

Queue Posting



System Impact Studies Completed

Merchant Transmission (MTX) Projects

Queue Number	Project Name	TO
AA2-054	Pumphrey 230kV	BGE
AB2-020	Roseland-Williams 230kV	PSEG



Long Term Firm Transmission Service (LTF) Projects

Queue Number	Path Name	MWs
Z1-043	AMIL-PJM	260
Z1-070	AMIL-PJM	1045
AA1-052	PJM-IPL	400
AA1-053	PJM-MEC	700
AA1-054	PJM-CIN	700
AA1-055	PJM-AMIL	1100
AA2-033	NYIS-PJM	300
AA2-034	NYIS-PJM	300
AA2-038	ALTE-PJM	312
AA2-074	CPLP-PJM	45



Long Term Firm Transmission Service (LTF) Projects

Queue Number	Path Name	MW
AA2-074	CPLP-PJM	45
AA2-089	CIN-PJM	200
AA2-090	CIN-PJM	100
AA2-092	PJM-AMIL	100
AA2-101	PJM-MECS	100
AA2-102	PJM-MECS	100

Generation Projects By Transmission Owner

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
AA1-104	Storage	0	20	AEC
AA1-108	Natural Gas	158	158	AEC
AA2-044	Solar	7.3	13.5	AEC
AB1-030	Natural Gas	3.5	7.5	AEC
AB1-116	Natural Gas	0	0.787	AEC
AB1-119	Natural Gas	0	0.735	AEC



AEP Transmission Zone

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
T126	Wind	40	200	AEP
T127	Wind	40	200	AEP
T131	Wind	30	150	AEP
X1-020	Wind	195	1500	AEP
Y3-038	Coal	36	36	AEP
Y3-039	Natural Gas	20	20	AEP
Y3-040	Natural Gas	20	20	AEP
Z1-051	Nuclear	83	102	AEP
Z2-113	Solar	2.3	4.6	AEP
Z2-114	Solar	2.5	5	AEP
Z2-116	Solar	1.3	2.6	AEP
AA1-013	Natural Gas	10	10	AEP
AA1-014	Natural Gas	5	5	AEP

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
AA2-116	Natural Gas	994	994	AEP
AA2-137	Natural Gas	45	45	AEP
AA2-138	Natural Gas	45	45	AEP
AA2-141	Natural Gas	45	45	AEP
AB1-032	Solar	1.2	3.3	AEP
AB1-055	Storage	0	2	AEP
AB1-174	Solar	6.6	10	AEP
AB1-180	Methane	2.4	3.2	AEP

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
AA1-015	Natural Gas	5	5	APS
AA1-047	Wind	9.1	69.6	APS
AA1-062	Wind	29	224	APS
AA1-070	Coal	1590	1710	APS
AA1-085	Wind	10.66	82	APS
AA1-092	Solar	8	12	APS
AA1-095	Solar	6.67	10	APS
AA1-100	Storage	0	11	APS
AA1-109	Solar	4.5	9	APS
AA1-112	Methane	4	7.2	APS
AA2-085	Solar	3.8	10	APS
AA2-103	Storage	0	20	APS
AA2-119	Natural Gas	550	550	APS
AA2-121	Natural Gas	685	685	APS

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
AA2-131	Natural Gas	18	0	APS
AA2-139	Natural Gas	45	45	APS
AA2-143	Solar	2.7	4	APS
AA2-145	Solar	10.9	20	APS
AA2-159	Solar	8.7	16	APS
AA2-161	Natural Gas	513	541	APS
AA2-173	Natural Gas	515	515	APS
AB1-064	Methane	2	4	APS
AB1-096	Solar	3.8	9.9	APS
AB1-127	Solar	7.6	20	APS
AB1-128	Solar	7.6	20	APS

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
Z2-028	Natural Gas	800	800	ATSI
AA1-044	Natural Gas	870	1000	ATSI
AA1-056	Natural Gas	46	161	ATSI
AA1-123	Natural Gas	1105	1152	ATSI
AB1-015	Natural Gas	0	16.5	ATSI
AB1-095	Methane	0	0.85	ATSI
AB1-115	Methane	2.5	3.1	ATSI

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
AA2-072	Solar	0	1.1	BGE
AB1-075	Storage	0	20	BGE

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
V4-046	Nuclear	20	20	ComEd
V4-047	Nuclear	20	20	ComEd
V4-048	Nuclear	20	20	ComEd
V4-049	Nuclear	20	20	ComEd
W4-005	Wind	45.6	351	ComEd
X2-022	Wind	0	189	ComEd
Z2-081	Methane	13.3	13.3	ComEd
Z2-087	Wind	26	200	ComEd
AA1-018	Wind	19.5	150	ComEd
AA1-040	Natural Gas	20	20	ComEd
AA1-078	Natural Gas	20	20	ComEd
AA1-116	Storage	0	20	ComEd
AA1-117	Storage	0	20	ComEd
AA1-146	Natural Gas	157	190	ComEd
AA2-123	Storage	0	20	ComEd

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
AA1-101	Storage	0	20	Dayton

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
AA1-099	Storage	0	4	DEOK
AA2-100	Methane	4.8	4.8	DEOK

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
AA1-099	Storage	0	4	DEOK
AA2-100	Methane	4.8	4.8	DEOK



DOMINION Transmission Zone

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
Z2-088	Solar	30.4	80	Dominion
AA1-038	Wind	10.1	78.2	Dominion
AA1-049	Solar	14	20	Dominion
AA1-050	Solar	25.6	0	Dominion
AA1-063A	Solar	50.9	74.9	Dominion
AA1-064	Solar	56	80	Dominion
AA1-065	Solar	56	80	Dominion
AA1-067	Solar	10.5	15	Dominion
AA1-083	Natural Gas	20	20	Dominion
AA1-132	Solar	42	60	Dominion
AA1-133	Solar	56	80	Dominion
AA1-134	Solar	56	80	Dominion
AA1-135	Solar	56	80	Dominion
AA1-138	Solar	56	80	Dominion
AA1-139	Solar	84	120	Dominion

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
AA1-145	Natural Gas	340	340	Dominion
AA2-053	Solar	52.4	74.9	Dominion
AA2-057	Solar	44.7	66	Dominion
AA2-068	Solar	13.7	20	Dominion
AA2-079	Natural Gas	0	28	Dominion
AA2-086	Solar	3.1	4.5	Dominion
AA2-088	Solar	38	100	Dominion
AA2-127	Natural Gas	32.2	7	Dominion
AA2-165	Solar	50	8.9	Dominion
AA2-169	Solar	13.7	20	Dominion
AA2-174	Solar	2.4	5	Dominion
AA2-177	Solar	56	80	Dominion
AA2-178	Solar	56	80	Dominion
AA2-180	Solar	14	20	Dominion

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
Z2-097	Solar	3.54	5	DPL
AA1-061	Solar	13.4	20	DPL
AA1-140	Solar	7.6	20	DPL
AA1-141	Solar	5.7	15	DPL
AA2-069	Natural Gas	451	451	DPL
AA2-129	Storage	0	20	DPL
AA2-130	Methane	2	2	DPL
AB1-183	Solar	0	0	DPL

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
AA1-060	Storage	0	20	JCPL
AA1-098	Natural Gas	560	560	JCPL
AA2-048	Storage	5.3	14	JCPL
AA2-049	Storage	0	3	JCPL
AA2-060	Storage	0	6	JCPL
AA2-061	Storage	0	8	JCPL
AA2-064	Storage	0	17	JCPL
AA2-082	Storage	0	20	JCPL
AA2-128	Natural Gas	70	175	JCPL
AA2-184	Solar	0	20	JCPL

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
AA1-043	Natural Gas	34.1	34.1	ME
AA2-115	Natural Gas	450	450	ME

