



JOINT COUNCIL OF LBI TAXPAYERS ASSOCIATIONS (JCTA)

This document was created by the Joint Council of LBI Taxpayers Associations (JCTA) as a public service regarding the planned wind energy farm to be located east of Long Beach Island. The questions were developed by the JCTA Board and submitted to the representatives of Atlantic Shores Offshore Wind, the company that holds the lease to build and operate these windmills. JCTA members and representatives from Atlantic Shores met via Zoom on February 3, 2021 for a detailed Q&A session.

The purpose of the document is to present information about the proposed wind energy project. This document is not intended to be a final or conclusive report and *we are mindful that it only presents the perspective provided by Atlantic Shores*. The JCTA is continuing to gather information from a wide variety of sources so that everyone is as well informed as possible and the concerns of homeowners, boaters, the fishing industry and tourists are addressed.

Should you have additional questions or comments, please submit them to the Barnegat Light Taxpayers Association through the website www.barnegatlighttaxpayers.org.

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- WHO:** JCTA members, invited guests and members of a panel from Atlantic Shores Offshore Wind (“ASOW”): External Affairs Lead Jessica Dealy; Developmental Manager Doug Copeland; Community Liaison Officer Karen Hershey
- WHAT:** JCTA meeting
- WHERE:** Online on Zoom
- WHEN:** February 3, 2021
- WHY:** To gather information about the wind energy project off the LBI shore from the company who has the lease to build it
- HOW:** Twenty questions were submitted in advance to the ASOW panel; all invited guests were supplied a copy of the questions prior to the meeting. A JCTA member moderated the meeting and we proceeded through all twenty questions with JCTA members asking additional questions as we went along. There was a Q&A period at the end of the meeting in which all invited guests could participate.

PROCESS

- 1) **How have you involved state regulators, government officials, community leaders and local residents in your plans?** Specifically, what meetings, communications and/or planning sessions have you had with those listed below? Please also state with whom and when.



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- a) Federal elected officials who represent LBI
- b) 20NJ Senators & State Assembly members
- c) Ocean County government officials
- d) Long Beach Island Mayors
- e) Representatives of the LBI-based fishing industry
- f) Representatives of the LBI tourism industry
- g) Public meetings with LBI residents (where, when, how publicized & turnout)

ASOW response: ASOW is a joint venture that formed about two years ago when the company acquired its lease after going through a federal process to obtain that lease. The lease area is 10 – 20 miles off the coast, stretching from Atlantic City to Barnegat Light. This project is unrelated to the project in the lease area south of us, which is the Ørsted project called Ocean Winds.

Ørsted is ahead of ASOW in the development process because ASOW only acquired the lease two years ago. Accordingly, ASOW does not have the layout process finalized, has not shared visualizations (i.e., renderings of what the turbines will look like from shore) and has not had community public meetings in person yet because it has not been awarded a contract by the state.

The New Jersey Board of Public Utilities awards a long-term power contract to projects from developers like ASOW; ASOW bids into the state and then the state lets it know how big its project is going to be and if Board of Public Utilities is going to buy its power. ASOW is in the stage right now where it just bid into New Jersey's second solicitation, which happened on December 10, 2020 and the NJ Board of Public Utilities is expected to announce their awards for the next contract on June 23, 2021. After that, ASOW will be able to come into the community and say, "This is the size of our project, this is what we are talking about, here are some visual simulations you all can look at" Anything that ASOW shows now would be premature.

When ASOW got its lease in December 2018, ASOW personnel started meeting with NJ state regulators. In the past 24 months they have met with all relevant federal and state officials. Starting early last year, ASOW personnel began to meet with county officials and local leaders, including the members of JCTA tonight.

ASOW employs fisheries representatives:



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- Kevin Wark, out of Barnegat Light, is the commercial fishing liaison officer. All leaseholders like ASOW are expected to have somebody like Kevin as a fishing liaison officer who gathers input from the fishing community and shares that information to Atlantic Shores. In addition, Kevin brings project information and ideas to the fishing community from Atlantic Shores. . Kevin has been a paid consultant for ASOW for about a year and a half.
- Adam Nowalsky is the recreational fisheries representative. ASOW is the first developer — and the only one so far — to bring on someone in that capacity.

ASOW worked heavily with the fishing communities along with the Beach Haven Charter Fishing Association. ASOW personnel engage frequently with the main surf clam company owners who have fleets along the coast.

Commercial Fishing Industry: We have spoken a tremendous amount to the surf clam industry and, with Kevin Wark, ASOW has spoken with other commercial fishermen, especially down in Viking Village. If you would go to the owners of the surf clam companies, they would know who [ASOW Developmental Manager] Doug Copeland is; if you were to poll all the commercial fisherman out of Viking Village, most would not, but they would all know Kevin Wark and know about the project because of Kevin.

Recreational Fishing Community: With Adam Nowalsky, ASOW hosted two meetings this past January to gather input from the recreational fishing community. Having these meetings is a targeted way to interact and engage with the NJ recreational fishing community. These January meetings were designed to share and gather input from this community. Those meetings have been the initial big push and we should be holding more of those kinds of meetings a little later on this year.

On LBI, ASOW representatives have reached out to every mayor and have met with municipal governing officials — mayor or mayor's representative — in Beach Haven, Surf City and Long Beach Township. Barnegat Light's mayor has spoken quite often with Kevin Wark. ASOW's presentations are mostly about providing information and answering questions; the mayors have not taken a position either way about this project. There is great interest in meeting with more governing officials in the municipalities on the island, particularly Harvey Cedars and Ship Bottom, and there has been considerable outreach.

