

Distributed Wind Portfolio Update
December 17, 2014

Coordinator: Welcome and thank you for standing by. For the duration of today's conference call all parties will be in a listen only mode. I need to remind parties that for today's conference call it is being recorded. If you have any objections to this recording, please disconnect now.

We'll go ahead and get started with our very first speaker. I'm turning the call over to Mr. Bret Barker. Sir, you can begin.

Bret Barker: Thank you. Greetings everybody. Happy Holidays. I realize now looking at the presentation cover here that I probably should have thrown a Christmas tree on here. But with that said, my names Bret Barker.

I'm a strategic advisor and portfolio manager contracted to the wind program at the U.S. Department of Energy. My primary role is identifying opportunities to reduce cost of wind energy from distributed systems and linking them to program R&D priorities and investments.

So today we're going to have presentations from myself. I'm going to cover an overview of the distributed wind portfolio here at DOE and provide updates on that. Ian Baring-Gould, the technology manager at NREL, is going to cover the wind regional resource centers.

Robert Preus is the technical lead for distributed wind technologies at NREL. He's going to cover the soon to be published site assessor's guidelines document for small wind.

And Trudy Forsyth, managing director at Wind Turbine Advisors, is going to introduce the smart wind consortium project. Regarding questions, we are

going to take questions after each presentation. To ask a question you simply click the Q&A at the top of the LiveMeeting window.

Type your question in the Q&A box and then click Ask. Upcoming WINDEXchange webinars, as you know, this is part of a regular series that WINDEXchange does. It takes place at this time on the third Wednesday of every month. Upcoming topics include the list in front of you.

And just as a side note, WINDEXchange organized a special series of offshore specific webinars. And the last in that series will be taking place in January.

For more information on WINDEXchange, which is our stakeholder education outreach arm from the wind program, you have the following contacts here—Brie Van Cleve, Ian Baring-Gould, and Suzanne Tegen. Feel free to shoot them questions or submit topics for future webinars.

So with that I'll get started with my portion of the presentations today. So I'll just go back one. Sorry. I'm a slide ahead.

So topics I'll be covering—first of all, to help put the distributed wind portfolio in context of the wind program and then also the Office of Efficiency and Renewable Energy, the US Department of Energy and the White House priorities.

I'm going to give a brief overview of that. Then I'll touch on the evolution of the distributed wind portfolio because we've been in a period of transition here for the last year I'd say. We recently had a request for information out, so I'd like to share some results from that.

Also I'll talk about our main mechanism for awarding funds for technology R&D projects, the competitiveness improvement project. And then finally finish with a brief update on turbine certification requirements.

So first off, White House priorities and how they trickle down all the way through DOE, EERE and the wind program to the distributed wind portfolio. The White House has priorities to hit 80% renewables by 2035, reduce carbon emissions 80% by 2050 and to win the global clean energy economy.

What that means for DOE is insuring the security and prosperity of the nation by addressing our energy and environmental challenges, while also maintaining science and engineering as a cornerstone of our economic success.

Within the Office of Energy—Energy Efficiency and Renewable Energy, are priorities to invest in innovative clean energy technologies to increase competitiveness—U.S. competitiveness in the global clean energy economy.

And within the wind program we focus on improving the performance and lowering the cost for wind power technologies and ultimately increasing the deployment of innovative technologies.

For the distributed wind portfolio what that's meant over the past five years or I should say the five years that I've been with the program, is we've really hit a transition a couple of years ago, where there's a clear trend in the market where distributed wind was a lot more than just small wind turbines or turbines under 100 kilowatts or 200 meters square, however you like to slice it.

And we felt we needed to take a leadership position by redefining distributed wind to include all wind technologies used in distributed applications and establishing new R&D priorities accordingly. So we established this new perspective with the 2012 market report which, you know, released in 2013.

And have since stated our new focus areas which are turbine technology R&D, soft cost reduction, distributed grid integration and wind resource characterization and assessment.

