ANBARIC

the future of electricity

August 10, 2018

Ms. Doreen M. Harris
Director
Large Scale Renewables Team
New York State Energy Research and Development Authority
17 Columbia Circle
Albany, NY 12203-6399

Re: Response to Offshore Wind Renewable Energy Credits Request for Information OSW-2018

Dear Doreen,

Thank you for the opportunity to provide comments in response to NYSERDA's Offshore Wind Renewable Energy Credits RFI. Our response is attached.

The extensive schedule of questions appropriately reflect the complexity of implementing the State's offshore wind goals and the need to get the many associated policy and process design provisions right during this critical early stage and throughout the coming years in service of meeting those goals.

We continue to be greatly impressed by NYSERDA's leadership in tackling these challenging questions head-on and soliciting the best thinking from the the broad community of stakeholders.

With many thanks,

Kevin Knobloch
President
New York OceanGrid LLC

Offshore Wind Renewable Energy Credits Request for Information OSW-2018

Respondent's name, affiliation, title, and primary contact information.

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Identify and provide general background about your organization, including a summary of any previous experience that could be relevant to this RFI.

Anbaric is one of the United States' leading developers of independent open access transmission lines. Our founder and chief executive officer, Edward N. Krapels, helped spearhead the development of two 660 MW high voltage direct current (HVDC) transmission lines linking New Jersey and New York. The first, the Neptune Regional Transmission System, became operational in 2007 and the second, the Hudson Transmission Project, became operational in 2013. Each was completed on time and on budget for State entities -- Neptune for the Long Island Power Authority and Hudson for the New York Power Authority – and each was buried underground or under the seabed for its entire length.

In March 2017, Anbaric and one of Canada's largest public pension plans, the Ontario Teachers' Pension Plan, announced a joint venture to expand Anbaric's transmission and microgrid businesses across the U.S. and Canada. As a result of the joint venture, Anbaric began to conceive, design, and develop open access transmission projects for the offshore wind generation projects proposed to be developed off New York, New Jersey and Massachusetts, based on the highly successful European experience with open access transmission for offshore wind generation facilities.

Here in New York State, Anbaric has designed a prototype Open Access Offshore Transmission system, our New York OceanGrid, capable of delivering to Load Zones J and K the entire 2400 MWs that the Cuomo Administration has proposed be deployed by 2030. Anbaric's New York OceanGrid is also being designed to optimize onshore interconnections should the Governor decide to increase the size of the offshore wind target from 2400 MW.

At this relatively early stage of development, Anbaric's New York OceanGrid is designed to utilize AC or DC technology and separate parts of the system could use either. For a particular offshore wind generation project, Anbaric would select AC or DC technology depending on market conditions and customer needs at the time. Key factors influencing the decision include the distance between a wind generation project's collector station(s) and the first point of contact with the onshore grid, the associated line losses and the cost of the technology.

Anbaric is well into the development stages of our planned open access transmission project. To date we have:

1) Identified ideal interconnection points with the NYISO grid in Load Zones J and K for the first 2400 MW;

2) Filed interconnection queue positions and repurposed ongoing permitting efforts to speed the development process where possible;

3) Commenced the Federal permitting processes to bury offshore transmission lines in Federal waters off the coast of New York State and to operate the OceanGrid system consistent with FERC regulations. See discussion of our application to the U.S. Department of the Interior's Bureau of Ocean Energy Management (BOEM) below.

4) Initiated the environmental due diligence and studies necessary to secure Federal and State permits for underwater transmission lines;

5) Engaged a range of stakeholders in communities on Long Island and in New York City, state and local government, industry, and environmental NGOs to share information about our proposed approach and to listen to concerns and guidance.

6) Completed a marine geotechnical and geophysical survey for State waters and initiated a marine geophysical survey, which is currently in progress in Federal waters off the New York coast.

7) Completed, for one of our recommended onshore interconnection points, Ruland Road, a survey of the upland cable route, with all utilities, boundaries and other relevant features located for construction plan development.

On April 30, 2018, Anbaric filed its application for right of way grants and rights of use easements with BOEM to site offshore collector platforms and bury transmission cables in Federal waters that will deliver all 2400 MWs sought in New York to the onshore NYISO grid. On June 22, 2018, BOEM approved Anbaric's legal, technical and financial qualifications to hold rights-of-way on the Outer Continental Shelf.

Anbaric selected locations for offshore collector platforms and routes for the transmission cables that harmonize its New York OceanGrid with the environmental conditions and human uses of Federal waters. Anbaric's planned transmission approach minimizes environmental impacts, because each transmission line can be shared by two or more offshore wind generation projects, reducing the number of lines to shore while minimizing construction and environmental impacts and lowering costs, compared to a model of each offshore wind generation developer building its own radial transmission facilities to interconnect with the onshore grid.

FERC has granted Anbaric's petition for negotiated rate-making authority in Massachusetts and we will soon file a similar petition for the New York OceanGrid.

(Each response should include the RFI question number and the page number.)

Procurement Schedule

1. The first solicitation will be issued in the fourth quarter of 2018 (Order, p. 27).

    a. How much time do proposers need to develop proposals, *i.e.*, time between issuance of the RFP and the proposal submission date?

A typical 90-day timeframe for responding to the RFP should be sufficient.

2. NYSERDA proposes requiring bids to remain firm and binding for 6 months in regard to the OREC pricing provisions and other commercial provisions. Is this duration reasonable, or is a longer or shorter time period warranted? What key factors affect how long a proposal can remain firm? How does this timeframe affect the preparation of the proposal?

A six-month timeframe for requiring bids to remain firm is reasonable, although given the number of project budget items over which a wind or transmission developer has no control – such as debt financing interest rates, exchange rates, and the volatile costs of key materials, such as copper for cables – some consideration of slider provisions may be in order.

Procurement Quantity

3. The Order requires NYSERDA to seek approximately 800 MW of capacity between procurements in 2018 and 2019. Should the 2018 RFP prescribe a minimum capacity or a minimum annual OREC quantity per bid, and if so, what should the minimum be? Should the 2018 RFP prescribe a maximum capacity or annual OREC quantity per bid, and if so, what should the maximum be?

We suggest that it is in the State's interest to inspire creativity and optionality through the RFP process, and the answer to question #3 should be guided by that goal.

