

U.S. SMALL WIND MARKET REPORT: 144,000 TURBINES DEPLOYED WEBINAR

December 15, 2011

Coordinator: Welcome and thank you for standing by. At this time all participants will be on a listen-only line for the duration of today's conference call.

Today's conference is being recorded. If you have any objections you may disconnect at this time.

I'd like to go ahead and turn the call over to your host for today to Ms. Lisa Daniels, Executive Director of Windustry. Ma'am you may begin.

Lisa Daniels: Thank you very much and good afternoon everyone. This is Lisa Daniels, Executive Director of Windustry. Windustry is a non-profit we're based in Minneapolis but we work throughout the Mid-West and the US promoting community and small wind. And today is the first Webinar of our new series called, "Community Wind Across America." And we'll be presenting the US Small Wind Market Report for 2010.

We have two speakers with us. We have Heather Rhoads-Weaver of eFormative Options. And we also have Larry Flowers of AWEA - of the American Wind Energy Association. Really happy to have all of you here with us and happy to be - have our expert speakers who worked on this market report.

And just a few housekeeping things we will go through both presentations and then have a period of time at the end where we have questions online which means you type them in and we'll have a screen up that tell you exactly how to do it as well.

This conference is - this Webinar is being recorded. It will be posted the Wind Powering America Web site. Also they'll be a link from our Web site the Windustry Web site as well in about a week. And I think that's it for now. And I think I'm - what I'm going to do is introduce both of our speakers and they will take it away from there.

Our first speaker will be Larry Flowers. Larry is an industry leader he has worked at the National Renewable Energy Lab for three decades. He now serves as the American Wind Energy Association Deputy Director for (Distributed) and Community Winds. In 1999 the then US Secretary of Energy Bill Richardson announced Wind Powering America. Larry was tasked with launching the program and formed a network of 35 state wind working groups and four regional training and outreach institutes.

Flowers also created the innovative Wind for Schools Program to educate K through 12 and university students about wind energy. Larry has been recognized with a host of career awards including the AWEA Special Achievement Award in 2002 and most recently the National Wind Technology Center Leadership Award in 2009.

I'm going to introduce Heather who will be the second speaker. Ms. Heather Rhoads-Weaver offers more than 15 years of experience and is the Principal Consultant with eFormative Options. eFormative provides marketing analysis, policy and development consulting services to support the formation and growth of community and distributed winds, solar and energy efficiency endeavors. She was the Founder of Northwest SEED and - Northwest Sustainable Energy for Economic Development which had the acronym of Northwest SEED and she has served on boards of numerous non-profits including Distributed Wind Energy Association and Solar Washington.

Heather previously worked for the Northwest Energy Coalition Global Energy Conference and the National Wind Coordinating Committee as well as Iowa's Citizens Action Network. She holds an MS from the University of Northern Iowa and a BA from Wesleyan University.

So we are just going to jump right in and start out with Larry Flowers talking about the US Small Winds Market Report. Larry it's all yours.

Larry Flowers: Well thank you Lisa and thank you everyone for joining us today to talk about an important report that AWEA does every year. And it's appropriate that I'm sharing this presentation with Heather Rhoads-Weaver a long time small wind advocate and my co-author of this report and (Unintelligible) spend a lot of time on this as Ron Stimmel my predecessor at AWEA who has helped me putting together the statistics.

And so we're going to go through the - some of the highlights of the report. I might mention that this report is available to the public online at awea.org and under the Small Winds section.

So let's look - jump right in. Next slide, (Sue) can you advance the slides (they're not) (unintelligible)? Thank you. So this is the statistical sort of summary of the report in a little more detail. But we've broken into sort of three categories, number of units sold and you can see that a decade of units sold and kilowatts which is many cases is the way when you see measures progress especially in the big industry and the megawatts and gigawatts and then in total sales. And the sales represent the actual installed cost of the systems. So it's not the sale of turbine it's the installed cost of the system.

So if you take a look at the units and there's an interesting change from over the last two years as we can see the number of units peaked out annual units at

little bit over 10,000 units in 2008 and now has dropped on an annual basis to 78 hundred units in 2010.

However the kilowatt sales and you can see it actually jumped 26% and over the last three years 20 - 2008, 2009 and 2010 we've had very significant growth in total kilowatt sales and we'll dig into some of these numbers in detail as we show you that the shift is being caused by and of course Heather will talk to you about some of the state and senate programs and the federal programs that have been very helpful in moving forward in a number of markets.

And then the sales actually had 50% growth in sales last year so that the 2010 in any way you really look at it was an important growth year.

Next slide please. Looking at cumulatively over those - over that decade we've now grown to almost 179,000 as you can see kilowatts I'm going to show you the megawatts over the years and then that Blue is the additional capacity. So you can see where we're tracking very nicely over the last four or five years as far as the growth of this - of the small wind industry.

Next slide please. Now this is the - a little different way of representing it. The cumulative units when you talk about kilowatts and we have to keep on changing slide to slide where we're talking about units or kilowatts. And as you can see cumulatively we've now reached about 144,000 cumulative units installed in the US market even though over the last two years you've seen annual drops in those Blue - in the Blue bars.

Next slide please. Now here's the - here is the detail that shows the shift in the marketplace. As you can see the on-grid sales in kilowatts has grown dramatically and the units over the last let's say four years have grown from

2007 to 2010. You can see a big growth in the on-grid sales. Now just compare this to the next slide.

The next slide is - next slide please is off-grid sales. When you can see off-grid sales has been slightly declining over the 2006, 2009 timeframe but on a significant drop in 2010. Now keep in mind that off-grid products turbines are significantly smaller. They're in the basically in the 1 kilowatt and below range and so what we're seeing is a significant shift from small off-grid units to larger on-grid units. And that accounts for this increase in kilowatts and sales and a reduction - slight reduction in the number of turbines.

