Attachment D – Interconnection Network Upgrades

SubId	Description	Cost Estimate ($M)	Required In-Service Date
n6605	Wreck and rebuild 0.99 miles of line 271 between Pocaty and Landstown with (2)-768 ACSS (20/7) “MAUMEE” conductor at 250 degrees C. Replace the line lead at Landstown.	6.5558	12/31/2026
n6639.2	Replace existing 345kV line conductor and possibly tower structures for approx. 27 miles, Sag mitigation on existing 345kV line conductor for up to 13 miles, Upgrade station 345kV conductor and motor operated switches, Upgrade 345kV relay scheme at one terminal substation. Tower work and cost will be identified during the Facility Study Phase.	146.0000	2/15/2029
n7175	EKPC to construct a new 138kV switching station (Three Forks Tap Switching) to facilitate connection of the Madison Solar generation project	3.5700	12/31/2028
n7176	EKPC to construct facilities (~125 feet) to loop the existing Dale-Fawkes 138kV line section into the new Three Forks Tap Switching substation and reroute the existing Three Forks Distribution 138kV Line (~900 feet) into the new Three Forks Tap Switching Station.	0.8200	12/31/2028
n7177	EKPC to upgrade relays and modify relay settings at Dale substation for existing line to Three Forks Tap Switching substation	0.0900	12/31/2028
n7178	EKPC to upgrade relays and modify relay settings at Fawkes substation for existing line to Three Forks Tap Switching substation	0.0900	12/31/2028
n7179	EKPC to install OPGW on the Fawkes-Three Forks Tap 138kV line section (3.6 miles)	0.6350	12/31/2028
n7553	Replace Northern Neck 115/230 kV transformer #6 with a 224 MVA (260/271/295 MVA).	7.2423	12/31/2029
n8205.1	Build a three breaker AF2-222 115 kV switching station.	7.9720	10/14/2027

SubId	Description	Cost Estimate ($M)	Required In-Service Date
n8205.2	Re-arrange line #154 to loop into and out of the new three breaker AF2-222 115 kV switching station	3.9800	10/14/2027
n8213.1	Re-arrange line #65 to loop into and out of the new three breaker AG1-135 115 kV switching station	2.8250	3/11/2026
n8213.2	Build a three breaker AG1-135 115 kV switching station.	7.9950	2/24/2026
n8213.3	Remote protection and communication work.	0.3050	3/3/2026
n8218	Add 4th breaker to interconnection switchyard	0.8440	1/8/2026
n8282	Install 1 new interconnect at Chesterfield 230 kV Station	3.7480	6/30/2027
n8316	AG1-153 Breaker Addition	3.3930	6/28/2030
n9101	L1 8806-Brokaw - AB2-070 - AC1-053 345 KV Line - Mitigate Sag on the Line.	15.0000	12/15/2030
n9107	Replace 477 KCM station conductor at Moore Park.	0.1500	1/31/2029
n9116	Rebuild approximately 11 miles of the Homer City-Shelocta 230 kV line with double bundled 795 kcmil 26/7 ACSS conductor	39.3122	9/1/2028
n9119	Reconductor/Rebuild the Shelocta – Keystone 230 kV Line, approximately 2.5 miles, with 1272 kcmil 45/7 ACSR 2-conductor	9.5336	1/1/2028
n9153	Wreck and rebuild 5.74 miles of 230 kV line 2128 between Fentress and Thrasher with (2) 768.2 ACSS/TW (20/7) "MAUMEE" conductor at 250 degrees C and replace line lead at Fentress.	33.2972	7/1/2027
n9195	Installation of a new 345KV Circuit Breaker at Station 12 Dresden.	5.0000	11/30/2029
n9207	Replace 6ELMONT 230 kV to 8ELMONT 500 kV circuit 1 with larger transformer (3-480 MVA single phase transformer).	38.2545	12/31/2028
n9217	Wreck and Rebuild 12.73 miles of 230 kV Line 298 from Buckingham to Farmville with dual (2)	40.4148	11/1/2029

SubId	Description	Cost Estimate ($M)	Required In-Service Date
	768 ACSS/TW (20/7) "MAUMEE" conductor at 250 degrees C.		
n9220	Wreck and rebuild 15.41 miles of 230 kV Line 298 from Buckingham to Bremo with dual (2) 768.2 ACSS/TW (20/7) "MAUMEE" conductor at 250 degrees C. Replace line lead at Bremo.	44.4659	1/1/2029
n9225	Replace 230 kV substation conductor and line drops at Shelocta substation for the Homer City-Shelocta 230 kV line terminal	0.1076	2/1/2027
n9259	Need for two 230 kV gas insulated switchgear ("GIS") bus ties for Coastal Virginia Offshore Wind ("CVOW").	25.3049	1/1/2030
n9267	Construct New 10.5 Mile Line 115 kV Line between Northern Neck and Moon Corner (AE1-155 Tap)	45.7301	10/1/2029
n9323	Remote Relay at Stone Mill Substation	0.2886	6/9/2028
n9324	Transmission Line Tie-in for new single breaker tap switching station for AE2-185 and AF2-404	1.2576	6/9/2028
n9325	Extend existing distribution power 3 miles to tie in the auxiliary power for the new interconnection substation	2.2770	12/31/2030
n9326	Build new fiber path (estimated ~ 4 miles) from TSS 934 Herman Road substation to existing fiber at TSS 155 Nelson substation and new fiber path (estimated ~ 4 miles) from TSS 934 Herman Road substation to existing fiber at TSS 111 Electric Junction substation.	4.9311	12/31/2030
n9327	Cut the Nelson - Electric Junction 345 kV line to loop into the new TSS 934 Herman Road interconnection substation	6.4608	12/31/2030
n9328	Perform relay upgrades at TSS 111 Electric Junction substation	0.7582	12/31/2030
n9329	Perform relay upgrades at TSS 120 Lombard substation	0.2662	12/31/2030
n9330	Perform relay upgrades at TSS 155 Nelson Substation	0.7582	12/31/2030

