Atlantic Shores 2 to Atlantic Shores 3 HVDC Platform Interlink

General Information

Proposing entity name	ANBARD
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	Yes
Company proposal ID	Boardwalk Power Option 3.4
PJM Proposal ID	896
Project title	Atlantic Shores 2 to Atlantic Shores 3 HVDC Platform Interlink
Project description	The project proposes a 700 MW offshore transmission link between the new offshore substation platforms (OSP) at Atlantic Shores 2 ("AS2") and Atlantic Shores 3 ("AS3") offshore Wind Energy Areas. This 700 MW offshore transmission link is referred to as Boardwalk Power Option 3.4 and can be categorized as "Option 3 – Greenfield upgrades between offshore substations proposed in response to the Option 3 problem statement" as outlined in the PJM/NJBPU SAA solicitation problem statement. The proposed project consists design and construction of a new ±400 kV 700 MW HVDC interlink cable connecting the OSPs at the Atlantic Shores 2 and Atlantic Shores 3 Wind Energy Areas. The Project is designed to optimally improve the availability of the offshore transmission system and unlock additional benefits. The project is a complementary solution that uses state-of-the-art offshore transmission technology to realize 700 MW of redundant offshore transmission capacity for offshore wind generation resources in a reliable and cost-effective manner using the HVDC submarine cable with minimal environmental impact. The transmission link rating is designed to match the anticipated offshore wind solicitation sizes as well as transmission capacities of other Anbaric "Option 2"' solutions with which it should be combined to realize the cost-saving synergies and performance improvements. Further details associated with the project are provided in subsequent sections of this submission in brief and discussed in extensive details the project analysis attachments.
Email	jfuller@anbaric.com
Project in-service date	01/2033
Tie-line impact	No
Interregional project	No

Is the proposer offering a binding cap on capital costs?	Yes
Additional benefits	"The project unlocks the following distinct benefits: The interlink realizes redundant transmission capacity whenever one offshore wind export link is out of service, improving the offshore transmission system availability. This results in a reduction of the annual expected energy not transmitted (EENT). Refer to Attachment 2 Cost Benefit Analysis in the Technical Description documentation provided in the project analysis attachments section for more information. The interlink realizes a redundant supply of auxiliary power to the Offshore Substation Platform (OSP) and the connected Offshore Wind Farm (OWF) whenever one offshore wind export link is out of service, reducing the CAPEX and OPEX associated with installing and running diesel generators offshore. The interlink provides an opportunity to re-route power from one POI to another POI during onshore grid outages and congestion. The interlink enables the future provisions for development of an offshore grid with the inclusion of HVDC circuit breakers. The benefits unlocked by using the interlink are shown by means of a cost-benefit analysis discussed in the BPU supplemental data collection form and Attachment 1 Analysis Report and presented in full in Attachment 2 Cost Benefit Analysis in the Technical Description documentation provided in the project analysis attachment section.

Project Components

1. 400 kV HVDC Submarine Cable

Greenfield Transmission Line Component

Component title	400 kV HVDC Submarine Cable
Project description	A 400 kV submarine cable facilitating the HVDC platform interlink between the two new offshore substation platforms (OSP) at Atlantic Shores 2 ("AS2") and Atlantic Shores 3 ("AS3") offshore Wind Energy Areas. The voltage level for the interlink cable system is ±400 kV employing DC cables and accessories. The choice for ±400 kV has been made to ensure compatibility with the Anbaric "Option 2" solutions. The HVDC submarine cable will consist of two cables insulated for ±400 kV with a copper or aluminum conductor. The cables will be designed for installation in sea water, buried in the seabed, and will be rated for the dynamic transfer of 700 MW. The cables will be insulated with solid extruded cross-linked polymer (XLPE) and will not contain any oil or other type of insulating fluid. The strength and flexibility of this type of cable make it well suited for installation conditions beneath the seabed, as planned for the Project. Further details regarding this 400 kV HVDC submarine cable system (including ampacity, insulation system design, key components, and installation methods) are outlined in the "Technical Description" documentation provided in the project analysis attachment section.
Point A	Offshore substation platform at Atlantic Shores 2 (“AS2”) offshore Wind Energy Area

Point B	Offshore substation platform at Atlantic Shores 3 (“AS3”) offshore Wind Energy Area
Point C	

	Normal ratings	**Emergency ratings**
Summer (MVA)	700.000000	700.000000
Winter (MVA)	700.000000	700.000000