As a part of establishing this—this new perspective and new national definition on distributed wind and reconsidering our R&D focus areas, we recently put out a request for information.

The purpose of this request for information was to inform future activities and priorities by soliciting feedback from industry academia, research laboratories, government agencies and other stakeholders, specifically regarding the new definition and our new focus—our new R&D focus area.

So as a quick summary, we had 52 respondents to the RFI. Fifteen of those were unique responses that addressed the purpose of the RFI. Thirty were form letters supporting one consensus response.

And finally, we had seven responses that didn't really address the purpose of the RFI and were more soliciting funding or just marketing material. So our key takeaways at a very high level here, from the RFI, is their strong support for the new national definition for distributing wind and no one opposed it.

So very positive feedback in that regard. It was clear that soft cost reduction and turbine technology are our top priorities for stakeholders and industry. We see significant—they see significant opportunities to reduce soft costs.

And though turbine technology has started to be optimized, it's not quite there yet. But industry is confident we're headed in the right direction.

As far as wind resource characterization and assessment go, this was identified as an area for improvement but, you know, wouldn't rise to the top of the priority list.

And then finally, distributed grid integration is—stakeholders felt was—is pretty well understood result of—pretty well understood as a result of increased solar penetration. And really required limited attention from our office. But that said, we should certainly be involved in conversations on this issue.

So in light of the top two priorities I wanted to highlight a couple of our main efforts—first with regard to turbine technology, the competitiveness improvement project and like I said, this is our main mechanism for awarding funds for turbine technology R&D.

But real quick, the—the industry in the US really hasn't seen a lot of investment over the past ten years, in technology development.

So in order to revitalize and expand industry domestically and maintain our leadership position internationally, we've just put the competitiveness improvement program in place for small and medium wind turbines.

We're—we're coming up on our third round of the CIP. You can see awards made in 2013 and 2014. But really the problem we're addressing here is unverified, unreliable technology, rising hardware costs and competition from other DG technologies such as solar.

And the solution to partner with US small and medium wind turbine manufacturers to maximize system performance and reliability and reduce hardware costs.

We're—our approach for doing that is one, to focus on component improvements; two, manufacturing process upgrades; three, prototype testing; and four, wind turbine certification testing.

So I'd just like to highlight that NREL who administers the—our request for proposals on behalf of the wind program, intends to release the RFP during the first quarter of the fiscal year, which for us ends on December 31st. So you can do the math. There's not a big window there.

Finally, I wanted to highlight the importance of wind turbine certification and pending requirements for turbine certification to qualify for the small wind to ITC.

Our program has been serving as a technical resource to the treasury department over the past year, to help them write new guidance with—with these certification requirements written in.

And the reason for that is distributed wind adoption has really been hindered by untested technology and unverified claims about turbine performance. We've even seen high profile equipment failures.

And as a result, our office has put a—made a significant investment over the past five years to stand up the framework for not only the standards and certifying bodies but also the test facilities where—where small and medium wind manufacturers can take their products for testing.

We have also recently issued a guidance memo to 17 federal agencies encouraging that they only expend public funding on certified machines.

The same goes for really anybody through access about small wind products are, you know, the first piece of information we provide them is on the importance of purchasing certified equipment. As—as of November 2014 there are 13 small wind turbine certified fully to the DWEA standard.

And most recently, the Interstate Renewable Energy Council posted a unified list of certified small wind technology that they believe will be in accordance with the requirements of treasury when they come out. And I imagine maybe, adopted or modified based on how that guidance looks.

So with that I will conclude my presentation and look for questions here since we're doing them by presentation. And just a moment while I pull that up.

Ian Baring-Gould: There's—Bret there's one—this is Ian Baring-Gould. There's one question so far and that is can we download copies of the presentation? And just to quickly answer that one, they will be put up on the WINDEXchange Web site. It takes about a week to be able to do that.

