Small Wind Standards and Policy
September 18, 2013

Coordinator: Thank you all for standing by. All lines been placed on a listen mode only throughout the duration of today's conference. Today's conference is being recorded. If you do have any objections you may disconnect at this time. I'd now like to turn the call over to Ian Baring-Gould. Thank you may begin.

Ian Baring-Gould: Hello. Thank you and thank you everybody for joining the September - we're already in September, the September Wind Powering America Webinar and this one building off last month's webinar which was focused on the small wind annual report.

This one is focusing on standards and policy in regards to the small wind industry and providing updates on that and just to be complicated we're going to actually reverse that order and start talking about policy first and then dive into standards.

We've got a great set of folks here that we'll be gaining knowledge from. The first kind of grouping is Heather Rhoads-Weaver, Chelsea Barnes and Matt Gagne who are going to talk about the policy aspects and then we have Brent Summerville and Val Stori talking about or bringing us up to date on certification and standards in the small wind area.

So quick introductions, Heather Rhoads-Weaver is the founder and principal of eFormative Options where she has specialized for a long time in policy market analysis consulting stakeholder communications mainly around the community and distributed wind area with other focuses in other renewables and energy efficiency as well.

She is a senior member of AWEA, has worked with AWEA and was distinguished by WoWE this last year as the mentor of the year. She got NREL and DOEs, the WTA Small Wind Advocate Award. She's been very involved in the wind, the small wind industry for quite a few years and has led the development of the distributed wind policy comparison and tooling guidebook which is what she'll be talking about today.

Chelsea Barnes comes from Keyes, Fox & Weidman which is a firm, a policy firm and lawyer if I'm correct. But she works primarily in legislative tracking with that organization and has a strong long history in this area. She does a fair amount of research and analysis on solar incentives and the incorporation to financial models, policy expertise including the viability of third party ownership models in the United States based on financing and a whole bunch of other things.

She worked extensively with the DSIRE Project so the DSIRE website that I'm sure all of us are very familiar with and then also worked with the development and kind of continued on doing maintenance on the distributed policy wind comparison tool and tons of years and expertise in the policy space around distributive renewables and clearly talking to us here about the wind space.

And then Matt Gagne -- last but not least -- is a consultant to eFormative Options but comes from a strong analytical and journalism background, has done lots of work in data analysis and GIS and translating the information into stuff that us mortal humans can understand. He's worked extensively in the small wind industry as a technical writer of data analysis modeling including a bunch of the standard deployment softwares that we know open wind and things like that and then he's worked with eFormative Options on a number of

different activities including the market survey compilation data analysis that Heather is going to introduce us to in the policy tool.

So we'll move on to their presentation and they're going to do a tag team. Typically we hold questions until the end but I think what we'll do in this case is after the first three speakers Heather, Chelsea and Matt will do a quick pause for any questions in regards to the policy tool then we'll move on to Brent and Val talking about again as I mentioned standards. We'll have some questions for them and then we'll open it up for more general questions in the distributed wind space.

As people see here the way to ask your questions is we don't do verbal questions. We type them in so if you go up on to the mini bar at the top and select the Q&A you'll have an opportunity to type in questions and then I'll moderate those questions when we get to that point. So without further ado Heather would you lead us off?

Heather Rhoads-Weaver: Sounds good and I think Tessa you're going to bring up my slides, is that right? And while she's doing that I wanted to acknowledge another team member who is not able to join us today but Alice Orrell is our contract manager of the Pacific Northwest lab and she's really been the brains behind our Proforma spreadsheet that feeds into our dashboard. So she's quite an expert on all the formulas that go into the policy tool.

I wanted to acknowledge Trudy Forsythe and Tony Jimenez. (unintelligible) has been an important partner on this project as well and both Chelsea as well as Laurel Passera and Amanda Venega that are at Keyes, Fox & Weidman and some of the other staffers that were at North Carolina Solar Center really helped to kick this off and Andy Schneider, Ed Delia and some other eFormative consultants have been helpful as well.

With that I meant to use this as a dashboard interface Proforma which really simplifies the what-if evaluation. You can use slider bars and dial up and down different functions. And we tried to simplify it so you really only need to take two inputs and get results right away if you want to look at a particular state and then an ownership sector which is a residential, commercial and non taxed.

Then the model populates immediately with all the default values that we've put in there in the background, pulls in the data feed from DSIRE and there's a lot of these assumptions that the user can adjust such as the exact turbine type and power. You can adjust the annual energy production as well as other market factors and incentives and things to evaluate if the situation changes. Now this is not a siting tool but it is adjustable so that you can evaluate a specific project scenario.

Just to jump real quickly into some results this shows just looking at our base case scenarios so all the defaults that are in there, what are the top states currently? Not a big surprise Hawaii although this is really the best case there. It's assumed that you can get retail value for all of your kilowatt hours and they do have some restrictions on net metering for the larger projects.

You might also need to adjust the cost for Alaska and Hawaii and some remote areas. You may have higher costs than the national average but in general you've got the non-taxed sector. There's only about half a dozen states that have a positive return on investment without tax credits. So type of projects you might need to partner up with and then can take tax credits.

