DOE Wind Workforce and Education Activities Update
January 15, 2014

Coordinator: Welcome and thank you for standing by. At this time all participants are in a listen only mode. Today's conference is being recorded. If you have any objections you may disconnect your lines at this time. I would now like to turn the meeting over to Mr. Ian Baring-Gould. Sir, you may begin.

Ian Baring-Gould: Hello and welcome everybody to our monthly Stakeholder Engagement and Outreach Webinar from the Department of Energy. This week we're—or this month I should say—we're focusing on Stakeholder Engagement and Outreach activities that are going to happen through the program.

And we've got great - three great speakers here to talk about the current, kind of, research and understanding in regards to work - the kind of national wind energy skills and workforce and Suzanne Tegen is going to give us a presentation on the research paper that she completed a number of months ago.

And then Julie Jones is going to give us a brief overview and update on the DOE Collegiate Wind Competition. And then we have the pleasure of Michael Arquin whose company, KidWind—who is - we've been working with—though is not directly funded under the Department of Energy for a lot of the work that he's talking about here. They're just kicking off their National KidWind Challenge. So it's a pleasure to have Michael with us to talk a little bit about the - do an introduction to the KidWind Challenge for folks that might not know about it.

Before we dive into that I would like to just quickly introduce our new leader from the Department of Energy, Brie Van Cleve, who has joined the Department of Energy for at least a year from the Pacific Northwest National Laboratories. And she is replacing Jonathon Bartlett, that we all know and left a number of months ago to work outside of the Department of Energy.

And so Brie comes to us from the Pacific Northwest where she has done lots of work in permitting and permitting issues, primarily around water technology. So she brings great expertise in areas like national resource management policy and also leading a bunch of stakeholder engagement activities in that area.

So there's a little blurb in there about her in the newsletter so I'd encourage people to check that. And then also contact Brie individually. I'm sure she's more than happy to talk to people about the DOE program—things like that. So welcome Brie). And if Brie has a few words that she would like to say, I would invite her to do so.

Brie Van Cleve: Thanks, Ian, that's kind of you. I don't want to take any time away from our speakers today, but I want to underscore the invitation to contact me. I'll reach out to a wide group as I'm able. I'm getting up to speed. There's lots of good stuff going on, so I'd really like to hear from people.

And I think my contact information is on the website. If it's not immediately, it will be soon. So I'd love to hear from anyone and everyone. Thanks.

Ian Baring-Gould: Yes. Thank you, Brie, and also her email address is at the end of the presentation today. So you can contact her that way as well. So without further ado, I'd love to invite Suzanne Tegen to present her work on the

National Energy Skills Assessment. Suzanne probably needs no introduction to the people here that are on our Webinar today.

But Suzanne is a manager here at NREL and she manages the market transformation and stakeholder engagement team here at NREL. She has a PhD and works in a whole bunch of economics and economic analysis areas—is the author and creator of the JEDI tools—which are very well respected and have a, kind of, a heart in a lot of the stakeholder engagement outreach work that we do.

And just recently she has moved into the workforce assessment area and completed this study that we're going to see right here. Really the first in-depth study of the wind workforce that's been publically - made publically available. So without further ado, Suzanne could you fill us in on the report?

Suzanne Tegen: Yes. I'd be happy to. Thanks Ian. So I also need to extend thanks to Michael Leventhal who worked on these slides and this project with me. So thanks to him. I'll just move right into the slides here. This slide covers why our work in this area is so important.

Of course we need—as you all know—a robust workforce to grow the domestic wind manufacturing capabilities and so many other parts of the supply chain. And then we also need to include into that deployment - development, deployment, siting, permitting, you know, all of the jobs that you all have and know are important out there.

But what we wanted to do was to better understand today's workforce and then the projected needs for the future, where are we going, by 2030, and then how existing and new education and training programs can meet future needs and which training programs we need to get to 2030.

We initially conducted a literature review that show a U.S. wind workforce assessment—like Ian just said—had not been performed on a national scale. And so our research and report and forthcoming career map will contribute to workforce needs, knowledge, including education and training.

