Clarifying Questions Set 2

New Jersey State Agreement Approach

Docket No. QO20100630

July 8, 2022

Prepared for

Anbaric Development Partners

On behalf of The New Jersey Board of Public Utilities

Responses are due by 5:00 pm EST on July 15, 2022

Instructions:
The New Jersey Board of Public Utilities ("Board") staff ("Staff"), and its consultant The Brattle Group ("Brattle") have prepared the following questions to clarify your application submitted under the State Agreement Approach ("SAA"), Docket No. QO20100630.

All responses are due by **5:00 pm EST on July 15, 2022.**

Responses must be uploaded to the Board's e-filing system. See the Board's e-filing website for further instructions on e-filing. Please note, the Board's filing system can support 10 files of 100 MB each for each submittal session. If you need to submit additional files, you may then begin another submission session. If you experience difficultly uploading your documents, you may contact Andrea Hart, contact information below, to make alternative arrangements.

All responses will be made part of the Board's record and relied upon by the Board, Board Staff and Brattle in the Board's evaluation, and possible selection, of the SAA projects submitted under this docket.

Confidentiality of Submitted Materials:
All materials filed with the Board are public documents and are therefore subject to the good government sunshine laws of the State of New Jersey. However, the Board appreciates the confidential nature of some of the material that must be submitted with an Application and recognizes that New Jersey law allows Applicants to request protection of:

> any information … which in the person's or entity's opinion constitutes trade secrets, energy trade secrets or other energy information submitted pursuant to N.J.S.A. 52:27F-18, proprietary commercial or financial information, or information which if disclosed, would be likely to cause damage to either a competitive or bidding position or national security, may assert a confidentiality claim by following the procedures set forth in this subchapter.
> N.J.A.C. 14-1-12.1(b).

To facilitate the review process, the Board will require all Project Sponsors to submit public (redacted) and confidential (unredacted) versions of their responses, per the Board's Rules of Practice and Procedure governing submission of confidential materials, N.J.A.C. 14-1-12.1, et seq., and the Open Public Records Act, N.J.S.A. 47:1A-1 et seq. ("OPRA").

Each uploaded file must include "Public" or "Confidential" in the file name. File names must be identical except for including "Public" or "Confidential" at the end of the file name. The public versions of all documents must also be searchable PDF files, except where a different file type such as Excel is required.

For the confidential version of the responses, Project Sponsors must include a statement identifying each type of data or materials it asserts are exempt from public disclosure under OPRA and/or the common law, and explaining the basis for the proposed redaction. Assertions that the entire response is exempt from public disclosure under OPRA, the common law, or the U.S. Copyright Act are overbroad and will not be honored by the Board unless appropriate.

The Board notes that it may elect to share confidential portions of the response materials with other New Jersey government entities, including, but not limited to, Rate Counsel and the Economic

Development Authority, during the evaluation period or post-award. Board Staff may also share the information to PJM.

Staff would like to share your Clarifying Questions responses with PJM; however, Staff wants to ensure all confidential information remains appropriately protected. As such, Staff will not share the responses, but requests that all bidders individually submit their Round 2 responses to *both* the Board (as described above) and PJM directly. The PJM OATT provisions cover treatment of confidential information of members that is provided to PJM by its members. To assure the protections of the OATT apply, please submit responses directly to PJM and mark as confidential per the Tariff provisions. Any documents, data or other information submitted with a project proposal for which confidential treatment is requested must be submitted in writing and designated as confidential pursuant to the procedures adopted by PJM and include supporting justification. Any information received by PJM will be maintained as confidential under the PJM Operating Agreement, section 18.17.

Please acknowledge receipt of these instructions.

Anbaric has used its best commercial efforts to respond to these clarifying questions within the response period. Our responses are based on information available to date and related assumptions. This submission may require adjustment as the specifics of project(s) awarded by the BPU become more defined, including the scope of the project(s), execution timing of such project(s), and respective roles and responsibilities of the project award recipients.

1. Are the components of the option 2 proposals that terminate at Deans (568, 574, 831, 841, and 882) separable?

   Yes. Anbaric designed the components of its projects to be modular, allowing the BPU to mix and match between Anbaric designs and modular supported designs from other developers.

2. If so, would Anbaric be willing to build only the components of the proposed substation near Deans to support two DC converter stations and acquire the adjacent land described in Scenario 1 and Scenario 2 below?

