Cardiff 2,700 MW DC Injection

General Information

Proposing entity name	NEETMH
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	Yes
Company proposal ID	2-C27
PJM Proposal ID	604
Project title	Cardiff 2,700 MW DC Injection
Project description	One 1,200 MW HVDC Symmetrical Monopole system and one 1510 MW HVDC Symmetrical Monopole system connecting offshore platforms to deliver the Atlantic Shores and Ocean Wind 2 offshore wind projects to a new Reega 230 kV switchyard. Loop in the existing New Freedom to Cardiff 230 kV line into Reega 230 kV. Construct a new 230 kV line from Reega to Cardiff and a new 230 kV line from Reega to New Freedom.
Email	Johnbinh.Vu@nexteraenergy.com
Project in-service date	06/2028
Tie-line impact	No
Interregional project	No
Is the proposer offering a binding cap on capital costs?	Yes
Additional benefits	See Attachment 1, Section 3.4

Project Components

1. Offshore Platform E
2. Offshore Platform F
3. Reega Converter Station

4. Offshore Platform E – Absecon Bay Landing HVDC

5. Offshore Platform F – Absecon Bay Landing HVDC

6. Absecon Bay Landing -Reega Converter Station HVDC

7. Remove and replace existing New Freedom- Cardiff 230 kV OH line and loo...

8. Build one new single circuit New Freedom - NEETMA proposed Reega 230 kV ...

9. Remove and replace existing New Freedom - Cardiff 230 kV OH line and loo...

10. Build one new single circuit Cardiff - NEETMA proposed Reega 230 kV OH l...

Greenfield Substation Component

Component title	Offshore Platform E
Project description	Offshore Platform E to collect offshore wind and deliver 1,500 MW at the point of injection at the Reega Converter Station
Substation name	Offshore Platform E
Substation description	Offshore platform with an HVDC VSC technology converter station that will allow offshore wind generation to interconnect at 66 kV AC
Nominal voltage	DC
Nominal voltage	400

Transformer Information

	Name	**Capacity (MVA)**	
Transformer	TBD	TBD	
	High Side	**Low Side**	**Tertiary**
Voltage (kV)			

Major equipment description	Offshore platform with an HVDC VSC technology converter station that will allow offshore wind generation to interconnect at 66 kV AC

	Normal ratings	Emergency ratings
Summer (MVA)	0.000000	0.000000
Winter (MVA)	0.000000	0.000000
Environmental assessment	See Attachment 19	
Outreach plan	See Attachment 12	
Land acquisition plan	See Attachment 22	
Construction responsibility	Proposer	
Benefits/Comments	See Attachment 1, Section 3.4	
Component Cost Details - In Current Year $		
Engineering & design	Confidential competitive information	
Permitting / routing / siting	Confidential competitive information	
ROW / land acquisition	Confidential competitive information	
Materials & equipment	Confidential competitive information	
Construction & commissioning	Confidential competitive information	
Construction management	Confidential competitive information	
Overheads & miscellaneous costs	Confidential competitive information	
Contingency	Confidential competitive information	
Total component cost	$808,274,461.00	
Component cost (in-service year)	$882,435,699.00	

Greenfield Substation Component

Component title	Offshore Platform F

Project description	Offshore Platform F to collect offshore wind and deliver 1,200 MW at the point of injection at the Reega Converter Station
Substation name	Offshore Platform F
Substation description	Offshore platform with an HVDC VSC technology converter station that will allow offshore wind generation to interconnect at 66 kV AC
Nominal voltage	DC
Nominal voltage	400

Transformer Information

	Name	Capacity (MVA)
Transformer	TBD	TBD

	High Side	Low Side	Tertiary
Voltage (kV)			

Major equipment description	Offshore platform with an HVDC VSC technology converter station that will allow offshore wind generation to interconnect at 66 kV AC

	Normal ratings	Emergency ratings
Summer (MVA)	0.000000	0.000000
Winter (MVA)	0.000000	0.000000