So next slide, this illustrates just a little bit better. So we've broken this down into sort of three bins the left kilowatt, the 1 to 10 kilowatts which is typically residential scale and then the 11 to 100 kilowatts which is more on the commercial, industrial and agricultural sector. And as you can see and again in that left kilowatt which is dominated by off-grid you can see there was a significant drop going from 2009 to 2010.

And the 1 to 10 kilowatt in a residential has significantly increased since 2006 but now has just a slight increase over the last three years. Whereas the 11 to 100 kilowatts in dramatic increase all three of the last year. So that's the significant change in sort of the market sector.

I might mention a note that the way we (cal) - (guide on this data) I should have mentioned this at the very beginning is we - this is really focusing on the US market as well as US manufacturers. And so we have about 26 US and non-US manufacturers who have contributed to this data.

So this is not exhausted data but it does capture a large percentage of what's going on in the US market. The piece that's missing that we didn't include

this year was an attempt to try to characterize and quantify the international market although we did have some interesting numbers when it comes to what the US industry is doing as far as exports. So I meant to mention that at the beginning and sorry about that.

So next slide please. So look at market - sales by market segment the last number was in kilowatts and now it's going to units. And even though the kilowatts are much, much greater of course in the big turbines the little (unintelligible) this in that (less than) a kilowatt size still is the most significant number of units in the marketplace. But there's again a big drop from 2009, 2010 nice growth in the 1 to 10 kilowatt. And from a percentage standpoint a very significant growth in the 11 to 100 kilowatts to a 100 kilowatt range.

Next slide please. Now this slide's a little busy and let me walk you through this. Let's first we'll look at these Blue bars. The Blue bars represent the US manufacturer's kilowatts in the US market versus the non-US manufacturer's imports to the US market. So in 2006 you can see that oh 80% of the US market was supplied in kilowatts for our US manufacturers.

If you look at the Green bar that's in number of units. And so in 2006 you can see a large percentage of that - of those units were supplied by the US to the US market.

Now if you go up to the line graph with the boxes that's the percentage the Blue is in percentage and kilowatts and the percentage is on the right hand ordinance. So as you can see the percentage of kilowatts has been a little bit up and down over the years but it's really not mid-80's range as far as a number of kilowatts - percentage of kilowatts sold in the US market by US

manufactures. And as far as the number of units from a percentage standpoint as you can see that's been again around 90 or a little bit above.

So over the - you can see the growth the left hand side is in kilowatts, the left hand ordinance in kilowatts you can see the growth in Blue which is the kilowatts. And then the percentage is in the line graph. So that's again a lot of information on one graphic. But the point is we have a growing market and the US manufacturer still dominates the US market both in units as well as in kilowatts.

Next slide please. At this point I want to turn it over to my colleague Heather Rhoads-Weaver who worked with us on this report and put a lot of effort in both the state and federal incentives had a lot of good information and other aspects of the market drivers that led to this robust 2010 market. So Heather.

Heather Rhoads-Weaver: Thank you Larry and Lisa for organizing this Webinar I really appreciate it. I did want to recognize some of the other team members that worked with us on this project in building our database. Matt Gagne, Kurt Sahl and Peter Asmus in particular and as well as the industry members and the state and federal agency folks that provided us data and responded to our queries. It was really a team effort. So and we did build on this next section was previous works that both Larry Sherwood and Trudy Forsyth have conducted in tabulating state incentives funding.

Here we go. Actually I'm going to start with the federal picture. This is breaking down for the USDA REAP program and Section 1603 grants. Just for small wind turbines up to 100 kilowatts.

And I mentioned our database. We have over 18 hundred records so this report was really only able to give a kind of high level overview of the data

and we can break it down in a lot more detail such as number of turbines, kilowatts, by state, by program if that's helpful for, you know, policy comparisons that kind of thing.

And we did capture more than \$67 million worth of funding over the last 11 years totaling 30 megawatts of projects and over 24 hundred turbines. So we don't have individual projects data for every single turbine but we do have quite a few of them broken out and we can tell, you know, where the money is flowing. And this is a really interesting way to look at it for me that Iowa got nearly a third of these two federal programs alone in 2010. But then if you combine all of the Midwest states with Ohio and the other central states you're looking at, you know, over two-thirds of the money going into the Midwest.

So with Nebraska as well being one of the leaders there. So it's pretty interesting that a lot of the funding was concentrated of course in the windy areas but I think that there's going to be a move to get that monies spread around a little more whatever money is going to be available in the future.

This shows both the federal and state and local dollars by state and by number of turbines. You can that California has one of the longest running programs and clearly the leader in terms of the number of turbines installed. But we've got quite a few other states that are coming up there. Arizona was somewhat of a surprise because we dug through all of the RPS reports for compliance reports for the utilities and was interesting to see how many turbines have actually been installed there.

And then the other surprises - see if I can get my pointer working here Wyoming had a huge increase last year and that was a ARA program that I believe was fully subscribed within ten days. And then we see Colorado is a

lot of growth in 2010 as well as Oklahoma fairly new programs getting started.

So and then on other hand we've got programs like Massachusetts that - and Washington State that have been around for a few years and it's a relatively smaller growth last year. So I think, you know, there's some differences that we're seeing.

(See) also on this slide I wanted to mention that the size of wind turbines Larry mentioned the overall for the entire market has grown for the turbines that have seen funding increases is even more dramatic in terms of let's see the size of turbines that received funding grew from 1.3 kilowatts average that were sold from during the period of 2001 to 2009. So it would be the Blue here and then in 2010 the average turbine size received funding was actually 3.3 kilowatts. So we're seeing a definite more than double increase in the size of the turbines that received incentives.