And one interesting note here in New Hampshire is fairly high on the list and Chelsea is going to talk a little bit more about that on some of the other recent

developments in a few minutes. So just looking at some of the - the overall picture the tools returns back four different metrics, the cost of energy, net prevalent value, the IRR -- internal rate of return -- and the simple payback in years. And each of these gives you slightly different information about the economics of a project.

We have ten different turbine models programmed in with their power curves with several different tower heights and types. As I mentioned you can adjust those and look at other options as well if you know the expected AEP for your site. Matt's going to go over how you do this, the technical tab during his demo.

We do have some wind resource options built in but again that can be adjusted as well. And this just shows you that a huge space - a total patchwork quilt around the country, the policies that each state has, a lot of specific variations. And what we've done to make your job easier is preprogram all of these details into the back end so that you don't have to understand all of the details of every state to be able to evaluate which ones have good market and how different assumptions can lead to the overall picture. And with that I'm going to hand it off to Chelsea to go into a little more detail on some of the recent policy developments.

Chelsea Barnes: Hi, thanks Heather. So I first wanted to cover a little bit of background on Keyes, Fox and Weidman. We are a distribution generation of renewable energy law firm. I'm not a lawyer in case someone misunderstood at the beginning.

This year a group of six policy analysts formally managed the DSIRE project including myself joined the firm to expand the policy research and solving capabilities on policy services to complement the firm's law services so

currently I do run the legislative side of tracking service and we have regulatory tracking as well. We're also developing a granular incentive database which will be available in 2014 because I know a lot of you are wondering about the DSIRE database, how this relates to the DSIRE database. We're partnering with NC State to develop a brand new DSIRE database.

We applied for a grant from the DOE together with NC State and that contract is currently being worked out right now. So lots of changes is coming down the line for your incentives and policy research but we'll keep you up to date and in the meantime if you have any questions about that you can feel free to shoot me an email.

So as part of our legislative and regulatory tracking services we track pending bills on regulations at the state level across the country. Policies and incentives are constantly changing and while we do our best to keep the wind policy tools up to date as possible on the back end so you don't have to worry about those things it's important to keep in mind that you might need to adjust the tool to account for such changes because they're ongoing.

So one of the most significant developments for wind this year was Colorado's RPF expansion when they expanded the RPF from 10% to 20% for certain utilities in addition the lot adds the carve out for small utilities. Half of that carve out must be met with retail distributive generation which is basically customer site of facilities and the other half was met with wholesale BG which is defined as any facility under 30 megawatts.

So these expansions provide significant opportunities for wind in Colorado. The expanded RPF is estimated to require an additional 1.34 million megawatt hours of renewable energy by 2020 and it's assumed that a lot of this is going

to come from wind. If all of this came from wind it'd be about 432 megawatts and generation has to be by 2020.

And so that new generation about 150,000 megawatt hours must come from DC and so the wholesale half of that is likely to be met primarily with wind. And it's assumed that the other half retail generation customer side of facilities will mostly be solar but not necessarily all of it so trying to guess what the landmark will look like in Colorado over the years will depend on how some of these rules are implemented but it's obviously the DC carve out and the RPF expansion.

In general we'll really expand the opportunity for wind in Colorado. And then to touch briefly on an issue that has received a lot of media attention this year, despite several attempts across the country still RPF policies were appealed this year. There were a couple minor weakening bills passed in primarily Washington and Montana but this is in contrast to a lot of RPF strengthening laws that were enacted this year.

So here interested in details of these kinds of changes my colleagues Justin Barnes and I wrote an article that will appear in the next issue of Solar Today. And then we also covered each bill in detail in a previous report that we released in April. You can see the links there on the slide.

The next we'll talk about incentive changes which there are a lot of legislative changes through incentives this year, as Heather mentioned before New Hampshire's rebate program, it was amended through a lot for systems up to 10 kilowatts and that's (UC) limited 25 kilowatts. And Nevada has implemented a system size limit of 500 kilowatts per win rebates and there are lots of other changes that happened in the past year.

You can kind of see some there on the slides but we try focus on the highlights. Outside of state legislatures in Vermont effective in October the small scale wind rebate program is no longer available. There's never been much participation from wind in that program so the board replaced it with a grant program and the (unintelligible) haven't been implemented yet. The Hawaii sea tariff is likely to undergo some changes over the coming months.

(Alaska) has been open to re-examine the program with once adjustment revision being limit the terrace to solar. And lastly Illinois and Maryland have recently opened programs. Illinois state rebate program opened on Monday, notably this year. It provides a higher rebate for systems that are SWCC certified and in Maryland they just opened a community wind graph program which will provide up to $1.2 million for community wind projects.

So moving on to net metering it was a very busy year for net metering as well. Connecticut enacted legislation that includes provisions for expanding virtual net metering to add in state customers. Previously virtual net metering was only available to municipal customers. And in addition net metering is now also allowed for third party owned systems and the customer processes that are eligible.