SubId	Description	Cost Estimate ($M)	Required In-Service Date
n9331	Install new Integrated Communications Optical Network (ICON) nodes at four (4) remote end substations: STA 6 Byron, TSS 144 Wayne, TSS 937 Lee County and TSS 113 Waterman.	0.4074	12/31/2030
n9332	Extend existing distribution power 2 miles to tie in the auxiliary power for the new interconnection substation	1.4931	6/1/2029
n9333	Build new fiber path (estimated ~7.5 miles) from TSS 971 Prairie to TSS 123 Marengo substation existing fiber and new fiber path (estimated ~5.5 miles) from TSS 971 Prairie to Garden Prairie area existing fiber	6.8177	6/1/2029
n9334	Perform Relaying Upgrades at TSS156 Cherry Valley	0.3063	6/1/2029
n9335	Perform Relaying Upgrades at TSS138 Silver Lake	0.3063	6/1/2029
n9336	Cut the TSS 156 Silver Lake – TSS 138 Cherry Valley 345 kV line to loop into the new TSS 971 Prairie substation	8.1989	6/1/2029
n9337	Fiber multiplexer installation at 6 remote substations: TSS 155 Nelson, TSS 937 Lee County, STA 6 Byron, TSS 144 Wayne, TSS 111 Electric Junction, TSS 113 Waterman	0.7972	9/30/2029
n9338	Extend existing distribution power no more than 1 mile to tie in the auxiliary power for the new interconnection substation	0.7293	9/30/2029
n9339	Build new fiber path (estimated ~9 miles) from TSS 953 Renner Road to TSS 155 Nelson substation existing fiber and new fiber path (estimated ~4 miles) from TSS 953 Renner Road to TSS 937 Lee County substation existing fiber	13.9503	9/30/2029
n9340	Perform Relaying Upgrades at TSS 937 Lee County substation	0.6796	9/30/2029
n9341	Perform Relaying Upgrades at TSS 155 Nelson substation	0.6796	9/30/2029
n9342	Cut the L15501 transmission line to loop into the new TSS 953 Renner Road substation	8.0998	9/30/2029

SubId	Description	Cost Estimate ($M)	Required In-Service Date
n9348	Proposed AF1-119 345 kV Station: Review and revise the protective relay settings to account for the additional generation of AG1-433.	0.0608	10/29/2027
n9349	Remote relay work at Chesapeake Substation.	0.1730	12/1/2027
n9350	Expansion of existing Yadkin Substation.	7.8514	12/1/2027
n9351	Build a new 115 kV three-breaker ring switching station located along VEPCO's existing 115 kV, 31 line from Altavista Substation to Perth Substation	11.5680	7/10/2028
n9352	Re-arrange line #31 to loop into and out of the new three-breaker AE2-291 115 kV switching station	3.6184	7/10/2028
n9353	Remote Relay at Substation Perth	0.1814	7/10/2028
n9354	Remote Relay at Substation Otter River	0.1289	7/10/2028
n9355	Remote Relay at Substation Altavista	0.1761	7/10/2028
n9367	Perform Relay Upgrades at STA4 Quad Cities station	0.4136	3/15/2029
n9368	The existing 345 kV line L0403 will be rerouted to accommodate the expansion of TSS 940 Cordova.	4.2267	3/15/2029
n9369	Expand existing 345 kV TSS 940 Cordova station from a bus ring switchyard to the ultimate breaker-and-a-half bus configuration.	28.5953	3/15/2029
n9370	Proposed AF1-119 345 kV station: Expansion. • Installation of one (1) new 5000A 63 kA 345 kV circuit breaker and associated control relaying. • Installation of two (2) new 3000 A breaker disconnect switches. • Installation of three (3) single-phase surge arresters on the generation lead to the Proposed AF2-388 collector station. • Associated bus work, bus supports, jumpers, insulators, grounding, SCADA (Supervisory	1.3829	10/29/2027