And this is also another way to look at the funding that was given out. Again California here on the top has been a clear leader but then Alaska is really starting to show a lot of growth and because they're funding especially the larger end of the scale wind turbines in this market.

And you can see here that the West is giving out, you know, quite a bit of money compared to the Midwest and the East. And I think that we're also seeing an increase of funding levels so in 2009 cumulative through 2009 there was about a 16% increase to 2010 on the just the funding level. And then on the per unit basis from 2009 to 2010 was a 57% increase. So we saw the average funding being given out about \$2.50 a watt and \$34,000 per turbine because of the - some of the larger size turbines that were being funded.

And here we've broken down the data by state and this is on a capacity basis. So this is cumulative through 2009. You can see here that California and Iowa and Massachusetts were the leaders as of the end of '09.

And then we can toggle forward to 2010 quite a few states are now seeing the above megawatt of distributed turbines and we're seeing quite a few that had considerable amount of growth during those - during that year period. And about I think about a third of the funding given out during 2010 was the ARA funding which of course has tapered off but we're still seeing some states that are increasing their programs and sustaining them so, you know, we're seeing that trend still moving forward in the future.

And it'll be interesting to compile this - the graph at the year end of 2011 and see which states are now into that upper category.

And just to draw your attention here I'm flipping back. So we had almost 15 hundred wind turbines that had \$32 million of funding totaling 14 megawatts at the end of '09 and here in '010 24 hundred wind turbines and \$63 million of funding so that's quite a big increase in one year.

This also shows the concentration of just the USDA program and the Midwest. But you can see a number of projects sprinkled around the country in a lot of the states that have diesel wind. So I think that it's important even for recently my own member of Congress from Washington State wasn't aware we had, you know, we have a number of projects up here that have gotten refunding. So it's still important to show that there's potential for these projects all around the country.

This is a export from the DSIRE database which is a wonderful source of information about incentives. And it shows which states have tax incentives

versus rebates and grants and really patch work quilt of policies that we see around the country. And unfortunately almost half of the states that have seen suspension for their programs or curtailments luckily California is back up and running now so that's been a recent update. But New Jersey is still on hold and some of the other programs like Ohio has not come back on line yet.

But, you know, I think there's still a lot of momentum for some of these programs to continue and to keep moving.

But I wanted to talk a little bit about what we see as the distinguishing features of the products. And we looked at the respondents for the survey that Ron Stimmel took see more than 51 different wind turbine models that reported sales in the US and including imports from Europe and Canada.

So we have mostly you can see here we broke it down by state. A lot of different US companies represented but then the imports as well. And more than three-fourths of these turbines are in the 10 kilowatt size and less. And about a fifth are above 10 but below 50. So there's, you know, only a couple that are at the top high end of the scale.

And so we broke down the turbines that are larger than 30 kilowatts. So if we group these turbines here they really only amounted to about 3% of unit sales but almost 60% of the capacity additions. So they represent a lot of the kilowatts but not as many of the actual installations right around the country. And so these nine states where the manufacturers are located offer 26 models and then we see that Canada, Spain and the UK have gained traction here. However we are seeing some more suppliers from the Asian market looking to expand their presence here in this country.

So this information is really interesting to compare the on grid and off grid supply. I was surprised to see some off grid turbines even in the 3 to 5 kilowatt range being sold in the US. But also some grid connected turbines as small as 1 kilowatt. So interesting to see some of these trends happening.

Also I wanted to mention as far as which turbines and which policies are giving the best rate of returns there's a new policy tool available at windpolicytool.org which breaks down the economics, the internal rate of return, payback period and that present value and cost of energy for a variety of different scenarios state by state looking at the current policy environment. And it really shows which states are the best sort of market right now and which markets could be improved with just a little bit of policy improvements.

So this is a new guidebook that's just been released. It's on the NREL Web site as well as Department of Energy's library. A Guidebook for Policymakers and I just want to mention this is definitely good use of looking at all of the market data and how can we match that up with states that, you know, just could use a little bit of improvements in their policy environment to make the markets really increase.

I did want to mention if you look through the report we had a section that goes through the various economic features of the market. So we looked at the workforce and how many jobs are created in the small wind industry. We came up with a total of approximately 15 hundred full time equivalent jobs here in the US. And we really looked at both the manufacturing sector as well as their supply chain which is quite a bit higher than on a per megawatt basis than what utility scale wind reports.

But we believe that there's obviously more labor intensiveness and installing small turbines and there's different ownership patterns that really create more

local economic development from locally owned small wind turbines. So this is definitely one of the features that I think we can look more at in the future that yes they cost more but there's also more value in terms of the local economy.

In terms of O&M cost is really hard to get data on specifics in terms of project by project but we've got some estimates of 2 to 5 cents per kilowatt hour, another estimate of 1.3 cents a kilowatt hour. And then even another opinion of half a cent to 1 cent per kilowatt hour. So, you know, you've got a range there but usually it's seen more as a annual cost. So for the 100 kilowatt wind turbines maybe looking at a budget of \$25 hundred to \$35 hundred a year but for the smaller scale turbines looking at \$200 to \$700 a year.

So that's something that I think more work to be done to document and I think that would help in terms of looking at the total life cycle cost for these projects.

And then Larry mentioned the domestic content. We looked at how - what portion of wind turbines here are actually sourced here. And there's quite a high percentage. So currently more than 80% of the components come from within even the own states in which the company is based. So that cuts down on transportation costs. But we're wondering if that trend may be changing over time that certainly some of the components themselves that cost more if you're looking at it on per dollar basis like the magnets that might drive down this ratio.

