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To: New England States Transmission Initiative

From: Elizabeth J. Wilson,

Professor, Dartmouth College

Guest Professor, DTU Wind, Danish Technical University, Denmark

Regarding: Comments on New England States Transmission Initiative

Background

The state and federal policy goals to support offshore wind (OSW) development in the United States have the potential to transform the U.S electric system, and the New England electric system in particular. Development of 8,400 GW of OSW resources in New England would transform the production of energy in New England, and along with it, the operation of the electric grid. It would also support the transformation of the regional energy system, by allowing for the electrification transportation and heat energy sectors. If done correctly, development of OSW in New England can also support climate and environmental goals, economic and social objectives, and allow for increased grid resilience in the face of shifting and emerging risks, from storms to geopolitics. The current New England States Transmission Initiative is an important first step in creating the essential transmission infrastructure to support OSW development and ensure a reliable and affordable grid into the future.

Comments on New England States Transmission Initiative

While the stated public policy goals to develop a large-scale OSW in New England are laudable, meeting them requires extensive industry development and coordination across public and private sectors. AND it requires developing an extensive offshore transmission system which integrates and supports the function of the New England grid. Meeting the OSW public policy extends beyond the OSW lease areas and turbines and into the supporting infrastructures. A critical first step do develop significant OSW resources to transform the New England energy system is a regionally coordinated transmission plan. To provide a robust grid for the future, the New England OSW system should be meshed with other regional grids, and supported by new planning processes and cost allocation methods. A coordinated planning process and updated funding models are the first steps needed to support OSW development at scale.

Done correctly, the Participating States OSW transmission planning process can help to meet OSW policy goals. This process can reduce OSW development risks and costs and accomplish several goals simultaneously:

1. Reduce public opposition by reducing the number of sea to shore interconnection points
2. Reduce environmental and maritime impacts from OSW operations by eliminating duplicative cabling and interconnections.
3. Reduce system costs and speed development by coordinating and "right-sizing" meshed transmission infrastructures to support large scale OSW development. Such development can also help to shape OSW lease development, and reduce wake effects (or power cannibalization) from wind plant to wind plant.
4. Increase grid reliability and operational flexibility thorough system linkages to other regions to support large-scale OSW deployment and whole system resilience. Adding 8.4 GW of OSW to the system and ensuring proper system balance works better if shared across a larger generation and load area. Meeting these levels of OSW projects works better if supported by a larger grid system. This makes linkages with other RTOs and power systems critical.

If done correctly, the RFI design guidance has the potential to support OSW development and the new England grid. This process should be informed by international experiences and adopt international standards whenever possible. If done correctly, the Modular grid transmission plans and interoperable components could work smoothly to support OSW and reduce overall system costs.

As the presentations in the Technical Information session highlighted, New England is not the first place to address these challenges, and learning from the 50+ GW of OSW development around the world can help to support grid planning and operational developments as New England develops its OSW industry. The proposed Energy Islands in Northern Europe allow for the examination of OSW at scale.

I submit these comments in the spirit of supporting the participating New England states and encouraging them in the coordinated transmission planning efforts in the region and as part of the DOE's Atlantic OSW Transmission study. I have seen firsthand how coordinated transmission system planning can support renewables development and deployment at scale, in the U.S. and Europe. If offshore wind is to develop at scale in New England and in the United States, coordinated transmission planning is key.

Learn from Other Experiences

Meeting the OSW state policy goals requires policies to support transmission infrastructure. This is similar to ERCOT's (Texas) CREZ investment and transmission build-out (where costs

were socialized across the region), or MISO's Multi-Value Project for transmission (where the MVP lines were part of a public policy upgrade for the region). Both of these multi-stakeholder (and multi-state in the case of MISO) projects were undertaken to support policy goals in building out renewable onshore wind resources. In Europe, OSW transmission planning and support across the EU and in member states like Denmark, Germany, and the Netherlands have allowed OSW developers to bring record amounts of wind on line. EU funding and member state support of planning and transmission funding have been crucial for success. The new frontier is the EU development of offshore Energy Islands which aim to provide better flexibility and control of OSW resources and enhance continental energy security. Learning from these systems can help to inform the New England plan too. The US-Denmark MOU on Energy Cooperation or links to Danish Universities could be very useful for transmission planners, grid operators and other policy makers as the plan is developed. Hopefully, this can help OSW development in New England avoid making costly and short-sighted transmission investment decisions.

Coordinated OSW transmission planning can:

1. Reduce public opposition: Public acceptance of OSW, (or any new infrastructure in New England) is not easy and will require significant community engagement. Experience from New England and abroad highlights that sea to shore interconnection points are often important sites of contention and public opposition for OSW projects and associated transmission needs. To reduce the number of sea to shore interconnection points, a multi-criteria evaluation matrix for transmission plans could include this variable. In addition to evaluating cost of OSW and transmission changes in proposals, coordinated transmission plans and the associated development of multi-criteria evaluations can support public acceptance. Such a metric will better allow projects also incorporate requiring fewer sea to shore interconnections in their evaluation.