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
AA1-034	Natural Gas	70	120	PECO
AA1-079	Natural Gas	74	74	PECO
AB1-033	Diesel	6.1	6.1	PECO
AB1-073	Storage	0	20	PECO
AB1-074	Storage	0	20	PECO

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
Z2-103	Natural Gas	1	1	PENELEC
AA1-046	Wind	10.4	80	PENELEC
AA1-076	Natural Gas	1000	1050	PENELEC
AA1-082	Natural Gas	0	57.5	PENELEC
AA1-106	Natural Gas	19.9	19.9	PENELEC
AA1-111	Natural Gas	463	463	PENELEC
AA1-115	Storage	0	20	PENELEC
AA1-144	Natural Gas	163	163	PENELEC
AA2-081	Natural Gas	19.9	19.9	PENELEC
AA2-112	Natural Gas	19.9	19.9	PENELEC
AA2-132	Natural Gas	19.9	19.9	PENELEC
AA2-133	Natural Gas	19.9	19.9	PENELEC
AB1-144	Natural Gas	590	590	PENELEC



PEPCO Transmission Zone

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
AA2-170	Natural Gas	92	111.1	PEPCO

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
Y2-015	Natural Gas	337	344	PPL
Y2-089	Natural Gas	370	370	PPL
Z2-107	Storage	0	10	PPL
AA1-057	Wood	16	16	PPL
AA1-066	Natural Gas	80	0	PPL
AA1-077	Natural Gas	34	113	PPL
AA2-008	Natural Gas	0	57	PPL
AA2-017	Wind	12.7	98	PPL
AA2-171	Natural Gas	60	97	PPL
AA2-182	Natural Gas	977	1030	PPL
AB1-084	Natural Gas	19.9	19.9	PPL



PSEG Transmission Zone

Queue Number	Fuel Type	MWC	MWE	Transmission Owner
Z1-058	Natural Gas	36	23	PSEG
Z2-002	Natural Gas	56	71	PSEG
Z2-089	Natural Gas	509	568	PSEG
AA2-052	Natural Gas	3	0	PSEG
AA2-058	Solar	0.3	1	PSEG
AA2-066	Natural Gas	0	2	PSEG
AA2-099	Natural Gas	32	0	PSEG
AB1-021	Solar	0.3	2	PSEG
AB1-025	Solar	2.6	6.8	PSEG
AB1-063	Solar	0	0.4	PSEG
AB1-139	Solar	2.5	6.6	PSEG

Network Upgrades

Upgrade Id	Project Description	Cost Estimate	Driver
n5024	Line protection and controls at the Kenzie Creek 345/138 kV Substation will need to be upgraded to coordinate with the new 345 kV switching station due to the new generation added.	0.6	AA2-116
n5023	Line protection and controls settings at Cook Circuit # 1 and #2 at Cook 345 kV substation will need to be changed to coordinate with the new 345 kV switching station due to the new generation	0.05	AA2-116
n5022	Line protection and controls will need to be installed at the new 345 kV switching station between Cook and East Elkhart Substations	1	AA2-116
n5021	Construct a new six (6) breaker 345 kV switching station laid out in a breaker and half arrangement including installation of associated disconnect switches, bus work, SCADA and 345 kV revenue metering.	14	AA2-116

Upgrade Id	Project Description	Cost Estimate	Driver
n5025	Line protection and controls settings at the East Elkhart 345/138 kV Substation will need to be changed to coordinate with the new 345 kV switching station between East Elkhart and Cook due to the new generation	0.05	AA2-116
n1505	Replace risers on the R49 terminal at Haviland Substation	0.265	T131
n1503	Replace risers on the Harper terminal at Milan Substation	0.01	T131
n1502	Replace risers and a 600A 138kV disconnect switch on the Tillman terminal at Milan Substation	0.21	T131
n1467	Rebuild the circuit between Lincoln and Anthony Substations i.e. 17 miles of 138kV circuit	26	T131
n1575	Re-conductor the 345kV line 4.39 miles with 954 kcmil ACSS wire between Sammis and Wylie Ridge Substations	0.002	T127

Upgrade Id	Project Description	Cost Estimate	Driver
n1501	Rebuild, re-conductor and replace towers in the approx. 8 mile 138kV circuit between Haviland and Milan Substations	12	T131
n1504	Rebuild, re-conductor and replace towers of approximately 17 mile 138kV circuit between Lincoln and North Delphos Substations	26	T131
n1580	Re-conductor (AEP portion) approximately 2.94 miles of existing 345kV line with twin bundle 795 Drake ACSS-AW HT conductor and replace the line trap with 4000A rated line trap between Sammis and Wylie Ridge Substations	1.9	T127
n1576.2	Replace wave trap to accommodate 3000A on Sammis - Wylie Ridge line.	0.07	T127

Upgrade Id	Project Description	Cost Estimate	Driver
n4713	Rebuild 2.83 miles of the existing Howe – Sturgis 69 kV line (AEP/MISO tie line).	3.4	X1-020
n4741	Rebuild of 1.91 miles of 69kV circuit	1.524	X1-020
n4740	Rebuild 2.76 miles of the existing Howe – Sturgis 69 kV line (AEP portion)	2.208	X1-020
n1881	Loop Olive - Dequine - #2 circuit into the expanded Meadow Lake switching station	0.6	T126
n1466	Replace 138kV riser on the R49 line and replace the bus at Haviland Substation	0.265	T131
n1465	Replace 138kV riser on the S73 line at Lincoln Substation	0.007	T131

Upgrade Id	Project Description	Cost Estimate	Driver
n1464	Replace 138kV risers on the T131 line, replace the 138kV 600A switch on the T131 line at North Delphos Substation	0.187	T131
n1494	Tap the line between Lincoln and Serling to the new station	0.1	T131
n1469	Rebuild 10.72 of 69kV between Haviland and Paulding Substations	3.87	T131
n1468	Replace 138kV risers on both the Tillman and Harper lines at Milan station, replace the 138kV 600A switch	0.22	T131
n4744	Modify relaying at Greentown 765 kV Station	0.7274	X1-020
n4743	Modify relaying at Dumont 765 kV Station	0.554	X1-020
n4742	Construct Interconnection Substation with Revenue Metering between Dumont and Greentown 765kV Circuit	30.092	X1-020

Upgrade Id	Project Description	Cost Estimate	Driver
n1577	Olive - Dequine - Replace 345kV Circuit #2 into Meadow Lake station in a breaker and a half arrangement	0.007	T126
n1493	Lincoln - Sterling - Construct a 3 breaker 138kV ring bus interconnection substation in the circuit between Project S73 and North Delphos	5	T131
n1579	Olive - Replace remote end relay at 345kV substation	0.04	T126
n1578	Dequine - Re-conductor remote end relay at 345kV station	0.04	T126
n1576.1	Sammis - Wylie Ridge - Replace GCX51 backup line relays with an SEL 421 and replace existing metering with digital multimeter	0.068	T127
n1574	Sammis - Wylie Ridge - Replace backup line relaying and metering on the 345kV line	0.173	T127

Upgrade Id	Project Description	Cost Estimate	Driver
n4250	Revenue Metering at the New Substation connecting to the Lincoln - Sterling 138kV circuit	0.268	T131
n4249	Modify relay settings at Sterling 138kV Substation	0.8888	T131
n4248	Modify relay settings at North Delphos 138kV Substation	1.7991	T131
n4247	Modify relay settings at Lincoln 138kV Substation	0.3749	T131
n4246	Modify relay settings at East Side Lima 138kV Substation	0.008	T131
n3530	Modify relaying at Dumont 765 kV Station	0.55	X1-020
n3529	Modify relaying at Greentown 765 kV Station	0.73	X1-020