The cap for virtual net metering was also increased to 3 megawatts whereas net metering for all the customers is limited to 2 megawatts. New Hampshire also enacted legislation to allow for group net metering and Nevada increased its aggregate net metering to 3% of capacity. And then the biggest news this year was Minnesota Bell which for net metering increased the system's capacity limit from 40 kilowatts to 1 megawatt.

While this was good on the surface it was out for how this log is being implemented as well. Excel filed a care provision to implement the law and

which it states the utility automatically owns all direct from net metering systems, not just from X generation but from all energies that are by any net metering system. So there's a doc open for that and the comments that are due by the end of the month.

Also in the regulatory arena New York has ruled that promote net metering does require a load onsite where the system is installed but there's no minimum load requirement. So this is big news for net metering especially for wind because basically it means that you can put up a light bulb inside of your wind facility and the (Mac) system is eligible for remote net metering.

So this expands options for site and remote net metering facilities that are physically located away from where load exists for especially for wind. And so lastly I just wanted to touch on one of the biggest issues we're using regarding net metering in general of country which is the future of net metering. A growing number of utilities are trying to amend their net metering turf or role attempting to implement charges or otherwise increase cost to decrease benefits for net metering customers and this was all U.S. cost shipping.

And the biggest mostly taking place between utilities and solar companies because solar makes up the bulk of net metering systems but it is an important discussion for the wind industry to watch and hopefully participate in despite the fact that many of the claims of the utilities might be controversial.

The fact remains that net metering policies enroll written for technologies with minimal market penetration and has those new energy industry goals. There will be a need to amend net metering policies eventually so it's an important issue to watch. So I'll pass it on to Matt now who's going to walk

you through some of the features of the tool so that you can see the effects of all of these areas of policy changes.

Matt Gagne: Okay so when you get to - to get to the tool you've got to endpolicies.org or eFormative Options.com. There's some guides to get the tool from the homepage. And when you first go there you'll get asked for some information about your use of the tool. There's no required identification information but we just want to see how people are using it.

It helps us keep track of the usage of the tool and help secure future funding. Once you put in that information you go to this first page. We've set it up so you have two simple steps to see results. The first is to select the state which you can either do by the drop down menu or by clicking on the map and when you click on a state it'll be immediately be populated. The result on the right will immediately be populated otherwise it'll immediately be populated with the current default scenario which starts off as a residential sector with 5.4 to a turbine on a 100 foot tower.

You can then either change the state or the default scenario. There's three others on another residential farm with 8.9 kilowatts of non taxed with pitch 5 kilowatts and the commercial with 84 kilowatts and the results will populate over on the right.

You can see what's the current scenario we're using on the right. After that you can go and look at each of the tabs on the top. There's the capital cost, financial, federal, state and technical. And each one of those has different inputs that you can look at or default inputs and you can also adjust the inputs to a specific scenario or to see how policies work and see what policies work best.

So what we're going to do is we're going to look at Hawaii because Hawaii's interesting because it has a feed in tariff and net metering and (unintelligible) here the commercial in (per kilowatt) north wind 110, 24, 160 foot tower and we're going to go to the state tab. And at the state tab we can change the defaults in net metering so we're going to change it to - we're going to change it to the feed and terra.

If you look at the results the results are pretty bad. The next one in value is negative by $94,000. So what we want to do is see if you adjust the feed and terra rate to see what it needs to be for that number to be processed for that specific scenario so there's two ways to do it. One, you can use the slider here or you can type in the number here and you can also adjust up or down here. Whatever value is in these boxes on any of these inputs will override the default value to the right of it.

Here are the gist of it so it's almost the (MPD) is almost positive. Twenty one cents, it goes positive and then what you can do is you can go over to the technical tab and change or go back to the scenario tab and change the scenario. So here I'll change it to residential and see it over on the right on the current scenario and with an 8.9 kilowatt (unintelligible) 160 foot tower and adjusted it so the (MPV) is positive. Here you can see that the FIT rate needs to be almost twice what it currently is for it to have positive results.

On the technical tab you can change a turbine. As Heather mentioned we have ten different types of turbines from eight manufacturers and you can also adjust the target wind power resource. So for example if you take the wind power or the wind resource is higher than what the default is you can change it here just like being done on the drop down menu. You can also click on this little eye button and it'll bring up a table that shows what the different wing classes are for different heights.

And then you can also change - below that there's hidden by the drop down menu right now you can change sector. Down on the bottom you can change the annual energy production. So if you want to look at why a different turbine is not in here they already know what their AEP would be. You can go in and you can type in the number or you can use the slider to change the number to what you want.

So on the - you can also adjust the capital cost so you can adjust how much the turbine costs and their connection fees, etc. For the rest of the tool if you wanted to reset and go back to the beginning just hit the reset button. It'll change everything. You can print your current results. It'll just come out basically the screenshot of what it's currently showing.

