



JOINT COUNCIL OF TAXPAYERS ASSOCIATIONS OF LBI
(JCTA)
BOARD MEETING JULY 15, 2021

JCTA members invited Karen Conover to meet with us tonight to discuss wind energy and the Atlantic Shores Offshore Wind project. Board members of JCTA member organizations were invited as guests to this portion of the regularly scheduled JCTA meeting. Nine JCTA members, two consultants to JCTA and seven guests attended. Below is the section of the minutes from this part of the meeting, which commenced after the business portion of the meeting had concluded.

► **Guest Speaker: Karen Conover**

Introduction. John Hailperin, JCTA Vice-President, welcomed our guests and introduced Karen¹, mentioning her experience in renewable energy technology over the last 35 years in Europe, Asia and The Americas. He reminded the audience that Karen is speaking as a private citizen and Beach Haven taxpayer, not as a representative of her employer.

Opening remarks. Karen thanked JCTA for inviting her and stated that she wanted our time together to be more conversational than formal. She mentioned that she has worked in wind energy for 35 years and it has been a passion of hers from childhood. She grew up on the island, spending her summers here, and eventually bought a house a few blocks away from her parents' house in Beach Haven so her children could have the same experience.

She described her employer, DNV GL Energy ("DNV"), as the largest energy consultants in the world. It started with the maritime industry and is now in 114 countries. She lived in London for several years during the time that the offshore wind leases were happening there. She stated that she has worked globally with every developer and turbine manufacturer as well as most governments. She mentioned that DNV has no vested interest in any offshore wind projects or turbine manufacturers; DNV works completely independently.

Karen said that her business and personal lives intersect with offshore wind because it is an important part of both.

She said that while she respects everyone's right to have an opinion, some are forming opinions based on misinformation. She said that it is important to have the correct information and to know what the actual data points are. She stated that some information that is being passed along now is not accurate, but she did not elaborate.

[Note from the JCTA secretary, who created these minutes:

From this point on, I have edited or edited out the following:

- *Statements of opinion that the speaker voiced without including any question*
- *Basic questions and answers, e.g. What is BOEM? What is the name of the wind farm off LBI? Where is Ocean Winds?*

¹ John Hailperin's background summary has been incorporated with other information about Karen's experiences in the field of renewable energy in the addendum beginning on page 8. The supplemental information has been copied from "Devoted To Wind: Meet Karen Conover" by Michelle Froese from windpowerengineering.com published April 20, 2018.

Further, I have adopted the Q&A format, when possible, throughout the document even if the Q&A exchange was not as neatly done in real time. In so doing, I have constructed questions that may not have been articulated exactly as they are written, but I endeavored to capture the gist. In the interest of clarity, I have also occasionally consolidated statements that were uttered at different times during the answer to the same question.

In few situations, an audience member spoke, but actually asked no question and I have so indicated that as a lead-in to Karen's remarks.

I believe that memorializing Karen's answers and insights was the most important thing and I strove mightily to faithfully do so.]

#1. A guest shared his personal frustration about certain aspects of the Atlantic Shores Offshore Wind project ("Atlantic Shores") and voiced his personal opinions about the visibility and height of the turbines.

Karen:

- There are two projects in our vicinity and technically many more. Oceans Winds is using 12 megawatt ("MW") turbines manufactured by GE. Those turbines are 853 feet to the top tip of the blade. Because Ocean Winds has committed to purchasing and using these turbines, it could produce visualizations so the public could get an accurate idea about what the turbines would look like from shore.
- Atlantic Shores has not made its turbine choice yet.
- There are three turbine manufacturers: Vestas, Siemens and GE. All are making bigger turbines now. A lot fewer turbines need to be used when they are bigger [because the machines themselves are more powerful]. Because fewer are needed, they can be spread out farther from each other.

#2: Why can't the turbines [in the Atlantic Shores project] be pushed out further into the ocean?