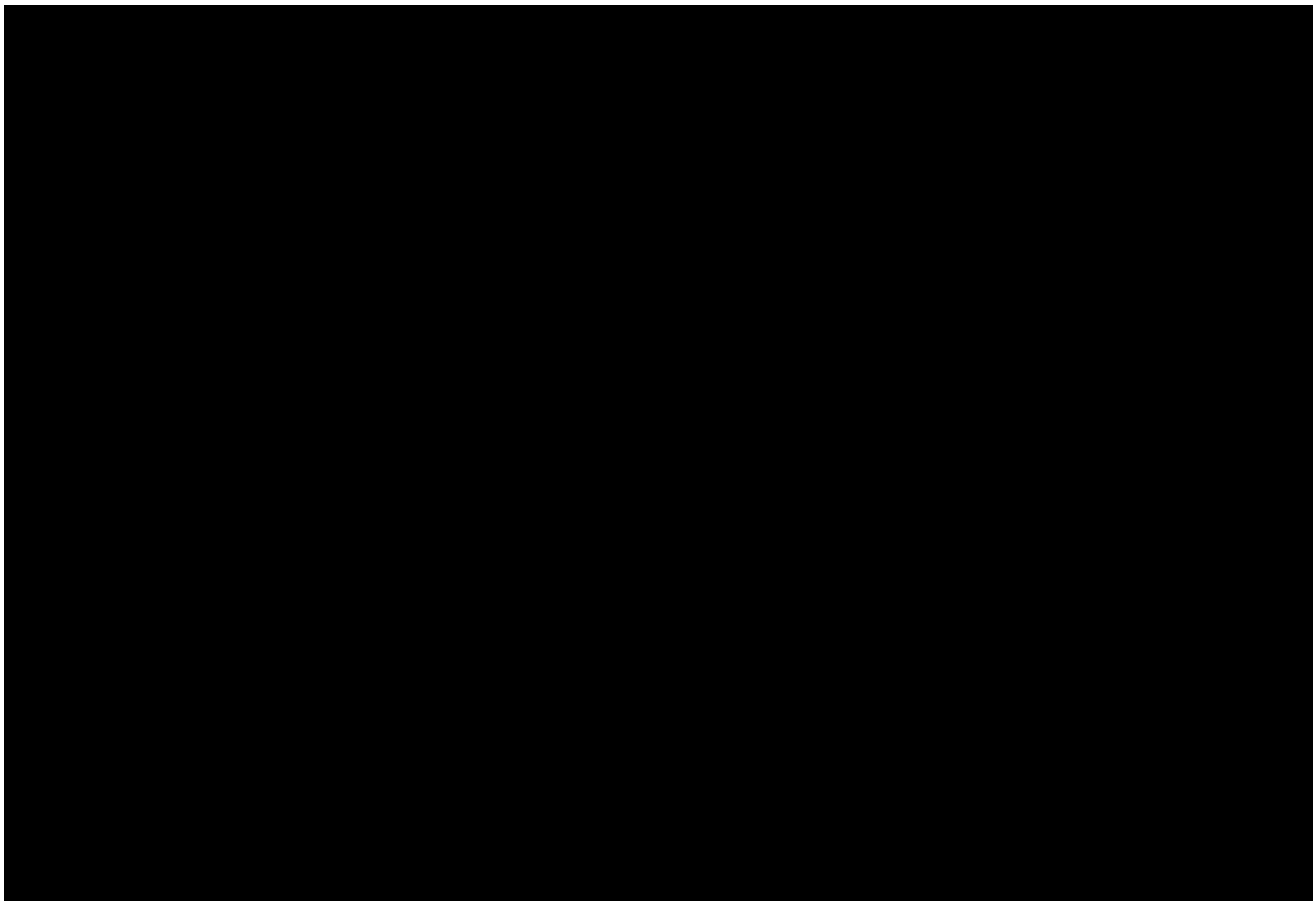
   Yes. Anbaric is willing to build only the components of the proposed substation near Deans to support two DC converter stations and acquire the adjacent land described in Scenario 1 and Scenario 2.

   - Scenario 1: Anbaric builds only the AC portion of the proposed substation near Deans in its proposals and acquires the adjacent land for two DC converters.

     Yes. Anbaric is willing to build Scenario 1.

     [redacted]

Configuration 1:



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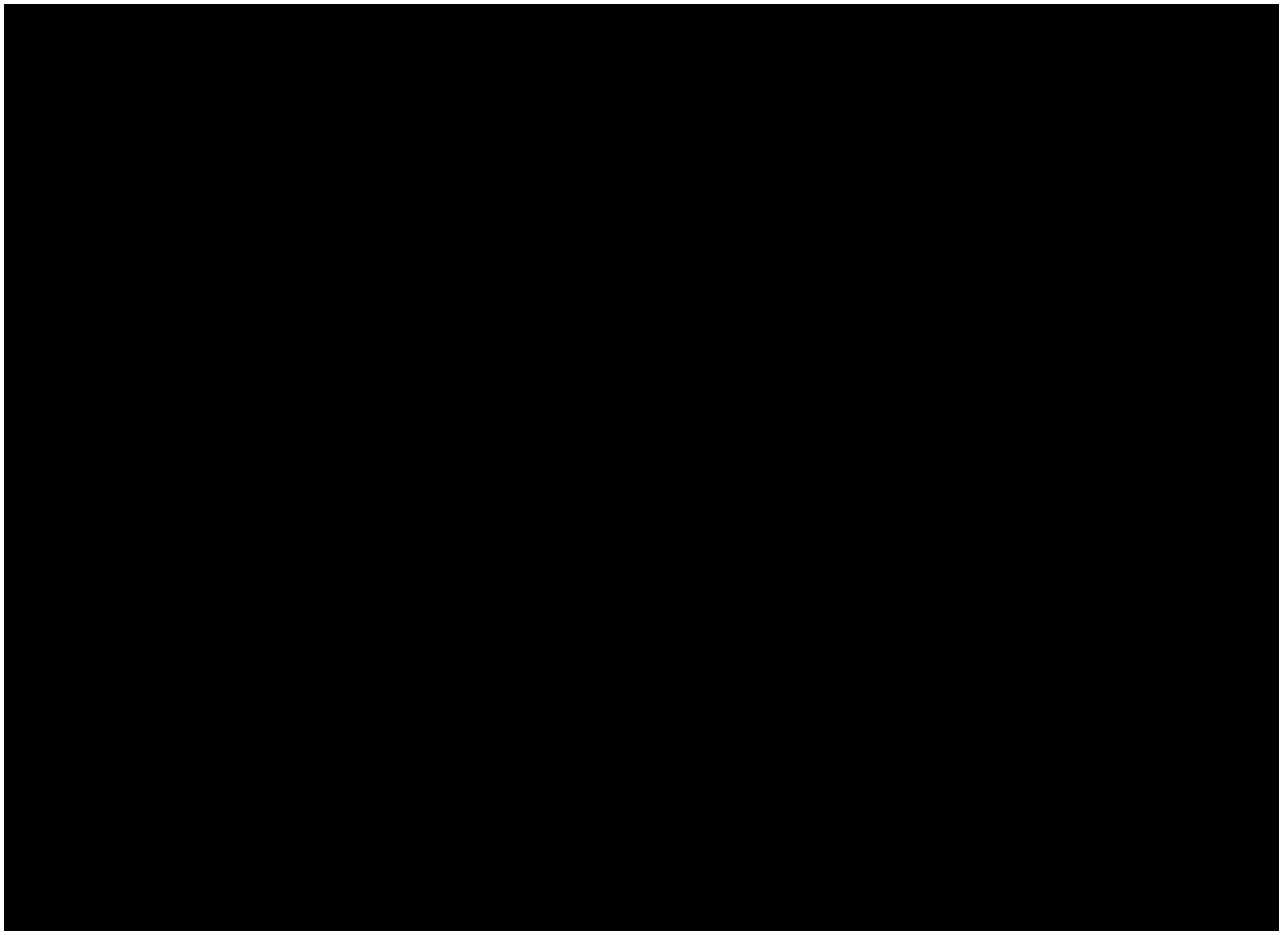