A minimum requirement of 400 MW is reasonable floor given that economies of scale are key to lowering costs and since 400 MW has become a typical wind farm size, such a requirement would likely be welcomed and easily met by most bidders.

Because the New York Public Service Commission Order[1] gave NYSERDA flexibility in implementing the 800 MW goal – specifically noting that "if sufficient attractive bids are received in the first solicitation, NYSERDA could award more than 800 MW in contracts in the first year alone" – there is no compelling reason to set a ceiling on the capacity or quantity per bid.

It is relevant to NYSERDA's deliberations to note that in Massachusetts' first round 83(c) offshore wind RFP, issued on June 29, 2017, the State required all bidders to submit a 400 MW project, while also allowing bids for projects up to 800 MW. The RFP further required that each bidder submit an "expandable transmission system" for 1600 MWs, Massachusetts' current offshore wind goal.

As you know, the winning bid, announced on May 23, 2018, went to the Vineyard Wind Project and consisted of two 400 MW projects. In its RFP bid, Vineyard Wind stressed that a single "transmission system" that both 400 MW wind farms could share would yield substantial costs savings, and those savings contributed to its low-cost winning bid.

Vineyard Wind described that advantage in its RFP response in this way:

> "The Vineyard Wind 1 and Vineyard Wind 2 proposals would benefit Massachusetts ratepayers by fully utilizing the cost synergies and savings from two separate 400MW offshore wind farms with a shared 800MW transmission system, and would reap those

[1] State of New York Public Service Commission Order Establishing Offshore Wind Standard and Framework for Phase 1 Procurement, Case 18-E-0071, July 12, 2018.

> synergies by mid-2022. The attractive pricing of both 400MW projects demonstrate that substantial savings may be realized by fully utilizing a transmission system."

The benefit of sharing the transmission system from the first 400 MW with the second 400 MW is reflected directly in Vineyard Wind's pricing. For the first 400 MW project, the nominal cost is $74/MWH in year one. The price then drops to $65/MWH in year one of the second 400 MW, which benefits from the "shared 800MW transmission system."

Subsequent to that award, the Massachusetts Legislature on July 31, 2018 passed new legislation, the Clean Energy Future Act, that emphasized the potential value of separately bidding transmission and considering a shared, offshore grid system. The new law outlines a path along which offshore transmission can be bid separately from generation, a significant change that will open up the process to new, independent transmission companies as well as generators and utilities.

The law allows the state Department of Energy Resources to conduct a separate bid for transmission infrastructure that could serve an additional 1600 MW of offshore wind – over and above the initial 1600 MW target. That process holds the potential to draw more competitive bids for offshore transmission systems. Previously, the law had required transmission to be bundled with wind farm development bids. The Legislature has sent a strong signal to the offshore industry that it recognizes the vital importance of planned, open access transmission infrastructure.

When the Commonwealth procures future rounds of offshore wind energy under the Energy Diversity Bill of 2016, it now has the option to separately bid an expanded offshore transmission system that would accelerate the growth of the Massachusetts wind energy sector.

4. Should the 2018 RFP allow bidders to submit multiple bids with differing capacity or OREC quantities? Should this be a continuous range, or should specific discrete target quantities be prescribed by NYSERDA?

Encouraging bids for multiple levels of capacity (e.g. 400, 800 and 1200 MW) would stimulate creative approaches and provide NYSERDA with multiple options and approaches to consider. As noted above, the baseline should be a minimum of 400 MW, with the option of any single bidder adding additional wind farms in 200 or 400 MW increments.

It is noteworthy that in the responses to Massachusetts' first round 83(c) offshore wind RFP (issued on June 29, 2017), the three eligible bidders submitted 18 project proposals with 27 different prices variations.

We strongly urge NYSERDA to encourage bidders in Phase 1 to include in their proposals information about how their approach would maximize the utility of any proposed interconnection point and/or preserve the ability to do so in a later round or phase. The existing interconnection points onshore that can handle a significant injection of electricity from offshore wind generation without costly technical and equipment upgrades are relatively few, and underutilization of those few optimal interconnection points will hinder the ability of state regulators, grid operators and wind generation and transmission developers to build out New York's offshore wind capacity in a timely way and at the scale envisioned by the State's leadership.

Further, we strongly encourage that the RFP require bidders to separately price the generation and transmission elements, so NYSERDA can assess the credibility of two very different components of the project and compare one bid to another with transparency and precision. This was required in Massachusetts' first round 83(c) offshore wind RFP Massachusetts RFP. The RPF specifically directed bidders to "Break out separately costs of transmission facilities, and ensure that both of these costs are stated separately from generation costs," and state decision makers received valuable cost data as a result.

5. The Order notes that NYSERDA could award more than 800 MW in the first year alone to secure economic develop benefits or to accept low bid prices that take advantage of the expiring federal tax credits. What should the RFP include to promote these benefits?

Maximizing economic development benefits and the ability of wind energy developers to employ expiring Federal tax credits are sound reasons to consider making an award or awards of greater than 800 MW total in the first year – but only if sufficient high quality, viable and cost-competitive bids are submitted.

The RFP could either set a ceiling above 800 MW -- or simply not set a maximum capacity -- in the first RFP to spur cost savings from economies of scale and allow one or more wind developers to benefit from the expiring Federal Investment Tax Credit (ITC). To state the obvious, because factoring in savings from the ITC will allow bidders to submit lower bids than they otherwise would be able to, the savings from those tax benefits would lead to lower costs for New York ratepayers.

The possibility of an award or awards totaling 800 MW or more in the first round underscores the importance of considering shared, open access transmission so that the few optimal onshore points of interconnection are fully utilized and the number of cables from windfarms to shore that cross valuable commercial fisheries and commercial shipping lanes and anchorages are minimized. NYSERDA's first round RFP should require that bidders explain how their proposed project(s) will be designed to feature transmission infrastructure that can be expanded to accommodate additional wind generation facilities and/or tie into a planned, open-access transmission system in the future.

A large award or awards in Round One of Phase 1 would send a powerful message that New York is acting with a strong sense of urgency and ambition and wants to move swiftly to build offshore wind at scale.

Interconnection and Deliverability

6. Are there unique challenges associated with interconnection of offshore wind into downstate New York injection points in New York City and/or Long Island that should be taken into consideration when preparing the RFP? If yes, please identify the challenges.