We had a little side bar about Plug-In Hybrid vehicles on Page 19 of the report and we think that that's potentially going to be a big new market area for distributed wind. And also some different export markets that might start changing how the US is supplying a lot of turbines now to the UK and other

countries that are starting to have more grants and policies. So that's something to keep in mind with cell phone towers rapidly developing in other countries in Africa and South America. So these are some emerging markets for US companies.

And finally we just wanted to mention a bit about what are the other economic benefits from small wind turbines. Of course reducing your utility bill, local jobs, looking at, you know, property tax benefits through local communities and just decreasing the amount of fuel needed for distributed operations in some cases. Because small wind turbines do power supply close to the point of end use so that reduces the burdens on the electric system and increases energy security.

So with that I'll turn it back to Larry and he can go over the final section of the report.

Larry Flowers: Well thank you Heather and just one quick follow up on your last lines. Many of you have heard of the JEDI model and (unintelligible) and development impact model that NREL created to characterize the direct indirect and induce benefits of wind developments. They are now developing a module for small wind and that module will work will be presented at Wind Power by NREL scientists to the (unintelligible) in Atlanta.

Okay I did want to mention one the graphics that we didn't have I wanted to mention to you because it's an important piece and it relates to what Heather was saying about exports. In 2010 in terms of kilowatts about a little bit over 30% of the US manufacturing went to foreign markets and Heather mentioned them as far as feed-in-tariff and Telecomm and so forth. That's a bit of a drop from over 40% that was exported in 2009. So I think you'll see as we move

forward in 20, the 2011 report that we'll issue next year that the export market continues to be an important part of the US manufacturing scene.

Okay so let's talk about a couple of things on the significant development sort of the qualitative side of the business. We mentioned about the shift to larger and (grid tracking) systems. We now have 13 manufacturers in the US that produced more than a megawatt of turbines last year so we have a good competitive marketplace. And Heather showed you the offerings graphically. But there's been some really important institutional developments which is a marker of a maturing industry. The Distributed Energy Association was formed last year by a number of AWEA and AWEA members.

As we really focus on the policy side the state and federal policy side of the distributed wind and I'll talk about that policy side in a moment. So that's an organization that Jennifer Jenkins our colleague is Executor Director of and they and AWEA collaborate on a number of policy issues as well as the annual Small Distributed and Community Wind conference which by the way will be coming up in DC in the end of March. Keep your eyes open for that.

The small winds from Vocation Council is something that is a critical need that the industry saw and working collaboratively with DOE and NREL and the industry this was formed basically to help distinguish between quality and reliable turbines and those that did not have adequate testing third party certification and commercial experience.

So as Heather mentioned state policy is very critical and (a number of incentive) programs have been hit pretty hard this year by turbines that had not had a reliable weren't producing what they were expected to produce. And this particular process of having the small wind certification council utilize performance data by a third party as a measure of the power curve and the

performance of small wind turbines is going to go a long way in helping state instead of managers to distinguish between which turbines they should give their incentives to.

The other piece of that is there's a new group that just formed called ITAC the Turbine Accreditation Council which is made up of a number of the state certification - I'm sorry - state incentive managers. The NABCEP is another group that has been formed to basically certify installers. Even if you have a good turbine you can all - if that turbine is sited or installed in a poor location either with poor wind resource or being blocked by trees or buildings the turbine is not going to perform.

So NABCEP which sort of already certifies PV installers and solar installers now has a program to certify wind installers. So we have SWCC basically looking at the turbine performance and reliability and now we have the NABCEP group that is certifying installers we have a good turbines, good installers, we have more reliable installations.

The Regional Test Centers this is something that NREL and DOE has established and funded and set up and these are the places that actually do the testing of these small turbines that the SWCC looks at the data from. So this is also a very important development again toward more reliable turbines.

The growth markets we didn't talk about markets too much but one of the reasons that these larger turbines are becoming more popular and starting to be an important player in the marketplace is we have schools, we have commercial buildings, agricultural applications that have always been sort of a vision of small wind and then exports. These are the markets that this year show significant growth in and is probably due to state incentives but also due

to some of the federal incentive programs like 1603 Treasury Brand as well as the REAP program.

This is an example of the sticker that we're going to be having on small wind turbines. For those of you, you know, who are in the efficiency business this is typical of what you see on appliances now. And so this is something that the industry came up with that really is going to help the consumer and the owner make an assessment of the different options that are available to him or her. And it deals with these sort of three major pieces of annual energy output at a given wind speed.

Of course if you're in South Dakota it's going to be more than this, if you're in a low wind speed area it's going to be less than this. But this is like the - like when you buy a car and they have miles per gallon in the city and (tour) driving.

Rated sound level and sound is a very important one of the key zoning and planning issues permitting issues. And so this is a measured sound level and then rated power because this is always been a bit of confusion it depends on, you know, what the wind speed and performance graphic looks like for your turbine. So this is a big step forward in trying to separate those turbines that you can count on and those turbines that are just coming along in the marketplace and may not have the testing in place. And so keep that - keep your eye open for that that's a very important development in the industry.

So I just - I don't want go through each of these federal policies but just to be aware that if you're a small wind advocate and you're really interested in small wind policies as a critical piece to level the playing fields. So there's many important federal policies that are out there that impact small wind. And there - some of them are in place some of them are being threatened right now

and you need to be connected to the policy scene so we're all rolling in the same direction so we have a level playing field with other distributed generation options.

If you go to the state level - excuse me - you go to the state level as Heather showed you. Again lots of policy options that are in play depending on what state you're in and it's important to take an advantage of both the state and federal policies that are available to you to minimize your upfront and operating costs for small wind.

