SUCCESS STORIES

June 20, 2012

Coordinator: Welcome and thank you all for patiently holding. I would like to remind all parties that your lines are on a listen-only mode throughout today's presentation. Also today's conference is being recorded. If you have any objections, please disconnect at this time. It is now my pleasure to turn the call over to Mr. Charles Newcomb with the Department of Energy, Wind Powering America Program. Sir, you may begin.

Charles Newcomb: Thank you very much (Laurel). Hi, this is Charles Newcomb with the Department of Energy's and the National Renewable Laboratory at the Wind Powering America program. And I want to welcome you all today to this month's installment of our WPA webinars.

And today we have a few fun case studies that kind of bridge the spectrum from small projects on the farm through a program with schools, all the way to kind of a community wind scale project up in Alaska. And just to remind ourselves, why do we do case studies? Why do we do success studies? And why do we even share them?

And the easy answer for that is that case studies, as we all know, serve as beacons of success. They show us markers that are safe passage through the shoals of the question marks in the industry. They give us nice examples of how to work with communities, what excited people look like, and how we can overcome some of the more interesting challenges.

So in that kind of key up, there're three speakers with us today and we're going to do an interesting, a little bit of a hybrid approach, because one of us, Chris Rose, our first speaker actually stepped out of a conference he's having

in Alaska to do this for us. So we appreciate that Chris - and needs to duck back in. So because of his time constraints, we're going to have him present first and then we're actually going to take questions and answers before we have the next two speakers. Then we'll go with the next two speakers, David and Dan and Dani, helping David out on the side.

And we'll take the final questions after those two presenters have presented to make sure they have an opportunity to do so. A couple housekeeping things. These presentations will all be available on the Web at the Wind Powering America website. Typically it takes, you know, five to seven business days or so to get them mounted, so those of you that are scribbling madly or trying to get screenshots, you can do that.

We won't stop you from doing that, but you can also relax and enjoy the presentation and sign on in a week's time or so and you'll find it on our webinars - past webinars. Also we have success stories, an entire category, within our website in the information sources section, over in the left-hand navigation bar. There's actually a success stories link that you can follow that you'll be able to dig deeper into more success stories if you so desire.

In terms of questions, the way we ask and answer questions, many of you may be familiar, but we may have some new folks on the line today. And the way you ask questions is there's a few little pull down menus, if you will, that go across the top of your Web portal and one of them is Q&A.

And if you click on that, you can launch Q&A window and you can ask a question and the question will come to me and then I'll ruminate on it and then I'll ask it of the speaker. Everybody's phones are off so you can chat away in your phone if you need to. We won't be able to hear you. So please use our Q&A little app to ask the questions. And again, we'll be asking the

questions of Chris as we go, immediately following his presentation and then we'll go with David and Dan with that.

So without further ado, I'd like to introduce our first speaker, Chris Rose. He's the founder and director of the Renewable Energy Alaska project. And Alaska represents a unique market and a unique market space where there're a lot of small communities out there that are very remote and are delivered fuel sometimes by barge and sometimes by other more creative means like, you know, smaller unit deliveries on snow machines perhaps in terrible conditions.

I remember one project, specifically, where nobody could bring in aircrafts for a while and they had to have everybody sweeping off the runway by hand, that kind of thing. So these are tough communities and Chris has played a leadership role in figuring out how to bring sustainable energy to these remote communities and has done a magnificent job establishing a stakeholder organization that facilitates the delivery of these technologies and the maintenance of these technologies and then most importantly the sharing of the successes and the methodologies behind the delivery of these innovative sustainable energy solutions. So, (Chris), with that I ask you to take it away.

Chris Rose: Thank you very much Charles and I really appreciate the opportunity to talk a little bit about what's going on in Alaska today. I'm going to start by just giving folks a brief overview of REAP and what the situation is here in Alaska and what I'm going to talk about.

