Wind Powering America Summit
May 9, 2013

Ian Baring-Gould: Good morning everybody and good morning to everybody on the phone. I think at this point you can hear us. So just a couple of things.

I'm Ian Baring-Gould, I think everybody knows me. So I want to thank Dr. Shahidehpour for hosting us here without question, and then the great support that his staff -- (Annette), (Danielle) and Sarah, as well as the IT folks -- have provided to us over the last five months as we've been working to put this together.

I want to also thank (Simon) from the Southern Alliance for Clean Energy for hosting last night's reception. I think everybody enjoyed hanging out and I think that was great. So please thank (Simon) -- where - he's right over there -- for that activity.

Certainly thanks to the Department of Energy, Patrick Gillman, right there, and Jonathan for the support of WPA, which makes all of this happen. Without the Department of Energy pulling us all together we wouldn't be here, we'd be off doing something else.

Certainly want to thank the Illinois Wind Working Group, represented over here in red, for their continued support and their continued due diligence and working within the state to make wind happen here and to help us here with this event.

Certainly thanks to (Sue), the jogger, the woman behind the curtain, (Tessa) wherever she disappeared to, behind the other curtain, as well as all of the folks in WPA who make this happen who aren't necessarily here, and that's

(Ruth) and (Corrie), (Marguerite Kelly), (Suzanne), Mark is here, right there, our newest member. So thanks all of them.

Thanks to the speakers, who have given up their time, especially after a very busy week, to be here. And thanks to all of you for again - busy week, not only being here, but for the whole last year of activities that you have undertaken, momentous efforts.

Last year we weren't quite sure what was going to happen this year. and I think the pulling together of this group and the ability to kind of put one's head down and continue to move forward is one thing that we're all very famous for doing. So that's fabulous.

As Dr. Shahidehpour mentioned, there is time at the end of the program to do a kind of a quick tour of the electricity center here. We probably - we're probably thinking about 4:30, for about 45 minutes.

How many people would be interested in doing that? It's a pretty impressive center. And you get to the 16th floor, so you get to see all of South Chicago, a pretty nice view I am told. So we have about a dozen people who will go on that tour, great, fabulous.

Last announcement. Luggage is being locked up in a room right around the corner out there. It will be available during breaks if you want to get in there, but it's just safer that way. And (Tessa) will be able to help get that for you, get your luggage if you need it. So that's the last announcement.

Quickly hitting the agenda today. The focus of this year's activities are strategies for dealing with change in an uncertain time. And so we have a number of speakers, kind of two main groupings of speakers.

The first one is really trying to hear from the organizations within the wind space to get a better understanding of what their needs are in deploying wind -- so that's just from an OEM standpoint.

Rich VanderVeen for a local kind of small-scale project developer.

Jim Walker here to talk about the large-scale developer.

And then Tom Wind talking about the success that Iowa has had and to give us all of us ideas about what these different organizations need to be able to operate in uncertain times so that we can all, from our state's perspective, kind of go back and think about how the needs of these different organizations, given the uncertain times that we have now, what we can do to help support that.

And then the session in the afternoon is really focused around business strategy, so with - as we kind of all talked about last night in the regional breakouts, the issues around the inability to get PPAs and the low natural gas prices are really hurting the big market. Uncertainty around the PTC certainly doesn't help. But these are kind of uncertain times in the large wind space.

And so what are some of these other business models that we can look at that could potentially help all of us think about ways that we can engage in the deployment of wind technology, the appropriate deployment of wind technology, as we go forward.

And so hopefully people will find the discussions interesting and we'll be able to walk away from this with a little bit more understanding of what happens -

or what's happening in the wind space, and new strategies that they could deploy when they're looking at wind deployment.

So without further ado, because we're running a little bit late, we will go around the room so that everybody here and everybody on the phone knows who's talking, and because it's important to recognize the family that we have here. So we'll do that quick. Please be brief because we don't have tons of time, and then we'll get on to the main speakers.

Jonathan Bartlett: Jonathan Bartlett, Department of Energy.

Chris Rose: Chris Rose, I'm the Director of Renewable Energy of Alaska Projects in Anchorage.

Randy Manion: Good morning, Randy Manion with Western Area Power Administration.

(Keith Langdon): (Keith Langdon) with the South Dakota Renewable Energy Association. I just want to thank you for all the cards and letters and emails while I was away.

(Rhondie Syteristak): (Rhondie Syteristak), I'm with the Kansas Department of Commerce and Manager of Energy Activities.

(Red Busey): (Red Busey), Illinois Institute for Rural Affairs at the Western Illinois University. We're also members of the Illinois Wind Working Group.

Jim Walker: Jim Walker, Vice Chairman of VDF Renewable Energy.

Andy Kruse: Andy Kruse, Vice President of Development for (Invarence) Wind Power.

John Dunlop: I'm John Dunlop, consultant with the American Wind Energy Association.

Man: (Unintelligible).

(Chris Douglas-Miller): (Chris Douglas-Miller), Kansas State University and the Kansas Wind Application Center.

Harry Holtz: Good morning, Harry Holtz, Chicago Southland Wind Council.

Patrick Gillman: Patrick Gillman, U.S. Department of Energy.

Samuel Gomberg: Sam Gomberg, Energy Analyst with the Union of Concerned Scientists.

Sarah Mullkof: Sarah Mullkof, National Wildlife Federation.

(Don Starberg): (Don Starberg), Great Lakes Renewable Energy Association and Michigan Wind Working Group.

Susan Williams Sloan: Susan Williams Sloan, Director of State Relations, American Wind Energy Association.

Tom Darin: Good morning, Tom Darin, also with the American Wind Energy Association. I'm on Susan's State Policy Team in (unintelligible).

Stephanie Nowers: Stephanie Nowers with the Alaska Wind Working Group.

Rich Stromberg: Rich Stromberg, Alaska Energy Authority, Wind Program Manager.

Jason Bush: Jason Bush with Idaho National Laboratory.

Stephanie Savage: Stephanie Savage with the National Renewable Energy Lab.

(Eric Williams): (Eric Williams), also from the National Renewable Energy Lab.

Brian O'Hara: Brian O'Hara with the Southeastern Coastal Wind Coalition.

(Jan Banks): (Banks), (Jan Banks), with the Southeastern Coastal Wind Coalition and the North Carolina (unintelligible).

Larry Flowers: Larry Flowers with AWEA and foundry member of (unintelligible) Energy.

(Chelsea Morales): (Chelsea Morales), Arizona Wind for Schools Program.

Candice Giffin: Candice Giffin, also Arizona Wind for Schools Program.

(Chris Hartman): (Chris Hartman), U.S. Department of Energy.

Tom Wind: Tom Wind, Community Wind Developer in Iowa.

Man: (Unintelligible).

Mark Jacobson: Mark Jacobson, NREL.

David Loomis: Dave Loomis, Professor of Economics, Illinois State University, and Director of the Center for Renewable Energy (unintelligible) the Illinois Wind Working Group.

(Pat Alderman): (Pat Alderman) from Illinois State University.

(Janet Mascoutah): (Janet Mascoutah) from Illinois State University, Illinois Wind Working Group.

Susan Stewart: Susan Stewart with Penn State and (unintelligible).

Alice Orrell: Alice Orrell, Pacific Northwest National Laboratory.

Dan McGuire: Dan McGuire, American Corn Growers Foundation (unintelligible) from the Wind - co-Chair Nebraska Wind Working Group in Nebraska (unintelligible).

Rich VanderVeen: Good morning, I'm Rich VanderVeen. I'm President of Mackinaw Power and I've been a user from Michigan for a long time with Mr. (Flowers). And thank you very much.

Lisa Daniels: Lisa Daniels, Executive Director of Windustry and also on the board for Women of Wind Energy.

Charles Newcomb: Charles Newcomb (unintelligible).

David Niles: David Niles with the Minnesota Municipal Power Agency.

(Berilla Lamb): (Berilla Lamb) with Northern Arizona University and the Arizona Wind for Schools Program.

Michael Arquin: Michael Arquin, Director of the Kid Wind Project.

(Terrance Sankar): (Terrance Sankar) with NREL.

Michael Milligan: Michael Milligan, Transmission and Grid Integration at NREL.

Dwight Bailey: Dwight Bailey NREL Source (unintelligible) consultant to state, and also Georgia Wind Working.

Kylah McNabb: Kylah McNabb with the Oklahoma State Energy Office, also the Oklahoma Department of Commerce.

Susan Innis: Morning, Susan Innis, Manager of State Public Affairs for Vestas an aspiring (geezer).

(Heather Rodcleaver): (Heather Rodcleaver) with eFormative Options. And I also work with the Small Wind Certification Council.

Bill Willis: Bill Willis with the West Virginia Division of Energy.

(Simon Mahan): (Simon Mahan) with the Southern Alliance for Clean Energy.

Brian Wallace: Brian Wallace, graduate student from Penn State University.

Katie Marquette: Katie Marquette, I'm the Communications Director for the Renewable Energy Alaska Project in Anchorage, Alaska.

Ryan Wiser: Hi, Ryan Wiser, Lawrence Berkeley National Lab.

Andrew Gohn: Andrew Gohn, Maryland Energy Administration, Senior Clean Energy Program Manager.

(Taylor Morris): (Taylor Morris) with the Virginia Center for Wind Energy at James Madison University.

(Marley Tangle): I'm (Marley Tangle) at the Center for Wind Energy, also at JMU, I'm the Activities Director and the Curriculum Coordinator.

(James Amit): (James Amit), Data Manager at the Virginia Center for Wind Energy.

(Del Mo): (Del Mo), Professor of Integrated Science and Technology at James Madison University and (unintelligible) Wind Center.

(Jana Zurman): (Jana Zurman), Outreach Coordinator Virginia Center for Wind Energy.

Kevin Borgia: Kevin Borgia, Public Policy Manager for Wind on the Wires in Illinois. And allow me to welcome you all to Chicago.

(Hedrom Sotuta): (Hedrom Sotuta), (unintelligible) candidate, Kansas State University.

Ian Baring-Gould: Great, thank you all. As we have done in the past, we have tried to do these meetings as a webinar as well because we know a lot of our state colleagues aren't able to travel due to budget issues. So we have about 30 people on the phone and as we did last year, we'd like to have them introduce themselves. And my understanding is that the operator will go through each person, introduce you, your line will be turned on, and if you could introduce yourself, and then we'll move to the next person. So people on the phone.

Coordinator: Okay, I apologize for the disruption. We do have lines open. I do not have names. So if you would take turns in order and announce yourself please.

(Parish Tuidame): (Parish Tuidame), New Jersey Board of Public Utility.

((Crosstalk))

(Tom Bradlinger): (Tom Bradlinger), (Unintelligible) Council and Pennsylvania Wind Working Group.

Debra Jacobson: Debra Jacobson, GW Law School.

John Gardner: John Gardner from (unintelligible) University.

Woman: (Unintelligible).

Jesse Harlow: Jesse Harlow, Michigan Public Service Commission.

Man: I'll let you go finish up your (unintelligible). No, not at the moment. No, I'm good for the moment.

Woman: (Unintelligible).

Bob Leker: Bob Leker, State Energy Office, North Carolina.

Julie Jones: We have Julie Jones and Ruth Baranowski (Unintelligible)...

Frank Oteri: Frank Oteri.

Woman: ...Frank Oteri from NREL.

Carl Joseph: Carl Joseph, the Virgin Islands Energy Office, Energy Analyst.

Suzanne MacDonald: Suzanne MacDonald, Island Institute in Rockland, Maine.

(Deanna Smith): (Deanna Smith), Southern Alliance for Clean Energy.

Phil Dougherty: P.J. Dougherty, Strategic Marketing Innovation.

Suzanne Tegen: (Suzanne Tegen), Wind Powering America and NREL.

Joe Dassin: Joe Dassin, GE Power and Water.

Ian Baring-Gould: ...everybody? Is that everybody who's on the phone?

Coordinator: I believe that's all Ian.

Ian Baring-Gould: Great, thank you all. And thank you for phoning in. I know the experience is a little bit different when you're sitting in front of your computer. But we all appreciate you being there. And as you read off your names, everybody was smiling and joking about who was on the phone. So we certainly do appreciate your participation.

So without further ado, Jonathan, do you want to come and start our first panel? It's actually not a first panel, Jonathan is going to do a quick overview and update on the DOE Education and Outreach Program, my mistake.

Jonathan Bartlett: No problem. Good morning again. And I will continue to assume that everyone on the line can hear me. If - well if you can't, we'll know soon enough.

Let's see what to click. All right, I can click. So today what I want to do is I will be giving an overview of sort of where we came from, where we are presently and where we're headed to. So in light of that, what have we accomplished?

In the now 13 years since inception, and P.J, glad you're on the line, you can speak to this during the Q&A session if you feel like it, the 11 years through 2010, wind capacity has grown to 40 gigawatts in the U.S. And a lot of these

stats you are already aware of, but so to set a context it's good to have this information.

Twenty-seven states have hit our initial targets of 100 megawatts of installed wind capacity, 14 states have hit at a 1000 - the 1000 megawatt threshold, and at the federal level in total we've spent around $27 million towards the WPA program and its related activities. It's a considerable investment and we'll see the dividends that have - it has paid through the years through our - the collective effort that all of you in the room, on the phone, and the related parties have made.

Very recently Navigant Consulting completed an evaluation of the Wind Powering America State Wind Working Groups. The evaluation initially was to focus specifically on the State Wind Working Groups and how they've influenced the deployment of wind energy in the United States.

The analysis that they were going to do initially was going to be a quantitative analysis, and as they got further into it they realized you know, there is a vast amount of information that's available. And thanks to many of you who contributed to taking the interviews from the consultants when they phone you, they began to uncover just how much information was available via just having conversations, versus looking at the straight data.

Of course there's always a need for data, and that's something that will influence our activities in the future. But what they found was that the program plays - (unintelligible) see these quote, "A vital role as a source of credible and unbiased technical information."

We've been saying this for years, that DOE, NREL, the technical reports, the people who go out and meet with decision makers, they need credible

information versus just call it, straight advocacy sides who are either (Nimbys) or bananas or developers who say, "Let's just build everywhere." So we need that balanced source of information.

And thankfully the money that we've invested has created that through the JEDI models, through resource maps, through educational webinars, workshops. And WPA has shown that market effects and capacity impacts extend beyond those states.

That's one of the things that they found as they were talking to people, they realized that you know, if one state had an active wind working group and another one didn't, the states can look at each other and say, "Okay, well what's happening in this state? What can we do?" You know, "How can we adopt these best practices?"

So the program's most important channel for capacity additions has been activities that, you know, influence state and local policies.

Thirty-six wind working groups were activated. You can see that the dots indicate what we - at the time we indicated - categorized as priority states, where there was a concerted effort to break barriers and move things forward.

According to the results of the Navigant study through around 82 interviews, 3.4 gigawatts of wind was added due to Wind Powering America activities. So it's nearly a 15% capacity additions in those states. And we're - you know, regional (unintelligible) workshops, as I said, "Bringing people together," over 8000 subscribers to the WPA Weekly Newsletter that is produced, the webinar and podcast series.

Important side note here, we have I believe it's on the 15th, an Offshore Wind 101 webinar that we're hoping to reach people that aren't really familiar with wind technology. So all of you in this room obviously are, but if you know people who aren't, we encourage you to spread the word about that.

The wind resource maps that I've - that I referred to, multiple iterations of the maps have been generated at different hub heights, national, state level.

Wind for Schools. Through two rounds of funding we've created 11 Wind Application Centers. Those Wind Application Centers have been highly influential in impacting the development of ordinance in - ordinances in communities that either had no wind development before, have helped to establish best practices for deployment over 125 turbines have been installed through the Wind for Schools program at K through 12 schools.

It's provided a tremendous practical experience for college and graduate students, and obviously has had a curriculum impact within the K through 12 schools which has been seen many times over. The last estimate that we had is roughly 55,000 people have been influenced by this. As many of you well know, I am a big proponent of Wind for Schools, always have been. I have a family of educators, think that this has been a great, great program.

This quote is an indicator, and I don't know if you can read it from the back so I'll quickly just go through it. It's a quote from WAC Director (Jerry Hugins) at the University of Nebraska Lincoln.

"Here at the university we have engaged students through a variety of means. We have helped develop university-wide education science minor. This minor discusses energy policy, energy use, different energy technologies. And this is

open for any student throughout the whole university that would like to take this minor."

"Other programs that we have been participating in is a meteorological tower equipment loan program. So it used to be the towers, we'd stick weather sensors on a site to collect weather data for a year or two and we've used student volunteers to help install these to analyze the data, help take them down, and just take care of this equipment."

Practical work experience, which is what you need. Even if you don't end up directly working on that part of the industry, having that understanding if you go into another part of the industry is extremely beneficial. As we indicated, over 125 turbine installed - turbine installations through Wind for Schools.

JEDI Model. As you well know, the JEDI model has been sort of the crux of economic analysis. It's that central core of providing unbiased information that is credible. To give you some statistics, we don't know exactly how many reports have been generated. We have approximately 25 of them online right now.

We do know how many people have downloaded the model potentially for usage and just to give you some stats, in 2009 1436 times the JEDI model was downloaded, this is land - the land-based model, in 2010 1435, interesting just one difference, 1436-1435, in '11, 1068, in 2012 909, and year-to-date so far in 2013 it's been downloaded 481 times. The JEDI offshore model year-to-date in 2013 has been downloaded 34 times.

Why this matters, we want to preserve or expand access to quality wind resources. We all know the factors that have created barriers. You have

environmental concerns, species concerns, noise, population density. So a lot of the great wind resources are close to these barriers that we need to mitigate.

So how will we mitigate those barriers? We gather people together. We provide them with the information that they need to be able to make honest decisions. If there's a spot that we don't - that wouldn't be good to deploy wind, fine. But as long as we have that open conversation, that's what moves things forward. That's what allows for 3.4 extra gigawatts to be deployed over the years of Wind Powering America.

So where do we go next? Wind for Schools.

You - many of you either saw or heard about the email that I sent out. What this means, the President's budget administration has decided to collect all the stim-related activities. As a consequence, that means Wind for Schools will no longer be part of the Department of Energy's active funding. It will end in Fiscal Year 2013.

For those of you who attended the Wind for Schools Summit in January, you'll recall one of the activities for Fiscal Year '13 that we were planning to do was an additional third round of funding for the next phase of Wind for Schools.

This is a change of our plans. It will mean that we won't be able to do - we won't be doing a third round of Wind for Schools funding for Wind Application Centers. But some of the activities that we already had planned for FY '13 will still take place, and this does also provide us with an opportunity to do some - to shore things up.

So we - the data transparency issue, as you're aware we were actively investing in creating a solution to access to the data that the turbines that had been installed through Wind for Schools. So it's providing a new database that you can access not only at the Wind Application Centers, but within the K through 12 schools as well, so the teachers can actually get to the data that their turbines are generating. We will complete that during this fiscal year. We're well underway.

Sustainability, the 3-year contracts for each Wind Application Center, the purpose was, one, we provide the funding to stand up the Wind Application Center, get things active, develop the curriculum for the K through 12 schools in the region that they'll be interacting with. And have the Wind Application Center at the end of the three years be sustainable.

As which happens with many organizations, some entities are better than others at leveraging funds, securing and sustaining funds. So we're going to put some funds that would have gone towards the third round of Wind for Schools Wind Application Centers towards shoring things up, making sure that all of the WACs are in the best possible position for the transition at the end of the fiscal year.

Turbine support, you know that with Southwest Wind Power closing its domestic U.S. operations, that we need to find a solution for the 125+ turbines that are already out in the field plus any additional installations that happen in the future.

So we need to select a new turbine - a new standard turbine for installation, we also need to ensure that the ones that are out there don't just go dark because that would be extremely detrimental, not only to the legacy of Wind for Schools, but just the industry in general. No one wants a dead turbine just

sitting on a school campus. And we are actively working to do our absolute best to transition Wind for Schools to another entity, which in all likelihood will be the NSF.

But we can't make any promises. And I don't want to sugarcoat this for you. We don't know exactly what that transition will mean. So we're going to do everything we can to make sure that the existing Wind for Schools Wind Application Centers are on the best footing as possible before the end of the fiscal year.

And we're going to have conversations and interact with parties that potentially will be taking it over. But at this point there are no guarantees. There is the possibility that things can change and that when the final budget is signed something would allow us to continue. But I don't want to pretend that that's actually a guarantee in any manner.

But we also do recognize the tremendous impact that this program has had. And I personally do wish it would continue. And I hope that it does transition.

So what you see in front of you is also in relation to WPA. We've had multiple conversations about how through the years the wind powering America activities have changed, which one would expect. Nothing can stay the same forever because the barriers that we faced in the year 2000 are not the same as the year 2013 or 2014 or 2015.

So in light of that, we will be transitioning to a new branding by the end of the fiscal year. Concepts will be completed in May of 2013, we'll select the new branding in 2013 - in June, and roll out a new Web site before the end of the fiscal year.

We've also spoken a lot about regional resource centers and our pivot from state wind working groups to regional based activities or regional view. So what we'll be doing is taking the national-level initiatives, making modifications to adjust for each region being able to attack barriers that are specific to regions and roll that down to a local level. That's sort of our - that's our philosophy.

The RFP for that, that we've talked about before, will be coming out by the end of - roughly by the end of this month. Selections will happen in August and the kickoff meeting in September. But by the end of the fiscal year, regional resource centers will be active.

The Collegiate Wind competition, which keeps us active in the university space, we've selected 10 teams to compete in the inaugural competition that will occur in May of 2014. Our initial kickoff call with the teams will occur next week on the 13th of May.

The kickoff meeting in person will happen before the end of the fiscal year, likely in August or September, and then as stated, competition in May of 2014, in all likelihood at AWEA's Wind Power in Las Vegas. (Unintelligible) additional details about the transition of WPA.

So we should acknowledge the fact that part of this transition is in relation to activities transitioning through the years. As stated, "Nothing stays exactly the same." But we're also aware of the fact that there are political pressures that sometimes influence decisions.

And some of you may have seen, especially over the last I'd say, 12 to 18 months, there have been occasions where congress has even debated Wind Powering America on the floor and started bills to eliminate the funding. So in

light of these pressures and in acknowledging the fact that we've transitioned some of our activities, it makes sense to rebrand and acknowledge that we're not the same organization that we were 10, 12 years ago.

So we've accomplished a tremendous amount, and will continue to do that. but because the barriers have changed, because the activities have altered and we're not doing exactly what we were a dozen years ago, there's the possibility that collectively as a group we may not be - have the same makeup next year.

So it's important to recognize the 3.4 gigawatts that WPA has influenced has made a large difference within the industry, but we're also aware of the fact that next year we may have a different makeup. The regional resource centers may comprise a different group of people in different organizations.

So in light of resources being finite and the barriers impacting (unintelligible), the RFCs are going to prioritize the, what we believe to be the current barriers that we can - the niche that we can actively influence. So we're finding this to be the best way to maximize the local impact, work with regulators and decision makers.

And I'm going to assume that the same topic came up during the regional breakout meetings yesterday. I was in the East room and it was a constant refrain of, "We need to reeducate." There is attrition throughout legislation and legislators and decision makers and influencing parties. And so as much as we've "finished," there's still work to be done.

So working off of the wind working group model, we'll provide technical expertise, information resources, tools to address stakeholder questions. We'll form working groups to address the specific topics. This is part of the benefit to having a regional based approach. And we anticipate all of this happening

before the end of the fiscal year. We've spoken a lot about this over the past year and a half, where we are now prepared to implement.

An example of what could be the regions, we're not necessarily going to prescribe these regions, but since we have - we envision different - we have different barriers, both for the different regions for an individual state, plus the national level initiatives, this could be how things line up.

Spoke about the Collegiate Wind Competition. We're looking forward to it. We're happy that multiple schools from the Wind for Schools program are participating. Assuming - I'm a glass half full type of person, so I'm going to assume that the competition goes well next year and we'll have a second round.

When that happens, we encourage more Wind for Schools Wind Application Centers to apply. We'd like to make the competition as robust as possible. So the way I look at things is, transitioning to sunset these activities isn't really a sunset per se. I envision this more as a sunrise in a different location.

So no matter what you call it, Wind Powering America, education and outreach, stakeholder engagement, communications, marketing, the dreaded fearful word within building of the (Puzzle) Council Forrestal advocacy. I didn't say that. The work will continue.

Your voices have influenced what we have done over the existence of WPA. It has also influenced our development of the regional resource centers, which we will launch later this year. So in no way, shape or form do - would I want anyone to leave here thinking that, "Well, the DOE has decided that this activity is no longer valuable."

That's not the case. We recognize the value of it, we also acknowledge that changes need to be made, new directions - a new course. And some of that was organic anyway. We read the tea leaves. We've seen how things have transitioned. And so we want to make sure that we can continue to attack the barriers and ensure for continuing wind energy deployment in the future.

I'm extremely proud to be in this space, working in education and outreach, working with all of you, working with Ian, Randy Manion, (Sue), Julie Jones, (Alista George), Charles Newcomb, Mark Jacobson welcome, P.J on the line -- there are too many people to mention.

But I look forward to the next phase. And at this point I'm open to any questions you have. And hopefully I'm not too far off on time so we actually have space for questions.

Ian Baring-Gould: We have about 10 minutes for questions. Any questions? We'll start here on the floor and then we'll - can people raise their hand on the webinar?

Coordinator: Yes they can. If you do want to raise your hand press star 1.

Ian Baring-Gould: So people on the webinar, hit star 1 and then we'll pull you in.

So there was a question over here I know.

Man: Yes.

Woman: You mentioned you'd be blessing a new (unintelligible) turbine for the Wind for Schools program and I'm wondering what your (unintelligible) will be for collecting that and if you might be consulting with (unintelligible) or ICAP when you do that.

Jonathan Bartlett: Multiple Wind Application Centers were - have already been active in trying to seek out replacement turbines or replacement companies. We've now consolidated that effort with Mark Jacobson, who has taken all of the information and is combining it with his active source. So I don't know if Mark, you want to speak to that or Ian does.

Mark Jacobson: Just quickly, I am calling all the small turbine manufacturers and I have a list of criteria that I'm working through. And the hope is that we'll have not just one but maybe a few. I know that list will be very small, but I'm - I guess I would think that we would get into that three range, where there'd be options for you and - based on your needs and your choice.

Jonathan Bartlett: And the criteria are the ones that you would expect, gone through the small wind certification (unintelligible) as a data acquisition possibility isn't too large, so that you could actually install it at a (unintelligible). It's the criteria that we use to select the - and select is the wrong word. We had this criteria, the only turbine at that point that fit the criteria was the (unintelligible), so that's why most people (unintelligible).