Successfully interconnecting transmission from offshore wind generation to New York City and Long Island will be extremely challenging for a number of reasons. These challenges, which are primarily associated with the injection of a large intermittent resource, should be factored into the bid valuation criteria.

These challenges include:

1) The number of existing interconnection points in the onshore grid that can accommodate significant new injections of electricity from offshore wind without major infrastructure upgrades are few, limiting the options for wind generation and transmission developers to connect wind farms to the onshore grid and placing greater weight on those few optimal points of interconnection.

2) The routes through which the cables transmitting electricity from offshore wind farms to either New York City or Long Island must traverse through one of the busiest ocean environments in the world. The waters off New York include congested shipping lanes used by commercial, military and recreational vessels, pilot boarding areas, historical features such as ship wreck sites, unexploded ordinances, ocean disposal sites, artificial

reefs and areas restricted by the U.S. military.

3) Cable routes seeking to interconnect with Brooklyn or other parts of New York City must navigate sea channels through the congested lower and upper New York Bay, and cable routes seeking to interconnect on Long Island face passage through highly ecologically sensitive barrier islands and coastal marshes. Once landing ashore, these cables must be routed through often highly developed and densely populated communities and neighborhoods.

4) Transmission developers must successfully secure interconnection rights from NYISO through an extensive, time-consuming and potentially expensive process that includes securing an interconnection queue position and conducting an initial feasibility study, a follow-on System Reliability Impact Study, and a facilities study. If all that goes well, NYISO assigns a Class Year Allocation and the parties sign an Interconnection Service Agreement.

5) Transmission developers must then successfully secure an Article VII environmental permit from the New York Department of Public Service.

6) The siting of both offshore and onshore cable routes is often of concern to a range of stakeholders, including the commercial and recreational fishing communities, the commercial shipping industry, communities and neighborhoods that would host the cable routes, and marine scientists and environmental organizations seeking to protect endangered marine species and threatened marine ecosystems. Transmission developers must effectively reach out to and understand and respond to the concerns of these stakeholders, potentially altering project plans to accommodate concerns.

In addition, the following specific challenges associated with injecting large amounts of electricity from offshore wind into the onshore grid should be addressed:

1) NYSERDA should consider overall deliverability across local interfaces as well as NYISO minimum interconnection standard impact on NYISO interfaces.

2) New York City and Long Island are load pockets, and load pockets within load pockets, which often require “must run” generation for voltage support and other system operating parameters.

3) A substantial amount of Operating Reserves for NYISO originate in Long Island and New York City. The impact of offshore wind on Operating Reserves may well alter the economic dispatch of local generation, which in turn could result in increased energy prices. The local ratepayer should not bear the cost of that impact and NYSRDA should consider how to socialize those costs across the New York Control Area. Similarly, the impact on economic dispatch of local generation and imports needs to be fully assessed to insure local ratepayers are not unfairly impacted.

4) New York City and Long Island in particular have a relatively low load factor and during shoulder periods and off-peak time frames the load is quite low and may not be able to accept injection of substantial quantities of offshore wind. NYSERDA should consider and plan for how to deliver the excess energy to the rest of the State as well as the impact of potential curtailments.[2]

5) Interconnection Costs are very much dependent on the service requested (i.e. ERIS and CRIS). The price of the OREC will be based on total revenue sources available. The cost of CRIS and system upgrades may result in increased OREC prices. To obtain the lowest OREC price, avoiding large system upgrades by selecting ERIS may be most economic but may result in periods of curtailment. NYSERDA should consider the cost benefit of this option.

7. The Order requires that an eligible project must deliver its energy into the New York Control Area (NYCA), either by direct lead into New York or directly into an adjacent control area with transmission into NYCA (Order, p. 46).

    a. Please specify the transmission service requirements and the transmission path from an adjacent control area to enable delivery into NYCA. What requirements should be included in the RFP to support NYSERDA's need to verify delivery into the NYCA?

The RFP requirements should follow the standard Regional Transmission Organization (RTO) protocols for scheduling transactions between control areas -- ensuring the accounting for the

[2] As one illustrative example: On Sunday, November 5, 2017 at 3 a.m. on Long Island, the real time integrated load was 1,472 MWs. Similarly, in New York City at that same day and time, the load was only 3,951 MWs. (Source: NYISO Load Data).

transaction (e.g. NERC Tag, Transmission use charges, Point to Point Transmission Service, GAT verifications etc.)

The difficulties of transmission predictability, both in day-to-day scheduling and over the long term, are substantial. For example, ISO-New England does not have a conceptual equivalent of firm point-to-point transmission service, making predictability and curtailments difficult to assess. As far as PJM is concerned, the Regional Transmission Expansion Plan (RTEP) process can appear unpredictable in both outcome (whether it applies to a particular project) and quantity (the amount of cost imposed on a project) and long-term risks of transmission of bulk power from PJM to the New York Control Area are difficult to assess. At a minimum, the RFP should require respondents to describe the measures to assure the delivery of a specific quantity of MWhs into the New York Control Area and measures to identify and control the regulatory and operational risks embedded in the delivery.

b. For projects interconnected in a control area adjacent to NYCA but that deliver energy into NYCA, please describe the risks associated with such delivery. How should these risks be allocated? What options are available to proposers to manage such risks? Should the risk of curtailment be reflected in the contract? If so, how?

Developers could be given the option for pricing the delivery of energy though firm or non-firm Point to Point transmission service. This will give NYSERDA the option of selecting the service that meets its needs and the most competitive pricing. For example, Firm Point to Point service is the most expensive service but mitigates potential curtailments. Non-Firm Point to Pont service is generally considerably less expensive but exposed to potential curtailments or congestion costs. Nonetheless, the price advantage could be quite substantial.

One major concern that would add considerable costs to the option of a wind energy developer seeking to interconnect in a control area adjacent to NYCA is the possibility that PJM or ISO-New England would allocate unreasonably excessive RTEP or other network improvement charges.

The various issues around RTEP have spawned a considerable amount of controversy and many administrative proceedings. Those matters are well on the way to resolution but appear to have left the RTEP methodology and many outcomes largely intact. As a result, RTEP risks remain formidable – at least for the near future – and it is difficult to define how NYSERDA or any other entity outside of FERC or PJM itself can change this.