Upgrade Id	Project Description	Cost Estimate	Driver
n1698	Wylie Ridge - Upgrade the Sammis 345kV RTU	0.005	T126
n3531	Need to install SCADA for curtailment purposes	0.25	X1-020
n3528	Install a new 4-breaker 765 kV at the X1-020 Tap switching station laid out in a breaker and one-half arrangement including associated disconnect switch bus work, SCADA and 765 kV revenue metering.	30.09	X1-020

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n5092	Adjust Remote Relay and Metering Settings at 4 Additional Substations connecting the tapped substation between Milesburg and Moshannon 230kV substation	0.049	AA1-085
n5090	Milesburg SS - Install anti-islanding facilities on the Shingletown 230 kV line terminal including tuner, transmitter and hybrid module. On the new AA1-085 terminal (Moshannon 230 kV) Install trap, turner, transmitter and hybrid module.	0.135	AA1-085
n5089	Moshannon SS - Install anti-islanding facilities on the Milesburg 230kV line terminal including RFL-9780 FSK transmitter and hybrid module.	0.038	AA1-085
n5088	Milesburg-Moshannon 230 kV line, Loop to AA1-085 Switching Station for PJM AA1-085. Install a loop, approx. 200' in length, consisting of two 3-way dead-end structures and rebuild of adjacent H-frame structures (rebuild outside suspension assemblies by installing 230kV horizontal post insulators)	0.642	AA1-085

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n5098.6	Replace Breaker WK-6 at Wylie Ridge 345 kV from 50 kA to 63 kA	0.798	AA2-121
n5098.5	Replace Breaker WK-5 at Wylie Ridge 345 kV from 50 kA to 63 kA	0.798	AA2-121
n5098.4	Replace Breaker WK-4 at Wylie Ridge 345 kV from 50 kA to 63 kA	0.798	AA2-121
n5098.3	Replace Breaker WK-3 at Wylie Ridge 345 kV from 50 kA to 63 kA	0.798	AA2-121
n5098.2	Replace Breaker WK-2 at Wylie Ridge 345 kV from 50 kA to 63 kA	0.798	AA2-121

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n5098.1	Replace Breaker WK-1 at Wylie Ridge 345 kV from 50 kA to 63 kA	0.798	AA2-121
n5091	Shingletown SS - Install anti-islanding facilities on the Milesburg 230 kV line terminal including tuner transmitter and hybrid module.	0.04	AA1-085
n5085	Lake Lynn SS. Install new 138 kV relay panel on the Hazelton Line. Install new communication equipment.	0.1296	AA1-047
n5084	Albright, Hazelton, Frostburg, Ridgeley, & Cumberland SS. Adjust remote-relaying settings for Albright, Hazelton, Frostburg, Ridgeley, and Cumberland substations. Adjust Frequency-settings at Hazelton substation.	0.0372	AA1-047

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n5083	Finzel SS. Install a transmitter for anti-islanding signal to the AA1-047 switchyard. Change power line carrier frequencies for the blocking scheme pilot channel.	0.0289	AA1-047
n5082	Finzel-Hazelton 138kV, Loop to 3-Breaker Ring Bus for PJM AA1-047 - Install a loop, approx. 200' in length, from the Hazelton-Jennings section of the Finzel-Hazelton 138kV line to the proposed 3-breaker ring bus substation for PJM AA1-047. Note that the	0.4687	AA1-047
n5081	Test the Williams substation 138 kV breaker & switch. Install control panel & revise relay settings. Install SCADA RTU and its associated fiber circuit. Terminate Developer's 138 kV line on William Substation dead-end and connect to Developer's fiber.	0.56	AA1-062

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n5080	Expedite project b2672 from the 2020 required in-service date. Change CT ratio and relay settings on the Seneca - William 138 kV line at the Seneca substation to facilitate a 150 MVA line rating	0.05	AA1-062
n4850.2	William Substation. Replace the No. 1 69 kV Capacitor circuit switcher with a 72kV Capswitcher	0.15	AA1-062
n4850.1	William Substation. Replace the No.1 138-69 kV transformer with a 40/50/60 MVA transformer	2.14	AA1-062
n5063	Install new 138 kV terminal and all necessary terminal end equipment to interconnect AA1-062 on the William bus, including: Test 138 kV breaker & switch, Install control panel & revise relay settings, Terminate Developer's 138 kV line on William Substation	0.24	AA1-062

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n5033	All Dam 6 Tap-Kittanning 138kV, Re-conductor ~6.4 miles with 795 kcmil ACSR conductor	6.6223	AA2-161
n5032	Huntingdon SS – Install new relay panels and carrier equipment on the Yukon 138kV line	0.1801	AA2-161
n5031	Springdale SS – Install new relay panels and carrier equipment on the Yukon 138kV line	0.1801	AA2-161
n5030	Yukon SS – Install new relay panels and carrier equipment on the Huntingdon and Springdale 138kV	0.36	AA2-161
n5029	Springdale-Yukon 138kV, Install a loop to the proposed 6-breaker ring bus	0.3575	AA2-161

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n5028	Huntingdon-Yukon 138kV, Install a loop to the proposed 6-breaker ring bus	0.4154	AA2-161
n5027	Buena Vista SS – Construct 6-breaker ring bus substation	7.1	AA2-161
n4905	Expand the bus and install two breakers at Hatfield 500kV Substation to Accommodate the generator	8.5491	AA2-173
n4904	Install fully rated disconnect switch in attachment line connecting Hatfield 500kV Substation	0.0055	AA2-173
n4903	Attachment line from POI to inside the of Hatfield 500kV substation.	0.0105	AA2-173

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4855	Rebuild 2.5 miles of the Glen Falls-Oak Mound 138 kV line and upgrade terminal equipment at both Glen Falls & Oak Mound substations.	9.482	AA2-119
n4854	Glen Falls SS. Replace the Buckhannon 50, Barnetts Run 406, Oak Mound 4, No. 1 & No. 4 transf. and 138 kV Bust tie breakers with 63 kA, 3000 A units. Install 3 new foundations, 4 switches, cable trench, control cable and all as	1.9153	AA2-119
n4853	Glenn Falls 138kV Substation - 16' x 16' expansion of concrete control building. ESTIMATE DOES NOT INCLUDE PROPERTY ACQUISITION NECESSARY FOR EXPANSION.	0.5133	AA2-119
n4852	Glenn Falls 138kV Substation - Extend 138 kV bus and install 138 kV SF6 breaker, bus/line disconnects, foundations, control cable and associated facilities.	1.21	AA2-119

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4851	Glen Falls SS: - Grade and extend fence and ground grid approx. 50' x 180'. - Install attachment line from 138 kV SF6 breaker to POI	0.075	AA2-119
n4874	Adjust remote end relaying and metering settings at Ronco 500kV Substation.	0.0127	AA2-139
n4850	William SS. Replace the (spare) No.1 138/69 kV transformer with a 40/50/60 MVA transformer and place it normally in-service with the No.2 transformer	2.2712	AA1-062
n4849	Adjust remote Relay and Metering Settings at Back Bone Mountain 138kV Substation	0.0091	AA2-103
n4843	Metering and relay settings adjustments at Oak Grove 138kV Substation	0.0122	AA2-131

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4837	Install new relay panel on the Mercersburg 34.5kV line (McConnellsburg SS)	0.0859	AB1-128
n4836	Install new relay panel on the Mercersburg 34.5kV line (Guilford SS)	0.0859	AB1-128
n4835	Install new relay panel on the Guilford 34.5kV line (Mercersburg SS)	0.0859	AB1-128
n4834	Install two (2) 34.5 kV manual line switches at the point of interconnection i.e. Saint Thomas and Mercersburg 34.5kV Substation	0.0568	AB1-128
n4833	Tap 34.5 kV line between Saint Thomas - Mercersburg substations and install a single tap switch.	0.02	AB1-128