Karen:

- The Bureau of Ocean Energy Management ("BOEM"), part of the U.S. Department of the Interior, identifies spots to put wind farms after careful study. They base their decisions on many environmental factors, including, but not limited to, the depth to the bottom of the ocean, which can significantly affect cost regarding cabling, as can the distance out.
- Off our shore, there is a big drop a certain distance off shore (Continental Shelf) and beyond that, it is impractical to build a wind farm.
- Other factors considered by BOEM include the location of navigation channels, military activities in the area and input by the fishing industry, which does not preclude more studies in the future.
- Focus on our area by BOEM has been going on for twelve years. Data has been and is being collected.

#3: Why didn't anyone tell us anything then?

A JCTA member volunteered that she remembered going to a meeting twelve years ago about a potential wind farm.

Another JCTA member pointed out that after the lease area was identified [by BOEM], it took some time to develop the plan for the project in the lease area. Consequently, there was

nothing to say than “We are working on it.” Once it was awarded by the BOEM, then you heard about it.

#4 A guest made a comment about the offshore wind project in Martha’s Vineyard and opined that the residents’ resistance to it was based on the visibility of the turbines from shore.

Karen:

- Visibility is also one of the many criteria BOEM uses to determine location of offshore wind farm leases.
- The process of determining where an offshore wind farm should be located, however, does not start with where we want it. Its location depends on what the data, thoughtfully collected and analyzed, reveals about the viability of that region.
- Offshore wind technology has become cheaper by 70% in the last decade.

#5 Can Atlantic Shores start building the turbines further out, i.e., starting at 20 miles out and building west vs. starting at 10 miles out and building east?

Karen: Sure, but it is more expensive to go out farther, i.e., more cabling. There are trade-offs, e.g., less visibility at the start vs. higher initial project costs. She clarified that the lease areas have already been sold by BOEM so there is less flexibility.

#6 Wouldn’t starting where it is less visible help the learning curve?, i.e., make the mistakes out there where they are less visible?

Karen:

- There is no learning curve. Offshore wind is not a fledgling effort.
- There are 116 offshore wind projects operating already and hundreds more are proposed. There are things to learn from all these projects, including those in the U.S., but there is no learning curve.

#7 Are you aware of any technologies being developed that would be alternates to offshore wind energy? A guest posed this question after pointing out that technology changes, i.e., what is cutting edge now would most likely be outmoded in 25 years.²

Karen:

- Figuring out how to make turbines run more efficiently while generating more megawatts of power produces cost reductions.
- Across the board, the cost has come down as manufacturers continue to update control systems and better understand the operation of the turbines. The cost of the technology itself is much cheaper than it used to be.

#8 The offshore wind areas that BOEM has put out for lease have already been determined, right?

Karen: Yes, for Atlantic Shores. The Hudson South area has not been put out for lease yet.

² A JCTA member concurred, further pointing out that this situation is true in all aspects of life in which technology plays a part.

#9 A JCTA member opined that New Jersey is being fairly aggressive in pursuing its renewable energy goals – perhaps too much so, particularly since offshore wind energy sources only operate at 50% capacity.

Karen:

- Don't confuse capacity and availability.
- Offshore wind turbines are available and ready to operate 97% of the time. Scheduled maintenance is part of the remaining 3%.
- Capacity = The percentage of time the turbine operates at 100% of its full output of power. Like any other machine, it is never going to operate at 100% capacity. Back up electricity grids are used when not operating at 100% capacity.
- Offshore wind turbines have more capacity than land turbines.

#10 Because of the variability of these machines, is there a back-up power source and if so, what would it be if it were not carbon-based?