ASOW representatives have met with the LBI Foundation of the Arts & Sciences and environmental groups Alliance for A Living Ocean and Rick Bushnell at Reclam The Bay.



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The way the communication plan works is that ASOW starts at the federal level, then goes to the state then county levels and then it goes into the community. In terms of the regulatory process, everything is in motion until the stage is reached when everything is set at all levels. Then ASOW has something concrete to tell the community about what is happening.

The first public open house meeting, which will most likely be virtual because of covid, will be right after the Board of Public Utilities announces its awards this summer. That means the first public meeting will be around July 2021. It is there that ASOW can share its visualizations and provide even more detail about the project.

2) Where are we in the approval process?

ASOW response:

- *State of New Jersey procurement process, i.e., Will the state buy the project and at what size?* The state has ambitious goals for offshore wind – 7.5 gigawatts by 2030 – so the state puts out a solicitation schedule, meaning that every two years they are trying to acquire a certain amount of offshore wind power from developers with nearby leases. The state of New Jersey has done one solicitation back in 2018 and the winner was Ocean Wind, the Ørsted lease to the south. The state just held their second solicitation in December 2020, in which ASOW participated by bidding, and the award for that comes out in June 2021.
- *Federal Permitting approval process:* Most of this process goes up through Board of Ocean Energy Management (“BOEM”). BOEM has created these offshore wind energy areas as well as offshore leases for oil and gas since the beginning of offshore leases. That is one of their responsibilities, creating lease areas and then auctioning them to developers so that they may have the rights to drill or develop offshore wind farms in a given area. With BOEM, companies have to pass their strict environmental hurdles to do anything within the leasing area.

Companies are required to submit two main pieces of federal permitting:

The first thing companies have to do is submit the Site Assessment Plan (“SAP”). It basically says that we want to go out in our lease area and put out buoys that are going to take meteorological and ocean measurements. We have to have approval to even deploy buoys, to show BOEM where they are going to be and that these buoys are not going to disturb anything on the ocean floor. ASOW submitted its SAP and it is waiting for approval.



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The second thing companies have to do is submit the Construction & Operation Plan (“COP”), which is essentially how the wind farm is going to be built. ASOW intends to submit its COP in March 2021. This effort involves local communities in the permitting process because there is a stage where, after the COP is deemed complete and sufficient, it goes to the next round where it is open to public comment. At that point, BOEM will publish the COP so the public can comment on it. ASOW expects that the first public comment period will take place in late 2021/early 2022 – that depends on BOEM’s approval timing.

LOCATION

- 3) What other installations on the East Coast — current or planned — are closer to shore than ten miles?

ASOW response: Block Island off Rhode Island is 2.8 miles offshore, but there are no others that are closer than ten miles. Most leases are all in the 10 – 12 mile range for the most part. Note all leases for commercial wind farms are in federal water, meaning further than 3 miles off the coast.

- 4) What is the justification for installing these turbines ten miles off the shore of LBI when other regions in the Mid-Atlantic, including Atlantic City, have turbines placed farther out, e.g., 15 – 20 miles off shore?

ASOW response: Developers have to use the leases granted by the federal government and those lease areas were chosen after taking into account proximity to larger populations or where there is a lot of demand for electricity (called “load centers” by utilities). Lease areas also took into account wind speed, vessel traffic, commercial fishing grounds and water depth. ASOW’s goal is to maximize the amount of renewable energy that can be generated from a lease area to help meet the state mandate for all offshore wind procurement, which is 7.5 gigawatts.

ASOW’s lease is located between shipping lanes and commercial traffic lanes, which are for tugs, barges, and large cargo vessels. Safety at sea has been in the forefront of lease siting much like commercial fishing activity has been. These leases were created to avoid a lot of commercial traffic so they are wedged in between.

- 5) In a recent meeting about residential fishing, your representative Jennifer Daniels stated, “The location of federal leases are determined by the BOEM after years of study.” Then after years of study, the areas were offered for leasing beginning ten years ago (2011). Climate change has accelerated in the past ten-plus years and has had a major impact on our



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coastline. **Why do you think a recommendation about location, based on data collected over twenty years ago, is still the way to go now to move forward?**

ASOW response: Data informed the creation of this lease and one of the two biggest drivers is the shipping lanes and those are not going to change. The other driver is the marine uses inside that leased area and those could change.

That is why, in our lease area, you see surf clams in a portion of it. If you are familiar with the surf clam industry, you know that surf clams used to be a lot closer to shore. That is an example of how things change over time, but what has really governed ASOW's lease here, as well as the Ørsted lease to the south, are those shipping lanes.

The other changes in climate, ocean temperature and acidification of the ocean are all factors that ASOW takes into account when it thinks about the other users of the ocean outside of its lease area, but the shipping lanes that are the boundaries of that lease area have not shifted in those twenty years and are not expected to. They are the Coast Guard's fairways that go up and down on the east and west sides of the lease area.

6) **If the windmills are moved from ten to at least fifteen miles offshore, what are the implications for the cost of construction, operation and maintenance of the windmills? Is cost the reason why ASOW cannot go further out?**

ASOW response: ASOW's mandate is to maximize the opportunity for renewable energy in this lease area, a mandate driven by the state goal of 7.5 gigawatts by 2030. Our lease will be able to power approximately three million homes in New Jersey. That goes a long way in realizing the state's goals and for the reduction in greenhouse gases. If ASOW were to build only in a portion of the leased area, it would not be contributing as much as we are able to in meeting that state goal.