There were a few other (unintelligible). We're not selecting a turbine, we're selecting a classification and any turbine that fits that, we're happy to have them (unintelligible).

Steve Wegman: Jonathan, this is Steve Wegman from South Dakota. Question I have is on renewable - or excuse me, the regional concept. Are they going to look at just wind or are they going to include geothermal, solar, biomass?

Jonathan Bartlett: First of all Steve, welcome back. Secondly, our focus will be on wind. We acknowledge that multiple renewables could come into a portfolio within a

space, so we'll provide whatever resources we can towards that. But our initial standup of the activity is to provide technical support information on wind energy and deploying the technology.

I mean a good example of that is multiple iterations of the JEDI model that don't just focus on wind but also thermal, solar and so on.

Jonathan Miles: Jonathan, Jon Miles from JMU here, actually two questions. One regarding the transition of Wind for Schools over to NSF or whatever other entities, will the WAC leads have an opportunity to be invited to work with you all in terms of developing your strategy to approach NSF and maybe consider or offer you some of our experience within NSF? I know a lot of us have those experiences in helping inform that process.

Jonathan Bartlett: Well we definitely will be addressing this as the primary subject on our next Wind for Schools conference call. So I would like everyone to think about that. You know, put your collective thinking caps on before we have the call, because any information that we can gather, if there's the opportunity to take that collective input and present to NSF we'll do it.

I - at this point I don't - we don't really know what the process will be, but to be prepared in advance is definitely something we would like to be if - in case there is an opportunity to do that.

Jonathan Miles: Okay. And the second question I had pertains to the competition. I guess I might view that as (unintelligible) activity. Is that likely to stay within DOE or could that transition as well?

Jonathan Bartlett: At the present time we're not referring to it as stim-related activity.

Jonathan Miles: I didn't say that, sorry.

Man: It's important to note that the Solar Decathlon was one of the programs with NERE that was not, so I would say we probably fall into that same category.

Jonathan Miles: So I was able to download the GAO report on all this last night, and I might recommend that as good reading for everybody who's going to be involved in the Wind for Schools conversation (unintelligible).

Jonathan Bartlett: Thanks John.

Ian Baring-Gould: I don't think you introduced yourself before, so why don't you take a second.

Victoria Pebbles: Victoria Pebbles, I run the Great Lakes Wind Collaborative, which is a consortium of wind interests in the 8 states and 2 provinces that touch the great lakes.

I have two questions, first is, "How do you anticipate that the regional resource centers will accommodate, or do you have any expectation whether they will work with the existing state wind working groups?"

Jonathan Bartlett: My initial answer is, "Yes." For happily, many of the state wind working groups that were stood up through WPA are still in existence. So in light of that it seems very logical for a regional resource center to reach out to them, particularly within their region, and use them as additional boots on the ground, if you will.

Victoria Pebbles: And my second question is, "How do you anticipate dealing with the word advocacy or the advocacy component of several regional entities that are already playing in the states on a regional scale are directly involved in

advocacy and will you have guidance in the RFP or are there other ways that you anticipate addressing that issue in the - with RRC?

Jonathan Bartlett: Our intention with the RC is - for example, let's say there's an entity that's within a region that is doing clear advocacy work. That does not preclude that entities, at least on our initial glance, from activities that we would fund.

We'll have to create some sort of a separation, but we don't want to eliminate the possibility of working with entities that are already active in the state and already know - who has an already established network. So we're going to work to try to make that possible.

Victoria Pebbles: So you think there'll be specific guidance in the RFP about that?

Jonathan Bartlett: It is our intention. If not it'll be added during the contract.

Victoria Pebbles: Thank you.

Ian Baring-Gould: (Barry), do you still have a question?

(Barry): Jonathan would you just put that regional map up there and talk to us a little bit about that as sort of a guide and how - are you accepting sort of thoughts on modifications to that or is that just something that is really conceptual?

Jonathan Bartlett: This was - it's conceptual in nature. We had debated internally whether or not we would prescribe the regions, but the benefit of not having an RFP on the Street now is we can speak to this. once it's out, things may be altered.

But at this point we're not going to - we will not be prescribing the regions, we'll let that organically develop based upon the proposal that we receive.

And that allows us the flexibility to make modifications if there's some sort of reason that we have on a national level that makes sense to alter a region. But we would like the applicants to propose regions at this point.

Ian Baring-Gould: Did we have one question on the phone?

Coordinator: That question comes from Joe Dassin. Your line is open.

Joe Dassin: Hi. Yes, a question about the 10 universities that were selected for the collegiate competition. (Unintelligible).

Jonathan Bartlett: Go ahead with your question.

Joe Dassin: Yes, is the line unmuted? The question is, "Who are the 10 universities selected for the competition?"

Jonathan Bartlett: Okay.

Ian Baring-Gould: You're asking the tough questions.

Jonathan Bartlett: I think I actually have the full list. I can rattle off most of them, California Maritime Academy, James Madison University, Northern Arizona University, Penn State.

Man: University of Fairbanks.

((Crosstalk))

Jonathan Bartlett: University of Fairbanks Alaska.

Man: KSU.

Jonathan Bartlett: Kansas State.

Man: Kansas University.

Jonathan Bartlett: University of Kansas. And let me see if I actually - thank you for the stumper question on the line.

Ian Baring-Gould: It is on the WPA Web site, as well as on DOE's Web site, the three that were missing. University of Massachusetts Lowell.

Jonathan Bartlett: Now we're down to 2.

Ian Baring-Gould: We'll go to another question and we'll come back...

Jonathan Bartlett: We'll come back...

((Crosstalk))

Ian Baring-Gould: (Kenji).

(Kenji): Just a quick question, is this like a - does this transition to (unintelligible) foundation, is this something that's happening DOE-wide? So there's a solar version of this, (unintelligible) type thing, are they also being moved over to (unintelligible)?

Jonathan Bartlett: This is throughout the federal government. So all stim-related activities are being collected. The K through 12 activities are going either to the

Department of Education or the Smithsonian. University level activities are moving to NSF.

So there are some that aren't - that have not moved. I can't speak to the specific. I mean obviously one of the exceptions is the Solar Decathlon, the Collegiate Wind Competition. But yes, that's the general divide.

Ian Baring-Gould: Did the person on the phone have a second question? Not sure if your line is still open.

((Crosstalk))

Ian Baring-Gould: Go ahead.

Coordinator: His line's not open. Let me reopen your line Joe. Your line is now reopened.

Joe Dassin: No questions, thank you.

Ian Baring-Gould: Okay, great.

Jonathan Bartlett: Thank you. And thank you for pointing out that I need to add a slide with these schools listed on the collegiate wind competition.

Susan Innis: Hi Jonathan, Susan Innis from Vestas. I'm also co-Chair of the AWEA State Policy Team and the industry is working on its outreach and education activities. We'd love an opportunity to sit down with the folks at DOE and NREL and compare some notes about how changes are impacting the activities that are going to be going on this year and going forward.

Thank you for being so straight-forward with your presentation. I'm sure that wasn't an easy presentation to make with all these changes coming forward. but the industry is definitely interested in having an ongoing discussion with you guys and learning more about how you see things (unintelligible). So I don't want to ask too many questions now but, let's see if we can (unintelligible).

Jonathan Bartlett: Great, we would definitely be interested in doing that. and for the record, you are correct, this wasn't exactly the most pleasant presentation for me, but I know you're with me in the fact that we have accomplished a great deal, we'll continue to do that it is just going to be in a different manner.

Ian Baring-Gould: Okay, and thanks to (Eric) for providing this, the last two that we had forgotten is Boise State and Colorado School of Mines.

Jonathan Bartlett: Right.

Kevin Borgia: Kevin Borgia, Wind in the Wires. I'm wondering if you can just go back to the slide on the regional resource centers. Not as much a question as a request.

Jonathan Bartlett: You mean this?

Kevin Borgia: That's it. Yes, thank you.

Jonathan Bartlett: You're welcome. Wow that was easy.

Kevin Borgia: Yes that's it. Thank you.

Ian Baring-Gould: And you just have to be able to read it from the back but (unintelligible). Chris?

Chris Rose: Two unrelated questions, one, "On the regional resource centers do you have an idea of how long a term these initial contracts are going to be?"

Jonathan Bartlett: Three years.

Chris Rose: Three years, okay. And then on the Wind for Schools transition, my understanding is that's in the President's budget (unintelligible). And given that there have been several continuing resolutions in the past, there hasn't been a budget passed, is there a possibility that if the budget's not passed by December 30 that we can go back into another stage?

Jonathan Bartlett: I have multiple answers to that.

Chris Rose: And none of them good.

Jonathan Bartlett: Well, there's no preclusion for funding in FY '13. We have Wind for Schools within our annual operating plan for FY '13 to do many of the things that I have listed we already had planned. We're transitioning from doing the Round 3 of funding to basically the reality is there's actually a benefit to the existing Wind Application Centers, if you will.

And this is sort of a weird way of looking at it, but because we're precluded from spending money in FY '14 and going forward on Wind for Schools, we can take the funds that we were going to put towards the third round towards the existing Wind Application Centers. So it's good for the existing Wind Application Centers, if you look at it that way.

But in regards to, if there's a (unintelligible) path, my gut would say, "No," unless the actual budget language removes the line item that says, "No more

funding from the Department of Energy for Wind for Schools," because to do that would be almost circumventing what we've been told. And it has political ramifications. So if the language is removed, sure we would love to have that option, if it's not, I don't believe so at this point.

Ian Baring-Gould: It's also good to remember that this is an ERE and government-wide activity. So it could very well be that higher management at ERE will make an executive decision about how they want to handle all 5 of the programs that were moving.

And they'll - and it's - to a degree, it's much better that it is 5 programs within ERE. That's compared to just Wind for Schools, because that can get lost in the shuffle. So we'll - I think what it means is uncertainty.

So we have time for two quick questions. And then if you have a question on the phone, please ask quick, and then we'll move on.

(Tom Barren): So this is (Tom Barren) with the American Wind Energy Association. Is there - for groups that might apply to these RCs, is there any issue with the way they might be structured - I mean with the IRS tax structure of C3s before (unintelligible). Is that going to be addressed? Because they cover different types of activities.

Jonathan Bartlett: That question, I can say, "I don't have a direct answer for you." I'll have - I will have to look into that and I can get back to you.

Kylah McNabb: Kylah McNabb with the State - Oklahoman State Energy Office. It looks like there's - in looking at your timeframe, looks like the turnaround to submit for the RFP is going to be extremely short. So do you have any anticipated - 21 days, 30 days? Because some of us that work out of our state energy offices

also have our STP applications due June 3. So trying to consider timeframe and planning.

Jonathan Bartlett: It wouldn't be 21 days. It's 30 to 45. So take this with a slight grain of salt. As soon as we can get it on the Street we'll have a 30 to 45 day window.

We want to make sure that there's enough time for people - for groups or people who are interested in applying to apply. But it is our intention to have it out early enough, and make the selections fast enough, that we can (unintelligible) at least initiate the contracts (unintelligible) the organization before the end of the fiscal year.

Ian Baring-Gould: Any questions on the phone?

Coordinator: We show no more questions.

Ian Baring-Gould: Great, thank you so much. Okay, thank you Jonathan. Certainly Jonathan will be around, so if you have other questions for him just corner him.

Jonathan Bartlett: And as well as Patrick Gillman is in the audience too, so you can corner both of us. And (Alyssa)'s here too, you answer questions. Corner was quick.

Ian Baring-Gould: Okay, great. Thank you Jonathan.

Jonathan Bartlett: Thank all of you.

Ian Baring-Gould: And since he's already at the podium, now we'll lead off into - or do we have a break?

Jonathan Bartlett: Think we break after this.

Ian Baring-Gould: That we break after, okay. So Jonathan will lead us into the first panel session.

Jonathan Bartlett: All right. I'm Jonathan Bartlett from the Department of Energy. Today our first session, discussion session is How to Ride a Roller Coaster, Success Stories Despite Uncertain Times.

And our panelists that will be discussing this are Tom Wind from the Wind Utility Consulting Group, Rich VanderVeen from Mackinaw Power, Jim Walker from enXco, and Susan Innis from Vestas Wind Systems. So come on down. Whatever seat you prefer. Yes, Tom will be speaking to us first.

Without further ado, Tom Wind.

((Crosstalk))

Tom Wind: Hi, I'm Tom Wind, an engineer, electric power engineer, and I work on developing community wind power projects, and I'm from Iowa.

The focus of this session is How to Ride the Roller Coaster, in other words, we've had a lot of uncertain times, how do we keep the wind industry moving forward? And I'll speak from a perspective of a state.

How many of you have not been in Iowa -- not been in Iowa before? Well I'll save you some time, here is the diagram that pretty much shows Iowa. And the colors are a little different than you'd normally see in Iowa. This is the land cover map, we use this for wind power. And the tan areas are farmland, and the light aqua areas are grassland and pasture.

And generally if you fly over in the spring, summer or early-fall, it's just this gorgeous green -- vibrant green. And in fall's harvest time it turns this beautiful tan. There's many shades of tan and brown and then it's brown the rest of the part of the year. But that's our major resource there.

Also on this map, I included our other energy resources. If you'll look closely on there, the black dots are the oil wells that we have in the state. The black shaded-in areas are our viable coal resources. And then the blue dots are our gas wells.

And then the area that has the cross-hatching, with the gray cross-hatching, is our new shale gas. It's kind of like the Marcella shale gas areas, except it's got a different name in Iowa, it's called the fictitious shale gas oil bearing layer.

And the last one I want to point out is our hydroelectric resources. Those are the blue reservoirs, and the big blue circles around it are the big hydro facilities.

So when the first energy crisis hit, and many of you have never lived through an energy crisis, first one I think was 1974. (Kim) remembers this well.

((Crosstalk))

Tom Wind: ...seventy-three, thank you. And then we had kind of a second one and there's a couple others beyond that, like I think...

Man: Seventy-nine.

Tom Wind: ...'79 right, and then there are some in '80, in '81-82, right in that area too. So how did the State of Iowa respond to an energy crisis? Well our politicians

responded. And as good politicians always respond, they passed legislation to fix the problem.

So in 1983 our legislature responded by requiring 2% of our energy in the - electrical energy in the State of Iowa to come from renewable energy. It was about 250 megawatts. Now Jim, I'm going to ask you a question, "In 1983, what's (unintelligible) typical wind turbine?"

Jim Walker: Say 65 kilowatts.

Tom Wind: 65 kilowatt. And to make 250 megawatts would have taken quite a few of those, right? And the average price of power probably, back in that period of time to make a project go, would have been what? Twelve cents?

Jim Walker: (Unintelligible).

Tom Wind: Fourteen cents, and then that doesn't include the California tax credit that you got for that, right?

Jim Walker: Right.

Tom Wind: So the unsubsidized cost would have been 25-30 cents a kilowatt hour.

Well I was working for an electric utility at the time and - as a resource planner, and we had just got done building a 600 megawatt coal plant. It was a beautiful thing, gorgeous building, well designed, I mean artistic. And we were so proud of that. We were sitting back thinking about the next one.

And here the legislature told us to go put in wind power. Well we must - we thought that a bunch of legislature - legislators must have got in their car and

gone to California and gone out there to see all - you know, what those West Coast liberals were doing with those little tiny things on all those hills. And we just - well let's put it this way, what happened next was, there was a lot of, let's call it discussion.

And I remember working at this utility, we'd go down for coffee break in the coffee room and we'd start complaining about what the legislature did, "Those idiots, what were they doing? What were they thinking?" Here we just put a coal-fired power plant on for 2-1/2 cents a kilowatt hour levelized cost, and we thought, "How in the world can this make any sense?"

So there was a long period of discussion. And the first utility installed, utility-scale wind turbine was installed in 1992. There it is, 1992. Remember, the law was passed in '83 -- 1992. So finally somebody did something. But guess who it was that did that? It wasn't a utility, it was the school district. What does a school district know about generating power?

Well a super tended up there at Spirit Lake School System just thought he's been to California too. And he thought, "Well those are kind of cool, why can't we do that in Iowa?" And so two wind turbines installed in 1992, and you can see that 500 kilowatts, we're on the map now.

And you see those over the next seven years there. The amount of power that was installed was 5 megawatts, far short of 250 megawatts. And all of that was community wind. It was school districts, it was farmers and land owners, entrepreneurs that figured out a way to do it. And there was a receptive utility, Alliance Energy, that bought that power for them, or they used the power themselves.

So how did Iowa get to 2%? Well the Iowa Utility Board started a long process after 1983. I won't go through the boring details. And there were numerous legislative challenges to the idiotic law to start with. And then there were legal challenges.

The Utility Board at one point said, "Okay utilities, you have to pay 6.271 cents per kilowatt hour to anybody who wants to sell you wind power." And then the utilities challenged that, said, "You cannot make us, you cannot specify the cost that we must pay for it (unintelligible)," and they won that.

So the legislature started passing incentives in that period of time, said, "Well maybe we're going to have to do a little bit more than just tell them that they've got to do it." So there was a reduction in property taxes, elimination of sales tax, exemption from power plants fighting regulations.

And then 3 wind farms were finally installed in 1999 using 750 kilowatt wind turbines. And they were installed by private developers because utilities were not allowed to install them. So in 1999 we met the 2% goal. What is that, 16 years after the law was passed -- 16 years.

So what happened next was magic. We had met our requirement. Utilities finally said, "Whew, we got that done. That's the end of wind power. We're never going to ever touch this stuff again." And they were paying probably anywhere from 4 to 6 cents a kilowatt hour for that wind power, which is sky high for that period of time.

But just two years later and a fourth wind farm was built. Nobody told them to build that wind farm. But the utility alliance said, "Yes, you know, this is not so bad after all." And then the next year a fifth wind farm of 98 megawatts

was built, again Alliant and (Thipco) took the power in (Cornville) cooperatives.

And then a sixth wind farm in 2003 with the lowest priced wind that I'd ever heard of at the time, 2 - just a little over 2 cents a kilowatt hour, using the first GE wind turbines in the windiest spot in Iowa, right, about 5 miles away from that very first wind turbine installed by (unintelligible). So all of these were by private developers. None of it was mandated. We were now at about 3-1/2% of our energy from wind power.

So more policy changes, citing in the construction of 34-5 transmission lines, it used to be - require a lengthy franchise process, no more. Just submit an application, go build the line. Why 34-5? That was the collection voltage of the wind farms. They needed - the first wind farms had to put it in at 24 kV to be able to get around the citing law.

And then legislation which allowed the utilities to own the wind generation, novel idea, letting a utility own electric generation. Utilities asked for that legislation and they got it.

And then there was a pre-approval process. They said, "Okay, if we come in with an application, tell you what we're going to do, and tell you the cost gap, will you guarantee us that we will be able to put it in rate base the next time we have a rate case?" And the regulatory board said, "Yes, and we'll guarantee the rate of return on it. You will know what you're going to make." And the initial wind farms got a 13% return on equity on that wind generation -- 13%.

So and then Iowa did something for the little guy, they provided incentives, 1-1/2 cent tradable state tax credit for 10 years. So for a little 2 megawatt, up to a 5 megawatt project, you could get that. And then the Iowa Power Fund

Investment. I was on the board of that and retroacted about $86 million over a five - four-year period.

And we gave money to the wind industry. We gave some to some manufacturers to help them develop new models, to TPI blade manufacturing, we gave it to universities to further their research to develop additional capacity in the education field -- we sprinkled the money around a little bit to kind of build our wind industry.

Well today Iowa has about 5100 megawatts of wind generation. And we were - last year we were at 24.6% of our energy, this year we're going to be well over 25% of our electricity comes from wind power.

So what does Iowa do to support wind power? Well, we started an association, a trade association called the Iowa Wind Energy Association, about five years ago. And we'd had one 20 years ago, but it went defunct.

This time we got a guy that's a real live firecracker, a salesman, a guy that can go out there and grab a politician's hand and just give them a 1-minute elevator speech just like that. He is so good, (Harold Trier). And he's very active in promoting wind energy. And we hired a lobbyist, a part-time lobbyist at the state legislature.

And then when AWEA calls and tells us, "Hey, get on a line, call your Senator or Congressman," we do it. And we send out a mailer and so we have support coming from Iowa.

Now our legislature is divided politically, Republicans and Democrats. And but it doesn't make a lot of difference which way - which party has control. And the other thing that's unique about Iowa is that if you travel outside of the

state - of the city of Des Moines you will see wind turbines, except if you go South. But you - even in the capital you'll see a big 600 kilowatt wind turbine at our state fair.

So here is a map showing what has happened. And it shows 3200 dots on there. These aren't oil wells, these are wind turbines. And you see that they're mostly in the Northern part, Northwest quarter of Iowa, but you know what, the dots are slowly moving down to the bottom-right where it's less windy. The windiest areas are the dark brown and the less windy areas are the lighter colors. And they're slowly moving that way.

And I don't know if you saw, but MidAmerican just announced another 1000 megawatts of wind generation addition. We thought they were done but they announced another 1000. So at the end of that thousand, which will be by 2015, MidAmerican energy, our largest electric utility, will be getting 40% of its electricity -- 40% -- from wind power -- 40%.

Here's a map showing this fall wind industry in Iowa. We're the only state that has figured out where every turbine is. Four-hundred-eighty-five turbines are shown on this map, from 1 kilowatt to 100 kilowatts. And all these are mostly functioning.

And you can see that the distribution of this - this is not in the windy area, it's in the area where the liberals live, the Eastern part, you know, the guys that want to, you know, save the Earth and all that, they're more in the Eastern part. And you see a lot more of them there, even though it's not as windy.

So what does it take to ride the roller coaster, in summary. I think that's my last slide there. Steady and stable policies. The last four governors we've had, regardless of whether they've been Democrat or Republican, have been

supportive of it. Both houses of our legislature, regardless if they've been Republican or Democrat, have stood steady. They've not tried to pull back any of those incentives that we have.

And why has that happened? Why is our politicians (unintelligible) follow behind this? Well we've been talking about energy since 1979 when we thought we were in a pickle because we didn't have energy resources.

And we've been educating our E&R, we've (unintelligible) conscientious policy to have a roadmap. What's the roadmap going to be? What - how are we going to get there? Energy efficiency, renewable energy (unintelligible) preaching it for years and years and years.

And you know, originally I thought all of that was a wasted effort. It was you know, typically government employees, E&R, whoever was doing that, going around speaking at every chance they had. But you know, as I get older I'm wondering, "Maybe that made the difference. Maybe that's why the people of Iowa just accept it."

The second thing that we've done in Iowa and steady is that we made sure it's a win-win situation. Utilities make money off of wind power. They rate-based it. You can't do better than that.

The small wind people like me, we get a tax credit. It's a subsidy. It helps us make a project viable. Now the state tax payers pay for my subsidies. Are they getting their money back? Well we create a few jobs. And as you know, we have a lot of wind industry main factors in our state. So I think we give it back there.

But you know what, it's just dawned on me the last couple years that our electric consumers are garnering the benefit of wind power because any day that it's windy in Iowa, the wholesale cost of power on the grid -- that's the cost that we consumers pay -- goes down by at least a penny if not more. So every day it's windy -- and you know, there's a lot of days that's windy in Iowa.

So we're getting lower electric bills in Iowa, but Minnesota is getting lower electric bills, Illinois, Indiana, we're all in MISO. MISO footprint now has 12,000 megawatts of wind. On a windy the power prices go down and everybody benefits. Is that a good deal? Do the tax payers benefit when that happens? You bet they do.

And the last thing we need, and the reason there's success in Iowa, is we have champions. And you may not believe this, but our champions happen to be utilities usually. As a small wind guy, it's the utilities on one side and the small wind guys on the other side, and they're fighting each other over policies.

Our champions happen to be MidAmerican Energy. Why? Well they just announced another 1000 megawatts. They must have $5 billion invested in wind turbines. They believe in it. Nobody told them to make that investment.

Alliant Energy doesn't own nearly as much wind power. But they were the ones buying the power from those early people in 1992. They bought it willingly. And then they bought wind power from the next four wind farms that were put on. Alliant raised their hand and said, "Yes, I'll take some more of that wind power."

So we - our two biggest utilities are champions. And there are the rural GNTs, they saw what was going on around them and they said, "Look, it's good for them it must be" - they're buying wind power too.

And then we have to - and then we have local champions, the small guys that hang in there and butt their heads against the wall until they're bloody and say, "We're going to put this wind turbine up one way or another." So the last secret to - was the champions.

So in summary, it's in our genes, not our blue jeans, the genetics that we have. So it's become natural, kind of instinctive. And really it's become part of who we are in Iowa. Thank you.

Jonathan Bartlett: Thanks Tom. And I'd like to thank the State of Iowa for lowering the power cost for my great state of Minnesota. Without further ado, the next speaker is Rich VanderVeen of Mackinaw Power, who will be speaking today about a project case study.

Richard VanderVeen: Well thank you Jonathan, and thank you all of you for this, I think - is it the 8th or 9th State Summit? It is clearly one of the high points of my year because it has been such a tremendous group of friends, group of lessons learned.

And I can say without any question that our case study, and what I'd like to tell you for a few minutes about, certainly due upon the lessons learned here. And I hope that we can leave today feeling that we are going to make some strides, we are going to overcome budget policy and other political nefariousness and other miscalculations that would put America back on its heels, just the opposite.

We should be moving forward optimistically, we should be moving forward with courage and determination, knowing that state, local and federal, even international policy must be steadfast, must be forward-looking, and I'll show you why.

There I am, okay.

((Crosstalk))

Richard VanderVeen: Okay, that one. Good. What I'd like to do today is briefly go through what I call our Community Participation model. And I'm going to give credit to a number of people in this room. But basically I would like to explain for a few minutes why 35,000 acres of family farms will be family farms for the next 50 years.

Our (unintelligible) wind project is going commercial, it's 133 GE 1.6 turbine. And it really had a number of very positive things happen. Not the least of which was on the far right there, MISO and ITC have put up five new substations now, and one of the interesting things is we're getting nine 9s in terms of power quality. Does everybody know what that means? Does anyone know what that means?

Okay, what that means is you're getting a level of power quality and voltage sufficient to attract major data centers. So when Google says, "We want a new data center," they can now come to Gratiot County because there's so much support in the electricity that it would take ten 9s to max out the grid. So we're thinking that this is another byproduct.