As you mentioned, we are an education advocacy group. We're a statewide non-profit. We have about 85 (unintelligible) organizations now from (Cathican) to (Katibu) which are, by the way, about 1500 miles in between them, and we're focused on promoting the increased production of renewable energy, all technologies and energy efficiency in the state.

We are composed of utilities which is really important because they provide most of the power. The cooperatives and the public utilities are very important up here. We're got businesses, developers, Alaska native organizations, environmental groups and so on.

We work a lot on policy. We also work on just educating people about how these technologies work. And as you mentioned, Charles, this is a very big state where you can fit the 23 smallest states into the state of Alaska. So we've got a lot of challenges with long distances and not a lot of population, only 700,000 people in the entire state of Alaska.

We have a grid system that includes Anchorage, where I'm talking from right now today. That extends about 350 miles north to Fairbanks and about 200 miles south to Homer. So that entire grid we've got is just a little under 600 miles long. All the other communities in the state are standalone grids, micro grids.

And as you mentioned, Charles, we have renewable energy, particularly wind, and many of those are diesel-only villages. Twenty-six villages now have wind diesel hybrid systems. In fact, the conference that we're at today is all about energy storage and how that plays a key role in those smaller systems.

But today I was asked to actually talk about the large wind that is finally coming on in the state of Alaska and we're very excited to be talking about some of the successes of the large wind. The turbines that we've been using in these small villages are 50 and 100 kilowatt units, so not to make large scale units that are being put in into most of the country.

However, now we are starting to see a megawatt scale. We're in (unintelligible), Alaska and it's been after a long amount of work on a lot of folks parts to get this going. I'm going to talk first about the Fire Island project and go to the next slide please.

It's a 17.6 megawatt project that's being installed as we speak. It has the opportunity to be up to a 54 megawatt project and we're hoping to expand real soon. It is on an island. It's just a few miles off the coast of Anchorage. It's an uninhabited island so it's actually the best of both worlds. There's absolutely no - not in my backyard over there because no one lives there.

You really can hardly see the turbines from downtown or other parts of Anchorage. But it does have excellent wind offshore there and it's also going to be a key project because, although you can't see it from town very well, it's right on the approach to the Anchorage International Airport, so it's going to become one of the more visible wind projects in the United States simply because the million or so people who fly into Anchorage every year are going to fly right over it.

The first anemometers went in there over a decade ago and it's - as I mentioned, a 33% capacity factor, a good wind resource. But we have had a lot of different hurdles we've had to get over and I'm going to talk most about (Fire Island) today just because it is here in Anchorage and we've been working on it for a long time, but you know, at first of course, there was a skepticism that revolved about wind energy and why that's a viable resource, so there's been a lot of work just discussing how wind energy's working in other places with the utility board, boards of directors, utility staffs, our regulatory commission, our legislature and so on.

So there's been a lot of work done just educating the public on that. There's also a resistance to independent power producers or has been, at least, in the state of Alaska. As I mentioned, we are mostly co-ops and public utilities and so we don't have a lot of independent power producers.

This particular project is being put together by an IPP. It's one of our Alaska native corporations (unintelligible) Incorporated and (series is) partnering with Summit Wind to do this project. And so it was a pretty significant hurdle for us to get a power purchase agreement negotiated and then actually approved by the regulatory commission of Alaska. That only occurred last October.

In the meantime, we dealt with (debt pay) issues because there was navigational equipment on that island that had to be moved onto the mainland. As I mentioned, it's offshore so we had to get some special funding. We were able to get a $25 million appropriation from legislature back in 2008 that's just been sitting in limbo until recently to help pay for the NRC cable.

And the last hurdle that we really - I want to thank actually NREL for helping us overcome - was the concern that this was not going to be easy to integrate into our grid. And as I mentioned, we've got a pretty long distance. It's not very stable and not very robust and you had the concerns of the integration.

However, as we speak the NRC cable is going in. If you go to the next slide please, and the turbines and the towers are here. There're going to be eleven 1.6 megawatt GE machines being installed here later in the summer and in the fall. And we're looking at this project being commissioned by sometime in late September, early October.

