

**Monhegan Energy Task Force Meeting
Meeting Minutes
May 24, 2016**

Present: Travis Dow, Angela Iannicelli, Jim Balano, Matt Weber, Ben Algeo, Mary Weber, Chris Smith, Tara Hire, Jackie Boegel, Billy Boynton, Norma Kaplis, Stew Way, Melanie Greatorex, Mott Feibusch, Barbara Hitchcock, Kathie Iannicelli, Marian Chioffi, Jake Ward, Nathan Johnson, Jim Galvin, Steve Aimone, Winnie Murdock, John Murdock, Mary Weber, Michael Brassard, Marlene Arvan, Frank Stettner, Chris Smith, Bob Smith, Penny Smith, Valerie Livingston, Charles Lyman, Sue Hitchcox, Doug Hitchcox, Emily Morse. Via zoom: Glenn Burdick and Laura Singer

Welcome and Introductions - Marian introduced Jake Ward (UMaine/MAV) and Nate Johnson from Ocean Renewable Power Company

Jake – Ocean Renewable Power Company (ORPC; www.orpc.co) is a tidal energy company based in Maine, with work in the Eastport/Lubec area and Alaska. MAV is looking to bring Nate on to do outreach. Nate lives on Long Island, Maine and is from a fishing family.

Nate - ORPC is a developer of hydrokinetic power systems technology. In 2012, ORPC launched its first turbine project in Eastport/Lubec and since then have done several projects both in US and internationally. ORPC Solutions is a subsidiary of ORPC. They have been successful in bringing together local knowledge and expertise in renewable energy projects. ORPC brings on-the-ground project experience to support the community outreach efforts of the MAV project team.

Brief Update from MAV (Jake) – The design and scope haven't changed since MAV submitted its original proposal to Department of Energy (DOE). In May 2014, MAV was not selected as a finalist for DOE funding; not selected as primary project but was selected as an "alternate" project. MAV received a smaller amount of funding to finalize design and engineering phases of the concrete floating platform. The next phase of the DOE – Advance Technology Demonstration Project for Offshore Wind – is the full-scale construction phase where DOE grants up to \$39.9 million toward the construction cost, to cost-share with other project investors. The original three primary projects have not met their milestones so their continued funding is in question. Jake has been told that DOE will know before end of May if other projects will go forward or not. The MAV project is one of two alternate projects (the other alternate project is in Ohio). In early May, all 5 of the projects submitted updated reports to DOE.

Since last year, MAV has gone from 50% to 100% design of the concrete floating hull, reducing the amount of steel and concrete needed (which cuts costs). MAV is working with wind turbine manufacturers to understand how turbine and tower mounted on a floating platform behaves under all wave/weather conditions. MAV has not done any additional work on permitting. UMaine has deployed a LiDAR (light detection and ranging) buoy last December to measure wind speed at various heights above the water. The floating LiDAR Buoy is located south of the

Island and wind speed measurements for the floating LiDAR are being compared to land-based LiDAR wind speed measurements taken on the southern tip of Monhegan to make sure wind estimates are accurate.

If fully funded, MAV will need to follow-up on several permits including: 1) hull construction site permits in Hampden, 2) permits to upgrade Mack Point pier in Searsport to accommodate larger/heavier turbines, 3) permitting of Monhegan test site; where MAV has already done most of the environmental assessments, 4) permitting for the cable route, and 5) cable landing site permitting. That would happen over the next year if MAV gets approval from DOE for additional funding.

(Note: on Friday May 27th, the DOE announced that two of the original projects would not go forward and the the two “alternates”, the University of Maine and LeedCo would be upgraded from alternate to Project Status. The Aqua Ventus Project is now eligible to receive the \$39.9 million construction grant from DOE, pending completion of milestones. The University of Maine received this information Friday along with the public announcement.)

Q & A and Open Discussion -

Q - Update to environmental studies?

Jake - Damian Brady (UMaine) knows that information but unfortunately was not available to visit Monhegan tonight due to a family emergency.

LiDAR only looks at wind speed.

Jake - The previous studies done by NJ Audubon used radar covering from 0-2000 meters or 0-6000 feet. 90% of the birds fly above hub height of the proposed turbines. This was the same with visual surveys.