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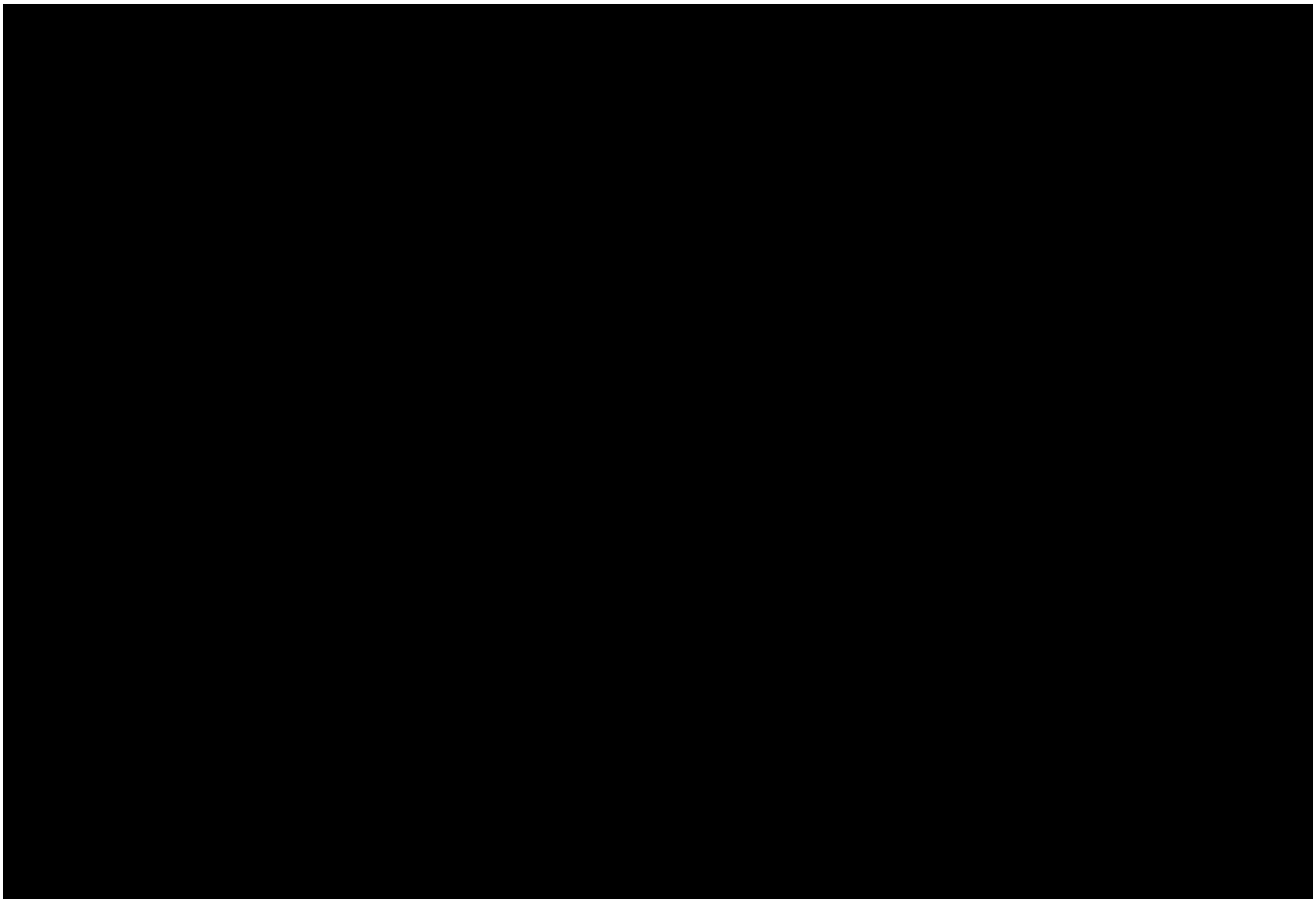
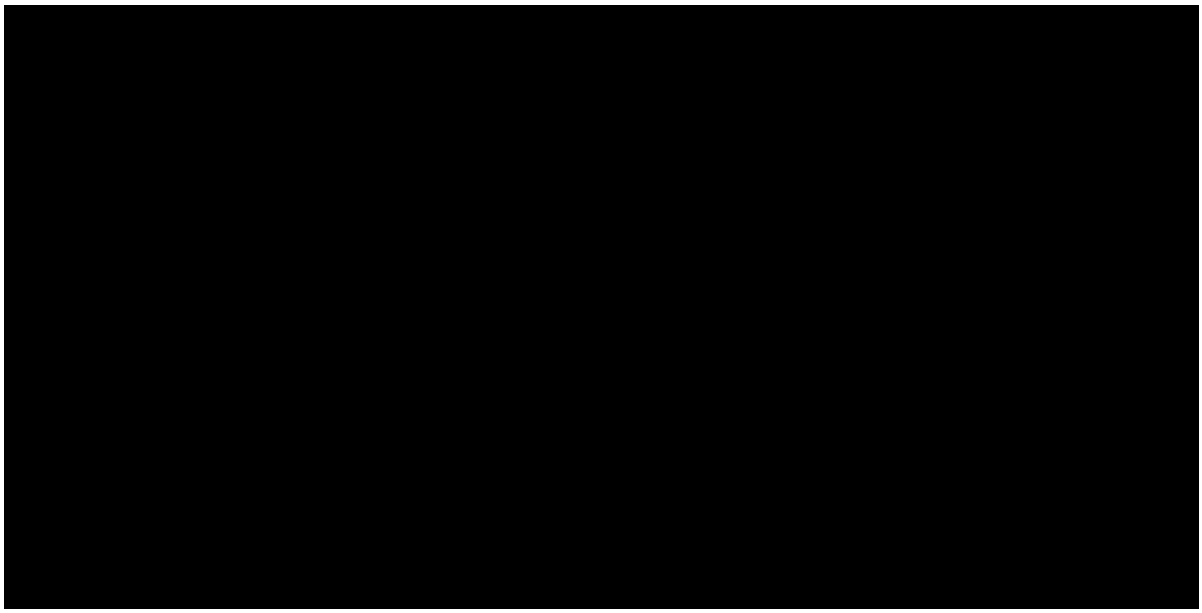