Environmental assessment	See Attachment 19
Outreach plan	See Attachment 12
Land acquisition plan	See Attachment 22
Construction responsibility	Proposer
Benefits/Comments	See Attachment 1, Section 3.4

Component Cost Details - In Current Year $

Engineering & design	Confidential competitive information
Permitting / routing / siting	Confidential competitive information
ROW / land acquisition	Confidential competitive information
Materials & equipment	Confidential competitive information
Construction & commissioning	Confidential competitive information
Construction management	Confidential competitive information
Overheads & miscellaneous costs	Confidential competitive information
Contingency	Confidential competitive information
Total component cost	$676,956,472.00
Component cost (in-service year)	$738,229,188.00

Greenfield Substation Component

Component title	Reega Converter Station
Project description	Onshore Converter station site with one 1,500 MW HVDC converter and one 1,200 HVDC converter to connect to the existing 230 kV system to deliver 2,700 MW of offshore wind from Offshore Platforms E and F
Substation name	Reega Converter Station
Substation description	One HVDC VSC 1500 MW converter and one HVDC VSC 1200 MW converter, tieing into a new 230 kV AC switchyard, with removal/replacement of the existing 230 kV Cardiff-New Freedom and loop-in to Reega
Nominal voltage	AC
Nominal voltage	230

Transformer Information

None

Major equipment description	One HVDC VSC 1500 MW converter and one HVDC VSC 1200 MW converter, tieing into a new 230 kV AC switchyard, with removal/replacement of the existing 230 kV Cardiff-New Freedom and loop-in to Reega	
	Normal ratings	**Emergency ratings**
Summer (MVA)	0.000000	0.000000
Winter (MVA)	0.000000	0.000000
Environmental assessment	See Attachment 19	
Outreach plan	See Attachment 12	
Land acquisition plan	See Attachment 22	
Construction responsibility	Proposer	
Benefits/Comments	See Attachment 1, Section 3.4	

Component Cost Details - In Current Year $

Engineering & design	Confidential competitive information
Permitting / routing / siting	Confidential competitive information
ROW / land acquisition	Confidential competitive information
Materials & equipment	Confidential competitive information
Construction & commissioning	Confidential competitive information
Construction management	Confidential competitive information
Overheads & miscellaneous costs	Confidential competitive information
Contingency	Confidential competitive information
Total component cost	$524,306,339.00

Component cost (in-service year)	$566,849,316.00

Greenfield Transmission Line Component

Component title	Offshore Platform E – Absecon Bay Landing HVDC
Project description	Submarine HVDC Symmetrical monopole system from Offshore Platform E to Absecon Bay Landing. NEETMA will deliver 1,500 MW at the onshore point of injection. Actual losses will be calculated based upon the exact location of the offshore platform and incorporated into the final cable design
Point A	Offshore Platform E
Point B	Absecon Bay Landing
Point C	

	Normal ratings	**Emergency ratings**
Summer (MVA)	1500.000000	1500.000000
Winter (MVA)	1500.000000	1500.000000
Conductor size and type	2000mm2 copper	
Nominal voltage	DC	
Nominal voltage	400	
Line construction type	Submarine	
General route description	See Attachments 4, 19, and 22	
Terrain description	See Attachments 19 and 22	
Right-of-way width by segment	See Attachments 4 and 22	
Electrical transmission infrastructure crossings	See Attachment 7	
Civil infrastructure/major waterway facility crossing plan	See Attachment 7	
Environmental impacts	See Attachment 19	

Tower characteristics	See Attachment 6
Construction responsibility	Proposer
Benefits/Comments	See Attachment 1, Section 3.4

Component Cost Details - In Current Year $

Engineering & design	Confidential competitive information
Permitting / routing / siting	Confidential competitive information
ROW / land acquisition	Confidential competitive information
Materials & equipment	Confidential competitive information
Construction & commissioning	Confidential competitive information
Construction management	Confidential competitive information
Overheads & miscellaneous costs	Confidential competitive information
Contingency	Confidential competitive information
Total component cost	$126,793,508.00
Component cost (in-service year)	$132,040,301.00