The regulatory commission of Alaska, without any specific in the statutes, actually went ahead and approved this PPA last October for about 9.7 cents a

kilowatt hour, $97 a megawatt hour, about another penny a kilowatt hour that we develop and we'll be paying utilities to help integrate it. So about 10.7 cents per kilowatt hour would be the cost of power over 25 years. There's no escalation in that contract. It's just a flat price for 25 years.

And we're very excited to see that happen. Our current cost of power right now to the utilities is just under 7 cents so it is over of what it costs right now. If you want to go to the next slide, you'll see a photo. This is a cement truck being unloaded from a barge onto the island. They had to go to this barge dock and the roads on the islands, of course, so there's a lot of infrastructure, a lot of mobilization costs. And again, that's why we're hoping this will become a much bigger project real soon.

The next (kodo), if you go to the next slide, is one of the foundations being poured out there. And this was just taken a few days ago. And if you go to the next slide, you can see the ships out there in (Kukimart). You're looking toward the mainland, toward Anchorage. Anchorage is just on the other side of that forest, and you can see the NRC cable being laid.

The (Cook) inlet right there has a huge tidal fluctuation and on low tide, that - the water pretty much disappears. It's pretty easy to put that cable in relatively speaking. So that's an exciting project. We're really hoping that it'll expand and it'll be a great project for the biggest population center in the state to learn about wind.

I'm going to go to the next slide and just talk briefly about the (unintelligible) project which is a project being put in by some local utility in Fairbanks, the Golden Belly Electrical Association. It's a 24 megawatt project. They're going to be putting 12, 2 megawatt repower machines in there. That project is also happening just about at the same time.

In fact, their turbines and towers are already at the port of Anchorage. They're doing site work and this is not in any kind of property. This is the local cooperative. So that's exciting in and of itself, that the utilities have gotten to the point now where they feel comfortable in trying this out. It'll be interesting to see if they can get this thing commissioned on time but they're also going to be sitting turbines before the end of the year.

When we go to the next slide, they got a lot of (cred) financing which has been critical for this project to move forward. And they're looking at a cost prior to integration of about 8.3 cents per kilowatt hour. That's significant for Golden Valley because they generate currently about 25% of their power with oil off the taps via a (trans luster) pipeline. So they're using (Napfa) to produce about 25% of their electricity and that power, it costs that about 18 or 19 cents a kilowatt hour to do, so that's a big deal, big savings for them.

If you go to the next slide, you'll see the other huge advantage of this project that's good for Fairbanks utility is doing near Heely which is actually about 140 miles away from Fairbanks, 140 miles south, the (unintelligible) Valley National Park, is that this main power line, the main intertie between Anchorage and Fairbanks runs right next to the site so a lot easier to get onto the grid there.

I'm just going to look at the last slide here and talk just briefly about a few other large turbines because I do want to give Delta Wind its due. It was actually the first project in the state to put up a large wind turbine, a 900 kilowatt EWT. That's on our grid about 100 miles from Fairbanks.

They have had trouble as an independent property, so getting a power purchase agreement with Golden Valley for more than 2 megawatts, and that's

why that site has not gotten bigger yet. They do have much more capacity there though. They're putting up another 900 kilowatt unit this year.

You - many of you may have hear, the Kodiak Electric project, it's been an excellent project but it's on an isolated grid on Kodiak Island. They have the first megawatt scale turbines in state. They've 3G 1.5 for three years. They've been working so well, they're putting three more in the summer for the battery bank and they'll be close to 20% wind on the island then and 80% hydro. So they'll be almost completely off diesel.

Those three turbines so far have been saving about 900,000 gallons of diesel a year. So they're looking at doubling that savings. And then lastly, (Kotspy) Electric, which has really been the pioneer for small wind in the state of Alaska, one of the first - no, the first of the 26 wind diesel projects I mentioned.