The presentation itself won't be downloadable but the copy of the webinar in its totality, will be available.

Bret Barker: Thank you Ian. So with that, a man that needs no introduction for this audience, Ian Baring-Gould, a veteran of NREL and the wind technology center.

He's the wind and power technologies deployment manager and has been the implementer of the Department of Energy's wind focus stakeholder engagement and outreach as well as workforce development activities for quite a while now.

And he's also recently taken over management of the distributed wind portfolio as well. So with that, Ian the floor is yours.

Ian Baring-Gould: Great. Thank you. I'm just going to do a quick introduction to the regional resource centers.

People have been hearing a little bit about them and they're a program that the Department of Energy has put in place through NREL to address the deployment challenges in regards to wind technologies, including land based distributed and offshore. And so they're a little bit different flavors.

But the real focus of this is to engage state—states on regional wind deployment issues as it says here in the slides.

Really trying to provide technical expertise and tools to insure that as wind deployment goes forward that it's done through informed decision making using the best available science.

And with people that are willing or—and able to address the key challenges that are—that are in a lot of ways, regionally focused. So a clear understanding that the deployment happens on a state basis and a lot of kind of policy decisions and such are state based.

But a lot of the issues that the wind industry has to face are regional in nature. And so bringing in that regional collaboration to help support the—the

deployment of wind technologies, makes a lot of sense. The Department of Energy funded six regional resource centers that you see on the map here.

And I'll talk quickly about the activities that—that each one of them are doing with a focus on distributed wind, the distributed wind marketplace. I'll—I do note the Web address at the bottom which is the WINDEXchange, a little bit hidden by the DOE logo, I'm sorry.

But most of the regional entities have their own Web sites that—that are easily accessible from WINDEXchange.

So instead of putting up six different Web sites that everybody would have to jot down, just go to WINDEXchange, look for the regional resource centers and then it will provide you links to the ones that would be most applicable to you.

Quickly jumping into each one of the—of the different RSEs—the one in the northeast quickly identified here the challenges that—that they have identified for primarily land based development.

I should mention that it's run by the clean energy group and sustainable energy advantage with the clean energy group, primarily focusing on the offshore market and then SCA focusing on land based technologies.

So a number of different issues that—that they have identified but clearly it's really driven by states. So each of the states have—have different issues, especially around distributed wind technologies.

There are specific activities and as we go through these you'll see that there are some fairly strong commonalities between the different things that the regional resource centers are addressing.

But the northeast is planning on pulling together kind of a regional wind working group building off a lot of work that—that both of those organizations have done in the northeast to kind of create this partner network that—to enable kind of information sharing.

They want to or they will implement an information clearinghouse which we're all looking forward to. But it will have kind of the most recent information on a whole host of (siting) related issues from sound and flicker, environmental impacts specifically relating to the northeast.

So it—it will hopefully become a pretty good one stop shop in regards to scientific information about the (siting) impacts of wind. And then they plan to do a fair amount of outreach across that region in land based wind technologies.

And—and as we know in the northeast, a lot of that ends up being focused in the distributed wind market. Moving onto—to the next one—the Midwest wind energy center—a fairly large consortium that's facilitated by wind industry.

You can see there the kind of challenges that they have identified for—for their region but clearly public acceptance, lack of information amongst decision makers so that they can make informed decisions.

And then a fragmented utility market with—with lots of small municipal utilities that—that are in varying stages of understanding about deployment of distributed wind technologies.

Their specific activities again, provide education and objective information about wind energy facilitating and improving local planning, permitting, (siting) and policy around wind energy with—with a clear focus on distributed.

Conduct outreach and support educational activities at the state and local levels. And then expand multi state dialog around wind dialog—around wind energy technologies and the deployment of—of wind energy. Moving on once more to four corners—that includes Nevada and activities in Wyoming.