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4832	Install 34.5 kV metering package in interconnection customer's facilities.	0.01	AB1-128
n4826	Install new relay panel on the Mercersburg 34.5kV line (McConnellsburg SS)	0.0859	AB1-127
n4825	Install new relay panel on the Mercersburg 34.5kV line (Guilford SS)	0.0859	AB1-127
n4824	Install new relay panel on the Guilford 34.5kV line (Mercersburg SS)	0.0859	AB1-127
n4823	Install two (2) 34.5 kV manual line switches.	0.0568	AB1-127

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4822	Tap 34.5 kV line between Saint Thomas - Guilford substations and install a single tap switch.	0.02	AB1-127
n4821	Install 34.5 kV metering package in interconnection customer's facilities.	0.01	AB1-127
n4820	Remote end relay, protection and metering settings adjustments.	0.0123	AB1-096
n4819	Tap 34.5 kV line between Carroll and Mt. Airy substations and Install two (2) 1200 A, 34.5 kV line switches.	0.1015	AB1-096
n4818	Metering package in interconnection customer's facilities.	0.1075	AB1-096

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4817	Build single span of 336 ACSR from distribution line to Interconnection Customer's POI.	0.8050	AB1-096
n4816	Change the No. 1 XFMR LTC controller	0.01	AA2-085
n4815	Install 200ft, 750 AL, underground substation exist.	0.01	AA2-085
n4814	Extend General Office 12.5 kV Bus and Install new feeder bay.	0.2983	AA2-085
n4813	Procure and install FE 12.5 kV metering equipment in the developer's collector Substation. Developer to provide mounting structures and phone line	0.033	AA2-085

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4812	Install (1)-12.5 kV 600A disconnect switch in attachment span.	0.012	AA2-085
n4811	Build one attachment span, 336 ACSR, from distribution line tap to dead end POI.	0.01	AA2-085
n4809	Change controllers on the Catoctin Substation 12.5 kV bus regulator	0.0458	AA2-143
n4808	Balance the Catoctin – Catoctin Furnace 12.5 kV circuit	0.0015	AA2-143
n4807	Procure and install FE 12.5 kV metering equipment in the developer's collector Substation. Developer to provide mounting structures and phone line	0.033	AA2-143

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4806	Install (1)-12.5 kV 300A disconnect switch and one span 336 ACSR span to dead end.	0.022	AA2-143
n4562	On the Cumberland 138 kV terminal, replace the 1200A wave trap with a 2000A wave trap and replace the 954 breaker risers with 1272 ACSR.	0.0458	AA1-047
n4561	On the Ridgeley 138 kV terminal, replace the 1200A wave trap with a 2000A wave trap and replace the 954 breaker risers with 1272 ACSR.	0.0458	AA1-047
n4656	Re-conductor the Rockwood – Somerset 115 kV line and upgrade terminal equipment at Rockwood and Somerset.	10.8944	AA1-062
n4606.2	Ridgeley Substation: On the Cumberland 138 kV terminal, replace the 1200A wave trap with a 2000A wave trap and replace the 954 ACSR breaker risers with 1272 ACSR	0.0363	AA1-047

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4606.1	Cumberland Substation: On the Ridgeley 138 kV terminal, replace the 1200A wave trap with a 2000A wave trap and replace the 954 ACSR breaker risers with 1272 ACSR	0.0363	AA1-047
n4706	Monocacy SS: Revise relay settings on the Catoclin 34.5 kV line	0.0137	AA1-109
n4705	Carroll SS: Revise relay settings on the Monocacy 34.5 kV line	0.0137	AA1-109
n4704	Catoclin SS: Revise relay settings on the Monocacy 34.5 kV line	0.0137	AA1-109
n4703	Tap the Catoclin - Troutville 34.5 kV and install 2 34.5 kV air switches and appropriate metering	0.2164	AA1-109

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n1381	Yukon - Replace 138kV breaker Y-6 (HEMPFLD) with 80kA Symmetrical Breaker	0.404	AA2-161
n1380	Yukon - Replace 138kV breaker cap with 80kA Symmetrical Breaker	0.404	AA2-161
n1373	Yukon - Replace 138kV breaker Y-7 (HTDN-HMF) with 80kA Symmetrical Breaker	0.404	AA2-161
n1365	Yukon - Replace 138kV breaker Y-3 (LYN-YNGD) with 80kA Symmetrical Breaker	0.404	AA2-161
n1364	Yukon - Replace 138kV breaker Y-1 (Youngwd) with 80kA Symmetrical Breaker	0.404	AA2-161

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n5062	Bruce Mansfield, Cedar Street, Cranberry, Crossland, Maple, Measury, McDowell, New Castle, Niles, and Sharon SS – Adjust Remote Relay Settings.	0.05	AA1-044
n5061	Construction Oversight for AA1-044 Interconnection Substation.	1.07	AA1-044
n5057	Adjust Remote Relay Settings at Bluebell, Bruce Mansfield, Evergreen, Glenwillow, GM Lordstown, Hanna, Highland, Hoytdale, Mahoningside, Newton Falls, Niles, Salt Springs, Shenango, Star, Toronto, and Z2-028 substations.	0.15	AA1-123
n5056	Install dual fiber optic cables from the new AA1-123 Interconnection SS to the Sammis SS approximately 11 miles.	1.39	AA1-123
n4695	Tie in new substation for AA1-123 to the Highland-Sammis 345kV line	2.6693	AA1-123

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4708	Raise 138 kV Berlin Lake-Nile 138kV and Bluebell-Highland 138kV Lines for Generation Attachment Line crossing clearance	1.1873	Z2-028
n4388	Loop in new 345kV five-breaker ring bus substation to Highland - Mansfield and Highland - Sammis 345kV lines: each approximately 900 ft. in length, utilizing steel pole structures	3.1958	Z2-028
n4612	Tie in the new substation for AA1-044 to the Shenango-Hoytdate 345kV line.	3.4104	AA1-044
n4611	Build new 345kV 3-breaker ring bus substation for the AA1-044 project.	7.4677	AA1-044
n4387	Build new 345kV five-breaker ring bus substation to interconnect project Z2-028	11.9143	Z2-028

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4694	Build new 345kV, 3-breaker ring bus for the AA1-123 project.	8.3632	AA1-123
n4614	Install two single channel transfer trip transmitters.	0.1869	AA1-044
n4613	Install two single channel transfer trip transmitters.	0.1869	AA1-044
n4697	Protection system modifications at Sammis substation.	0.4193	AA1-123
n4696	Protection system modifications at Highland substation.	0.4594	AA1-123

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4389	Upgrade Highland 345kV substation line relaying to new Z2-028 interconnection bus	0.4153	Z2-028
n4710	Upgrade Mansfield 345kV substation line relaying to new Z2-028 interconnection bus	0.008	Z2-028
n4709	Upgrade Sammis 345kV substation line relaying to new Z2-028 interconnection bus	0.008	Z2-028
n4681	Replacing 5 motor-operated disconnected switches is required.	2	AA1-056
n4680	Replacing two disconnected switches with 3000A rating and two breakers with 4000A rating is required along with upgrading relays and communication.	4	AA1-056

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4390	Install approximately 1.23 miles of fiber from Z2-028 interconnection substation to Highland 345kV substation	1.8977	Z2-028
n4340.2	Replace 2 overdutied 345kV circuit breakers with 80kA circuit breakers. @ Bruce Mansfield breaker HOYT-N. BUS	0.9722	AA1-044
n4340.1	Replace 2 overdutied 345kV circuit breakers with 80kA circuit breakers. @ Bruce Mansfield breaker HIGH-N. BUS	0.9722	AA1-044
n4339.3	Replace 3 overdutied 345kV circuit breakers with 80kA circuit breakers. @ Bruce Mansfield breaker HIGH-CRESCEN	0.9697	AA1-044
n4339.2	Replace 3 overdutied 345kV circuit breakers with 80kA circuit breakers. @ Bruce Mansfield breaker GEN3-S. BUS	0.9697	AA1-044

