

MEMO

To: DE Offshore Wind Working Group
 From: Willett Kempton, U Delaware
 Date: 6 Dec 2017

Re: Delaware strategy for offshore wind

Thank you for the opportunity to present options for Delaware to the Working Group this fall. In summary, Delaware could commit to a future project of economic size, with conditions attached to assure minimal ratepayer impact. This will be more effective than a small buy today. Second, Delaware can develop an OSW port, based on DE Bay's unique advantages which will lead to continuing utilization as the industry develops. Developers, testified to the Working Group that they expect a very large demand for deployment facilities. Each of these two recommendation is independent; only one of the two, or both, could be pursued.

My concern motivating this memo is that the Working Group discussion so far does not seem to recognize that we are in a radically different situation than when Delaware last considered offshore wind. Prices have dropped more than 50% over the past 18 months, and all our neighbors (NY, NJ, MD, VA) have made firm commitments to purchase offshore wind power. As of November 2017, Eastern state commitments add up to a 7,900 MW build, that is \$23.7 B of logistics, supply, and construction, right in our state's region, with correspondingly sized creation of heavy industry and jobs. Right now, Delaware stands alone in our region as letting this opportunity pass by.

Here I present just two recommendations, each buttressed by a series of facts. The facts are based on my extensive collaborations and planning over the past 8 years with marine contractors, vessel suppliers, port designers, and industries that build and install structures in the ocean.

Recommendation I

Delaware should establish a firm commitment to receiving bids in 2019 for facilities to be operational by 2023, for commercial-sized projects, which covers 16% of DE's electric load). The bidding process should seek at least 3 bidders and set a required limit on either price per kWh or ratepayer impact in \$/month. This might, but need not be, accompanied by an increase in the Delaware RPS for 2025 by about 25%. Ideally, a commitment would be a matter of state law to give investors confidence that Delaware will be in the game. (I do not believe that a small purchase today (say, 50 MW) is helpful to the state.)

Supporting facts:

- 1. The recent Maryland bids are over power market price.**

The prices for Offshore wind power in MD (~13¢/kWh, with subsequent escalators) are above the market price of power (DE has varied from 8.4¢ to 10.5¢ /kWh over past two years¹). Offshore wind power prices are now on a declining trajectory in the US, and I predict we will see further price reductions from the current competitive auction in MA, bids due by the end of 2017.

2. There is no need to pay more than we want for power. A commitment to a near-future auction (say, an RFP in 2019) can include conditions limiting any incremental cost. Maryland set a limit of a \$1.50 increment per residential bill; due to competition both bids from MD developers were under this criterion and both those are now signed contracts. Subsequent projects, if States conduct bidding well, could meet this incremental cost even if wind were a greater fraction of the load than it is in MD. There is no need to trust me or other cost analysts; the conditions can be set by the auction terms, as MD did. If they are not met, there is no deal. The price is totally in control of the buyer.

3. Delaware gains advantage by committing today to a power buy in the near future. By setting a significant target size, maximum price limit, and year range, Delaware would have an impact on the industry and on the state's bargaining power. Some flexibility in build year can help developers achieve best utilization of equipment and personnel, lowering the price, yet with no cost to DE ratepayers.

4. A small (say 50 MW) add-on to a Maryland project would not accomplish any job creation by Delaware. 50 MW is too small to get serious attention or consideration from developers, as their comments at the hearing suggested.

5. A target could be for clean energy; it need not be for only offshore wind. Delaware should of course continue to pursue solar, the small amount of on-shore wind available, and efficiency. The reason offshore wind should be included is that it is the largest commercial renewable resource in the state, and it is economical only in larger chunks. As an example, if the Delaware RPS were increased from 25% to 50%, meeting 2/3 of that 25% increased RPS, would be a significant size from a developer perspective, and the announced commitment would show that DE is serious and would give DE a seat at the table. Given price trends and a proper competitive auction, it should be possible to build such a project with, say, 2019 bidding and 2021-2023 start of construction. Ratepayer impact could be required to be, say, less than 2% over the past three year's average bill, or we could set a dollar limit like Maryland.

