ACE 02

General Information

Proposing entity name	AE
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	Yes
Company proposal ID	02
PJM Proposal ID	734
Project title	ACE 02
Project description	Upgrade Cardiff-Lewis #2, Lewis #1-Lewis #2, Cardiff-New Freedom, Peach Bottom-Conastone, Richmond-Waneeta, Peach Bottom-Furnace Run circuits, rebuild Cardiff substation and rebuild Cardiff-New Freedom line to add a second circuit
Email	michael.donnelly@peco-energy.com
Project in-service date	06/2028
Tie-line impact	Yes
Interregional project	No
Is the proposer offering a binding cap on capital costs?	No
Additional benefits	See NJ BPU Data Collection Form and supporting documents for additional information about this proposal. The cost details and work schedule are provided in the NJ BPU Data Collection Form and supporting documents.

Project Components

1. Upgrade Cardiff-Lewis #2 138 kV line
2. Upgrade Lewis #2 - Lewis #1 138 kV bus tie
3. Upgrade Cardiff-New Freedom 230 kV line

4. Upgrade Peach Bottom-Conastone 500 kV line
5. Upgrade Peach Bottom South substation
6. Upgrade Conastone substation
7. Upgrade Richmond substation
8. Upgrade Peach Bottom-Furnace Run 500 kV line
9. Rebuild Cardiff substation
10. Rebuild Cardiff-New Freedom 230 kV line

Substation Upgrade Component

Component title	Upgrade Cardiff-Lewis #2 138 kV line
Project description	Replace 1590 kcmil strand bus inside Lewis substation
Substation name	Lewis
Substation zone	AE
Substation upgrade scope	Replace 1590 kcmil strand bus inside Lewis substation

Transformer Information

None

New equipment description	New bundled 1590 kcmil strand bus to increase summer ratings to 377 MVA normal /478 MVA emergency
Substation assumptions	Adequate space exists within the substation.
Real-estate description	
Construction responsibility	ACE
Benefits/Comments	The cost details are provided in the NJ BPU Data Collection Form and supporting documents.

Component Cost Details - In Current Year $

Engineering & design	detailed cost
Permitting / routing / siting	detailed cost

ROW / land acquisition	detailed cost
Materials & equipment	detailed cost
Construction & commissioning	detailed cost
Construction management	detailed cost
Overheads & miscellaneous costs	detailed cost
Contingency	$.00
Total component cost	$100,000.00
Component cost (in-service year)	$100,000.00

Substation Upgrade Component

Component title	Upgrade Lewis #2 - Lewis #1 138 kV bus tie
Project description	Replace Lewis #2-Lewis #1 138 kV bus tie with 2000 A circuit breaker
Substation name	Lewis
Substation zone	AE
Substation upgrade scope	Replace Lewis #2-Lewis #1 138 kV bus tie with 2000 A circuit breaker

Transformer Information

None

New equipment description	2000 A circuit breaker; facility summer rating increases to 478 MVA normal / 478 MVA emergency
Substation assumptions	Adequate space exists within the substation.
Real-estate description	
Construction responsibility	ACE
Benefits/Comments	The cost details are provided in the NJ BPU Data Collection Form and supporting documents.

Component Cost Details - In Current Year $

Engineering & design	detailed cost
Permitting / routing / siting	detailed cost
ROW / land acquisition	detailed cost
Materials & equipment	detailed cost
Construction & commissioning	detailed cost
Construction management	detailed cost
Overheads & miscellaneous costs	detailed cost
Contingency	$.00
Total component cost	$500,000.00
Component cost (in-service year)	$500,000.00

Substation Upgrade Component

Component title	Upgrade Cardiff-New Freedom 230 kV line
Project description	Modify existing relay setting to increase relay limit
Substation name	Cardiff
Substation zone	AE
Substation upgrade scope	Modify existing relay setting to increase relay limit

Transformer Information

None

New equipment description	No new equipment is needed.
Substation assumptions	Existing relay is able to be modified.
Real-estate description	

Construction responsibility	ACE
Benefits/Comments	The cost details are provided in the NJ BPU Data Collection Form and supporting documents.

Component Cost Details - In Current Year $

Engineering & design	detailed cost
Permitting / routing / siting	detailed cost
ROW / land acquisition	detailed cost
Materials & equipment	detailed cost
Construction & commissioning	detailed cost
Construction management	detailed cost
Overheads & miscellaneous costs	detailed cost
Contingency	$.00
Total component cost	$300,000.00
Component cost (in-service year)	$300,000.00

Transmission Line Upgrade Component

Component title	Upgrade Peach Bottom-Conastone 500 kV line
Project description	Reconductor Peach Bottom-Conastone 500 kV line
Impacted transmission line	Peach Bottom-Conastone 500 kV line
Point A	Peach Bottom
Point B	Conastone
Point C	
Terrain description	Relatively flat

Existing Line Physical Characteristics

Operating voltage	500 kV
Conductor size and type	2-2493 kcmil 54/37 ACAR
Hardware plan description	New hardware will be used.
Tower line characteristics	The age of the line is 54 years. There are no known condition issues with the existing towers. The towers should be capable of accommodating the reconductor.