There will be turbines out at fifteen miles, but ASOW would like to have them in the closer areas as well because like any project, there are economies of scale. The other part that comes with this is that with renewable energy, there is a huge economic development component. The larger the project — and our lease area will hold multiple projects over time — the more opportunity there is for local businesses in New Jersey, such as making the foundations for the wind turbines themselves or the vessels that help service them. It is about finding ways to create the most opportunity to produce that renewable energy in the state and the most opportunity to create positive economic development as well.

JCTA question: What is the reason for building turbines 9½ miles offshore off Holgate when other places in the lease area are at ten?



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ASOW's response: ASOW's lease area has an irregular shape and the shape is primarily governed by the shipping lanes. In some portions of the lease area, the shipping lanes are twenty miles off shore and in other portions, especially near the north, the shipping lane is only about 13 – 14 miles off shore.

Side note: One part of the lease area is off-limits. There is a little notch at the top of the lease area and if you look at a nautical chart, that notched area is marked "Danger Area" because after World War II, some munitions were dropped there.

JCTA question: Is it correct to say that since the entire leased area is going to be completely built out eventually, being ten or fifteen miles out is just a place to start?

ASOW response: Yes

JCTA question: What is the size of the turbines ASOW is planning on using in this project? Is there a possibility of using less bigger turbines instead of more smaller ones?

ASOW response: ASOW's plan is to work with each vendor to use the latest and greatest turbine technology available and that does mean larger — and fewer — turbines, which is a good thing for viewshed¹ and also for rate payers because it is cheaper. "Larger" means the ability to generate more power, not to be necessarily taller. Larger turbines generate more electricity at a faster pace and you'll need fewer of them.

Turbine technology is pretty impressive, the same way solar panel technology has been impressive over the past ten or twenty years. It continues to improve and become more efficient and cheaper. Turbines used to be a lot shorter, much smaller and they were about one-megawatt machines. Now about every two years, you see about a two-megawatt increase in turbines. ASOW's plan is to take advantage of this progression by using the most efficient cost-effective turbines available.

Offshore wind turbines are even larger than onshore turbines because the construction is not limited to railways and semi-trucks for delivery of the turbine parts because they can be delivered by really large vessels. ASOW's parent companies are Shell Energy and EDFR, two of the largest utilities in the world, with great supply chain contacts. ASOW works with top turbine manufacturers such as GE, Vestas and Siemens Gamesa among others, and we figure out which turbine is the most cost effective and fits the meteorology of our site the best. The sky is the limit [referring the future advances in wind energy technology].

¹ View of an area from a specific vantage point



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Right now the current technology goes to about 12 – 15 megawatts. By the time ASOW builds this project, one could speculate there may be a 20-megawatt machine on the market. We plan to start construction offshore around 2024 – 2025, so we are looking at the technology that is going to be available on the market then.

The other thing to note about turbine technology is that turbine manufacturers do not continue to manufacture their outdated models, so if one of those top three manufacturers had a 10-megawatt machine, once they come out with a 12- or 13-megawatt model, they retrofit their manufacturing facility to build their newer model. The old model is obsolete so you can't go back into time and buy the older model. Also, viewshed simulations show that there is a cluster effect with the smaller turbines – you see more of them and more of a visual impact with the smaller turbines than you do with the larger turbines because you need less larger turbines. It seems counterintuitive to say that the bigger machines will decrease impact on and be better for viewshed, but they are and the simulations show that, but ASOW wants to use whatever is best for the project and the rate payers.

Invited guest from Holgate: When you say, “The sky’s the limit,” does that mean that there are no limits on how these turbines can be?

ASOW’s response: No. That phrase was used earlier as a way to make the point that innovation and scientific technology continue to improve and it is really awe-inspiring what is popping up with renewable energy technology.

There actually is a limit about how high you can build associated with the Federal Aviation Association (“FAA”). You have to get air clearance to build these wind turbines and there are certain ceilings that the FAA creates. Once you exceed 500’, you need even *more* clearance and permitting procedures to ensure that it is safe for aviation. There is no expectation that these turbines are going to increase in height by a significant amount. Most of the improvements are in the engineering of the inside efficiency.

ICTA question: Please comment how the location of this leased area impacts the fishing industry and wildlife in general.

ASOW response: On the fishing side, the commercial fishing that is going on within the boundaries of the leased area is primarily surf clamming and, in the north, there are a number of different kinds of fish that are caught depending on the season. Recreational fishing is focused more in some areas in the south. Both types of industries go through the leased area.

When we build the wind farm, we will basically have a kind of pegboard, a regular grid pattern that goes through the area that will create opportunities for vessels of all sizes to



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make it through going east to west, north to south, northwest to southeast. Those orientations are based on some of the predominant vessel traffic lanes.

The turbines themselves were discussed a lot in the January calls with the recreational fishing community. There were a lot of questions about artificial reefs and how the turbines could become artificial reefs; some people on the call were talking about expanding the area around the foundation with additional rock to make more of a reef.

The whole process of the design is intended to make it as orderly as possible so that the transit through and around will not be random — there will be lines that you can follow.

Regarding wildlife, those are the studies that are going on right now. Our Permitting manager has been very active in all of this, including last summer when we did some studies of the red knot. A little radio transmitter was attached on the back of those tiny birds so researchers were able to see how they fly. Once you are out at the distance we are in the ocean, there are birds flying, but they are usually much higher; the red knots are at a couple thousand feet. All of that is part of the study; there are monthly surveys going on right now.

Regarding marine mammals and turtles and species like that, that is also part of the study work that we have been doing. Other Geotech and geophysical work is going on — looking at the sea floor — all those vessels involved have monitors on them. They are out there spotting so if there is a whale or a turtle nearby, basically the operations are shut down until it moves out of the area and then our work continues. We adhere to vessel speed limits and we are very strict about that.