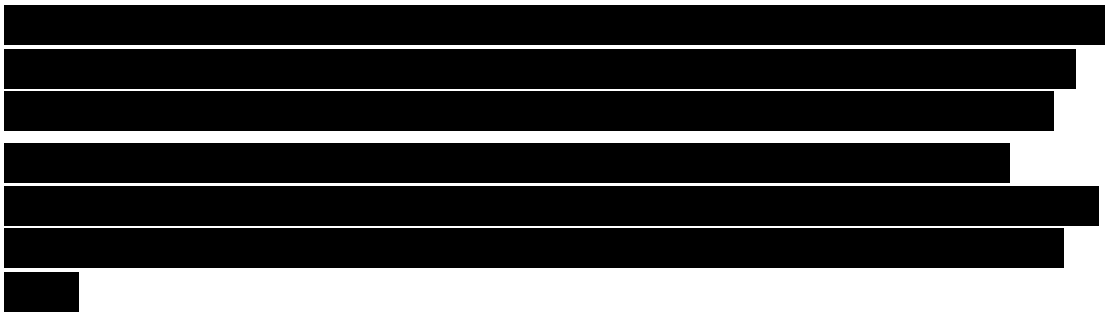
- Scenario 2: Anbaric builds or acquires the facilities and land in Scenario 1 plus the underground infrastructure included in Anbaric's proposal from the proposed substation to an offshore bulkhead location capable of hosting DC cables and converters later installed by offshore wind generation developers (i.e., land for converter stations, vaults and duct banks, but not the DC cables and converter stations themselves). In this scenario, Anbaric would complete all of the onshore work and near-offshore work necessary for use by future offshore wind generation developers to be able to install their own DC cables and converters using the facilities built by Anbaric with interconnection at Anbaric's proposed AC substation.

  Yes. Anbaric is willing to build Scenario 2 – a power corridor from the shore in Keyport, NJ to the 500kV Deans substation. Anbaric respectfully suggests that the advanced permitting of the land route, the accelerated development timeline, our control of key parcels adjacent to the Deans substation and at the Keyport waterfront, are essential components of building the power corridor envisioned by Scenario 2 and provide substantial benefits to New Jersey ratepayers.

Anbaric interprets "all of the onshore work … necessary for use by future offshore wind generation developers to be able to install their own … converters using the facilities built by Anbaric" as detailed in the table below.

Table 1: Description of Anbaric's Scope of Work for Scenario 2





3. If so, please provide cost estimates (based on and at a similar level of detail as provided in its Option 2 proposal) for the facilities included in Scenario 1 and Scenario 2. Please include estimates with and without the land necessary to support two DC converter stations.

The cost estimates for each component of Scenario 1 and Scenario 2 are tabulated in the following tables (according to PJM cost breakdown template) based on 2021 dollars. The in-service year costs for the facilities to support 2800 MW of offshore wind is assumed to be in-service in 2031, however, if desired by the NJ BPU, Anbaric could accelerate the development and construction of these projects. It is important to note that based on Anbaric's design, the AC switchyard and converter stations share the same parcels, therefore, the land to support the

two DC converter stations will be under Anbaric's control under any scenario that includes construction of the AC switchyard. The technical description for the AC portion of HVDC converter station is presented in Appendix A.

Cost Elements and Total Cost for Scenario 1:

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[3] [redacted]

Cost Elements and Total Cost for Scenario 2:

[redacted]

[redacted]

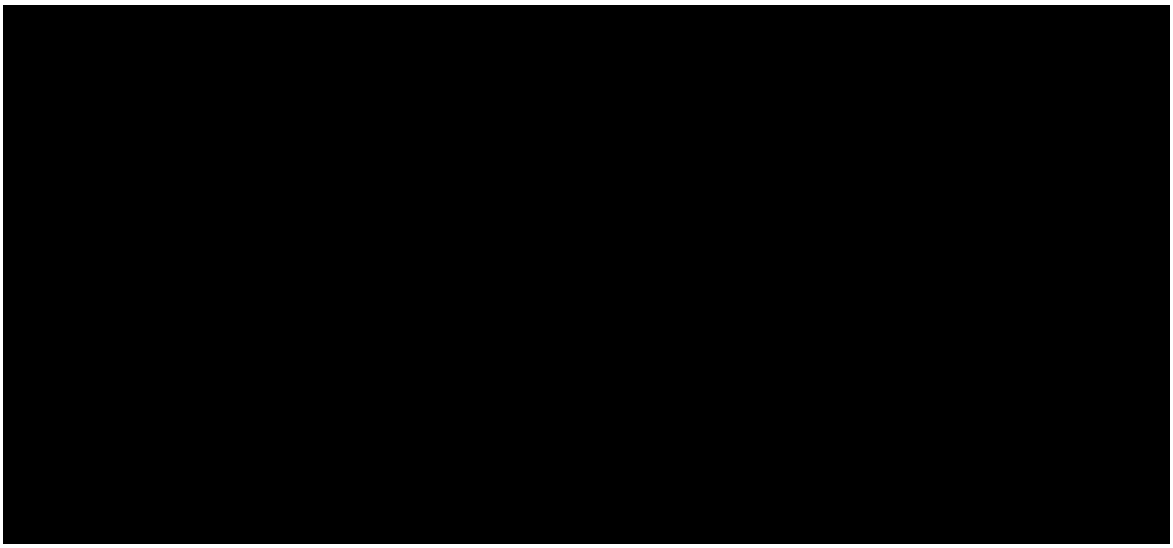
[redacted]