And is run primarily by the Utah Clean Energy Alliance. And (Interwest) and then NAU is also partnering with—with the four corners region.

Lots of challenges—cost competitive in comparison to grid power, something that we're all very familiar with. Inability of the public to accurately estimate the costs and benefits of distributed wind technologies. Local ordinance is a common one.

And then utility and local regulations preventing community scale turbine deployments. And then again, the general lack of information on distributed wind technologies.

Similar types of activities that they're undertaking—regional wind working group—developed of a regionally focused Web presence which they have launched education to the public.

And then utility and service commissioners, other regulatory agencies and utilities so that they have up to date information about wind energy, education for a wide host of stakeholders at multiple levels about the—the permitting process.

As well as they're going to identify a couple of specific areas that they want to target for—for permitting—for working with them to implement good ordinances.

So clearly if you're in that region and—and know of specific counties or—or the like that could use some help in ordinances, please contact them directly. And they're currently looking for that. And then providing accurate information to the public.

The islanded grid system center which is primarily based out of Alaska with—with the Renewable Energy Alaska Project and then partnered with the Island Institute which is—is working off the coast of New England. And they have a very strong focus on community wind projects.

Some undistributed wind but pretty much community wind again. They're focused on these islanded technologies and these islanded areas.

You see the list, it's a little bit unique as compared to the other ones, the other (RRC)s because of their focus on isolated grid systems and—which—which adds a little different flavor. And their specific activities therefore are a little bit different, creating best practices for off grid power systems.

A lot of work in connecting the technical experts and the operators of islanded grid power systems to provide that information.

Connecting operators of existing systems with other technical experts and decision makers who—who might be working or thinking about the deployment of—of wind in their isolated power systems, making sure decision makers are aware of what's happening.

And then also another connective failure groups in partner organizations to—to expand kind of the understanding in the community around the use of wind in off grid power systems.

The northwest regional resource center led by renewable northwest but northwest seed, is really doing the distributed wind lead for this (RRC). Very similar challenges that they've identified.

The constrained markets, specifically with low cost (unintelligible) and then also the low cost of power in—in the northwest region.

Poor examples of operating systems and some negative public perceptions based on systems that have been deployed that haven't worked very well, again with focusing on distributed wind technologies. Permitting is—is as always, an issue.

And then also financing packages for small and community projects is another thing that they've identified, specifically for the region.

Specific activities you see listed there but developing a regional wind working group with the focus on distributed wind technologies, providing fact based information, improving permitting, looking at financing options and then also providing testimony when—when available to state PUC hearings and the like.

The last center that—that I'll highlight here is the southeast. There isn't much activity currently in the southeast and the southeast RRC is—is not planning on doing a lot of work from a regional basis. Everybody understands that the wind resource in the southeast is not that great.

And—and therefore the focus primarily now is large utility scale turbines that they can get up to the 110, 140 meter heights and then offshore. But specific states are doing work in the distributed wind market, with a focus on—on Virginia and North Carolina.

So from a regional perspective of all of the (RRC)s, the southeast is the one that has the—the most limited global distributed wind activity. So as I say, specific states are—are jumping in if the market dictates that they should.

And with that, I'll turn it over—back to Bret. We can—we can do questions here about the—the (RRC)s or move on.

Bret Barker: So it looks like we've got a couple of questions in the queue here. So first off, do we see the wind program growing a lot in the near future? Or is PV taking more control in this area? I'd have to ask the person who asked this question, to be a little bit more specific about what exactly they're asking.

So if you could resubmit that I'd be happy to take a stab at it. And then there's also a question about providing insight into what the pending treasury rules may require for medium wind turbines and timing of compliance for both small and medium wind turbine models.

And I would—at this point I'm not prepared to answer that question but would be happy to follow up with the person who did ask it, at a later date. So not seeing further questions at this point, so we will transition to Robert.