If you have suggestions about how the tool works or if you have questions or want to see some changes you can give us feedback by clicking here and then we have a pretty extensive help section. The help section has a user guide that we just updated and the original user guide which is a lot longer. It's a little bit outdated and then we have some other help items and questions and definitions.

In the about sections we have our assumptions and clear information about the tool. And then we have - like I just mentioned before any of these little eye buttons you can click on and it'll give you information about whatever it's next to. So for the - what's new in this version of the tool version 3.0, we've adjusted the IR calculation to account for projects with negative/positive cash flows.

So for example if the loan amount is very large the loan extent can exceed the project revenues especially in later years after a tax credit or a rebate term

expires and it'll result in negative cash flow. So for that situation there's more than one IR because project negatives and positives and negative again cash flow. So the tool then return the not applicable value for the IR in that case.

We've updated all of the incentives with DSIRE. The renewable energy credit prices are updated, same with net metering policies and the state tax incentives. We eliminated rebates to New Jersey that are no longer available and for Massachusetts for the (Mass CC). The incentives are updated and cleared only turbines phenomenal capacity less than 100 killowatts. And then the - we also added minimum fits inside those three states.

We have changed the turbines. We eliminated the sky stream 2.1 kilowatt turbine even though it's still certified, maybe at a later once the ownership of the turbine gets all ironed out. And then we added the 2.5 kilowatt Kestrel and the 5.2 kilowatt Kingsband and the 5.5 kilowatt (part) Excel 6.

We updated all the power curves from the certified power curves in cost, the tower types and we recalculated the energy production. And a calculation in our related to reference links assumption and the wind share assumption was corrected resulting in a slightly higher and more accurate AEP estimates for all turbines. And eventually before we have the user guide and tips were updated and we updated all of the definitions and assumptions in the tool and we made some minor changes, this version usability and we're always open to more suggestions. So that's all I have. If you have any questions feel free to contact us.

Ian Baring-Gould: Great, thank you all three for that update on policy issues around wind in general but small wind. At this point we don't have any specific questions. Just to remind everybody from the Q&A bar highlight that. You can type in your question to any of the speakers. Since we don't have any questions we'll

move on to small wind standards and certification processes and I'm very happy that Brent Summerville is able to join us.

Brent is a technical director of the Small Wind Certification Council where he works quite heavily in the development and maintenance of both international and domestic wind energy standards around small wind turbines. Formally he was manager of Appalachian States, a small wind research and demonstration site on Beach Mountain where he received his Masters degree. Brent is also ATE in the state of North Carolina so Brent can you give us an update on the SWCC?

Brent Summerville: Hi and hello everyone and thanks for the opportunity to speak today. Okay so flashback to 2006 essentially a group of industry stakeholders got together and everyone had an interest in development of the North American small wind market. They all recognized the need for basically a purpose built certification body for small wind. By the 2010 came around the SWCC was open and that was just after the release of the new small wind standards from the American Wind Energy Association.

SWCC, we have programs for small and medium wind turbines so we call it now independent certification of distributed wind. And our certification really serves to prove to provide consumers with objective performance information that essentially characterizes a turbine in a standardized way and enables incentive agencies an objective way to determine which turbines are eligible for incentive programs.

Small wind turbines are defined by the international standard as having a swept area of up to 200 square meters and that's not - there's not a hard kilowatt that's commissioned there. That's roughly 40, 50 and 60 kilowatts depending on the wind turbine design. And it's open to all types of electricity

producing wind turbines, (hots) horizontal axis, (lots) vertical axis and even (dots defuser) augmented wind turbines.

This process verifies that the turbine has been field tested for safety function, performance reliability. There's a lot of mechanical engineering and design that goes into this project and it's all based on the industry standard. SWCC certifies that testing the design at all conforms to be a WIA standard.

Now relatively recently this new group of wind turbines medium wind have come to everyone's attention. They're essentially greater than 200 square meters of (unintelligible) area but they're not exactly large wind turbines that would meet those standards. So what we offer for medium wind turbines are power performance certification and acoustic performance certification.

These performance certifications help meet the relatively new and somewhat interim guidelines for eligibility of medium wind turbines. We'll hear more about that from Val in the next presentation. So far we have certified - fully certified seven small wind turbines that you see there. They're also posted on our website.

We have two that are conditionally certified meaning they're certified in the UK for their micro-generation certification scheme and they're working on their WIA standard requirements, five that are under test and six under contract. We just recently started this medium wind program and we have one turbine from Endurance Wind Power and the contract for that system.

So a small wind turbine that goes through the process is issued a consumer label. This is something that we're seeing recently added to international standards and it's essentially a way that consumers can receive some single

number ratings in an effort to improve some tools for comparing wind turbines that are available and certified.

The 3 ratings that comes from the WIA standard or rated annual energy, this is the single kilowatt hour number at an assumed site with an average wind speed of 5 meters per second of hub height and a regulated distribution. Of course everyone's actual AEP production will vary but this gives folks an idea at a fairly typical size how much energy it'll produce, rated sound levels of what it sounds like about 60 meters away from the rotor.