So here's just a bit about - more about the project. The purpose of this particular research for the wind workforce report was to survey the current wind focused education and training programs at American colleges and universities, determine which jobs were available in the wind industry today and which types of training employers wanted their employees to have before entering.

And then estimate the needs for newer expanded wind-focused education and training programs to reach future goals. So in this presentation I'll go through the methods and results for both parts of this—the education and training as well as the industry part of it.

And I'll end with kind of a sneak peek at what we're doing with our results now. So this was kind of two projects in one. The first one was this education and training database, gathering data for our education and training database that we created by reaching out to colleges and universities.

We ask questions about the number of current students, the number of graduates, and then the percentage entering the wind industry—which some could answer and some couldn't.

And then next the industry survey where we asked about the number of workers that are currently in specific jobs, the categories of jobs, and the skills

that the employees have and then the employee training. And both of these led into our report.

And I'll show the link to that report at the end of the slides. But it's the wind - National Wind Energy Skills Assessment. So I'll go over how we got to the education and training database. And we got a really good start on this database.

But it's by no means all inclusive. My email will be shown at the end of this presentation. So do contact me if your program can answer questions like the ones you'll see here and has not been included that you know of—because we know we didn't capture everything.

But here is how we went about this. Here's our method. So we sent surveys out to 49 different schools. And then got different responses and got really good quality data from about 20 schools. But that meant 40 programs—in total, actual 43 programs responded to us.

And you can kind of see that we got about half were associates degrees, post-secondary certificates. And then other ones were undergrad, Bachelors, Graduate Certificate, Master's Degree and Ph.D. So kind of half and half. And they averaged about two to three programs per school.

So these next few slides will be a bit hard to decipher, but it's not important to see the exact test. I wanted to show what our data looked like. And so what we - this is an example of quality feedback from one school.

This happens to be Texas State Technical College. And so here we would get the name, the website, the degree level—which you can see there are different. There's an Associate's Degree and then a certificate.

And the name was in wind energy technology. And there are a lot of schools that have, like, energy technology. But it wasn't necessarily wind energy technology. So we didn't include those unless a large portion of the time that the spent was dedicated to wind energy.

And then there's additional information. The graduates per year. So you can see there, 50 and 10. And then the placement rates—which were also really important part of the survey.

And again, that was an example of good feedback. And we did get some incomplete feedback from different schools too. So with the feedback that we got, we created a database. And it looks something like this. And then you can see the importance there—that arrow at the bottom --that number entering the wind industry.

So what we did was we searched the Web site first—the school's Web sites—to see what we could glean from that without, you know, bothering somebody at the school. And then we needed to follow up and really get good information from somebody who was more in the know.

And this is just - I'm going to go over the industry survey here. We contracted with a company called BW Research. They had performed some other surveys for NREL in the past and were very helpful.

They - NREL's - online and phone survey. So we tried first online. And if that didn't work, we tried a phone survey. And it began in August of 2012. We ended up with 418 companies for large wind. And then 18 companies for small wind.

So research will focus on large wind. And we did keep the small wind response in case we can do something with that in the future. Again, this is one of those, kind of, concentrated slides. And you'll have to disregard the numbers over there on the left. Those are just for our own - being they don't have any significance.

So we wanted to get a handle on the level of difficulty in finding qualified applicants by occupation. So we actually asked the employers, you know, how hard was it to find these people? And we can see that—at least according to the employers we surveyed, the most difficulty was found in the - in looking for professors, teachers, educators.

So that includes trainers also. So those jobs at the top there—the ones in orange especially—engineers, product designers, trade workers and specialists, heavy equipment operators including cranes, technicians, project managers—that's with technicians, project managers, professional trainers and technical specialists.

And this was another one of our questions—preferred educational attainment. So these data shows the preferred educational level for new hires. And you can kind of see here—for construction laborers they want - they don't need a high school diploma. Then if you go to trade workers, they want some sort of training—a journeyman or technical training programs or something like that.