So Robert Preus joined NREL in 2013 and brings more than 27 years' experience in wind energy. He was the founder of Advanced Renewable Energy Technology which provided training, engineering and certification support for small end manufacturers.

He led successful development of a 2.5 kilowatt machine and upwards to a 300 kilowatt machine. He has extensive experience in design of wind energy systems. And for those reasons he is our distributed wind technical lead at NREL. So with that we will turn it over to Robert.

Robert Preus: Great. Thank you. Now let's see, ah yes. Good. So first of all, I'm going to provide information about the small wind site assessor guidelines document that—including what it basically covers and when you can expect to see it. I am the editor, not the author. The author is (Tim Olsen).

So first of all, it's a guideline. It's not a manual. It is not sufficient for training someone to be a site assessor. But it provides a framework so that anyone from site assessors to incentive program managers to customers, have it as a reference for what to expect out of a site assessment.

Covers the required skills for site assessors and all the actions that they need to go through to develop a good site assessment. And provides links to a lot of available resources for the information needed. And talks about what kind of reporting needs to be done to cover—provide the necessary information.

So as a bit of background, we're talking site assessment here which is different than wind resource assessment. Wind resource assessment is obviously a subset of site assessment.

But site assessment covers the whole package, including having a clear understanding of the site conditions impact on the—both the installation of the wind generator and the subsequent performance.

Part of the motivation to do this or a significant part of the motivation to do this, was poor production estimates historically. There's been a lot of improvement over the last oh, five to ten years.

And that for one thing, optimistic manufacturer power curves have been almost completely replaced by third party tested power curves. And a lot more information has become available in the sort of adjustments you need to make from global wind speed data to adjust for the site conditions.

The general content overview of the guidelines is again, the assessor qualifications in the site evaluation and description. Basically, when you visit the site what do you—what information do you have to go away with to finish your work?

And sources for wind resource data and how to get from the wind resource data with the site data, to production estimates. And then pretty extensive covering what needs to be in the site assessment report. And links to some great examples.

There are three examples that we have linked to now, that are all by different site assessors. And are all in somewhat unique formats. But they cover all the same information very well. And then one of the things that I think this is a great contribution of, is the glossary.

It really has the intent of getting us all speaking the same language around wind resource and site assessment. A tremendous amount of references, both

for the more detailed information you need to know to do the work, and where to get all kinds of information and samples and examples.

And then there's a sample checklist to facilitate folks making sure they don't drop any of the things out. And then a set of case studies that—that are examples of the variation of the results you get when you don't have a good site assessment in most cases.

Sometimes it works out great and sometimes it doesn't work out so great. So a lot of lessons learned available in that. So take a little deeper dive on the biggest core issue which is the wind data—getting from the wind data to production estimates.

There's a pretty good coverage of wind data sources, a lot of conversation about topography and its effect to support the understanding of the micro siting of small wind generators. Pretty extensive instructions on wind shear and how to pick wind shear adjustment parameters.

And how to go through the mathematics of that process. Discussion of the impact of turbulence intensity and the necessity of including that and estimating that. Because in most cases there isn't good data available. And you have to be able to estimate that based on the local conditions.

And then taking all that information and using it—excuse me a minute. I'm losing my voice here. And getting from that basic wind data, making all of the adjustments that are necessary to get to a gross annual energy production estimate.

And then finally, looking at the losses between the wind generator production, either from availability or other—other things to get to a net annual energy

production. And produce a conservative estimate of the annual energy production for a given turbine at a given site.

Timeline for completion—I pretty much finished the editing except for the case studies. And as soon as that's done in the next week or so, that will go out for a final review from the experts that have contributed so much to the development of this.

And so they're all volunteering efforts. So it may take a few weeks to get their comments all back. So sometime in January I should expect to get everything back from them. And then I'll incorporate their comments which would be a brief endeavor.