Proposed Line Characteristics

	Designed	**Operating**
Voltage (kV)	500.000000	500.000000
	Normal ratings	**Emergency ratings**
Summer (MVA)	4962.000000	6126.000000
Winter (MVA)	5276.000000	6395.000000
Conductor size and type	1962 T-11 51/19 ACCR	
Shield wire size and type	2 9/16 19 9 Alumoweld	
Rebuild line length	16.4 miles (reconductor)	
Rebuild portion description	The entire length of the line (16.4 miles) will be reconductored. The existing towers will remain in place and be reused.	
Right of way	No new ROW will be needed.	
Construction responsibility	PECO	
Benefits/Comments	The cost details are provided in the NJ BPU Data Collection Form and supporting documents.	

Component Cost Details - In Current Year $

Engineering & design	detailed cost
Permitting / routing / siting	detailed cost

ROW / land acquisition	detailed cost
Materials & equipment	detailed cost
Construction & commissioning	detailed cost
Construction management	detailed cost
Overheads & miscellaneous costs	detailed cost
Contingency	$.00
Total component cost	$36,289,000.00
Component cost (in-service year)	$36,289,000.00

Substation Upgrade Component

Component title	Upgrade Peach Bottom South substation
Project description	Expand the existing 500 kV bus inside Peach Bottom South substation by adding a bus section with two new circuit breakers
Substation name	Peach Bottom South
Substation zone	PE
Substation upgrade scope	Expand the existing 500 kV bus inside Peach Bottom South substation by adding a bus section with two new circuit breakers

Transformer Information

None

New equipment description	bus section - 5in. schedule 80 6063 circuit breakers - 5000 A nominal rating
Substation assumptions	The existing substation footprint will need to be expanded on one side to accommodate the addition of the new bus section. Spare transformers located within the substation will need to be relocated.

Real-estate description	The existing substation fence would need to be expanded on one side. The land that would be needed for the expansion is owned by Exelon Generation. PECO has an easement for use of its existing substation on land owned by Exelon Generation. PECO and Exelon Generation, both divisions of Exelon Corporation, would need to amend the existing easement agreement to allow for the new substation footprint.
Construction responsibility	PECO
Benefits/Comments	The cost details are provided in the NJ BPU Data Collection Form and supporting documents.

Component Cost Details - In Current Year $

Engineering & design	detailed cost
Permitting / routing / siting	detailed cost
ROW / land acquisition	detailed cost
Materials & equipment	detailed cost
Construction & commissioning	detailed cost
Construction management	detailed cost
Overheads & miscellaneous costs	detailed cost
Contingency	$.00
Total component cost	$49,598,167.00
Component cost (in-service year)	$49,598,167.00

Substation Upgrade Component

Component title	Upgrade Conastone substation
Project description	Replace two 500 kV circuit breakers inside Conastone substation
Substation name	Conastone
Substation zone	BGE

Substation upgrade scope	Replace two 500 kV circuit breakers "B" and "C" inside Conastone substation with new 5000 A nominal rating circuit breakers

Transformer Information

None

New equipment description	circuit breakers - 5000 A nominal rating
Substation assumptions	It is assumed that there is sufficient space within the substation to perform the upgrade.
Real-estate description	No new real estate should be needed.
Construction responsibility	BGE
Benefits/Comments	The cost details are provided in the NJ BPU Data Collection Form and supporting documents.

Component Cost Details - In Current Year $

Engineering & design	detailed cost
Permitting / routing / siting	detailed cost
ROW / land acquisition	detailed cost
Materials & equipment	detailed cost
Construction & commissioning	detailed cost
Construction management	detailed cost
Overheads & miscellaneous costs	detailed cost
Contingency	$.00
Total component cost	$2,078,000.00
Component cost (in-service year)	$2,078,000.00

Substation Upgrade Component

Component title	Upgrade Richmond substation

Project description	Install a Smart Wires device at Richmond substation in series with the 220-35 Richmond-Waneeta 230 kV line
Substation name	Richmond
Substation zone	PECO
Substation upgrade scope	Install a Smart Wires device at Richmond substation in series with the 220-35 Richmond-Waneeta 230 kV line

Transformer Information

None

New equipment description	Smart Wires device - 0.003pu reactance at 230 kV on 100 MVA basis
Substation assumptions	The substation will need to be expanded on one side to accommodate installation of the Smart Wires device.
Real-estate description	The substation fence will need to be expanded. The additional land required to install the Smart Wires device is adjacent to the existing substation and is owned by PECO.
Construction responsibility	PECO
Benefits/Comments	The cost details are provided in the NJ BPU Data Collection Form and supporting documents.