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4339.1	Replace 3 overdutied 345kV circuit breakers with 80kA circuit breakers. @ Bruce Mansfield breaker GEN2-CHAMB	0.9697	AA1-044
n4338.3	Replace 3 overdutied 345kV circuit breakers with 80kA circuit breakers. @ Bruce Mansfield breaker GEN NO 3-N.	0.9697	AA1-044
n4338.2	Replace 3 overdutied 345kV circuit breakers with 80kA circuit breakers. @ Bruce Mansfield breaker GEN NO 2-N.	0.9697	AA1-044
n4338.1	Replace 3 overdutied 345kV circuit breakers with 80kA circuit breakers. @ Bruce Mansfield breaker GEN NO 1-N.	0.9697	AA1-044
n4337.3	Replace 3 overdutied 345kV circuit breakers with 80kA circuit breakers. @ Bruce Mansfield breaker CRESENT-S. B	0.9697	Z2-028

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4337.2	Replace 3 overdutied 345kV circuit breakers with 80kA circuit breakers. @ Bruce Mansfield breaker CHAMB-S. BUS	0.9697	Z2-028
n4337.1	Replace 3 overdutied 345kV circuit breakers with 80kA circuit breakers. @ Bruce Mansfield breaker BVLY2-S. BUS	0.9697	Z2-028
n4337	Replace 3 overdutied 345kV circuit breakers with 80kA circuit breakers. @ Bruce Mansfield breaker CRESENT-S. B	0.9697	AA1-044
n4336.3	Replace 3 overdutied 345kV circuit breakers with 80kA circuit breakers. @ Bruce Mansfield breaker BVLY2-GEN1	0.9697	Z2-028
n4336.1	Replace 3 overdutied 345kV circuit breakers with 80kA circuit breakers. @ Bruce Mansfield breaker BVLY2-GEN1	0.9697	AA1-044

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4711.2	Replace breaker W-8 at WYLIE RG 139 kV bus with a 80 kA breaker	0.55	AA1-123
n4711.1	Replace breaker W-3 at WYLIE RG 139 kV bus with a 80 kA breaker	0.55	AA1-123
n4680.9	Replace breaker HIGHL-GEN.3 BUS with a 80 kA breaker at Sammis 345 kV substation	0.765	AA1-123
n4680.8	Replace breaker GEN.7-E. BUS with a 80 kA breaker at Sammis 345 kV substation	0.765	AA1-123
n4680.7	Replace breaker GEN.6-E. BUS with a 80 kA breaker at Sammis 345 kV substation	0.765	AA1-123

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4680.6	Replace breaker GEN.5-E. BUS with a 80 kA breaker at Sammis 345 kV substation	0.765	AA1-123
n4680.5	Replace breaker GEN.4-E. BUS with a 80 kA breaker at Sammis 345 kV substation	0.765	AA1-123
n4680.4	Replace breaker GEN.3-E. BUS with a 80 kA breaker at Sammis 345 kV substation	0.765	AA1-123
n4680.3	Replace breaker BVR VLY-W. B with a 80 kA breaker at Sammis 345 kV substation	0.765	AA1-123
n4680.2	Replace breaker BVR VLY-GEN with a 80 kA breaker at Sammis 345 kV substation	0.765	AA1-123

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4680.16	Replace breaker WR-W. BUS : with a 80 kA breaker at Sammis 345 kV substation	0.765	AA1-123
n4680.15	Replace breaker WR-GEN.6 : B with a 80 kA breaker at Sammis 345 kV substation	0.765	AA1-123
n4680.14	Replace breaker STAR-W. BUS with a 80 kA breaker at Sammis 345 kV substation	0.765	AA1-123
n4680.13	Replace breaker STAR-GEN.4 : with a 80 kA breaker at Sammis 345 kV substation	0.765	AA1-123
n4680.12	Replace breaker S.CAN-GEN.5 with a 80 kA breaker at Sammis 345 kV substation	0.765	AA1-123

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4680.11	Replace breaker S. CAN-W. BU with a 80 kA breaker at Sammis 345 kV substation	0.765	AA1-123
n4680.10	Replace breaker HIGHL-W. BUS with a 80 kA breaker at Sammis 345 kV substation	0.765	AA1-123
n4680.1	Replace breaker 780-B-298 with a 80 kA breaker at Sammis 345 kV substation	0.765	AA1-123

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4726	Transmission Tie in work between AA1-018 interconnection substation and Line 0303	3	AA1-018
n4728	Raise 93503 and 0302 for 0303 line crossing	2	AA1-018
n4058	Perform a sag study on the Stillwell - Dumont 345 kV line	0.03	AA1-018
n4349	Re-conductor or rebuild AEP portion of the University Park - Olive 345 kV line. Also upgrade risers and relays	45	W4-005
n4348	Mitigate sag limitations to achieve full conductor thermal capability on Loretto - Wilton Center 345kV line	16.7	W4-005

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4001	Install an extra three 345kV breakers at TSS 92 Mt. Pulaski substation	9	X2-022
n4199	The upgrade is to install a new transformer.	30	W4-005
n3999	Install 345kV three breaker ring bus	15	W4-005
n3998	345kV transmission line tie-in	3	W4-005
n4727	Install new AA1-018 345kV Interconnection substation	18	AA1-018

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4000	Remote-end relay upgrade	1	W4-005
n4761	Remote-end relay upgrade	1.5	W4-005
n2130	Install new 345kV bus tie circuit breaker at TSS 900 Elwood Energy Center	2.34	W4-005
n4601	Replace 1 overdutied 138 kV breaker with a 63 kA breaker at NELSON B4 bus. Breaker name: 155 15507	1.65	AA1-146



DOMINION Transmission Zone

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n5079	Upgrade Relay at remote ends connecting AB2-057 switching station	0.15	AA2-057
n5078	Tap 115kV between Homertown Substation and Roanoke Rapids Substation to Build Switching Station for the generator	0.7	AA2-057
n5077	Build new three breaker ring bus at AA2-057 substation	4.5	AA2-057
n5075	Upgrade relay at substation AA2-088 to accommodate queue AA2-088	0.15	AA2-088
n5074	Modify transmission line #140 and loop into AA2-088 substation	0.7	AA2-088

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n5073	Build a new three breaker ring bus at Boykins - Handsom DP	4.5	AA2-088
n5072	Upgrade Earleys - Suffolk relay to accommodate queue AA1-138	0.37	AA1-138
n5071	Modify transmission line #246 (Suffolk - Earleys 230kV) to loop into Haslett substation	1.1	AA1-138
n5070	Build a new three breaker ring bus at Haslett substation	5.66	AA1-138
n4507	Split the existing 230kV line between Suffolk and Earleys substation to connect new interconnection substation	0.6	AA1-063A



DOMINION Transmission Zone

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4503	Split the existing 230kV line between Sunbury and Winfall substation to connect new interconnection substation	1	AA1-134
n4715	Loop the existing 230kV circuit between Winfall and Sunbury substations into the new Switching Station (Acorn Hill 230kV) for the generator	1.65	AA1-133
n4718	Loop the existing 230kV circuit between Fentress and Sligo substations into the new Switching Station for the generator	1.65	AA1-132
n4485	Loop the existing 230kV circuit between Shawboro and Hickory substations into the new Switching Station for the generator	2.3	AA1-139
n4551	#320 to three phase 477MCM AL	0.3	AA1-067



DOMINION Transmission Zone

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4721	Loop the existing 230kV circuit between Wake and Heritage substations into the new Switching Station for the generator	1.85	AA1-064
n4486	option to build oversight and protection to accommodate new generation and interconnection substation	0.5	AA1-139
n4502	Build AcronHill Switching Station (230kV) to Accommodate the new generator. The switching station is located between Winfall and Sunbury 230kV Substations	4	AA1-134
n4299	Option to build 3 breaker ring bus between Tarboro – Everetts 230kV line	0.865436	Z2-088
n4553	#320 to three phase 477MCM AL	0.05	AA1-067



