



Meeting Notes
Small Wind Working Group
April 14, 2011
11:00am – 1:30pm

Welcome and Intro: Scott Hunter, RE Program Administrator from the BPU, welcomed participants and discussed that because of some safety concerns in the REIP program for wind systems, the program was put on temporary hold. This meeting is to review research activities started since we were contacted about the safety issues, hear best practices from some the national experts and to solicit recommendations from stakeholders on moving the program forward to avoid these types of issues in the future.

Presentation #1 - Summary of Actions taken by Program staff:

David Hill, from the Market Manager (MM) team discussed the research activity focusing primarily on the industry outreach that was conducted with National Renewable Energy Laboratory (NREL), American Wind Energy Association (AWEA) and the Small Wind Certification Counsel (SWCC). David invited contacts from both AWEA and SWCC to join in this meeting and discuss further the findings. David mentioned that Trudy Forsyth, from National Renewable Energy Laboratory (NREL) will be presenting later in this meeting. David Hill said that when the events occurred it was important for the MM to proactively help support the states effort and reach out to and very actively find out the answers to several critical questions. The MM wanted to find out if there have been any 3rd party independent studies on turbine failures and safety for the small wind industry. Unfortunately the consensus was that there have not been 3rd party studies completed in this area but it was also the consensus that this would be a helpful step for the industry to take. The MM also wanted to learn about other current and past similar incidents. This discussion will be covered by David Damiani from the MM team. David mentioned that the MM looked at what approaches did exist for identifying eligible turbines. Larry Sherwood, will talk about the Small Wind Certification Counsel and John Dunlop will discuss the AWEA standards. David also mentioned that the MM would share the information we found on safety and our performance issues amongst program administrators. David Hill had contacted many program administrators during his research and all of them felt it would be great for there to be a single coordinated source for this information like the Clean Energy States Alliance (CESA) or Wind Powering America. Finally, during our outreach with the NREL and SWCC it was proposed to conduct a 3rd party investigation of the current incidents in order to have a credible 3rd party investigation of what are the issues and what caused these failures.

David introduced John Dunlop from AWEA who was on the phone and asked him to comment. John Dunlop (AWEA) said that he have been with AWEA now for 18 years and have been in the industry over 20 years. John said that he started promoting small wind turbines when he worked with the State of Minnesota Energy Office. John said that when he heard about the turbine failures in NJ, he felt that these were very unique and isolated situations but he was anxious to find out what happened. John said that he fully expects the 3rd party investigation to conclude this to be a very unusual incident and he certainly endorses Larry Flower's proposal that NJ continue the rebate program for wind systems.

Questions:

Mike Ambrosio: Larry Flower's letter encourages the BPU board to restore the program with appropriate precautionary modifications. Did you have any specific appropriate precautionary modifications that you are recommending, or could you make a recommendation?

John: I'm not sure what Larry had in mind, but I believe that Larry Sherwood will be talking about in the certification program. Using certification and testing to the AWEA standards would be a great step towards accomplishing this.

Next Larry Sherwood and Brent Summerville from the SWCC were on the phone and gave an update on the Small Wind Certification Council process. It was discussed that the SWCC is in initial phases and because certification takes quite a while it would be important to help stakeholders understand the different stages and where a turbine fits in the stages. The SWCC can provide some materials that can be helpful for programs as systems move through the certification process.

Larry Sherwood said that the Small Wind Certification Council certifies turbines to the standard that AWEA has developed. The AWEA standards include small wind turbine performance and safety and as it relates to safety, that standard has a number of requirements. The certification requires an engineering analysis of the mechanical strength of all the major components of the turbine and it also requires a safety and function test. This includes testing all the safety equipment or safety operations on the turbine – how it starts, how it stops and what protections are in place when there is an over speed situation. There is also a duration test includes 2,500 hours of operation to show that the turbine operates in a good fashion for that length of time. There are many other requirements in the standard related to performance issues. Once the turbine is certified, the manufacturer would be required to report to the SWCC any problems or failures that have occurred in their turbine that relate to the items that we certify and we would look at those items. The SWCC does have a procedure and process where the SWCC could suspend or revoke the certification depending on what we've learned in those situations. If in the future the industry is faced with a situation like what was experienced in NJ, it will be easier to find out if there are other instances of failures from the SWCC.