Okay so there's a number of challenges as we - what we did in this report is I interviewed a number of the industry leaders to get their perspectives on what's going on in 2011 and what are some of the real challenges. As Heather mentioned the state incentive programs which are very important. A number of them went through a period of time when they were halted and redesigned. And some of them still haven't come back on in full speed.

But DOE and AWEA and the in state advocates are working very hard to get those back on line and that ITAC group I mentioned to you Turbine Advisory Council is working hard to make sure that we're using the best practices in selecting which turbines can apply for those programs.

As I mentioned before there's a lot of wind turbines out there and the ones that don't have a third party power curve and testing and have been certified some of them are causing problems and it unfortunately spoils the market for quality turbines. And that's an important piece that has to be CC we'll be addressing.

The MSDA reprogram which under attack with the Congress colleague Andy Olson from, you know, PC is putting together a good coalition to write to our

Senators and Congressmen to make sure that this program doesn't go away and continues to add wind as an element.

Fish & Wildlife there's been a FACA program to look at wildlife impacts and wind turbines and unfortunately the draft guidelines that came out didn't distinguish between the single and small wind turbines and large wind arrays and that's something that both AWEA and DWEA are working pretty hard to see if there's a way of distinguishing the small distributed wind applications from large wind turbines - large wind turbine arrays.

Planning and zoning remains a major barrier. DWEA has a very strong committee on this. AWEA is doing some work on characterizing zoning and various priority states and coming up with a graphical representation someone who'd be easy to navigate through different ordinances because even within the state we might have 30 or 40 different ordinances on setbacks and sounds and height restrictions and so forth.

One of the things that we're hoping for is a number on for your portfolio standard is 36 I believe that we build portfolio standards now. So we're set aside and we'd like to see or our distributed generation set aside. So where it says solar set aside you'd like to see that (changed) so it should be set aside like you see in Arizona for instance.

Utilities especially rural co-ops not I don't want to generalize here but that's one of the real challenges. Wind is in rural America we don't put many wind turbines in the urban areas and we really need to get the co-ops to be welcoming. And there's a number of co-ops that are now have good incentive programs and net metering and minimal resistance. But in general this is a big challenge.

Competitive economics PV's coming down rapidly it's getting very close to being on par but it's not yet with the small wind. And with gas prices out there lowering not raising utility rates economic still plays a big role in the determination and small wind again needs those incentives to be competitive.

I think that's about all I had except for this graphic which I think represents sort of the small wind industry with great potential but it's a real challenge and we have to all be working together on the policy, the technology, the testing, the outreach and education in order to bring this important sector to its full bloom. Thank you.

Lisa Daniels: So thank you Larry and Heather. And now we'll be moving into our question and answer period. One thing that I wanted to mention is we have as one of our guest speakers we have a - somebody from the US Department of Energy Headquarters. We have Jonathan Bartlett who will - who runs the Wind Powering America program from headquarters in Washington, DC. And he happens to be online with us. So he can help answer any questions that have a larger DOE focus if anybody wants to ask at this time about the small wind activities.

As you can see here we have a way you can ask questions. And I also want to really be sure to thank the National Renewable Energy Lab and most especially the Wind and Water Program at the US Department of Energy for sponsoring this Webinar and helping us get this information to you.

We do have some questions that have come in and I will start to answering those. (Baline) has asked, "Will these slides be made available to the attendees?"

And yes they will. There will be - they'll be made available on the Wind Powering America Web site and probably in about a week. This whole Webinar will be posted with the audio and the slides together.

Also (Brooks Winter) has asked, "Has the South built any community wind or has the South built any, maybe any community and small winds?" And does somebody want to take that question?

Larry Flowers: Well the small turbines - this is Larry - the small turbines certainly in North Carolina and Tennessee, in Northern Georgia you need a good wind resource class 2 or above with good access to that wind. So there are turbines in the South. The deep South when you get down into Southern Georgia and Florida and Alabama and Mississippi there's not a lot of wind resource down there although there are some turbines installed that I know of on hilltops in open space. Heather do you want to make any comments on that?

Heather Rhoads-Weaver: Oh sure Arkansas recently installed a 50 kilowatt turbine for municipality so that would qualify as community wind. And if you look back at the graph of states that got USDA grants, you know, there's a sprinkling of them well certainly Oklahoma and Texas that have good wind but, you know, I would say the vast majority has been in the Midwest and Northwest and West Coast. So, you know, we haven't seen quite as much development there but, you know, that's certainly something to look at for the future.

Lisa Daniels: Great, we have one more question here. (Rich Stromberg) from Alaska is asking us to consider that most of the Alaskan grid side machines not turbines are on isolated grids that don't extend beyond the small village. So he just wanted to qualify what's happening in Alaska. Does anybody want to elaborate just a little bit on that? And how...

Larry Flowers: Yes I'd like to do that. Alaska is a great story actually for a couple of reasons. I've been doing the wind diesel thing for over 20 years. There's thousands of diesel isolated grids all over the world. And wind diesel is I think a very viable solution. But the critical piece we found in doing wind diesel internationally was not the technology because the technology works it's the institutional support that's provided to keep the technology operating.

And in Alaska with the rural utilities AVEC and KEA and Kodiak and TDX they're all utilities that understand the high cost of electricity in these rural villages and have been the leaders which is unusual for the utilities to be the leaders and putting these new technology innovative technology out into the villages. And Alaska has on the order well over a dozen villages now with wind diesel and has the potential of over 50 villages with a good wind resource that can reduce the use of diesel and stabilize energy prices.

So we look to Alaska as a real world leader in this technology and congratulate them for moving forward.

Lisa Daniels: ...okay and next we have some questions that I think are really wonderful questions for Jonathan Bartlett. We have a question and Jonathan just feel free to make any comments in association with anything with this as well.