DOMINION Transmission Zone

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4506	Build a 3 breaker switching station (Pecan 115kV) between Caolina and Seaboard 115kV substations to accommodate the generator	4.2	AA1-063A
n4782	Add additional breaker in the ring bus configuration of Four River 230kV substation to accommodate the generator	0.6	AA1-145
n4717	Build 230kV switching station (3 breaker ring bus) and loop the 230kV circuit between Fentress and Shawboro into the new switching station	5.6	AA1-132
n4720	Build 500kV switching station (3 breaker ring bus) and loop the 500kV circuit between Wake and Heritage into the new switching station	16	AA1-064
n4714	Build 230kV switching station (3 breaker ring bus) and loop the 230kV circuit between Shawboro and Hickory into the new switching station	5.6	AA1-133

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4693	Replace equipment, wave trap at Four Rivers and line switches at Hanover	0.25	AA1-145
n4692	Replace equipment, wave trap at Four Rivers and line switches at St. Johns	0.15	AA1-145
n4508	Revise Relay Setting at remote ends of Pecan 115kV substation to accommodate the new generator	0.5	AA1-063A
N4722	Upgrade Relay Settings and Communication Equipment at Wake and Heritage 500kV Substations to accommodate the generator	0.627	AA1-064
n4719	Upgrade Relay Settings and Communication Equipment at Fentress and Sligo 230kV Substations to accommodate the generator	0.627	AA1-132

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4716	Upgrade Relay Settings and Communication Equipment at Shawboro and Hickory 230kV Substations to accommodate the generator	0.127	AA1-133
n4496	Upgrade transmission line protection and anti islanding schemes at Showboro Substation and Fentress Substation	0.057546	AA1-139
n4407	Remote Terminal work at remote substations (Edgecomb, Everett, and Tarboro)	0.186	Z2-088
n4552	For transfer trip scheme with IC and upgrade protection equipment	0.4	AA1-067

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4504	Upgrade relays at remote ends of Acron Hill 230kV substations to accommodate the new generator	0.6	AA1-134
n4484	Add a new bay at Earlevs 230kV substation with 2 new breaker to accommodate the new generator	2	AA1-065

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4844	Upgrade relay settings at Cartanza and Red Lion 230 kV buses	0.01	AA2-069
n4691	Reconfigure Line 6719 to accommodate the new line terminal positions at the new substation between Jacktown Substation and East New Market Substation.	0.35	AA1-061
n4618	Construct a 69 kV terminal position on the 69 kV ring bus at Worcester Substation. The additional position will require a 69 kV circuit breaker, instrument transformers, substation bus equipment, structures, and disconnect switches.	1.2	AA1-140

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4629	Construct a 69 kV terminal position on the 69 kV ring bus at Kenney Substation. The additional position will require a 69 kV circuit breaker, instrument transformers, substation bus equipment, structures, and disconnect switches.	1.2	AA1-141
n4690	Construct a three-position 69 kV ring bus along Line 6719 between Jacktown Substation and East New Market Substation. See notes for more info	2.6	AA1-061

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4985	Horseshoe Road Substation: Construct a 115 kV three breaker ring bus interconnect substation between Raritan River and Werner substations for AA2-128 Interconnection.	5.9208	AA2-128
n4984	Raritan River – Werner 115 kV Line: Loop the existing Raritan River-Werner 115kV circuit into the new Horseshoe Road Substation.	1.1972	AA2-128
n5002	Distribution protection system settings changes at Ocean View 34kV Sub	0.0392	AA2-184
n5001	Distribution protection system settings changes at Atlantic 34kV Sub	0.0392	AA2-184
n5000	New 34kV tap connection to the Atlantic – Ocean View 34kV line	0	AA2-184

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n5002	Incorrect NUN. Remove from DB	0.0392	AA2-184
n5001	Incorrect NUN. Remove from DB	0.0392	AA2-184
n5000	Incorrect NUN. Remove from DB	0	AA2-184
n5044	Protection system modifications to support re-conductoring of the Freneau-Parlin 230kV line	0.012	AA1-098
n5043	Protection system modifications	0.012	AA1-098

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n5042	Protection system modifications	0.012	AA1-098
n5041	Protection system modifications	0.012	AA1-098
n5040	Protection system modifications	0.012	AA1-098
n5039	Protection system modifications	0.2351	AA1-098
n5038	Install new fiber optic communication cable along existing transmission line	0.1666	AA1-098

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4941	Re-conductor South River Junction 230kV line drops due to overloading, and Replace limiting components at the Atlantic substation	2	AA2-128
n4940	Re-conductor the 2.1 mile Lake Nelson-Kilmer (I1023) 230kV line w/ single 1590 kcmil ACSS conductor, replacing the existing 1590 kcmil ACSR conductor	8	AA2-128
n4939	Adjust remote relay settings	0.02	AA2-128
n4920	Adjust remote, relaying, and metering settings	0	AA2-049
n4916	Build a new 34.5kV Tap off The Branchville - N. Newton 34.5 kV Line (F708)	0.4304	AA2-064

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4907	Build a new 34.5kV Tap off The Branchville - Sussex #2 34.5 kV Line (Q745-3)	0.4409	AA2-061
n4878	Adjust Remote Relay and Metering Settings.	0.0129	AA2-082
n4877	Build a new 34.5kV Tap off The Gilbert - Phillipsburg 34.5 kV Line	0.441	AA2-082
n4876	Build a new 34.5kV Tap off The Branchville - Sussex #1 34.5 kV Line	0.4409	AA2-060
n4875	Adjust remote, relaying, and metering settings	0.01	AA2-048

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4668	Upgrade line drops, auxiliary CTs (and related settings changes), and wavetrap on Parlin line exit.	0.174	AA1-098
n4667	Upgrade line drops, auxiliary CTs (and related settings changes), and wavetrap on Parlin line exit.	0.174	AA1-098
n4687	Tie in new substation to Raritan River-South River Junction.	2.2488	AA1-098
n4670	Re-conductor the 18.5 mile Atlantic-South River Jct. (P1030) 230 kV line w/ single 1590 kcmil ACSS conductor, replacing the existing 1590 kcmil ACSR conductor.	33.4959	AA1-098
n4673	Re-conductor the 7.9 mile Raritan River-Kilmer (W1037) 230kV line w/ single 1590 kcmil ACSS conductor, replacing the existing 1590 kcmil ACSR conductor (W1037).	10.4932	AA1-098

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4672	Re-conductor the 7.9 mile Lake Nelson-Raritan River (I1023) 230kV line w/ single 1590 kcmil ACSS conductor, replacing the existing 1590 kcmil ACSR conductor (I1023).	14.0265	AA1-098
n4677	Re-conductor an approx. 1.0 mile section of the Hartle-South River Jct. (T1034) 230kV line w/ single 1590 kcmil ACSS conductor, replacing the existing 1590 kcmil ACSR conductor.	1.9516	AA1-098
n4676	Rebuild the 2.6 mile Raritan River-Red Oak section of the Parlin-Raritan River (G1047) 230kV line w/ twin bundled 795 kcmil ACSS conductor, replacing the existing 1590 kcmil ACSR. The new structures shall be steel poles w/ foundations.	14.8863	AA1-098
n4675	Re-conductor a 2.35 mile section of the Hartle-Raritan River (T1034) 230kV line w/ twin bundled 795 kcmil ACSS conductor, replacing the existing 1590 kcmil ACSR conductor.	2.7466	AA1-098