And then it goes into our communication system for publication. That could take anywhere from a couple of weeks to longer, depending on how much activity is going on that time of year. I hope we'll be out in February but I put March down here to—just to be conservative.

The—I think that's about it. Yep. So I'm ready for questions. It looks like there's one here.

Man: Yeah Robert the—the—there are no questions specifically in regards to your presentation at this point.

Robert Preus: Okay. Great. Okay. Oh, and let's see, there were a couple of other things that you folks wanted me to comment on.

The workshop—we are organizing a wind resource and site assessment tool workshop to engage a—a broad overview of the—of the industry, to get a

very clear picture on what capabilities and tools are out there and where there are needs for improvement and opportunities for improvement.

That workshop is scheduled for June 18 and 19. And it's going to be in Wisconsin at Stevens Point attached to the—or adjacent timeline wise, to the small wind conference.

And the distributed wind deployment model tool that models the diffusion of the small wind tech—or distributed wind technology into the market that tool is expected to be complete at the end of this year.

And then—and during the first quarter of the—of the year we will be using it to run scenarios and eventually write a document looking at what sort of things have big impacts on the extent of the market development for distributed wind.

So are there specific price points at which there's large growth? And—that we need to create as targets—excuse me—for the industry? And in January we'll be giving a presentation of the model and in March we'll be giving a presentation of—of results. I think that's all I've got on that. So—excuse me.

Bret Barker: Thanks, Robert. Bret here again. So real quick, to—we've got one question for you Robert. But first I want to answer a question that came in previously, about do you see the wind program growing a lot in the near future? Or is PV taking more control in this area?

So I can only speak to the—the wind side of this and what was recently passed by Congress as far as our program's budget for fiscal year '15. And Congress did encourage our office to increase support for distributed wind in fiscal year '15.

And we are presently going through a planning process to identify the right investments to make to align with Congress's guidance. As far as out year budget it's not appropriate for me to comment on that at this time.

So that said, Robert you've got a question. What is the typical cost of doing third party assessment of power curves and who does it in small wind?

So I—I would interpret that—I'm not sure if that's asking about, you know, having someone do a performance projection and the cost of that in the site assessment process. Or is that referencing the cost of getting a certified power curve for a machine?

But since you're talking about site assessment why don't we—why don't you give a range of cost for small wind generators, third party performance prediction?

Robert Preus: Okay. It varies widely. The type of site assessment that we're talking about in the guidelines which is—does not involve long term data collection, etc., varies from a few hundred dollars to \$1500 or so.

And in Wisconsin they had a program where the utility was paying for part of that as part of the incentive program. So the customer was paying \$200 or \$300 and—and the utility was paying half of it. But that program is no longer active.

As far as certified power curves go, usually that's done as part of the overall turbine certification which is fairly expensive. We're talking, you know, \$80,000 to \$100,000 depending on a lot of details. I don't know the cost of having just the power curve certified. I don't have that figure in front of me.

Bret Barker: Okay. Robert, I just piggyback on your initial answer here with feedback we received through the RFI. And that is that there's very little cost tolerance for resource assessment as a part of the site assessment process, especially for smaller systems.

Robert Preus: Yeah.

Bret Barker: So as the system gets smaller, the amount a developer or a customer is willing to pay to do that analysis, decreases.

And—and that said, even as the—the funding for that type of analysis goes down, the quality of the assessment is going to vary as well, based on the tool they're using, the experience of the user performing the analysis, and also the, you know, the size of the system. So there's...

Robert Preus: And—and the complexity of the environment that they're doing it in.

Bret Barker: Absolutely. So there's a—a great deal of variability there. And part of the intent of the site assessor's document which Robert spoke about, is to help put forward a standardized process and template for going through the site assessment process for small wind turbine generators with a focus on resource assessment and (siting) based on, you know, analysis of wind resources on a given site.

So with that, I don't see new questions. And I think—I guess we will move onto our final presenter. Trudy Forsyth also needs no introduction.