An illustrative example of this challenges occurred in 2015, when the New Jersey electric utility, PSEG, tried to allocate charges for upgrades in the New Jersey electric system to New York consumers. Initially, the bulk of these upgrades were going to be assigned to a long-standing transmission agreement with Consolidated Edison (called "the Wheel").[3] ConEd filed complaints against the allocation with FERC, which the Commission rejected, whereupon ConEd renounced the transmission rights that had been granted to it under the decades-old arrangement. In a demonstration of why the stakes in this RTEP allocation drama were extremely high, Con Ed was assessed more than 80% of the $762.6 million for its 1,000 MW wheel while PSEG with its load of 11,000 MW was assessed only 7%. These procedures and regulations, while highly technical, have huge implications for interregional transmission projects.

8. With respect to capacity attributes of projects:

    a. What transmission arrangements would have to be made in ISO-NE or PJM to facilitate the long-term delivery of capacity to NYCA? What requirements should be included in the RFP for NYSERDA to evaluate the feasibility of delivery of capacity to NYCA?

The NYISO Installed Capacity Manual's Requirements to Qualify as an External Installed Capacity Supplier (ICAP Manual, Section 4.9.1) addresses this question. The requirements are detailed in this section. NYISO establishes the maximum amount of Unforced Capacity that can be provided to the New York Control Area by resources located in each neighboring control area, according to the procedures contained in Section 2.7 of the ICAP Manual.

Alternatively, a resource from ISO-New England and PJM can provide capacity to NYISO via Unforced Capacity Deliverability Rights (UDR's) as described in section 4.14 of the ICAP manual, where by definition UDRs are rights, as measured in megawatts, associated with new incremental controllable transmission projects that provide a transmission interface to a New York Control Area locality.

    b. For projects interconnected in a control area adjacent to NYCA but that deliver capacity into NYCA, please describe the risks associated with such delivery. How

[3] As reported in RTO-Insider of August 14, 2017, "The Con Ed-PSEG wheel began in the 1970s as a grandfathered service by PSE&G, and was converted in 2012 to the PJM Tariff…. Con Edison says RTEP charges currently represent about $9 million of the wheel's $40 million annual cost. The $600 million allocation for the short circuit fix would quadruple the cost of the wheel to $160 million annually, Con Ed says. 'While Con Edison continues to find value in the service that the Commission approved as important to regional reliability, irrational increases in costs could ultimately undermine this arrangement.'"

could these risks be allocated? What options are available to proposers to manage such risks?

It is certainly possible that wind generation developers who hold leases in Federal Wind Energy Areas off the coasts of Massachusetts, New Jersey or other states might submit bids to "wheel" power through ISO-New England or PJM to the NYISO. However, the history of RTOs and Independent System Operators (ISOs) allocating unreasonably high RTEP allocations for such cross-jurisdictional transmission suggests the possibility that this option could make such bids untenably costly. (See answer to 7B above for further detail.)

To manage and seek to decrease that risk, NYSERDA could engage the neighboring PJM and ISO New England in discussion and negotiation to convince them to refrain from such RTEP overcharges.

Irrespective of whether such an overture is successful, we urge NYSERDA, to ensure deliverability and comparability of bids, to be clear that all wheeling and related charges for transmitting wind-generated electricity through neighboring control areas will be the responsibility of the generator.

9. What level of detail should proposers be required to provide to demonstrate the reasonableness of their transmission cost estimates for HVDC or AC export cables, interconnection, and/or transmission system upgrades (if needed) included in their bid prices?

We encourage NYSERDA to require significant details from bidders about their transmission design, including cost estimates for HVDC and HVAC export cables, interconnection infrastructure, collector and/or converter stations, substation upgrades and other related components.

NYSERDA should require separate pricing of the transmission and generation elements of the project, and, within the transmission element, a breakdown of pricing – perhaps through employing cost ranges to reflect some variability in vendor negotiations, volatile prices of component parts like copper, and interest and exchange rates – for each of the major components: export cables, interconnection infrastructure, collector and/or converter stations, and substation upgrades.

NYSERDA could consider providing preliminary cost estimates for system upgrades at key points of interconnection and give developers guidance on their selection. For example, the Long

Island Power Authority provided such guidance in its August 2010 Request for Proposals To Provide Electric Capacity, Energy and Ancillary Services.[4]

A major uncertainty that will challenge bidders is the challenge in accurately estimating what the relevant ISO or utility will charge to connect to the system. While the developer can hire expert engineering firms to estimate what the RTO or ISO or the utility will charge to connect to the system, even the best experts have repeatedly underestimated what will be charged for the connection.

For example, Anbaric was one of the developers of the Hudson Transmission Project (HTP), in which the initial feasibility study conducted by PJM indicated the project would be charged about $50 million for upgrades to the PJM system. On the basis of that study, HTP proceeded to the next phase: a system impact study. That study was delivered a year later and issued a new interconnection cost estimate of $500 million. After another year of discussions between HTP and PJM, the final cost was settled at $170 million, after HTP reduced the quantity of firm transmission withdrawal rights requested from 660MW to 330MW.

10. How should NYSERDA consider a strategic partnership between an offshore wind developer and a transmission owner in project viability or other award determinations? Are there reliability, economic, and/or operational benefits associated with such a strategic partnership as it pertains to "wet transmission," i.e., onshore substation, offshore substation and export cable?

The challenges involved in designing, siting, permitting and constructing transmission associated with any electric generation project -- and, because it is a new activity, especially offshore wind generation -- are significant. We are very encouraged that Governor Cuomo this week announced a study of successful offshore wind transmission models, with a specific focus on large scale European projects.

Independent transmission developers with extensive experience designing, permitting and building transmission in the United States – and especially in New York -- are a potent resource to both wind generation developers and New York energy regulators in maximizing the viability of offshore wind projects and speeding their deployment with skill.