SubId	Description	Cost Estimate ($M)	Required In-Service Date
	Control and Data Acquisition) connectivity, structures, and foundations.		
n9378	Replace existing Carson transformer 2 with 3-480 MVA single phase transformer.	37.8013	12/31/2029
n9379	Replace existing 230/500 kV T1 XFRM at Midlothian with 3-480 MVA Single Phase XFRM.	37.8363	12/31/2029
n9380	Replace Existing Ladysmith XFRM 1 with 3-480 MVA Single Phase XFRM.	37.5876	12/31/2029
n9393	Timber Switch 138 kV: Review and revise the protective relay settings to account for the additional generation of AF2-376.	0.0608	5/15/2029
n9394	Proposed AG1-410 345 kV Station: Review and revise the protective relay settings at the AG1-410 Proposed 345 kV Station to account for the additional generation	0.0608	2/15/2030
n9399	Remote Relay at Moon Corner Substation (including fiber)	0.3074	2/24/2026
n9408	Remote Relay work at Finneywood Substation	0.1358	6/1/2032
n9409	Remote Relay work at Clover Substation	0.1781	6/1/2032
n9410	Re-arrange line #556 to loop into and out of the new three-breaker AF2-042 500 kV switching station	9.2365	6/1/2032
n9411	Build a new 500 kV three-breaker ring switching station located along Dominion's existing 500 kV, 556 line from Clover Substation to Finneywood Substation	26.7413	6/1/2032
n9413	Remote Relay at Lone Pine Substation	0.1864	11/10/2028
n9414	Remote Relay at Dennisville Road Substation	0.1442	11/10/2028
n9415	Re-arrange line #1007 to loop into and out of the new three-breaker AF1-294/AF2-115/AG1-021 115 kV switching station (including fiber)	3.7816	11/10/2028

SubId	Description	Cost Estimate ($M)	Required In-Service Date
n9416	Re-arrange line #TBD to loop into and out of the new three-breaker AG1-285 230 kV switching station.	6.0291	3/1/2031
n9417	Build a new 230 kV three-breaker ring switching station located along VEPCO's new 230 kV line from Farmville Substation to Finneywood Substation.	12.9251	3/1/2031
n9419	Interconnection Substation Tie-in	1.9572	3/31/2030
n9429	Re-arrange line #35 to loop into and out of the new AE2-283 single breaker 69 kV tap	3.5215	12/1/2030
n9432	Expand the existing Moyock 230 kV substation by adding one new circuit breaker.	3.6630	1/31/2031
n9452	Fiber Installation from TSS 956 Rimsnider Rd to TSS 113 Waterman	2.2774	12/31/2029
n9453	Extend distribution power to tie in the auxiliary power for the new interconnection substation.	1.5625	12/31/2029
n9454	Perform relay and communication upgrades at TDC 569 Sugar Grove 138 kV	0.4023	12/31/2029
n9455	Perform relay and communication upgrades at TSS 113 Waterman 138 kV	0.4057	12/31/2029
n9456	Cut existing L11106 138 kV transmission line between existing structures 245 and 246 to loop into the new TSS 956 Rimsnider Road Substation and break into new L95602.	3.0323	12/31/2029
n9460	Remote Relay at Mount Laurel Substation	0.1205	12/10/2026
n9461	Remote Relay at Clay Mills Substation	0.0519	12/10/2026
n9462	Remote Relay at Chase City Substation	0.0519	12/10/2026
n9463	Re-arrange line #33 to loop into and out of the new three-breaker AG1-105 115 kV switching station	3.1257	12/10/2026
n9464	Build a new 115 kV three-breaker ring switching station located along VEPCO’s existing 115 kV, 33 line from Chase City Substation to Clays Mill Substation	10.9346	12/10/2026
n9472	Remote end upgrades	1.0397	1/30/2030
n9473	New Interconnecting Substation	12.4121	1/30/2030

SubId	Description	Cost Estimate ($M)	Required In-Service Date
n9474	Interconnecting Substation tie-in	1.0157	1/30/2030
n9485	Loop existing Summer Shade - Green County 161 kV line into new interconnection switching station.	1.0410	5/30/2028
n9487	Revise Relay Settings at Summer Shade Sub.	0.1460	5/30/2028
n9488	Revise Relay Settings at Greene County Sub.	0.1460	5/30/2028
n9490	Install/Test approximately 3.12 miles of new 48 count ADSS fiber from the AG1-548 substation control house to the nearest splice point on the Zayo-owned fiber backbone (near 41.914, -79.820). Utilize the Union City to Backbone ADSS fiber cable to create a full fiber path between AG1-548 and Union City.	0.7976	12/8/2028
n9491	Design, installation, and testing/commissioning for Multiprotocol Label Switching (MPLS) equipment for Supervisory Control and Data Acquisition (SCADA) transport at AG1-548 Substation including: Crossbow engineering and materials, new All-Dielectric Self-Supporting (ADSS) Fiber installation, (1) in-sub fiber run from AG1-548 Substation control house to developer-built fiber run to support communications and control to generator site.	1.0487	12/8/2028
n9492	The Erie South – Union City 115 kV, PNT-115-RC line will be cut and looped into the new interconnection substation at a point approximately 2.8 miles from Union City substation, between structures 116 and 117.	1.3581	12/8/2028
n9493	Install new relaying and carrier equipment and modify drawings for line name change at Erie South Substation.	0.9127	12/8/2028
n9494	Install new relaying and modify drawings for line name change at Union City Substation.	0.6569	12/8/2028