Component Cost Details - In Current Year $

Engineering & design	detailed cost
Permitting / routing / siting	detailed cost
ROW / land acquisition	detailed cost
Materials & equipment	detailed cost
Construction & commissioning	detailed cost
Construction management	detailed cost
Overheads & miscellaneous costs	detailed cost
Contingency	$.00

Total component cost	$4,700,000.00
Component cost (in-service year)	$4,700,000.00

Transmission Line Upgrade Component

Component title	Upgrade Peach Bottom-Furnace Run 500 kV line
Project description	Reconductor the Peach Bottom-Furnace Run 500 kV line
Impacted transmission line	Peach Bottom-Furnace Run 500 kV line
Point A	Peach Bottom
Point B	Furnace Run
Point C	
Terrain description	Relatively flat

Existing Line Physical Characteristics

Operating voltage	500 kV
Conductor size and type	2-2493 kcmil 54/37 ACAR
Hardware plan description	New hardware will be used.
Tower line characteristics	The age of the line is 54 years. There are no known condition issues with the existing towers. The towers should be capable of accommodating the reconductor.

Proposed Line Characteristics

	Designed	**Operating**
Voltage (kV)	500.000000	500.000000
	Normal ratings	**Emergency ratings**
Summer (MVA)	4962.000000	6126.000000
Winter (MVA)	5276.000000	6395.000000

Conductor size and type	1962 T-11 51/19 ACCR
Shield wire size and type	2 9/16 19 9 Alumoweld
Rebuild line length	10.2 miles (reconductor)
Rebuild portion description	The entire length of the line (10.2 miles) will be reconductored. The existing towers will remain in place and be reused.
Right of way	No new ROW will be needed.
Construction responsibility	PECO
Benefits/Comments	The cost details are provided in the NJ BPU Data Collection Form and supporting documents.

Component Cost Details - In Current Year $

Engineering & design	detailed cost
Permitting / routing / siting	detailed cost
ROW / land acquisition	detailed cost
Materials & equipment	detailed cost
Construction & commissioning	detailed cost
Construction management	detailed cost
Overheads & miscellaneous costs	detailed cost
Contingency	$.00
Total component cost	$23,000,000.00
Component cost (in-service year)	$23,000,000.00

Substation Upgrade Component

Component title	Rebuild Cardiff substation
Project description	Rebuild Cardiff substation to accommodate a breaker and a half bus design.

Substation name	Cardiff
Substation zone	AE
Substation upgrade scope	Rebuild Cardiff substation to accommodate a breaker and a half bus design. See NJ BPU Data Collection Form and supporting documents for additional information.

Transformer Information

None

New equipment description	230 kV bus with 4000 A nominal rating circuit breakers with 3000 A nominal rating See NJ BPU Data Collection Form and supporting documents for additional information.
Substation assumptions	Substation will be rebuilt on ACE owned land. See NJ BPU Data Collection Form and supporting documents for additional information.
Real-estate description	Land acquisition is not required. See BPU Data Collection Form and supporting documents for additional information.
Construction responsibility	ACE
Benefits/Comments	See NJ BPU Data Collection Form and supporting documents for additional information about this component of the proposal. The real estate plan, substation drawings and cost details are provided in the NJ BPU Data Collection Form and supporting documents.

Component Cost Details - In Current Year $

Engineering & design	detailed cost
Permitting / routing / siting	detailed cost
ROW / land acquisition	detailed cost
Materials & equipment	detailed cost
Construction & commissioning	detailed cost
Construction management	detailed cost
Overheads & miscellaneous costs	detailed cost
Contingency	$.00

Total component cost	$70,095,409.00
Component cost (in-service year)	$70,095,409.00

Transmission Line Upgrade Component

Component title	Rebuild Cardiff-New Freedom 230 kV line
Project description	Rebuild the existing Cardiff-New Freedom 230 kV line to a double circuit tower line with two circuits from Cardiff to New Freedom
Impacted transmission line	Cardiff-New Freedom 230 kV line
Point A	Cardiff
Point B	New Freedom
Point C	
Terrain description	Relatively flat

Existing Line Physical Characteristics

Operating voltage	230 kV
Conductor size and type	1590 kcmil ACSR 45/7
Hardware plan description	New hardware will be used.
Tower line characteristics	The existing tower line will be rebuilt to a double circuit tower line.