I'm from Michigan and this is our Michigan wind map, again thanks to NREL and the WPA. We are - and I like to think WPA is - you know, the Wind

Work Progress Administration was one of the great things in America. And Wind powering America is also one of the great institutions we'd like to see continue.

The middle of Michigan is flat open ground and provides a very steady wind resource. Our first project however, was up in the straights of Mackinaw, between the upper peninsula, we say, "The (Upers) reside," and the lower peninsula.

And that project was put up in 2001. And as we were educating people, it was great fun to bring them up to Mackinaw City and say, "Stand inside the turbines. Listen to the turbines. Talk to the Mayor."

Talk to the people in town who like to say - some people like wind power and then they say, "Not in my backyard." Well we in Mackinaw City think our backyard is just fine. And so it spends - 6 million people a year have seen those two turbines. They were the biggest in the world back then, 2001. Vestas Energy Micon 900 kw turbine.

We found, again flat open ground, and a very easy interconnect. And we used the JEDI model again and again to say, "Well what is it that we are doing, in terms of job creation, both direct - indirect and induced."

We liked - we also took a page out of our 2000 (unintelligible) 141, which required our two major utilities to report biannually, the amount of emissions that they provide us. In addition to power they provide a 10.4 pounds per megawatt hour of sulfur dioxide, 1 ton of carbon dioxide, 3 pounds of nitrous oxide and .55 - .0055 pounds per megawatt hour of high level radioactive waste.

So this project then, in generating 500,000 megawatt annually will permanently, annually reduce sulfur dioxide by 5.2 million pounds, 1 billion pounds of CO2, 1.5 million pounds of nitrous oxide and 2750 pounds of high level radioactive waste every year that will not be generated.

So this is another measure of how to look at wind factory to say, "Are there health benefits?" "You bet." "Are their cleaner air and cleaner water measurable?" "You bet."

"Renewable energy credits, are those - this intangible funny bookkeeping thing?" "Well actually, no, this is a measure of the externalities that come with running a system like Michigan with 25,000 megawatts installed, about 60% coal, about 20% nuclear." I forget the number - amount of gas that's going up, but we'd like to tamp down the nuclear power and coal with more wind.

I'll go over - I'll come back to this but I want to keep moving. So if I want to contrast this morning on three things, the - I'll say, "Outside developer utility model of developing a project with a solid community wind project owned by the people completely through an LLC and so forth, with what's called - I call a, Community participation model where we draw upon some of the best thinking of community wind. But we also allow the amount of capital to be raised, $450 million, from various sources.

Then lessons learned and early public engagement however, are the fundamental building blocks. Earning trust, inviting participation from Day 1, shared rewards, these are the fundamentals. Lisa Daniel thank you very much for all of your leadership over the years in founding Windustry.

If you haven't been to the Windustry Toolbox I commend that to you. This is something I wish I'd had in 1999, how to build a wind project. And Lisa you

have done that critical thing of distilling it down into very useable parts. How does one go about that?

Larry your community wind working group, again excellent participation. And a number of ways - again I say, "Support strategic analyses of the federal and state policies." These are critical things that AWEA is doing and should be supported.

We put out a brochure last year for their Upper Peninsula communities, this is a joint venture of our company and the Superior Watershed Partnership, which oversees 13 counties in the Upper Peninsula.

So if you think about the community participation model again, what we were looking at is a deep look at this particular community called Gratiot, and it has had its share of disasters.

In fact in Saint Louis Michigan, which there's a big map as you drive into town, we are at the heart of the Lower Peninsula, right in the center. There they had a company called Velsicol Chemical Company that left the second biggest superfund site in the country. They invented a little product called DTT.

And on top of that, in the 1970's unbelievably they packaged fire retardant into animal feedbags and shipped them out to elevators all over the state of Michigan. And so by the end of 1976 about 90% of the adults in Michigan had EDB in their blood.

There were several million cows and cattle slaughtered, tens of millions of other livestock, and this company of course, is now shut down. But this is an example of what has happened in this community.

So when we went to talk about wind power our listening tour quickly decided, "Well let's really understand what has happened on the downside of this community, and then let's look for the upside." And it was all about cooperatives, the sugar beet co-op.

There are mounds of sugar beets in the fall out in Gratiot County. There are a huge - the biggest, the tallest structure on this flat ground were the two elevators of the Michigan Agricultural Cooperative.

Quickly we learned that we're going to modify the easement agreement that we've been using elsewhere and create a pooling easement agreement that's going to involve and embrace as many people as possible from the beginning.

So our company decided to pay every single landowner a $1000 option to sign our easement. And by doing that we treated everyone with respect and fed at 300 kitchen tables. As Victoria has heard me say before, "It was at least 50 cups of coffee per megawatt to get this done, to have 256 families actually sign the same pooling easements."

Now the blowback list unexpected, was the largest families said, "No, we always get the better deal. Just put it in the addendum there that - what our special deal will be."

And the art of getting out of that conversation was not to have a lawsuit, not to have a recall, not to have a referendum, which has happened in many other communities where - that those landowners that aren't part of the process, say, "Well we're going to just take everybody else on and we'll ruin it for everybody."

So it was an art to get out of that tense conversation and say, "Let's be adults, let's agree to disagree, let's just - we're going to go on and you have until December 1 to join with everyone else. Otherwise, we're just going to go for it."

And of course the irony is these big farmers now are surrounded by wind turbines and everyone from the 1 acre landowner to the - those who have many acres, are sharing a pooling easement payment of $2 million a year for the next 20 years. And they're receiving, these landowners that refused to sign, nothing.

So it was one-size-fits-all in terms of our pooling easement agreement. And that took a lot of careful drafting, it probably went through, I'm not kidding, at least three different universities, economic agricultural people, University of Iowa, Michigan State and others, many law firms. And by the time we had this out, it's a unique agreement that really tries to balance the interests.

Parallel to that was again, steadfast policy. At the local level in Michigan we have so many units of government it's hard to count, but I'll try, 600 municipalities, 83 counties, 1250 townships and 550 school districts, each of whom have planning and taxing power in Michigan.

So to do things regionally there are actual disincentives for your governments to work together. So one of the first things we did in Gratiot was to get all 16 townships and the core cities on the same page, to write the same rules for wind.

You say, "Well that's no big deal." But it was more than 20 public meetings, and 20 policy decisions by the planning commissions of those respective

bodies to all adopt the same rules, the same careful balancing with wildlife issues, high best standards and we tried to bring the best thinking from every wind energies ordinance in the country we could, to these 20 meetings. And by the time we got done, we really do have a model zoning ordinance.

And probably one of the great events that happened along the way was the Future Farmers of America, because they were founded in 1923. So they're celebrating their 90th year this year. Future Farmers of America, has anyone here been an FFA member?

Nobody, well we're working right now to have an FFA Chapter in Detroit because there are agricultural activities taking place in downtown Detroit, downtown Flint, downtown Grand Rapids, the new farmer's markets trying to get bright young people integrated into thinking about keeping family farms, family farmers for future generations.

While in Breckenridge we have a lot of family farms. In Ithaca where Odysseus finally ended his sojourn. Ithaca Michigan has a very active Future Farmers of America. And these kids were unabashed, they had - they could ask any and every question you could think of.

So when preparing for their district, regional and state debate, they came in third in the state, their title was, Wind power, are the benefits over the ray by the risks, the quick vignettes, a congressman with his constituents, two farmers leaning over a tractor, two sessions that were the coffee house where neighbors were talking back and forth about wildlife issues and wind power and all of the perceived human and health and wildlife issues of property values. What is this really about?

And of course these bright young people are bringing this home. And this - the very people that were signing the easements, their parents, were being influenced by their children. And that was a major good stroke for the - for everybody.

So when we were able to then sign off on our purchase agreement with the great edits, we were able to then finance the project. I was able to bring our friends in (Vernegy) to the table. I could see the (Peter Principle) coming over the hill and knew that we needed the right turbines, the capital and a team to really make sure we did this right.

And I was very pleased to meet with (Michael Pulsky) and (Brian Schooler) and (Kevin Parsik) and (Jeff Kirk), three or four of the land people, people-people, financial people who could really help me get this done. And I say this many times, "(Unintelligible) myself for people better than I, and my wife of 38 years says, "Well that's easy. You know." So it came together and we were very fortunate.

And we also had this other dynamic of keeping labor and non-labor workers working side by side, digital and steel worker who don't normally see eye to eye on certain things, that was part of the test. Everyone had to be on the job working together, bringing this together, on time, on budget.

And so September - or August 16, 2011 the first turbine went up. These are 100 meter towers, some of the first 100 meter towers in the country. GE did, I'd say, "A very good job." But the first 20 towers that arrived had 80 meter wiring.

So there's never - you're never quite done, it always - there's another something going on. And of course that was solved but it wasn't overnight.

Things had to go back and retrench and rethink and - we had a jar in construction of office, it was full of dollars and five dollar bills, because every time you use an expletive you had to put a dollar in the thing. It was pretty - it went to local FFA.

So this had been a lot of fun and I did want to say one other thing, I thought I had a spot in here about our community wind ibook. But again, Lisa and Ryan and Larry and a number of you in this room have had - helped us in the last 90 days. We've taken a lot of the thinking about community wind and we've published an ibook on iTunes for $5.99. Apple gets $2 and the other $4 Windustry and our greater Gratiot Development Think and FFA.

So this is something that I would I say be worthy of your consideration going to ibooks and looking at our community wind ibook. Because there's a lot of lessons learned in this new, little book.

This, and finally this - and then we have a number of key required reading, we - at every turn from Day 1 we said, "You know, it's not enough to just believe us, let's have required reading." So we kept putting out the NREL 10 Benefits and Myths about Wind Power, the MSU citing book, the County Commissioner's Planning Book, the AWEA citing guidelines, UWIG information, National Coordinating Council, Wind on the Wires.

(Jim Locker) gets huge credit for founding the American Wind and Wildlife Association. I know you speak to that Jim.

These are the principle about best practices. These are the valid science, the market based thinking, the way in which all of us need to up our game, learn more, be able to synthesize the lesson and really think ahead now.

America has its opportunities, but it has a lot of challenges. People in this room need to multiply every day, when you go out into your fields at your universities, at work, at church, schools, spread the word. Make sure that people understand that wind is stable, wind is renewable, wind is something that can drive America forward.

I think we need strong leadership in this country, I like to say that, "As we look ahead even to the next Presidential election, the RSP states those Presidents that take those RSP states, those candidates, should be elected."

We need to make sure that the people we elect are able to see the benefits of wind power and all that it provides for local communities. Communities are the beyond political boundaries.

And all of us have an obligation to continue to learn lessons, continue to communicate clearly and make sure that our local, state and federal policies truly steadfast and not wobbly, not prey to those people who would tear down our society. Public service is an honor and all of us are part of that. Thank you.

((Crosstalk))

Ian Baring-Gould: Thank you Rich. Now we'll have the developer case study overview by Jim Walker of enXco.

Jim Walker: Okay well it's a great pleasure to be back at the summit. And it's also a pleasure to sort of be able to talk about the history of our company and where it's come in the last few years.

And the - when you're looking at the themes for how we've survived and even thrived the rollercoaster, well as major developer you're really feel that stop-start-boom-bust of the unstable federal policy and so forth. Not as much as the manufacturers, but if they're at the end of the diet chain, but still it's - has been quite a challenge.

And I think we've accomplished - identified three themes here, quality, diversity and flexibility. First a little corporate history, that looks pretty tough to read but the company was founded in 1985, and for the first few years is was kind of a sleepy little office, I mean operations and maintenance company. And also managing some assets from some Danish investment funds. So it was an asset management and operations company.

Then it started to do a little bit of development work, but it was really not a full born developer, it didn't have the capital to actually carry the projects, it couldn't order the turbines. But it would build a project, get about - I mean it would develop it most of the way, get the land, most of the permits. And then sell it to (Synergy), sell it to (SLP Energy), things like that. But it was beginning to build up some knowledge in greenfield development.

Then in the I think 1999, the management buyout with two Danish pension funds, and they had a three year exist deadline. And so they we - this company was on the blocks (unintelligible) in tune in the middle. And it was bought by a company, it's misspelled here, (Ceef Energies). A French company owned by a French entrepreneur.

And he had done - he had a very successful plane flight with the CEO of Électricité de France, the world's largest utility. But he negotiated a deal to have a worldwide exclusive for EDF, as a 50/50 joint venture. And they put up 600 million euro. So that was a good deal.

But I've always said, "You know, one good entrepreneur can outnumber a whole electric utility." And I think it was one of the most successful joint ventures in recent energy history.

They acquired enXco, as the company was called then. And in 2003 built the first leveraged tax-advantaged, project financed project in Minnesota, in the country. In Minnesota $125 million financing.

And this is the proof concept, because it was not clear that a French company, with tax liabilities in the United States, and the only real incentive being the production tax credit, could make that work. And I tell you, it was really expense to monetize those PTCs.

We had - we got a tax letter that cost us $200,000 a page from the attorney. But it worked, that (unintelligible). But that put us in business at the 100 megawatt scale.

But then, you know, talking about the flexibility the PTCs expired in 2004. And we were developing a second project. At that time we were a one project a year company, and I was the CEO then. And in December the CEO became the Project Manager because everything became desperate, you had to make that PTC deadline. So all of the sudden you had to know everything about the project.

And in this town our management in France said, "We're not going to start construction until the President signs the tax extension." Okay, he signed it on October 14, so built then a $80 million, 60 megawatt project in 72 days. Including a 230 Kv (unintelligible) station that we broke ground on November 15, and energized December 15.

You know, and (Edison), (Edison) who had to coordinate with (Edison), we had to get on their schedule to have the utility inspectors come out. And we had a date for December 15. And they said, "We can't keep that place for you, you'll never make that schedule. You'll never do that." And we did. So that was a certain flexibility.

We also around that time were - I was - the original business model was, in international circles, would be the BOO, Build, Own, Operate. You wanted to maintain equity ownership of the projects.

But we were developing projects in Iowa and little states we've learned something about, and a company from Mid-American said, "We don't want to give you a PPA, we want to have you built the project and we'll take it over then."

And I said, "I have to go back to my Board on Friday." This was Wednesday. And they said, "Well you know, we're Mid-American, and either you say yes or no now, or the deal is off and we'll never do business with you again." So I said, "Yes."

So we built the first project with Mid-American and set up an extremely successful relationship. And I think as Tom was describing it, the way that it's been happening with Mid-American has overcome the fatal flaw of the 1978 law PURPA, which made the IPP PPAs a zero-sum or slightly negative game for the utilities.

So you know, very frankly if it's a PPA, most of our customers hate us. They really don't like it, they can't turn us off and on, they don't make any money. They get some disallowance over the 30 year life of the PPA. So that's a big

(unintelligible), and I think the - Warren Buffet, he's got a reputation for being a pretty smart investor actually. And he discovered that if you can persuade local utility commissioner to rate base these projects you can build a very, very good business.

And one of the other things about the way this has to be done with these financing, or these project bills, or are you just monetizing tax credits, is these projects have to be extremely clean. I mean we have - some of our projects we have 800 landowners, all the title problems have to be more or less solved. There's always one or two at the end that have a problem.

But to build a project and finance project it makes it a blue chip project. For example, we built a project in Northern California and we financed it non-recourse, leverage, tax advantaged and closed a $385 million financing in March of 2009 in the depths of the deep recession while all the capital markets were frozen.

And we could still do it why, because it's absolute blue chip investments. And compare that quality with the project for example in China where 15% or 20% of them aren't even connected to the grid, you know, they're just based on investment tax credit like the old days in California.

So let's move on here. Our parent companies, I mean these are one of the ways you can survive the rollercoaster is by having a rich parent. And it does help, no denying that. But they made us be more or less self-sufficient in capital here in the United States.

But it's also interesting that they are, you know, they're large and nuclear, but they are very determined to go towards a non-fossil future. So by 2020 their

target is to be only 75% non-carbon, 25% renewables. So that's I think a very laudable objective.

I'll go back to one thing, and I did find out that in the - in 2011 after Fukushima, EDF looked at its investment opportunities around the world and realized that the nuclear renaissance had just been moved back in time substantially.

So we'd been on the public market for a couple of years, they bought back all the stock. They said, "The best investment we can see around the world is to invest in renewable energy." So that's a real statement of confidence.

We in our history we've developed nearly 4000 megawatts of projects, our main line of business has been greenfield development. So in 2012 we went from having one project a year to having 11 under construction and built 1.7 gigawatts.

We now own and operate a 2.2 gigawatts in North America. And our Operation and Maintenance Group has over 7000 megawatts that it operates with 95% wind and some solar.

So one of the things you see there is there is a very diverse base. We are developers, we make some development profit. We're constructors, we make some construction margin.

You saw the projects here, ownership, and now that's built up to a very sound cash flow with over 2000 megawatts owned. And then you have the largest independent service business in the wind business. So that provides a lot of stability even if some part of that business is down any one particular year.

If you look at the - we are - now our - our company now is responsible for North America, Canada, Mexico and United States. And so when you look at that, I mean it's really an impressive - these aren't all projects, not our projects. But you know, we have to recognize that our neighboring countries that have strong relations with us, and if you're a big enough developer you can get some projects in those areas and you can stabilize some of your rollercoaster.

Because actually the Canadians and the Mexicans know what their tax codes are going to be in the year after next. Well we don't. This is our North America presence, and we're in about 25-26 states and providences either in development operations or in operations maintenance.

And this again, is another summary which I think more or less we went over before. But this was a record year for us, and really - so in the teeth of the recession.

Now it's interesting to see one aspect of the rollercoaster. Here's our install capacity, and the big blue circle is U.S. wind basically. So it's - that's been the majority of our portfolio. The blue is not wind here, there is no - in what we're constructing now, there is no U.S. wind. You know, that's the expiration of the PTC does to you. We will definitely have some by the end of year, or 2014, but right now it looks like zero.

We went from - when the company was acquired it had developed - half developed 25 megawatts a year. And now it's in the - about 3 per developer. Is that visible there?

And in terms of - okay I didn't know it was a dynamic slide. So that we're Number 3 in terms of partially added in 2012, and in terms of ownership, we're now Number 7.

We were always sort of a quality second tier, we're sort of the Lexus of the developers you might say. We were a polling second tier developer, and now we're getting up into that volume. And I think we've been able to keep the quality, which has been very important.

You're looking at the market outlook. You know, there's been - there's the ITC until 2016, and the PTC has been renewed. We don't know really how long that renewal is viable for because the start of construction language is being refined. We've diversified into technology, we are now doing solar and biomass and biogas. As well as wind, but wind is still our core for our business.

The markets - the biggest challenge is lack of PTAs at the moment, you know, because as we were talking about - with the panel on the renewal of the wind vision study in 2008 when my report, the 20% Wind Report came out it envisioned using EA, IEA - no EIA scenario that included a 39% increase in total electricity demand by 2030. Now it's basically flat for a long time.

But I'm hopeful that with the - one of the hidden silver linings of low natural gas prices I think will be expansion of the U.S. industrial base, and that may bring more of a demand back.

So we're pleased that we think we're well positioned to continue to use our development expertise, operation electrical and our financial strength and continue to move on here.

I would say some other - several other points on the - as - this is to describe, you know, we were - we took a very active role in trying to shake policy. And

Tom really didn't mention also that Senator Grassley from Iowa is considered the Father of PTC, so Iowa may create some of its own luck as well.

And you know, we are a very active CEOs on the Board of AWEA. I always worked as a member of AWEA. We really helped to actively work on the first 20% Wind Report. We helped create the America Wind Wildlife Institute, which is a unique institution which helps us broaden our communications with the environmental groups.

But we have - doesn't mean you're not going to sued every so often, but does mean that you have access at the highest level that you need to at all these environmental groups. Or at the ground level, when that's needed as well.

So I think that's - you can - we all have to try to work to improve the stability of the policies. One of the simple things we found is that we went through a very painful process installing Enterprise software, SAP, some of the companies have Oracle and things like this, it's really painful because all of the sudden you have to do everything different.

It turns out that that database and the overlap with congressional districts, so we can now - if we spend $1 billion in procurement in the year, we can tell you exactly, you know, how many Chevrolets we bought in a particular congressional district and so forth. And use that for a grassroots or grass box effort. So that's the kind of the thing we're doing.

I also say that I was privileged to be a pair of the peer panel for DOE, for them last summer. And I conveyed then, and I think it was joined by other developers, one of the most valuable programs that a developers sees from DOE has been Wind Powering in America. That's where we get the maps, that's where we get the energy relations stuff and so forth.

So I'm hopeful that the transition to a regional effort will simply allow that to continue, because it's, you know, other industries benefit from federal support in the - after the startup period. I mean this is a big industry now, 60,000 per ground. But the land (unintelligible) have started in the Civil War, and they're still getting $200 or $300 million a year.

You still have the (C Grant) (unintelligible) that supports the fishing and offshore oil industry. They keep getting $80 million a year. Nuclear Institute, that sprang funds for nuclear engineers.

So I think there's a very justifiable lull for DOE and the other agencies in helping to continue to support and educate. And I think this new Wind Vision effort that (Jose Ziaz) has initiated has been a very important piece of it. Thank you very much.

Ian Baring-Gould: Thank you Jim. Susan Innis of Vestas Wind Systems will now provide us with the manufacturers case study overview.

Susan Innis: Good morning. It's very hard to follow this distinguished panel, this has been quite a treat. Just to give you a little bit of background on myself, I have been working in wind and focused on policy issues since '99.

So my first ride on the rollercoaster was the California Energy and Enron. Because when I started working in wind in 1999 you'd go to conference like this and these very sharp looking, fancy dressed, very smart sounding guys from Enron would be making the presentations. And everybody in the room wanted to be the guys from Enron. So it's been fun and I'm still in it.

I'm also really keen to see what happens with Wind Powering America, and agree with Jim's comments that it's been hugely important to the success of the industry in the last couple of years. And it's been great in particular to see the growth of the Wind for Schools Program and the Wind Assessment Centers, because Larry Flowers bought me a lot of beer a couple of years ago when we did the first Wind for Schools project in Colorado.

And I've now seen how that has come full circle and (unintelligible) Colorado is now home to a 30 megawatt utility scale project that features Colorado made Vestas wind turbines.

So who would have thought that working with a crazy bunch of folks from NREL and a very willing rural electric cooperative would ultimately lead to not just the first Wind for Schools Project, but really get a whole community engaged in attracting large scale wind development in their area. And quite a treat to see that.

So now that the Vestas story, who can tell me what Vestas stands for? All right, how about where we're from? You guys probably all know where we're from. Denmark.

So Denmark is a lot like Iowa, Denmark had an energy crisis and Denmark took a look at what their resources were. And a lot like Iowa, they looked around yes, not a whole of options for how to get power.

So part of the reason for Vestas and many of the other large wind companies origins is Danish government's commitment to using and developing clean energy resources.

So Vestas is actually well over 100 years old, we started in 1895. And the name Vestas is short-hand for something like (unintelligible). It was farm equipment company.

Obviously we don't do that anymore, now we just to wind turbines and we do a lot of them. We celebrated last year, our 50 gigawatt of installations. So we're in 73 countries around the world, so we're big.

Here in the United States we've been here since the early days of the industry in California. So many of those (unintelligible) that Mr. Walker referenced, we're Vestas Machines in California, you know, more 30 years ago. And say we're in 28 different states, and have also invested heavily in U.S. manufacturing over the last couple of years.

So we've been around for a long time, we've seen the ups and downs, we've seen this faucet effect that the U.S. production tax credit has on turning on and off the investments in the United States.

So in terms of our manufacturing footprint, and particularly with respect to the decision to invest in U.S. manufacturing, it took us several years poking around before we made the commitment to go ahead and build factories in the United States.

And part of the idea of building factories here is actually kind of cost cutting mechanism. It's very expensive to move these large, heavy pieces of equipment around the globe on ships and trains and trucks.

So by having manufacturing in the United States we've been able to tap into and expand a supply chain. So now we have a global supply chain including many connections here in the United States and across the country.

And I know you guys are using that in the Wind Powering of America network with the factoids about the manufacturing supply chain and local job creation. So that's great.

Part of how we ride the rollercoaster, you know, being on the ground with manufacturing has been great. It certainly has a lot of cost cutting and consolidation. We've closed our research and development offices in the United States and consolidated those activities back over to Denmark.

So we've been doing a lot of streamlining and adjustments and some of these things, and we have a lot of long-term optimism for the wind market in the United States. We've got a lot of places like Iowa to get at their potential.

One of the other things Vestas is doing is trying to be a little more creative. We've been the industry for a long time, we're an industry leader and we're interested in new ways and ideas to make the markets.

So if you guys were at the convention this week we may have seen the WindMade Program. And this is a labeling program we helped start with a number of global companies. And the idea is to take those Googles and Facebooks and Microsofts who are interested in using wind to meet corporate sustainability goals and use that to help drive the market going forward.

The state renewable standards, the RPS Programs, a lot of the tax incentives, all of these things have been great. It's building a base in the U.S. market, but we're interested in how we create new markets. How do we go above and beyond those and what's the next big thing? So we invest in programs like WindMade to try to drive that.

Any of you stop by the Vestas booth at the show, if you were over there? Charles did, Charles got a table top (unintelligible). He might have to take the logo off because I put it on his desk and during (unintelligible).

One of the other things you may have heard about if you stopped by our booth, our new products and services. We've got a got a couple of new turbines we're pretty excited about for the U.S. market and we're also doing a lot more with wind data.

And working closely with our customers on site design, layout, qualifying a site for a particular turbine and using the vast amounts of wind data that we collect from virtually every turbine we have under service across the globe. And using that to make wind projects even more efficient and productive. So in addition to cost cutting we think we're also trying to be creative and come up with those new things.

We also take an active role in policy. Jim mentioned EDF (unintelligible) on a number of things. We took that same approach, we see policy as an important place for a manufacturer to be side by side with our customers and stakeholders. Trying to figure out how to level the playing field, how to keep policies more consistent.

So we spend a lot of time on federal and state policy efforts and making sure legislators and regulators understand the impact those policies have up and down the supply chain.

Not just on developers that might be in front of them for a particular project, but also for manufacturers and the buyers and the employees and families behind that. So we spend a lot of time on those things as well.

So we don't have a rich parent, I wish we did. But we did benefit in the very early days from fore thinking in the Danish government and that country's commitment to turn a crisis with the - the energy crisis in the 70's into an opportunity to move into a different sort of energy future.

So it's a tumultuous time especially in this room, but when you go through a tumultuous time there's lots of opportunities. So (unintelligible) we're optimistic, we're trying to figure out how to stay competitive and be creative and anybody in the room can be the same thing. So thanks for letting me be here today.