SubId	Description	Cost Estimate ($M)	Required In-Service Date
n9495	Proposed AF2-177 345 kV, 3M 345 kV, and Jay 345 kV Stations: Install two (2) station exit all dielectric loose tube (ADLT) station exit transitions and two (2) new fiber optic cable paths consisting of a total 6.9 miles of 144 count ADLT cable installed underground in new right of way.	2.3777	11/15/2029
n9496	Sorenson - Desoto #2 345 kV Circuit: Construct a new 345 kV breaker and a half station, initially populated with three (3) circuit breakers, expandable to six (6) circuit breakers. • Three (3) 5000A 63 kA circuit breakers with associated control relaying. • Nine (9) 3000A circuit breaker disconnect switches. • Two (2) single phase station service voltage transformers (SSVT). • One (1) 16' x 48' DICM. • Four (4) single phase wave traps, two (2) each on the line exits to the Desoto and Proposed AF1-148 345 kV Stations. • A directional comparison blocking (DCB) protective relaying scheme for the line to the Proposed AF1-148 345 kV Station. • A DCB protective relaying scheme for the line to the Desoto 345 kV Station. • Two (2) 3-phase coupling capacitor voltage transformers (CCVT), one each for the line exits to the Proposed AF1-148 and Desoto 345 kV Stations. • Two (2) A-Frame line exit structures, one each for the line exits to the Proposed AF1-148 and Desoto 345 kV Stations. • Associated conductors (bus work, ground grid, jumpers), telecom terminal equipment, insulators, arresters, foundations, and structures.	14.9206	11/15/2029

SubId	Description	Cost Estimate ($M)	Required In-Service Date
n9497	Sorenson - Desoto #2 345 kV Circuit: Proposed AF2-177 345 kV Station tie-in. • Remove two (2) tower structures (#419 and #421) along with approximately 0.4 miles of existing wire. • Install two (2) new 150' custom steel, single circuit, single pole dead end structures on concrete piers with anchor bolt cages along the existing Sorenson - Desoto #2 345 kV Circuit. • Install two (2) new 130' custom steel, single circuit, single pole, running angle structures on concrete piers with anchor bolt cages along the perimeter of the Proposed AF2-177 345 kV station. • Install four (4) spans of double bundle aluminum conductor steel-reinforced (ACSR) 2156 (Bluebird) transmission line conductor with 12/7 Guinea shield wire.	2.8558	11/15/2029
n9498	Proposed AF1-148 345 kV Station: • Review and revise the protective relay settings.	0.0608	11/15/2029
n9499	Desoto 345 kV Station: • Review and revise the protective relay settings.	0.0608	11/15/2029
n9500	Jay 345 kV Station: • Reconfigure the existing ethernet switch, installing one (1) new Small Form-Factor Pluggable (SFP) transceiver.	0.0701	11/15/2029
n9501	3M 345 kV Station: • Reconfigure the existing ethernet switch, installing one (1) new Small Form-Factor Pluggable (SFP) transceiver.	0.0701	11/15/2029
n9502	Proposed AF2-177 345 kV, 3M 345 kV, and Jay 345 kV Stations: Final tie in for fiber installation in new right of way.	0.3786	11/15/2029

SubId	Description	Cost Estimate ($M)	Required In-Service Date
n9510	Install new overhead optical ground wire (OPGW) on the existing Wayne County - Massingale Road and Massingale Road - Summer Shade 69 kV line sections for a total of 44.2 miles.	5.4570	12/15/2028
n9511	Loop existing Upchurch Tap - Wayne County 69 kV line into new interconnection switching station	0.5540	12/15/2028
n9512	Revise Relay Settings at Wayne County Sub	0.0630	12/15/2028
n9513	Revise Relay Settings at Summer Shade Sub	0.0630	12/15/2028
n9514	Massingale Road Substation: Construct new 69 kV switching station	7.0500	12/15/2028
n9521	Install equipment for anti-islanding scheme at Union City Substation.	0.4737	12/8/2028
n9522	Install equipment for anti-islanding scheme at Titusville Substation.	0.3503	12/8/2028
n9523	Install equipment for anti-islanding scheme at Erie South Substation.	0.2999	12/8/2028
n9524	Install equipment for anti-islanding scheme at Grandview Substation.	0.2999	12/8/2028
n9534	Riverville - Gladstone 138 kV and Proposed AG1-124 138 kV Switching Station: Final Tie in for Fiber installation.	0.3610	3/15/2030
n9535	Proposed AG1-124 138 kV Switching Station: Install two (2) station exit transitions and two (2) new fiber optic cable paths, one (1) consisting of 0.3 miles of underground 144 count ADLT cable and the other consisting of 0.1 miles of optical ground wire (OPGW) fiber optic shield wire.	0.4280	3/15/2030
n9536	Riverville - Gladstone 138 kV Circuit: Proposed AG1-124 138 kV Switching Station tie-in. Install two (2) new steel, 75', double circuit, two-pole dead-end structures on concrete piers with anchor bolt cages, and three (3) spans of ACSR	1.7549	3/15/2030

SubId	Description	Cost Estimate ($M)	Required In-Service Date
	795 26/7 (Drake) transmission line conductor with 7#8 Alumoweld shield wire in the existing Riverville - Gladstone 138 kV Right of Way, cutting in the proposed AG1-124 138 kV Station in an in-and-out arrangement from an existing structure.		
n9537	Riverville - Gladstone 138 kV Circuit: Construct a new 138 kV ring bus station; initially populated with three (3) circuit breakers, expandable to four (4) breakers. • Three (3) 138 kV 40 kA circuit breakers with associated control relaying. • One (1) 16' x 27' DICM. • Six (6) breaker disconnect switches. • Three (3) line disconnect motor operated air breaker (MOAB) switches with associated control relaying, one (1) each on the line exits to the AG1-124 collector, Gladstone 138 kV, and Riverville 138 kV stations. • Six (6) single phase CCVTs, three (3) each on the line exits to the Riverville and Gladstone 138 kV Stations. • Two (2) single phase station service voltage transformers (SSVT). • Two (2) Monopole dead-end take off structures, one (1) each for the line exits to Riverville and Gladstone 138 kV Stations. • A direct fiber current differential line protection relay scheme for the line to the Riverville 138 kV Station. • A direct fiber current differential line protection relay scheme for the line to the Gladstone 138 kV Station. • Associated conductors (bus work, ground grid, jumpers), telecom terminal equipment,	7.5325	3/15/2030