This is a sound level that's not going to be exceeded 95% of the time so it's taken at about 10 meters per second wind speed and then of course rated power is taken at a calmer wind speed of 11 meters per second. If you go to the website you can see that for each model we've published a rating that annual energy can vary from 3 to 14,000 kilowatt hours a year. Rated sound level, it gives you a way to compare what they sound like to the observer. Rated tower is given here and on the right you'll see the certification document.

So if you click here on our website you'll go to the certificate which verifies the validity of the certification. The summary report gives information on all the testing and the conformity to the standard and the consumer label that we just talked about. So that's basically the summary of SWCC. We hope things are moving along. We're certifying turbines in the process and it's going fairly well. Having a look at the standards, you realize that there are these three base small wind turbine international standards. IEC 6400-2 is the strive of the design and the small wind turbine overall. Dash 11 in acoustic noise standard and - 12, - 1 is the power performance standard so those are out there.

They've been out for many years and they're under the revision cycle. You've heard about national standards and teams like in the U.S. we have the WIA standards. In the UK they have their micro-generation certification scheme which uses the (Abilia) of British standards. Japan recently came out with a Japanese small wind turbine standard and of course globally you can have the small wind turbine types certified per IEC 61 400-22.

Keep in mind that all of these national standards incorporates these base IEC standards so that's good news and we'll see more in detail about what is the WIA standard and what are some of those differences. But good news is we're all working off the base of IEC standards for prep and certification end design.

These three base IEC standards are in a revision cycle. Dash 2 is Edition 3 is out as an (unintelligible), a final draft of the international standard. Everyone's voting on it for final approval and voting will close. In mid-November it'll be released finally. After I think 2006 version we'll have a new - 2 small wind turbine design standard. It was basically overhauled and we'll see corrections in improvement for that standard.

Dash 11, the acoustic standard. Edition 3 was released in late of mid-November 2012. The industry is still in transition from Edition 2. For example there's some - there's a new small wind turbine annex in the standard now. There's a major change for the way the evolved acoustic data is analyzed and it takes a while for the test site. The certification body is manufacturing everyone to transition to the new version of the standard and all the tools.

And finally - 12, the power of performance standards, it's still being revised. It's in the second committee draft that's up for review right now for that so what is the WIA standard? We already saw that the small wind turbine performance and safety standards from (OEL) we call it WIA standard 9.1. It

incorporates the IEC standards but it does pass on to modifications. It's written in a way to ensures that the quality of the wind turbine can be assessed while improving only reasonable costs and difficulties.

So basically it resolves in a way that optimizes process. Many of the original changes in the WIA center have gone into the revision in the IEC standards so it's healthy and it's through change. One particular WIA standard amendment is that tower foundations aren't considered part of the overall system. Of course they're important to the system turbine tested on a tower but it's recognized that in North America -- typically in the (unintelligible) stamps design power of foundation.

So that takes care of certifying this portion. We have standard certified wind turbine system, the power outlet, that overall system. The overall field testing changes power performance is not yet drastically different from the IEC standards. It does as a result and we have rated power and energy and there are some requirements of how far out to take the database and to ensure that you're showing power control.

2.6, a few changes that are now incorporated in the new Edition 3 small wind turbine annex and the acoustic standards taken function testing as the same as IEC and duration as basically the same duration. Duration's the same with the addition of the 25 hour (unintelligible) 15 meters per second and above so some fairly small changes to the turbine testing during (unintelligible) of the test of the structural analysis for the -2 standard.

Now this is a small part of the WIA standard but it's a lot of work calculating all the locations, performing the standard strength analysis on the major wind turbine components based on those loads. And it's used basically to achieve SWCC certification and/or the design file that shows all the mechanical

engineering speculation based on these IEP standards and it's requirements that observe the dynamics of the system on the field.

So the WIA standard is going through an update of its own and we have decided for it's only a second time in history to promulgate a standard to determine that anti-national standard. Promulgating just means officially published. The idea is with new WIA SWT-1. The small wind turbine standard will bring it in line with the updated IEC standards and incorporate any other lessons learned about the industry over these past few years. And myself, (Troy Hughes) and (unintelligible) are meeting that effort so you'll see it circulated amongst the stakeholders (unintelligible).

So that was an overall of the IEC design power to the WIA standard. Now if we switch gears a little bit there has been some recent developments in electrical states and standards. This was by basically showed the driving force behind what's coming. In 2011 national electric code 694-27b said (unintelligible) used in small wind electric systems shall be identified and listed.

So everyone knew that your (unintelligible) needed (unintelligible) 41 but now the 2014 code, this same section says when the electric system equipment sub assembly and components shall be looked at in March for the applications, therefore this new UO standard UL 6142 which applies to small wind. The overall system will need listing for that UL standard, not (unintelligible) it's a big change coming in 2014 for electrical (unintelligible) station.

To wrap it up you're working in this industry as a certification body. As a manufacturer you realize that wind is a global business so manufacturers are trying to meet the requirements of the U.S., Canada, Japan, the UK, India. So

hopefully we saw that all these national standards are based on the IEC standards. They vary a little bit so the idea that's happening now is we try to set it up so the manufacturer tests the turbines once and they meet all the requirements everywhere. Folks want certify everywhere.