And you can kind of see the difference - the different jobs there—engineers need at least a Bachelor's—if not a Master's Degree. And then there are people who need a Master's Degree or PhD or law degree. You can see kind of over on the right—the top right there—research engineers and attorneys.

Not just too surprising there. So we'll move on. This is the importance of a wind-specific degree. So this question is one of our, kind of, top questions. And we wanted to know how important the employer thought it was to not only be a good, you know, whatever you are—a good trade worker or a good manager—but be - have wind-specific experience when you came in.

And for some of the jobs, it was not important or relatively unimportant to have wind-specific training. For some of them—thank goodness—like wind technicians and assembly workers—it is important to have wind-specific training.

But this was very interesting to us. The development and technical specialist, it was important. Research engineers, trade workers. And we also have a category for general engineer and managers. And, you know, it is somewhat important—it seems like—for those jobs.

But maybe they could first be a good manager and then second, you know, be trained either on the job of be trained in that specific - in the specific job for wind.

So this is an overview of our survey results. And I want to just caution that these are not all of - this didn't capture all of the people in today's wind workforce. You can see up there at the top it says approximately 46,000 workers.

And so that's what we captured with the 418 survey - the 418 companies that we surveyed. And the American Wind Energy Association has very good estimates of the workforce numbers now. And they've been hovering around 80 to 85,000 jobs in the past couple years for the domestic wind workforce.

And we, you know, we think those numbers are very good. They come from their own surveys. So just to caution that these are just from the answers that we got. So the results from our industry survey showed that - showed this breakdown of jobs.

So you can see that - where a lot of them that were wind technicians, then engineers, and the percentages get smaller as you go through the circle there. And there's a note at the bottom because people are definitely interested today in supply chain.

And so I wanted to look specifically at manufacturing jobs. And they - we did a different breakout for those and they included the categories that I listed up there—like trade workers and assembly workers.

And so if you go through those ones and kind of break out different sales people and transportation that are involved in manufacturing you'll get to about 25%. So that's not showing up there, but that's in a different break out that we have.

So that was what we found. And as far as the overall project results when we put it all together, the - to project the needs for the future workforce in 2030 we used estimates from DOE's 20% Wind By 2030 Report that I know most of you are probably familiar with.

We anchored some of the jobs to what we had predicted in that report—what they had estimated for that report jobs wise. And then we also built in retirement rate and labor efficiency gains based on industry standards.

And there's more about all of this is the report if people are interested in hearing more, of course. But this is what we came up with. The estimate of the

education and training gap that exists between now and then. So the programs that we might need to have to get to where we would like to be in the 20% Wind Report are in the right hand column there—difference—is what you want to be looking at.

So for the post-secondary professional certificate like journeyman and trade technical programs we need 90 more programs in the US to get to what we need - where we want to be for the 20% wind level.

The Associates Degrees—it actually looks like we probably have enough programs in the community and technical colleges if, you know, if the methods that we used were indicative.

Bachelor's Degrees—I mean there are different ones, of course, but it looks like we might need about 30 more programs. And then Post Bachelor's—0 to 10 programs. And the Master's Degree and higher—about 10 new programs would be needed for wind specific training.

So there are all, again, in the right row of this wind specific training needs. And one thought we had, kind of, post results was that we could also ask the current employers—or excuse me—the current trainers and educators, you know, how hard would it be to double the size of your classroom? Would that add that too much stress on your program? Is that really feasible? And could you pretty easily do that?

So they - instead of having 90 new programs, perhaps, you know, 45 programs that are already existing could double their size. We don't know the answer to that. But that was one thing that—like I said, I just wanted to mention on that one.

So - and then I promised you a little sneak peek about what we are doing this year with some of our data. We'll be doing something similar to the solar career map. And this is the career - let's see. The solar career map on the DOE Solar Page.

And you can see the URL there. And you click on one of those dots. So you can hover over one of those dots that you see in the career map. And it will show you the job names and then it will also show you - this is just one of the features, but it shows you a career path potential.

So it'll show you engineering technician and then how you can get to all these other engineering jobs. And then over on the right you can click route to advancement, job details, that kind of thing.