Q – [Terns, great cormorants ??? any studies on nesting?]

Jake – MAV did baseline studies on ambient noise on the island and previously proposed wind turbine. They are checking on the decibel level of new model to see how that compares with previous studies.

Q – My sense is that these turbines are very different than the original plan

Jake – In 2007-2008, the strategy was to design and construct a single floating turbine model and bring a full-scale model to the field for testing. The floating hull Statoil uses is a “spar buoy”, UMaine’s floating hull is more like a catamaran – two different hull types. MAV feels its design is better suited to the coast of Maine because it doesn’t require water as deep as water as a spar buoy. MAV thought the 1/3 scale model was going to Monhegan. However, due to fiscal constraints the 1/3 scale model was reduced to 1/8 and deployed off Castine. Subsequently, MAV responded to a U.S. DOE funding opportunity for a full-scale turbine

demonstration project, now being proposed for the test site south of Monhegan. Floating turbines have not been tried at a large commercial scale, but they have been done on a smaller scale.

Jake - 6 MW Wind turbines (the electric generator/blade combination) themselves are in the field already. For example, the project currently under construction off Block Island RI is using a GE 6 MW turbine. GE, Siemens and other manufacturers have to go through rigorous testing of any turbine to be certified and any project will not get financing unless it is using a turbine that is certified as a viable technology.

Q – 70 feet tall turbines went to 600 feet; chance to have input and understanding about that was not clear to Monhegan residents. To me this in an off-the-bell shape curve experimental testing, it is discomforting that it was a major change that was not our understanding of a demonstration site.

Jake – MAV is under microscope with DOE and others that will do extensive review of the project and technology (turbine and platform). Along with the extensive scale model testing at the 1/50 scale and 1/8 scale, MAV feels that the third party review will minimize risk associated with the project. Third party verification (certification by ABS – American Bureau of Shipping) of the project is required, especially by funders; all testing data is reviewed by the financiers.

Q – All testing at the site was based on a 1/3 model, will this information be used now that it is a full-scale turbine?

Jake – Where previous information was dependent on turbine size, studies will be updated for the currently proposed technology.

Q – As permitting process moves forward, what types of problems are you anticipating?

Jake – Permitting is not a simple process. Environmental monitoring plans will be implemented during project operation so as we move forward, if what we predicted doesn't happen we'll have to adapt.

Q – Do you have documentation of impacts, especially with respect to birds?

Jake – UMaine has shared the results of the previous base-line studies with METF and those reports have been posted on the METF website since 2014. This includes the previous bird studies & radar studies performed by NJ Audubon and other consultants doing visual observation of the test site. UMaine is bringing experts back to Monhegan on June 23-24 for a community meeting to answer questions. This includes Wing Goodale with the Biodiversity Research Institute, a bird expert.

Q – The bird studies for the MAV project seem inadequate when compared to what was done for Statoil, e.g. not done during foggy weather; not conclusive compared to other reports.

Jake – The radar studies were done 24/7 year round. The visual observations are correlated to the radar. We would be happy to look at the Statoil studies to see how they correlate.

Q – Birds impact with turbines are more than what was studied ...

Jake - Permitting requires input from – USFish and Wildlife, NOAA, U.S. Army Corps of Engineers, Coast Guard etc., and state agencies include Maine DEP, Maine DMR, etc. The topics are more extensive than just birds.

Q - Do any of the permits have a public notice requirement?

Jake – I will have our permitting team review that issue. The State permitting requirements are listed as part of LD 1465, which is posted on the METF website.

Q – Are there examples of commercial scale wind towers within 2 miles of shore?

Jake – Yes, some of the European turbines are large and close to shore. There is a proposed wind farm off Atlantic City, NJ that is 3 miles off shore. In addition, the wind farm currently being constructed off Block Island is a similar distance and turbine technology (6MW) is the same size as the MAV project proposed for the Monhegan test site.

Jake – The height of the turbine is set so distance between the water surface and blades is sufficient to minimize turbulence that occurs at the water/air interface.

Q - How far do you want to be offshore?

Jake – If technology pans out, we'd want to go at least 10 miles offshore, including 10 miles from any inhabited islands. There you have consistent winds.

Q – How long would you have to test them before you would move them out of the site?