Proposed Line Characteristics

	Designed	**Operating**
Voltage (kV)	230.000000	230.000000
	Normal ratings	**Emergency ratings**
Summer (MVA)	1508.000000	1754.000000
Winter (MVA)	1582.000000	1829.000000

Conductor size and type	2-954 kcmil ACSS/TW
Shield wire size and type	7#6 Alumoweld
Rebuild line length	33.2 miles
Rebuild portion description	The line length is 33.2 miles. The existing line will be rebuilt to a double circuit tower line. There is adequate space in the existing ROW for the rebuild.
Right of way	No new ROW is needed.
Construction responsibility	ACE
Benefits/Comments	See NJ BPU Data Collection Form and attachments for more information. Google Earth KMZ file included in NJ BPU Data Collection Form and attachments. Line impedances and charging in pu are 0.003066+j0.035023, b=0.133062

Component Cost Details - In Current Year $

Engineering & design	detailed cost
Permitting / routing / siting	detailed cost
ROW / land acquisition	detailed cost
Materials & equipment	detailed cost
Construction & commissioning	detailed cost
Construction management	detailed cost
Overheads & miscellaneous costs	detailed cost
Contingency	$.00
Total component cost	$154,661,006.00
Component cost (in-service year)	$154,661,006.00

Congestion Drivers

None

Existing Flowgates

FG #	From Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
28-GD-W15	214277	RICHMOND35	214012	WANEETA3	1	230	230	Gen Deliv (winter)	Included
35-GD-W16	214277	RICHMOND35	214012	WANEETA3	1	230/230	230/230	Gen Deliv (winter)	Included
35-GD-W5	200064	PCHBTM1S	200004	CNASTONE	1	500/500	230/232	Gen Deliv (winter)	Included
35-GD-W6	200064	PCHBTM1S	200004	CNASTONE	1	500/500	230/232	Gen Deliv (winter)	Included
28-GD-W4	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-W5	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-W110	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-W111	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-W112	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-W16	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-S2-W9	214277	RICHMOND35	214012	WANEETA3	1	230	230	Gen Deliv (winter)	Included
28-GD-S2-W9	200066	PCHBTM1N	270072	FUR RUN_500	1	500	230/225	Gen Deliv (winter)	Included
35-GD-S2-W1	200066	PCHBTM1N	270072	FUR RUN_500	1	500/500	230/225	Gen Deliv (winter)	Included
35-GD-S2-W1	214277	RICHMOND35	214012	WANEETA3	1	230/230	230/230	Gen Deliv (winter)	Included
35-GD-S2-W1	200064	PCHBTM1S	200004	CNASTONE	1	500/500	230/232	Gen Deliv (winter)	Included
35-GD-S2-W3	200064	PCHBTM1S	200004	CNASTONE	1	500/500	230/232	Gen Deliv (winter)	Included
35-GD-S2-W5	200064	PCHBTM1S	200004	CNASTONE	1	500/500	230/232	Gen Deliv (winter)	Included
28-GD-S2-S13	227900	CARDIFF C	219100	NEWFRDM	1	230	231/234	Gen Deliv (Summer)	Included
28-GD-S2-W14	227900	CARDIFF C	219100	NEWFRDM	1	230	231/234	Gen Deliv (winter)	Included
28-GD-S2-W14	227900	CARDIFF C	219100	NEWFRDM	1	230	231/234	Gen Deliv (winter)	Included
28-GD-S2-W13	227900	CARDIFF C	219100	NEWFRDM	1	230	231/234	Gen Deliv (winter)	Included
28-GD-S2-W14	227900	CARDIFF C	219100	NEWFRDM	1	230	231/234	Gen Deliv (winter)	Included
28-GD-S2-W3	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-S2-W3	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-S2-W1	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-S2-W2	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included

FG #	From Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
28-GD-S2-W3	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-S2-W36	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-S2-W99	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-S2-W38	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-S2-W37	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-S2-S132	227934	CARDIFF2	227945	LEWIS #2	1	138	234	Gen Deliv (Summer)	Included
28-GD-S2-S138	227945	LEWIS #2	227902	LEWIS #1	1	138	234	Gen Deliv (Summer)	Included
35-GD-S2-S8A	227900	CARDIFF C	219100	NEWFRDM	1	230/230	234/231	Gen Deliv (Summer)	Included
35-GD-S2-W7	227900	CARDIFF C	219100	NEWFRDM	1	230/230	234/231	Gen Deliv (winter)	Included
35-GD-S2-W38	227900	CARDIFF C	219100	NEWFRDM	1	230/230	234/231	Gen Deliv (winter)	Included
35-GD-S2-W102	227900	CARDIFF C	219100	NEWFRDM	1	230/230	234/231	Gen Deliv (winter)	Included
35-GD-S2-W99	227900	CARDIFF C	219100	NEWFRDM	1	230/230	234/231	Gen Deliv (winter)	Included

New Flowgates

None

Financial Information

Capital spend start date	01/2023
Construction start date	01/2023
Project Duration (In Months)	65

Additional Comments

None