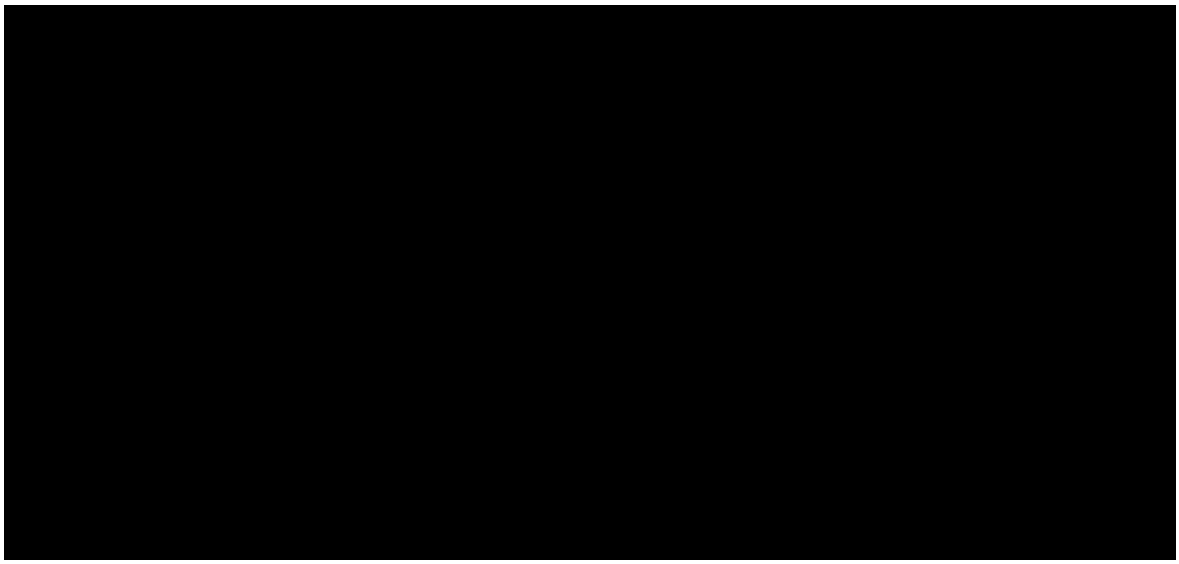
[redacted]

[redacted]

[redacted]

[redacted]





4. For Scenario 1, if Anbaric is willing to build the facilities described above, would Anbaric allow the winners of future offshore wind solicitations to lease applicable portions of the land necessary to build and operate DC converter stations that connect to the AC portion of the substation? If so, please explain the approach Anbaric would take to provide all offshore wind generation developers equal access to the land while minimizing costs to New Jersey ratepayers. Please feel free to propose an alternative arrangement that would permit Anbaric to allow future offshore wind solicitation winners to use the land.

If Anbaric were selected by the NJ BPU to build the facilities and hold the land described above, Anbaric would allow the winners of future offshore wind solicitations equal access to the facilities and associated land on which to build and operate DC converter stations. If Anbaric builds the AC transmission facilities, access would be based on the PJM tariff regarding interconnection rights and order. Under either scenario, it will be critical to minimize costs to the ratepayers, ensure reasonable returns for these investments, and reach commercial terms that will be embraced by all parties and FERC.

Anbaric is open to various approaches that embody the above principles while providing such access to the offshore wind developers. Potentially viable approaches include:

1. [redacted]
2. [redacted].
3. [redacted]

5. For Scenario 2, if Anbaric is willing to build the facilities noted above, would Anbaric allow the winners of future offshore wind solicitations to access the underground facilities for installing their DC cables and to lease applicable portions of the land necessary to build and operate DC converter stations that connect to the AC portion of the substation? If so, please explain the approach Anbaric would take to provide all offshore wind generation developers equal access to these facilities and land while minimizing costs to New Jersey ratepayers. Please feel free to propose an alternative arrangement that would permit Anbaric to allow future offshore wind solicitation winners to use the land.

If Anbaric were selected by the NJ BPU to build the power corridor and hold the land described above, Anbaric would allow the winners of future offshore wind solicitations equal access to the facilities and associated land on which to build and operate DC converter stations. If Anbaric builds the AC transmission facilities, access to would be based on the PJM tariff regarding interconnection rights and order. Under either scenario, it will be critical to minimize costs to the ratepayers, ensure reasonable returns for these investments, and reach commercial terms that will be embraced by all parties and FERC.

Anbaric is open to various approaches that embody the above principles while providing such access to the offshore wind developers. Potentially viable approaches include:

1. [redacted]
2. [redacted]
3. [redacted]

6. Please indicate any other changes to Anbaric's proposal that would be impacted by BPU selecting just the components identified above in Scenario 1 and Scenario 2.

   Because the components identified in Scenarios 1 & 2 are limited to terrestrial and near-shore construction, we anticipate a somewhat shorter permitting process. Likewise, because Scenarios 1 & 2 exclude HVDC converter stations, offshore platforms, and export cables, the duration of construction will be reduced.