Karen:

- Intermittent is not the same as unpredictable. Wind and solar are intermittent, but they are not unpredictable. Twenty years of data have been correlated and studied; there are tons of wind data from all over the world.
- Regarding power use, of course there are variations. Every time you flip on the air conditioning, there is always an adjustment being made. Power ramps up and ramps down continually.
- Coal and nuclear are terrible for ramping up and down. Gas is mostly used now to ramp up and down efficiently.
- The Utility³ puts all these pieces together – all the sources of power – and manages it through the power it buys across all available energy sources. Wind and solar complement each other very well, but the whole system works together as a whole to deliver power.
- How well the pattern of wind matches up with the actual demand helps us understand the value that energy has (value is not the same as cost). Offshore wind matches up well with the patterns of demand. In other places, it is solar that has more value, based on the particulars of the location.
- Intermittent power is not a problem per se. The future: Smart grids are where we are going because they integrate all sources of power.

#11 A JCTA member mentioned that 100% of our electricity now comes from coal, gas and nuclear. He stated that nuclear is going away as a power option and so is coal – both are in decline for different reasons, so both will have to be replaced. Wind and solar do not completely replace carbon-based fuels.

Karen: Wind and solar will never replace everything. There must be a balance. Power from ocean thermal [ocean thermal energy conversion] may be in the future.⁴ Battery storage is very exciting right now; there are some incredible innovations going on.

³ Based on context, I assume "Utility" is a reference to state offices of public utilities that purchase power for their states. In New Jersey, it is the NJ Bureau of Public Utilities.

⁴Ocean thermal energy conversion (OTEC) is a process or technology for producing energy by harnessing the temperature differences (thermal gradients) between ocean surface waters and deep ocean waters.

#12 What public agency is developing standards that developers have to follow? Are U.S. standards superior to standards in other countries? Who is in charge of monitoring?

Karen:

- DNV is the busiest certification company in the world and she mentioned several examples of specifics for which complex and detailed standards exist.
- Specific standards covering all aspects of these types of projects internationally and in the U.S. are established by the International Organization for Standardization.⁵
- In the U.S. BOEM is in the lead position, tasked with overseeing and coordinating all the other state and federal agencies involved. The BOEM website has tons of information on it, including all the studies done through the U.S. Department of the Interior.

A JCTA member also mentioned the Federal Energy Regulatory Commission, which is involved in development and construction operations. [**Note:** Website is www.ferc.gov]

#13 Are local contracts part of the initial offshore wind area leasing process?

Karen:

- No. That is done by BOEM. BOEM first issues the right to a developer or other entity to investigate the site and then BOEM awards the lease with the right to do something in that site.
- The NJ Bureau of Public Utilities purchases the power from the developer or other entity who has leased the site. EDF and Shell are the owners of this project and Atlantic Shores, the developer, has been awarded the lease; BOEM gives them the right to build.
- The State of New Jersey and the federal government (BOEM) oversee the project.
- In Massachusetts, there was an offshore wind project that was never developed. There was opposition and because it happened way before its time — ten years ago — no one knew what to do. The developers who had the project spent a fortune on pre-development work for years. Offshore wind development is beyond that now.

#14 The bigger the turbines, the more cost effective?

Karen: Depends on the contract, but yes, in theory.

#15 A guest suggested that the interests of corporations (profit) and property owners (views; lifestyle) are at odds and conflict arises when corporations seek to increase profits at our expense, even though we want clean energy.

Karen: I understand that there are differences of opinion.

A JCTA member said that you have to decide if it is a trade-off you are willing to make – you will see them to get the clean energy.

⁵ *The International Organization For Standardization (ISO) is an independent, non-governmental, international organization that develops standards to ensure the quality, safety, and efficiency of products, services, and systems. Its certification certifies that a management system, manufacturing process, service, or documentation procedure has all the requirements for standardization and quality assurance. ISO certifications exist in many areas of industry, from energy management and social responsibility to medical devices and energy management. ISO standards are in place to ensure consistency. Website: www.iso.org*

#16 After wind energy farms were installed and functioning in areas where there was initial resistance, was there any change in local peoples' opinions?

Karen:

- People liked them better than they thought they would. There have been many studies that concluded that people thought the wind farms were not anywhere near not as bad as they thought they were going to be
- Ultimately, no one wants change.
- Europe is always a mixed bag. In the five countries with offshore wind, property taxes and tourism were not affected.