Ian Baring-Gould: I'd like to thank all the panelist this morning. And I believe we have some time for Q&A. So for those of you on the line or for those of you in audience, raise your hands.

Man: I'll start off quickly. If we could just go down the panel and say the one thing that you would like everybody in the room to do to support your state development, a local development project, a national development organization and a wind company, what would it be? Just one thing that pops into your brain. And then who has the questions.

Man: You know, the one thing that I see is stable policies. Everybody says that all the time, because it's true. And if you do it from a state perspective, it's the state policy. And it can't buy any influence over the federal, but make your state - show everybody that the Governor, the legislature is not going to backslide on past commitments.

Man: Ditto, with this proviso, that each of us have a way to communicate with your local, state and federal people. So between now and the end of this year at

least once a month, encourage local, state and federal officials, and prospective candidates to visit a wind farm, visit a Wind for Schools Program, understand the financial, social and ecological value of a wind project.

So you can communicate, "This is about American economic growth, this is about stability in our energy security. This a complement to natural gas." There's a whole range of very positive, very optimistic, creative things that each of you can do and that's the most important thing for me is to engage, involve and educate the public and public officials. That each of you have a role to play in that regard. Thank you.

Man: Yes, well it's hard not to agree with those statements. I think wind is actually fairly big part of the last Presidential election, and a lot in Iowa and the PTC. And I think I would, you know, my hope would be, optimistically that by being active right away and really showing how broadly beneficial this technology is, it would be wonderful not to have green energy being issue in the 2016 Presidential election. Have it just be taken for granted it's something that everybody is for.

Woman: I agree with everything they said, and I'll just add since we do have so many universities in the room and folks that worked on (unintelligible) education. Education is key, educating legislators, educating the next generation of folks that are going to come work in this industry keep going with their education, keep telling the stories, keep finding those creative minds that are going to keep this going.

Man: That's loud.

Man: I have a question back here Tom. You mentioned in Iowa on windy days the wholesale power price goes down. And that's a really powerful thing to show

people. And the effect may not be exactly the same in every location. But have you all, or has anyone, put together visualizations, graphs that show that sort of on a time period. I'm a big fan of showing data and showing graphs and that's one that I think would be really interesting.

Tom Wind: I don't know of visualization of that. That's a really neat idea. And it would be even better is to do a more scientific evaluation of it, to correlate the amount of wind power per price savings.

It's hard to do because you've got to realize what the world would have been without the wind power, or it's hard to go back and do that. But that's just an excellent thing, and probably that may be the best tool that we would have for policy makers show it's working today.

You know, kind of like what's happening in Germany during a sunny, the price of power during the day time is lower than it is at night. You know just the opposite of what it normal is.

So that's a great idea. I don't know if anything else. Do you guys know of anything?

Man: Maybe one of the things that could be looked at in that (unintelligible) study. I also know that some of the nuclear utilities are looking at it too, because they see the prices they're getting paid to go down because of wind and blaming it on us.

Ian Baring-Gould: Other questions?

Man: Sure.

Michael Milligan: Michael Milligan, got a comment. Hello? Resource here. Comment on the pricing, I think that the (REF) study that was recently completed has a math, I can't remember if it's in the study or if it's sort of an ancillary slide that shows the number of hours a year that prices hit zero or less in the - across the U.S.

It doesn't quite address the issue we're talking about here, but there's sort of a flip side to that and we're involved with the International Energy Agency on some work looking at the need for enhancing bulk power system markets.

And there's two aspects to that, one is when LMPs or energy prices get that low for that long, it makes it difficult if not impossible for other generates, gas units, or whatever the balance to complete is, to pay the mortgage. And there's a lot of concern over that revenue sufficiency question.

So lower prices are definitely good, but we have to have a sustainable business model, and so we're going to be looking at some of that at NREL and also through the IEA.

Ian Baring-Gould: Other questions?

Man: I want to put (unintelligible) and Jim and Rich on the spot here. Since Jonathan opened up, you know, our session with some tough news I want to ask you guys some reality - a reality check.

We have Michael here from Kid Wind, which is just an extraordinary program to excite kids about wind. We have Wind for Schools, which is sort of the same area, we have (WindForce).

As you guys know, we made an attempt during a tough time to raise some money from the industry to support through application centers, which I really

think we should have in 35 states across this country, getting the college kids excited about wind as a career.

When is the industry going to be in a position to help out here? I talked to the wind application center's lead, at the summit. I said, "What is it..."

((Crosstalk))

Woman: Larry I think you're asking, "Where's the money?" Right, is that your question?

Larry Flowers: Yes, show us the money. I mean I asked what is it going to take to continue their great work that they've been doing for six year, and most of them said, "You know, $20,000 a year will keep us in the game." Now that's - and we just spent $25 billion last year installing wind turbines across this country. This seems pretty meager to me. What's the deal?

Woman: There's a couple of ways I can answer that, one is you've got a couple of champions sitting in front of you here that know this is a big issue and know just how important it is that we keep these activities going.

This week during the wind power conference we had four or five different discussions about the importance of state policy, outreach and education. Either conference sessions, board meetings, things like that, raising awareness among wind industry companies about the importance of these issues.

And you know, this year we had things like moratoriums proposed in New Hampshire and Vermont. We states that wanted to expose their state for a business. So if that doesn't get somebody's attention, I'm not quite sure what will.

I'm really sorry I missed the reception last night with this group, to get a chance to spend more time with you, but I had an opportunity to sit down with two our global heads of marketing and talk to them about the budget we need for my company in this country given the level of opposition we see, the need for outreach and education and trying to make a pitch for us to get more engaged directly in that.

So I think it's a matter of making sure we've got the industry paying attention and we tried really hard, Susan (unintelligible) and Tom Darin are here. Larry I know you did too. We tried really hard at the conference (unintelligible) to convey that to other companies in the industry.

Man: So I think last year was a rough year for a lot of companies because anticipating the possible non-passage or late passage of this PTC. Many have even - were cutting way back on staff and on their association dues and things like that.

And I - but you know, one of the things is we never get asked, actually, you know, in a sense. So there has to be a two-way need. And I think there's an effort that we should get more involved. We're getting to be at the point where we're a mature industry. But I don't think we yet have the mechanisms very efficiently to get those requests into the companies.

Man: Public, private, non-profit funding is always an issue. But I think if you can educate people with funds to become part of a solution with an ongoing commitment, that's the key for me.

And I think right away, Larry about capital campaigns, I've been a President of a foundation for 25 years, we're constantly trying to endow scholarships so

that we have an ongoing stream of income. We are constantly trying to raise funds to feed this year's budget, but make sure we have a saving account.

I wonder if AWEA could through its foundation, set that up a little bit more. We've talked about that before, "How could the AWEA Foundation be perhaps one of the central points to anchor long-term funding for outreach?" That's a power goal.

Perhaps there's some kind of a voluntary tax on the amount of megawatt hours sold, shave off a penny for the AWEA Foundation. Create a toll that is in fact small, incremental, but builds up over time. These are kinds of things that if we could create a mechanism, like Susan just indicated, that would be very forward, understandable, and incentivize people to think about the long run and the savings account, not just the checking account.

You know, in Michigan we started - we had eight community foundation ten years ago, and we talked the Kellogg Foundation into matching local community foundation funding. Raise the million, they'll give you a million for you. And it all had to be endowed.

That was very powerful, but then in addition to that we put together philanthropic infrastructure, training the boards of directors, training executive directors on how to do a philanthropic organization and be of course 100% accountable by 1CC rules and local and state laws.

All - what I'm saying is that this is a process that we've gone through at many, many other forums and to anchor that (unintelligible) savings account for down times, and have an ongoing endowment that then can toss off enough cash for every program in the room here is not out of reach here.

But we need to spread it out so that every developer and every manufacturer and every project sees this an easy way to participate at a broader national agenda.

Man: I didn't want to give the wrong impression, I think almost all developers make a lot of contributions to the schools and so forth, but they're usually associated with particular projects, so you get the local benefit and that sort of thing.

The Wind Energy Foundation is just sort of getting off the ground and its sort of faced - looking first at some policy issues such as supporting the AWEA, your Wind Vision thing.

But it has formed something called Wind Force, which you can all get on the Wind Energy Foundation Web site and you can make a small contribution, $5 or whatever it is, and that's designed to sort of help the people in workforce, you know, build up something so if they're - perhaps even if they're injured or something like that, there can be some support for them as well.

But I think - and I'm hopeful that the new CEO of AWEA, because he was able to build up the grassroots organization for the national conservation fire truck association from 300,000 to 800,000. So he'll some - gradually will have some creative ideas about to engage the grassroots more meaningfully.

Ian Baring-Gould: There a question that came in from the people who are online. And it's, "Can you - can each of you provide us with examples of small wind or smaller community wind projects in non-windy states? Either examples or what you would recommend for the non-windy states if they're dealing with a small wind project or community wind project?"

Man: In not sure how this qualifies, but I know for example that there are some efforts for urban wind applications. You know, for example, cleaning of the Philadelphia Eagles Stadium, things like that. That sort of provide visibility (unintelligible) about them.

It's hard to put windmills in non-windy areas. I think Senator Reed in Nevada has one of them now.

Man: That's (unintelligible) as a form fund to take down all the non-working small wind turbines, because they really have advertise - I mean I was associated with a fellow that put small wind turbines on buildings. I remember (Larry Powers) looked at him and said, "Don't do it." And now that business is out of business. But there's a lot of kinetic sculptures on roofs.

So I mean you want to be - Rule Number 1 is it must be high, good NCF, that's the capacity factors in order to have any kind of payback enter, and to have the integrity of the project be fundable and financeable and returning the investment people want to see.

And what you don't want is a failure. And we can all think of many, many failures. So - but learn from those and not make mistakes.

Man: Thank you.

Ian Baring-Gould: Is there - are - do we have any other questions in the room? I don't believe we have any online correct? Okay, with that I'd like to thank each of you for providing us with your examples today.

So we're about to hit break so just a couple of announcements. There are additional restrooms that are down the hall toward the Expo Room, that's

where the table tops will be. It's the opposite end of the hall from where we are now.

Lunch will be back in this - for those of you who have brought luggage into here, since we won't be - no one will be in here (unintelligible). Thank you. Up to the front room of the building where many of you entered, we have a secure room that you can add your luggage to.

And at lunch we'll be back here in this ballroom after the table top discussion and there will be feedback cards on the chairs after the break and after lunch, which will be here, we're doing a self-cleanup. So let's be responsible.

Ian Baring-Gould: So the table tops after our 30 minute or so break, again down at the end. And we have Systems Integration and Energy and Balanced Markets that Michael Milligan will be leading. Working with Public Power that Randy Manion will be leading. Jonathan will be available for discussions on DOE and WPA overview. So any questions from this morning.

I'll be handling Social Acceptance, Rich VanderVeen will be doing Zoning and Permitting, (Terrance Sankar) will cover Wildlife, (Eric Lance) will be doing Economic Development, (Simon Mahan) will be doing Offshore, Wind Resource is Charles, Distributed Wind is Larry, Policy and Markets is Ryan. And then Wind for Schools is Dan McGuire and Mark if I remember correctly.

And so again, the standard table top speed dating as Larry always calls it, will be about 15 minutes at a table and then everybody will get up and go to another table to catch up. And then we'll be back here for the afternoon.

Table top keep going straight down past the bathroom and you'll see it's obvious. Just at the opposite end of this building. Thank you all.

((Crosstalk))

Woman: And this is the conferencing coordinator, we will resume at about 1:45, again we will resume at about 1:45. You may disconnect your line and dial back in at that time if need be.

Ian Baring-Gould: All right, let's plan to start moving. If Chris would stop engaging with our distinguished speakers. So we have the great pleasure of having Dr. (Howard) Learner from the Environmental Law & Policy Center here to talk to us a little bit.

Dr. Learner and - is a lawyer with tons of experience, certainly one of the though leaders in regards to renewable energy and energy efficiency in this part of the country, as well as one of the clear leader leaders, so not only thinking about what needs to happen in the future, but actually getting out there and with the Environmental Law & Policy Center, making that happen as we go forward.

You can go on the Web and read his bio, but very distinguished, has held so many positions, senior positions that trying to go through them here would be - would take away time from listening to him speak, and that's much more important that listening to me speak. So Dr. Leaner.

Dr. Howard Learner: Thank you very much Ian. No you don't have to go read the bio and all that stuff. All right we're fired up and ready to go and here's how we're going to win and what we're going to win, and how we're going to do it working together, okay?

Because too much of the time we all stood here all gloom and doom, "It's so hard, RES's are getting screwed up in some of the legislatures. You know, PTC is such a struggle, the Farm Bill and the REAP Program we've had to work so hard to create and now keep it."

Let's look a little bit about where we've come, and then what we need to do to win going forward, okay?

This is from where we've come, this is the Midwest. A number of groups, Environment Law & Policy Center and a bunch of our colleagues working together in 2000 and 2001 did Repowering the Midwest. The Clean Energy Development Plan for the Heartland, and Job Jolt, which was the job impact of the Clean Energy Plan, okay?

Right here, 2000, there was about 500 megawatts of wind power running in the Midwest. When we talked about having 20% renewables by 2020, remember that Lisa Daniels, wherever you are? There you are.

We said, "Twenty percent renewables by 2020." People looked at us and sort of said, "You're out there." Okay? We prefer the term, Visionary, okay?

Here's what's happened, 18,000 megawatts of wind installed in the Midwest right now, and that's the rate at which it's growing. Okay? Iowa is the Number 2 in the country in terms of wind power developed. Illinois is Number 4. How many of you all in addition to Kevin are from Illinois?

Okay, if somebody had said ten years ago Dave Loomis that Illinois was going to be Number 4 in the country in terms of wind power, he's laughing. Okay. May the record note that David Loomis is laughing.

The idea that Illinois would be Number 4 in the country in terms of installed wind power and one of the Top 5 last year, I think it was about another 900 megawatts was installed. That would have been a laugher ten years ago, okay.

So before anybody in this room or anywhere else, in any of your space, gets into the gloom and doom of, "It's so hard, it's so difficult." Who the heck ever said this was going to be easy?

We are trying to transform one of the two most significant business sectors in this country, the energy sector and the transportation sector being the second. Who said that was going to be easy, it is hard.

But you want a quick map in terms of progress, here in the Heartland where you are, here in the Midwest, here in Chicago, Illinois Number 4 in the country in installed wind power, the Midwest from 500 up to 18,000 megawatts. And that number this year is going to keep going up at the glide path that you see on this chart. We've come a long way.

We're not resting on our laurels, we have a vision for where we're going from that, and let me tell you where it goes. Off the charts, keeps going up. We're going to blow by 20% by 2020. Even though people said, "That was a little out there," we prefer, Visionary.

That's our vision, we're going beyond vision, we're going to transform that vision into reality. That's making a difference in the world, that's about job creation, that's about economic growth, that's about the environment.

Right, whenever we talk about wind power, whether it was back when it was 500 megawatts or now when it's 18,000 megawatts, we frame it in the same

way, good for jobs, good for economic growth, good for the environment. That is a winning message here in Illinois, here in the Midwest and nationally.

Indeed it's a message that our President has adopted. How many times have you all heard the President talk about this, good for jobs, good for economic growth, good for the environment. When that's tested among people it's off the charts in terms of support.

The public is way ahead of some of our politicians. The public gets, the public believes that it isn't the old false paradigm, the old myth of jobs versus the environment. We can achieve jobs, economic growth, and environmental progress together. And that's what wind power is doing.

All right, so how do we get past, "Nice line (Howard), sounds right, good messaging, great rhetoric, field tested, it works but come on, where are the facts?" Okay.

Facts matter. So the Environmental Law & Policy Center and some of our colleagues put out the Supply Chain Report, that I'm sure some of you have seen. If you haven't find them on our Web site, elpc.org. This is one of the most effective things we've done in years.

We did it for Illinois, more than 300 companies as of 2011, in the wind, solar and geothermal supply chain, okay? These are businesses around the state, and I'm going to talk about them in just a second.

As you'll see as we go forward, we did it in Michigan, Ohio, Minnesota, Iowa, et cetera. I'm just showing you Illinois because you're here today. Right. Three hundred businesses is a real number, I mean that matters. And what really

matters when you start talking about the types of businesses, because it's diverse.

Chicago has more wind power corporate headquarters than any city in the United States, and maybe more than any city in the world, okay. Major cities fight for corporate headquarters. Mayors, governors, you know, genuflect ring your headquarters.

Manufacturing jobs are important, we'll talk about that in a second. But corporate headquarters jobs are a source of civic pride, they're a source of legal and finance and insurance and downtown jobs, that major cities fight to get.

It's why Mayor Rahm Emanuel was at Wind Power 2013 as part of the welcoming speech, and then met the CEOs of all the wind companies there in a room, you know, afterwards. And you better bet that Rahm was saying to people, "What does it take to get you to move your headquarters here if you haven't already?"

Right, that's huge in terms of Chicago. It's significant in terms of Illinois. And it leads to an industry saying, "You've got to get the policies right if you want to have our trade show here, you got to get the policies if you want to have 13 corporate headquarters here." In other words, that's political clout, okay?

But it's not just, you know, the management jobs, the legal jobs, the finance jobs, it's manufacturing jobs. You know, it's good paying with benefits jobs for people who make things.

How many of you all grew up in the Midwest, anybody? All right, what do we do in the Midwest, we make things. Okay? I grew up in a small steel business,

okay? There are businesses - we look at for example, high speed rail, there's going to be 170 railcars manufacturers in Rochelle, Illinois.

The interesting thing is they're actually not manufacturers, they're assembles. And there are companies that make the seats that go into the railcar. They're the companies that make the industrial bolts that connect the seats to the chassis. There are companies that make the couplers that connect the railcars together. That's what we do in the Midwest, we make things.

The same is true when it comes to wind machines. There are the companies that make the gears, there are companies that make the turbine blades, there are the companies that make the bolts, there are companies that make the gear boxes that hold the gears.

And that goes up and down the supply chain, and that is a powerful set of businesses that are employing people in fulltime good paying jobs with benefits that make things that go into the equipment, that if you get the policies right, then there's more of a market in order to build and manufacturer equipment. That's a powerful constituency.

And the third are people who work on developing projects, people who do construction, people who make the concrete and pour the concrete. People who provide the materials that go into the concrete. This is heavy stuff.

You don't ship concrete from China to Peoria. You do it locally. And that's a whole different set of jobs, the people who make the stuff and the people who go and lay the concrete pads that the wind machines go on top of.

People think of Detroit as building cars, or manufacturing cars, Detroit doesn't manufacture cars, Detroit assembles cars, The mufflers come from Monroe,

the shocks come from Monroe, remember those stickers you had when you were a kid, Monroe Mufflers, Monroe Shocks.

The windshields come from Toledo. The tires come from Akron. The same is what happens in the wind industry. Only here we have very diverse jobs across sectors you can't put into just one box.

So we took the supply chain study that we did in Illinois, we did it in Iowa. We did it in Michigan. We did it in Ohio. We did it in Wisconsin. Okay? We did it separately in all the states, because if you are the congress person from the 4th Congressional District in Wisconsin, you really don't give a hoot who the businesses are in 5th Congressional District in Ohio. Indeed you might see a little bit of competitive rivalry. Tip O'Neill, "All politics is local."

So we not only identified the companies, we mapped them out. This isn't a quiz, you don't have to read it all, the salient piece of this is this is broken out by legislative districts, and Kevin has used it before. You bring it to a legislator like Senator (Kaylor) from you know, Peoria. He doesn't care what's in Rockford. Rockford is up at the top there.

By the way, for those of you who don't know Illinois, just fun geography. And every state has its own sort of vernacular. As (unintelligible), in Illinois there are three parts to the state, there's Chicago, you can figure that out. That's - oops, wrong button here. Chicago is right here, that's where you are.

There's the suburbs, okay. That's this area around Chicago. Okay? Then there's something called, Down state. Okay, down state most people would think of like here, you know. Here's where Dave Loomis is right here. Rockford up here, all those businesses, all those jobs, that's down state. Just that's Illinois, okay.

But if you are the state senator for Rockford, or that surrounding area, which is not exactly compromised entirely of liberal Democrats, okay? Or if you're from here or here, this is basically Republican territory in Illinois.

This is about business, this is about jobs in your community, okay. What's interesting about this is the businesses aren't all concentrated in Chicago, they're scattered pretty well around the state.

And what each state legislator does when you show the legislator this report, the legislator looks at it and says, "Wasn't my district." Not hard. To make it really easy because sometimes you just got to spoon feed it, we even have these pull out maps.

You know, so if you're from Champagne or Chicago or Quincy Illinois or Rockford, we're going to give it to you so you have the numbers right there. And then in case that's too complicated, we're going to give you a list. And we put the list not by the alphabetical order of the company, but by the alphabetical order of the city.

So it becomes really easy for a legislator to look at it and say, "What's in in for my district, what's in it for me?" And you know, when you have something that goes one page -- I know you can't read that from the back -- two pages, three pages, that's a pretty good visual.

You know, what does this say to you if you're a legislator, this says to you, "There are a heck of lot of businesses in this state, and there are a lot of them in my district."

This isn't complicated, it required a bunch of interns to put together. They dialed up a lot of businesses that we knew from SIC codes and from trade associations. We said, "Are you manufacturing wind equipment, are you a design and engineering firm that's doing wind? Do you make concrete that goes into concrete pads for wind machines?"

But this is political dynamite, we did this is each of the states, and there is nothing that has made our case better with the public, with local legislators, with state legislators, with a congressional delegation in the Midwest states, than this analysis. Good for jobs, good for economic growth, good for the environment.

All right, this shows you the battle that we're fighting. And again, I'm giving you the Midwest power market because I know it best. It's different for example than the Pacific Northwest where hydro is a very, very big part of the power supply.

But you're here in Chicago, you're here in the Midwest, I'm a Midwest guy, I work nationally, but I was born a mile and a half from where I live in the City of Chicago. So let's sort of do the marketplace by the numbers on what this says, because this is pretty dang interesting.

This isn't our vision, this is reality, which just so happens to fit with our vision. All right? The red is nuclear, yellow natural gas, green wind and solar, black, anybody know what black is? Come on? Coal.

Top energy efficiency, let me explain this. There's a quiet revolution going on in energy efficiencies, we're shifting from incandescent bulb to CFLs to LEDs. A little bit of quick math, residential is about 40% of the load in a state like Illinois. Lighting is 20% to 25% to the residential load. So in other words,

8% to 10% of the overall load. All right, tricky math, 20-25% time 40% is 8% to 10%. CFLs as you know are about 75% more efficient that incandescent bulbs, and LEDs are about 95% more efficient.

By 2015-2016 the GEs and the Philips of the world tell us we will be moving to LEDs for much of your traditional residential lighting. I haven't even talked about commercial lighting, I'm just talking residential.

So if you take out somewhere between 70% and 90% of the lighting load from residential, multiply that by 8% to 10%. You're reducing overall electricity demand in the read by something on the order of 6% or 7% just from changes in residential lighting and technological improvements.

That is massive. That's not even talking about commercial lighting. It's not including the impact of appliance efficiency standards on air conditioners and refrigerators. My wife and I have three very large teenage sons, they're all 6' 3" or 6' 4", they eat a lot.

Our old refrigerator was old and it wasn’t appropriate for the degree of eating by three teenage sons. If any of you have teenage sons you can do your own visualization. We got a new refrigerator, it is 35% more efficient than our older refrigerator.

The remarkable thing about it was, you know, green (Howard) and green (Lauren), didn't even go and buy, "Oh you guys bought the super-duper efficient refrigerator." We actually didn't.

Everything we found was 30% to 40% more efficient than what we had. Refrigerators run 24/7. Boom, our electricity load goes down. That's if the kids close the refrigerator. Another story.

Pumps and motors becoming more efficient, HVAC controls, everything is becoming more efficient, and what we're seeing with adjusted EIA data is that demand is actually going to decrease.

So if we get the policies right in terms of renewable energy standards and the production tax credit, and natural gas prices continue to be call it, the $3.50-$4 range. Today it's around middle-low 3s, EIA predicts the migration up to about $4.

And if we don't have any post-Fukushima, the nuclear industry shuts down, we're looking at a tremendous squeeze in the markets of the existing coal plants at exactly the time that the clean air act retrofitting standards are coming into play.

As we've modeled this out what winds up happening is a tremendous reduction in CO2 from the clean renewables coming in the relatively cleaner natural gas take a larger share of the markets, the market being smaller because of the quiet revolution in energy efficiency and coal plants simply getting squeezed out of the market on economic ground let alone where public and political support is.

This is a phenomenal transformation of the Midwest energy economy, the vision is becoming reality and this is why you're seeing the assault that we're seeing in so many of our states on the renewable energy standard and federally on the production tax credit that are important, necessary and vital to wind power moving forward.

We're no longer at the stage in the Midwest and nationally back where we were in 2000 where there was 500 megawatts of wind power. We're now at the stage where there's 18,000 megawatts of wind power in the Midwest.

And that and its continued growth is threatening the companies that own a lot of nuclear and the companies that own a lot of coal. This is what's happening in the market.

It's why you're seeing the coal companies come against and fight all they can on the RES and the production tax credits. And it's why you see Exelon which has something of a green quality in the past, the nation's largest nuclear company, 24% of the nuclear plants in the company are owned by Exelons in Illinois, Pennsylvania, New Jersey and Maryland. Exelon is opposing the production tax credits.

Now let's be clear in the energy industry, everything is subsidized. Coal, nuclear, gas, oil, wind, solar all have subsidies and incentives behind them.

If you don't like it you call it a subsidy, if you do like it you call it incentives. Okay? Same thing. Who's kidding who?

The Woodrow Wilson Institute did a study of what piece of the industry got the most federal incentives and what we used in my law school class at Michigan, the number one part of the industry getting incentives believe it or not is foreign oil.

That makes great sense. That's according to the Woodrow Wilson Institute and the Environmental Law Institute. It makes no sense. So everybody in the

industry has sort of a delightful jujitsu of saying, "Somebody else's incentives are bad subsidy, but ours are justified. We ought to keep them."

I mean everybody plays that game. But unless you're going to do a Cato Institute approach of wiping out everything - in which case wind power would actually do pretty well - and that has an intellectual principal and consistency behind it.

Unless you think there's a political reality to do that keeping the renewable energy standard through boost and create a market for renewables - particularly wind power - and extending the production tax credit for another two to three or four years is absolutely vital if we want to get to that situation have wind power on a level playing field with other energy source.