Larry also said that the Small wind certification is a new program and the SWCC currently has 25 turbines pending application for certification however there are none certified to date. Larry estimated that by the end of 2011, the SWCC would have about 8 turbines that will be certified. The challenge for NJ and other state incentive programs is that they want to use certified turbines in their program but there aren't any certified turbines at the present time. Larry stated that the one piece that the SWCC is doing to try and help in this is to provide additional information to show the progress and work the manufacturers are doing towards their certification. This information will be able on the www.smallwindcertification.org. Shortly will have new information up on the website that shows which turbine are under test so you can see the turbine that are seriously pursuing this certification and testing. These separate milestones will specify when the test report is submitted to the SWCC. We have a proposal to add a 3rd milestone which would be to publish the power curve, power rating, and energy rating information for the turbine. That information is much quicker to come up with and to do the full duration test.

Questions:

Owen Highlander: In regard to reporting failures, a failure might have a range of definitions, and yes, blades falling off are clearly a failure, but there is a lot of subjectivity on this topic, any idea how that might be defined?

Larry Sherwood: The SWCC has a failure defined and I believe it states that the turbine manufacturer must report any problems that happen relative to the performance of the turbine. The fact that a problem is reported does not necessarily mean that we would take any action and presumably some of the problems that were reported; probably most of the problems that were reported would be relatively minor in nature.

Brent Summerville clarified that the SWCC policy is defined as all abnormal operating experiences, equipment failures and malfunctions and other problems related to the certified turbine.

Mike Winka: Will these abnormal operating experiences be available to the public?

Larry Sherwood: As we currently have it envisioned, it would not be public information; however it could potentially become public if an action or change in the status of certification of that particular turbine.

Jim Fry (Ocean Gate): When you define failure, are you actually saying that if a fuse fails in a circuit or in a controller or something, would be classified as a failure? It would be important that the SWCC is extremely careful when it define failures.

Larry Sherwood: The SWCC's interest is to have the problems and failures reported, however they are defined. It's in the SWCC's interest to protect the certifications that we are issuing and to make sure the turbine is still meeting the requirements of the standards and the requirements as it was certified. The fact that the incidents are reported, there would be a lot of minor issues that would not necessarily affect the certification.

Scott Hunter: Can you talk a little bit about the preliminary milestones that you said were under consideration and when they might be rolled out?

Larry Sherwood: Next week, we will put up on our website the milestones that show under test and test reports submitted. And I also should mention, that there are a category of turbines that have been certified and written and are essentially transferring the certification of their turbine in Britain to the United States. So of those 25 turbines, there are about 4 or 5 of those have been certified in Britain and in order to transfer that certification we need to have an agreement with the certification body in Britain and we are negotiating those agreements at the present time and we will list the turbines that are under test and are not certified in Britain and there will be 4 or 5 of those when we list them next week.

Andy, a phone participant: Commented that the certification process seems to be a little more stringent in the UK because it requires a manufacturer to get a utility inspection as well.

Presentation # 2, Wind Turbine Analysis:

David Damiani discussed that the BPU asked us to conduct an analysis on the turbine failure and certifications for 14 different turbines, representing 10 manufacturers. This group represented the turbines and manufacturers for current REIP projects that had received approval letter for rebates. David Damiani stated that the MM reached out to the manufacturers and received their answers on 6 questions that we presented them with. Questions included: if they had any turbine failures, if they have certifications, if they had 3rd party testing, how many installs they have had in the United States and also worldwide. All 10 manufacturers responded. The MM team is still in the process of collecting more detailed information from some of the manufacturers. All the manufacturers have all been forthcoming with information. The MM has had multiple phone conversations, multiple email correspondence back and forth. They have all been very willing to cooperate. Various testing reports on their turbines have all been submitted to us. Turbine manufacturer's install base includes dozens to thousands and some of them have very extensive background information on their safety records and performance, etc. The MM team reviewed the responses and at that time determined we needed some additional and more detailed information to be disclosed to us. At that point, we organized the information in a spreadsheet and reviewed the information with the team.

