11/1/2022
n8370.1	Tap Cambridge Springs-Corry Central 34.5kV line and convert approximately three-quarters of a mile of 12 kV to 35 kV.	$0.42	1/1/2023

Upgrade ID	Description	Cost Estimate ($M)	Required In-Service Date
n8370.2	Update relay settings on 34.5 kV Cambridge Springs line.	$0.05	1/1/2023
n8370.3	Installation of one 700 MHz radio system to support SCADA Switch at AF1- 094 tap location.	$0.06	1/1/2023
n8374.1	Warfordsburg substation: Replace existing McConnellsburg line relaying with one standard line relaying panel with two SEL-421 and one SEL-501 BFT.	$0.19	3/28/2019
n8374.2	Warfordsburg-Purcell Jct 34.5 kV Line: Install two main line switches on the existing Warfordsburg-Purcell Jct 34.5 kV line.	$0.12	3/28/2019
n8374.3	Mercersburg-AD1-061 34.5 kV Tap: Reconductor approximately 1.6 mi from Mercersburg-AD1-061 (Elk Hill 1) Tap 34.5 kV line from Mercersburg substation to Pole PA406-WP47 with 795 ACSR conductor.	$1.32	3/28/2019
n8374.4	Mercersburg substation 34.5 kV: Replace limiting conductors and revise relay settings.	$0.23	3/28/2019
n8374.5	McConnellsburg substation 34.5 kV: Revise relay settings.	$0.13	3/28/2019
n8438.1	Construct three Breaker 138 kV station in a Breaker and a Half Configuration for AE2-323 interconnection.	$6.36	4/4/2019
n8438.2	Install two Dead End Structures, two Spans of Conductor, two Spans of OPGW Shield wire, Connect New 138 kV station to Existing Twin Branch-Guardian Transmission Circuit and upgrade remote end relays.	$0.69	4/4/2019
n8443.1	Build a new 69 kV IC substation with a three-breaker ring bus. Two of the positions on the ring bus will be transmission line terminals for the tie-in of the Kellam-Cheriton 69 kV line (Line 6750) to the substation. The other position will be a terminal configured for AF2-055 with a disconnect switch.	$5.00	6/1/2027
n8443.2	Rebuild about 20 miles of Cheriton/Bayview-Kellam 69 kV. Install reverse power relay at Cheriton station to trip the generator tie if power flow is greater that 0.15 MW toward AF2-055.	$20.00	6/1/2027
n8443.3	Install dynamic VAR compensation at Kellam-Chriton 69 kV substation.	$5.00	6/1/2027
n8443.4	Communication network upgrades for Island detection at Oakhall 69 kV substation.	$0.50	6/1/2027
n8443.5	Communication network upgrades for Island detection at Oakhall 69 kV substation.	$0.50	6/1/2027
n8445	Update Protective Relay Settings at the Proposed AF1-215 345 kV station.	$0.05	3/16/2020
n8449.1	Install one 230 kV breaker and a new 230 kV line terminal position to create a five-breaker ring bus at Erie East substation.	$2.91	6/1/2026
n8449.2	Install anti-islanding (transfer trip) equipment at Four Mile Junction substation.	$0.63	6/1/2026
n8449.3	Fiber connection and associated conduit to customer substation at Erie East substation.	$0.18	6/1/2026
n8450.1	Bruceton Mills Interconnection Sub 138 kV: Construct three-breaker ring-bus substation for new generation interconnection.	$8.38	9/30/2021
n8450.2	AE1-106 Sub: Design, install and test/commission multi-protocol label switching (MPLS) equipment for SCADA transport.	$0.74	9/30/2021