But this is where the market is going in the Midwest. The Midwest has the largest concentration of (unintelligible) and coal plants. And if we run it out with the existing policy and existing market pressures and expected technological developments between now and 2020, this is the change in the electricity sector we are likely to see.

And that is a market, that is a society, that is an environment, that is an economy that creates jobs and that is worth our fighting for. It wasn't going to come easy. Anybody who said it was going to become easy was kidding themselves.

This is where we want to go, this is where we can go and this is where we need to go. All right? So let's figure out how all of us in different states working together can get to that point in each of our states and each of our regions. That makes a difference in the world. Thank you very much.

Man: Move on to the awards. Any (unintelligible) from people in the audience?

Man: I persuaded everybody.

Man: (Unintelligible) have a question.

Larry Flowers: I saw you effectively debate an English conference a number of years ago in the famous winners and losers presentation.

Man: I remember.

Man: Glenn has now gone away our ECA coops (unintelligible).

Man: We're losing you Larry but I think you were saying the coops were becoming (unintelligible)

Man: Have a distribution line in the country. Do you know the person that has now come in and head of RCA, she's apparently a congresswoman? And what are our prospects for breaking in that important sector?

Man: I think what you're seeing happen on the coop side is a lot of vulcanization. You're seeing a number of coops - for example Dairyland up in Wisconsin - is now moving into wind.

Some of the coops in Iowa have been leaders. South Dakota, East River coop has been pushing to move forward on wind power for a long time. They're pretty forward-looking people.

If you were to talk with the folks at the Illinois Association of Rural Electric Coop, these are good people who are moving wind power. Because what they

are saying is that it is good for farmers' income, its economic growth in their communities as well as good for the environment.

I think it's for lots of reasons that are institutional combined with the legacy ownership on the G&T coops with some older coal plants, it's going to be very, very hard to get (unintelligible) as a whole to be completely with us.

On the other hand I think we've moved past the time where Glenn could take the position that he took which really did represent most of Glenn's members. Because the members are now increasingly all over the place.

I think what you're going to see happening with NRCO, National Rural Coop Association for those who don't know the shorthand, is that on a number of these issues they're just going to wind up saying we have members here, we have members there and we either have to punt.

But you're going to see them not be attacking things in the way that they have in the past. And I'm not taking a shot at Glenn. I think Glenn at that point probably represented a good number of his members but since that time a lot of his members have moved in.

That whole distribution side and at the GMT side into wind power developments. At that point it just makes it difficult for the National Trade Association to be against what they were against but because of some of the legacy they may have a hard time being for, for another thing.

But that's why for example they supported the transferable tax credits, the renewable energy tax credits (unintelligible) the renewable energy bonds for the rural electric coop.

I think ten years ago they might have said we're not interested. Now they're saying we want the clean renewable energy bonds because we have a fair number of coops that want to go forward with wind. That's a good step.

Man: Hi. Do you know of any municipal utilities that have substantially high penetration of renewable energy?

Man: A couple of them. Some of the Pacific Northwest utilities like Seattle and so forth have a lot of renewables as part of their portfolio.

Sacramento has, the city of Austin has, and in a different way there are now 300 municipalities in Illinois that are doing what is called municipal electricity aggregation and procuring their own electricity supplies.

I think you'll see a lot of them begin to green it up. For example the city of Chicago made part of its procurement a no-coal requirements and they're increasingly buying more in terms of renewables.

They created a $6 million fund by renewables. I think you're going to see the muni, some of which are quite large, get cleaner and greener first because of the price differential and risk factors has converged in favor of renewables.

And secondly because that's what the people want.

Rich VanderVeen: Rich VanderVeen. I'm always interested in your view about the Great Lakes piece. I appreciate you're for the supply chain reports state by state and I understand exactly what you're saying about all policies are local.

From the other standpoint one of the driving issues across any poll I've ever seen is to protect their Great Lakes for future generations -- 95% of the fresh water in America is the Great Lakes.

(Unintelligible) a great writer says if you put all the water in Canada and the United States in ten buckets, the Great Lakes are nine and a half.

It's such a legacy. Such an important driving way to get people's attention and make the link between water systems and food systems and energy systems.

Do you see the possibility of a Great Lakes integrated resource plans whereby we could pull together the governors and the (unintelligible) to focus on capacity needs for the next 20-30 years and doing some serious planning about transmission systems, electrical generation systems, food systems, transportation systems using some of the existing platform we have with the Great Lakes permission, the international cities.

The mayor's meeting in Marquette in June, arrange of international previews that are already in place paralleling the St. Laurence sea-way thinking for eight states and two provinces, Ontario and Washington actually get on the same page and try policies. Do you see that as an organizing principal?

Man: I do but in a somewhat way Rich. And I'm going to make some friends and not make some friends on this.

We see development of wind power in the Midwest and the Great Lakes states as begin vital, necessary, essential, important, good for jobs, good for economic growth, good for the environment.

We don't think that necessarily should involve development in the Great Lakes. I'll tell you why.

Great Lakes as you point out provides fresh water for about 42 million people and eight states and two provinces. It's an ecological gem. It's the largest source of fresh water in the world.

Many people in the environmental community have fought to keep a lot of ill-advised out of the Great Lakes. There have been proposals over the years as some of you may know for oil drilling, gas drilling, tankers carrying oil and so forth.

The Great Lakes are held in the public trust in terms of not developing the Great Lakes. There are about four reasons why we think developing wind power in any significant way - and I don't mean Toronto's one turbine by the lake or Cleveland's talking about doing four or five turbines - why we don't think it's well advised.

First of all big winds. Did we learn something from Cape Wind? We've learned that it's highly controversial once you start developing in the lakes. And the wind industry will be scarred by a huge battle of people who would otherwise support wind development but will oppose it in the Great Lakes.

If that were the only place to do it in the Midwest it would be one thing. But we have tens of millions of acres of rural lands with high wind speeds in which wind development is good for farmers' income, good for rural economic development and good for the environment.

In short, we don't need to do it. Secondly, there will trigger a legal battle over the public trust doctrine and things will drag on for a long time.

Third, the fact of the matter is wind development in the Great Lakes is going to be about three times expensive as it will be on land.

And the question is why is anybody going to pay three times as much for wind-generated in Lake Michigan than they would pay three times as much from wind generated by Rockford, near Bloomington, Illinois.

The numbers don't come remotely close and the logistics of doing it in the Lake are very, very complicated and there hasn't been very much development in fresh water which freezes over in the winter more than saltwater.

And fourth and finally apart from the economics and the legal problems, just from the environmental community we have a hard time saying, hey, wind power in Lake Michigan is just great.

You want to do oil and gas developments? No way. Keep it out of the Lake. Once we open up the Great Lakes to energy development Great Lakes and all the reasons Rich that you said, it becomes a lot harder to stop other things out of the Great Lakes.

We have tens of millions of acres of windy areas of the midwest that can be developed with wind power. Let's focus where the public supports it, where there are fewer legal barriers, where the economics are much, much, much more favorable and where this can be done in a way that doesn't present ecological risks in a bigger picture.

That's where we come down in terms of Great Lakes wind development. We want it in the Great Lakes in the Midwest states. We don't necessarily have to do it in the Great Lakes.

Ian's giving me the time to go unless there's one more question.

Man: One more question.

Man: All right, yes ma'am. Howdy.

Woman: Wind development in the Lake. I think you have the baseline point you raised or the point of starting a dialogue. I would disagree with some things and agree with others.

With that said I'm not sure you answered Rich's question which was an IRP for the league and (unintelligible) was talking and clarify with me for about in the Lake.

So take that off the table. I think he was talking about a regional IRP, and could the states and possibly the provinces get together and think about it.

We don't have a national energy plan. I mean we have the new 80% report but really a policy driver -- could those states and potentially the provinces get together on an IRP.

Is that right, Rich? Okay.

Man: Got it. So I gave Rich a long answer but I didn't answer his question. What can I say?

I think the regional IRP is interesting but as a practical matter here you have separate state public utility commissions and there are huge legal issues on what can be required of the separate states or not.

Fact of the matter is right now you have Illinois -- well, let me take it from the top. Iowa is number two in the country in terms of wind power development. And MidAmerican Energy announced two days ago that they're going to do another 1500 megawatts of wind power.

Illinois is number four in the country. Minnesota is number six in the country. There's more wind development in Indiana than people thought remotely possible.

(Unintelligible) said about - Larry remember we had this discussion six, seven years ago (unintelligible) was Indiana there's nothing that's developable or not much. I mean Indiana is a huge amount of wind power beginning to be developed.

So things are actually working pretty well. I think if somebody could construct an IRP that all the states would buy into that's something that is worth exploring.

I just don't think it's necessary. And I think you'll find a number of the states for reasons of public utility law in each of the states being very reluctant to do it.

So worth exploring. Talk to some of the state public utility commissioners but back in Ontario and most of the Great Lake states are frankly doing pretty well in terms of developing wind power.

Every thing's not perfect and every thing's not rosy in (Glucamoma) as they say. We certainly, Rich, as you know took a hit in Michigan last November.

But there's a lot of wind power going up and it's not clear to me that an IRP would necessarily drive more.

But if you can find a way to do it -- our goal is to get that wind up. Thank you very much.

Man: Thank you all. And thank you (unintelligible) for coming in and talking to us. It was great.

So the next element of our program today is one of the best elements and that's the award for all of you. So the Wind Power America award for the different organizations.

And the first one that we need to dive into is the outstanding Wind Working Group Award and this one is for Wind Working Group that has demonstrated extraordinary efforts in promoting wind energy deployment in a state.

When we sat down and started thinking about this and got the nomination it wasn't that much of a decision. There's one working group that has started very early on in WPA's history.

When you talk to the ringleader of that state he always knows exactly what's happening exactly everywhere and he comes and he tells you the six or seven things that he knows is happening to make wind development in the states.

Even though they haven't had funds from WPA in a long time, still get newsletters from the state, still is very active, and he seems to drive everywhere whether he's in his car or his motorcycle, he will show up all of the time.

And if that didn't give it away I would like to present the Outstanding Wind Working Group of South Dakota and Steve Wegman.

So Steve, for staying with us and putting up the great fight for all of those years. Thank you.

Man: (Unintelligible).

Man: The next one is Outstanding Wind Leadership Award in the education award. And this is to an individual organization to be recognized for extraordinary efforts developing and implementing and/or promoting wind energy education at all levels.

Steve Wegman: So everybody knows I graduated from the University of Massachusetts or most people do. One of the kind of core university's that have been doing wind energy for a very long time.

But there is another organization out there that has been doing wind development in the education phase for about as long as UMass.

As I started getting into the industries the gray beards of this organization would come up, have always been overly engaged both looking at hyper-powered systems and testing of turbines have always been at the kind of forefront of research and moving things forward.

They're not here today but the team of (Kent Archer) and (Von Nelson) who have been working in west Texas for years promoting wind development and training people in wind technology are the award recipients to this award.

Ian Baring-Gould: (Thomas) I think you're up.

(Thomas): Thank you Ian. So actually let me switch this. Sometimes it's weird. Sometimes it goes on and off.

So I have to interrupt our broadcast for a quick PSA about the MVP of WPA. I can explain that. You paid for it. (Unintelligible) Susan Hagan, Mark Jacobson, (unintelligible), (Cory Kristle), (Ruth Baronowski), Frank Oteri, Julie Jones, (Zack Parker), (Margerite Kelly).

Let me do that one more time. (Unintelligible), Susan Hagan, Mark Jacobson, (unintelligible), (Cory Kristle), (Ruth Baronowski), Frank Oteri, Julie Jones, (Zack Parker), (Margerite Kelly).

I alluded to this earlier in the day but it's extremely important that I'm (unintelligible) what's it about now.

All of you in tribute to this group but we all talk about how great this event is each year. But it's very important to pull back the proverbial curtain and recognize the wizards that are behind it.

The list that I just read for you, I would love for every person on that list to have been here today. Many of them have been here in prior years so you know virtually everyone on that list personally or you've seen messages from (unintelligible) or you've been on conference calls or webinars with them.

But it's extremely important for us to recognize just how impactful their efforts are. Especially in light of budget cuts and austerity movements where not everyone is here even though it's on (unintelligible) wind power there were far fewer people in attendance.

I wasn't an attendant this year so I'm very fresh now (unintelligible). But many of the slides in the presentation that (Royce) put together today wouldn't have happened were it not for many people on this list.

This whole even would not take place for all of them. So while this is the equivalent of a voluntary RPS, I'll call it an EAA voluntary (unintelligible) acknowledgment.

I'm about to applaud everyone on that list that I read. And we will bring the video link up again in a moment.

Now back to our regularly scheduled broadcast. There's a lot here so I did have to put together some notes.

So for the outstanding wind partner America award, partner award, this is for an individual group that has provided strong support to WPA's teams' efforts, educate and engage and enable critical stake holders to make informed decisions about how wind energy contributes to the US electricity supplies.

The award is for continuing efforts to support WPA including (unintelligible) project and (unintelligible).

Today this award goes to James Madison University with some background information. Yes. Congratulations.

JMU is working on the (unintelligible) school's best practices manual which obviously in light of recent events is all the more needed.

They've been active vocal participants in (unintelligible) schools. The WAC sites four installations as well as five affiliate schools with 13 turbines.

They've been working with (unintelligible), (unintelligible) and off shore (unintelligible). (Unintelligible) is in the audience still and he's right there.

Jon, please come on down with your entire team. Congratulations.

Man: So next I'd like to invite Larry Flowers to give the Larry Flowers Updating (unintelligible) Award. Remember that comment about never wanting to be a part of a club that would have me as a member?

Larry Flowers: Yes I do.

Man: First of all before I do this I want to recognize my colleague and several guys. Dwight Bailey, (unintelligible) in America. Dwight, stand up and be recognized.

For all you young people here (unintelligible), all you young people you work really hard and are really effective, an extraordinary effort. That's what you look like if you're successful.

He's come back to touch the crows and I also appreciate this opportunity to see all your faces and some (unintelligible) as well.

This is an award that I'm happy to present to actually not only a colleague but a real friend. This goes to an individual that exhibits extreme dedication, leadership, has overcome significant obstacles to successfully deploy wind.

And this year it goes to the cruise missile Andy Kruse. So (Andy) the nomination goes (unintelligible) he's a visionary, an advocate, a salesman, a lobbyist, an optimist, a tireless spoken for (unintelligible) wind despite seeing

the company that he founded (unintelligible), he managed it to bankruptcy, he moved onward in his leadership role with a (unintelligible) while maintaining leadership with my committee, the American Wind Energy Association for wind committee.

He's a winner by any standards so (Andy), congratulations.

This reads the (unintelligible) leadership award is presented to Andy Kruse for being a visionary, an advocate, a salesman, an optimist and a tireless spokesman for (unintelligible). Way to go, man.

Man: I'm back again and just for the record MVT is Most Valuable Team. I left that off. So, the next award that I'm presenting is Novis Ventis, the new wind award for an individual who's relatively new to the wind field but is already playing a major role in advancing wind energy deployment.

So for dedication to wind energy outreach efforts in the southeast region to advance deployment, (Simon Nieham). (Simon)'s been a leading voice for the wind industry in the southeast through his role as a southern alliance for clean energy (unintelligible).

He has contributed to the North Carolina wind working group, South Carolina wind task force, Georgia wind working group, Tennessee/Kentucky wind working group and the Appalachian wind energy institute.

It helps develop significant progress in engaging stake holders throughout the region. (Simon), congratulations.

Man: Good one or the bad one? All right. This next award is for an individual or group that has played a major role in advancing the deployment of small wind,

100 kw or smaller. And the winner goes to (Brent Summerville). Where's (Brent)?

(Brent) can't be with us here today but Ian will accept the award on his behalf.

Ian Baring-Gould: So for his leadership in the small wind certification counsel and all of the work that he has done to promote small wind turbines and the sustainability and survivability of that industry (Brent) received that award. So we'll get it to him.

Man: (Unintelligible). So now we're going to go to the regional awards is next. So for the western regional leadership award - and all three of these awards, western, eastern and central or the Midwest sorry, it's all for individuals or groups who have played major roles in advancing the appropriate deployment of wind energy and explaining the wind energy story within their regions.

The next organization isn't here today but is western resource advocates for the west. It is for the work that (Suzanne) and her team have done in times of water and energy nexus.

For years Western Resource Advocates have been an organization that has talked about power in the west and linked the issues in regards to water. How many board hearings that (Suzanne) and her team have had to sit in front where you have (PUC) members who are not at all convinced, utility boards who are not at all convinced, talking about the role that water has in the power sector in the west.

So for their dedication and effort, Western Resource Advocates.

So for the Midwest region another organization that has been tireless in the efforts to overcome barriers to wind energy in this part of the country, one of the AWEA partner organizations but again, huge history of tackling the complicated issues primarily around transmission and power in the Midwest. So Wind on the Wires, I believe we have someone from Wind on the Wires here to receive the award for the Midwest.

Man: Great. Thank you.

Man: And then finally Eastern wind power was down in Atlanta last year and the whole development of turbines, the class three turbines on tall towers that can now further development in the Southern part of the United States.

There's one organization that has taken the cake in regards to promoting development in the Southeast both looking at land-based but also in offshore wind technologies.

Also an organization that has supported WPA and has kept up the efforts when other organizations could not. The Clean Energy States Alliance receives their Eastern award. Oh, I am sorry I did it again. Yes, sorry.

And then lastly, the final one is Larry Flowers (unintelligible).

Larry Flowers: When Wind Power America got going, one of the things that we only had 2500 megawatts installed. There really are only four states that has serious wind installed - Minnesota, Iowa, Texas and California - so we thought it would be appropriate as state put in their first commercial wind project to celebrate that with a (unintelligible) award.

So I got to go and (Marguerite) got to go to a number of celebrations of a first project in the state and of course the first project is sort of that's the one everybody goes to to say, can I live with this in my backyard, is the sound okay, what's happening with the rural economic development in this area, what businesses have popped up, what's happened to (unintelligible) deployment.

And it was really the stimulus of that first project that really created where we are today so I don't know where they got the 3.4 gigawatt Wind Power of America actually connected to but it was that first project that we worked so hard on with the developers, with the state, because we knew once wind was installed in their backyard for the most part people would embrace it because the reality of wind is it's good.

You have to see it in your backyard because you folks in Nebraska wouldn't believe us in Colorado or Iowa. You'd have to get your own first project. That first one's all (unintelligible).

So we really celebrate these first big commercial projects so this year it goes to (unintelligible) Electric. Suzanne Gibson for the Fire Island project. There it is folks on the front of the cover. They're going to be flying to Anchorage to see this great project.

Suzanne, come on up here and get this on behalf of (unintelligible) electric.

So I've been corrected and it won't be the first or the last time. In theory, the other thing about this project that makes it so exciting is Wind Power America also as you know worked with Native Americans. Everybody remember (Bob Doff) and the great guy he is in floating wind on tribal lands.

And this is also a Native organization owned project. Not only is it the first large commercial project in the last but it's Natively owned. So this is like a double award and so way to go to them.

(Unintelligible) the Fire Island Wind Farm (unintelligible) in recognition of efforts to develop the first utilities (unintelligible) Wind Farm Alaska. This did not come easily folks. This was many, many years, a guy named (Steve Gilbert) at (unintelligible) four jobs ago was working this. He invited me up to meet with the (unintelligible) board.

It wasn't one of my better days but despite that they were successful so congratulations.

Man: Great. Thank you all for the award and as is always the case we can only recognize a very few number of the organizations and the people that make this organization, all of you, function the way you do.

So one last round of applause to all of the winners. And then a round of applause for everybody else. So next up on the -- I have to give the webinar audience a minute to go crack in.

But as we do that the next speaker always highlight the WPA events here. Ryan Wiser is going to give us the market overview. Ryan really needs no introduction. He and his colleagues Mark at Lawrence Berkeley National Laboratories have developed a very well-deserved reputation for the analytical work they have done analyzing the wind market, incentives, tax credits, all of these types of things that make the wind market move forward.

Every year the report that he and his team pull together to really summarize the wind market is one of those reports that is eagerly awaited by everybody (unintelligible) document from the department of energy that get tons of use.

So Ryan is going to tell us how we did for the first time, he's going to tell us how we did last year.

Ryan Wiser: Correct. Good afternoon all. A pleasure to be here. So this is going to be a bit of a preview. This is an annual report that we put out but the year is not done and therefore the report is also not done so you'll be getting the quick preview here today.

Most of the content that will be in the report will also be in this presentation so I imagine that a lot of them may be a little updated before we go to the press in a month or so.

For those of you that are not aware of this particular report it's a report that the Department of Energy puts out on an annual basis for a good number of years now.

It features summarized trends in the US wind power market obviously with some focus on the last year, in this case 2012.

I want to be really clear about scope. Our scope focuses in effect on wind turbines over 100 kw in size and this report in part has spawned two additional reports as well, annual reports the Department of Energy is now executing.

There's an offshore wind energy report that Navigant and NREL and others are involved with now in its second year. And there's a distributed wind report that a lot folks in this room, Alice Orrell, (Eldridge Weaver) who I don't see

but is perhaps out there somewhere. I think Larry Flowers is also involved with that particular effort.

So if you're interested in distributed wind and look forward to an annual report coming out shortly on that topic and if you're interested in offshore wind similarly an annual report on that topic as well.

I also want to acknowledge not only the funders but of course also the co-authors and (Mark Bolinger), my colleague at LBL puts in an enormous amount of effort to really pull together what I view as the most interesting aspects of this presentation that I get to give today.

But in addition we have a whole crew with us at LBL that play varying roles as well as important contributions from NREL and from Exeter associates as well. So thanks to all of those folks.

The contents of the report are pretty broad. Installation trends, industry trends, top performance and pricing trends. Policy and market drivers and future outlook.

It's really the cost performance and pricing trends that are really the unique aspect of this report so for the purpose of this presentation I'm going to go through installation and industry trends pretty quickly and then pause and maybe take a little bit of a breath and go a little bit more slowly through cost, performance and pricing trends and end with a bit of future outlook leaving most of the policy and market drivers material for another day.

So starting with installation and industry trends many of you have already heard some of this information so again I'm going to be skimming through this pretty quickly.

I think we're all aware that 2012 was an enormous year. A new record of wind power installations motivated in large measure by the then planned expiration of the federal tax incentives. Those now of course have been extended but that prospect for an expiration created a huge rush to develop projects last year.

About $25 billion of investment in over 13 gigawatts in wind power capacity. Really a record year. As a result of that record year 43% of all electric capacity addition in the US last year were from wind. That is the leading contributor to our new electric capacity addition above natural gas, above coal, above all other resources.

And also for the first time the combination of all the renewable technology especially wind and solar made the renewable contribution over 50% of the new electric capacity edition in the US. So certainly an important milestone there.

In addition, the US regained though narrowly I believe in annual wind power addition. China has led in this category for a ccuple of years. This last year you can see on this chart on the upper left that we narrowly beat China out.

So one might acknowledge the China is still ahead of us in total installed capacity and indeed though the US addition this last year helped lead the global growth in wind power additions. The last the contraction of the US market this year in 2013 is going to lead a contraction probably for the first time in global wind power capacity addition. So not all good news.

The US gets about a little more than 4% of our electricity from wind. Not bad. God a long way to go to get to the market leaders. Denmark is about 28%, Portugal, Spain, Ireland and Germany are all at 10% or above.

We've got a long ways to go to the countries that lead on this particular matrix. But at about 4% of the nation's energy mix from wind, wind is knocking on the door of hydropower here. Give it a couple more years and wind will surpass hydro in terms of overall production of electricity in the US energy system. Certainly an important contribution.

Looking at individual states, Texas added the most wind power capacity in 2012 followed by California, Kansas, Oklahoma and then Illinois. Texas still leads from the cumulative aggregate capacity by a wide margin, more than a two multiplier over California, Iowa, and all other states.

Importantly, three states are now able to meet more than 20% of their electricity generation from wind and nine states over 10%. So we're seeing very sizable penetrations of wind of course in a growing number of states.

(Unintelligible) we have a lot of wind still in the planning process. There are currently roughly 120 gigawatts of wind that are sitting in transmission (unintelligible). These are wind projects that are in development, that need to be interconnected as all wind projects do to a transmission line or distribution line and therefore enter into the transmission and interconnection queues.

A 120 gigawatts, twice as much wind power capacity we have today. And very similar to natural gas. Natural gas also at around that 120, 130 gigawatt level.

I want to acknowledge though that if you looked at this chart a couple of years ago there would have been more than 300 gigawatts of wind in transmission and interconnection queues.

Now that's partly because transmission and interconnection queues were formed at the curb so I don't want to state that that's as a result of lower interest in wind. I don't think that's an appropriate message here overall.

But there is less capacity there and if you look over the last several years you've seen drops not only in wind capacity in the transmission and interconnection queues but also (unintelligible) and nuclear.

And you have simultaneous increases in the amount of natural gas in transmission and interconnection queues and solar. And that's certainly a reflection of the dropping cost of both solar and natural gas. A cogent competition for wind in some regions of the country.

Let me talk a little bit about industry trends and that's all of the installation trends I'm going to talk about now let me turn to I think what are about four slides on industry trends.

So last year the three big OEMs, big turbine manufacturers, GE, Siemens, Invensys represented roughly 70% of the US wind turbine market. At the same time we see increased diversity among the number of wind turbine manufacturers that are installing turbines in the US.

If you go back to 2005, in 2005 there were only five turbine OEMs that installed turbines over 100 kilowatts (unintelligible). That grew to nine in 2007, 21 in 2009 and now 27 in 2012 but notwithstanding the fact that the big three continue to really dominate this market.

There are a huge number of turbine manufacturers that are interested in the US markets and indeed are participating in the US markets in varying degrees.

So now let's talk a little bit about imports and exports. Ultimately how much of this equipment being installed in the US is coming from domestic manufacturers rather than being imported from overseas.

So this first chart shows the aggregate import of wind turbine equipment over time. So on the left here this is 2006, about $2 billion of wind turbine equipment was imported into the US for installation and wind turbine projects in that year.

You can see imports grew up to 2008 but dropped substantially since then through 2010 and then we see a progressive increase in the amount of wind turbine imports over the last couple of years.

Now I want to be very clear here. This is a relatively modest growth in wind turbine equipment imports relative to the massive growth in installed wind power capacities that has occurred over this time frame. What does that mean?

That means in 2006 and 2007 roughly 70% of all of the equipment going into wind projects installed in the US was being imported from overseas or at least outside of the US and not overseas.

