COASTAL WINDlink

A PSEG and Ørsted project

Response to clarifying questions

Newark, NJ
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1. ***Are the components of the Option 2 proposals separable?***

   Yes.

2. ***If so, for each point of interconnection proposed, would PSEG/Orsted be willing to build the components of Option 2 proposals described in Scenario 1 and Scenario 2 below?***
   - ***Scenario 1: PSEG/Orsted builds only the AC portion of the proposed substation and acquires the adjacent land for one or more DC converters.***
   - ***Scenario 2: PSEG/Orsted builds or acquires the facilities and land in Scenario 1 plus the underground infrastructure included in PSEG/Orsted'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 <u>not</u> the DC cables and converter stations themselves). In this scenario, PSEG/Orsted 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 PSEG/Orsted with interconnection at PSEG/Orsted's proposed AC substation.***

   CWL can successfully build the components of the Option 2 proposals described in Scenario 1 and Scenario 2 above. Furthermore, the CWL team has considered two other scenarios presented as Scenario 3 and Scenario 4. However, CWL does not recommend that the project be split between the transmission developer and generation developer in this manner as doing so will shift risks to the offshore wind developer, increase interfaces complexities, and limit the optimization of the design – ultimately increasing the costs to New Jersey ratepayers.

   Considerations and risks for each of the scenarios are described in further detail in question 6 below. CWL is providing this information to support the BPU evaluation. If BPU determines it would need additional information, we would work to accommodate future requests.

   Scenario 1: CWL sees two interpretations of Scenario 1.

   - 1A: CWL constructs the AC portion of the station which includes civil components such as excavation, piling (if applicable), foundations, grounding, control house, steel work associated with the AC portion of the site, breakers, disconnects, Instrument transformers, bus, lightning masts, AC station lighting, and protection relays. This does not include the converter transformers but does include the converter transformer foundations. Furthermore, the control house will be able to house developer's protection and control equipment.
   - 1B: CWL constructs the AC portion of the station with all items in 1A and the work up to and including the converter transformers.

Scenario 2A: As described by BPU in question 2 above. CWL has included the cost of scenario 1A plus all the infrastructure up to and including the landing (e.g. HDD) absent any physical cables (DC, fiber, etc.)

Scenario 2B: As described by BPU in question 2 above. CWL has included the cost of scenario 1B plus all the infrastructure up to and including the landing (e.g. HDD) absent any physical cables (DC, fiber, etc.)

Scenario 3: CWL constructs everything described in Scenario 1B above.

Scenario 4: CWL builds everything described in Scenario 3 above

Other Considerations:

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 one or more DC converter stations.***

   Cost estimates are presented below for Scenario 1 through 4 using the breakdown requested by PJM. Please note all costs are in 2021 dollars, subject to negotiation of commercial terms, and are based on the original proposal schedules.

Note: CWL currently assumes the 2 spur export cables to Deans will run in separate duct banks on different routes. CWL's preliminary analysis indicates that the maximum ratings of 1500MW per circuit are not achievable in a common duct bank due to mutual heating. CWL will evaluate constructing a common duct bank once it has further site investigation data.

4. ***For Scenario 1, if PSEG/Orsted is willing to build the facilities described above, would PSEG/Orsted allow winners of future offshore wind solicitations to lease applicable portions of the land necessary to build and operate one or more DC converter stations that would connect to the AC portion of the substation? If so, please explain the approach PSEG/Orsted 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 alternate arrangement that would permit PSEG/Orsted to allow future offshore wind solicitation winners to use the land.***

CWL has site control for converter stations near the Sewaren, Deans, and Larrabee POIs as described in the table below. CWL anticipates that it would be able to lease applicable portions of the land to other developers in order to build and operate one or more DC converter stations that connect to the AC portion of the substation. If CWL were to build these facilities, equal access would be provided offshore wind solicitation winners per the PJM tariff requirements.

5. ***For Scenario 2, if PSEG/Orsted is willing to build the facilities noted above, would PSEG/Orsted 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 one or more DC converter stations that connect to the AC portion of the substation? If so, please explain the approach PSEG/Orsted 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 PSEG/Orsted to allow future offshore wind solicitation winners to use the land.