What - the question is "What are DOE's plans for continuing to support small wind in the future?"

Man: Yes.

Larry Flowers: Jonathan you might still be on mute.

Lisa Daniels: Jonathan is he still with us?

Coordinator: Jonathan your line is open. Jonathan your line is open.

Jonathan Bartlett: I think I'm here now.

Lisa Daniels: Oh there you go beautiful...

Jonathan Bartlett: Sorry about that little technical delay. This is Jonathan Bartlett from DOE's Wind and Water Power program. First what I wanted to just interject quickly is I'm very pleased that AWEA has provided an overview of their Small Wind Market Report. WPA is very happy to have Larry and Heather presenting today. Thanks to both of you and thank you Lisa for moderating the Webinar.

Lisa also we'd like to thank you for your efforts with the Community Wind Across America project with Windustry. It's very important to keep community and small wind in the spotlight within an industry since significant resources are available within this space to continue to grow energy from wind power.

Lisa Daniels: Well wonderful thank you very much.

Larry Flowers: Jonathan this Larry I just want to - I didn't mention this and I really apologize because DOE is the one who funds the development of this Small Wind Report. So that DOE Wind and Water without your funding this wouldn't have happened.

Jonathan Bartlett: Thank you Larry. Yes we're very happy with the results...

Lisa Daniels: So I'm not sure if you heard the question I'm not, you know, with the (confusel) with the technology there. But there was a question here about

maybe could you give us a little preview of DOE's plan for continuing to support the small wind program in the future?

Jonathan Bartlett: Primarily our efforts with small wind in the future will center on testing and certification at this point certification for small turbines from 1 kilowatt of (unintelligible) kilowatts machines are standards are for the small and mid-size from 100 kilowatts to 1 megawatt.

Lisa Daniels: Well great. And then we had one other question as well. Have you looked at different policy effectiveness? And what, you know, and what lessons can we learn from some of the different policies?

Heather Rhoads-Weaver: Well Lisa I could chime in on that one since we certainly looked at that for the policy tool project and I would say certainly long term availability of a program is critical to its effectiveness that these programs that kind of come and go with very short periods and then they fully subscribe. It doesn't really build the market so you might have a little blip but you're not seeing the long term growth that we've seen in states like California that really did have a long running program.

But certainly looking at the types of programs we actually did a case study where we broke down different types of policies and by far a rebate or incentive similar to what (unintelligible) has can give you the most impact for the dollars. But then net metering obviously if you can get full retail value for onsite consumption and have a statewide policy that can really help the economics for small wind.

And then things like a sales tax exemption or improving the cost and (half the factor) of zoning and interconnection all those things can combine together to have a good policy scenario or environment for small wind. So you really

need to have kind of all of those things to drive the market. But probably the very most important is to have is either a upfront rebate or some kind of production base that's estimated production that you feel that effective that right away with the project.

Larry Flowers: I might add a couple of others. There's some innovative policy being developed up in New England where you're actually combining meters and you can also go virtual net metering where you can actually put the wind turbine up on the ridge up where the best wind resource is and then count it against your (bill) down in the valley where your home is. So it basically takes advantage of this differential of the wind resource where the load is versus where the turbine is.

Another thing that we don't see a lot in the US but it's growing interest in Europe and certainly in Toronto is this idea of feed-in-tariff where they offer an incentive to feed the electricity into the grid on a particular rate that makes sense from an economic standpoint and so keep your eye on that in Toronto which is being - I'm sorry Ontario not Toronto Ontario the biggest load in Canada.

And I have to agree with Heather with the idea of having incentives that have sort of a longer time period the on again off again stuff is just too hectic to build a stable supply chain that can lower the cost of these products.

And lastly I'd say this idea of if there is a set aside for the RPS it really needs to be distributed generation and not choose winners and losers let the marketplace and the consumer make the choice as to what technology they want to apply to their applications.

Lisa Daniels: Okay we have several more questions here and we're going - and this is going a little bit over but I think the questions are really, really good. We have a good question here about "How big of a player is China in the small wind market?"

Larry Flowers: Well China is a big market in itself. I mean there's many small wind turbines that they use in China in remote locations. So China as far as their supply I would say Asia I'd broaden it to Asia because you have a number of products coming out of Korea as well. We don't have a good handle on how many of those small wind turbines are coming into the US. When we try to talk to the import folks they group these products in such a way that you really can't pull out the individual turbines.

But we see them in the marketplace and we're trying to make sure is in all those states and incentive programs they have some kind of qualification testing required so that the turbines that are both domestically and internationally produced have good information on their power curves and their performance. So I think we expect to see China as a bigger player in the future but hopefully they'll go through the independent testing and certification processes that are available before they are getting applied in large numbers.

Lisa Daniels: Okay and here's another good one that I think comes up quite often. "Is there a corresponding data or reports available about associated storage technologies? Many who want to invest in small wind these storage is a key to a better economic return." And maybe this is, you know, I don't really know if we are the right people to ask this question (of but).

Larry Flower: Well I'll give you my opinion on that and I (Ian)'s on the phone as well. (Ian) and I have worked in the hybrid systems area for a long time and batteries

which are typically right now the most used storage device are very important in off grid applications where you basically need to have power everyday and yet the wind's not going to be necessarily consistent to supply that energy. So there are battery storage devices that exist right now.

But when do the (unintelligible) cost of a hybrid system that uses batteries the batteries are all at the highest cost, life cycle cost because they don't last. They last three to five years. And so the battery technology still hasn't gotten to the point where it makes a lot of economic sense for on-grid systems for sure and it certainly is a problem in off-grid systems. You know, we see mostly as wind diesel and some kind of short term storage device and you can make the switches between the diesels. But batteries still aren't there yet.