There is a focus on protecting wildlife from the survey period all the way through operations and post-operations.

JCTA question: Are fishers going to be able to fish in the leased area and around the turbines?

ASOW response: Yes. You can fish right up to the turbines. We just ask that you don't touch them or hook up to them. There is no limit to the proximity to the turbines especially for recreational fishers.

The one caveat is this: During construction, we will have some safety boundaries around the turbines that are being installed or during operations if there is a turbine that needs some major component repair. We might have to set off a little bit of a parameter around that during that brief period of time, but during the regular course of operations, there are no limits to vessels either transiting through or fishing in the lease area.



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On Block Island and in Europe, tourism around fishing, party boats, spear fishing and scuba diving has really boomed around offshore wind because a lot of people actually really like to go fish around these turbines and to sightsee. All of these activities are allowed and hopefully the artificial reefs created by the turbines makes it even more interesting for people who are want to do these things.

JCTA question: It has been said that commercial fishing fleets will have to go around the leased area, but that statement is not accurate, correct? There will be lanes that the boats can use to go where they want to go?

ASOW response: Correct

JCTA questions: We have heard that 20-megawatt turbines might possibly be used on this project by the time construction takes place. How tall is a 20-megawatt turbine? What are the heights of a 14- or 15-megawatt turbine?

ASOW response: ASOW has not yet decided what size turbine it will be using for this project. The height of a 20-megawatt turbine is yet to be determined and even the existence of a turbine of that size by the time the project starts to be built is complete speculation at this point. It would be difficult now to predict the exact height of future models of turbines, but we want to use the most cost effective and efficient turbine for our project.

Ørsted is using 12-megawatt turbines and those are 850' tall.

The turbine industry is growing, but whether we get to a 20-megawatt turbine in five years or whether we get to 14-, 15- or 16-megawatts depends on the changing technology. A lot of that technology is about squeezing more megawatts out of roughly the same size turbine — maximizing their efficiency. For example, Vestas had an 8-megawatt turbine, then a 9-megawatt, then a 9½-megawatt turbine — it was actually the same turbine; they were just improving the “guts” inside.

As the technology advances, size is not changing so much — and if it does, it is only by a few feet — but rather the inner workings of the turbine, e.g., the drive; the generator, are improving by becoming more efficient. It is entirely possible that a 14-megawatt turbine could be 850', but no manufacturer has publicly announced that they have a 14- or 15-megawatt turbine yet so that information is not available. [Note: After the meeting, the Atlantic Shores team was able to find that a proposed 14-megawatt wind turbine from one manufacturer is expected to be approximately 850' tall.]

7) Is trading lease areas an option? And if not, why not?



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ASOW response: No. It never happens. It is a long legal process to get a lease and it is a heavy investment to secure one for developers, which is why you see these joint ventures come in. A company may purchase a lease from another company, however, but we are not aware that kind of thing is happening now.

VISIBILITY

8) How visible are the windmills from the beach *and* from the second floor of the average LBI ocean front — At 10 miles? At 15 miles?

ASOW's response: We know this is the #1 concern and we understand that you really want to know what they are going to look like. We are not trying to keep this information hidden from you at all. At this stage in the development, however, we have not nailed down a project size or a turbine size, so it would be premature to say what the turbines look like. We are going to release our visualizations as soon as the Board of Public Utilities gives us the project size and we have secured our turbine technology because anything that we show you right now is not going to be accurate. We want to show you what the whole project is going to look like, not just one turbine. This information will be shared with the public in our open house meeting, which most likely will be in July. Ørsted has a project that they have already won, so it becomes very clear for them to show on their website what their 1,100-megawatt project looks like.

Additionally, ASOW is in the process of doing a study on the overall visibility. Just because the turbines are out at ten miles does not mean that you are going to see them all the time. When you look out at the sea, there is a layer of fog out there, so we are working to further identify what the turbines will look like on a clear day but also what they might look like from shore on a regular day when there is fog out there

Ahead of releasing our simulations, we have been working with the Rutgers University Center for Ocean Observing Leadership (RUCOOL) lab on a visibility analysis coming from Atlantic City and several points off the coast of New Jersey. No one has really looked at visibility outside of airports — that is typically where visibility is measured. There are not a lot of coastal observation stations, so ASOW, after hearing this need from the scientific community, is trying to get observation sensors on our buoys and on more stations on the coast.

We were able to pull a couple of stations into the study in draft form (the study is still ongoing) and they found that the highest visibility comes in early spring and late fall. The reason for that is because the water temperature and the air temperature are equal; the marine layer — that haze on the horizon — is formed whenever there is a difference



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between the air and water temperature. So typically in the summer there is cooler water and warmer air, which creates the marine layer, which can limit visibility. Those conditions also create a lot of summer thunderstorms and sea breezes, which is what our wind farm takes advantage of.

Through the study so far, we found that during the peak summer tourism season, often times by mid-morning through late afternoon the marine layer forms, which can limit visibility. We are assessing adding even more sensors on offshore buoys we install or on coastal weather observation stations so we can better verify that going forward. We want to share this study publicly as soon as it is finalized.

ASOW will also work to make the visibility data public so mariners can see what the conditions are out in the ocean. If you visit our website, ASOW has a public buoy data available, so if you are going fishing out in the Atlantic and want to know what the wave heights are and the temperature, it is there.

9) How can we get a copy of the Rutgers visibility study to review?

ASOW response: It should be ready to be released within the next several months; we want the public to have this study as soon as it is complete. Rutgers wants to gather more data before they release it to the public.

ASOW personnel will get back to JCTA about a specific date when the study may be made public.