So, of course, ours would be focused on wind. And we're trying to do something similar. And that should - we're working on that this year. So we'll definitely let this crowd know when we're able to publish something like this. And it will also be on the DOE website—but it would, of course, be on the DOE Wind website.

So again, the reports that Michael and I produced are listed here. You can get to it with that website. And if you have questions or if you are interested in being added to the training and education database, let me know. You can email me there.

And otherwise I thank you for your interest in this topic and thank you for listening to the presentation.

Ian Baring-Gould: Great. Thank you Suzanne. Additionally, people who have been doing this for a while know if you have questions for Suzanne, we're - to address during the

Webinar, we do that at Type in Questions. Or if you go to the top of your screen and there's a little Q&A. Hit that and you can type in a question and we'll address questions at the end of the presentation or at the end of all three presentations.

So moving onto to our next speaker, Julie Jones, who is going to be talking about the Collegiate - the Department of Energy Collegiate Wind Competition. Julie earned her Master's Degree in technical communications in 2001 from Colorado State University.

And she has been a kind of core member of the NREL program here for quite - for quite a few years—for 16 of them as a contractor initially supporting the Village Power Program and then the Wind Powering America Initiative over that time.

Just recently Julie became an NREL Project Leader here at NREL—so a full employee. And is currently managing the DOE Collegiate Wind Competition as well as a number of other activities in the stakeholder engagement outreach area. So Julie.

Julie Jones: Great. Thank you Ian. Hello everybody. Nice to speak with you. Some of you may be familiar with the competition. But I'm just going to give a broad overview. And I'd like to leave quite a bit of time for the end because we've got one of our wind tunnel engineers on the phone that I'm sure you'll have some interesting questions about some technical details.

So I always like the feedback. So just to begin, this is leading somewhat Suzanne had just presented about the need for workers in wind industry. And just focusing down here—and you can't see my mouse moving.

But it's towards the bottom of the page where it says all of the studies show that in many cases wind-specific advanced degrees are not required. Wind experience is highly important in these fields.

So over to the bottom right we know that in the future we're going to need these positions filled if we're going to reach the approximately 16 gigawatts per year. So engineers and professors and the project managers—so while they'll earn their advanced degrees, it's also going to be beneficial if they've got wind experience.

And that leads into the competition and what it is meant to do. So the DOE Collegiate Wind Competition—this is its inaugural year. The competition will be held in spring of 2014. And it is meant to address multiple disciplines.

We are engaging engineering schools, the business schools, and other colleges within the university to be able to compete in the competition. So we are at looking at interesting—getting students interested.

And also connecting with the wind industry and looking at the different educational program that the universities have and the actual curricula that they provide for these students to get engaged with wind energy technology.

So the competition platform in general—not necessarily just for the inaugural year—has three different components. One is to develop a business plan. And from that business plan build a wind turbine that can be tested at the competition.

And then the third component is to be able to present on wind energy topics. So when we're - we're thinking about the competition contest and looking

towards the event that's going to be happening in the spring, there is some guiding principles that we keep in our mind constantly.

So we're always making sure that we're aligning our work with these principles. And that is to provide real world experience for these students earning their advanced degrees and trying to provide that wind-specific experience in their classroom that they will demonstrate at the competition because they are going to be the future leaders of the wind industry.

We're also recognizing the innovative collegiate educational programs from which they come. And like I said, they span across the university—in the engineering department, in the business school. We've got public policy. We've got communications students.

And so they're all working together as a group. We're looking to provide a safe and fair competition and a positive experience that will carry into the future because we want this competition to continue. And want to build upon the success that we experience for the inaugural year.

We want to create opportunities for industry to engage with the competitors because they could be perspective employees. We want to provide a high-quality competitive environment. And we also want to engage K through 12 students in a competition to increase their future entrance into higher academia.

So the theme of the inaugural DOE Collegiate Wind Competition is to design, build, and test a lightweight, transportable wind turbine to power small electronic devices according to their customized data-derived business plan.