There is work under way with the IEC certification advisory committee meeting later in October. A new small wind turbine subcommittee and this committee is working on the global certification scheme where you'd just test one, certify one for that type certification to the IEC standards would be globally accepted.

So it's sort of the shining gold out in front of it so we're all working for it right now. Luckily the standards are fairly harmonized because they're all based on IEC standards and there's agreements between certification bodies to exchange information. That's it for me, thank you very much for your time.

Ian Baring-Gould: Thank you so much Brent. Last but not least we'll move on to Val and then we'll take questions at the end. Val is the project director and research analyst to the Clean Energy States Alliance and the Clean Energy Group and she's directing the Interstate Turbine Advisory Council, ITAC, which is the purpose of her talk.

It's a national effort to create a unified list for small and mid-sized turbines that meet the performance and durability expectations of state incentive programs so going beyond just the standards that Brent was talking about but how do we expand on that so that we're sure that the products that go in can survive for a long time. She's also the staff lead for Offshore Wind Communications for CESA. Val is also the staff lead for the small wind and fuel cell technology areas so Val? Are you on mute Val?

Val Stori: Sorry I was on mute. Thanks Ian and thanks everyone for listening in today so a little bit about CESA before I dive into ITAC. CESA is the Clean Energy States Alliance for a national non-profit base in Vermont and we work to advance state and local efforts to implement smart clean energy policies and programs and also within research papers and publish papers on innovative finance tools.

We work across the country with states and public clean energy programs and we provide information sharing and technical assistance to these states and also to local governments. So from Brent's presentation you all have now learned how small wind certification works and why it's so critically important to the performance and the safety of the duration of wind turbines. My presentation will be more about why certification and the other ITAC requirements are so important to state and utility programs.

ITAC is the Interstate Turbine Advisory Council and it was through CESA's work with our member states that it became pretty clear that trying to create and maintain separate turbine eligibility lists amongst different states was not only inefficient and confusing for the distributor's wind market but there was also a lot of confusion. Different states were applying different review criteria and approval that varied from state to state and sometimes it was difficult to determine why a turbine might be eligible for funding and state A but not in state B.

In other cases states relied on (unintelligible) list of the California's CEC's list to do the heavy lifting of turbine review and then would just use that list as the eligible list for their state program. And then perhaps most strikingly review processes are failing to screen out unsuitable and unreliable and sometimes dangerous turbines.

So in 2011 Night Serta and the Energy Trust of Oregon approached CESA to see if CESA would be willing to host a collaborative group of intended programs providers to evaluate small and medium sized turbines and that's how ITAC was born. The goal of ITAC is to pull together resources, share information and develop a set of criteria against which we evaluate both small wind turbines and now medium wind turbines. And then these turbines that pass (unintelligible) are placed on what we call the unified list. It's essentially a list of incentive eligible turbines.

So in a nutshell we are a form for state wind incentive programs who work collectively to share information and ensure that both rate payer or tax payer funding is supporting the installation as technology with a proven record. ITAC has grown in its last two years to include the following members.

We've recently added Maryland Energy Administration as a member and we are - we just approached the Vermont Department of Agriculture to join ITAC and I'm hopeful that they'll become a member. So these programs have decided to use ITAC as their - provide eligibility but they also maintain the right to have their own list or to not list a particular turbine that might be on the ITAC list. But together the ITAC members believe that the unified list and ITAC itself is a great way for moving industry and the market forward.

ITAC decides the unified list to also have information sharing platform. We meet about every two weeks and we address a variety of topics trying to address inefficiencies in the marketplace, improve our programs and incentives. And in the end we hope we'll produce - have a better market for wind turbines.

One thing that we do know is that if states are working individually that state might not have enough. There might not be enough of a market in that

particular state to drive the wind industry but by working together and pooling our resources we can have a greater effect there. Another benefit to working together is that we are saving on time and we're also staying on top of any issues and challenges that are occurring from state to state. So each week we might share insider information on what's going on in the field.

We also try to have a pretty transparent process. Everything comes onto the ITAC website and we serve the essential clearing house. Another change that we've seen by working together is that the rebate and incentive landscape is changing not necessarily because of the work we've done but one thing that's come up within the program - within the program members in ITAC is that we've seen some programs have extended their wind turbine incentives.

Others are re-evaluating their wind programs and others have moved to offering performance based incentives rather than using capacity based incentives and others are offering a hybrid approach. So how do we review turbines?

We're currently reviewing small wind turbines and medium wind turbines. In our first round of turbine review about two years ago we invited only manufacturers that had turbine listed with (unintelligible) where the energy trust is Oregon or focus on energy to submit applications. Now the application process is open to any manufacturer and the application and the application's structures are on the ITAC webpage.