For that reason, we were pleased to see that the New York Public Service Commission (PSC), in its July 12 Order, explicitly stated that its decision to hold the generator responsible for

[4] See "Request for Proposals To Provide Electric Capacity, Energy and Ancillary Services to the Long Island Power Authority, originally issued on August 20, 2010 and amended on December 17, 2010.

transmission development in Phase 1 "does not preclude any potential independent developer from participating in the Phase 1 procurement process." The PSC added that "any generation develop is free to arrange for transmission with an independent developer to provide services, and present that arrangement in its bid." NYSERDA, the PSC said, "should take into account the potential effects on project viability of varying transmission arrangements."[5]

By encouraging strategic partnerships between offshore wind developers and experienced independent transmission developers, within the project viability section of the RFP, NYSERDA would be signaling that it will assign value to project bids that recognize how difficult it is to successfully build transmission in the United States and mitigate that difficulty by partnering with seasoned, U.S.-based transmission developers, ideally those with experience building transmission in New York.

This would allow independent transmission developers to apply their expertise, talent and assets to work with wind generation developers to plan and construct the best transmission solution for ratepayers. Rather than slowing the process, as some have suggested, an experienced transmission developer intimately familiar with the engineering challenges, large-scale project management, permitting processes and public engagement could accelerate the pace of transmission permitting and construction.

Wind generation developers frequently raise a concern about so-called "project-on-project risk." To address the risk of the generation component being completed ahead of the transmission component, or vice versa, a commonly deployed contractual obligation would legally bind each party through interlocking development schedules, milestones for payment, and contractual provisions requiring specific performance throughout development. Properly drafted and structured contracts would produce timely delivery of each project milestone at every step of the process.

The contracts would include financial penalties for either party which fails to meet the schedule and/or performance benchmarks, compensating the on-time party for any lost revenue. This approach is a common application of liquidated damages found in many contracts and is frequently used to resolve misaligned schedule performances in development partnerships.

From our deep experience, we also believe that both winning companies would have extremely strong financial and reputational incentives to make every effort to work effectively together and

[5] State of New York Public Service Commission Order Establishing Offshore Wind Standard and Framework for Phase 1 Procurement, Case 18-E-0071, July 12, 2018, page 58.

to deliver their respective projects on time and on budget. Developers of all stripes naturally have maximum incentive to complete their projects and begin generating and transmitting energy as soon as possible.

Bid Price Evaluation

16. How should the Benefit Cost Analysis Framework set forth in Case 14-M-0101 (Reforming the Energy Vision) be applied or otherwise refined in the 2018 RFP regarding price evaluation?

As the PSC's Benefit Cost Analysis (BCA) Framework order acknowledges, externalities associated with carbon have yet to be quantified and in lieu thereof the EPA's Social Cost of Carbon value has been used to support the State's REC program. There is no specific role for the BCA Framework in assessing offshore wind proposals given that the State's Clean Energy Standard goals have been set.

In comparing competing proposals for generating and delivering offshore wind production, more traditional means should be employed focusing on societal costs as well as ratepayer impacts and ensuring an apples-to-apples comparison by looking at total all-in costs on the basis of GWH delivered into the existing grid at nodes with well understood economic properties.

18. What bid price evaluation process "lessons" have been learned from offshore wind procurements in other jurisdictions that NYSERDA should take note of for purposes of the 2018 RFP?

As New York looks to generate 2400 MW of offshore wind power by 2030, it is imperative that State leaders use and improve upon the lessons learned from Europe to develop crucial transmission infrastructure. European countries, including Germany and the Netherlands, have the most experience developing offshore wind in the world and continue to embrace open-access transmission systems that have enabled the offshore wind industry to thrive and see remarkable reductions in costs.

We were thus delighted when Governor Cuomo this week announced a study to guide cost-effective offshore wind development in New York. By examining and understanding successful offshore wind transmission models – with a specific focus on largescale European projects – New York can determine how key learnings can help guide the State to reach its offshore wind goals. We look forward to the results of this study as we expect that it will provide a timely

roadmap for how carefully planned transmission infrastructure can yield the best results with increased competition, affordability and scale.

21. Are there other provisions that are consistent with the structure of the order that would, if included in the RFP, allow for more competitive pricing?

We were dismayed that the New York PSC Order appeared to discourage bidders from including and/or advancing creative thinking about an expandable open-access transmission infrastructure in Phase 1.

The Order states: "If a developer presents a bid that includes transmission or interconnection systems that are built to serve greater capacity in the future, the overbuilt portions will not be accorded additional value in the bidding evaluation." The Order continues: "Developers may choose to size their transmission facilities with increased usage in mind, but that business decision should be reflected in the bids presented in subsequent procurements."[6]

It is important, given that direction from the PSC, that a NYSERDA priority should be to "do no harm" by avoiding steps in Phase 1 that make it harder and costlier to build subsequent rounds of offshore wind and related transmission. At a minimum, NYSERDA should be concerned about developers underutilizing and tying up one or more of the few optimal interconnection points.

By only allowing offshore wind generation developers to respond to the Phase 1 RFP(s), the Order will likely lead to those developers seeking to secure the least expensive, easiest-to-reach points of interconnection with the onshore grid to minimize the near-term costs of the generation projects they offer in response to a RFP. This would have the effect of precluding future use of these optimal interconnection points because the best and likely only viable route from the shoreline to the optimal point of interconnection with the onshore grid will already have been used to accommodate the generator interconnection facilities for the offshore wind generation projects selected in the initial RFPs. No reasonable neighborhood, hamlet, village, town or county will allow its roads to be dug up again shortly after an early winner's onshore transmission line has been buried in or alongside a road to allow another, similar transmission line to be buried there.

[6] State of New York Public Service Commission Order Establishing Offshore Wind Standard and Framework for Phase 1 Procurement, Case 18-E-0071, July 12, 2018, page 58.

Those initial generation developers will enjoy significant and lasting advantages that may allow them to pose barriers to future competition and foreclose – or at least render far more costly - the development of open access offshore transmission that would remove or lessen such barriers to competition. Under such a scenario, the fundamental benefit of planned open access offshore transmission – robust competition among wind generation developers and the lower costs and prices that it produces over the medium and long term for offshore wind infrastructure – will be lost.

With due respect to the PSC's direction on this point, we strongly urge NYSERDA to include guidance in the RFP that encourages inclusion of responsible and creative thinking about how its initial project transmission infrastructure could be expanded in the future to become part of an expandable open access transmission infrastructure. Because planned, open access transmission will be key to lowering costs and accelerating deployment timetables in successive RFPs in Phase 2, this encouragement would fit appropriately into the weighting and scoring for economic benefits.