Upgrade ID	Description	Cost Estimate ($M)	Required In-Service Date
n8450.3	Design, install and test/commission microwave equipment for Supervisory Control and Data Acquisition (SCADA) transport between AE1-106 Customer Facility and Bruceton Mills 138 kV substation.	$0.23	9/30/2021
n8450.4	Brandonville Junction (Albright-Hazelton-Lake Lynn) 138 kV: Loop the existing Brandonville Junction (Albright-Hazelton-Lake Lynn) 138 kV line into the new Bruceton Mills substation.	$1.67	9/30/2021
n8450.5	Lake Lynn substation 138 kV: Replace Panel No. 4 existing line relaying with new breaker control panel with one SEL451 and one SATEC meter.	$0.33	9/30/2021
n8450.6	Hazelton substation 138 kV: Provide remote end equipment required for AE1-106.	$0.93	9/30/2021
n8450.7	Albright substation 138 kV: Provide remote end equipment required for AE1-106.	$1.72	9/30/2021
n8451.1	Construct a new 138 kV three-breaker ring bus looping in the South Akron- Toronto 138 kV line to provide interconnection facilities for AE2-194.	$6.38	5/1/2022
n8451.10	Relay settings for the Gilchrist- Lakemore 138 kV line will be adjusted.	$0.09	5/1/2022
n8451.12	Relay settings for the Lakemore- South Akron 138 kV line will be adjusted.	$0.19	5/1/2022
n8451.13	Relay settings for the Boardman-Toronto 138 kV line will be adjusted.	$0.09	5/1/2022
n8451.14	Relay settings for the Lowellville- Dobbins 138 kV line will be adjusted.	$0.09	5/1/2022
n8451.15	Relay settings for the Urban-Firestone 138 kV line will be adjusted.	$0.19	5/1/2022
n8451.16	Relay settings for the Tusc-Urban 138 kV line will be adjusted.	$0.09	5/1/2022
n8451.2	The South Akron to Toronto 138 kV line will be cut and looped into the new 138 kV interconnection substation. This cut will take place at a location that is approximately 21 miles from the Toronto substation. It is assumed that the interconnection substation will be located within one span (approximately 0.1 mile) from the existing line.	$3.06	5/1/2022
n8451.5	138 kV line relay setting for AE2-194 Interconnection (South Akron) will be changed.	$0.50	5/1/2022
n8451.6	One 138 kV 2000A dual-frequency wave traps, line tuners and coax will be installed.	$0.17	5/1/2022
n8451.7	Relay settings for the Dobbins-Toronoto 138 kV line will be adjusted.	$0.19	5/1/2022
n8451.8	Relay settings for the Dale- South Akron 138 kV line will be adjusted.	$0.09	5/1/2022
n8451.9	Relay settings for the Sammis-Toronoto 138 kV line will be adjusted.	$0.09	5/1/2022
n8455.1	Sandridge substation: Establish new 69 kV line position for AF1-064.	$1.56	3/31/2022
n8455.2	Midway substation 69 kV: Install Carrier equipment for anti-islanding.	$0.50	3/31/2022
n8455.3	Bowling Green No.2 69 kV: Install Carrier equipment for anti-islanding.	$0.47	3/31/2022
n8457.1	AE2-262/AE2-263 Interconnection Sub: Construct a new 230 kV three-breaker ring bus looping in the Moshannon-Milesburg 230 kV line to provide interconnection facilities for AE2-262/AE2-263.	$11.43	6/30/2022
n8457.2	AE2-262/AE2-263 Interconnection Sub: Design, install and test/commission MPLS Equipment for SCADA transport at new Interconnection Sub.	$0.24	6/30/2022
n8457.3	AE2-262/AE2-263 Interconnection Sub: Install fiber from AE2-262/AE2-263 New Interconnection substation to fiber backbone for communication transport.	$0.15	6/30/2022

Upgrade ID	Description	Cost Estimate ($M)	Required In-Service Date
n8457.4	Moshannon-Milesburg 230 kV Line: The Moshannon-Milesburg 230 kV line will be cut and looped into the new 230 kV interconnect substation. This cut will take place at a location that is approximately 16.3 miles from the Moshannon substation.	$1.72	6/30/2022
n8457.5	Moshannon 230 kV: Anti-islanding and carrier equipment will be installed in existing relay panels. Existing Milesburg line relaying will be replaced.	$0.69	6/30/2022
n8457.6	Milesburg 230 kV: One existing 230 kV CVT, wave trap, line tuner and circuit breaker will be replaced. Anti-islanding will be installed. Existing Moshannon line relaying panel will be replaced.	$1.82	6/30/2022
n8457.7	Dale Summit 230 kV: A new carrier relaying panel with anti-islanding will be installed for the Milesburg and Shingletown exits.	$0.57	6/30/2022
n8457.8	Shingletown 230 kV: A new carrier relaying panel with anti-islanding will be installed for the Dale Summit exit.	$0.61	6/30/2022
n8458	Install one 23 kV line potential transformer and associated structure on Bedford North line Replace 23 kV Bedford North line relays with one line relaying panel with one SEL351S and one SATEC Meter.	$0.69	12/15/2022