10) When is the first installation scheduled or planned? How many wind turbines are you planning to install in two, five, ten and twenty years? How will the visibility from shore change during those same time periods?

ASOW response: ASOW starts constructing offshore in 2025. The number of turbines actually installed depends on how much power the Board of Public Utilities actually buys in our leased area. Our largest project size in the leased area is 2300 megawatts, so if you do the math and divide by the megawattage of whatever turbine models are out there, you can get an approximate number of turbines for this project.

During the first construction wave, beginning in 2025, foundations would be put in and during the second construction wave, the turbines would be installed. The exact schedule of each “wave” will vary based on the size of project but in most scenarios the foundations are put in over the course of a few months and the turbines are installed the next year. By the time we get to the end of the decade, we would expect that the entire leased area would be built and it would remain that way for the duration of the lease, which is up to 30 years. Once it is permitted, we can build it and with that permit, we are not allowed to place extra



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turbines in there after the fact. At the end of the lease, ASOW is required by law to remove everything

The onshore construction starts in 2024, i.e., the local fabrication of foundations and wind turbine components and perhaps some of the right-of-way work onshore.

RELATED INFRASTRUCTURE

11) Where are you planning to put the cables — specifically, what part of the project will run through Barnegat Bay and the Barnegat Inlet?

ASOW response: No part of the project will run through the Barnegat Bay or the Barnegat Inlet. We expect to make landfall in Atlantic County and then further north up in Monmouth County, so there will not be any infrastructure that will come on shore on LBI and nothing in the bay. The substations in the two counties mentioned are inland.

The cables that are buried six feet under the sea floor will be parallel to the shore from Atlantic County to the Monmouth County area, not coming west toward LBI.

There are two types of cables, one large and one small. The smaller cables run between the turbines and they come together into one large cable at a substation in the offshore wind lease area. The large cables are buried underground and about a ¼ mile off the beach, they tunnel under the beach and comes on shore to an underground vault that is about 15' x 20' wide. At the vault, the three cables inside the large cable are then split and they continue underground to the next substations.

12) What type of onshore buildings and structures will be required to be repurposed or built and how many?

ASOW response: There are no plans for structures to be repurposed or built on LBI. The operations and maintenance center will probably be located in Atlantic City.

ASOW has been working with the Executive Director of the LBI Foundation for the Arts & Sciences ("LBIF") and learned that the walkway that leads to the Bay through the marsh area is in a state of disrepair. We are working with LBIF to see if we can lend some support to rebuild that walkway.

13) Is it possible that residue or leakage from the turbines and cables could wash up on LBI shores? What is in place to prevent those types of situations from occurring?

ASOW response: There is no leakage from turbines or cables and there has never been an occurrence of residue washing up that we are aware of. The cables have no fluid in them. Older transmission cables had oil in them, but ASOW does not use anything like that. The



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cables ASOW uses are solid and have multiple layers of copper, aluminum and steel sheeting and then a very thick plastic layer and then they are all buried.

In the turbines, there is very little fluid in them and that fluid is designed for the lubrication of the equipment and the gears in them. There is fluid in the transformers connected to the turbines, but they need to be — and are — very well sealed because they are in a marine environment so they are sealed inside to prevent anything from going in and from coming out.

JCTA question: What kind of maintenance is required for the turbines? If something breaks, will a new one have to be installed?

ASOW response: As with any power plant there is always going to be one sector of the power plant shut down and having maintenance performed on it. If you are familiar with a nuclear or gas or coal power plant, it is never operating at 100% capacity because of operations and maintenance. The ASOW staff will always be going to and from the operations center and daily performing maintenance on the turbines, e.g., a little bit more oil; nuts and bolts tightened; an issue with the braking system. The goal is to keep the turbines functioning at their maximum efficiency. Both parent companies — Shell and EDF — have a long track record of maintaining equipment in green environments and for wind turbines

If something breaks, ASOW can absolutely get a replacement part — that is part of the purchasing agreement with the vendor who supplies the turbine and the manufacturer comes out and replaced it.

The whole turbine would not have to be replaced. The average life of a turbine is about thirty years and how long it lasts is a function of how well it is maintained. As a company, we have a long track record of keeping those turbines running. When a company buys turbines, it also buys a lot of spare parts. If something happens, you can patch the turbines, but it is not a job for the faint-of-heart, however, because you have to rappel off the side of the wind turbine out in the middle of the ocean. Across the country, we have kept turbines running that are no longer made by having local suppliers make parts or by taking advantage of the long-term service contracts we have with manufacturers.

JCTA member: What will be impact of taxes regarding on-going maintenance and cost of the entire project?

ASOW response: All applicants who are interested in building wind farm projects apply for an Offshore Renewable Energy Credit so they get paid for every hour of electricity they generate — and only if they generate electricity — for the life of the project. The manufacturing, construction and maintenance are all part of that. If there is a year, for example, that the turbine in the third row needs extra maintenance, that is just part of it —



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ASOW does not get to bill anyone extra; it is just the cost of operation. That is why so much attention goes into producing a detailed plan because it is basically set in stone once it is approved.

This whole process is driven by the rate payers and the cost of the benefit that they get back. The only way ASOW is going to be successful if it can show a net benefit to the rate payers; that benefit comes in the form of jobs in local manufacturing, environmental impact and providing electricity. There is an impact on the bill of the average rate payer and that is up to the Board of Public Utilities to decide what they want that to be. The Board of Public Utilities is going to look at ASOW's application, chose a project size, accept, reject or change the price ASOW submitted to be paid, but no matter what, there has to be a benefit to all the rate payers in New Jersey so if rate payers are giving something, they are getting something much greater in return.