Small wind turbines are reviewed to our technical and non-technical review criteria and these are also available on ITAC's webpage and they're down here at the second bullet in the slide. Our primary requirement is certification to the WIA 9.1 standard. We have made exceptions to this in the past and you'll - one side flip to the list, you'll see some of those exceptions that we've made

but we're trying to move away from that. But we understand that we are trying to build the market so we make exceptions or we set a timeframe for moving towards certification.

For example we accept SWCC's conditional temporary certification and we have accepted MCS certification and that's been verified by Intertech or as I just mentioned, if it has SWCC's CTC. There are a few things that you have a turbine that might qualify. Just please get in touch with us. We're likely to say it depends rather than to give you a straight answer but it's better to ask and begin a conversation with us and move towards getting your product on the list if it's a good one.

One of the new things for ITAC is moving to medium sized review. These medium criteria were developed under the guidance of (Julia's) mid-sized committee and it includes power performance and acoustic third party test reports to IEC-12-1 and -11 which must be certified by an accredited certification body.

And in addition to these test reports the medium sized turbine must have a certified design evaluation but if that's not available we'll take a look at your operational history. So we're looking for a 500,000 hour of fleet operation or we're looking in addition to 25 operating turbines and at least two years of operation from five wind turbines and then we look at the same non-technical requirements that we look at for the small wind turbines which I didn't fully go through so I'm going to go back one slide.

In addition to the WIA standard for small wind turbine review we are looking at a bunch of non-technical criteria such as warranty, dealer and installer training, a presence in North America and the manufacturer's ability to respond to any kind of problems or complaints. We look at these non-

technical criteria in addition to small wind certification because we feel that certification is only a piece of the puzzle.

These additional review criteria we feel compliment certification. We often say a certified turbine doesn't necessarily mean a good turbine so ITAC members care about the soft good side of the wind turbine experience. Again things like the warranty and the customer support and the ability to respond to issues so we feel that the non-technical criteria really compliment the (unintelligible) standard and the work that SWCC is doing.

This is our current list of small wind turbines. We've reviewed over 40 applications and we have a list of a dozen small and medium wind turbines. I'll pull up the medium list. These are both up on the website with actually more information and links to the manufacturer and links to some of these test reports so you can access all of that via the Web.

So now this is the unified list and I said (unintelligible) is a single individual public clean energy program. It's not likely large enough to influence the marketplace. We're hopeful that by presenting a unified list by which all our members use more a more powerful force and we think that this was just critical to building a distributed wind market.

How is it an opportunity? Meeting wind turbine review is quite a challenge. When we were developing the medium wind criteria to which we had help we created -- let's go back to that slide. We created some flexibility in our review criteria. For example we discovered the problem of variant turbines, changes that might've been made to turbine design after it had gone through the certified design evaluation or it had received the third party certified test report whether it be power performance or acoustic test.

And so the ITAC team grappled with what comes to the variant turbine and what comes to the new model and when is a minor change significant and when does the minor configuration change affect the performance of the turbine. So as we've done medium sized wind turbine review we purposely left the definition of variance. So we did say that any more than a 10% performance change means a new model but we still reviewed these on a case by case basis. So if anyone on the seminar listening has any ideas on how to better define or whether we should leave this vague we'd be happy to hear your input.

Likewise you'll notice under extensive operational history -- it's not listed out in full here but under our operational history requirement we - for example for the 500,000 hours we say that it can come from a fleet. So again let's say okay, what's fleet and what'd be considered a variant turbine. So that's something that we think presents a challenge to us as we move forward with medium sized or (unintelligible).

For now as Brent eluded to earlier it's really a bridge until international standards and more formal standards are developed. But for now the state programs needed something in some way of evaluating these medium sized turbines so that's one challenge for us.

Another challenge for all the programs (unintelligible) the bad press about wind of all kinds and that definitely has an effect on small wind and medium wind programs at the state level. ITAC's efforts are more focused on making sure that any turbines that do get funded perform well at their space and that manufacturers respond appropriately to any kind of complaints.

Another problem that we see that we bump up against as far as incentive programs is competition with solar. Other challenges are limits placed on net

metering although there are opportunities there as well as we saw in the Minnesota (unintelligible) expansion of their net metering program and then permitting various states across county lines, across townships have been difficult for us to address and ITAC members individually speak before zoning boards.

And that takes up a lot of their time but it's necessarily something we can address as a group. Other opportunities, we'd like to continue expanding ITAC's membership so if anyone knows of other incentive programs that are not members of ITAC please feel free to let them know about ITAC or let us (unintelligible) about that program and then we'll do our best to pull them into the group. That's all I have, thanks for inviting me to participate and thank you for listening.

Ian Baring-Gould: Thank you Val. I have one question. A little bit over time but please feel free to type in questions and this goes out to base, standards base but any information on installer certification. So Val or Brent do you want to address that one?

Brent Summerville: My answer to this gentleman, we chatted about it for a while but essentially - I don't know if Val has anything more but installer certification mansets did roll out the program but at this point I'm unsure. I don't have a solid update about the future of that program.

Val Stori: I don't have that update as well. It's one of those chicken and egg situations. I feel as though it'd be great to have installer certification but at the same time we could really hinder growth in the market.