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4666	Re-conductor the 11 mile Freneau-Parlin (K1025) 230 kV line w/ single 1590 kcmil ACSS conductor, replacing the existing 1590 kcmil ACSR conductor.	23.5263	AA1-098
n4664	Re-conductor a 1.4 mile section of the Parlin-South River Jct. (G1047) 230 kV line w/ single 1590 kcmil ACSS conductor, replacing the existing 1590 kcmil ACSR conductor.	2.3168	AA1-098
n4686	Construct new 230kV 5 breaker ring bus substation.	6.3349	AA1-098
n4662	Upgrade line relaying for AA1-098 Interconnection.	0.1955	AA1-098
n4661	Upgrade line relaying for AA1-098 Interconnection.	0.1955	AA1-098

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4689	Replace relaying at Red Oak	0.1955	AA1-098
n4688	Replace relaying at Raritan River.	0.1955	AA1-098
n4674	Assumes re-attachment of Fiber at 35 towers needing Reinforcements.	0.1389	AA1-098
n4671	Assumes re-attachment of Fiber at 35 towers needing Reinforcements.	0.4053	AA1-098
n4669	Assumes re-attachment of Fiber at 15 steel poles needing replaced.	0.1737	AA1-098

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4665	Replace existing 2000A Circuit Switcher with 3000A Circuit Switcher on Lake Nelson line exit.	0.0927	AA1-098
n4678	Assumes re-attachment of Fiber at 10 towers needing Reinforcements.	0.1158	AA1-098
n4659	Build new 34kV line tap to connect AA1-060 to the Great Adventure-Great Adventure Tap line.	0.4529	AA1-060
n4663	Replace existing 2000A Circuit Switcher with 3000A Circuit Switcher on Lake Nelson line exit.	0.2779	AA1-098
n4679.4	Replace breaker PB by a 63 kA breaker at South River 230 kV substation	0.273	AA1-098

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4679.3	Replace breaker TA by a 63 kA breaker at South River 230 kV substation	0.273	AA1-098
n4679.2	Replace breaker PA by a 63 kA breaker at South River 230 kV substation	0.273	AA1-098
n4679.1	Replace breaker BT by a 63 kA breaker at South River 230 kV substation	0.273	AA1-098

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4865	Upgrade the overdutied circuit breaker at South Reading Substation	0.7375	AA2-115
n4864	Upgrade limiting OC facilities in order to increase the thermal ratings of the bank. Constraining Equipment @ Location: South Reading Substation: (1) OC IBC51A Constraining Facility: South Reading 230/69kV #8 Bank	0.1593	AA2-115
n4863	Upgrade limiting OC facilities in order to increase the thermal ratings of the bank. Constraining Equipment @ Location: South Reading Substation: (1) OC IAC, (2) OC IBC51A Constraining Facility: South Reading 230/69	0.1593	AA2-115

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4862	(1) Replace the transformer with a new 168 MVA transformer (2) Install a new 230 kV high side circuit breaker on the new transformer at 230 kV North Boyertown Substation	3.598	AA2-115
n4861	Loop the South Reading-North Boyertown 230kV Line into the new AA2-115 interconnection substation (Approximately 200' in length); Location South Reading- North Boyertown 230kV Line.	0.6796	AA2-115
n4860	Upgrade carrier relaying affected by the AA2-115 interconnection; Location: North Boyertown 230kV Substation.	0.419	AA2-115
n4859	Upgrade line carrier and transfer trip relaying/equipment affected by the AA2-115 interconnection; Location: Hosensack 230kV Substation	0.4308	AA2-115

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4858	Upgrade line carrier and transfer trip relaying/equipment affected by the AA2-115 interconnection; Location South Reading 230kV Substation	0.4546	AA2-115
n4857	Construct a new three (3) breaker ring bus interconnection substation near the South Reading - North Boyertown 230kV Line; Location South Reading - North Boyertown 230kV Line	7.6262	AA2-115
n4856	Install attachment line between TO facilities and POI and install one (1) disconnect switch.	0.045	AA2-115

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4658	Change the connection point of the 220-56 line (Eddington to Holmesburg 230 kV to Richmond) at Richmond substation from its current position between circuit breakers #475 and #575 to a new position between circuit breakers #185 and #285	3.7	AA1-079
n4657	Change connection point for 220-36 line (213489-213588) at Chichester substation from bus #1 (213489) to bus #2 (213490).	1.4	AA1-079

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4990	34.5 kV Pole Recloser Work Wyalusing-New Albany 34.5 kV.	0	AA2-133
n4989	East Towanda SS. Relaying Upgrade for AA2-133 Generation Interconnection.	0	AA2-133
n4988	Wyalusing SS. 34.5kV Relaying Upgrade for AA2-133 Generation Interconnection.	0	AA2-133
n4987	New Albany SS. 34.5kV Relaying Upgrade for AA2-133 Generation Interconnection.	0	AA2-133
n4986	Region Line Tap on Wyalusing 34.5 kV line AA2-133 Point of Interconnection including costs associated with 34.5 kV Metering Package.	0	AA2-133

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4997	Replace the disconnect switch at the Sabinsville 115 kV substation.	0.0856	AA2-081
n4913.9	Incorrect NUN. Remove from DB	0.2593	AA2-132
n5060	Hooversville, Rockwood, and Bedford North SS 115 kV substation – Adjust Remote Relay Settings.	0.04	AA1-046
n5059	Construction Oversight for AA1-046 Interconnection Substation.	1.02	AA1-046
n5058	Westfall & Summit Substations- Adjust remote relay settings.	0.03	AA1-115

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4997	Replace the disconnect switch at the Sabinsville 115 kV substation.	0.0856	AA2-081
n4967	AA1-144 Interconnect SS. Revise anti-islanding scheme for AA1-111 Interconnect line.	0.0823	AA1-111
n5026.3	Replace nameplate for H1T561 breaker from 40 kA to 50 kA. Cost estimate of about \$2000 each with 3 months to receive and replace.	0	AA1-144
n5026.2	Replace nameplate for H1T539 breaker from 40 kA to 50 kA. Cost estimate of about \$2000 each with 3 months to receive and replace.	0	AA1-144
n5026.1	Replace nameplate for H2t539 breaker from 40 kA to 50 kA. Cost estimate of about \$2000 each with 3 months to receive and replace.	0	AA1-144

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4977	Relaying Upgrades	0.5181	AA2-081
n4976	Relaying Upgrades	0.4667	AA2-081
n4975	New Tap on Wellsboro 2 34.5 kV line	0.1044	AA2-081
n4970	Install tap from Thompson 34.5 kV line	0.133	AA2-132
n4967	AA1-144 Interconnect SS. Revise anti-islanding scheme for AA1-111 Interconnect line.	0.0823	AA1-111

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4959	Moshannon 230 kV Sub. Adjust Relay Settings	0.053	AA1-111
n4958	Marshall 230 kV Sub. Adjust Relay Settings	0.1186	AA1-111
n4957	Marshall-Moshannon 230kV, Loop to Proposed 3-Breaker Ring Bus	0.5239	AA1-111
n4956	Install New 230kV three breaker ring bus substation	7.8285	AA1-111
n4923	Replacing the wave trap on the Hillside with an emergency rating of 615 MVA is required	0.0656	AA1-111

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4932	Removing South Transformer low side breaker, installing new breaker in existing 230kV breaker and one half configuration, and re-terminating transformer connection in newly created position are required	1.38	AA1-144
n4931	Re-conductoring 230 kV line from Four Mile Junction to the W3-099 Tap point with 1033 ACSS high temperature conductor, and replacing the line drops at the Four Mile Junction substation	10.4584	AA1-111
n4930	Replacing the existing wave trap and line drops at East Towanda is required	0.1201	AA1-111
n4929	Building a new 345kV string on the east side of the substation, remove existing North Transformer breaker, and re-terminating Transformer connection on new 345kV string are required.	6.67	AA1-111
n4928	Re-conductoring 0.1 miles of existing 1033 ACSR conductor with new 1033 ACSS conductor from Chapman Sub to new AA1-111. adjusting remote settings at the Moshannon	0.4674	AA1-111