In 2012, our estimates put it under 30%. We've got over 70% of the equipment going into US wind projects domestically made. Pretty substantial. Not too many consumer products, not too many energy infrastructure projects have 70% local content.

So very, very substantial improvement in the amount of domestic manufacturing over this time. Now let me not fool you. The supply chain is under severe pressure. It's pretty tough to go through the (unintelligible) and ramp their business in a logical fashion so there are certainly folks that are

losing their jobs, a number of the manufacturing facilities are struggling, some of them are closing and consolidating.

But nonetheless this substantial decline in imports and consequent substantial rise in domestic manufacturing really is an extraordinary story for the US wind sector.

So where -- and actually let me back up one more moment and talk a little bit about exports. Historically we don't talk too much about exports of wind equipment from the US but in fact we do have some exports and those exports are also growing.

And I want to emphasize that we're really focused on larger turbines here. If you look at the small turbine market, the US dominates that market even more so than the large turbine market. Within the large turbine market you can see that there is - it's a small line here - but there are exports and you can see that those exports have been growing over the last couple of years.

So where are importing good and where are we exporting them to? If you look at imports on this chart you can see about half of those imports are coming from Asia, something like 35% or so from Europe and then quite a bit also from South and North America.

If you looked at where we're exporting wind turbine equipment and specifically wind turbine generating sets you can see really largely North America, Canada and then South America, Brazil and others as well.

Now this slide is an eye test. But what it says for those of you who do not wish to enter in the eye test portion of the presentation this afternoon is that if you focus on total wind turbines, a wind turbine to sell, an imported wind

turbine to sell, you can see most of that equipment is coming from Europe. A relatively substantial amount from Asia as well including both China, India and Japan. But a substantial amount from Europe, basically (unintelligible), Siemens importing a whole wind turbine in effect at least to sell in the US.

If you look at towers, the vast majority of towers that are imported - and we certainly domestically manufacture a large fraction of our towers - but those that are imported they are mostly coming from Asia. Wind blades and hubs and wind generating sets pretty globally sort including significant factions from Asia, South America, Europe and in North America.

Okay, so that was the quick portion of the presentation. I'm going to go just as quickly through the next portion but I probably have more slides to go through. But nonetheless I do want to really emphasize the cost performance and pricing trends because this is really what is unique about this annual report.

WIA has an annual report. Bloomberg new energy finance has an annual report. (Unintelligible). Everybody has an annual report on the wind factor but the cost performance and pricing trends are relatively unique that we collect at LBL.

So let me start with capital costs then I'll talk about wind project performance in the US and finally I'll talk about the most important aspect per wind power purchase agreement pricing. Basically what are utilities paying for wind.

So starting with (unintelligible) one of the major components of (unintelligible) cost reports are the turbines themselves, how much does the turbine cost.

A turbine represents anywhere from about 65% to 75%, typically of an installed wind project. So wind prices you can see bottomed out here in about 2002 or so. They then increased rather substantially through about 2008 and subsequent to that we can see a very substantial decline.

That decline occurring really at the same time that we're also seeing a dramatic upscaling in the size and performance of wind turbines and so made all the more impressive that this cost decline is occurring at the same time as (unintelligible) are getting higher, rotors are getting larger, turbines are getting bigger in terms of (unintelligible).

If you wanted to do a turbine order today and you were a big developer you could certainly get a standard GE technology for $950 per kw. If you wanted to get a more advanced low wind speed technology you might get up to $1300 per kw range.

That's where the range of current wind turbine pricing in the market depending on the technology and of course depending on the bargaining power and location of delivery for the turbine as well.

The results of that decline in wind turbine prices is also that the aggregate installed cost wind power project has also declined over the last couple of years. That is what (unintelligible).

Again you see this rather unfortunate increase in the installed cost of project earlier than 2000 but we're now beginning to go down the bend of the curve and the installed cost of wind project across the US. That's a huge range, right. Each of one of these dots is a different wind project.

We've got a sample of 50 gigawatts of wind project in our installed cost sample. It's a big range but if you look at the overall capacity way it averaged at now below $2000 per kw.

We do see some economies of scale so here the smaller project under 5 megawatts in size. These are the biggest projects, over 200 megawatts in size. Again, substantial scatter from one project to the next but the overall average cost of projects declined with project size. Not altogether surprising.

We also cut the data by regions. These are the regions as we've defined them so far at least for this year's report still perhaps subject to some revision.

We have the Western US, we have interior US - really the massive wind belt here - the Great Lakes region, the Northeast and the Southeast and it will all be presenting on the next chart and then some additional charts later to cut our data into those larger regions.

If you look at the installed cost data across the region you do see some variation in the average installed cost. The interior part of the US, again that big central part of the country has the lowest installed cost well below $2000 per kw.

Great Lakes region is in second place there and then the Northeast, then the West and then the Southeast. But the Southeast has very little sample here so I wouldn't place a huge amount of emphasis on the overall average in that particular instance.

Okay, that's installed cost now let's talk a little bit about performance trends. Performance trends are complicated for a variety of reasons and that's because they're impacted by a lot of different variables.

The first variable of course that impacts performance -- actually let me step back a moment and say what do I mean by performance. In this case I mean capacity factor. That's the definition of performance that I need to be using for this module of the presentation.

Energy output for wind facility divided by the amount that would be theoretically feasible were the wind really operating at nameplate capacity 100% of the year.

So one of the things that impacted the capacity factor is scaling in turbine. And you can see here that the blue sort of bars here represent the average nameplate capacity of turbines. You can see that increased over time.

You can also see that quite recently there's been an uptick in the average height in wind turbines and more significantly in the average rotor diameter of turbines. This increase in the rotor diameter of turbines is not only substantial but it's also one of the things that's unlocking a lot of the lower wind speed sites that we otherwise have available in the US.

So performance is clearly impacted - as you'll see later - by the turbine technical trends that we see in the market. The addition of course, performance impacted by where you place your turbine.

Are you putting them in a low wind speed site or are you putting them in a high wind speed site. And in the end we find is that in the US we have progressively moved towards lower wind speed sites over time.

Now is that because we've run out of high wind speed sites? No. I mean it doesn't take much to realize when you look at -- I'm going in the wrong direction. That's not good.

If you look at this slide alone I mean look at that wind resource. I mean we're not anywhere close exhausting high wind resource sites in the US by any means. But we are moving towards lower wind speed sites on average.

Why? Partly state policy. Right? Some low wind speed states would like to have projects in their state for economic development reasons but as or more importantly because the technology that we developed in the upscaling in turbines has allowed us to economically extract energy from lower wind speed sites.

So this blue line here - it's kind of hard to see - is the average wind resource quality in which wind projects have been going into the US. We haven't got the 2012 data yet. It will be coming in the final report but you can see that in 2011 wind projects on average installed in 2011 were located in wind resource sites that were roughly 17% less energetic than similar projects installed in 1998-1999 timeframe.

Again, partly a reflection of state policy. Partly also a reflection of these amazing improvements in technology that allow us access to those sites and access to economically attractive with energy from them.

Another factor of course that impacts wind project performance is curtailment. Because of transmission limitations, because of generation in flexibility wind power projects are not always allowed to deliver the electricity that they could supply to the grids.

Now one thing that I want to very clearly note here is that we've had an enormous increase in the amount of megawatts and wind installs over the last number of years. We all know that.

The amount of curtailment that we've seen has actually decreased over the last number of years. You can see here now -- let me be very clear. This is not a comprehensive picture. Curtailment is a very difficult thing to estimate first of all because it's for how much wind did you generate and how much could you have generated? And how do you know how much you could have generated if you didn't actually generate it?

A bit of a complicated aspect, there's some other complications there as well and as a result we don't have comprehensive nationwide data on curtailment.

So focusing on the particular regions for which we were able to collect data you can see a dramatic decrease in curtailment. In 2009, within these regions for which we collect the data have gotten almost 10% of all potential wind energy was curtailed.

In 2012 that figure is down to 2.7%. Note in particular the dramatic drop in curtailment in (unintelligible) in Texas. From 17% in 2009 to just 3.7% in 2012. What's going on there?

Two things. Transmission. Texas built transmission to where the wind is. That's curtailment. You can get it out of the West Texas region and get it into Houston and the other load centers in the other parts of the state.

In addition, market. That just went from a (unintelligible) deficient zonal energy market to a more efficient nodal energy market. Not all of you - some of you know what I'm talking about. The others (unintelligible).

But suffice to say that that unlocked additional flexibility in their system allowing the curtailment level to decline.

Curtailment is still important across these regions -- 3%, not minor. Obviously the wind, if you're a wind owner you'd like that figure to be zero but certainly 3% is a lot better than 10% at a minimum. So we have seem some decline in curtailment.

Now as a result of all of those factors however, we actually have not seen on average an increase in capacity factors in the US over the last ten years taken place. The average capacity factor for wind projects installed in 2011, in 2012 basically the same as what we were installing in 2002 and 2003 timeframe.

So a little bit peculiar. You'd think okay we've got these great turbines why aren't we seeing better capacity factors but it's in part a result of some of those other trends. Moving to lower wind speed sites in particular.

Okay. Let me talk about trends that we do find. The first is a regional one. This slide focuses just on projects installed from 2007 to 2011. You can see that the interior part of the country which was basically selected by us to include the most windy areas of the country not surprisingly has the highest average (unintelligible) factors of probably about 36% there it looks like (unintelligible).

And you see lower capacity factors in the Great Lakes, the Western region, the Northeast and then finally the Southeast among the samples.

Now I mentioned earlier that the average wind resource condition in which project has been going in has declined over time. So let's try to control for that so we really can see the evolution of wind turbine technology.

So this graphic splits all of the wind projects in our data sets into three kinds of underlying resource conditions. Lower wind resource sites, medium scale resource sites and high resource sites.

This is basically wind speed, it's not exactly wind speed but let's not go into the details. But in effect this is class three, this is probably class five and above and medium is around class four in terms of wind speeds.

We then cut our data into three turbine (unintelligible). So just focusing basically on GE technology, GE is a major supplier in the US, they've seen a pretty steady and obvious progression in technology over time.

The GE 1.5 turbine with 70.5 meter rotor diameter, this was a technology that was being installed in the 2003-2004 timeframe. And the GE 1.5, 77 meter, this might be a 2010 project and the GE 1.5 82.5 meter diameter. This is standard GE technology installed let's say in 2011 as well as to some extent in 2010.

And you can see within those (unintelligible) substantial increases in average capacity factors. So in medium wind speed price (unintelligible) low wind speed site old technology installed in 2003 would have 25% capacity factor. That same very project today if using GE standard technology would be about a 32% capacity factor.

Let me also be very clear. GE has gone well beyond these three technologies. There's now a 100 meter rotor diameter option. That 100 meter rotor diameter

option was largely in our data set installed in the year 2012 which also means we do not have a year's worth of production data for them. So we cannot show those on this particular chart.

But suffice it to say that in a year or two where we clock a GE 100 meter rotor diameter technology on this start as well these lines are going to almost off the chart. They're going to be way up here. Substantial, enormous improvement in project performance with wind turbine technology over the last 10 years really opening up the low wind speed markets in the US for economically extracted wind development.

Okay, so cost trends, installed cost trends and performance trends are nice but utility is typically purchasing wind energy under a long-term contract and we as end-use customers care about what those contracts are priced at and how that compares with the competition.

So I want to talk now about wind power price (unintelligible). In particular, at LBL we've collected data on over 300 power purchase agreements for wind projects installed from 1998 to the year 2012. We have about 24-25 gigawatts of wind power capacity for which we have long term pricing knowledge for those individual projects.

That represents approximately 42% of all the wind capacity added over that period and up 70% of all the capacity that was sold under a bundled PPA. There's plenty of projects that are sold on a merchant basis in short term markets. Those are excluded from our sample.

Similarly excluded from our sample any project that held energy and renewable energy certificates separately. And there's why there's two different

revenue streams. We want to focus just on those projects that have really one single primary revenue stream. That's a sample and what does the data show?

So each of these little dots represent a wind project. And we're cutting them by execution date not the installation date of the project and it said when the power purchase agreement was executed.

So you can see there's like this really big green bubble up here. This is a very expensive project in California. In fact, you might notice that many of these larger green bubbles are in fact California projects in a particularly high-priced environment in California.

And as a result the rest of the Northwest also has relatively high PPA prices in large matter because a lot of those PPAs are sold into the California market.

So you can see in general PPA scattered here of course. You can see an increase in overall PPA prices through about 2008. Subsequently a rather significant decline.

You'll note that if you're in the interior part of the country basically all of the projects that have executed PPAs over the last couple of years are selling from as well as just above two cents per kilowatt hour to maybe as high as at maximum about four cents per kilowatt hour.

There are some regional trends here and (unintelligible) they're kind of scattered here so it's kind of hard to see what's going on so let's look at overall averages.

The blue represents the average PPA price over time. So the average PPA price and the projects themselves in 2002 to 2003 actually with PPA executed in 2002 or 2003 probably was about maybe 3.3 cents per kilowatt hour.

You can see that as a result of those (unintelligible) mentioned earlier those prices increased substantially through 2009 and has subsequently, absolutely plummeted.

The average price for PPA (unintelligible) probably for the last couple of years in the US is now under four cents per kilowatt hour. You can see in the interior part of the country those are three cent contracts. There are plenty of contracts that are being had for well below three cents but there's some that are about three cents of course as well. So the overall average is about three cents.

Higher pricing again in the Western US driven in large measure by the large demand for renewable energy at almost any price from the state of California and somewhat higher pricing of course as well in other regions in our sample here in this case in the Northeast and this is the Great Lakes region right here.

So very significant improvement in PPA prices over the last couple of years. I also want to note, one can focus on this part of this slide or one could say, oh my gosh, prices are like three or four cents but that was the same as in 2002. You're talking about all these improvements but let's just port ourselves back ten years we could have exactly the same pricing today.

Okay, that's true. But remember, these projects on average are sited in much lower wind report conditions. And so this pricing is in fact substantial improvement on this pricing when adjusted for the wind resource conditions in which these projects are located.

So how does that compare with natural gas? On this last chart -- again I mentioned over here that the average pricing was from nationwide (unintelligible) was about four cents per kilowatt hour.

So this chart (unintelligible) four cent kilowatt hour price over time. A nominal price now, not a real price but whatever. This is the line of the overall average with the production tax credit of wind pricing.

These three lines, those are dotted black lines, represent reference-based natural gas prices from the EIA where this grey sort of tone of uncertainty as we are now calling it at Berkeley Lab represents different price forecast for natural gas as delivered by the Energy Information Administration.

Now this slide presumes that the only benefit of wind in an electricity system is offsetting fuel costs from natural gas generators. Very simplification of either the value or the cost of wind for that matter but nonetheless we just compare the underlying cost of wind contracted over the last couple of years with simply an ability to offset fuel demands in natural gas generator you can see that wind looks terribly attractive in comparison to the reference-based forecast after about 2015.

And thirdly attractive relative to the full range of uncertainty throughout the entire time frame. Now if we didn't have the production tax credit that story changes. And thus concern of the production tax credit within the wind community.

With the production tax credit it's rather evident that today's PPA pricing especially in the interior part of the country, it's really extraordinarily

attractive in comparison to just about any other probably any other generation options.

Okay the last two slides I think. So what does all this mean? Where are we going with the market? So this next slide simply reports the forecast from a variety of different forecasting entities from Bloomberg to (unintelligible). Bottom line, all of these forecasts are rather in agreement that 2013 is going to be a pretty slow year.

We all know that. It takes time for the pipeline to rebuild itself after the expected or prospective expiration of the PPC at the end of the last year. It accelerated everybody's development activity so they would complete their projects in 2012.

So 2013 is going to be a slow year. There will an enormous amount of wind capacity that starts construction to meet the IRS rule and as a result the expectation is that 2014 will be a pretty darn good year. Not back up to the 13 gigawatts we saw in 2013, or 2012 rather but still a very significant year in terms of aggregate (unintelligible).

In 2015 and beyond, kind of anybody's guess. You can see that there is quite a range among just those three forecasts adjusted for 2015 and beyond. And that uncertainty is really driven by a number of the factors (unintelligible).

On the one hand as I just mentioned wind energy with the production tax credit is extremely cost effective in a huge proportion of the United States. So quite obviously that can motivate substantial capacity additions in future years. At the same time though that low pricing is motivated in large measure by the availability of federal tax incentives and lack of clarity in those federal tax incentives certainly is a constraining feature of the markets.

In addition to that low natural gas and wholesale prices, modest electricity demand growth expectations. A pretty limited incremental demand from state RPS's outside of California and the Northeast.

Most of the middle part of the country are well ahead of their RPS obligations in most states and so that's not going to be a huge check in terms of additional capacity installations in the near term at least.

Inadequate transmission infrastructure. Less of a concern than it was several years ago but still an issue in regions. And ultimately especially in the desert Southwest competition from solar.

So pretty uncertain times. We've obviously been very successful for wind over the last number of years but terribly uncertain times at this point and one thing that I would note is that none of those growth expectations suggested here keep us on a path to hit the 20% wind energy target that the Department of Energy analyzed in 2008.

So we've been running ahead of that required growth rate to hit that 20% target ever since 2008. But that is about to come to a crashing end and none of the forecasts over the next couple of years expect that we're going to get back on track absent new or expanded policy efforts.

With that, let me end it and open it up to as much time as we have for questions.

Man: Thank you, Ryan. Always a fabulous presentation. We have about five minutes or so for questions. Or 10 a little bit longer.

Man: Great. Ryan, again fabulous research. I always look forward to seeing this every year.

I have a question about your slide about natural gas prices versus wind PPA prices that we're seeing in a post-PPC scenario you have, I mean it looks like you've just increased it $23 but is that overly conflicting in that the PPC isn't necessarily worth a full $23 to project owners.

Have you run any scenarios that look at what the actual value is if it's much lower, if you look at all the inefficiencies and all the lawyers that have their say.

Ryan Wiser: In fact though it's true, that the current PPC at $23 that is similar to the $23 is the same as $23. In fact that $23 per megawatt hour is not simply the $23 ten-year value of PPC.

The PPC is an after-tax incentive. The pre-tax value of a $23 per megawatt PPC is about 3.5 cents per kilowatt hour. So PPA prices would have to increase by 3.5 cents per kilowatt hour to provide equivalent value as a 2.3 cent production tax credit. The PPA prices are taxed. The PPC is not. That's one factor.

The other factor of course is the PPC is a ten-year incentive. These are 20-year PPAs. And so the $23 is a reflection of both of those factors so levelizing over 20 years and accounting for the pre-cast value of the PPC.

What is not included here in an accounting for the fact that with the production tax credit you're reliant upon a tax equity market that maybe a more costly financing mechanism than what you might otherwise have available to yourself in terms of lower cost and these sorts of things.

There's a range of opinions about what that value might look like not that I acknowledge that that value from here does not account for that and so you might in fact were the PPC to entirely go away the PPA prices wouldn't increase as a whole 2.3 cents per kilowatt hour.

But they go pretty high up in there if not all the way.

Man: Could you go back to the slides on purchasing agreement. The one before that.

Ryan Wiser: There's nothing before that.

Man: Okay, are those numbers (unintelligible) for inflation?

Ryan Wiser: Yes. These are all real 2012 dollars and so all of these figures are levelized over the term of the PPA. Most of these PPAs are 20-year deal but there are some 10-year deals, there are some 25-year deals, there's some 30-year deals but the vast majority are 20-year deals.

These are levelized real 2012 dollar prices.

Coordinator: And once again to ask a question from the phone lines you press star one.

Man: Future outlook slide. You didn't mention anything about coal retirement which we think is one of the bigger opportunities over the next decade.

Ryan Wiser: Yes I think that's a great point. Yes we should add that in. Let me expand on that just a little bit.

We are in a relatively low load dose environment. EIA is anticipating that load will grow maybe by 1% a year over the next 10 to 20 years. That's substantially below low-growth expectations from EIA from a number of years ago.

There's plenty of others who believe that we may see no load growth over the next 10 years. So on the face of it that imposes some challenges for wind. But as Larry just mentioned there's also the prospect for substantial full plant retirement partly due to competition with natural gas and partly due to EPA regulations.

That makes the relatively slow load growth or the pain of the relatively slow load growth partly eased because there's a certain amount of capacity that's simply going offline and to some degree needs to be replaced with something which is most likely to be either natural gas or wind.

Man: Can you give us a sense of how many of the towers that were installed last year were 100 meter hub height and were they scattered across the US or were they predominantly in a particular area.

Ryan Wiser: Oh that's such a stumper because I have no idea. We have the data. We can definitely get it to you. It's not on my brain what proportion of 100-meter towers, certainly a significantly growing proportion and of course one would anticipate that they would predominantly in the lower wind speed areas.

But we certainly looked at the first of those two questions. I don't know if we've looked at the second of the two but we're certainly capable of looking at both and giving an answer so shoot me an email and we'll get it to you.

Man: Ryan, have you modeled or looked at the impact of access to match unlimited partnerships on energy prices, what that would do for wind energy prices?

Ryan Wiser: At LBL we really have not done that. I think there's a range of opinions about the importance of match unlimited partnerships. There are certainly some who believe that it's the only possible federal policy win so we might as well go after something even though it's not going to matter very much.

There's another set of folks who think that it really could matter quite a lot and that full range of opinion is most certainly out there. In either instance it's pretty clear that master unlimited partnerships would be far more valuable in a no PPC world than in a PTC world.

So that's another factor to consider with the production tax credits and presumably the wind and primary goal is to attend the production tax credit, the incremental value of MLPs in a PTC extension environment is much lower than they would be in a post-PTC environment.

Man: Great stuff. You had the one graph that showed the relatively high (unintelligible) cost in California. The little red dots, you talked about that. Have you got any insights whether any policies that either give you extra credit for in-state or penalize you for out-of-state resources what impact that has on the price?

Ryan Wiser: That's a good question. I think in California we don't require the projects to be in-state but we do have certain delivery requirements but really a sizable fraction of the incremental wind serving California load is not located in the state of California.

So I think the higher prices in California are partly a reflection of underlying development costs being higher in California than most parts of the country. It's partly a reflection of relatively lower capacity factors both in California and in the Northwest in comparison to the interior portion of the country.

But it most certainly also simply a reflection of the fact that we have a very aggressive renewables portfolio standard and the utilities need a contract with as much renewables as they can get.

Outside of California I think there's a question of whether there's a question of whether there's an in-state restriction or not is really going to be dictated at the state level so if you think about the state of Texas.

Texas basically requires that their RPS is achieved with in-state resources. But does this have any economic penalty to Texas? No. They have some of the best wind in the country. Why would they need to go outside of the states' borders to get wind even if it were allowed.

On the hand, a place like Ohio that might have an in-state restriction certainly is going to bear a higher price as a result of that. Now there are some offsetting benefits, there's economic development, there's environmental benefits that need to be considered and that legislatives consider obviously when they establish such legislation but there are certainly some states that will pay higher prices to the extent that they restrict the boundaries, the (unintelligible) boundaries that they can purchase in.

Man: Thank you, Ryan. As always. So we're going to take a quick break and come back. Everybody don't run for the door. We've saved to a degree the best for last. That was a hook to get everybody to stay, to (unintelligible).

So the last session is a little bit interesting. We're going to be -- it's another panel session. We'll have a short presentation from a number of different people. Stephanie Savage looking at solar market models.

And the whole idea here is to spend a little bit of time talking about what one organization or one sector is doing and then we will talk about how applicable that is in the wider space.

So whether it's a different state, a different region, whether it's a different technology and get the dialogue going for about another 10 minutes, 10 minutes is the presentation, 10 minute discussion on solar market models, innovative community models with Kevin Schulte.

(Resale) on models for small wind (Andy) is going to lead that. We have a great opportunity, David Niles is that right from the winner of this years wind faring America muni award for the great work that Oakland wind farm has done from a muni development perspective.

And then Larry Flowers wherever he ran off to talking about state incentive programs. And so again quick presentations by all of these speakers and then discussion amongst the panel and amongst the audience all of us about how we can take what was learned from that project or learned from the things that are successful in other areas and how we can expand that more widely to do it across the country.

So let's take 10 minutes and pop back here and we'll finish up. For the people on the phone please hang out for a second and then as everybody knows please clean your own table so take your plates and your cup and stuff and there's recycling and compost bins and stuff at the back of the room.

And we're going to collect in about five minutes there are more snacks and coffee out in the main lobby as well. A little sugar and a little caffeine to keep you going.

Can we get our esteemed panel up here Stephanie, Kevin, (Andy), David and Senior Flowers. No, no we hide them from you no it's up there I'm kidding. No we have the cheap little, we have the cheap little monitor that's up there it's like the unfancy company we are.

Yes what's that step back, Senior Flowers the last person. Of course he's out there talking. So everybody grab your seat, thanks again for hanging out for the bitter end.

So as I said before did the screen go black? It always worries me when there's a black screen. So again as I indicated we're going to start talking about different models that are applicable in different market sectors.

And then have a little bit of facilitated discussion amongst the panel as well as the people in the room in to how applicable those models are in the wind states.

And so to start off we have Stephanie Savage I think.

Stephanie Savage: Hi.

Ian Baring-Gould: Hi, Stephanie comes to us with a very long kind of history in wind, working at NREL initially doing the 1509 grants and helping develop that whole activity.

And then went into the private sector and now luckily to say like Charles and we're hoping that unlike Charles she's not going to flip back out and don't - keep your hands off her (Andy).

Okay good and Stephanie is going to talk to us about solar business models, all the solar gardens and things like that we have - that have really made solar power that is much more, well fairly more expensive than wind be widely applied and why we can or can't use those same types of models in the wind space, Stephanie.

Stephanie Savage: Hi everyone, so as Ian was saying I've kind of worn a few different hats in dealing with wind and primarily distributed wind is most of my experience. I've actually been a spectator, I've been an enabler, I've been a participant in the market in a variety of ways so either through kind of helping in administer various grant programs, (REID) I've spent a lot of time with that program.

Like I said on both sides of the table as kind of a enabler helping with the administration of that program and of those applicants. I've seen a lot of sides of distributed wind.

And so earlier on we were talking about a few times that Tom (unintelligible) this morning about going to California and seeing things. And so I was recently in California and I knew I had this presentation coming up.

And I was on Sand Hill Road, which if you know about Sand Hill Road is where all these crazy (unintelligible) hang out. I have no seen so many (unintelligible) in my life in one area.

It was remarkable this environment to be in I personally spent a lot of time in Silicon Valley before this but being in that environment was just interesting.

So thinking about, you know, the distributed wind market is an interesting market.

Howe can we attract more capital to that market to really make it explode and that's really, you know, we're going to talk a little bit about solar and that's what's happening.