Greenfield Transmission Line Component

Component title	Offshore Platform F – Absecon Bay Landing HVDC
Project description	Submarine HVDC Symmetrical monopole system from Offshore Platform E to Absecon Bay Landing. NEETMA will deliver 1,200 MW at the onshore point of injection. Actual losses will be calculated based upon the exact location of the offshore platform and incorporated into the final cable design
Point A	Offshore Platform F
Point B	Absecon Bay Landing
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	1200.000000	1200.000000
Winter (MVA)	1200.000000	1200.000000
Conductor size and type	2000mm2 copper	
Nominal voltage	DC	
Nominal voltage	320	
Line construction type	Submarine	
General route description	See Attachments 4, 19, and 22	
Terrain description	See Attachments 19 and 22	
Right-of-way width by segment	See Attachments 4 and 22	
Electrical transmission infrastructure crossings	See Attachment 7	
Civil infrastructure/major waterway facility crossing plan	See Attachment 7	
Environmental impacts	See Attachment 19	
Tower characteristics	See Attachment 6	
Construction responsibility	Proposer	
Benefits/Comments	See Attachment 1, Section 3.4	
Component Cost Details - In Current Year $		
Engineering & design	Confidential competitive information	
Permitting / routing / siting	Confidential competitive information	
ROW / land acquisition	Confidential competitive information	
Materials & equipment	Confidential competitive information	
Construction & commissioning	Confidential competitive information	

Construction management	Confidential competitive information
Overheads & miscellaneous costs	Confidential competitive information
Contingency	Confidential competitive information
Total component cost	$119,248,814.00
Component cost (in-service year)	$124,090,924.00

Greenfield Transmission Line Component

Component title	Absecon Bay Landing -Reega Converter Station HVDC
Project description	Two terrestrial HVDC Symmetrical monopole systems in a common duct bank from Absecon Bay Landing to Reega Converter Station. NEETMA will deliver 2,700 MW at the onshore point of injection. Actual losses will be calculated based upon the exact location of the offshore platform and incorporated into the final cable design
Point A	Absecon Bay Landing
Point B	Reega Converter Station
Point C	

	Normal ratings	**Emergency ratings**
Summer (MVA)	1500.000000	1500.000000
Winter (MVA)	1500.000000	1500.000000
Conductor size and type	6000kcmil copper	
Nominal voltage	DC	
Nominal voltage	400/320	
Line construction type	Underground	
General route description	See Attachments 4, 19, and 22	
Terrain description	See Attachments 19 and 22	

Right-of-way width by segment	See Attachment 4 and 22
Electrical transmission infrastructure crossings	See Attachment 7
Civil infrastructure/major waterway facility crossing plan	See Attachment 7
Environmental impacts	See Attachment 19
Tower characteristics	See Attachment 6
Construction responsibility	Proposer
Benefits/Comments	See Attachment 1, Section 3.4
Component Cost Details - In Current Year $	
Engineering & design	Confidential competitive information
Permitting / routing / siting	Confidential competitive information
ROW / land acquisition	Confidential competitive information
Materials & equipment	Confidential competitive information
Construction & commissioning	Confidential competitive information
Construction management	Confidential competitive information
Overheads & miscellaneous costs	Confidential competitive information
Contingency	Confidential competitive information
Total component cost	$524,090,880.00
Component cost (in-service year)	$584,480,880.00

Greenfield Transmission Line Component

Component title	Remove and replace existing New Freedom- Cardiff 230 kV OH line and loop-in at NEETMA proposed Reega 230 kV substation, upgrade line section Reega - New Freedom
Project description	Remove existing Cardiff - New Freedom 230 kV OH line and utilize the existing ROW to build single circuit New Freedom to NEETMA proposed Reega substation 230 kV OH line