(Ian) do you want to make a comment on that?

Coordinator: I do apologize it looks like (Ian) had disconnected.

Larry Flowers: Okay...

Woman: Oh he's here hold on one second.

(Ian): Hi Larry what was your question?

Larry Flowers: ...well there's a question about batteries. And I just gave my answer which was for off-grid applications you typically use batteries just because of the need to have energy when you want it and (unintelligible) having the wind or solar wind when you need it. But for on-grid systems it's just too expensive at this point. And some battery technology has a ways to go before it becomes mainstream in a small wind system.

(Ian): Yes that is certainly the case unless there is some kind of unusual conditions if you're in an area where the grid goes out frequently or something of that nature and you get additional benefit from having the batteries. We're hoping that with more focused research in batteries due to electric car industries and things like that that we'll get improvements in batteries but at this point in time it's not cost effective.

Lisa Daniels: And I have one more question here. And this one is probably for anybody who's on the phone in terms of the bigger picture. You know, what is the most affective route in which to apply effort to get more consistency in interconnection and in permitting requirements from state to state and utility to utility within a state? So this, you know, this might be a piece where there can be more research and development. For instance out of DOE maybe not just on the technology but on the application side (of things). So I'd be interested in anybody responding to this.

Larry Flowers: Well there is - there are standard interconnection processes and standards. So there is a challenge sometimes in getting the utilities to recognize this especially in the rural areas. But there are, you know, national standards for interconnection of small wind generators.

Heather Rhoads-Weaver: I would just add also there's a great annual report that comes out called "Freeing the Grid" which has been ranking the states on their interconnection and that metering policies mostly from a solar perspective so they don't necessarily look at the difference between, you know, statewide policies that incorporate all of the rural utilities and rural co-ops. But, you know, so I think that we could get more active as the small infector with that effort that looks at utility policies and changing them in terms of just highlighting which ones need more work.

And I think that's been pretty effective to focus efforts on that side. And then on the permitting side, you know, a similar effort could be and I think Larry has actually started to just document where our good policies and permitting ordinances that we can hold up as good examples so that when we start seeing language that's really prohibited that it doesn't keep getting repeating over and over in every county and every town.

So Larry did you want to talk more about that project?

Larry Flowers: Yes there are model ordinances out there a number of states have them Wisconsin, Pennsylvania. I know that AWEA has a model ordinance on the Web site. DWEA is about to issue its model ordinance and what we're looking at on a project is to go to some of the priority states and look at the variation in maybe the eight different attributes of an ordinance.

So typically the most important ones of course are setbacks and height and sound and we were trying to show by municipality or at least by zoning area how they vary from with, you know, within a state because they - what happens is most of these ordinances are developed around a model ordinance. There's a model ordinance looked at and then the locals debate that and modify it to suit the local conditions.

And if you talk to any installer they like the fact that there's an ordinance. If you have no ordinance in the township there's nothing that the zoning and permitting officials have that basically counter challenges. Whereas as you have - if you have a well designed and well written ordinance then the county officials and municipal officials could actually have something they can evaluate your application again.

So a good ordinance goes a long way in minimizing the permitting challenges. So there are a number of us who are - and we'll be putting this on the Web site showing what different states have and what municipalities have as far as their ordinances and which ones are outliers and which ones are favorable toward wind development.

Lisa Daniels: Okay so we have another question as a follow up question to the challenges discussion. I think one of your last slides there Larry. "The 2011 REAP program results were way different than the 2010 and likely given cuts are likely again to be substantially different and the results will be substantially different in fiscal year 2012. Can someone address REAP and 1603 current status in DC and where they feel these programs are going for the rest of 2012 and for 20 - fiscal year 2013 and beyond?"

I think isn't this the last year of the existing Farm Bill or could I be wrong? I thought the Farm Bill is being rewritten and...

Larry Flowers: Yes the Farm Bill - the Farm is under attack, you know, enormous reductions in funding are being recommended. The House (unintelligible) in (out) REAP and then the Senate for 2012 put it back \$37 million. So they're actually, you know, in a committee now working on what the actual number will be. As I mentioned Andy Olson and his network has done a yeoman's work in at least getting REAP back into the discussion. 1603 yes it ends this year if there's a pretty strong effort being made by the solar distributed generation groups to get 1603 extended.

1603 had some real innovative and affective policy by not having sort of the, you know, the passive income requirement or the PTC and also giving the sort of the upfront cash that really promoted a lot of those projects that we saw in 2010 and in 2011. Whether that goes forward with this Congress is anybody's

guess but there's a pretty strong effort being made by distributed generation sector renewable energy sector to get that included in any tax package coming forward.

Lisa Daniels: Thank you and, you know, and I would say the biggest thing, the biggest answer to this is these are all policies that are, you know, up for renewal in Congress. So the best answer is to keep checking in with your elected officials and keep asking what they're doing to support a particular program that you're interested in having them support whether it's REAP or the 1603 or whatever it is. Because this is how the policy gets in place.

So, you know, stay in touch with your elected officials. That's my...

Heather Rhoads-Weaver: I...

Lisa Daniels: ...(input).

Heather Rhoads-Weaver: ...want to mention so I've responded to a few questions typing in and, you know, if we don't get to everybody else's questions you're welcome to contact us and we can try to get back to you individually. There is one question I think I might have misinterpreted. Someone asked about what defines a qualified supplier or model? And, you know, if you were asking about the product chart that I showed for the report so with the 51 wind turbine models that had reported sales that had a reported sales presence in the US from 22 different manufacturers.

So those - all those turbines are not necessarily certified yet although there are quite a few in the process of being certified. So I just wanted to clarify that and should we go ahead and try to answer a few of these or...

Lisa Daniels: Well yes...