So teams - we have ten teams. And they are listed here. The Boise State University, California Maritime Academy, Colorado School of Mines, James Madison University, Kansas State University, Northern Arizona University, Pennsylvania State University, University of Alaska Fairbanks, University of Kansas, and University of Massachusetts Lowell.

They will all come to the competition with a prototype wind turbine that will fit into the wind tunnel for testing. And if their market turbine is based on their business plan is larger or different from the one that they prepared to be tested, they will also bring that as well and talk about its application based on their business plan.

So I'm very interested to see how they're going to market their turbines and how they look because I think that there's some range in there between - by definitely of being lightweight and transportable to power small electronic devices.

And the teams did just submit their first deliverable for their project portfolio at the end of December. I haven't read them yet, but I do have to say I'm very excited to see the variety that they've thought about since the team started gathering.

Some of the teams started gathering soon after they submitted their proposal. And then others started at the beginning of the academic school year—which is around late August.

So there's a project timeline that I have up here. I'm not going to spend too much time on it here, but what it's meant to show is that the competition is currently biannual and it's depending on funding sources.

But it is set up that it could be conducted every year. So if we were to do that, we would start the solicitation in January of the year to be held the following year. So it's an 18-month cycle.

And this inaugural year it's everything starting from scratch. So it was the initial request for proposals, needed to develop the purpose, the objective, the theme, what the contests were that we would be testing to, the rubric, the rules and requirements, just a lot of the fundamental base things that you would need to conduct a competition in the future. And, of course, subsequent years, we'll be able to use that material that was initially developed this year.

So for the competition event schedule we've got two full days of testing. So we're looking at a good, you know, 10 - 12 hour day. The first day that I have up here—which is day zero—is actually going to be a testing day where the teams can all come in and use the wind tunnels and, you know, put their prototypes in there, test them, make sure they're performing as they expected when they were on campus.

And then Day 1 of the competition is the engineering design review and the turbine performance testing. So the teams will gather in the morning and then they'll enter into the design review judging sessions. It will be a 10-minute presentation with a 10-minute Q&A from the judging panel.

And then they'll have a 30-minute break in between there and then they move into their turbo performance testing. That's where there's a power core verification, a cut in wind speed, and control at maximum power and durability and safety testing.

And that spans the entire day. At the end of that day we have a wrap up and a photo opportunity. The second day is the business plans and the market issues presentations.

We're going to start off on the main stage in the big open area and they - the teams - will have a 8- to 10-minute public business plan presentation pitch where everybody can come and see what their business plan is, what their market turbine is.

And then the teams will break off into different sub tracks. And the teams going to the business plan judging session will have a one-on-one time with the judges and then the market issues presentations with the public where teams will present for 7 minutes and then be questioned coming from the judges for the remainder of the 3 minutes. And then we have an award ceremony at the end of the day.

Second to last slide is the wind tunnel. We have a generic diagram up to the top left. The Plexiglas see-through area you see there is four feet by four feet by eight feet. But the entire tunnel spans 19 feet and we will have a distance of probably 25 feet in total to allow the intake air coming in, 6 feet of space to allow air to come in on the left where you the square.

And then it will exit out on the right hand side where the fan is. And that will be - so it's going to be a pretty significant size in the room. And you can see - there's a picture to the right. That's me standing there next to the Plexiglas that testing component that's eight feet long.

So that gives some scale of how large these wind tunnels will be. And then the bottom photo is the inlet just facing down as our wind engineers are building the tunnel.

Then for the last slide—if you are looking to get involved, our schools can be contacted directly. If you are interested in providing consultation on turbine design or business plan technical assistance—maybe read and provide some feedback on their business plan.

And maybe even inviting them to tour machine shop or use your machine shop or any materials. And, of course, you can also support them monetarily with contributions.

If you would like to do that, I have the team principle investigator information that I can send you their contact information. Or you can help during the competition by participating as an onsite logistics volunteer. Or you can join our sponsorship program.

And you can sponsor a reception, food, or useful materials that we will need to be able to conduct the event. Or - and if you're interested in being a judge, you can also contact me. My contact information is right below—julie.jones@nrel.gov and there's my phone number. Thank you very much everybody. And I will gladly answer questions at the end. And like I said, our wind tunnel engineer is also on the phone that will answer questions. Thank you. Ian?