#17 Where would we get more electricity for NJ if we did not have this project? There cannot be any more solar farms in NJ because there is not enough room and we obviously need more electricity.

Karen:

- Offshore wind is here because of the load center in the Northeast and the limited amount of land available for other options.
- Some businesses such as IKEA and Walmart are installing solar panels on their stores, but that is not enough.
- It is impractical and very expensive and inefficient to import power to the Northeast from other states, such as low-population states like Wyoming or Iowa.

#18 What is the impact of offshore wind on climate change?

Karen:

- Using offshore wind reduces the emissions put out by carbon-based fuels as our demand for electricity continues to increase. For example, a warmer planet makes us turn our air conditioning on more, which uses more energy.
- Emissions contribute to rising seas and ocean acidification, which causes higher water temperatures and huge damage in the ocean. For example, as a result, clams cannot make shells and without shells, they die.
- Rising seas cause worry about rentals property, e.g., Will renters want to come if there is worry that the beach is going to be closed because of flooding and erosion?
- Flooding is increasing – streets become impassable and renters demand refunds.
- Some people are concerned that the production of the turbines requires the use of rare metals, steel and other materials that use a lot of energy to produce. There is already a method in place to figure out how much things cost and the cost of wind is lower than any other energy sources.

#19 Is offshore wind production more reliable than on-land wind production?

Karen: Offshore wind is more consistent than on-land wind and, therefore, offshore wind optimizes production. The offshore wind turbines are more efficient and taller; the higher up you are, the better the wind sources.

#20 Who owns the wind farms?

Karen:

- Speaking from a global perspective, the answer is mixed: government, utilities, corporations, independent power producers (who work under contract, mostly the case in Europe, but not all), partnerships.
- In Asia, projects are owned by the government because that is how the system works there.

#21 How far are the blades off the water? If the seas swell – and they can 45' in a storm -- is that a problem?

Karen: The blades are 75' – 80' off the water.

#22 What are the wind turbines going to look like at night? Will they be lit?

Karen:

- They must be lit at night to aid aviation; the FAA (Federal Aviation Administration) has a lot of regulations about that, including that a structure more than 200' tall must be lit.
- Technology has been proposed for the Atlantic Shores project that allows the turbines to only be lit when a plane is in the vicinity.
- A Texas project with 100 turbines only lit the ones on the corners. There was a four-year study of this project that produced a lot of research about how many lights need to be on and for how long.
- The offshore wind energy community would love for the FAA to be more flexible, but the jury is still out.

A brief discussion ensued between audience members about whether the water towers on and off the island, which are all lit at night, were noticed after dark.

#23 Will the lit windmills look like an 18-mile landing strip at night?

Karen: The turbines are not in rows. They are in a grid, in squares one mile apart. Every tower does not have to be lit when a plane comes into the vicinity.

A JCTA member mentioned that in his experience, Atlantic Shores has never lied to the public. Representatives may have soft pedaled answers a little bit, but they have never been intentionally deceptive.

#24 Will wind turbines get taller?

Karen: The height of the turbines currently available is already pushing the limits of the ships and trains that transport them and highway underpasses that are involved in land travel.

#25 Why can't we see renderings now of what turbines that Atlantic Shores is going to use will look like from shore?

Karen:

- The visualizations that Atlantic Shores produces will answer a lot of questions about what the turbines will look like from shore.
- Atlantic Shores is currently in the process of negotiating deals to purchase the turbines and it would lose leverage if it prematurely published the visualizations before the deals were set. Also, there is a question of supply. One JCTA members suggested that visualization

drawing will be seen during the Construction Operation Plan of the process which will be open for public comment. Karen concurred.

#26 How are the turbines maintained and what happens after 25 years?