We've spent a lot of money pouring into solar and you can see the results from that. And so when I was there thinking, you know, if I had my five minute time in the elevator or in the parking lot in line for the valet with some of these investors and they ask me about distributed wind sort of and what my take was - would be on that, what would I say.

Even from the first I kind of had been thinking about this presentation so I'll just jump in here. So here we go, here's solar PD and the recent history in the last 12 years.

You can see some pretty big jumps here starting at 2009, some of this, you know, a new era is kind of coming out there's a lot of stimulus the treasury, you know, three programs being stood up at this time, this is some pretty remarkable growth.

There were 90 - over 90,000 installations of solar that happened in 2012, 83,000 of those were residential solar installation. So I think in states where there are third-party (PKA)'s allowed I think everyone is seeing influx of companies like First City, Sun Run, Sungevity, lots of other independent folks running around installing a lot of solar.

California, Arizona, Colorado, New Jersey some states we've seen a lot of especially solar residential action as well as, you know, you can see on this

graph here 40 - 488 megawatts of residential were installed last year, which is a good number.

You know, a lot of the utility scale as well and sort of this category that (greentech) needed both non-residential solar, which is about, you know, 1000 megawatts it's a pretty large amount and that's an interesting mix of kind of distributed scale.

That might be a few hundred kilowatts, it might be, you know, a couple megawatts or something that's kind of how they bucket and it's non-residential but, you know, I don't think anyone disagrees that there's been explosive growth in this market in the past two years.

So how do they accomplish this, this hasn't been all (interviews) for sales, this isn't just folks going out and finding an installer and buying a solar ray for their home, their business et cetera.

And there's a few different models that they've used sort of that have contributed to this growth. So there certainly has been a lot of residential leases as I mentioned that was 83,000 of those 90,000 installations last year alone.

So other third-party power purchase agreements by some of those same folks that are working the residential space they've also either started with more kind of commercial scale, hundreds of - or hundreds of kilowatt scale systems to third-party CPA's, so some of those same names that we've talked about that you've seen before that have been players in the market for a few years.

There's also a lot of other smaller players in the market that are going out that has maybe a little bit of capital but they're using (unintelligible) projects it's a pretty broad range of folks kind of playing in that space.

You also see on this list some models that are very familiar to the wind space. You'll see partnerships lists, that's something that wind is very familiar with if you think back to some of those Minnesota flips that happened, you know, over 10 years ago.

These are models that are very familiar to the wind space. Also kind of crowd funding community projects I know there will be some discussion of that up here after my presentation, something else that lends itself very well I think to the community wind space.

Or to the wind space is kind of this idea of getting community involved, helping find new sources of capital to build projects that really kind of have this community focus where the benefits stay in the community and benefit the community.

There's also been some complex kind of financial engineering you'll see that the solar industry has gotten very good at. Part of that is a function of their incentives being more based on actual capital costs, you know, 30% of costs they're used to the IDC world where the (unintelligible) wind has been really playing in a (TPC) space for many years.

And so they've gotten really good at kind of figuring out interesting ways to structure their projects that sort of help capitalize on maximizing those incentives.

I could get into how sale lease back structures were and inverted leases they can be a little bit complicated. Sale lease back transactions you'll see a good number of those in the solar space.

They're just ways to finance your deals, banks really like this kind of structure it's a way that they've financed a lot of residential or real estate market transactions.

It's something they're comfortable with, it minimizes construction risk, it has a lot of benefits, they're basically just getting - they're minimizing all that construction risk and really just taking ownership and revenue once the projects are actually built.

And this crowd funding kind of community projects is also interesting. Recently you might have seen a company called Mosaic in (unintelligible) where they're recently overcome some regulatory hurdles where they're now able to basically kind of really take this crowd funding idea to the masses.

Where you can put in $25 to basically buy shares, solar these small kind of solar projects and it's just another way to sort of - it's another source of financing that, you know, previously we hadn't really thought about having.

So that's really something that's been expanding as far as in the solar world and I think we're going to see more and more of that. So, you know, fortunately or unfortunately there are some differences between kind of solar markets and wind markets.

Let's talk about some of these characteristics and essentially as you'll see at the bottom it's all kind of boiling down to this. If you're trying to attract more capital markets to really expand your reach investors are concerned about risk.

You want to try to get the lowest cost of capital as possible and risky projects in risky markets make capital expensive. Let's compare and contrast a little bit solar and wind.

And I'll say up front solar is not as fun as wind, that's why we all work in wind. I'm not trying to make solar sound like it's inferior in any way, solar is kind of boring in my opinion.

But it has a lot of - we had some bumper stickers coming out Larry and I that will be our crowd funding projecting coming out but so I'm not trying to make solar sound like it's all peaches and cream it's not and it doesn't work in every situation.

Wind clearly has a lot of advantages over solar but and this is really talking a lot more about distributed wind and craft utility sale but there's some debate about whether modules are approaching commodity status that's maybe true or not true but they're definitely a lot closer that than to say distributed wind turbine.

At this point aside from utility scale manufacturing if you think about the distributed wind phase kind of one megawatt scale (unintelligible) and lower it's really small scale manufacturing, it's much more of a handcrafted material than it is (unintelligible).

And a lot of this again isn't news for most folks but let's just kind of go through some of these. I think (unintelligible) has done a good job of establishing some testing requirements in, you know, small distributed wind for getting there.

There's some good efforts around that but I don't think we're quite there yet. There a lot of different manufacturers on the floor side, you know, and all the way down the chain there's multiple inverter manufacturers.

We have some equipment manufacturers but definitely not as much diversity as to have a solar. The resource piece especially on the distributed side I think is a lot tougher for wind than it is for solar.

Solar is a fairly known quantity it's fairly predictable I think especially on the distributed side. Resource assessment and micro siding is still challenging it's a little bit of a dark art still, which just again it's all feeding into this more risk.

You know, we all know that wind turbine projects can be very controversial against adding to this risk. (PD) I think at this point is much more socially acceptable and part of that is because it's boring it doesn't move it just sits on a roof, it sits on the ground.

It's just not - it seems much less menacing than maybe wind does sometimes. You know, we've seen solar costs decrease dramatically in the past few years. I mean I think a few years ago we were talking for residential for instance, you know, 7 to $8 a watt was pretty common.

I've seen numbers as low as, you know, $2.50 to $3 a watt in falls to residential floor, which is remarkable considering that was only a couple years ago we were talking double those costs.

You know, I've talked to some kind of smaller manufacturers they seem to think they're - the costs are even increasing a little bit. (Brian)'s presentation shows maybe on the utility side that equipment costs might be decreasing slightly.

But definitely not seeing the gains that have been kind of shown kind of the floor module side. A lot of the solar projects I think are much easier to replicate actually in very small scale residential projects.

You know, a lot of distributed wind projects are unique they all have their kind if individual considerations it's hard to sort of replicate some of those. I think permitting for PD's has been easier it's tougher for wind, down the list.

I mean for me it basically all boils down to we're still in a state where there's more risk for a lot of these distributed wind projects than there are for solar. So again if you're trying to attract capital if there's a really, you know, there's a limited amount of capital out there in the world.

And we have a lot of competition from solar, from, you know, these young bright kids in Silicon Valley that are making apps and all these other technological advances there's a lot of places where folks can put their capital.

So as far as really being the most practical on capital in small wind we really want to kind of minimize some of these risks. So what recommendations do I have because I think there is - distributed wind is a really great space.
And I think we've all seen how transformative it can be for communities, it has a lot great economic benefits, it's a really great market that I think has a lot of potential to expand it's just a matter of how we get there.

So here's some of my recommendations, obviously up front incentive in capital, you know, decreasing capital costs are always great but unless states are in the position for it that's going to be something that's politically viable at this point.

So there's lots of other things that you can do that might be able to - that might be slightly more politically viable at this stage just considering the financial climate for a lot of these states.

So, you know, it's simple things again a lot of this isn't really new, this isn't really new ideas but expanding that metering, simplifying interconnection processes is always a good thing.

That's only going to help support a lot of these markets. Small wind ordnances, you know, anybody who's kind of been involved in (unintelligible) development knows it's much easier to work with sort of bad ordnances sometimes than it is to work with no ordnances.

So having kind of rules and working on some of those ahead of time just kind of helps that development process helps decrease risks. And simply the environmental permitting, this isn't always an issue depending on what scale you're working at but there's some, you know, some states where the - there's just a lot of variety and kind of the rules.

You don't really know what you're getting into, again it's all about mitigating that risk. Supporting consumer education I think this is a really important one.

There's certainly been a lot of projects and needs in the distributed wind space. We've had really a lot of great successful projects, we talk a lot about a lot of those today I think we'll be talking about some more of those.

But we've also had some projects that don't look great for the industry. You have turbines that aren't operating as turbines, you know, we've had issues with refurbished turbines.

There's been a lot of issues out in the market place that don't look good for the industry and again makes that perceived risk greater. So things like the efforts of IPAC and the small wind certification council I think are great.

Sort of help inform consumers, help raise the market and show that this is really a viable technology and a good market. And sharing owners experiences I think it's great to share your successes and share the challenges that you've had with other folks so that we don't we make the mistake again and we continue to build on the those successes.

Encouraging the appropriate wind type installation. Again it kind of feeds into supporting that consumer education and really just showcasing the right way to do wind, the right way to really kind of build those projects.

You know, there's been a lot of other experiments and there's certainly a lot of other things we can point to but let's really encourage with your policies and with your efforts let's try to focus on those projects that are really going to be successful.
And then considering (unintelligible) source you are going to do kind of other types of financial incentives in your state. Just thinking about at least considering the production of some of those units.

I think we've all heard a lot of different stories about the pitfalls of maybe just having a capacity based incentive or a cost based incentive that both can be problematic and so at least having I think, you know, States like Ohio and some other states have done a good job of at least having that be - when they did have a financial incentive program for small wind in their states.

At least looking at production as one of the factors in evaluating how much money that you're going to give out for projects. Again it just it feeds into the

idea that we're supporting successful projects that are actually going to produce that are going to be not black eyes on the industry that are helpful.

And that's it and so overall I just - I'm really looking for ways like I said if you're thinking about it from a investment perspective it's all about getting, if we're really going to expand that market and deal with some numbers like Fuller has in the past few years they received huge infusions of dollars, you know, hundreds of millions of dollars from companies like Google.

Big banks like U.S. Bank, Citi Group, lots of other places with money in there. It really boils down to getting that cost of capital to be as low as possible and the way you do that is minimizing risk so that's what I was trying to drive home. So thank you.

Ian Baring-Gould: Thank you Stephanie so starting off with the panel we talked about using some of the models that solar industry has picked up in deploying wind technologies to go a smaller wind technology.

Any thoughts on the panel or thoughts in the field?

Man: Stephanie's exactly right it's a risk question and so for us in the distributor (unintelligible), distributed wind space the way to use most of the solar financing resources that are out there is to mitigate the risk for them.

So if you actually do a quality (unintelligible) assessment and have a solid O&M plan and deliver a project to a financier with relatively mitigated risk or even installed those tools are really easy to use but most of the players in that market do not understand moving parts, variable resources, and those sort of things.

So I think the financial tools are there but the risk equation is still not quite understood by the same folks so all of the same financial tools work but you have to in the wind space have to take the project further down the playing field to be able to use them.

Man: I come at it from a utility perspective I work for utility and going along with what Stephanie said, you know, a lot of the solar things at the utility level you're starting to see that ramp up also in Minnesota so the solar angle is not quite so good.

But what I see is that, you know, from our perspective wind is still the more cost effective technology. Currently we think those in the next couple of years that we're going to be moving over there.

What I also see on the individual retail customer side, which I don't interact with directly but I do see a lot of interest but what I often hear is people, utility managers or a member of community calling me up and saying someone whose connecting solar and they sort of go down the road with it a bit.

And more than half of them seem to drop off and so I think about what you said about the education piece until people learn more about the full cost and the full benefits I think we'll get people to adopt that more and I think that's a real exciting opportunity.

Man: Yes so much of what I (unintelligible) when you look at the whole challenge in distributed wind and financing it's what's (unintelligible) it's about risk mitigation it's also about aggregate of assets both together.

I just want to think (unintelligible) really makes the source successful and what, you know, we need to work towards that, you know, and I'll talk with a little bit later about some of the ideas that are happening and how I think we can set the stage within the industry so that we can start doing the same thing.

But clearly it is about risk mitigation, it's about really creating finances so that we can do the same to different models.

Man: Yes first of all Stephanie that was really good stuff and it's important that we keep our eye on Fuller for a number of reasons. I - three things that come to mind, the reliability issue and I think it has to be (unintelligible) is well on the road but sort out the weeds from the chaf on that that's critical we keep pushing SWCC and communicating the results there.

Secondly we have to do something about the costs we've crossed over now in costs people don't necessarily buy the absolute low cost stuff but clearly we need to turn that over and start reducing the cost of small wind turbines.

And then the third one, which is a risk issue is the policy stuff, these solar guys have done an extraordinary job of getting their product in advantageous incentives and policy at the state level and we need to level that playing field.

Ian Baring-Gould: Any thoughts before we move on to Kevin? Okay our next speaker, Kevin Schulte is another one of these leaders in the community wind space sustainable - sustainable energy development company that started in and if I was going to curse my worst enemy I would say go to New England and put community projects in.

And the great thing is that Kevin has been able to do it so Kevin is talking about new not new they're kind of unusual models that you're coming up with to support community development.

Kevin Schulte: So I was asked to talk about innovative finance models in community wind and I have now 55 operating wind projects with 55 different finance structures that have been deployed to get them done.

So I think that the main piece for what I'm going to talk about is if there's a will there's a way. You know about who we are, to Ian's point our projects are (unintelligible) it's very different from what a lot of people.

The immediate municipalities more than 1 million people, 10 million people or 3% of the U.S. population in countings of our installations,-1/2 million people a day see our turbines just based on driving down the throughway in Massachusetts or the Mass Pike.

And then a 400,000 people a year ski under them at our ski resort project, one of which is now a 900 kilowatt turbo with a half a megawatt solar. So our installation map looks a little bit like that.
We have bludgeoned ourselves with projects across the Northeast, like I said 55 operating wind projects and now 7 solar projects. So what I did was I'm actually just going to walk through one finance, innovative finance model because I think, you know, when I'm working everyday how do we get past all the subsidies, how do we get past particularly the federal tax subsidies?

And this particular product is dear to my heart because I think it might be the most innovative thing that I've done when it's complete. We just got the bond to build this project and it's a pretty awesome model and I think it proves the

sort of through process that you have to figure your way through the regulatory environment you're working in.

And there's always a way to get these things done, 100% of the time there is, you know, I don't believe in people that think there's an excuse as to what's going to stop a project that's why we've been successful it's also why I have to make very much money.

So in this town Otis, Massachusetts, which is not near Otis Air Force Base it's in the Western part of the state in the Berkshire mountains we have saw the first wind turbine was done in 2008 for a (unintelligible) quarry.

And very neat we put up our best (B47) very, very successful project. The owner of the stone quarry came to the first meeting when the town wanted to put up their own turbine and his statement to the town that made everyone vote yes to do this was I don't really understand why you wouldn't do it my wind turbine spits out money.

And so that was really convinced them to do it and (Ed Williams) is about six five and looks like he's made of granite from his quarry. So he's a big guy, very convincing.
So they came to us and they said we want to put up our own wind turbine and the owner of the owner of the original turbine (unintelligible) to the town. But they said to us we will not do it unless it directly impacts the electricity bill of the permanent residence of our community.

That's the only reason we would install wind power and so we had to come up with a way to make that work. One wind turbine or multiple wind turbines that are literally physically reduce - they said we're not going to reduce the tax rate we're not reduce the water bills, we're not going to reduce or provide

additional fire trucks or other services we want individuals power bills to go down.

So we came up with two questions, how do we answer these two questions? Question number one can we install a turbine and make it profitable and they want to own it.

This is the type of sort of homogenous community that we don't want anyone else from outside our community coming in and owning this or bringing us money we're going to get our own money from our local bank, we're going to own it ourselves, which meant tax is out.

So can I profitability install (unintelligible) wind turbine with no tax incentives? That's a difficult question to answer I think many of us in the business understand that.

And then second can that profit be distributed to the permanent residents of the town through their electricity service? So part one Otis win one with the system finance we disclosed on the bond we we're going to be - we're under construction on this shortly.

A single (unintelligible) 100 on an 80 meter tire, a CDC grant so Mass can (unintelligible) grant for 400,000. For those of you in markets that don't have state grants $400,000 to a $6 billion project is immaterial so it's not really - that's not a drive for this project.

It's a little bit of a blanket of comfort for the town officials but economically it's not a driver. The renewable energy credit for Massachusetts are actually valued quite a bit higher than 4 cents per kilowatt hour, they're actually close to 5-1/2 cents per wind directs right now.

We sold them for a (unintelligible) of four cents, 500,000 kilowatt hours for Massachusetts has virtual net metering meaning if you put up a wind turbine you can send the power to any electricity in the same utility territory that you want.

So the first 500,000 kilowatt hours used by the wind turbine, which are produced about 6 million total will by a virtual net meter will be used to reduce and eliminate all of the electricity loads in the town.

Town hall, the school, everything that the town owns so a half a million co-watt hours there. However, under the virtual net metering law in Massachusetts you specifically cannot take a municipally produced net metering credit and apply it against a residential account because the utilities will get real mad at me and more mad than they already are.

So the other 5-1/2 million kilowatt hours has to be sold to another municipal entity or government entity. So we looked at colleges and universities that are owned by the state or locally owned community colleges.

We looked at towns, we looked at everybody we actually - the neighboring school district is a big a much bigger school district than the town of Otis, they actually are going to take 100% of the real energy credit and we can do that through this virtual net metering.

So 5-1/2 million will be sold to them at about almost 11 cents a kilowatt hour. The cost of maintenance is included, the cost of capital reserve is included and then the bond we just got was actually at 2-1/2% although I said here it's 4-1/2%.

So the story actually is a little bit better than when I wrote this - originally wrote this slide. So the payback will be zero years once we apply the bond, they'll be making money year after year.

And that present value is about $3 million for the project, their average lifetime cost of grid power would have been about 11-1/2 cents for turbine with all the financing included because when you really look at that 4-1/2 cents over 20 years you're paying a lot of interest even though the payments, the annual payments are pretty low in comparison to the electricity.

So you're paying a lot of interest so your cost of power is actually pretty high at 8 (unintelligible) cents a kilowatt hour however that's lower today and will be lower forever in Massachusetts than the cost of retail purchase of electricity.

So the important line here is that the first year on a P15 analysis W wind production the first year is going to pay this town $275,000. So we're going to in a minute we'll talk about well what are we going to do with this $275,000?

So the next part is how does the town now that they're generated this revenue how does the town get to the point where they can actually reduce their electricity bills.

So we dug through Mass general law and pursuant to Mass general law section 164 part 136 you can read this here. Energy cooperatives have broad authority including to among other things purchase and own generation transmission and other projects and (properties).

They can enter into contracts and incur liabilities they can borrow money issue notes for bonds, i.e. the bond we were just talking about. The can enter it

to private public collaborations, they can purchase, sell and distribute energy and they can sell electricity to any customer within the cooperative member community.

So what does this say, in simple English through those six parts of this part of this rule in Massachusetts this says that the municipality in the town of Otis can own it's own generation asset, it can profit from it and it can share those profits with whoever it wants whether it's taxpayers or anybody else.

And if you do this because it's allowed to form an energy service company, which part 5 can purchase, sell and distribute energy to its residents. So part number one of forming the energy service cooperative is you can't just sell them the green power.

You can't just sell them the power from the wind turbine you have to actually produce, model the electricity from the independent system operator and deliver it to your customers.

So they have to go out now and we're in the process of forming all this now that we have money and getting it all done. They have to go out by a 5 million kilowatt hours, 5000 megawatt hour a year block of electricity from the independent system operator.

Last year the difference in price between the retail cost for Western Mass Electric for residents and the cost of purchasing that power from the ISO was 3.6 cents per kilowatt hour down here on the bottom left.

We're going to take a penny of that difference and we're going to use it to administer the program so right now they already sell, everyone in the town uses town water and so there's all 500 residences also take 500 - well they're if

they buy into the program they will also buy their energy bill through the safe billing structure of their water company.

So a penny to administer the project and then you get 2.6 centers per kilowatt hour savings. This has nothing to do with the wind turbines, separate track, energy service company municipally owned already powered to its residences cheaper than they could buy it themselves through the utility because the utility who has 20,000 employees and overcharge everybody.

They charge way more than the state they basically make this 3.6 cents their profit. So that was we just talked about 2.6 cents a kilowatt hour that we saved them with wind turbines.

So going back a couple of slides 275,000 was the profit from the wind turbine, 50,000 a year to add to their administration costs we got to go read the meters every month.

Permanent residential load 5 million kilowatt hours a year gives us a savings of 4.5 cents a kilowatt hour, 4.5 cents a kilowatt hour plus 2.5 cents a kilowatt - 2.6 cents a kilowatt hour is 7.16 a kilowatt hour savings on everybody's bill that they're currently paying 10.9 cents per kilowatt hour.

When you boil that down to the actual bill the average resident using 10,000 killowatt hours a year will save $708 a year on their electricity bill. So steps to get this done.

One, have (unintelligible) Otis service company called Otis Energy Cooperative in Mass this is known as a retail energy provider. The town of Otis permanent residents will switch competitive suppliers from whoever they are using now through to the town of Otis.

The program requires 100% subscription rate but if I was saving 70% off my electric bill I'm probably going to switch. And then we have to go make the bulk energy purchase from the New England ISO.

Second step is we're going to install the wind turbine, power will be sold to other municipal and government loads that we talked about and then the revenue is used to further reduce the cost of energy delivered to the retail customer.

And then they want to build Otis wind two so they want to build a second wind turbine on the same parcel of land and open the program to non-permanent residences, local businesses and other loads and expand their revenue for their own energy service company.

So what - let's talk about the replicability where's supply, how does it work for other people. Number one, it requires no tax incentives the only tax incentive is municipal bonds.

The municipal bond market been around forever it's going to be around forever so this will be there in the future. So no we don't get a production tax credit of 2.2 cents but we have a cost of capital of 2-1/2%t whereas most projects right now even the really big 500 megawatt cost the capital (unintelligible).

So this is a huge difference, the market must be deregulated allowing competitive energy supply so any of you who live in a place where you get a flyer in your bill from your local utility that also says you could buy from some other Tom, Dick and Harry energy service company you have to have that same opportunity.

And then the wind project must be profitable there are three main things in Massachusetts that can make wind projects profitable and we won't talk about the ones the (unintelligible) issues that make them less profitable but Western Massachusetts isn't subject to the same stuff as Cape Cod.

So the wind project must be profitable one, virtual net metering. All this does is increase the value propellants but we're at a relatively low capacity back there so you can balance those two things in your own modeling to look at, you know, in Iowa where you might have an 8 meter per second wind well we're at 6-1/4, 6-1/2 meters per second.

So there's a huge difference, power may only be 5 or 6 cents but you're going to produce a 35% to 50% (unintelligible) down in the high 20's, low 30's so that's a huge difference.

So can you get the value for the power to be equivalent? We are doing it through virtual net metering it's not necessary it's just creating the value for the power.

State grants is not impactful to the bottom line - once you advertise the cost of the project over 20 years that $400,000 becomes very minimally impactful. And then direct market, direct market is hugely impactable.

The fact that the State of Massachusetts has a (unintelligible) targets and the value for those new laundry credits is 4 cents a kilowatt hour, that's 30% of the total value in every kilowatt hour you use, that's impactful to your bottom line.

So all of that just saying if you can make the (unintelligible) wind project then you can actually replicate this through some of these conditions. And so the point of the presentation really is just and I'll tell you a funny story about how I came up with this.

If you're willing to find your way to slug your way through the regulations of any market you can get these things done, you can figure them out. I've done it 100 times in Iowa and that's just the way that community wins really work is you've got to find a way to make the project profitable and deliver power to your community.

So there's - if there's a will there's a way. It's interesting - fun story is we were driving to a meeting where we had been given the -- about an hour before the meeting -- we'd been given the directive from the board of selectmen, which is what we call our town boards. In Massachusetts they call them the board of selectmen. That - this - we already told them we could make them and save them $275,000 on their tax register every year and they said, "No, no, no, no. We don't want tax saving. We need energy savings for our residents. The only way you can do it."

So we were about an hour from the meeting and the guy I was driving with was a terrible driver so I sort of closed my eyes and I just woke up and just started to scribble this down on a piece of paper. And so I handed off to the team that looks at laws and regulations within SED for (unintelligible) (Terri O'Conner) and she sort of when through MGL and came up with, hey, you're right this can happen.

And so the only reason I bring up that story is there's no show stoppers. You've got to go finance your projects and you've got to find a way through

that stuff. There is a pathway through the law. Just the way you save on your taxes, you can, you know, beat the utility at their own game. Thank you.

Man: Thanks, (Kevin). Again, thanks from our panelist.

Man: This is a little bit outside of my area of expertise, but it's a really interesting presentation. But I would just say that the two main takeaways that I heard were (unintelligible) is that for a project like this to be successful is the importance of having someone in the - who's driving the project from a leadership standpoint as well as a political body that's willing to understand and make the decisions and have the political capability of doing that. And I know that can sometimes be a challenge, so I think that's really impressive.

Man: I'm trying to decide if this is pure genius or total insanity. It's amazing. No, I don't know what to say. That's - you know, it really is demonstration of where one project can make a significant difference in the community and if someone's willing to dig into it that hard, not make a whole lot of money at it as I know Kevin doesn't - and still go forward and make something happen, that's just - I don't know, it's definitely a testament to what community wind can really, really do in the country if we work so hard at it.

Woman: Yes, I agree. I mean, it's really exciting to see creative thinking and ways to accomplish projects such as these and hopefully they can be replicated in other areas of the state. I mean, I think if other cities can kind of see those numbers and it's - those are pretty powerful. And again, it also speaks to kind of what cheap capital can do as well and how that can really change a project.

Man: Yes, I (unintelligible) comment on this as it reflects on the diversity of community wind solutions. You know, in the west we're not - we are regulated, so this is - I have a little trouble - RECs aren't really very highly

valued. It really is the one size doesn't fit all aspect and that we have creative people in this marketplace -- whether it be Kevin in New England or Tom and (Dan Jewel) out in the Midwest or John (unintelligible) out in California or (unintelligible) in the Northwest -- is it takes creative people that -- in their marketplace with that solutions to situations they're facing. And this is very exciting, (Kevin) and congratulations.