2. Reduce environmental impacts and impacts on other maritime users: Reducing duplicative cabling and associated transmission building can reduce the environmental impacts of OSW development and also reduce impacts for other users like fishing communities or shipping interests.

3. Reduce system costs and time lag: The current grid planning model is slow, with transmission queues often stretching decades. This is not effective for developing OSW to scale or meeting the stated policy goals. It is also expensive and uncertain. Additionally, the project by project approach for system upgrades creates uncertainty for developers and opens potential to "game" the system. As it is today, the transmission planning system is insufficient for OSW development at scale. Studies by the Brattle Group found over $1 billion in potential transmission savings. (Pfeifenberger, Johannes, Sam Newell, Walter Graff, Offshore Transmission in New England: The Benefits of a Better Planned Grid, Brattle Group, May 2020). Reducing redundant transmission system infrastructures can also reduce environmental

impacts and consumer costs. It can de-risk projects for developers as well and allow for better use of leased area space.

4. Increasing grid reliability and operational flexibility: Better coordinated transmission planning, and development of a meshed grid to better connect New England with neighboring energy systems can also reduce the costs of needed onshore transmission systems and better buttress system reliability needs. Active New England participation in the DOE's Atlantic OSW Transmission Study is critical to codify the benefits to the system and the system goals of developing OSW at scale. Ensuring that reliability and resilience interests extend beyond more narrow state or ISO-NE interests is critical for system development. Adding 8.4 GW of new OSW onto the grid works better if the system is larger and more able to balance the variable resource in an effective manner. Coordination and interlinkages with neighboring systems is critical for the smooth operation and integration of this resource. This is demonstrated regularly in the EU system.

Conclusions

In sum, supporting OSW development at scale means thinking beyond today's projects and today's transmission infrastructure to support the development of a reliable, affordable, and socially supportive energy system. The NE State Transmission Initiative is a good first step to meet OSW policy goals.

As a researcher focused on energy system transitions, renewable energy and transmission in the U.S. and Europe, I am happy to share publications, link with other colleagues in the U.S. or abroad, and support this process in any ways which are useful to the participants. Ensuring that the latest information supports New England OSW development efforts is one thing that Universities can effectively contribute. Information on my prior publications on this topic and biographical information below. I can be contacted at elizabeth@dartmouth.edu.

Best regards, and wishing you the best with the Integrated Transmission Plan.

Elizabeth Wilson

Professor, Dartmouth College

Guest Professor, Danish Technical University, Risø Wind Group

NOTE: These comments express the sole opinion and ideas of the Author. They are not in any way reflective of any position by Dartmouth College or its associates.

Selected Publications:

1. Monti, M, Rose S, Mullins K, **Wilson, EJ**. 2016. Transmission Planning and CapX2020: Building trust to build regional transmission systems. Report. May 2016.
2. Stafford, B, **EJ Wilson,** (2016) Winds of Change in Energy Systems: Policy Implementation, Technology Deployment, and Regional Transmission Organizations in the United States, In press: Energy Research & Social Science 21 222-236, http://dx.doi.org/10.1016/j.erss.2016.08.001
3. AB Klass and **EJ Wilson,** Interstate Transmission Challenges for Renewable Energy: A Federalism Mismatch, 65 *Vanderbilt Law Review* 1801 (Fall 2012), special edition on energy, awarded Honorable Mention in the 7th annual Environmental Law and Policy Annual Review (ELPAR)
4. Lincoln L. Davies, Alexandra B. Klass, Hari M. Osofsky, Joseph P. Tomain and **Elizabeth J. Wilson**. 2022. Energy Law and Policy, 3rd Edition. West Academic Publishing.
5. Jennie C. Stephens, **Elizabeth J. Wilson** and Tarla Rai Peterson. 2015. Smart Grid (R)evolution: Electric Power Struggles. Cambridge University Press.

Biography:

Dr. Elizabeth J. Wilson is a Professor of Environmental Studies and was the founding Director of the Arthur L. Irving Institute for Energy and Society (2017-2022). She studies how energy systems are evolving in the face of new technologies, new societal pressures and new risks. Her work focuses on how energy and environmental policies and laws are implemented in practice. She studies how institutions support energy system transitions and her work focuses on the interplays between technology innovation, policy creation, and institutional decision making. Her research has examined how energy policy stakeholders engage with the opportunities and challenges of within Regional Transmission Organizations, which manage the transmission planning, electricity markets and grid operations for over 70 percent of North American electricity sales. Her recent books include Energy Law and Policy, Third Edition (West Academic Publishing) (with Davies, Klass, Tomain and Osofsky) and Smart Grid (R)evolution: Electric Power Struggles (Cambridge Press) (with Stephens and Peterson). Wilson is on sabbatical until 2023 at the Danish Technical University's Wind Division in Risø, Denmark.

Elizabeth@Dartmouth.edu