We do have another presenter following. Michael Arquin is on the line. He will be presenting about the KidWind National KidWind Challenge.

Michael Arquin: And I'm on the line. I don't know - do introductions or not.

Julie Jones: I think Ian might have lost connection. I know that he's traveling. So Michael, can you go ahead and give us an introduction.

((Crosstalk))

Michael Arquin: I'd be happy to. Hello everybody. Thank you for being on the line. I do not have a slideshow, but I think they were going to put up the KidWind Challenge main page so you can sort of see it. And I'll talk a little bit from there.

My name is Mike Arquin. I am the director and founder of the KidWind Project. And it's an organization basically that's focused on helping teachers and students learn how to integrate wind other renewables into the classroom through - we distribute lots of free curriculum.

We distribute kits and materials we've invented. And then we also have these student-driven competitions that are designed for students to, sort of, get engaged with building their own wind turbines and kind of learning from wind energy experts and things like that.

It's very much - the line I like to use in terms of understanding it—think pine car derby when you were a kid in Boy Scouts or - some of the - it's sort of an easier version of getting into technology - like a first robotics where the kids build Lego-based robotics and things like that.

But in these competitions the students are building wind turbines and trying to play with them. And I don't know, Julie, do you know if people can see the web page?

Julie Jones: Yes. They can.

Michael Arquin: Okay. Great. So the KidWind challenge has been going on for about - we're in our fifth year. And this year we'll have about 30 events in—I want to say—19 states. They're regional events. And the KidWind challenge is broken into two major ways people can participate.

One is through an online competition where teachers in classrooms can be building turbines with their students and the students upload their turbine on their own with some basic data. And if whoever is running in, if they can click on Online Competitions for me, that'd be great.

And then click on Current Competition way up at the top right on that page. You'll see this list of turbines that appears. And basically what is - the design of this is that any - lots of classrooms are basically having kids build and test wind turbines.

So the kids will go into a classroom, test their blades. They'll make gearboxes and things like that and upload that data. And they can participate from anywhere in the world.

And they can be using our gear, any - there's lots of companies that make kits and equipment. They could be using their gear. It's completely open source. And we've been getting hundreds of entries a month. It's pretty exciting.

And it's, sort of, in the year too—every month we pick a winner. And they get some T-shirts and the teacher gets a cash prize. And so it's, sort of, keeps going. And each month the winner from this will get an invite to the National KidWind Challenge.

So that's, sort of, one way you can get to the National KidWind Challenge. If you go back to the Main Page—Main Challenge Page and click on Event

Competitions you'll - the other way we have events is just where kids actually come to a big event gymnasium at a school or a science museum.

And they bring these turbines that they build and we put them in a wind tunnel. It's not as fancy as Julie's. It's 48 inches by 48 inches and a bunch of fans. Calling it a wind tunnel might be a bit glorified. And they basically are tested on how well it performs.

They're asked a number of questions about what their knowledge is about the wind industry. They may also have to do project reports and things like that. But it's basically just to engage them in the wind energy space with - by building and learning some concepts.

These ones are a lot harder to pull off, but they, you know, each one we probably have 100 to 200 kids that show up—their coaches and things like that. And it's been - it's been getting more and more popular.

We have a number of, sort of, companies that are helping us fund it and events like that. You may—and I don't know where everybody is on the call, but like Julie says, we have needs for all sorts of things in these competitions. Sort of, how you can help is we need judges who can judge the kids when they bring their turbines to the competitions.

Some of the teams need mentors and coaches. So if you have any interest at all in, sort of, helping out on this project—if you got to the website and you click on, you know, connect or info, that comes to me basically. And we're really motivated to, you know, get more people from the industry involved in either being coaches, judges, mentors to the teams.

We've had a really nice alliance with the Women of Wind Energy. They've provided a number of judges and mentors that are women from the engineering space. And I think that's a really great role model for the students.

We tend to have very good male-female ratios at our challenges—very close to 50/50. Renewable energy is very interesting from a STEM perspective for K through 12 students.