Kevin Schulte: If I could just make one more comment, which is the reason that we decided to invest in figuring the cooperative model out in Massachusetts is at one point 103 towns in the state of Massachusetts came forward through (Jim Manwell)'s program at the University of Massachusetts and wanted (unintelligible) and said, "Hey, we want to put a wind project up here."

Now, the market's receded dramatically because of some of the many problems that we've had in Massachusetts and in the Northeast, but there's still a lot of communities out there that could do the exact same thing and that's why we invested the time and energy to sort of create the model. Because in Massachusetts and in New York we believe it's replicable.

We're actually installing a turbine for a school district in New York who is a member right now of a municipally owned (unintelligible), which is what gave us really the seed idea of the municipally owned (unintelligible) to do this in Massachusetts. So -

Man: That is so creative, Kevin. Much more creative than anything I've ever done. I am so impressed with what you did. I have two questions. One, did the town put any money down as equity for the project? Cash down payment.

Kevin Schulte: The town - so the town's equity in the project would have been like our development fee has been paid. And so probably 5%, total.

Man: Okay.

Kevin Schulte: And then they'll issue the bond and so they'll start paying and the amortizing that bond before the project is carrying revenue. So you could really consider the next 120th payment on the amortization as also down money because that'll happen before the revenue starts.

Man: So not a whole lot of cash. Maybe 7, 8% at most of the whole project - something equivalent to that. And then the second question is, in your mind, you said - is there a risk in the bulk energy purchase that the town has to make, you know -- I suppose renew every year -- is - could you discuss that a little bit? Because I don't really understand that too much.

Kevin Schulte: Well, it's just going out and buying market power. So the risk is - in - the way that the markets work in the Northeast is you can't just go out and buy, like - if you need 4,599,000 kilowatt hours, you can't go buy 4,599,000 kilowatt hours. You have to buy them in 5 million kilowatt hour blocks.

And so the risk is if the consumptive load of the town were to go down, you couldn't service all of it, right? You would be buying more power than you need, so the price might go up. But its 7 cents difference between the two, you could assume that risk and still really feel comfortable that you're going to offer a savings.

Man: Let's move on to the next speaker. Andy Kruse, the cruise missile. I think we'll have to start calling him that all the time.

Andy Kruse: I hope not. I think its Larry's distinction.

Man: So as - we don't need to introduce you. Everybody knows Andy.

Andy Kruse: Yes, so, you know, that's the given presentation on financing of wind - distributive wind. And (unintelligible) large scale systems. And, you know, this is actually one of the greatest challenges that, you know, led to the demise of wind power was the simplicity at which solar has managed to be able to do with leasing programs. And secondly, that - you know, while (unintelligible) and after I'd left I kind of - really kind of picked right back where I was when I joined Endurance Wind Power. And it's just still one of those juggernauts we're trying to develop.

So when I was trying to put this together, I'm thinking to myself, "Well, what do we have? Where are we?" The bigger challenge really comes down to the size of the deal. And the smaller the deal is, the more complicated it becomes - or really it makes it almost impossible.

Solar City and some of those guys that are out there - they manage to do this by taking a whole bunch of small loans and aggregate them into bigger ones. It's how cell phones are purchased. It's how so many different products that we buy, you know, on a loan practice - satellite TV, Dish Network and what not. They're all done in this certain way where they bundle together these debts. And so it makes it a sizeable project.

Now, the question is, is well, what's the minimum size of a project? It's - you know, that number varies. Like I've heard lowest of about $2 million, but a lot of banks don't even want to touch that. You know, the (unintelligible) several years ago (Mike) is - he's the guy from Citibank and used to run (unintelligible). And now Citibank - I said, "Well, what's your minimum size project?" He said, "100 million." And I was like, "Well, that's going to take a lot of sky streams or a lot of, you know, endurance wind turbines to get there."

And so it really became a question of how this would all be done. And I've been studying that a lot and this presentation is really about what I've learned so far -- and I still have a lot more to learn -- but where kind of things are going. Because it's not all dark out there. There are some great opportunities, even we are working on some pretty creative projects -- which I can't get into details right now -- that could really change everything about distributive wind. Once we do figure this out, once, you know -- as Stephanie was saying -- once we get this thing under control, we will be much like, you know, where solar has been taking off the last few years.

So with that, a little bit of history here. of course, since the -- and some of this might - you know, this is sort of just duplicated because I really did have not a lot of slides to be able to figure this out -- so, you know, one of the important things to understand is why all this is happening. Well, it's happening because there's so many people out there - since the time we've been buying power is how cheap can we buy it? Where can we buy it from or can we produce it ourselves? I think that's a lot of what's innate in Americans, too, is trying to be more independent, whether it's at the community level or at the household level.

And nuts like this will even do anything - they'll attach whatever to their house in order to try and find a way to be able to reduce or eliminate their electric bills. And ultimately that's what we're doing. Because if electricity was -- as they used to say in the dreams of the nuclear age in the 1960s -- too cheap to meter, we wouldn't bother. But we do because it is expensive and there is, you know, it does make a big impact on our finances.

So - but, you know, the evolution of this whole process started - the reality started in the 80s, you know, when we first started doing these (unintelligible),

people started really imagining where we could actually do something like this. And - but the challenges at that time were - there's so many of them. Like, you know, solar was at $12 a watt. You know, wind turbines were still - you know, when I got in this business in '87, Wind Charger -- which was a wind turbine brand in the 1920's -- was still being sold. And it was pretty much an off-grid thing and you'd hook a trip light converter to it and - or you use a couple of car - automotive lights - headlights in your room and you've got something.

But it wasn't quite where - anything close to where we need to be. And so what's happened, though -- and Stephanie brought that up as well -- is like, there's certifications there to involve, interconnection standards, installation standards, permit streamlining, recourse identification predictability tools - all these things were coming together from different angles, different worlds. Some of them through really good trade groups, some of them just through, you know, really dedicated individuals.

But it established standards that it couldn't happen -- none of this could happen -- but until all these pieces of the puzzle came together. And that's what was really important is that we're not just seeing this because we figured out, you know, one thing, you know, that everything took off. It was that a lot of things were figured out over the last, you know, 30 plus years. And they have evolved to what it is today.

So if we had leasing financing and we didn’t have resource assessment tools that are for wind, it still wouldn't work. Or interconnection, it still wouldn't work. So all these things had to happen.

So - but what's making solar successful? It's - in the most simplified method -- and we're specifically talking about residential applications or small - and

specifically here, schools, for example -- you know, a lot of these things are much more simpler. Stephanie's were a lot - she had a lot more complex methods, which generally you won't see in these smaller applications. But the bottom line is there's three different areas.

Outright purchase, lease to own -- and lease to own is generally a lease but then there's some kind of a thing that doesn't make it a lease or doesn't make it a loan -- and then a power purchase agreement. So those are the three methods in which those things are working. And that's what - we're - as insurance we're also working towards that.

And within that -- I get a little caveat there -- is that all of them have some sort of service agreement. When you start working in - I mean, solar has it as well, but they're a little bit more complex than wind. And in every case these contracts have some sort of an arrangement in there to make sure that they're going to work for the life of the project.

And of course, we all know -- this is what we've been talking about -- solar is the first one to really figure this out. It's the last component -- in my opinion -- really that is driving and making the success with it. You know, that we've all been looking for for all these decades. And it's the financing component that really makes it simple so that the upfront cost isn't there and so that the risk -- at least to the consumer -- is - apparently isn't there.

And we've seen that. I mean, it's not even in question. I mean, you know, (unintelligible) which is amazing looking at that growth rate in the last few years with PTA - or with leases. And I have a similar slide that's in a specific region of the country, you know - all this started around 2008 and now it's grown dramatically. Here's 2012 - more than half the installations that were done were lease based systems.

But we're seeing this big movement towards this. Why? Because it gets that consumer the, you know, no risk. You just put these panels on your roof, make an agreement to make a monthly payment. It's going to be based on, you know, your savings - your monthly savings. You're going to be at least 10% ahead -- perhaps more in some cases -- and, you know, how could you lose? Sign up today. So it's worked. It's worked very well.

So how it's done. It requires - and if you look at it actually flow chart - I took it out - I had one in here earlier. And if you looked at the actual flow chart of what it takes to put together a project there's about 50 of these boxes. There's not just three. But the three most important things is how this thing comes together - the developer and seller. It's the customer, you know, the person that's going to, you know, buy the power. And of course, the bridge that - and the various types of financing that are required. You don't really need as much as the bridge financing and the solar side as you do - and you can do them in a couple - you know, two or three in a day.

It takes a little more time to do that, so that's built into it. But this is largely the combination of what's necessary. So the big question is - is then, why don't we see more? If all this has been worked out, why don't we see more installations right now in wind? And again it's really about - it's really about risk assessment and also spreading the risk.

So it's looking at - the banks look at three primary factors. One is the reliability of the hardware. Well, we didn't have that until SWCC came along and UL came along. But those standards are being evolved so that there's confidence in which that product is going to last as long as the customer claims.

Those turbines that I showed in the first image, you know, hanging off of a roof, you know, the chances of those things being there in five years from now are really slim to none. You know, and the chances of them actually performing to the standards in which, you know, they were hopefully dreamed about - pretty slim to none as well. And maintenance agreements - probably that's somebody with some WD-40. It's not there and no one's going to finance those kind of things.

So what we're seeing here is -- in the banks -- when you see an agreement and a relationship in a lease arrangement, these are the three factors that are most critical. And these are the things that we at Endurance are actually working on as well and I think a lot of other players -- Fergie and whatnot -- are looking at this and saying, "We have to come to this as well."

So reliability of the technology, performance of the technology. If you're going to create a cash flow statement, you need to know a couple of things. One, you need to know the turbine's going to be around -- it's going to work -- and that there's a resource out there that can do it. You know, that's actually going to turn the blades to make the kilowatt hours.

And finally, the long-term maintenance. You know, is this a man and a dog and a truck that's doing the maintenance program, the bank's going to be a little bit concerned about that. Is that guy or that, you know, that company going to be around next 20 years and - or as long as this contract lasts? That's the big question that has to be asked.

And so those three things are really what it - needs to be done in order to - and from the market. And we studied those things every day. We interviewed people, we tried to do the same thing.

So where it's at now. So first of all -- as I said earlier -- SWCC, Seeso -- which, to a certain degree - because, you know, there's the certification standards -- but to them there's somebody else. They're looking at UL. They've all established these certification standards that are best for liability concerns. It doesn't make them foolproof by any means, but at least there's somebody saying, "Okay, you know, somebody other than the manufacturer's making the claims as to what this can do."

The reason - the wind resource assessment - when I got in this business in the 80s, you know, and I remember getting the first in-rail wind map and I thought, "Wow, this is cool." It was hand drawn, I think. That big blue and white thing. And we would literally, "Oh, we think the wind is here and the wind is here." We sort of kind of got it right. And then I remember the second generation, I think, was like 20 square kilometers or something like that. It was the big digital, you know, dot squares.

You know, today we're down to I think 90 square meters or something like that. The resolution is so fine. Now, it's not to say those are perfect, but we also have some really good tools out there that it could also support that can get to a point where you don't have to use 18 months worth of data to be able to know whether a particular watt turbine is going to be a good investment spot.

So we're getting there. And there's some really cool things that are being done within the industry to be able to very accurately predict what the energy resource is going to be for the next - you know, hopefully couple decades. That is critical and that's going to be a big, big indicator for the banks. And so far we're getting green lights on the stuff that we're working on.

And last one is just maturity of organizations. And that's the company that's going to be out there doing the work. There's a lot of new ones coming into play. We're working with a pretty large companies that we know they're going to be there for the next 10 years. And so we're feeling comfortable about them, you know, servicing our equipment.

So where exactly are we at? So there's about two players right now that are just sort of emerging. One's been around for a while - it's one of the bridge loan group, (unintelligible). There's quite a few other ones like that, I just put them up because they're very involved in this - in wind energy specifically in community wind. This is some way that actually understands the business -- the technology -- they're not afraid of it. They're willing to take the risks to invest, to, you know, invest really in small scale projects. To get them bridge the long-term debt.

And then groups like United Wind -- which you'll learn a lot more about in the next couple of months -- (unintelligible) is a distributor out of Southern California who's actually put together -- this is a brand new Web site -- they don't quite - just put in there United Wind and I think you'll find it. Which is the first one where he will be able to finance smaller (unintelligible) 10 kilowatts. And then as big as a one megawatt turbine.

And so he's doing something that's very unique, he's partnered with resource assessment companies -- we're actually part of this -- where they build confidence that the data that's coming out of this thing is accurate. So really exiting area to, you know, exciting movement.

And this is the first step. And if this can work, it's going to make a significant difference in the future of our industry. And I look forward to seeing (Ryan Wiser) go look at what's going on in community wind because I think that's

what - I'm quite confident that's where we're going to go. Thank you very much.

Man: Thank you, (Andy).

Man: (Unintelligible) from the panel. People don't have to make comments unless they want to - so we're not forcing.

Man: But I think it's the big key. I mean, the only way distributive wind gets the scale is financing. I mean, it's - there's no if, ands, or buts about it, so - and the word that I always use about the financing is efficient financing. So I don't know if the United Wind thing will work or not, quite honestly, but I hope it does for the growth of the industry, you know.

Man: I mean, my thoughts on that are very similar as it relates to, you know, convincing the capital providers that you've got a model that's sustainable and not exposing the capital provider to too much risk, I think at the expense of the offerings get more standardized -- the more proven over time -- I think there's going to be a lot more success implementing that on a lot broader scale.

Woman: I think it goes back a little bit to - I think a comment that Kevin made. It's also -- another piece of it -- is finding the right investors who really understand the space and understand variability in seasonal trends. I mean, that's something that - you know, investors are great, but it's also - you got to find folks that are really willing to ride it out. I hope that United and some of these other folks are - do have that good understanding and will be able to sort of not make judgment early on in the process and really kind of see how it plays out over a few years.

It's hard to judge a wind project successful after one year or six months. And I feel like a lot of investors are used to that in other areas. You know, like solar you sort of know if it's working the way it's supposed to pretty quickly and you get a pretty good warm fuzzy that you're going to get the return that you were hoping for pretty quickly. Wind it might not be that way. So I'll be excited to kind of see how some of these new folks manage that and how that works.

Man: (Andy), I thought this was interesting. The issue I have is the sighting issue and installation issue. As we - as you know, solar, you know, it faces south, you know, it's not a real - get a reasonably right angle and so forth on a roof. You make a pretty good calculation from old, you know, old tools are pretty close. Wind's not that way. I mean, you've got to resource off by 20% you're off in energy by 80%.

The tools -- I've seen - there's been some advances in tools -- but micro-studying tools - do you feel they're in a place right now where the (unintelligible) guys can feel comfortable in the projection?

Andy Kruse: That's a really good question. You know, the tools get you about 60% of the way. The other 40% is actually walking the ground, looking. Looking at the - what's going on there, asking questions about it. And there's a last piece of - we're using in the U.K. very successfully. We'll put up a light R system at a spot and we'll run it for three months and we'll compare it to the wind maps and it'll tell us very accurately. We have not blown it once and we've got 350 installations operating all across the island and they're working very well.

So we think that the tools are there. Now, (unintelligible), how much do they cost? About 100 grand apiece. But, you know, $100,000 is the, you know --

that you get to use over and over and over again -- it's become very cheap to be able to verify that site. So, yes, we're feeling pretty good about it.

Man: Great. Next - our next speaker. David Niles comes from the Minnesota Municipal Power agency. And as I said earlier, his organization was the muni of the year award recipient for this last year for some really great, innovative project development leading to the completion of the Oakland Wind Project, which is a 44 megawatt - is that right? 44 megawatt wind farm. But also included the installation of turbines in local communities in addition to that larger installation.

So you probably felt a little beat up today because we keep beating up on the munis and the co-ops, but as we have said, there are ones that are figuring out how to do it right and make the wind win that Tom was talking about and so we get an experience of a win-win from a muni and the question is how do we replicate - how do we replicate David and do this all across the country?

David Niles: Alright, well thank you very much. I think my presentation's a little bit of an outlier here in the panel that I'm talking about the utility scale project and I'm also going to take a step back from the Oakland project itself and talk broader about the energy education that MMPA has put in place.

So to start, I'm just going to quickly give you an overview. I'm going to tell you a little bit about MMPA and its wind program and then I'm going to - the centerpiece of my presentation is about the Oakland Wind Farm project and I'm going to focus on two main areas: the contracting and financing approaches that we did -- which we think were fairly innovative -- and then talk about the community relations aspect. And then take a step back from that and that community relations aspect that we've taken to a broader program,

which is our energy education program that we've rolled out in the last two years.

So MMPA is a municipal power agency in Minnesota, serves about 125,000 people and 60 retail - 60,000 retail customers. Sell about a million and a half megawatt hours a year with a peak load of about 315 megawatts in 2012, so as munis go -- wholesale munis and even in Minnesota we're not that big -- clustered sort of - primarily around the twin cities area with one outlier up in East Grand Forks, Minnesota.

As Ian talked about, our wind program consists mainly of the hometown wind program and Oakland Wind Farm. And as I said, I'm going to focus on the financial approach and talking about the community relations aspect.

The hometown wind program we installed these turbines in 2009 and 2010. They're 12 160 kilowatt turbines - these are refurbished turbines as you were talking about. I think this make MMPA the fist -- and as far as I still know -- only municipal power agency in the country to have a turbine in each member community. We also put one in at our Farabell Energy Park project, which is our largest generating resource.

As it relates to financing, we financed these projects with the Clean Renewable Energy bonds. These were the old (unintelligible) - those of you familiar with the variations of that program. And we put educational signage in at each of these sites that talk about -- at the base of each turbine -- that talks about how the wind energy is generated.

Another thing we do is we coordinated with members on sitting, so that means we didn't necessarily put the turbine in the best wind resource in each

community, but what we did was we worked with the community and listened to them and listened to what their needs were.

So this is Buffalo -- one of our communities -- as you can see on the right side of the picture, you've got a baseball field there. That's because this is right next to the high school and they thought that was an important aspect to be able to talk about with their high school kids - their science classes. And in fact, in many of our communities, that was where they wanted to put it.

So now on to Oakland Wind Farm. It's a 44 megawatt wind farm in Steele County, Minnesota, about 45 minutes to an hour southeast of the Twin Cities. It's made up of 24 1.8 megawatt vespis turbine. Not located in an MPA member community - that was one of the things - the discussion as we were developing it.

When we went to contract this, instead of doing a lump sum contract, we did a guaranteed maximum price contract that provided the savings below the guaranteed maximum price the contractor was willing to do would be shared between us as the owner and the utility and the contractor itself. And we thought this was very important. It aligned the incentives and interests of both parties. We weren't always quibbling over change orders like sometimes happens on some of these projects. It fostered a more collaborative relationship, and as a result the project came in under budget and early.

On to the financing. We considered four different approaches. The first traditional debt financing, which is sort of the mainstay of municipal power agencies. This was sort of our back stop scenario - worst case. We wanted to try and improve on that.

So other alternatives we looked at were a power purchase agreement with a developer. That's actually how this project got started. This was a developer's idea. I can't remember if he ran out of capital or failed on some other way, but for whatever reason the project came to us.

We also talked with several banks. And we went fairly deep into discussions with two different banks about a tax equity deal, but in the end we couldn't get to the end there either.

And so we ended up going with was this locker entity approach under 1603. So MMPA -- as a tax exempt entity -- cannot directly benefit from any of the tax incentives - be it BTC, ITC or the 1603 grant, but the treasury department put forth some guidance about an approach that you could take that would make what would otherwise be an ineligible entity into an eligible entity.

And so what we have is we have MMPA on the top there, which owns Minnesota Renewable Energy, LLC -- which is oftentimes referred to as a blocker LLC -- which in turn owns the project company Oakland Wind Farm, LLC. Now, Oakland has a CPA with MMPA and then MMPA provided a loan to Oakland Wind Farm, both a grant anticipation loan and then a term loan over the - most of the life of the project.

But the two criteria that the treasury set forth for this as it relates to the blocker LLC are two things. One, it has to have an independent board of governors from the ultimate owner. And so what we do is we have a five member board of governors and three of those members are selected by an independent governor selector -- it's a very unusual sounding term -- but that is completely independent from MMPA. And those governors currently are former chairs of the Iowa Utilities Board, the Minnesota Public Utilities

Commission, and the Wisconsin Public Service Commission and then MMPA gets to appoint two of - the other two of the five members of the board.

The other criteria is that the LLC be tax (unintelligible). Now, when we set this up, the PTA crisis such that the entity cash flows, the project entity - but that we don't expect it to have much taxable income over its life due to accelerated depreciation and other things.

So as a result, Oakland -- about a year ago -- received a $25.4 million 1603 grant. And another aspect of this project from the financing standpoint that I think is different than official is that MMPA has the right to dispatch -- and more importantly -- curtail the plan. As we talked about -- some of the speakers this morning talked about and this afternoon -- curtailments are still a part of life, particularly in the Midwest.

Under PTC deals, usually -- almost always -- the incentive is produce as much as you can so you get as much of the PTCs as you can. Well, in an environment such as (unintelligible) where MMPA is where the prices go negative from time to time, you don't want to be paying to generate. And so by having the right to curtail that and not having an economic penalty while doing that, that's a big benefit for MMPA as well.

So I may move now from the contracting and financing approach to the community relations. And what we - the approach we took was to talk with people early and often and to focus on land owners, county officials, and other stakeholders. We had a lot of one on one discussions as well as we - early on in the project we came down to a local service man's club in the local community where this was going to be, sponsored a dinner for everyone and told them about the project and our approach to it.

We also exceeded required setbacks for non-participating landowners, we didn't just do the bare minimum, although we didn't have much of a problem with non-participating landowners because of the compensation structure that we offered. We also mitigated noise - turbine noise and flicker concerns by a specific placement of turbines. And as a result, we had no opposition to the project at any point during the siding, permitting process or any other time.

Oops, wrong way. Try that again. So then when the project was done, we held a grand opening event, and that included lunch for the host community and narrated bus tours of the project. So what we said as an agency is sort of part of our philosophy and part of the whole public power ecos, I think, is we don't want to stop there. It's not - we're there now, thanks for letting us come in, enjoy the turbines. We did a one year anniversary celebration as well and we presented the city with a gazebo with educational signage similar to the signage that we had at the base of each of the hometown wind plants.

So here's a couple of pictures from these various events. This is the grand opening. It was a rainy day, but still -- for a 2,000 person community -- we had quite a turnout, I would say. And as you can see, we fed people, that often succeeded to bringing people.

Man: Right.

David Niles: And at the one year anniversary, this is the gazebo we presented. The ideas of this is meant to be an outdoor classroom. You can see on the right there -- I've got one more picture a little bit better down the road -- it has educational size ideas to be an outdoor classroom at the first - the local first grade community there. It was right around Halloween, so we gave out bags of candy, popcorn, and pinwheels to symbolize wind energy and I think the kids really enjoyed it.

And so here they are reading and learning about wind energy. And so we really hope this will be a good community resource.

And so then I wanted to take a step back and talk about how this incorporates and is similar to the education - energy education program that we do as an agency. So what we did is we developed a fourth grade energy education curriculum. It includes providing a very popular pizza lunch and tour of our Farabell Energy Park -- that's our 250 megawatt combined science - combined cycle, dual fuel facility that is our main power supply resource -- to member and host community schools.

So we don't just invite the fourth graders from our member cities -- all 11 of those cities -- but also our host communities, which is Blooming Prairie -- where the wind project is -- and Farabell itself where the - yes, turbine is.

And I'm pleased to say that this year 8 of the 11 cities are participating. And for the one city that was way off on the map, we're taking a program to them as well. And so what we do is we bring our staff down to the plant over a series of about two weeks. We pay for the school communities to bus in the fourth graders, we take them through the plant, we talk to them about energy and the various forms, and we also provide to the teachers pre-tool workbooks that has information on conventional and renewable energy resources.

And got a couple of excerpts here. This is sort of about the large scale overview of how the wind power gets from the wind to people's houses. And then a little bit more of the detail of how the wind turbine itself works. And these are excerpts from what's in the book. And we also provide this information on our Web site for teachers to use.

And so what you see here - this is the observation room of Farabell Energy Park. This is something that - we built this plant, went in service in 2007 as a combined cycle facility. What you'll see is on the right we've got windows that - this is a publicly accessible area. It's separated from the secure part of the power plant. Has windows for people to look into the control room of the power plant to the east and then to the north there a view into the steam turbine hall. So people can actually see the equipment that's used to generate their power.

And so this is the energy education field trip with the kids listening to one of our representatives. And then we've got a TV there that runs a video about how power is generated. You'll see they've got the same pinwheels there. Educational signage on the walls. It's really meant to be a community resource.

And then here -- as I mentioned -- we put a wind turbine in each of our member communities, but we also put one at Farabell, and so this way we're able to bring the kids - just to walk out from the power plant - to walk about a couple hundred feet and see an operating wind turbine. Now, it is 160 (unintelligible) wind turbine -- it's not the big utility scale ones -- but it really gives them a sense of the size and scope of them, which I think a lot of the kids is pretty neat.

And so we can also see as they're walking on a walking trail because this goes to the whole energy education park that we talked about with Farabell Energy Park. In addition to the observation room with signage and videos, we also have wetlands with fishable ponds, we stock ponds with fish -- so you can see the kids fishing there -- as well as the walking trail you saw the kids walking on. There's four different wetlands and there's little paths around each of them that people do come out and walk on.

And so that's our philosophy there about how to make friends for a new power plant. And so -- in summary -- I think we can say - we can say that success can be defined in many different ways. You know, we had a good financial outcome for the project, we had community support, but really longer term -- and I think maybe even more importantly -- engaging young minds. We talked about earlier the future engineers, future policy makers, future business leaders of our communities and getting them interested, excited, and engaged in energy at an early age I think is really important.

And so that's our philosophy on being a good neighbor in both member and project host communities. So thank you very much for your time.

Man: Thanks, David. Again, thoughts about this model being widely applicable across the country.

Man: Sure. What are 60% of the utilities in the company - country municipals and RECs? Could you educate them? Please?

Man: Experiments are great, but (unintelligible).

Man: Well, I mean, we all consider it the big enchilada, right? I mean, if we could get the munis and RECs to -- Rural Energy Cooperatives -- to really accept community distributive renewables into them, then we could really, you know, scale up fast. And that's been our challenge, so - need innovators like yourself in those organizations to get it done.