Economic Benefits

23. In addition to project-specific spending and job creation in New York State, the Order encourages investment in enabling supply chain and infrastructure in New York, and commitments to offshore wind industry and supply chain stimulating activities that create real, persistent and sustainable institutional or labor capabilities in New York State, and that lower the cost of future offshore wind projects (Order, pp. 52-53).

    a. How should NYSERDA evaluate whether any investment is likely to lower the cost of future offshore wind projects?

Please see our answer to question #21 above.

26. In accordance with the Order, NYSERDA is interested in conveying greater weight to those expenditures and investments that (i) create persistent institutional or labor capabilities in NYS, and (ii) lower the cost of future offshore wind projects (Order, pp. 52-53). Please comment on:

    a. The proposed approach;

    b. What information may be reasonable to use as the basis for assigning such additional weight; and

c. How much additional weight is appropriate to assign to expenditures or investments that create such benefits.

Because we strongly believe that a planned approach to open access transmission for offshore wind is essential to lowering the costs of future offshore wind projects and achieving the Governor's goal of 2400 MW by 2030, we were disappointed that the final decision reflected in the PSC Order bundled generation and transmission and excluded independent transmission developers from competing to build the transmission component.

We took heart from the Order's encouragement to accelerate serious planning for open-access transmission system for Phase 2 and NYSRDA's announcement that it will convene a technical conference on offshore wind transmission by the end of September. We also greatly appreciated the Order's specific note that generation developers are permitted to partner with transmission developers. More recently, we were delighted by the Governor's announcement this week of a study of offshore wind transmission models with a focus on the European experience.

The design of optimized transmission infrastructure that anticipates, from the outset, the best ways to bring wind-generated electricity from current and future offshore areas to shore and to connect and integrate it into the onshore grid is vital to the successful deployment of offshore wind energy in a way that best serves the public interest of New York's residents and businesses. In New York, this requires designing transmission routes that navigate potential environmental and use conflicts while integrating with and making efficient use of limited interconnection points to bring offshore wind energy to the grid.

Open access, planned transmission has been implemented to great success in Texas with land-based wind generation and in Europe with offshore wind generation. This approach to shared offshore transmission in Europe has helped lead to zero-subsidy bids by wind generators, with The Netherlands and Germany leading the way. It is also the way that the bulk power grid operates across the United States, especially bulk power grids administered by RTOs and ISOs, where transmission facilities are subject to open access rules and transmission planning and operations are always at least functionally separate, and often structurally separate, from generation.

Incorporating this approach to offshore wind would provide the following advantages for New York:

1. *Accelerated permitting, construction and grid connection* – Rapid and efficient deployment of wind energy to the grid is a major priority for New York's leadership. Planned transmission systems can be designed, reviewed and built in parallel with wind farms and are scalable as multiple WEAs, within the New York Bight and regionally, are developed and ready to be brought on line. An experienced transmission developer familiar with the engineering challenges, large-scale project management, permitting processes and public engagement could accelerate the pace of transmission permitting, construction, and ultimately connection of offshore wind power generation facilities to the grid.

2. *Reduced footprint and conflict* – An approach that requires each offshore wind generation developer to build its own transmission infrastructure from each offshore wind farm to an interconnection point with the onshore bulk power grid, when extended over the development of an offshore wind program scaled to meet, for example, New York's 2,400 MW goal, could yield six or more sets of generator lead lines across the ocean floor. Those six lines would all compete for the few viable interconnection points capable of accommodating large amounts of injected electricity without dramatic and costly upgrades. That proliferation of seabed transmission cables is inconsistent with avoiding and mitigating impacts on environmental resources and potential conflicts with other uses, especially in crowded and complicated areas in the New York Bight. Indeed, NYSERDA has specifically highlighted the avoidance of "third-party infrastructure," including subsea cables, as a major challenge facing offshore wind developments off of New York.[7] The impacts of multiple lead lines carry over to the onshore as well. Activities involved in laying and connecting six or more sets of generator lead lines to inland interconnection substations would require digging up the roads and rights-of-way, along with other construction disruptions, six times in the example we use, through communities along the routes—as compared to as few as two, with a planned transmission system featuring offshore collector stations. This raises significant onshore engineering challenges in limited rights-of-way, increases the potential for the use of eminent domain, and complicates the ability to avoid estuaries and navigate other sensitive shoreline points of entry.

3. *Efficient access to limited interconnection* – If planned open access offshore wind transmission is not incorporated into New York's planning and permitting processes, an unfortunately likely outcome will be that scarce and high-value interconnection points, cable routes, and sea-to-shore transition points will become a choke point for bringing wind energy to the grid. This problem is particularly acute in New York, where there are limited points of interconnection that can accommodate injection of 2,400 MW without major and expensive upgrades. Additionally, projects may find themselves precluded from using these scarce assets because, in the densely populated areas where the grid attachments are most likely to be made, it

[7] NYSERDA Report 17-25 at 55.

will be extremely challenging and cost prohibitive to lay additional cables on an already used route, to expand the relevant substation, or to permit another line in an environmentally sensitive area.

4. *Cost savings* – Planned open access transmission can advance the public interest by harnessing the power of competition to secure the best projects at the lowest cost, while at the same time share transmission costs across multiple offshore wind generation projects. Transmission costs typically range between 15 to 25 percent of an offshore wind project's total and can be as high as 30 percent.[8] Based on reports from European offshore development, sharing transmission results in cutting transmission's portion of the project cost, reducing those costs up to 40 percent. Additionally, as it relates to financing, the cost of transmission can also be financed separately from generation and paid off over a much longer period — with corresponding lower monthly payments.

Project Viability

30. What information and documentation should be required of proposers to demonstrate viability (please be specific as to the type of information and the level of detail which should be submitted), as follows, based on the criteria listed in the Order (Order, p. 53):

    a. Permitting Plan and Status: What level of detail should a proposer provide with respect to the project permitting plan and the status of each required permit?

Bidders should provide a detailed list of all permits, licenses, or other permissions required to build and operate the project, the status of each permit, and for those not yet obtained, a detailed plan and schedule to do so. Bidders should also describe their experience permitting similar assets in New York State.

    b. Financing Plan: What level of disclosure should a proposer be required to submit to demonstrate financial strength, *e.g.*, audited financial statements, project pro forma, expressions of interest from equity and debt investors, other?