SubId	Description	Cost Estimate ($M)	Required In-Service Date
	insulators, arresters, foundations, and structures.		
n9539	Relay and SCADA Updates	0.0652	3/31/2029
n9541	Valley 138 kV Station: Review and revise the protective relay settings to account for the additional generation.	0.0608	1/31/2029
n9542	Build new fiber path (estimated ~6.5 miles) from TSS 978 Miller Road Substation to TDC 527 Plano West and new fiber (estimated ~ 5.5 miles) from TSS 978 Miller Road Substation to Sta 1 LaSalle Substation.	6.7569	2/28/2030
n9543	Perform relay upgrades at TSS 146 Sandwich Substation.	0.1704	2/28/2030
n9544	Perform relay upgrades at TSS 167 Plano Substation.	0.6891	2/28/2030
n9545	Perform relay upgrades at TDC 527 Plano West Substation.	0.9422	2/28/2030
n9546	Cut L14609 138kV line to loop into the new TSS 978 Miller Road interconnection substation.	5.8838	2/28/2030
n9547	Construct a new 138 kV breaker-and-a-half interconnection substation, TSS 978 Milller Road, tapping the L.14609 138 kV line.	26.8763	2/28/2030
n9556	Valley 138 kV Station: Re-termination of the Stinger Circuit in the Valley 138 kV Station. • Remove the existing Stinger - Valley 138 kV Circuit connection to the Valley 138 kV Station by removing one (1) existing 65 ft. wood pole structure (#285) and one (1) span of line conductor with shield wire. • Install one (1) new custom 80 ft. steel, single circuit, single pole dead end structure on a concrete foundation with an anchor bolt cage. • Install one (1) span of ACSR 1033.5 54/7 (Curlew) transmission line conductor with 7#8	0.5770	1/31/2029

SubId	Description	Cost Estimate ($M)	Required In-Service Date
	Alumoweld shield wire for the new Stinger line exit.		
n9557	Valley 138 kV Station: Expansion of Station. • One (1) new 3000 A 138 kV 40 kA circuit breaker (breaker “Q”) with breaker control relaying for the Stinger Circuit relocation. • Two (2) new 3-phase 3000 A circuit breaker disconnect switches. • Three (3) single phase capacitor coupled voltage transformers (CCVTs) and associated structures for the Stinger Circuit relocation. • Three (3) single phase Arresters and associated structures for the Stinger Circuit relocation. • One 16 ft. x 18 ft. DICM expansion to the existing Valley 138 kV Station DICM control house. • Dual fiber-based integrated communications optical network multiplexor (ICON MUX) current differential relays for the protection scheme for the re-terminated Stinger Circuit. • Expansion of a 132' section of the Valley 138 kV Station fence by 20' to the East, across from the east side of the middle box bay. • Associated jumpers, insulators, grounding, fiber-optic relaying connectivity & equipment, cables, pull boxes and foundations. • Protection and control settings review for the existing relays at the Valley 138 kV Station and adjustment as needed.	2.1665	1/31/2029
n9558	Stinger 138 kV Station: • One (1) 3000 A 40 kA circuit breaker with associated control relaying.	2.1692	6/1/2029

SubId	Description	Cost Estimate ($M)	Required In-Service Date
	• One (1) breaker disconnect switch. • Two (2) single phase CCVT for the line exit to the Brody 138 kV Station. • Expand the station by 24 ft. x 225 ft to the north. • Review and revision of the protective relay settings for the remainder of the Stinger 138 kV Station. • Associated conductors (buswork, ground grid, jumpers), telecom terminal equipment, insulators, arresters, foundations, and structures.		
n9564	Jay 138 kV Substation: • Extend the north Bus #1 to the east. • Install one (1) new circuit breaker string with two (2) new 3000 A 138 kV 40 kA circuit breakers with associated control relaying. • Install four (4) new 4000 A circuit breaker disconnect switches. • Expand and extend the southeast corner of the Jay Substation by 170 ft. x 75 ft. to accommodate the relocated capacitor bank and associated equipment. • Relocate capacitor bank AA, circuit breaker AA, and associated equipment to the south side of the Jay 138 kV Bus #2. • Install associated and additional buswork, bus supports, jumpers, insulators, grounding, ground grid extension, SCADA (Supervisory Control and Data Acquisition) connectivity, fiber-optic relaying connectivity & equipment, cables, pull boxes, and foundations. • Review and revise the protective relay settings for the remainder of the Jay 138 kV Substation to account for the addition of the new circuit breakers and the AF2-068 generation source.	1.4836	10/15/2028
n9565	Upgrade TSS 177 Burnham substation	7.0720	2/28/2030