Heather Rhoads-Weaver: ...(unintelligible).

Lisa Daniels: ...there's one other question that I really wanted to pick up here because it's a nice discussion. Cliff Ryden from Hawaii is asking, "Because our small grids - because our small grids we have areas that are being closed to further grid connection by renewable energy. This is due to a 15% feeder penetration limit being reached in certain areas. Is this happening elsewhere and what are some of the solutions?" This is from Cliff Ryden of Blue Pacific Energy.

Larry Flowers: Yes Hawaii of course is (say) Alaska is a state that we're looking to in this whole issue of penetration of large wind and there are other places in the US, Texas in particular but others as well where there's not sufficient transmission to take the instantaneous wind resource to loads. And as a result they have some instantaneous curtailment going on that's very significant.

Tell you about (unintelligible) generation is generally it's small enough where it doesn't impact the loading of the transmission lines and typically is on - it's always on the distribution system. Of course you have to do some analysis if you get up into the sizeable single turbine applications to make sure that you're not going to be affecting the power quality. But it's generally not a problem on the distribution grid for small turbines.

Heather Rhoads-Weaver: Well and I guess I would say it sounds like there is a 15% limit set either by the utility or maybe the utility commission and maybe that's a policy issue that could be examined because I know there's certainly other regions and countries that are seeing a higher penetration level than that without any problems. So, you know, maybe that's a research question that can be provided back to the Hawaii utilities. But I certainly see with increasing

electric vehicles and the smart grid and, you know, more storage technologies coming online that that's going to help offset some of the concern there for distributed generation.

Lisa Daniels: Okay we have one more question for Jon - aimed at Jonathan Bartlett. I'm not sure is Jonathan still with us? I think he is. So Jonathan a question, "Are you aware of any plans for DOE programs for 2012 to help fund renewable energy projects in Indian countries more specifically as it relates to small winds?"

Jonathan Bartlett: This is Jonathan again. And in the wind and water program we do not have any (unintelligible) in this plan and FY12 that's not handled within our program. However there may be some activities within the overall office of EERE. We can check on that and we can respond back.

Lisa Daniels: Okay beautiful and maybe the Interior - maybe there are programs within the Department of Interior. But usually those are commercial scale. I think we have one question here for those wishing to apply to the wind program where would be a good place to start? I'm not sure in what manner this question is asking apply.

Jonathan Bartlett: If that's in regards to general applications for funding for or (unintelligible) product projects or activities in R&D our Web site would have any funding opportunities announced on it.

Lisa Daniels: Beautiful.

Heather Rhoads-Weaver: You know, another good place to look at is grants.gov and fedconnect also have listings of different federal programs. But of course if you're looking at the state level DSIRE - dsireusa.org lists all the incentive

programs available and you can click through and usually find out if an application needs to go in for your local program.

Lisa Daniels: And I think we have one last question that we haven't hit on all the exact questions but I think we've hit on most of the topics. And here's one last topic, "Are there model community education programs out there model community education about small wind?"

And I think there - I think there are. One community education program is an effort that for instance that Windustry has led where we are doing a train the trainer program for small wind installers. We have developed a curriculum that follows the NABCEP requirements and work to get small wind installers educated for putting these projects into place helping to get more of these projects into place.

So we have - we've done a train the trainer program where we're training people in community colleges in Minnesota to carry - to take the course and train it within their curriculum - curricula of either electrical and, you know, electricians or the wind turbine technician.

Heather Rhoads-Weaver: And Lisa I think another good model is the Wind for Schools program of course that Larry mentioned...

Lisa Daniels: Absolutely.

Heather Rhoads-Weaver: ...and I know that NREL has an affiliate program for states to try to become part of that program even though the official federal funding is not available anymore but here in Washington state we're looking to raise some money locally to have that happening here in our state. So there is one other question also before we sign off I wanted to make sure Larry mentioned about

the 1603 program of depending legislation that is up in front of Congress right now and we're, you know, what do you think the prospects are for that?

Lisa Daniels: Larry.

Heather Rhoads-Weaver: Did we lose Larry? Well Lisa you may know you're - you've been involved with that program as well and we know with the 1603 program expiring at the end of this month do you think there's any hope for it continuing for next year?

Lisa Daniels: Well the 1603 program the way I understand it is 16 - it goes production tax credit investment tax credit or cash grant.

So in order for and I could be totally wrong but in order for the cash grant to be extended the PTC the Production Tax Credit has to be extended. The way it's written right now so the whole thing the whole ball of wax has to be extended. It can't just - right either that or there has to be a separate amendment to just do a cash grant.

So yes I mean who knows? Who can predict what this Congress will do? I would be the last person but the only thing I can say is everyone on the phone and everybody who's interested has to be sure that they're in touch with their elected officials about supporting these particular programs and these particular incentives. I don't know if you want to predict what Congress do - is going to do go right ahead.

Okay I think we have addressed most of the topics of all of the questions. Thank you all for being - stay - hanging in there a little bit longer and staying with us and we are extremely pleased to be presenting this Webinar.

And actually in the New Year we will have Community Wind Across America will have a small series of a few more Webinars talking about community wind and small wind and we hope you can join us.

And I guess we'll be signing out for today. Thank you...

Heather Rhoads-Weaver: Thank...

Lisa Daniels: ...all...

Jonathan Bartlett: (Unintelligible)...

Heather Rhoads-Weaver: ...you Lisa.

Lisa Daniels: ...and...

Jonathan Bartlett: ...Lisa.

Lisa Daniels: ...Happy Holiday.

Heather Rhoads-Weaver: Thank you. Bye bye now.

Jonathan Bartlett: Thanks.

Coordinator: And today's call has ended. Please disconnect at this time.

END