JCTA members: After ASOW receives its approval in June, what is our recourse if we are not happy after you receive those approvals? Is anything likely to change based on public comments?

ASOW response: Besides the public meetings that ASOW holds, the Construction & Operations Plan actually has a process connected with it where the federal government comes and holds open house meetings. They will provide opportunities for input; they will come to the communities — in 2021, they might come virtually — and solicit feedback. ASOW submits its project design about the total impact of its project, then the people who are going to be impacted in a positive and negative way are able to provide a lot of feedback through that process. There is a multiple series of meetings where federal government representatives from BOEM take the input and then they actually tell ASOW at the end of it what we can build.

There are two levels of approval: 1) the state of NJ for the power contract; and 2) the federal government, which issue the permits ASOW needs to build. Both are needed to move forward. That process with the federal government is designed to get maximum input from the community.

JCTA member: Will there be giant cranes on the boats that come to fix the turbines?

ASOW response: Hopefully not. If there *is* a giant crane out there, that means that some major component needs to be replaced.

There are two types of maintenance: the easy stuff and large components. For the easy repairs, a vessel, basically the equivalent of the ocean's pickup truck, comes out with a small crane and a crew on it; the ship is about 65' long. The turbines themselves have a crane on the top of the structure that can drop down to the vessel and bring things up. If the blades



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need to be repaired, it is possible without a crane, but as mentioned before, not for the faint-of-heart.

If there were a need for a giant crane to come out for larger/heavier components repair, it would be there for a couple of days while the repair work was being done and then it would move out.

IMPACT

14) What will be the impact of installing wind turbines on the major industries that sustain LBI?

- a) LBI fishing
- b) LBI tourism
- c) NJ shipping

15) How did you reach those conclusions about the impact, e.g., studies commissioned; studies and experts consulted; monitoring other, similar installations on a long-term basis

ASOW response:

- *Fishing:* Determining the impact to this industry is a lot of the work ASOW is doing right now. We are making sure that we are understanding all the issues for both recreational and commercial fishing and the surf clam industry. We are doing some other modeling work with Rutgers around the impact on some fisheries so if there is going to be an impact, we can best figure out how to quantify it and how we would mitigate it.

Figuring out this impact to this industry is a big part of what goes into the Construction & Operations Plan. That plan is the place where every potential impact that this project could have on the shore-side community and on the industries that are nearby is identified and discussed. By the time the Construction & Operations Plan is submitted, it has about 60 – 70 chapters with thousands of pages based on years of study. It is on us as a developer to prove that either there is not going to be an impact or if there is going to be one, how we intend to address it and solve it.

- *Tourism:* Tourism is not likely to suffer. Block Island in Rhode Island was the first community in the US to host a wind farm and they have actually seen an increase in tourism. Wind farm development has not significantly impacted tourism or property values in Europe, where turbines have been in operation since the 1990s. There is a lot of literature that backs that up.
- *Shipping:* The shipping lanes exist on the east and west side of the lease area and there will be many ways to transit through the area itself.



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JCTA member: Do you have any documentation to support your statement that the wind farm will have no impact to fishing and tourism industries and, if so, can you provide it to JCTA? Can you provide us with assurances that there will no impact to the commercial fishing industry *specifically* on LBI?

ASOW does not have the jurisdiction to prevent any commercial or recreational fishers from fishing in the lease area. ASOW is analyzing how these boats could best transverse the lease area so they can move around it and through it in the most efficient ways possible.

Kevin Wark, the commercial fishery liaison officer in our project for the past year and a half, has been talking to the commercial fishermen and some of them have voiced concern to Kevin [*Subsequent to the initial posting of this document on the Barnegat Light Taxpayer Association website, an ASOW representative updated his statement to clarify that there were concerns voiced by the local fishing industry*]. The surf clam industry is set up a little bit differently, so ASOW representatives have been speaking with them to make sure that we can understand the science behind where their resources are going to be now and also in the future; if there is going to be an impact of the project on this industry, we want to make sure we understand what it might be and how we can work with them to mitigate it.

Regarding the recreational fishing community, there is a lot of positive data, but that is why we are out here with the meetings we have had with recreational fishers and the follow up we will have to make sure we understand the issues. A lot of the concerns that are voiced will be included in our Construction & Operations Plan and in the studies we have to do, so that is on us to prove. It is not that we just have to give assurances — we have to do studies to prove that what we say is the case. Those studies are all shared.

JCTA member: Will those studies also indicate what the impact on these industries will be due to a change in tides?

ASOW response: Not so much tides in isolation, but definitely as part of the whole climate impact, particularly how it affects the surf clam industry because clams do not move the way all the other species do.

ASOW is one of five developers who is part of a group called the Responsible Offshore Science Alliance (“ROSA”), which also includes members from the commercial and recreational fishing industries and regulators. ROSA is doing a lot of research across the eastern seaboard on offshore wind and supporting studies that enable developers, fishers and state regulators to understand both the positive and negative impacts of offshore wind farms and what that might mean. There is a lot of collaboration across the fishing communities and the developers to make sure we are looking at the science appropriately.

JCTA member: How are fish affected by the noise and vibrations from the turbines?



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ASOW response: All the literature about European wind farms shows that certain species might avoid the area during construction but, much like how humans react to areas of road construction, after ocean construction is finished the fish come right back. The vibrations of the turbines themselves do not seem to drive fish out based on the science readily available; they return to the area and to the artificial reefs at the bottom of the turbine bases. Even after the project is built, ASOW is going to continue to collect scientific data so we have better data on fish migration, avoidance or anything like that.