SubId	Description	Cost Estimate ($M)	Required In-Service Date
n9566	Proposed AF2-359 345 kV Station: Review and revise the protective relay settings at the AF2-359 proposed 345 kV Station to account for the additional generation of AG1-447. • Settings will need to be revised for each generation project (AG1-436 & AG1-447) unless they share an in-service date.	0.0608	10/30/2028
n9567	Proposed AF2-359 345 kV Station: Review and revise the protective relay settings at the AF2-359 proposed 345 kV Station to account for the additional generation of AG1-436. • Settings will need to be revised for each generation project (AG1-436 & AG1-447) unless they share an in-service date.	0.0608	10/30/2028
n9568	Fiber Installation	1.5302	12/15/2030
n9569	Perform Relaying Upgrades at TSS 964 Clear Creek (L90302) and Sta 21 Kincaid (L2105)	0.4334	12/15/2030
n9570	Cut the STA. 21 Kincaid - Auburn Solar 345kV line (L2105/L9032) to loop into the new TSS 903 Tovey substation	7.4449	12/15/2030
n9571	Extend existing distribution power to tie in the auxiliary power for the new interconnection substation	1.4915	12/15/2030
n9572	Extend distribution power to tie in the auxiliary power for the new AE1-114 interconnection substation.	3.4528	6/1/2029
n9573	Install microwave communication at TSS 923 White Eagle Road and TSS 124 Maryland substations.	2.8225	6/1/2029
n9574	Interconnection Substation Tie-in	3.5293	6/1/2029
n9575	Remote Relay at TSS124 Maryland	0.7016	6/1/2029

SubId	Description	Cost Estimate ($M)	Required In-Service Date
n9576	Remote Relay at TSS119 Lancaster	0.4858	6/1/2029
n9577	Remote Relay at TSS180 Lena	0.1434	6/1/2029
n9578	Remote Relay at TDC 370 Eleroy	0.1434	6/1/2029
n9579	Remote Relay at ESSB-427 Titan Tire	0.1434	6/1/2029
n9580	Interconnection Substation Tie-In: Cut and loop Spurlock - North Clark 345 kV line into new interconnection substation with four (4) total new guyed steel 3-pole dead-end structures.	1.4490	10/30/2029
n9581	Fiber Installation in Existing ROW: Install overhead optical ground wire (OPGW) on the North Clark - Mason County and Mason County - Spurlock 345 kV line sections for a total of 45 miles.	6.9160	10/30/2029
n9582	Revise Relay Settings at Spurlock Substation	0.0570	10/30/2029
n9583	Revise Relay Settings at North Clark Substation	0.0570	10/30/2029
n9585	AG1-410 Proposed 345 kV Station: Install one (1) station exit transition from the AG1-410 proposed 345 kV Station, 0.7 miles of 96 ct all dielectric loose tube (ADLT) fiber cable in new underground right of way, and 0.6 miles of 96 ct all dielectric self supporting fiber optic cable along existing distribution structures to a splice an existing AEP fiber cable.	0.3238	2/15/2030
n9586	Maddox Creek - RP Mone 345 kV: Install two (2) station exit transitions and 3.05 miles of OPGW fiber cable along the existing Maddox Creek – RP Mone 345 kV circuit, terminating at the Maddox Creek 345 kV Station.	0.9853	2/15/2030

SubId	Description	Cost Estimate ($M)	Required In-Service Date
n9587	Van Wert 345 kV: Reconfigure the existing integrated communications optical network at the Van Wert Station, installing a new SFP transceiver.	0.0234	2/15/2030
n9588	Maddox Creek 345 kV: • Remove two (2) single phase line traps on the line exit to the AG1-410 proposed 345 kV Station. • Replace the protective relaying scheme at the Maddox Creek 345 kV Station with a dual, fiber-based integrated communications optical network multiplexor current differential scheme. • Reconfigure the existing integrated communications optical network at the Maddox Creek 345 kV Station, installing a new small form-factor pluggable (SFP) transceiver.	0.4076	2/15/2030
n9589	Maddox Creek - RP Mone 345 kV: Work required for the new station tie-in. Install two (2) steel, 150' single circuit, single pole dead end structures on concrete piers with anchor bolt cages in the existing Maddox Creek - RP Mone 345 kV Circuit Right of Way, two (2) additional steel, single circuit, single pole, dead end structures on concrete piers with anchor bolt cages along the perimeter of the AG1-410 proposed 345 kV station, and four (4) spans of double bundle aluminum conductor steel-reinforced (ACSR) 954 (Cardinal) transmission line conductor with 96 fiber optical ground wire shield wire, cutting in the AG1-410 proposed 345 kV station in an in-and-out arrangement.	2.0021	2/15/2030
n9590	RP Mone 345 kV: Review and revise relay Settings.	0.0608	2/15/2030
n9591	Maddox Creek - RP Mone 345 kV: Construct a new 345 kV ring bus station, initially populated with three (3) circuit breakers, expandable to four (4) circuit breakers, including	17.0904	2/15/2030

SubId	Description	Cost Estimate ($M)	Required In-Service Date
	• Three (3) 63 kA circuit breakers with associated control relaying. • One (1) 16' x 48' DICM. • Six (6) motorized breaker disconnect switches. • Two (2) 3-phase coupling capacitor voltage transformers (CCVT), one (1) each on the line exits to the Maddox Creek and RP Mone 345 kV Stations. • Two (2) single phase station service voltage transformers (SSVT). • Two (2) A-Frame line exit structures, one (1) each for the line exits to the Maddox Creek and RP Mone 345 kV Stations. • Two (2) single phase line traps for the line exit to the RP Mone 345 kV Station. • Associated conductors (buswork, ground grid, jumpers), telecom terminal equipment, insulators, arresters, foundations, and structures. • A fiber-based integrated communications optical network multiplexor dual current differential line protective relay scheme for the line to the Maddox Creek 345 kV Station. • A directional comparison blocking (DCB) protective relay scheme for the line exit to the RP Mone 345 kV Station. • The civil work required to develop a site that accommodates the installation of the above station includes grading of a 460' x 350' pad.		
n9592	Proposed AG1-226, Proposed AG1-237, Eugene, and Dequine 345 kV Stations: Final Tie in for Fiber installation in new right of way.	0.4806	3/31/2029
n9593	Proposed AG1-226, Proposed AG1-237, Eugene, and Dequine 345 kV Stations: • Install exit transitions at the Proposed AG1-226, Proposed AG1-237, and Eugene 345 kV	8.9527	3/31/2029