She was—she is presently the managing director at the Wind Advisors Team which is a virtual consulting company specializing in distributing small wind turbine technology, global markets and policies.

Perhaps best known from her days at NREL, from 1994 to 2012 where she served as the Department of Energy and NREL lead for distributed wind—for the distributed wind program and coordinated efforts between technical staff and US manufacturers and developing strategies for the small and medium wind turbine industries.

So Trudy is a mentor to many, including myself. And at this point I'm happy to turn it over to her. It's all yours Trudy.

Trudy Forsyth: Oh, thanks Bret. Thank you for that—that wonderful introduction and—and thank you for the opportunity to participate in this WINDEXchange webinar. Well today I'm going to talk about a project that's been funded out of the Department of Commerce (unintelligible) (Amtec) program.

And it's called the SMART Wind Consortium project. And SMART stands for Sustainable Manufacturing Advanced Research and Technology. As you'll see, we're going to be involving a number of people. And hopefully we could build this consortia as it goes forward.

So if I hit page down will that work? Here we go. So the definition of a consortium is an agreement, combination or group formed to take an enterprise beyond the resources of any one member. And indeed that's what we're—we're looking at. We have over 80 collaborators.

And we're looking at near term and midterm actions that can be taken to relieve the gaps and barriers of distributed wind manufacturers. Some of those

are in the research space, some of those are in the advanced manufacturing space.

And really to find out more about the project just take this Web site. All of the information of course comes through the Distributed Wind Energy Association's Web site as DWEA is the grantee for this project. So this is a two year grant which ends May 2016.

Again, the issuer as the primary grantee, is the Distributed Wind Energy Association and it is supported by the (informative) option team as well as the Wind Advisors team. We have two main things that we're doing.

One is forming this consortium of distributed wind manufacturers, suppliers, academics, researchers, manufacturing experts. And we're coming together with this consortium to figure out new solutions to lowering the overall install cost of distributed wind turbines.

Those solutions or actions, will be documented in the roadmap. And the roadmap is due at the end of the grant period which is the end of May 2016.

And before that we're going to have what's called the roadmap prioritization meeting, to get everybody's input on where the different actions should rank when—when looked at together.

The team is made up of two groups and one is the core team as we call it. And the second is the support team. Jennifer Jenkins is our fearless leader at DWEA. (Heather) keeps us all organized and makes sure we're doing everything when we need to do it.

As a project manager myself, I am the technical lead. And (Brant Summerville) is my co-technical lead. (Brant) leads two of the support—two of the subgroups—the mechanical systems and the electrical systems. And myself, I lead the other two which are for support structure and composites.

You can see the support team as well. We have (Bruce Baranowski) with communications; Mary Childress with the financial operations. And she's backstopped through a bookkeeping organization. And then stakeholder research from (Kurt Stahl) and market analysis with (Mark Gamier).

So this isn't just about the support team. We have a whole variety of industries that have engaged with us from submitting letters of support and letters of commitment in the initial grant period to continuing involvement in one of the subgroups as I've mentioned, or continuing involvement at the end of the project as a roadmap reviewer.

The left hand column that you see, starting with Aeronautica, if you go right down that column all—those are our additional equipment manufacturers who are a part of the steering group yet provide advice to the project on what to go look for and what to try and find in terms of establishing partners—partnership and new research and manufacturing techniques that can be used and identified as part of the roadmap.

We also have a whole host of academic and research participants. We see those listed there. Again, this a partial list as the previous one. We're sort of like a stone gathers no moss.

Well we—we are continuing to gather participants as we rollout this project and get more into the specifics of research and manufacturing needs, to lower

the distributed wind industry's cost. This again is the OEM steering group. You see the names of the companies and their logos.

Each of these entities is a member of DWEA at the industry level or above. And they provide direction to this project in terms of what we should look at, what we shouldn't look at. You—(Brant Summerville) and myself, have been working with them to understand the metrics that they—they work under.