Jake – The testing/demonstration program is to validate the technology and demonstrate the efficiency of the turbines (i.e. will they generate the amount of electricity as predicted). DOE requires 5 years monitoring all aspects of the project. The State permit is 5 years. I would suggest the

Q - Are you saying you wouldn't be quick to move them?

Jake – If you are successful with the demonstration project and then pursue a commercial farm development there could be a case for moving the two demonstration platforms to a commercial farm, but it would be a case of economics. With the platforms/turbines designed for a 20 year life span, if everything is successful at the test site (i.e. generating power, etc.) it may not make sense to move them. The initial State permits for devices located in the test site are for 5 years with renewal intervals of 3 years thereafter. – The design life of the turbine/platform is for 20 years.

Q – Would you take the turbines away after 20 years if they are still working?

Jake – At the end of 20 years we will have some choices We believe the platform has a longer life than 20 years – the design life of the platform is 60 years. Theoretically, we could tow the platform back to shore and install a new electrical turbine. That may or may not make sense. By the time the demonstration project gets to 15 years, we'll know if the project is economically viable at the commercial scale. MAV project financing for the demonstration project (two turbines) is modeled for 20 years and for financing purposes, there is no residual value at the end of the initial 20 financing period from a bank/financing viewpoint.

Jake – MAV will need to continuously monitor and report information. After 5 years, we can submit to renew the permit. In the interim, if there were an environmental problem we would need to adapt the project to address the problem (e.g. shut down for periods of the year or times of day, etc.)

Q – Once technology is established, is the motivation is to keep them going as long as possible?

Jake – Correct, for the term of the financing, i.e. 20 years.

Q – At the end of 20 years, can you do something else on the test site?

Jake – Yes. The test site can be used for testing wind or wave energy devices. There is not a megawatt limit per project, but there is 25 megawatts power generation maximum for the test site.

Q – There was a small rotor area for original scope of the 1/8th model, did the radar go up higher?

Jake – Yes, radar went up to 2000 m (6561.68 ft). The radar looked at all the targets in the whole area and based on radar signals they could tell what species were there, i.e. birds , bats, etc.

Q – How many lights will be on the turbines?

Jake – That is still under discussion. Navigation lights may be required by the Coast Guard and FAA; typical of land based turbines flashing white in day and flashing red at night. New technology now has lights that can be radar-activated (from the plane) so they only go on when planes are close by. There will also likely be lights on the platform. The base of platform will be yellow (approximately 55' above the water) for navigation and the towers and blades are expected to be white consistent with land-based turbines.

Q – Will foghorns be required?

Jake - I am not sure of the Coast Guard requirements. I will check.

Q – What about the noise from the turbines?

Jake – When it is quiet here, the winds are not blowing so the turbines not turning, i.e. no noise. The noise testing showed that the ambient noise on Monhegan is largely from wind/waves and is louder than the projected turbine noise.

Q – Any noise testing away from Monhegan that might effect nesting seabirds for example?

Jake – We have not yet Eastern Egg Rock is close by Monhegan with endangered species so [MAV] may want to test noise levels there.

Jake - platform will be 65 feet below water, hub height 375-400; about 600 to top; want to have turbine as high as you can to get clear air, but when you go higher it costs more.

Q – Am I hearing you saying “no problem pal”?

Jake – No, not at all. One of the reasons we are doing the test site is to see what the issues are. Permitting is rigors and challenging; by comparison federal permitting for offshore oil rig is 45-90 days; offshore wind is much longer.

Q - So, you are saying that there is potential for unintended consequences?

Jake – All the testing and monitoring is to assure there are no catastrophic impacts. The process is to avoid impacts first, find out what actually happens through monitoring and adapt the project if you find out there is an unanticipated consequence

Q – Is there a prospectus you could share?

Jake – MAV is not at point where we have a financial prospectus/offering document that would share with investors, because until we get a nod from DOE, we haven't put energy into actively soliciting other investors; DOE is first round money on the table; At what level and when would that be shared? – Will share if available and can be shared in compliance with financing regulations.

Q – If waiting for DOE nod, then what?