Other questions that we asked the manufacturer include: Have you experienced any safety problems or system failures with your turbines? If you have experienced any problems, please provide some information about the incidents. Can you provide independent test results for your turbine? Is your wind turbine currently certified by any independent agency? Do you have plans to have your wind turbine certified by an independent agency, and if so, could you give us a timeline?

Scott Hunter: To clarify, these 10 manufacturers are turbines that we have made commitments for rebates on projects and so, when Dave says, moving forward, he means moving forward with those 10 manufacturers' turbines and commitments but not moving forward for new rebate commitment activities. The REIP wind program for new applications is what we'll be discussing later on the agenda today during the ideas for program design and improvements to the current processes. This is all about getting a level of comfort with the turbines that we have made rebate commitments. These projects are various stages of that commitment - some are constructed and waiting to submit Final As-Built paperwork, and some probably haven't even broken ground yet.

Presentation # 3, Next Steps and Current Process:

Charlie Garrison presented the next steps and current process for projects that are currently approved in the REIP. When the MM first heard of this incident, we had 37 wind projects that were currently active. This means they had current rebate commitments in the program but hadn't yet reached the stage where they were completed. There are other projects that are already completed, they've been up and running for a number of years. The MM didn't examine those because those projects are already completed. For those 37 projects there were 10 unique wind turbine manufactures that were specified for these projects. As of April 12th, 7 of the 10 manufacturers that supplied adequate responses to our questions and provided appropriate back-up documentation. The other 3 manufacturers have been working with us and are still getting us information. As David Damiani said everybody is being cooperative and is working with us to supply information, but some of them need a little bit additional time. From those responses, we created a matrix and the MM team reviewed that matrix and our intent is to provide a written recommendation to the OCE to remove the temporary hold from those projects that satisfactorily answered the questions posed. The written recommendation will be sent to the OCE shortly. With the other 3 manufacturers, when that data does come in, we will continue the same process.

Scott Hunter: Since we have folks from the SWCC, AWEA and NREL on the call and participating, did we miss any appropriate cautionary steps or questions that you'd recommend that we pursue before moving forward?

Trudy Forsyth from NREL mentioned that we should find out if the system has undergone any changes because in her experience the turbine configuration and design can affect the system performance.

Jim Fry: I am assuming that the 37 applicants are obviously aware that there was a temporary hold. I'm just wondering is there any plan for some notice or information to be provided as to what we did and what we found and what it means and doesn't mean.

Scott Hunter: I test that first assumption that all the 37 consumers have been alerted to the hold. These customers' installers are more likely to be knowledgeable that we drafted some communication. We are still working on a letter to each of the individual rebate applicants, the customers, as well as any of the other parties on our application materials. We have not, to my knowledge, formally reached out to those customers, but we do anticipate that will be a critical step before we move forward. It was important for us to summarize where we are in the process to the customer. It's one thing just to send them a notice saying that we're temporarily suspending the program, but I think it's more important that we include, here is what we are doing and here is the timeframe for being able to respond. That message just taking a little longer to put together. What we did so far is put a notice on the website and anybody can go to the website.

Scott said that David Hill also mentioned that it is important and incumbent on the installers and on the industry to communicate effectively with the customers about the process and to say that the state is going through a process and is working towards a formal communication. Scott thought that the contractors were aware of the temporary hold and to keep good customer relationships and transparency, etc. Contractors should make their customers aware of this situation and not wait for the program to send a letter.

Charlie Garrison discussed the next slide that talks about the REIP program inspection process. Wind and biopower systems are inspected at 100%, as opposed to solar. Mike Ambrosio also stressed that a program inspection does not include doing structural code examination or climbing up the tower to make sure the bolts were put on right. Our focus is on making sure that the system meets the program requirements.