Ian Baring-Gould: Yes and for those that don't know (unintelligible) had a program and training protocol around or certification of installers but I don't even think they ever

held one session as it never really got off the ground. A question for you Val from (Fred Patrick) I believe. What is the cost to join ITAC?

Val Stori: A state member can pay between $10,000 or $5000 a year but I'll also say it depends. It depends on the size of your program.

Ian Baring-Gould: Great. Is there information on the Web on that or something or would they just contact you? Is that the best way?

Val Stori: Yes, either way. There is information on thesis ITAC webpage.

Ian Baring-Gould: Okay great, a question probably open to all. What is the stance on refurbished turbines by the group and I guess broadening the question under what regulations or how does certification play for refurbished market?

Val Stori: So ITAC members states only Nevada Energy incentives program allows refurbished turbines and that (unintelligible) that the refurbished turbine might have to be certified.

Ian Baring-Gould: (Unintelligible) go ahead Brent.

Brent Summerville: Well as far as particular programs the (unintelligible) design is nearly manufactured so we don't offer certification to remanned turbines but it's something that is possible. It's probably a case by case look at who's doing the work, what are they doing, what's the design from field testing? But (unintelligible) of our scope probably limited new and manufactured turbines.

Heather Rhoads-Weaver: This is Heather. We don't include any refurbished turbines in the policy tool primarily because none of them carry current certifications. If the turbine model was certified in its prior use it'd still need to get recertified

under today's standards and with the - all of the remanufacturing it's gone under. So if someone wanted to look at the cost effectiveness of the refurbished turbine they could put in the expected energy production into our tool.

However I'd recommend they'd also increase the amount for expected maintenance costs per year because those turbines typically need a little more TLC as they're operating. So just keep that in mind with - you might be saving a little bit on the front end but you might be paying more over time as well.

Ian Baring-Gould: Okay. We've got a number of requests for restating the websites for all the different organizations so Val do you want to - what's ITAC's website?

Val Stori: That along so if you go to www.cleanenergystates.org and then if you click under projects you can pull up the Interstate Turbine Advisory Council's page but I believe if you do cleanenergystates.org/task/ I believe that's the URL.

Ian Baring-Gould: Yes my bet would also be if you do the name in Google it'll come up.

Val Stori: CESA ITAC will come up.

Ian Baring-Gould: Brent what's your Web address?

Brent Summerville: Smallwindcertification.org.

Ian Baring-Gould: And then you have information on all the turbines you certified? Is that correct?

Brent Summerville: As well as applicant servants that are in process.

Ian Baring-Gould: Great, Heather for the policy tool?

Heather Rhoads-Weaver: It's windpolicytool.org. That'll take you to it. It's actually housed within the eFormative Options website but that's the easiest link to remember.

Ian Baring-Gould: Great, any other ones that I'm forgetting? Okay. For you Val what certification is ITAC looking at for medium powered turbines - medium scaled turbines?

Val Stori: So there's currently no certification scheme in place so we're looking to form a power performance and acoustic test reports plus the operational history, not sure if that answers the question.

Ian Baring-Gould: Probably. Brent you're developing a standard at this point?

Brent Summerville: We're not developing the standard. The work for developing a medium wind standard originated in the UK because they came to an issue there with their (unintelligible). And it's now moved to a committee with the IEC 61-400-1. The big wind all wind turbine standard is creating a medium wind anex to try to resolve this lack of clear tabloid certification.

Ian Baring-Gould: Great and then probably a question for you Brent but do you know when UL6142 certification is required for good connection in North America?

Brent Summerville: Well it's out. The U.S. standard is now. We saw that the 2014 energy code will drive the requirements and if we have any knowledge of the A exchange, the authorities having jurisdiction, their requirement of what they enforce, which year of the energy code they use varies all over the place. So it's going to be here or there requirement but based on this change in the 2014 code 2014 is when it'll be required.

Ian Baring-Gould: Great so required in 2014 but not if the jurisdiction will mandate that the 14 is used at this point in time.

Brent Summerville: Right.

Ian Baring-Gould: Okay that's it for our questions so once again I want to thank our panel. It was a great presentation to everybody. I have on the screen here the upcoming webinars a recent study that was just released by LBNL on residential property value impacts of wind development. So that will be the topic of the October webinar and then November we'll have the first results or discussion of the first results of the offshore wind Jedi model specifically results from the southeast and the Great Lakes.

The webinar was recorded and it'll be available in about seven business days up on windbearingamerica.gov so if you think this webinar was interesting and you know colleagues who'd find it interesting please let them know it'll be there as well as all of the other previous webinars that we have.

Finally special thanks to the Department of Energy for funding all of these activities and then we list our contacts there so if you have any questions, comments or thoughts about future webinar ideas please don't hesitate to contact any of us. Thanks again to our speakers and we'll talk to you all next month at that webinar. So thanks again and have a great day everybody. Bye-bye.

Heather Rhoads-Weaver: Thanks Ian. Thanks.