PENELEC Transmission Zone

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4927	Rebuilding the line with 1590 ACSS, replacing the disconnect switch at the Canyon 230 kV substation, and replacing the wave trap at the N. Meshoppen 230 kV	21.1533	AA1-111
n4926	Re-conductoring line with 1033 ACSS conductor and replacing the line drops at the Moshannon 230 kV substation	30.7652	AA1-111
n4925	Replacing North Meshoppen #3 230/115 KV transformer with an emergency rating of 300 MVA. Updating the existing RTU are required	4.88	AA1-111
n4924	Rebuilding the line with 1590 ACSS	30.4768	AA1-111
n4922	Replacing the wave trap on the E. Towanda with an emergency rating of 615 MVA	0.0846	AA1-111

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4921	Replacing the existing breaker and waver trap at East Towanda 115 kV bus, and replacing the wave trap at the North Meshoppen	0.2428	AA1-111
n4918	34.5 k Pole Recloser Work.	0.0266	AA2-112
n4917	Oakland SS. 34.5kV Relaying Upgrade for AA2-112 Generation Interconnection.	0.3778	AA2-112
n4915	Tiffany SS. 34.5kV Relaying Upgrade for AA2-112 Generation Interconnection	0.4011	AA2-112
n4914	Install tap from Franklin Forks 34.5 kV line	0.1065	AA2-112



PENELEC Transmission Zone

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4913	Thompson SS. Installing anti-islanding and voltage sync check	0.2593	AA2-132
n4631	Tie in the new 3 breaker ring bus for the AA1-046 project to the Somerset-Allegheny 115kV line.	0.3498	AA1-046
n4683	Tie in substation built for AA1-076 to the Hunterstown-Conemaugh 500kV line.	4.1958	AA1-076
n4699	Tie in new substation for AA1-144 to the East Towanda-Marshall 230kV line	0.6132	AA1-144
n4637	Expand the existing 3-breaker ring bus substation to a 4-breaker ring bus. 115 kV Thirty first street substation	1.0696	AA1-115



PENELEC Transmission Zone

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4630	Install new 115kV 3 breaker ring bus substation for the AA1-046 project.	4.8775	AA1-046
n4682	Construct new 500kV 3 breaker ring bus substation to connect the AA1-076 project.	15.2352	AA1-076
n4698	Build new 230kV 3-breaker ring bus for the AA1-144 project	7.8944	AA1-144
n4635	Protection changes at Bedford North	0.0131	AA1-046
n4701	Protection work at Marshall	0.0803	AA1-144



PENELEC Transmission Zone

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4700	Protection work at East Towanda	0.1558	AA1-144
n4685	Protection system modifications at Hunterstown substation	0.2	AA1-076
n4684	Protection system modifications at Conemaugh substation	0.2	AA1-076
n4702	Install new fiber optic communication line along the East Towanda-Marshall 230kV line	0.2991	AA1-144
n4634	Install carrier equipment at New Baltimore.	0.0791	AA1-046

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4633	Install carrier equipment at Allegheny.	0.4907	AA1-046
n4632	Install carrier equipment at Somerset.	0.3251	AA1-046
n4660.5	Replace Keystone 500 kV breaker NO.3 TRANSFO from 40 kA to 63 kA breaker	1.329	AA1-144
n4660.4	Replace Keystone 500 kV breaker Juniata from 40 kA to 63 kA breaker	1.329	AA1-144
n4660.3	Replace Keystone 500 kV breaker #1 from 40 kA to 63 kA breaker	1.329	AA1-144

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4660.2	Replace Keystone 500 kV breaker NO.16 CABOT from 40 kA to 63 kA breaker	1.329	AA1-144
n4660.1	Replace Keystone 500 kV breaker NO.14 CABOT from 40 kA to 63 kA breaker	1.329	AA1-144
n4660	Adding a new 500/345kV transformer and constructing a 500 kV yard in breaker and a half layout is required. The proposed 500kV yard will tap into the existing Keystone – Conemaugh 500kV line.	33.8454	AA1-082

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4945	New 500 kV GIL(Gas Insulated Line) will be required along with a tie into 500kV GIS yard. Option is to tie into the existing 500kV bay 2 requiring one new circuit breaker and associated motor-operated disconnect switched to complete the breaker and a half bay.	4.1	AA2-182
n4944	Build a new double circuit 69kV Tap off East Palmerton-Acahela #1 & #2 69 kV lines	2.749	AA2-017
n3900	Break Eldred-Frackville 230kV line to tie in new substation.	2.98	Y2-015
n4358	Tie in W3-022 230kV switchyard to Catawissa/Frackville 230kV line	10.420204	Y2-015
n4393	Rebuild 4.5 miles of the conductor using 556 ACSR, remove 110 structures, install 55 new conductors, remove 24,000ft of (3) 336 MCM 30/7 ACSR.	13.5	Z2-107

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4354	Construct new transmission line between W3-022 230kV switchyard and Y2-015 POI	0.62519	Y2-015
n3968	Upgrade the line described in N3562 to be triple bundled 1590 ACSR.	1.81	Y2-089
n3908	Rebuild the Eldred-Frackville 230kV line using double 1590 ACSR conductor (12 miles)	34.62	Y2-015
n3911	Replace the substation conductors with 1590 ACSR. Replace two breakers, 4 switches and associated equipment with 3000amp rated equipment.	71.77	Y2-015
n3907	Install a second 900MVA 500-230kV transformer and associated equipment.	25	Y2-015

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n3902	Install dual fiber optics on the Eldred-Frackville 230kV line.	3.56	Y2-015
n3901	Oversight, testing, and commissioning related to a new 230kV substation along the Eldred-Frackville 230kV line. The substation will be constructed under Option to Build provisions.	0.66	Y2-015
n4356	Install new 500/230kV substation on of Y2-015	102.9	Y2-015
n4394	Modify SCADA, alarm, Alarm Management System, perform system checks and testing at Lackawanna substation in support of Z2-107	0.15	Z2-107
n3906	Replace wave trap and protective relays.	0.25	Y2-015

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n3905	Replace wave trap and protective relays.	0.25	Y2-015
n3904	Protection system modifications.	0.25	Y2-015
n3903	Protection system modifications.	0.25	Y2-015
n3912	Replace the substation conductors with 1590 ACSR. Replace one breaker, one MOD and associated equipment with 3000amp rated equipment.	3	Y2-015
n3910	Replace the substation conductors with 1590 ACSR. Replace two breakers, 4 switches and associated equipment with 3000amp rated equipment.	3	Y2-015

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n3909	Replace the substation conductors with 1590 ACSR. Replace two breakers, 4 switches and associated equipment with 3000amp rated equipment.	4	Y2-015
n4651	The project was evaluated as a 16.0 MW injection at the Viking 69kV substation in the PPL area. Protection and communication work at Sunbury substation and Milton substation is required.	0.068865	AA1-057
n4650	Protection and communication work at Milton substation	0.068865	AA1-057
n4355	Expand the W3-022 230kV switchyard to accommodate the connection of Y2-015	3.47754	Y2-015
n4359	Upgrade "Eldred South" circuit breaker	0.46	Y2-015

Upgrade Id	Project Description	Cost Estimate (in mil\$)	Driver
n4357	Expand the W3-022 230kV switchyard to accommodate the connection to Catawissa	5.17131	Y2-015
n3969	Upgrade the equipment described in N3563 to be rated for 4000A	0.43	Y2-089
n3914	Replace XK BNK #24S circuit breaker	0.46	Y2-015
n3913	Replace ELDRED NORTH 230kV circuit breaker	0.46	Y2-015