Jake – MAV committed to a cable for Monhegan in PUC term sheet (approved in Jan 2014). In subsequent conversation with METF, the idea of an alternative benefit (i.e. a monetary community fund in lieu of the cable) was suggested. Part of the engineering challenge for MAV is to design for the cable to Monhegan or not ... that decision impacts our engineering, our bidding, our permitting, etc. If Monhegan has an interest in the cable and fiber optics as a community benefit ... then let's go down that road. If not, then let's work on a community fund agreement.

The project requires the construction grant from DOE, equity investment as well as debt financing. An application with any financial institution requires nearly complete design, construction, operations and maintenance details. Initial conversations with financial

institutions at this time are for “level of interest” (i.e. *do you invest in offshore wind, what level of investment would you consider, what are typical financing terms, what level of detail do you need to make decisions, etc.*)

Q – So DOE money will not be sufficient? MAV needs other sources?

Jake – Correct, we will need additional investors and debt financing. If we get green light from DOE for full construction, DOE will award MAV \$39.9M for construction. We will still need to get other funders onboard.

Q – Have you done any studies to assess the impact on property values?

Jake – I’m not sure exactly how to assess that. There are links on the website that offer more general studies on the impact to property values.

Q – Are you going to do any?

Jake – We would need to look at comparable projects. Block Island’s new offshore wind project may be a good example for us to use.

Since the meeting, I was able to consult with other team members. The following is a link and list of studies looking at impacts on real estate values.

Impact on Real Estate Values (<http://www.realtor.org/field-guides/field-guide-to-wind-farms-their-effect-on-property-values>)

[The windy city: Property value impacts of wind turbines in an urban setting \(link is external\)](#), (*Energy Economics*, 44 (2014)). “Broadly, the results suggest that there is no statistical evidence for negative property value impacts of wind turbines. Both the whole sample analysis and the repeat sales analysis indicate that 11 houses within half a mile had essentially no price change”

[Relationship between Wind Turbines and Residential Property Values in Massachusetts \(link is external\)](#), (*U of CT/ US Dept. of Energy*, 2014). The study “found no net effects due to the arrival of turbines in the sample’s communities. Weak evidence suggests that the announcement of the wind facilities had a modest adverse impact on home prices, but those effects were no longer apparent after turbine construction and eventual operation commenced. The analysis also showed no unique impact on the rate of home sales near wind turbines.”

[A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States \(link is external\)](#), (*U.S. Department of Energy*, Aug. 2013). Building on its earlier 2009 study, the research team collected data from more than 50,000 home sales among 27 counties in nine states. These homes were within 10 miles of 67 different wind facilities, and 1,198 sales were within 1 mile of a turbine—many more than previous studies have collected. “Regardless of model specification, we find

no statistical evidence that home values near turbines were affected in the post-construction or post-announcement/pre-construction periods.”

[Values in the Wind: A Hedonic Analysis of Wind Power Facilities \(link is external\)](#), (*Land Economics*, Aug. 2012). 2011 draft [available here \(link is external\)](#). This paper uses data on 11,331 property transactions over nine years in northern New York State to explore the effects of new wind facilities on property values. They find that nearby wind facilities significantly reduce property values in two of the three counties studied. These results indicate that existing compensation to local homeowners/communities may not be sufficient to prevent a loss of property values.

[Wind Energy Facilities and Residential Properties: The Effect of Proximity and View on Sales Prices \(link is external\)](#), (*Journal of Real Estate Research*, 2011). Same authors as the DOE report below.

[The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis \(link is external\)](#), (*U.S. Department of Energy*, Dec. 2009). A three-year study by the U.S. Department of Energy’s Lawrence Berkeley National Laboratory concludes “neither the view of wind energy facilities nor the distance of the home to those facilities was found to have any consistent, measurable, and significant effect on the selling prices of nearby homes. No matter how we looked at the data, the same result kept coming back—no evidence of widespread impacts.” The link is to the press release on the study. A PDF version of the study is available at the bottom of the press release along with a PowerPoint of highlights and contact information. Critics of the study appeared almost immediately, including the [Acoustic Ecology Institute \(link is external\)](#), appraisers ([here \(link is external\)](#) and [here \(link is external\)](#)), as well as from [established opposition groups \(link is external\)](#). Study author Ben Hoen presented the following slides at the New England Wind Energy Education Project webinar, 2010: [Impacts on residential property values new wind turbines: An overview of research findings and where to go from here \(link is external\)](#) [PowerPoint in PDF]. This presentation shows updated research and conclusions from the Berkeley study that suggest that effects on property values can exist and need to be addressed.