SubId	Description	Cost Estimate ($M)	Required In-Service Date
	Stations. • Install a new fiber optic cable path consisting of 25.1 miles of 144 count ADLT cable in new underground right-of-way.		
n9594	Dequine 345 kV Station: Review and revise the protective relay settings.	0.0548	3/31/2029
n9595	Proposed AG1-237 345 kV Station: • Review and revise the protective relay settings. • Reconfigure the ICONs, installing SFP transceivers.	0.2517	3/31/2029
n9596	Eugene 345 kV Station: Review and revise the protective relay settings.	0.2791	3/31/2029
n9597	Eugene - Dequine 345 kV Circuit: Proposed AG1-226 345 kV Station tie-in. • Remove two (2) steel lattice structures, #354 and #355, with associated conductor and shield wire along the existing Eugene – Dequine 345 kV Circuit. • Install two (2) single pole, double circuit, steel dead end structures along the existing Eugene – Dequine 345 kV Circuit. • Install two (2) three pole, single circuit, horizontally configured steel dead end structures for the Dequine – Sullivan 345 kV Circuit. • Install two (2) new steel, 120' single circuit, single pole dead-end structures and two (2) spans of double bundle ACSR 1272 (Pheasant) transmission line conductor ACSR 159 (Guinea) shield wire routing the Eugene – Proposed AG1-237 circuit above the Dequine – Sullivan 345 kV Circuit, cutting in the Proposed AG1-226 345 kV Station in an in-and-out arrangement.	7.0027	3/31/2029

SubId	Description	Cost Estimate ($M)	Required In-Service Date
n9598	Eugene - Deguine 345 kV Circuit: Construct a new 345 kV breaker and a half station, to be operated as a three (3) circuit breaker ring bus, initially expandable to six (6) circuit breakers. • Three (3) 63 kA circuit breakers with associated control relaying. • One (1) 16' x 48' DICM. • Nine (9) motorized breaker disconnect switches. • Six (6) single phase CCVTs, three (3) each on the line exits to the Eugene and Proposed AG1-237 345 kV Stations. • Two (2) single phase station service voltage transformers (SSVT). • Two (2) A-Frame line exit structures, one (1) each for the line exits to Eugene and the Proposed AG1-237 345 kV Stations. • Associated conductors (bus work, ground grid, jumpers), telecom terminal equipment, insulators, arresters, foundations, and structures. • A dual, fiber-based, integrated communications optical network multiplexor (ICON MUX) current differential line protection relay scheme for the line to the Eugene 345 kV Station. • A dual, fiber-based, ICON MUX current differential line protection relay scheme for the line to the Proposed AG1-237 345 kV Station.	16.0520	3/31/2029
n9599	Eugene 345 kV Station: Expansion. • Installation of one (1) terminal riser for the line exit to the AF1-204 generator lead circuit. • Review and revise the protective relay settings for the remainder of the Eugene 345 kV Station.	0.3912	3/31/2029

SubId	Description	Cost Estimate ($M)	Required In-Service Date
n9606	Grounding Study at Flemingsburg Dist. Sub.	0.0850	3/1/2029
n9607	Interconnection Substation Tie-In: Cut and loop Spurlock - Flemingsburg 138 kV line into new interconnection substation with two (2) total new guyed steel 3-pole dead-end structures.	0.8470	3/1/2029
n9608	Fiber Installation in Existing ROW: Install overhead optical ground wire (OPGW) on the Spurlock-Flemmingsburg-Goddard line section (32.1 miles).	4.1064	3/1/2029
n9609	Revise Relay Settings at Spurlock Substation	0.1340	3/1/2029
n9610	Revise Relay Settings at Goddard Substation	0.1340	3/1/2029
n9611	West Flemingsburg Substation	12.6180	3/1/2029
n9612	Corey 1385 kV Station: Re-terminate the Hydramatic - Corey 138 kV Circuit. • Remove two (2) steel tangent structures, one (1) steel dead end structure, and associated conductor and shield wire along the existing Corey – Hydramatic 138 kV Circuit. • Install one (1) new 90’ steel, single circuit, single pole, running corner direct embedded structure. • Install one (1) new 90’ steel, single circuit, single pole dead end structure on a concrete foundation with an anchor bolt cage. • Install two (2) spans of aluminum conductor steel-reinforced 1033.5 (Curlew) transmission line conductor with 7#8 Alumoweld shield wire.	0.6010	2/28/2029
n9613	Corey 138 kV Station: • Installation of one (1) new 3000A 40 kA 138 kV	0.8040	2/28/2029