6. A zero or small ratepayer impact gives a net benefit to ratepayers. There are two arguments for ratepayer benefit. First, single-digit percent or dollar cost/month for substantial clean energy has been widely supported by Delaware consumers, as shown in surveys by the University of Delaware and as seen in other Eastern states. Second,

¹ Delaware residential Price to Compare: <http://www.delmarva.com/my-home/choices-and-rates/delaware/price-to-compare/> Per Delaware regulations, Price to Compare is approximately the wholesale cost of electric energy.

studies provided to the committee (Buonocore, et al, Harvard School of Public Health),, for example, a 500 MW project would have approximately \$40/month per household in health benefits. With the ratepayer impact in the range of a dollar per month, and \$40/month in health benefits. If you spend \$1 on electricity to get savings in health cost of \$40, this is not a “cost” to the ratepayer, it is a benefit.

Recommendation II

Delaware should encourage the development of an offshore wind deployment port. This could be at a location like the OxyChem site or at one of several sites further to the south. Ways to encourage are to facilitate private, public, or public-private partnerships to invest in such a port, to help work through permitting, and to support any needed channel extension.

Supporting facts:

7. There will be substantial power plant retirements (>15,000 MW) in PJM over the next decade², and offshore wind could displace 1/3 to 1/2 of that, with OSW growth now committed by Atlantic states at 5,500 to 7,900 MW³. The state of DE, by requiring that some of that new offshore wind be sold to Delaware ratepayers, frees existing in-state generation, if competitive, to substitute for the coming wave of power plant retirements. Without state action, 100% of this coming \$23.7 B industry is ceded to our neighboring states.

8. As all developers testified before the Working Group, several ports will be required to build and service this industry; Delaware has a natural advantage in potential ports. Delaware has the unique natural advantage of having potential port sites along the Delaware bay. These are within a protected bay with no overhead obstructions from Delaware City/OxyChem to the ocean. Also, these DE sites have substantial laydown area (well over the needed 86 ha or 200 acres). No other port in the Mid-Atlantic or Northeast has these characteristics—it is a unique advantage that Delaware has by virtue of its geography. Attracting builds and jobs to such a port would not require tying it to power contracts; it would have an inherent logistics and cost advantage. And, lasting employment is produced by providing superior facilities, like a purpose built port, not by “incentivizing” developers with one contract.

9. Demand for a port in the mid- to lower- Delaware Bay, with the described characteristics, would start in 2019 or 2020. I estimate need and year based on

² Retirement of 4,965 MW are already planned, and an additional 14,500 MW “at risk of retirement” per slides 55-58, Monitoring Analytics, Joe Browning presentation, “State of the Market Report for PJM”, MC Special Session, March 23, 2017.

³ MA 1,600 MW, by law. NY 2,400 MW, by executive order. MD 386 MW, already contracted. NJ 1,100 by law, or, with commitment by new governor and legislatively supported, NJ 3,500 MW. All-in capital cost using 10MW turbines by the early 2020s is expected to be \$3000/kW.

already-contracted build schedules and extensive discussions with marine construction and vessel operators. It is not speculative.

10. A \$500,000 DOE study which I directed found that current and advanced offshore wind technologies could be deployed from a properly designed Delaware port. Such a facility would begin to be used for offshore wind development as soon as it was developed (the need is as of 2019-2020), and in the longer term would gain an advantage over all existing, and most potential, ports in the mid-Atlantic and NE. This is documented in the report “Industrializing Offshore Wind Power with Serial Assembly and Lower-cost Deployment” for the US Department of Energy.

I am glad to answer questions about specifics or to provide the extensive analysis and data backing up either the facts or recommendations discussed. Willett Kempton, University of Delaware, willett@udel.edu