So that's all I want to show. Like you said, we have a lot going on and it's kind of going crazy. We are going to be at the Collegiate Wind Challenge doing a, sort of, a KidWind Challenge with a bunch of, like, 1,500 Nevada - Las Vegas students.

And then some of those will get to come to the Collegiate Wind Challenge to see the college kids—to see, sort of, see those career connections too. But really psyched. Really psyched for the opportunities to share a little bit about it.

But if you do want to learn more and get involved—plenty of time. There's lots going on between now and May. So appreciate the time.

Ian Baring-Gould: Great. Thank you Michael. And apologies. Of course the phone cuts out as soon as I'm supposed to introduce you.

Michael Arquin: No worries.

Ian Baring-Gould: Always works that way. Again, Q&A. So please go up to the top of your screen under the Q&A and you can ask a question there. The two questions that we have are for Suzanne. So the first one—address these and then have a

few others. But if you have a question, please go up there and ask your question.

But from Debra Jacobson. Most people know Debra but she is a law teacher. And so she has a question in regards to the survey. And you focused on (unintelligible) and attorneys and government regulatory workers. But could you talk a little bit more Suzanne about the data that we collected in regards to the legal field.

Suzanne Tegen: So yes. So thanks for the question, Debra. And actually our survey was really broad ranging and we found mostly wind technicians - with the results that we have is that it was - we found mostly wind technicians, engineers, trade workers, some managers, and others.

And attorney and government workers were a very small percentage of what we found. However, what you might have picked up on is that employers in those fields—so in the legal field and in government worker field expect a high level of education.

So that's, kind of, where they were at the top. They expect a Master's or a PhD or JD. However, in both of these cases, most employers do not necessarily prefer wind specific training before you take the job.

And only about a quarter of employer felt that qualified applicants were hard to find for attorney jobs. And even fewer than that for the government and regulatory workers.

So I'm happy to maybe talk to you offline about more specifics if you have them. But I think maybe what I showed up here might have misled you a little

bit. But the reason that they were at the top where - that was when we were looking at the preferred education level. So that's what that was about.

Ian Baring-Gould: Great. Thank you Suzanne. And then the other question from Heather Rhoads-Weaver tries to get a little bit more into the smaller distributed wind companies. So her question is how was the 46,000 workers calculated? That's the more general one.

And then how many of these workers did come from the 18 small wind companies that you mentioned in the survey?

Suzanne Tegen: Great. Great question. And I encourage everybody to read the report. And it will go into more detail for all of these issues except we don't focus on small wind for the - in the report.

And we hope to gather more data in the future to be able to focus on small wind. But I think that the 18 companies that we surveyed were not enough to - for to do a report.

And I'm sure you would agree, Heather. But we started out with 1900 contacts. And we ended up with 418 companies in commercial scale and large scale wind.

And those were the ones that we then got the good answers from—the good feedback from—those 418. So we used a ratio in coming up with the 46,000. Between the 418 and the 1,900 plus—also what was known from AWEA surveys.

And we had estimated in a previous year—I want to 20 - 10 or 20 - maybe it was 2011—that there were at least 70,000 jobs in the wind industry. And then

we worked with AWEA. And there estimates—which are very good—are that there are about 80 to 85,000 jobs in the wind industry—at least that was in the past couple of years.

So again, we just used a ratio to get to the 46,000. And as far as the small - I don't have the number in front of me right now. But I can get that for you, Heather. I'm happy to do that. And, you know, if we can, we'd love to do this same survey for small and distributed wind in the future. So we'll see if that pans out.

Ian Baring-Gould: Great. Thank you Suzanne. As we dive into a couple of the other questions, Heather asked if we could put up the link for Suzanne's report again. My bet is though that if you type in the National Wind Energy's Skills Assessment into Google the report will probably come up. It is on the part of NREL's publication database. So you can find it there.

Suzanne Tegen: It was also my last slide—is where that was. If - I don't know if you can pull that up. But yes. I think Googling it is - it works.