[Green vs. Green: Measuring the Compensation Required to Site Electrical Generation Windmills in a Viewshed \(link is external\)](#), (*Appalachian State University*, June 2007). A study finds that “individuals who perceive wind energy as a clean source of power require less compensation. Those who retire to the mountains or individuals who have ancestors from Watauga County require more compensation to accept windmills in their view-shed. The annual compensation necessary is estimated to be about \$23 per household. In the aggregate, citizens need to be compensated by about \$500,000 a year to allow wind electrical generation turbines in Watauga County.” A version of this paper appeared in the journal [Energy Policy \(link is external\)](#) in 2008.

Q- Is there any chance of moving them to a different site?

Jake – This is the site that was designated for the University of Maine.

Q – Will there be job growth?

Jake – Laying out all the different community benefits; already offering captain jobs to Monhegan first, other jobs as well, 5-year monitoring; committed to fiber optics for Monhegan.

Q – Have there been any habitat studies done?

Jake – We have shared studies that we have completed with METF. They are posted on the Monheganenergy.info site. Other projects have shown increased biomass under/around platforms. We would expect an increase in benthic activity. UMaine has a few proposals out for review that would use platforms to demonstrate co-location of mussel rope aquaculture; a platform of this size could be a significant opportunity to co-locate other aquaculture activities.

Q – Maine DMR has not been willing to perform PSP testing on Monhegan?

Jake - Need to get copy of shellfish closure site. Paul Anderson might be a resource to look into this further.

Q – Is there any potential for a commercial scale farm at this test site?

Jake – The physical requirements for the test site is limited to 1.1 x 2.1 miles square. This would not allow enough room for a commercial scale wind farm. UMaine has already committed to not sell our UMaine technology to anyone who would be locating a commercial scale wind farm within 10 miles of Monhegan. The cable to shore from the test-site will be capped at 12 MW and would not accommodate a commercial scale wind farm.

Q – So, could you go out to 3 miles into federal waters?

Jake – It would take longer to get permitting in federal waters and federal permitting does not have as rigorous a monitoring component as the state requires. We would be starting from scratch to do the baseline environmental data collection to apply for federal permits and a great deal has already been invested in the base information collected at the test site.

Q - Is the cable still landing in Bristol?

Jake – We stopped all conversation about a cable landing in Bristol in May 2014. We will not restart cable way evaluation until a (go-no-go) decision with DOE is made. I talked with Bristol last week. We have not taken anything off the table. One of the concerns from the Bristol was that Bristol fishermen did not want the cable going through fishing grounds.

Q – Is there a schedule yet of what will happen when?

Jake – We have not finalized a specific schedule, however, while platforms are being constructed and assembled on the shore and shore-side on mainland, anchors and mooring chains for the Monhegan test site will be installed so then everything is ready when turbines are ready to be towed out.

Q – Would UMaine have a private office out on Monhegan?

Jake – That is up for discussion. Some people would think that is good thing and some would not think it was a good thing.

Q – Any comparable data with European projects?

Jake – There is lots of data being collected, but none are floating platforms.

Q – Are there studies available to look at?

Nate – Europeans are leading on tidal as well as offshore wind. You need to be mindful that every site is different and species composition is different, but certainly valuable when looking at a commercial array. Samsø in Denmark has invested in land and offshore wind. They have embraced renewable energy as an economic development opportunity that has worked for them.

Q – Do you have to hunt around to find the information?

Nate – There are a few websites and we can come up with a list. But sometimes they are difficult to navigate and can be technical. (we are collecting some of those sites and will share with METF)

Q – What is the size of European floating wind farms?

Jake – From 6 MW to larger; will all be at similar height range to MAV 6MW turbines. The Wikipedia site has a table with the top 25 operating offshore wind farms that shows the farms location, the size of the turbines and the number of turbines.

https://en.wikipedia.org/wiki/List_of_offshore_wind_farms

For example:

[Westermost Rough](#) 210MW United Kingdom 🌐 35 × [Siemens](#) SWT-6.0-154

35 Seimens Turbines @ 6 MW /turbine with a rotor diameter of 154 m (505 ft)

Q – You’ve alluded to a larger wind farm in the future; what will be the scale?