SubId	Description	Cost Estimate ($M)	Required In-Service Date
	circuit breaker with associated control relaying. • Installation of one (1) three phase 3000 A circuit breaker disconnect switch. • Installation of one (1) three phase coupling capacitor voltage transformer and associated structures for the line exit to the Hydramatic 138 kV Station. • Installation of one (1) H-frame dead end structure for the line exit to the Hydramatic 138 kV Station. • Installation of associated and additional bus work, bus supports, jumpers, insulators, grounding, and foundations.		
n9614	Corey 138 kV Station: Re-terminate Kenzie Creek - Corey 138 kV line. • Remove one (1) steel dead end structure and associated conductor and shield wire along the Kenzie Creek – Corey 138 kV Circuit. • Install one (1) new 100' steel, single circuit, single pole dead end structure on a concrete foundation with an anchor bolt cage and two spans of aluminum conductor steel-reinforced 1033.5 (Curlew) transmission line conductor with 7#8 Alumoweld shield wire.	0.5914	2/28/2029
n9615	Install carrier equipment at Eagle Valley Substation.	0.7460	12/31/2028
n9616	Install carrier equipment at Shawville Substation.	0.7805	12/31/2028
n9617	Install a new 115 kV breaker and associated controls direct connection of AG1-090/AG1-377/AG1-378 Generating Facility to the existing Philipsburg Substation.	1.7720	12/31/2028

SubId	Description	Cost Estimate ($M)	Required In-Service Date
n9618	Revise relay settings Ayersville.	0.0583	4/30/2026
n9619	Revise relay settings Midway.	0.0583	4/30/2026
n9620	Revise relay settings at Bowling Green No. 2.	0.0583	4/30/2026
n9621	Revise relay settings at Sand Ridge.	0.0583	4/30/2026
n9622	Revise relay settings Fiddlers Green.	0.0511	12/17/2029
n9623	Revise relay settings at Johnstown.	0.0511	12/17/2029
n9624	Revise relay settings at Bear Rock.	0.0508	12/17/2029
n9628	Expand the Davis Creek 138 kV Substation to accommodate the AF2-095 Project	1.1668	12/31/2030
n9629	TSS132 Substation Expansion Expand the TSS132 Garden Plain substation to accommodate the AF1-296 Project	11.6720	5/31/2029
n9630	Construct a new 230 kV line from the AG1-285 substation to the Finneywood 230 kV Substation. Expand AG1-285 substation and add two (2) new 230/115 kV transformers.	71.6978	12/31/2029

SubId	Description	Cost Estimate ($M)	Required In-Service Date
n9631	Install new overhead optical ground wire (OPGW) on the existing Summersville - Green County line sections for a total of 4.2 miles.	1.0610	11/30/2029
n9632	Revise relay settings at Hodgenville Substation	0.0680	11/30/2029
n9633	Revise relay settings at Stephensburg Substation	0.0680	11/30/2029
n9634	Loop existing Glendale Tap - Stephensburg 69 kV line into new interconnection switching station and install overhead optical ground wire (OPGW) on the tie-ins from South Hardin - Stephensburg 69 kV line section and from the South Hardin - Glendale Tap line section	1.0170	11/30/2029
n9635	Expansion of existing 161 kV Summer Shade substation to include one (1) 161 kV A-Frame substation structure, one (1) 161 kV 2000 amp Circuit Breaker, four (4) 2000 amp switches (includes PCO switch), three (3) 161 kV metering CTs, and three (3) 108 kV station class surge arrestors.	6.0020	6/30/2028
n9647	Install a 300 MVAR STATCOM at Fentress Substation for Coastal Virginia Offshore Wind Project.	49.1633	3/31/2029
n9651	Wreck and rebuild 10.05 miles of Line 1059 between Northern Neck and Moon Corner with (2) 768.2 ACSS/TW (20/7) "MAUMEE" at 250 degrees C and replace line leads at Moon Corner (AE1-155) and Northern Neck.	28.4770	3/31/2029
n9654	FirstEnergy work at new Interconnection Substation. Install (1) security system and camera system. Install (1) indoor security AC cabinet.	1.2122	12/8/2028
n9655	Remote end substation work at Chase City to support new interconnection substation	0.1286	6/24/2027
n9656	Remote end substation work at Farmville to support new interconnection substation	0.1250	6/24/2026

SubId	Description	Cost Estimate ($M)	Required In-Service Date
n9657	Remote end substation work at Pamplin to support new interconnection substation	0.1286	6/24/2027
n9658	Remote end substation work at Twitty's Creek to support new interconnection substation	0.2210	6/24/2027
n9659	Perform relay upgrades at TSS 189 Crego Rd substation.	0.2680	12/31/2029
n9660	Perform relay upgrades at TSS 56 North Aurora substation.	0.2680	12/31/2029
n9680	Sag mitigation - Remove and replace sixteen (16) existing double circuit towers with taller double circuit custom steel poles. (Towers 11, 14, 45, 47, 52, 57, 59, 61, 63, 66, 67, 71, 77, 84, 91, and 96). Remove and replace two (2) existing river crossing lattice towers with taller lattice structures. (Towers 2 and 140)	24.0060	5/31/2029
n9681	Reconductor 1.04 mile segment of Carson - Chaparall 230 kV Line 249 between structures 86 and 93 with (2) 768.2 ACSS Maumee at 250 degree C.	3.0420	9/1/2027
n9682	Perform sag mitigation on the Powerton - Tazewell 345 kV Line and replace disconnect switches at Powerton substation.	5.0174	2/28/2029