Scott Hunter stated that since we are discussing program design issues right now this would be a good time to hear Trudy Forsyth from NREL's presentation about a national perspective on program design issues. Before Trudy started her discussion, Scott reviewed the history of the wind program and how it has evolved over time. In end of 2003 and early 2004, the Board of Public Utilities took over the renewable energy rebate programs from the utilities that had a wind rebate program. The BPU took the existing design which was a capacity based rebate. In end of 2006 and early 2007, the MM and BPU staff held a small wind working group meeting at Rowan University with funding from the US Department of Energy towards developing this stakeholder advocacy group. The changes that have occurred since 2007 have been processed through this Small Wind Working Group (SWWG). The program design changes and issues have become part of the NJCEP through our annual budgeting and program development process. In the summer of every year, we go through a budgeting exercise looking at what we spent to date, what we expect throughout the rest of the year, looking at funding available and what the program design needs to be in order to achieve our larger goals. In that program design and program budgeting exercise the MM develop compliance filings that have the details of these programs. The programs are approved by the BPU Board in an annual budget that occurs typically in December of every year for the year following. Through the SWWG the program design was changed to include an expected performance based buy-down. The rebate has a performance based rebate that uses a calculator developed initially for the Wisconsin Clean Energy Program. This calculator is populated with turbines that have been added to the Wisconsin program and the performance has been reviewed by that program. We also have an alternative rebate incentive program for the turbines that was approved in 2011. This alternative program is for all turbines that don't have that history and we require of those turbines to have a certified power curve. This alternative program is the Innovative Wind Technology Incentive (IWTI). With this incentive we estimate the performance and then we pay the rebate quarterly over that year after the system is installed based on actual performance. These changes were designed so rate payer's investment in the turbine is proportionate to what we're expecting to get out of it. Only the most productive turbines give off the greatest amount of incentive and the marginal proposals get less rate payer rebates and the customer generator is expected to take the risk and foot the bill for the installed cost.

It was discussed by many participants that the calculator that is used to estimate performance is currently over estimating the performance and therefore overestimating the rebate. It was also discussed that one of the calculators available in the market is a little bit more adjustable both for you to add power curves and to alter that sheer coefficient based on site conditions. This calculator is from New Roots.

Scott Hunter stated that the agenda for today's meeting before these safety issues had arose was going to be performance and how we tweak the program so that we actually have an accurate estimation of performance. Comments in writing on program changes in order to better calculate estimated performance would be greatly appreciated.

Presentation #4 – NREL NJ Testimony:

Trudy Forsyth from NREL talked primarily about the wind resource, the challenges and understanding the wind resource. She also discussed what is happening in terms of certification, not just nationally but internationally as well. She shared a bunch of examples in her presentation regarding good sited wind systems and the wind resource.

She stated that the US Department of Energy carefully tracks the number of turbines installed each year. That information is provided through the American Wind Energy Association (AWEA). You have probably seen their small wind market global reports that they come out with every year. Trudy said she has been in field for 17 years and she thought that wind speeds varied only about 20% per year but when her team started to look at some

wind data from our site which is at 6,000 feet elevation, and a pretty clear site coming off the mountains, we see up to 50% variation on wind speeds. So whatever performance calculator any program decides on using, it's not ever going to be right. Next she discussed the importance of micro siting and that you don't want to put your turbine behind the barn, silo, the trees the buildings in the prevailing wind direction because all you are going to do is increase the turbulence. She stressed that systems get better performance with a taller tower because as you go up into the earth's atmosphere so the wind speed increases. She said that installers should be installing a tall tower at sites where you have trees and houses and other things blocking the wind. The challenge is getting a performance estimator that's going to have any type of accuracy. She also discussed capacity factors. The capacity factor really is an indication of the site. It is not an indication of the turbine. It is an indication of what type of site do you have in terms of clean, good wind resource and so here's the actual formula – it's the kW hours of electricity produced per year divided by the rating of the turbine times the number of hours in here and historically small turbines have a hard time because they were rated at different wind speeds. But the standardization of the small wind certification counsel and the AWEA standard are saying we will all know rate our turbines at 11 meters per second. That's a huge step in the industry because now you can compare product to product and see which one is likely to produce KW hours.

The other thing is the wind resource is high variable. On the NREL site, where there is not any blockage in the wind, there is a 50% difference in wind speeds. The solar resource is much more stable compared to the wind resource. If you have a performance based percentage piece of it, that consumer is taking lot of risk because it's really impossible to control the wind. So those are some of the pluses and minuses of different incentive programs.