Jake – A commercial scale wind farm is possibly 500 MW, 83 turbines at 6 MW, perhaps an 8 x 8 square mile array. Floating technology can allow a change in configuration (i.e. doesn’t have to be square). Off the coast of Massachusetts, BOEM has picked “wind areas of interest” that were auctioned off to potential offshore wind companies. The nice thing about floating turbines is that you can avoid areas (based on bottom or other uses) or orient them to capture prevailing winds, independent of bottom characteristics.

Q – Would it be possible to connect to an offshore transmission cable?

Jake – The only plans for subsea cable that Jake is aware of is a cable (Maritime Link - <http://www.emeranl.com/en/home/themaritimelink/overview.aspx>) which runs from Labrador to NewBrunswick and has subsea offshore sections. Another concept plan is the Maine Green

Line a subsea cable from midcoast Maine to Boston
<http://anbarictransmission.com/projects/mainegreenline/>.

If that ever went into place, I am not sure if offshore wind farm could plug into that?

Q – How does tidal current power compare to wind? Would it be applicable to Monhegan?

Nate – Not today. Current profiles are used to assess a site (similar to wind speed). We look for peak velocity of 2m/sec. Certainly the early adopter places are high velocity sites. As prices go down for technology, it could be a viable option in places with lower currents. Currently Downeast Maine is the best area to explore for using tidal currents to generate energy.

Q – What would be mutually beneficial to MAV an ORPC?

Nate – My interest is both personal and professional. ORPC as a company wants to see positive economic development in Maine. We think there are opportunities to grow industries that complement and not misplace traditional marine industries; this is what we look for as a company and seek in our partnerships. On the community level, Eastport has been benefitted from our tidal project. It has brought extra people in restaurants, in rooms, etc. They take pride in the project. ORPC is a start-up company so there is financial incentive for us to partner with MAV. Personally, one of my passions is to give my kids opportunities to stay in Maine. I still commercially fish and do some aquaculture work. I think this project has the potential to bring benefits to Monhegan.

Nate – My personal perspective is that this project has the potential for benefits. Reduced power costs and access to a fiber optic cable would allow people stay on the island longer. Initially, there could be positive impacts on tourism and a positive impact on local economies during construction and monitoring. I think there are opportunities here.

Q – What do you think the negative impacts are?

Nate – I don't think everyone wants to look at turbines and that's a personal choice. The location was chosen to minimize those impacts. There are localized impacts to fisheries. From an environmental monitoring perspective, the one measureable impact seen at ORPC's Cobscook Bay Tidal Energy Project has been a positive one – an increase in benthic organisms using the structure as an artificial reef (e.g. blue mussels and urchins). Cobscook Bay is heavily dragged so the restricted ORPC site also has likely contributed to the increase in benthic organisms.

Review Decision Process/Calendar and Determine Next Steps - Marian gave a brief review of the process for moving the discussion forward. At the community meeting in April, people asked for another meeting in June when more summer people were here and to bring experts back to the island. METF is hosting sound and bird experts June 23 and 24 so people in community can ask questions directly to those people. METF has had several discussions to help them hone in on what the majority is for community but we can't just keep discussing it ... we as a community need to come to a decision. By time of next meeting we hope to know DOE

decision, but wouldn't put in writing on ink on calendar. We will hold another survey that includes an option for the community to just ignore the project and an option to actively fight the project along with the cable option and the monetary option.

Q - What form will the decision-making take? Who decides?

Marian responded that decisions are made at a special town meeting. People who can vote are those that are registered to vote on Monhegan, but the people will also have a sense of what summer residents and others may feel.

METF has been charged with collecting information and passing on information. We will give that information on to assessors. The assessors are charged with signing on behalf of the town. METF is still working on the rest of answers to questions posed by the community in April. METF to is a communication link – bringing the results of the survey to the assessors and we will incorporate other previous work on community benefits discussions.

Next meeting is Tuesday, June 15th at 5:30pm at the Library.

Notes taken by Laura Singer and Marian Chioffi