Karen:

- Routine maintenance is scheduled during low periods of wind. Unscheduled maintenance is accomplished as soon as it is possible.
- Wind turbines are extremely sophisticated and preventative maintenance is a big part of the industry now. Understanding what might happen allows the crews to be proactive.
- Maintenance vessels are a big deal in this country and that industry supports the offshore wind projects. Specialized vessels would need to be built, which spurs investment in this country. For example, Texas and Maryland are building facilities to handle construction and operations.
- After 25 years when the deal is up, nothing is abandoned, even though there is a rumor going around that they will be. That is not true. All of these projects are bonded and secured, so nothing is abandoned. Global powerhouses worldwide are involved in these power projects and walking away from them would be terrible for their reputations.
- On the subject of trusting these corporations to take care of their wind energy farms for the long haul, how do you trust anyone? With corporations, however, it is in their best interest to do the right thing so they continue to make money. They do not make money unless they continue to produce electricity. They own the projects. They are responsible for finding solutions if they do not deliver the power and they have to pay back the investment they put into this project. The owners of these wind energy projects take on all the risk.

We briefly discussed Maine's new law (effective July 7) that prohibits offshore wind farms in state waters up to three miles from shore. Karen stated that Maine has a contract for floating wind turbines, so maybe that is the direction they are going.

We circled back to climate change and the commitment to address it. Karen stated that Europe has made a major commitment to climate change, going further than the U.S. A guest pointed out that in the U.S., states control emissions standards. Tariffs are federal, but each state has the power to create its own emission regulations.

Regarding who is ahead regarding safety standards, Karen said that Asia blows our standards out of the water. She said that China is #1 in producing emissions, but the U.S. is #1 in emissions produced per capita.

ADDENDUM

Karen Conover

Karen Conover is a Vice President at DNV GL Energy, a global risk management company with multiple renewable energy advisory and certification offices in the Americas, Europe, and Asia.

Karen barely remembers a time when she wasn't interested in or researching renewable energy. It all started at a community science and energy event she attended in fourth grade. She remembers

going with her dad who, at the time, worked for the New Jersey Department of Environmental Protection and was an advocate for conservation and the environment.

In high school, Karen told her career counselor that she wanted a job in renewables and was told to pursue engineering. "I'm not even sure she knew what renewables were back then!" she laughs. But Conover was already well informed. She even wrote her college application essay on the benefits of recycling and renewable energy, not common topics for the early 80s.

After receiving her undergraduate degree at Duke University in Mechanical Engineering and Material Science, she sought a graduate program that specialized in renewables. Karen obtained a Masters in Science and Engineering from University of Arizona in Renewable Energy Systems where she focused on wind, solar, and clean-power generation.

After some time at an energy consulting firm, Conover decided to venture out on her own and started Global Energy Concepts ("GEC") in 1992. A wind-focused consulting company, GEC provided a range of services such as wind-resource assessment and due diligence. Clients included developers, equipment manufacturers, investors, government agencies, and utilities.

"GEC thrived, despite a challenging market for wind in the U.S.," she shares. "Although based in Seattle, we focused on international markets and I spent a lot of time on the road. In 2000, I brought on a business partner and we expanded further to meet the needs of a growing industry." Those in the industry took notice. In 2002, the America Wind Energy Association (AWEA) recognized GEC with an award for "building one of the world's leading wind consultancies." The company grew to over 100 employees, and eventually added an east coast office. GEC was acquired by DNV in 2008.

Karen has been working in the renewable energy industry for over 35 years and she has been a member of the American Wind Energy Association ("AWEA") Board of Directors since 1997. She is a Past President of the AWEA Board, has served as Chair of WINDPOWER, and on the Nominations, Membership and Awards Committees. In 2010, she was recognized as the Industry Woman of the Year by Women of Wind Energy and in 2012, she received the Britt Theismann Award for Outstanding Contribution to the Wind Industry from AWEA.

Beyond DNV GL, Karen is also a member of the board and co-founder of the parent committee at The Valley School, on the environmental grant committee of Social Venture Partners, and engaged in a number of local and national energy and environmental organizations.