Trudy shared some data points from same study that focused on performance. The data looked at total incentive funding by state and average incentive per kW rated capacity by state. NJ seems to be right in mid-point at the average 240 a watt and this was a current study that was done compared to capacity. The NJCEP incentive amount is probably right where it should be. Total amount of rebate funding used for small wind projects around US and NJ is pretty respectable too.

She also discussed what is happening internationally regarding certification for wind turbines. A group of experts have been asked to convene a panel. It's a very formal process that goes through new work item proposals to how standards get started and they typically take about 3 years to develop. They are typically consensus based what everyone can agree on from all of the countries representing all of the products in the marketplace. And there are 3 main standards that have impact for small turbines: (1) -2 design requirements for small turbines, (2) acoustics, (3) power performance -- the international best knowledge on standards. AWEA set up a committee and part of these international standards. So if somebody comes to you and says I have a certificate that meets the IEC standards -- that is a higher level standard than either of these international standards. Between the AWEA standards and the British Wind Energy standard, they are essentially the same.

In UK, they have this micro generation certification – it's on the website. She showed the products on their list. As Larry Sherwood said, there seems to be a reciprocal agreement between the UK and the US in exchanging certifications and standards. The most important part is its labels and all turbines will be evaluated at energy production at 11 miles per hour 5 meters per second. Than the sound level is 95% of the time based on that wind speed and weighted power is 24 miles per hour which is 11 meters per second. The good news is you can compare every single product because all turbines will have these numbers produced.

After Trudy finished the presentation, Scott Hunter summarized what was going to be discussed during the rest of the meeting. Scott said that we would be discussing ideas on future program changes needed in order to open the program again.

There was much discussion that centered on the following topics:

- Insurance & bonding
- Safety

- Warranty
- Training
- Certification

Scott Hunter facilitated the 1 hour discussion and then asked stakeholders to submit their ideas in writing so that staff can develop a straw proposal. Scott Hunter said that Alma Rivera would send out a note to the Small Wind Working Group with this request and timeframe to submit. The meeting ended approximately 2:00pm.

Attendee List:

Name	Company	Name	Company
Melissa Smith	NJCEP/ CSG	Brian Lipman	NJ DOL
Jim Fry	Boro of Ocean Gate	Roger Dixon	Skylands Energy
Frank Dewitt	Alternative Energy Associates	Sherret Chase	CCMI
Owen Hyland	Alternative Energy Associates	Gayle Rowe	JBS Solar and Wind
Joe Crecca	JBS Solar and Wind	Alan Axworthy	Northern Power Systems
John Kim	Infinite Wind Energy	Filipe Goncalves	Infinite Wind Energy
Michael J. Asche	Atech Energy	Dan Murnane	Applied Energy Group
Joyce Kimek	Free Water Wind	Jenny Wang	Natural Electric Products
Peter Fang	Natural Electric Products	Scott Hunter	NJ BPU
Doug Rickert	Langan Energy	Domenica Conserva	Natural Electric Products
Ralph Conserva	Natural Electric Products	Jamal Gamer	NJ BPU
Alma Rivera	NJ BPU	Tammy Gray	NJCEP - VEIC
Ron Reisman	NJ BPU	Mike Ambrosio	Applied Energy Group
Mike Winka	NJ BPU	Bob Miller	Miller Consulting
Elizabeth Terenik	Terenik Land Use Consulting	Kevin Schulte	SED, Inc. and DWEA
Anthony Catanoso	Atlantic City Steel Pier	Robert W. Bucco, Jr	Recycling Technologies Development
Jon Youngmans	Fresco Realty	Floyd Donahue	Shore Storage
John Donahue	Shore Storage	Lowel Neff	Omni Wind Energy
David Damiani	NJCEP/CSG	Bob Krees	Rowe-Electric
Paula Stowe	Ryan, Inc.	Larry Sherwood	Small Wind Certification Council
David Hill	NJCEP/ VEIC	Brent Summerville	Small Wind Certification Council
Henry Ogden	NJ Rate Council	Trudy Forsyth	NREL
John Dunlop	AWEA	Charlie Garrison	NJCEP/CSG
Janja Lupse	NJCEP/CSG		