Ian Baring-Gould: So there it is right there. Very - as with most NREL publication documents, a very clear and understandable Web link to get to that.

Suzanne Tegen: Yes. You can memorize that pretty easily.

Ian Baring-Gould: So there are no other questions for the speakers. But there is one question for - just kind of more general. There are a couple of activities that are notably missing from this presentation—the two ones that are most clear are the Wind for Schools activity and then the second one is the North American Academy of Wind Energy—which are both two programs that the Department of

Energy is - has supported and will likely support going into the future, but are not included in this activity.

NAWEA is a number of universities—so a consortia of universities that have come together. It's actually an essential organization. And if you Google NAWEA you'll get their homepage and it'll tell you about them.

But it's a consortia of universities similar to the European Academy of Wind Energy—which has a fairly long track record. The Wind for Schools program is a little bit more complicated. Wind for Schools got swept up as part of - well, it wasn't legislation—but an effort by the administration to streamline and coordinate stem activities across the government space.

And so the - coming out of the administration, there was a directive that pulled the Wind for Schools activity out of DOE. And unfortunately with a, kind of, a combination of activities and confusion in regards to budgets and things of that nature.

It really has not been picked up by the National Science Foundation or the Smithsonian Institute, which were the two organizations that were supposed to coordinate STEM activities at the university and then at the K through 12 level.

And DOE is currently working through the Office of Budget and Management—or Management and Budget to kind of address this gap that we see within the Wind for Schools activity.

SO DOE is currently supporting Wind for Schools at a very, very minimal level to kind of keep the network together. But there are no real activities within the Wind for School spaces as we try to orchestrate or work within the

administration to figure out what's happening with that program. So stay tuned.

Ken Sarver had specific question in regards to the Wind for School activity. And that's with the Federal funding level as - for states that had Wind for Schools programs. And it varied from state to state.

But it is basically in the $60,000 range with most of that going—well, all of it going to two entities. One would be the university - the wind application center within the state. And then we also either funded independently or through the contract with the Wind Application Center or the state's facilitator.

So the Federal investment per state was in that $60,000 range to answer that question. That's all the questions that we have. And kind of a quick update of the programs that we have that are being supported through the Department of Energy.

So quickly moving on for upcoming Webinars—the next one that we have is in February - so February 19th is an introduction to the new DOE and industry wind vision. So if people haven't heard about this, the Department of Energy in collaboration with AWEA and the Wind Energy Foundation are basically doing an update to the 20% Wind By 2030 Report.

It's an activity that was kicked off at Wind Power last year and a whole host of organizations are working on it right now to kind of do an update. And that will be released - at least portions of it will be released at Wind Power this year in Las Vegas.

But we're going to - the February Webinar is going to be kind of an introduction to that - introduction to the process if you haven't seen in. And then having a couple of speakers talk about key elements of the wind vision in preparation for the release at Wind Power.

And then the March Webinar is going to be on property values. It was the one that was scheduled for October, but was canceled because of the government shutdown. To a degree, it's nice that we canceled it because LBNL in collaboration with a few others just released last week another report on property values, focusing in the Northeast.

And so this Webinar will cover both of those—the one that Ben Hoen released about 5 months ago and then this new study. And so that will be the subject of the March 19th webinar.

Reminder to everybody that the webinars are posted on the windpoweringamerica.gov website. Takes us about a week to get it up there. But if you know someone who would be interested in seeing this webinar or you'd like to any of the past webinars, go there and you'll be able to download it.

So without further ado, just a special thanks to all of our speakers—to Julie, Suzanne, and Michael for their discussions. Also special thanks to the Department of Energy who funds this Webinar series. And then you have our contact information there for Brie, myself, and Suzanne.

If you have any questions, comments, or have ideas for future webinars, please don't hesitate to give us an email of give us a call. All of our contact information is readily available if you search us on the Web.

So thanks again everybody. Thanks again to our speakers and look forward to seeing you, at least, at the next webinar next month and happy New Year to everybody. And we'll talk to you soon. Bye-bye.

Coordinator: This concludes today's conference. You may disconnect your lines at this time.

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