Point A	Reega	
Point B	New Freedom	
Point C		
	Normal ratings	**Emergency ratings**
Summer (MVA)	669.000000	821.000000
Winter (MVA)	669.000000	821.000000
Conductor size and type	795 kcmil Drake ACSS/TW HS: 1C	
Nominal voltage	AC	
Nominal voltage	230	
Line construction type	Overhead	
General route description	See Attachments 4, 19, and 22	
Terrain description	See Attachments 4, 19, and 22	
Right-of-way width by segment	See Attachment 22	
Electrical transmission infrastructure crossings	See Attachment 19	
Civil infrastructure/major waterway facility crossing plan	See Attachments 7 and 19	
Environmental impacts	See Attachment 19	
Tower characteristics	New monpoles and new dead end structures will need to be installed in order to loop existing and proposed lines into the NEETMA Reega substation	
Construction responsibility	PSEG	
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process	
Component Cost Details - In Current Year $		
Engineering & design	Confidential competitive information	

Permitting / routing / siting	Confidential competitive information
ROW / land acquisition	Confidential competitive information
Materials & equipment	Confidential competitive information
Construction & commissioning	Confidential competitive information
Construction management	Confidential competitive information
Overheads & miscellaneous costs	Confidential competitive information
Contingency	Confidential competitive information
Total component cost	$77,170,000.00
Component cost (in-service year)	$83,540,000.00

Greenfield Transmission Line Component

Component title	Build one new single circuit New Freedom - NEETMA proposed Reega 230 kV OH line in same ROW parallel to proposed rebuild of 230kV existing circuit
Project description	Build one new single circuit New Freedom - NEETMA proposed Reega 230 kV OH line in same ROW parallel to proposed rebuild of 230kV existing circuit
Point A	Reega
Point B	New Freedom
Point C	

	Normal ratings	**Emergency ratings**
Summer (MVA)	669.000000	821.000000
Winter (MVA)	669.000000	821.000000

Conductor size and type	795 kcmil Drake ACSS/TW HS: 1C
Nominal voltage	AC

Nominal voltage	230
Line construction type	Overhead
General route description	See Attachments 4, 19, and 22
Terrain description	See Attachments 4, 19, and 22
Right-of-way width by segment	See Attachment 22
Electrical transmission infrastructure crossings	See Attachment 19
Civil infrastructure/major waterway facility crossing plan	See Attachment 7 and 19
Environmental impacts	See Attachment 19
Tower characteristics	New monpoles and new dead end structures will need to be installed in order to loop existing and proposed lines into the NEETMA Reega substation
Construction responsibility	PSEG
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process
Component Cost Details - In Current Year $	
Engineering & design	Confidential competitive information
Permitting / routing / siting	Confidential competitive information
ROW / land acquisition	Confidential competitive information
Materials & equipment	Confidential competitive information
Construction & commissioning	Confidential competitive information
Construction management	Confidential competitive information
Overheads & miscellaneous costs	Confidential competitive information
Contingency	Confidential competitive information
Total component cost	$77,170,000.00

Component cost (in-service year)	$83,540,000.00

Greenfield Transmission Line Component

Component title	Remove and replace existing New Freedom - Cardiff 230 kV OH line and loop-in at NEETMA proposed Reega 230 kV sub, upgrade the line section Reega-Cardiff
Project description	Remove and replace existing New Freedom - Cardiff 230 kV OH line and loop-in at NEETMA proposed Reega 230 kV sub, upgrade the line section Reega-Cardiff
Point A	Reega
Point B	Cardiff
Point C	

	Normal ratings	**Emergency ratings**
Summer (MVA)	1512.000000	1785.000000
Winter (MVA)	1512.000000	1785.000000

Conductor size and type	2627.3 kcmil Santee ACSS/TW HS: 1C
Nominal voltage	AC
Nominal voltage	230
Line construction type	Overhead
General route description	See Attachments 4, 19, and 22
Terrain description	See Attachments 4, 19, and 22
Right-of-way width by segment	See Attachment 22
Electrical transmission infrastructure crossings	See Attachment 7
Civil infrastructure/major waterway facility crossing plan	See Attachment 7
Environmental impacts	See Attachment 19