7. Please specify the maximum capacity rating of the AC portion of the proposed substation design to support two DC converter stations.

   The Boardwalk Power Portfolio includes pathways which foresee the connection of two circuits with a rating up to 2 x 1400 MW = 2.8 GW at Deans 500 kV POI. This is reflected in the proposed ratings for the 500 kV AC equipment envisaged in the Deans substation expansion.

   It is possible to increase the circuit ratings up to the maximum loss of infeed of 1500 MW, e.g., 2 x 1500 MW = 3 GW. To assess the impact of such an increase, a system impact study would have to be repeated, and the ratings of the 500 kV AC equipment, with associated cost impact, would have to be re-assessed. The SLDs, layouts and schedule of the Deans POI expansion would remain unchanged. Anbaric is willing to do so, if desired by the BPU. It is noted that in case the circuit ratings are increased to 2 x 1500 MW, the ampacity studies for the trenchless crossings (HDD and jack-and-bore) of the HVDC circuits have to be repeated, which will be done in coordination with the selected HVDC cable provider. Results of the ampacity studies could require redesign of some of the trenchless crossings, which could impact costs.

500 kV Dual Terminal Converter AC Substation Scope Narrative

1. **General Description**

   The proposed new converter station infrastructure is in response to the 2021 New Jersey Offshore Wind State Agreement Approach (SAA) Transmission solicitation. These upgrades are necessary to facilitate the State of New Jersey's goal to deliver 7,500 MW of offshore wind to the electric grid by 2035. The upgrades discussed below are to support up to 2,800 MW of offshore wind injection on the 500 kV system at Deans substation as a default POI location.

   The converter stations are to be located just outside of PSE&G's Dean's Substation will be subdivided in its AC and DC converter component work scopes. The line of demarcation will be at the AC network side of the interface transformer, with the interface transformer integrated as part of the DC Converter equipment. This will leave the AC GIS switchgear, metering equipment, and AC filters to be constructed as part of a stand-alone AC substation. Two separate stations will be required, one for each DC terminal to be connected.

2. **Key Assumptions**
   a. Right of way can be obtained to the locations indicated for the new 500 kV AC underground line.
   b. There is sufficient space in the existing control building and relay racks to support the new protection and control equipment without the need for expansion.
   c. The POI demarcation is assumed to be at the aerial lugs for the new 500kV AC cable terminators inside Deans substation & the AC network side connection the interface transformer. Revenue metering equipment will be located at the onshore converter station and may need to be compensated for losses depending on final metering plan, asset ownership and service agreements.
   d. A grounding study will be required during detailed design to demonstrate that the substation ground grid meets the requirements of IEEE 80 (this includes the existing ground grid and any new/expanded areas).
   e. Direct lighting stroke protection and insulation coordination studies will be conducted during detailed design to determine the lightning protection design and surge arrester parameters.

3. **Civil/Structural**
   a. Site Development

      The area for the two new converter station AC yards and AC filter yards will be new greenfield construction. Land will need to be cleared, grubbed, and graded for the new station pads. Unsuitable soils may be present and will need to be accounted for during final design. A geotechnical survey of the site will confirm subsurface conditions. Newly

constructed or disturbed areas within the fence shall be covered with a 4" minimum finishing layer of ¾" clean crushed stone.

b. Fencing, Roads and Physical Security

New fencing will be required for the new each of the new AC switch yards. The approximate area of each of the main AC switch yards will be 250' by 250', with an additional 150' by 3000' area for the AC harmonic filters. New access road will be required to access the new switch yards, the final length of which will be determined as part of detail design.

c. Structures
   - Install sixteen (16) new static wire mast
   - Install Two (2) new 14'x28' prefabricated control enclosure
   - Install vendor provided equipment stands for the new GIS outdoor switchgear
   - Install vendor provided equipment stands for the new AC filters

d. Foundations
   - Install sixteen (16) new static wire mast foundations
   - Install Two (2) new 14'x28' prefabricated control enclosure foundation
   - Install required foundations for new outdoor GIS switchgear
   - Install foundations for new AC filter arrangements.

4. Physical Electrical

a. Major Equipment
   - Install Two (2) 500 kV, 3000 A, 63 kA, SF6 Dead Tank Circuit Breaker
   - Install Two (2) 500kV pre-insertion resistor in a by-pass arrangement
   - Install Six (6) 500kV 3000 A GIS disconnect switches
   - Install Four (4) 500kV GIS Maintenance ground switches
   - Install Four (4) 500kV GIS High Speed Ground Switches
   - Install Two (2) Metering class combo current & voltage transformer

b. Bus & Insulators
   - Install new 500kV 3,000 Amp GIS bus to connect equipment.

c. Substation Grounding System
   - Equipment and Structure Grounds: Two (2) 19#6 grounding pigtails shall be connected to all new equipment and structures from the ground grid.