JCTA member: Will there be written guidelines that confirm the accesses of commercial and recreational fishing in the lease area, provided there is no tie-up to the turbines themselves?

ASOW response: It is actually already in Coast Guard regulations, which makes it is very clear that ASOW is not allowed to limit anyone going through. The tying-up is simply a safety issue.

16) What studies, experts, etc. disagree with your point of view and why did you think those studies and opinions were not valid?

ASOW response: When ASOW is looking for studies, it is looking to see how these studies have fared during peer-review process and whether a study can be repeated and get the same results. There are probably articles out there that disagree with us, but it is important that they come from credible sources and are further peer-reviewed by trusted sources, e.g., different university research teams coming to the same conclusions. All the bodies of evidence that ASOW has used has come from those sources.

We have not seen anything that disagrees with us at all, but we are open to seeing any studies that the community might have seen so we can address them directly. We would never disregard any scientifically sound evidence no matter what results it showed.

If you do see something that disagrees with us, ask yourself if it is scientifically sound? Is it reviewed by a trusted source? Could it be repeated? Is it just a magazine article or is it a scientific study?

17) If the windmills are moved from ten to at least fifteen miles offshore, what are the implications for LBI fishing, LBI tourism and NJ shipping?

ASOW response: Our mandate is to generate as much renewable energy out of this area as we can, so if we were to only build a portion of our lease, we would only generate a portion of that power. We are trying to be as responsible as we can to support the state requirements to maximize the amount of renewable energy produced by offshore wind as well as the economic and environmental benefits that come from that.

From a fishing perspective, if the turbines were not there, presumably fishers would fish in a way similar to what they have been doing, but with the turbines there, we will work



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together in a way that enables both industries to thrive. So, for recreational fishers, it might mean that if there are less turbines, there is less opportunity for artificial reefs.

JCTA member: If the entire leased area were to be shifted east by five miles (from 10 – 20 miles offshore to 15 – 25 miles off shore), how would that affect LBI fishing, tourism and shipping?

ASOW response:

- *Fishing:* You would end up in the scallop grounds.
- *Tourism:* We think there is a lot of opportunity around tourism where it is, but we are not sure how moving this area would impact LBI tourism
- *Shipping:* You would be in the shipping lane, which would be a big problem.

It is highly unlikely that the federal government will change its mind about the location of the lease area.

COST

18) What are the results of a cost benefit analysis for the implementation of your project for the consumers and all of our taxpayers? **Specifically, what do you anticipate will be the additional cost of electricity for an average LBI resident and business and the amount of increased taxes for LBI residents and businesses?**

ASOW response: When we talk about increases in the rate payers' electric bills, we are not talking about a major increase such as a \$10 - \$20 [per month]. We are talking about a very small percentage on your monthly electric bill. It depends, however, on the New Jersey Board of Public Utilities' procurement, i.e., what they buy and how. The price increase per bill is a big part of the analysis done by the NJ Board of Public Utilities, which determines that number and makes it public.² Accordingly, beware of quoting us at this time, except for the part where we said our project will not cause a \$10 - \$20 increase per month.

In terms of taxes, the project does not cause any increases in taxes. In the areas where ASOW is installing underground cable inland, any damage to the streets caused by that installation is paid for by ASOW. There is no separate tax that is going to show up for offshore wind.

19) **Does the presence of wind energy turbines produce any benefit or adverse effects for LBI municipalities, e.g., increase/decrease state tax rates (local county, state, federal); imposition/reduction of fees (local, county, state; federal)**

² The meetings of the NJ Board of Public Utilities are public. Its docket is public as well; you can look on the website and see what its meetings are about. You can also watch the meetings on YouTube.



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ASOW response: No

20) How much more expensive is it to build turbines at fifteen miles offshore than it is to build them at ten miles? How would that presumed increased cost of construction affect the cost of electricity for the average consumer and business on LBI and the amount of taxes residents and businesses on LBI would pay?

ASOW response: The way that projects like this get constructed is that the turbines are built in rows. They are not necessarily built all along the western edge of the lease, rather they might be built more east to west so there are some turbines further out and some closer in. The further out you are, the more it costs because you have more electrical line costs, but you are doing this cost as part of the cost of the whole project, not looking at an increased cost per turbine.

The gradation of slope is quite gentle – about 60 feet at the front of it to about 90’ at the back of it and that means you don’t see a dramatic swing in installation or equipment costs at different portions of the lease area.

JCTA member: How do you install, e.g., west to east; north to south; entire rows at a time? What is the layout of the wind farm?

ASOW response: That has not been determined yet. You do try to pick a pattern and move along with it, but our installation team has not figured that out exactly yet.

JCTA member: If you have a five-year build window and there is a possibility that the turbines could become larger, could those be placed in the back and the front could be built with smaller turbines first?

ASOW response: We don’t have an answer on that, but it is an interesting idea.

Keep in mind, however, that before the project is built, there has to be a commercial agreement about the turbines that you are purchasing, so we can’t go back to a turbine manufacturer mid-construction and say that you have a better model and let us have that for the second half of our project.

In later phases of the project, in the second or third phases, for example, we can take advantage of later technology as it advances, but once construction starts, the manufacturer is producing the turbines and there is no turning back, but a lot of analysis goes into that decision to make sure companies get the right turbines in the end.

JCTA member: Are second and third phases going to be built off LBI?

ASOW response: It is ASOW’s intention to build out the entire lease area and you can have multiple projects in one lease area. The first phase is 2300 megawatts this round, which will take up a considerable amount of our lease area. It just depends on what the state procures and how much. If they only buy a small amount of electricity and it only takes a



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small amount of our lease area to produce it, then we have more space within our lease to bid another project. Again, the goal is to build our entire lease area whether or not that happens in this round of procurement, or subsequent rounds.