And in some cases those metrics are individual from the manufacturer and in some cases those are aggregated. But one way to look at this, if we go down to the next slide, is basically a collage of items.

And so, you know, there's not a specific number of OEMs that have listed for example that this (date) is an issue. But you get a sense based on the (box) side, as to how many of those 11 OEMs have identified particular items that are either hard to produce or hard to source.

And so it's in fact those items that we're looking at in priority from the ones that have the most OEM interest to the ones that have the least OEM interest. We are divided into the four subgroups—electrical systems; mechanical systems; report structures and composites.

We did this so that as we are considering advanced manufacturing techniques, we could begin to group those—those together. It's bit a little bit of a hindrance because, you know, controls dominate the whole of small and distributed wind design.

And those are often found in multiple subgroups. And in calling out the support structure, unique from the mechanical system, presents another

challenge and that really all of those two combined give you the mechanical strength of the system.

But in any case, this is how we've listed it out. And we've set up face to face or in person meetings. You can see that there was a consortium launch in October. And in November we had the mechanical systems subgroup meeting at the end of ETC.

In January we're going to have the support structure and subgroup meeting at lower NREL followed by the composite subgroup meeting at the NWTC in February.

The electrical system subgroup meeting will be in Washington, DC and it is back to back with the Distributed Wind Energy Association's 2015 (solar) event. So those are the face to face meetings.

And then we're going to break into holding a series of teleconferences that are targeted either at specific parts or specific manufacturing processes and continue the dialog on. Draft a roadmap presented in February or March of 2016 in Washington, DC. And allow the consortium members to vote on that.

Again, our final product will be the roadmap and that will be done by the end of May 2016. Here are some initial strategies. We're looking for those distributed wind manufacturing gaps and barriers.

We want to have a prioritized set of solutions or actions for today's manufacturing volume but then also be ready to scale up. I'm trying to facilitate a rapid transfer of innovation from what I would call near term applied research into the manufactured part.

And we're looking at the whole system cost, not just the turbine system, but the install cost. And we're looking for high product quality and safe installations. All of this of course, will help our manufacturers maintain their edge in the global marketplace.

This is our top level schedule. Along the bottom you can see our schedule goes from June 2014 which is when the grant started, through May 2016. You see our—on the top we have the consortium coordination, our subgroup meetings or subgroup virtual meetings.

You have a series of financial reports that are due to the Department of Commerce. And then below the second gold bar you see the roadmap development cycle. So if you're interested in finding out more about this particular project or are becoming directly involved, we'd love to have you.

You can contact Jennifer Jenkins at the DistriutedWind.org site and you can find out more at the SMART Wind signup, (unintelligible) level to the Web site.

Bret Barker: All right. Trudy, is that it?

Trudy Forsyth: That's it. Thank you.

Bret Barker: Thank you Trudy. I just want to make one note here that a participant pointed out to me, and that is with regard to turbine certification requirements being incorporated into the guidance for Treasury and IRS to qualify for the ITC.

When—when that guidance is made public there will be a webinar hosted by I believe the Distributed Wind Energy Association with representatives from

Treasury and IRS to directly answer any questions manufacturers or stakeholders may have, with regard to the revised—revised guidance.

I believe DOE also anticipates participating on that. So at this point I—I'm not seeing any other questions coming in. And if there are no further comments from presenters—are there any? It sounds like no.

Man: Not from me. Thank you.

Bret Barker: I think we'll conclude there. And just a reminder if you have questions for the WINDEXchange team or want to suggest future topics, please reach out to either (Bree), Ian or (Suzanne). And with that, thanks for—thanks for calling in. And have a happy holiday season. Merry Christmas all.

Coordinator: At this time all parties are welcome to go ahead and disconnect from today's conference. At this time all parties are welcome to go ahead and disconnect from the call. Thank you for joining and have a great day. Thank you.