- Grounding Connections: All below grade connections shall be exothermically welded. All equipment and structure grounding connections shall be compression or mechanical type per IEEE standards.

d. Conduit and Cable Trench
   - Install 200 Linear Feet of 30" x 16" Cable Trench for each new 500 kV bay
   - Install Two (2) 4" Conduits to Each New 500 kV equipment item
   - Install one (1) 2" Conduits to new shield wire poles, yard receptacles, and other miscellaneous equipment.
   - Install One (1) 4" Conduit w/Innerduct from each New Fiber Optic Splice Enclosure at the New 500 kV AC Underground Circuit Interface Inside the Substation to the Nearest Cable Trench Section (for New ADSS Fiber Optic Cable)

e. Low Voltage Power, Instrumentation and Control Cable
   - Install approximately 36,000' of misc. control and switchboard panel wiring.

f. High Voltage Underground Cable System (by Others)

   The new 500 kV AC underground line will consist of one (1) XLPE solid dielectric cable per phase. The new underground line will also include a 48 fiber single mode ADSS cable. The cable system components installed within the substation are as follows:
   - 500 kV AC underground line duct bank with conduits to each termination structure and communication conduits to fiber optic splice enclosure.
   - 500 kV AC cable terminators and terminal hardware, including hardware for primary and grounding/bonding connections.
   - Link boxes, mounting hardware and insulated cables for sheath grounding/bonding system.
   - Conduits between each single-phase termination structure for underground cable grounding/bonding system.

g. Control Building

   A new 14' by 28' prefabricated control enclosure will be required to house the new AC yard protection and control equipment for each of the two substation yards.

   i. AC Station Service

Two new AC station service transformers will be required to provide primary and alternate service for the AC yard. An automatic transfer switch will also be included to ensure uninterrupted AC station service.

ii. DC Station Service

Two new 125VDC batteries and chargers will be needed for the new AC yard, one for the primary system protection and one for the secondary system protection.

5. Protection & Control

a. Protection

The new 500 kV line terminal will require redundant, high-speed line protection systems with DTT functionality. New primary relaying will be in a new primary system protection panel in the new control enclosure. The Secondary system will be in a secondary system panel physically separated from the primary system panel in the new control enclosure.

- New Primary Line Relay Panel (Deans #1 and Deans #2):
  - 500 kV Future Line: Space for new primary line relay and associated teleprotection terminal or power line carrier (PLC) equipment.
  - 500 KV OCS #1: New high-speed line differential relay, with direct fiber communication capability for end-to-end communication.
- New Secondary Line Relay Panel (Deans #1 and Deans #2):
  - 500 kV Future Line: Space for new secondary line relay and associated teleprotection terminal or power line carrier (PLC) equipment.
  - 500 KV Deans #1: New high-speed line differential relay, with direct fiber communication capability for end-to-end communication.
- New 500 kV Bus Protection: new Primary and secondary bus protection systems will be required to protect the new GIS bus through to the interface transformer. The Primary bus protection system will be a high impedance bus differential system located in a primary relaying panel. The secondary bus protection system will be a low impedance bus differential located in a physically separated secondary protection panel.

b. Control

New multifunction bay control relays will provide control, reclosing, and breaker failure functionality (via DTT) for each new circuit breaker. Additionally, the new

multifunction bay control relays will provide control for the GIS disconnect switches associated with each new breaker.

- New Control Relay Panel: two (2) multifunction bay control relays in a new panel to provide control functionality for the one (1) new 500 kV breakers and associated GIS disconnects for each AC station yard. A Bay control relay will be required for control of the PIR bypass disconnect switches.

c. SCADA, Disturbance Monitoring & Synchrophasors

All new intelligent electronic devices (IEDs) will be connected to the new substation network to provide operational metering data, control, indication, alarms, and sequence of events reporting per utility convention. All new IEDs will also be connected to a time synchronization signal that is part of the existing substation network. The existing disturbance monitoring and synchrophasor measurement philosophy will be utilized for any equipment.

d. Revenue Metering

The requirement for local revenue metering must be determined as the project matures and details of the metering plan and asset ownership are finalized.

e. Telecomm

Interfacility communications for transmission protection and SCADA functions between Deans and the new onshore converter stations (OCS #1& OCS #2) will be via single mode fiber optic cables routed with the new 500 kV AC underground circuit. Independent paths are required for primary and secondary protection signals. Two (2) fiber optic cables will be routed in separate communication ducts with the 500 kV AC underground line and terminated in a separate splice enclosure inside Deans substation (by Others). The primary and secondary paths inside the substation will be as follows:

- Primary System: Install 500’ of 48 fiber single mode ADSS fiber optic cable from OCS #1-1 splice enclosure to existing Deans control building via 4” conduit and primary system cable trench (utilize innerduct for entire route).
- Secondary System: Install 700’ of 48 fiber single mode ADSS fiber optic cable from OCS #1-2 splice enclosure to existing Deans control building via 4” conduit and secondary system cable trench (utilize innerduct for entire route).