Tower characteristics	New monpoles and new dead end structures will need to be installed in order to loop existing and proposed lines into the NEETMA Reega substation
Construction responsibility	PSEG
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process

Component Cost Details - In Current Year $

Engineering & design	Confidential competitive information
Permitting / routing / siting	Confidential competitive information
ROW / land acquisition	Confidential competitive information
Materials & equipment	Confidential competitive information
Construction & commissioning	Confidential competitive information
Construction management	Confidential competitive information
Overheads & miscellaneous costs	Confidential competitive information
Contingency	Confidential competitive information
Total component cost	$4,670,000.00
Component cost (in-service year)	$5,060,000.00

Greenfield Transmission Line Component

Component title	Build one new single circuit Cardiff - NEETMA proposed Reega 230 kV OH line in same ROW parallel to proposed rebuild of 230kV existing circuit
Project description	Build one new single circuit Cardiff - NEETMA proposed Reega 230 kV OH line in same ROW parallel to proposed rebuild of 230kV existing circuit
Point A	Reega
Point B	Cardiff
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	1512.000000	1785.000000
Winter (MVA)	1512.000000	1785.000000
Conductor size and type	2627.3 kcmil Santee ACSS/TW HS: 1C	
Nominal voltage	AC	
Nominal voltage	230	
Line construction type	Overhead	
General route description	See Attachments 4, 19, and 22	
Terrain description	See Attachments 4, 19, and 22	
Right-of-way width by segment	See Attachment 22	
Electrical transmission infrastructure crossings	See Attachment 7	
Civil infrastructure/major waterway facility crossing plan	See Attachment 7	
Environmental impacts	See Attachment 19	
Tower characteristics	New monpoles and new dead end structures will need to be installed in order to loop existing and proposed lines into the NEETMA Reega substation	
Construction responsibility	PSEG	
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process	
Component Cost Details - In Current Year $		
Engineering & design	Confidential competitive information	
Permitting / routing / siting	Confidential competitive information	
ROW / land acquisition	Confidential competitive information	
Materials & equipment	Confidential competitive information	

Construction & commissioning	Confidential competitive information
Construction management	Confidential competitive information
Overheads & miscellaneous costs	Confidential competitive information
Contingency	Confidential competitive information
Total component cost	$4,670,000.00
Component cost (in-service year)	$5,060,000.00

Congestion Drivers

None

Existing Flowgates

None

New Flowgates

None

Financial Information

Capital spend start date	01/2022
Construction start date	12/2025
Project Duration (In Months)	77

Cost Containment Commitment

Cost cap (in current year)	Confidential competitive information
Cost cap (in-service year)	Confidential competitive information

Components covered by cost containment

1. Offshore Platform E - Proposer
2. Offshore Platform F - Proposer
3. Reega Converter Station - Proposer
4. Offshore Platform E – Absecon Bay Landing HVDC - Proposer
5. Offshore Platform F – Absecon Bay Landing HVDC - Proposer
6. Absecon Bay Landing -Reega Converter Station HVDC - Proposer

Cost elements covered by cost containment

Engineering & design	Yes
Permitting / routing / siting	Yes
ROW / land acquisition	Yes
Materials & equipment	Yes
Construction & commissioning	Yes
Construction management	Yes
Overheads & miscellaneous costs	Yes
Taxes	Yes
AFUDC	Yes
Escalation	Yes
Additional Information	Confidential competitive information
Is the proposer offering a binding cap on ROE?	Yes
Would this ROE cap apply to the determination of AFUDC?	Yes
Would the proposer seek to increase the proposed ROE if FERC finds that a higher ROE would not be unreasonable?	No

Is the proposer offering a Debt to Equity Ratio cap?	Confidential competitive information
Additional cost containment measures not covered above	

Additional Comments

None