JCTA member: What is the impact on the increase in rate payers' electric bills if the project has to be modified and the turbines have to be placed further off shore?

ASOW response: The NJ Board of Public Utilities gives ASOW a price and that is what we gets. If there was some really dramatic change, I guess we could try to make the case that there should be a change in price, but for the most part, this is part of our project development and we have a lot of experience pricing out these projects. Ultimately, it is our risk to accept and we have to bear that cost.

JCTA member: Is there any technology that will allow this energy to be stored or does it all have to be released into the grid?

ASOW response: ASOW is investigating storage and it has an innovation plan associated with this project. We are looking at things like green hydrogen, i.e., using hydrogen as a fuel source that can be pumped through the natural gas grid; it is similar to natural gas, but it is a clean fuel. We have partnered with South Jersey Industries on that.

We are looking at storage with Rutgers' Laboratory for Energy Smart Systems ("LESS") program and all things complimentary to offshore wind and renewable energy in general. The state has made it very clear that they are interested in innovation and storage because they want to be 100% renewable energy by 2050 — that is in Governor Murphy's clean energy plan.

QUESTIONS FROM INVITED GUESTS

From Beach Haven: Assuming that ASOW uses the 12-megawatt turbines, it seems that the lease area would hold about 250 turbines. Does that sound about right?

ASOW response: It could be; we are sorry we don't know for certain.

From High Bar Harbor: You said the windmills are 850' tall. Does that include the blade? Is there a way we can get a diagram of the whole wind farm and where it will be?

ASOW response:

- *Height.* Height is measured to the blade at the very top and the tower is about 300' below that. The blade and its mechanism is about 500 – 550'.



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- *Layout & project design.* ASOW will be able to share this information during the summer at the public open house meetings.

From Harvey Cedars: I have read that some resort communities in New England and in the South were successful in saying ten miles is too close and were able to get the wind farms pushed back to fifteen miles. How did that happen?

ASOW response: We are not familiar with any leases that have been officially moved back. The boundaries of the lease areas have been determined for years. There have been people who have had questions about it and discussions, but we are not aware of any place in New England or elsewhere where they have formally moved the border or boundary of the lease area back.

From Holgate: Turbines have an economic life of thirty years, so after that time, if a 20-megawatt model is available, is it possible that the older turbine could be replaced with a taller, more modern one? Is there a magnetic field created around the turbine and power line and, if so, does it have any impact on anything, including wildlife?

ASOW response:

- *Replacing turbines:* There is a thing in renewable energy, and wind energy in particular, called repowering and that is happening now with the first phases of the turbines that were built in California onshore in the 1980s. Their turbine technology is now obsolete, but they are in the best wind areas available and already connected to the grid. What they can do is remove those obsolete turbines and put new turbines in their place with more efficient technology. Doing so is called repowering, which is definitely an option at the end of this project's lifetime to remove the older turbines and install newer, more efficient ones.

Our federal lease is only for thirty years and at the end of the lease, a couple of things could happen: If we were to ever seek to put new turbines in there, we would have to go through a federal leasing process again. At the end of our lease, we are required by law to take everything down and remove it. We don't have that flexibility that you do when you have projects on private land.

- *Electromagnetic field (EMF).* The cables themselves are buried at six feet and they are armored and insulated so there really is no magnetic leakage that would be felt by sea creatures on the surface or by equipment in nearby vessels. This includes the equipment that our operations maintenance crews use for maintenance or navigational safety. We have some links to some articles about this topic on our website.

It is correct that there should be no impact on navigation, equipment and wildlife by the conducting of the electricity through the power lines. The blades can create



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some radar impacts and we are looking at how to mitigate that by, potentially, placing a tracking system on the turbines themselves so people coming through the wind farm, particularly in bad weather, would have a clear line of sight on their radar as they transit through.

This topic is something that all developers on the eastern seaboard are focused on and we are trying to work as closely as we can with the commercial fishing industry to have some alignment and regularity across all these areas.

From Barnegat Light: Where is the north end of the lease area? Do you think Barnegat Light will be impacted by the same number of turbines as the parts more south on LBI? Do you know the location latitude or length of the lease area in miles?

ASOW response:

- *North end:* We always say that the top of the lease is Barnegat Light. Technically, if you were to go straight across, it would be just a little below Barnegat Light.
- *Viewing:* There are not going to be turbines north of Barnegat Light in the same way that there are going to be turbines north of the people who live on the south end of the island. If you are standing at the lighthouse looking north, you will not see turbines. If you are standing at the lighthouse looking south, you will.
- *Length of the lease area:* It is about 12 miles from the top of the lease to Barnegat Light. We do not have the exact latitude in front of us, but we can provide it.

JCTA member: Are the turbines going to be illuminated at night? Are there going to be flashing red lights? What goes on after dark?

ASOW response: All turbines are required to have FAA lighting on the top of the tower so we are working with a technology that does not turn them on unless aircraft is in the vicinity so we can mitigate how often those lights needs to be blinking. We are not sure how close the aircraft has to be before the lights activate, but we believe it is a couple of miles, but we cannot say for certain. The lights all blink in unison, so it does not produce some random pattern.

All the leaseholders from New England down to Maryland are working collaboratively with FAA to figure out an efficient way to do this type of lighting so that it is uniform. As part of the project, there are all sorts of documentation that is filed and it becomes part of the charts that pilots are using.

The turbines are required to have lighting at the top and at the bottom as well to help anyone navigating through the wind farm at night by boat. These lights are on in different types of weather and are not visible from shore because they are forty feet above the water all the way out there.