Conductor size and type	1x800Al 400kV
Nominal voltage	DC
Nominal voltage	400 kV
Line construction type	Submarine
General route description	The submarine cable route from the Atlantic Shores 2 OSP to the Atlantic Shores 3 OSP is approximately 15 mi (24 km) long. A detailed offshore cable route map can be found in Attachment 20 of the Technical Description documentation provided int he project analysis attachments section. The cable system is expected to be installed in water depths of up to approximately 92 ft (28 m). A detailed routing diagram can be seen in Attachment 3 Constraints Mapbook of the Technical Description documentation. Attachment 18 Permitting Plan of the Technical Description documentation describes the complete permitting status for cable route. The preliminary assessments show that sharp gradients of the water depth are not present along the proposed route. This will be confirmed with further detailed bathymetry surveys during the development stage. The seabed material encountered along the route is mostly sand, gravel and some clay. A detailed description of the proposed route is presented in the "Technical Description" documentation provided in the project analysis attachments along with figures and associated route maps.
Terrain description	The sea floor along the submarine transmission link route is relatively flat and shallow, approximately 92 ft (28 m).
Right-of-way width by segment	The offshore transmission link route is approximately 15 mi (24 km) in length and requires a 200-ft wide area for work activities. The offshore transmission link route is located in federal waters and requires a new Right of Way/Right of Use Grant or Easement Grant from BOEM.
Electrical transmission infrastructure crossings	Boardwalk Power Option 3.4 cable route does not cross any electrical transmission infrastructure.
Civil infrastructure/major waterway facility crossing plan	Not applicable to Boardwalk Power Option 3.4 cable route

Environmental impacts	Installation activities for the offshore transmission link may impact physical resources (air quality, geological resources, water quality), biological resources (avian and bat species, benthic and shellfish resources, finfish and essential fish habitat, marine mammals and sea turtles), cultural resources (marine archaeology), and socioeconomic resources (commercial and recreational resources, commercial shipping, environmental justice populations, existing infrastructure, tourism, public health and safety, workforce and demographics). The environmental Protection Plan (Attachment 15) includes a preliminary evaluation of potential impacts to these resources and proposes preliminary avoidance, minimization, and mitigation measures. Studies and assessments to be completed once the solicitation bid is awarded include geologic hazards, air emissions, water quality, seagrass and macroalgae, benthic resources, marine mammals and sea turtles, fish and fish habitats, birds and bats, marine archaeology, socioeconomics, electric and magnetic fields, in-air and underwater acoustics, commercial and recreational fisheries, military activities, radar, and navigational aids. The submarine transmission link is located on the Outer Continental Shelf and will require a Bureau of Ocean Energy Management (BOEM) Right of Way/Right of Use Grant or Easement. Anbaric will obtain all required federal and authorizations as described in Attachment 18 Permitting Plan and will comply with all permitting requirements resulting from the permitting process.
Tower characteristics	Not applicable to Boardwalk Power Option 3.4
Construction responsibility	Proposer
Benefits/Comments	"The project unlocks the following distinct benefits: The interlink realizes redundant transmission capacity whenever one offshore wind export link is out of service, improving the offshore transmission system availability. This results in a reduction of the annual expected energy not transmitted (EENT). Refer to Attachment 2 Cost Benefit Analysis in the Technical Description documentation provided in the project analysis attachments section for more information. The interlink realizes a redundant supply of auxiliary power to the Offshore Substation Platform (OSP) and the connected Offshore Wind Farm (OWF) whenever one offshore wind export link is out of service, reducing the CAPEX and OPEX associated with installing and running diesel generators offshore. The interlink provides an opportunity to re-route power from one POI to another POI during onshore grid outages and congestion. The interlink enables the future provisions for development of an offshore grid with the inclusion of HVDC circuit breakers. The benefits unlocked by using the interlink are shown by means of a cost-benefit analysis discussed in the BPU supplemental data collection form and Attachment 1 Analysis Report and presented in full in Attachment 2 Cost Benefit Analysis in the Technical Description documentation provided in the project analysis attachment section."
Component Cost Details - In Current Year $	
Engineering & design	CONFIDENTIAL AND PROPRIETARY INFORMATION
Permitting / routing / siting	CONFIDENTIAL AND PROPRIETARY INFORMATION

ROW / land acquisition	CONFIDENTIAL AND PROPRIETARY INFORMATION
Materials & equipment	CONFIDENTIAL AND PROPRIETARY INFORMATION
Construction & commissioning	CONFIDENTIAL AND PROPRIETARY INFORMATION
Construction management	CONFIDENTIAL AND PROPRIETARY INFORMATION
Overheads & miscellaneous costs	CONFIDENTIAL AND PROPRIETARY INFORMATION
Contingency	CONFIDENTIAL AND PROPRIETARY INFORMATION
Total component cost	$65,464,193.00
Component cost (in-service year)	$88,042,063.00

Congestion Drivers

None

Existing Flowgates

None

New Flowgates

None

Financial Information

Capital spend start date	01/2023
Construction start date	12/2031
Project Duration (In Months)	120

Cost Containment Commitment

Cost cap (in current year)	$84,393,839.00
Cost cap (in-service year)	$113,500,331.00

Components covered by cost containment

1. 400 kV HVDC Submarine Cable - 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	No
AFUDC	No
Escalation	No
Additional Information	Refer to the cost commitment legal language
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?	Yes
Additional cost containment measures not covered above	Refer to the cost commitment legal language

Additional Comments

None