Yes, CWL would allow winners of 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 one or more DC converter stations that would connect to the AC portion of the station. CWL proposes additional commercial discussions on this topic when further details on BPU's proposal are available.

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

Although we would not expect any significant electrical design changes in this portion of the scope, we would anticipate there are multiple interfaces in our proposals that could be impacted. The cost estimate and the technical review must be refined if BPU wants to explore in more detail one specific scenario.

CWL has identified initial risks during the assessment of the different scenarios, and the team offers the below items to BPU during the evaluation of CWL's proposals. Note that further additional details will need to be worked through from both a technical and commercial perspective.

Considerations for Scenarios

i. Will require more coordination on site than a single entity building all facilities (and expect additional resources to manage the coordination).

ii. As the duct bank is designed for the cable, splitting the civil and electrical work into independent projects introduces the risk of not knowing the cable design and manufacturer when the duct bank is designed and constructed. Risks include:
   - Not meeting the thermal rating (since typically the cable manufacturer will independently confirm the rating).
   - The duct bank and the individual conduits not being designed for the size of the cable and the bending radius specific to the cables. For example, the deployment of HVDC technologies varies significantly between a bipole or monopole system.
   - The splice vault locations, length between earthing locations, and length between communication splice boxes not being able to be coordinated.

General considerations awarding a limited scope

- **A meshed grid design which represents the best way for the state to cost effectively achieve its goals and signifcant savings for ratepayers.** CWL believes a meshed grid is an integral part to this offshore wind transmission system. A well-functioning meshed grid will save New Jersey tens of millions annually[1] by lowering potential curtailments and improving system congestion. Splitting the scope makes it more challenging to have an integrated meshed grid as it creates additional scope seams that need to be coordinated in already complex projects. It is important that standards are developed upfront to insure coordination and functionality in the future.

- **Increase of costs and risk for rate payers if HVDC is procured by OSW generators:** There is more risk that independent and uncoordinated HVDC equipment purchases by offshore wind

[1] A NYSERDA study identified $55-$60 million in annual savings associated with a meshed grid solution. (https://www.marinelog.com/offshore/offshore-wind/new-york-state-releases-third-competitive-offshore-wind-solicitation/)

generation developers (assuming BPU plans to leave the HVDC part to the offshore wind generation developers) may not allow developers to secure the volume necessary to secure capacity and have the equipment delivered in time. This is likely to result in increased costs to ratepayers. Given BPU and CWL's shared goal of minimizing rate payer impacts, we recommend looking at this risk closely.

- **CWL has mitigations in place to better navigate supply chain risks.** Supply chain risks could impact the cost or timely procurement of the necessary equipment (HVDC and cable among other things) to complete projects in a timely manner.

- **Using this approach, it is unclear when the transmission equipment is in-service:** It is unclear how the project can be eligible for revenues if generation enters in operation several years later. This raises rate questions as the equipment is not considered used and useful until it is energized. Timing concerns and schedule coordination can impact costs negatively, for either customers, CWL, or the OSW generation developer.

- **This approach can create "interface risk" particularly in the design:** As this approach creates an interface, coordination will need to occur on detailed interfaces in areas such as SCADA, protection, communications, fiber, control systems, NERC compliance, permitting, export cable crossings and deep burial, operations, and maintenance. This can cause the design to be delayed and scope changes to result.

- **Planning and building the transmission scope will result in the most efficient, lowest cost solution for NJ:** Views on all of these transmission related risks will be factored into OREC prices submitted by the OSW generators. The risks mentioned above will increase the risk premium that generators will charge in the OREC. Awarding the transmission solution in the SAA allows customers to pay only for the actual costs that materialize.

7. Please specify the maximum capacity rating of the AC portion of the proposed substations to support one or more DC converter stations.

CWL original design in the proposals anticipates a maximum capacity rating up to 1500MW per single 400kV HVDC converter station based on the limits set by BPU and PJM. Please refer to the table below.