[8] The PSC recognizes that "[t]ransmission is a large cost component of an offshore wind project," which "may comprise 30% of total costs of an offshore wind development." Phase 1 Procurement Order, at 54.

Bidders should demonstrate the financial viability of their proposed project. Each bid should include a description of the business entity structure of the bidder, from a financial and legal perspective, as well as any relevant affiliate relationships. A financing plan should be included, covering budgets for development, construction, and operating expenses and anticipated revenue sources. Expressions of interest from equity and debt investors should not be required, but the RFP should request them and give appropriate weight to such expressions. Bidders should demonstrate experience in financing projects of similar size and technology.

c. Developer Experience: How should proposers demonstrate that each member of the proposed project team has sufficient relevant experience to finance and develop the project?

Each bid should describe in detail the experience of the bidding organization and each senior member of the proposed project team in designing, financing, developing and building wind generation and transmission projects of similar technology and scale (to the proposed New York offshore wind project). Each should list projects successfully developed and include resumes of key personnel dedicated to the proposed project. Bidders might also note projects that were fully designed and largely developed by the company but which were not financed and constructed, including a description of the reasons why, as that experience can inform and equip a project team to successfully deliver the next project.

d. Proposed Technology: What level of detail should a proposer provide with respect to the project design and construction plan? How specific must a development plan be with respect to turbine arrangement, number and size of turbines, foundation design, turbine / blade selection, electrical collector station, export cable design / route, landfall location, and interconnection point(s)?

The technologies behind offshore wind and transmission are rapidly evolving, and may improve dramatically, even in the short time between when bids are submitted to NYSERDA and when a project is ready to begin construction. For the benefit of New York's ratepayers, bidders should have the flexibility to deploy the most cost-effective technologies available at the time of construction. The general location of the proposed wind farms should be identified, and potential foundation types should be discussed. However, detailed designs and turbine layouts need not be completed until developers file their Construction and Operation plans with BOEM. Longer-lead time requirements, such as onshore points of interconnection, landfall locations, and onshore cable routing should be described with sufficient specificity to demonstrate viability.

e. Development and Logistics Plan: What level of site control should be required for the necessary port facilities and other support infrastructure? What level of detail should be required in order to demonstrate the reasonableness of proposer's equipment procurement plan, including selection and scheduling for construction vessels? Should proposers be required to submit a decommissioning plan, and if so, what level of detail and specificity should be required?

At a minimum, a construction and procurement plan should be required that identifies a schedule for executing contracts, mobilization and delivery of equipment. Of note is that the MA 83C offshore wind RFP included construction and logistics parameters in its Appendix B, Section 10 (pages 68-69) that are worth review.[9]

f. Interconnection Status: Should the RFP require additional minimum requirements, beyond a valid interconnection request having been submitted to NYISO, with respect to completion of interconnection studies and the project's status in the interconnection process? If so, what should the

[9] Appendix B, Section 10, reads as follows: **CONSTRUCTION AND LOGISTICS.** This section of the proposal addresses necessary arrangements and processes for outfitting, assembly, storage and deployment of major project components such as turbine nacelles, blades, towers, foundations, and transmission support structures. Please provide a construction plan that captures the following objectives:

10.1 Please list the major tasks or steps associated with deployment of the proposed project and the necessary specialized equipment (e.g. vessels, cranes).

10.2 Please provide documentation to demonstrate site control for all marine terminals and other waterfront facilities that will be used to stage, assemble, and deploy the project for each stage of construction.

i. If available, evidence that the bidder or the equipment/service provider have right(s) to use a marine terminal and/or waterfront facility for construction of the offshore wind energy project (e.g., by virtue of ownership or land development rights obtained from the owner).

ii. If not available, describe the status of acquisition of real property rights for necessary marine terminal and/or waterfront facilities, any options in place for the exercise of these rights and describe the plan for securing the necessary real property rights, including the proposed timeline. Include these plans and the timeline in the overall project schedule.

iii. Identify any joint use of existing or proposed real property rights for marine terminal or waterfront facilities.

10.3 Please describe the proposed approach for staging and deployment of major project components to the project site. Indicate the number, type and size of vessels that will be used, and their respective roles. Please include specific information on how the bidder's deployment strategy will conform to requirements of the Merchant Marine Act of 1920 (the Jones Act).

10.4 List the party (e.g. the bidder, or equipment/service providers under contract to the bidder) responsible for each deployment activity and describe the role of each party. Describe the status of bidder's contractual agreements with third-party equipment/service providers

requirements be? Please describe in detail how transmission and interconnection cost risk should be analyzed by NYSERDA.

Onshore transmission system upgrades are one of the biggest unknown costs to any generation or transmission developer. All bidders should meet the threshold of having filed a valid interconnection request with NYISO or the relevant RTO. If a proposed project has not yet completed the System Reliability Impact Study (SRIS) phase of the interconnection process, then the bidder should provide a technical study, conducted by a reputable engineering firm, to anticipate the NYISO (or relevant RTO) SRIS (or equivalent) results, including the costs of system upgrades necessary to ensure full deliverability of the generation from the offshore wind farm. Projects that have advanced through the NYISO interconnection study process should score better in the NYSERDA evaluation process.

g. Reasonableness of Project Development Milestones: What milestones should be included in the development plan? What factors determine the reasonableness of the milestone schedule?

Bidders should provide a complete critical path schedule for the project from the notice of selection for a contract through the RFP to the beginning of commercial operations. Milestones should include preliminary engineering, financing, acquisition of property, permit acquisition (Federal, State, and Local), completion of interconnection studies and execution of an interconnection agreement, procurement, start of construction, relevant construction milestones, and finally, commercial operations date.

h. Community Outreach: How should proposers be required to credibly demonstrate their community outreach and support?

Bidders should describe their outreach to date and plans going forward to engage with affected communities. Stakeholder groups should be identified and a plan for disseminating project information and updates provided. Community agreements or letters of support from any stakeholders should be provided.

i. Environmental Impact: At the time of proposal submission, what geotechnical, geophysical, biological, and archeological studies should be completed and available?

NYSERDA should develop a description of all geotechnical, geophysical, biological, and archeological studies that it will expect to complete for each proposed project before a date

certain after the award(s) are made and any initial or baseline studies that it will require as part of the proposal submission. We expect that such studies will be at various levels of completion at the point of proposal submission and it may not be reasonable to expect all to be completed as of that juncture. That said, bidders should be required to provide summary reports of any geotechnical, geophysical, biological, and archeological studies that have been completed or are underway at the time of proposal submission, and provide a description and schedule of any such studies that the bidder expects to undertake prior to finalizing project design.

j. Wind Resource Assessment: At the time of proposal submission, what wind resource studies, turbine power curve data, energy yield calculation, gross (turbine) output, expected availability, and losses by category should be available or provided? Should this this information be indicative or binding? What changes should be allowed?

Any available wind resource assessment reports should be provided subject to confidentiality protection. However, changes should be allowed to encourage offshore wind developers to take advantage of technology advances.

Marine, Environmental and Other Impacts

31. The Commission Order references that the Offshore Wind Master Plan and its incorporated study that concluded that a 20-mile setback from any coastal position would minimize visual impacts during most times of day (pp. 49-50). NYSERDA has the discretion to tailor the setback requirement if it determines that a modified approach is necessary to optimize the overall environmental and economic benefits.

    a. What factors should NYSERDA consider in determining the RFP's setback requirement?

As NYSERDA considers how to tailor the setback requirement, Anbaric urges the agency to be mindful of transmission infrastructure needs and to accommodate the potential for transmission-related infrastructure outside of the WEAs, such as offshore collector platforms (OCPs).

NYSERDA's setback requirements should accommodate the siting of OCP infrastructure in proximity to the anticipated WEAs, while also recognizing that the potential impacts of transmission-related facilities on values such as view shed, fishing, navigation, and existing infrastructure are different from and often less significant than large-scale wind generation developments. Accordingly, siting and mitigation considerations, such as exclusions within 15

or 20 nautical miles of shore to minimize visual impacts, should be evaluated separately and on a site-specific basis with respect to transmission infrastructure.

32. The Order includes a number of provisions relating to environmental concerns and commercial fishing interests (Order, pp. 47-48) including the development of best management practices and the submission of a fisheries mitigation plan.

    a. Are there examples of best management practices that could serve as a useful starting point for environmental and commercial fishing considerations?

While most of the submarine export cables off New York will likely be buried, it is possible that some localized sections of the submarine cables will be at a shallower than normal burial depth or laid on the surface as a result of geologic obstructions or the need to cross other existing submarine cables or pipelines. In these areas, some form of cable protection is required to protect the submarine cables from what is known in the cable industry as "external aggression events" – that is, anchor strikes, dragging anchors, fishing gear entanglement, etc. A typical strategy has been to place articulated concrete mattresses on the seabed over the submarine cables. Such mattresses are typically 8 to 9 feet wide, 20 to 40 feet in length, and about 9 to 12 inches thick.

Unfortunately, commercial fishing operations that trawl or use drag nets have said that their nets sometimes become caught on these concrete mattresses, and such events often damage fishing equipment at considerable cost of lost time and equipment repair.

NYSERDA could consider requiring alternative approaches to concrete mattresses as a response to this concern from the fishing industry. Several alternative options for physical protection of the submarine cables exist.

Protective mats made out of polyurethane that provide a smoother exposed surface (Polymat™) can be used. Cast iron split pipes (also known as ballast shells) can be attached to the submarine cable section that will be surface laid either prior to deployment from the cable lay vessel or by divers. Split pipes have a diameter slightly larger than the submarine cable they protect and when joined together can increase the bend radius of the submarine cable to allow it to match bottom contours. A similar alternative to split pipes is a polyurethane cable protection product called Uraduct®. The Uraduct® is attached to the section of submarine cable to be surface laid in the same manner as the split pipes.

To provide mariner awareness protection for submarine cables during the life of the cable, the use of Virtual AIS systems is becoming more commonplace and, in some cases, now required by cable insurers. These systems provide the ability to remotely mark the location of the submarine

cable in the seabed so it is visible to mariners through their onboard AIS system. The system can be configured to automatically send an alert to vessels within an established virtual protection zone around the cable to advise the mariner of their position relative to the submarine cable and to allow them to take corrective actions if necessary. Virtual AIS systems have already been deployed on submarine cables in New York State waters.

Eligibility/Contract Provisions

38. What factors should be considered in setting a latest allowable commercial operation date (COD) (Order, p. 46)?

An earlier commercial operation date will advance New York's interests by moving more quickly toward achieving the State's offshore wind goals and, perhaps more importantly, in the race to attract investments in the offshore wind supply chain and the ensuing economic development opportunities.

However, it may be less critical for New York to set a "latest allowable commercial operation date" than to be able to assess whether bidders' proposed CODs are achievable. Hence, bidders should be required to demonstrate the credibility of their development plan, construction plan, and their ability to meet their targeted COD. NYSERDA can then weigh the benefits of earlier vs. later proposed CODs and the implications of such for New York State.

c. If a selected project is not completed by the contractual COD, what size financial penalty should be levied for failure to perform?

This is a matter of ensuring that the financial penalty is calibrated to be a strong incentive to meet the contractual COD, but is not so outsized that it has unintended and/or negative consequences. Developers must be held accountable for their contractual obligation performance. However, the cause of the delay should be given consideration at the point of penalty assessment.

When excessively burdensome penalties are adopted, many developers will quantify and incorporate that risk into their pricing – creating a situation in which the ratepayer ultimately bears, indirectly, the cost of these penalties. An excessively burdensome financial penalty might also create challenges as developers seek to secure private financing. Penalty size consistent with Alternative Compliance Payments that Load Serving Entities are subject to for failure to secure sufficient RECs would be a fair approach for failure to achieve the contractual COD.

NYSERDA should also consider a cap on the financial penalty, for without one securing financing may be extremely difficult for developers.

39. The development of offshore wind is important to New York both economically and environmentally. Timely completion of on offshore wind project, in a cost-effective manner, is critical. What measures or arrangements do you consider the most efficient and effective ways to

    a. Ensure that the project proceeds on-time and on budget, and is protected from potential disruption and delays due to labor disputes?

Bidders should be strongly encouraged to enter into project labor agreements prior to the notice to proceed.