They just installed two, 900 kilowatt EWTs as well. We were up there just a couple weeks ago looking at those. So that's exciting to see a smaller (energy) starting to put in the larger turbines. So I'll stop there and answer any questions people might have.

Charles Newcomb: Thank you Chris. And this time you're question free. And that's not unusual actually. People like to focus on what you're saying and they - questions bubble around and they start asking the questions usually a few minutes after you stop talking. So we'll give people a moment to ask those questions and maybe I'll take a little bit of a risk and go out and make the introductions for the next speakers so we have a little bit of time and we can be using that time fruitfully.

Chris Rose: Sure.

Charles Newcomb: And then we'll maybe ask questions right before David jumps in if that works.

Chris Rose: Okay.

Charles Newcomb: So our next speaker is David Belding with the Cross Island Farms. Cross Island is up in the part of the world that looks beautiful from Google Earth anyway, but it's about 100 miles due north of Syracuse, sort of up in the middle of the St. Lawrence River. So it's a neat little group of islands off the right-hand side of - is that Lake Ontario?

Anyway, and what's fun is that this is a great example of, okay, so small wind often will need a suite of incentives to kind of make the business case because especially projects in this scale can require a certain amount of capital. And buying now that first hurdle is an important piece and knowing how to navigate those various incentive mazes is really important.

So partnering with qualified and experienced development partners at the small end scale is really important. But, you know, just as important is having the right customer and having the right champion for the project that's going to see it through.

When Chris talks about a project that's taken 12 years, that's an example of needing a long term champion and I think we're all reminded of that when we hear from someone like David. So David and Dani both are at Cross Island and there's a pair of innovative community support agriculture folks who have a neat small farm, primarily in the meat market.

So you'll see a little bit of their product offering on some of their slides as they're also showing their wind turbine, which I think is fun. David grew up in the Midwest, in Ohio, and had a long passion for not renewables only, but also for sustainability and local, you know, eating locally and food - clean food, green food, and so now I'm seeing the questions rolling. Can you tell I'm distracted?

So let me ask the questions first real quickly. So, Chris, are you ready for a couple of questions?

Chris Rose: Sure.

Charles Newcomb: Still with us? Okay. So there's a question from down South, somebody with an offshore interest, who says, what's that - do you have some estimates, early estimates on a sub C transmission cable cost? And can you share anything about its rating? Do you know if it's a 33 KV or something higher?

Chris Rose: I'm almost positive it 33 KV and I am also going to go out on a limb and say that the cost is going to be closer to $40 million than $25, which is what the state helped with. But it's not quite in and so we don't know all the final costs yet.

Charles Newcomb: Okay, well, you know, what's nice is that if it's a state supported project, that would suggest that there may be greater transparency into the project (economics)...

Chris Rose: ...is what the state helped with. But it's not quite in and so we don't know all the final costs yet.

Charles Newcomb: Okay. Well you know, it's nice is that if it's a state supported project that would suggest that there may be greater transparency into the project economics. Is that a fair statement than if it were totally private?

Chris Rose: Well I think that's - that the developer has been really transparent. They're using a lot of 1603 money that they are passing all of those federal subsidies on to the rate payers. And that's been part of the negotiation from the beginning with (Sherry) and the utilities is that they wanted to pass on the subsidies to the rate payers and buy down the cost of the project. So it's been pretty transparent from the beginning.

Charles Newcomb: That's good. Well it'll be nice to see those - some of those details, like the undersea cable costs, come through because those don't land in our world where we get to see, "Oh, this is what it actually cost," that often. So if there's a way to kind of remind people that that information will be valuable to the stakeholders that would be terrific.

Chris Rose: Sure, and the other thing to think about up here is that even though the water is not as deep, as I pointed out, just mobilizing things in Alaska typically costs twice as much as anywhere else because the transportation costs for getting that equipment up here and so on, are really high. So I'm not sure how transferrable the cost will be, but we'll be happy to share them when we find out.

Charles Newcomb: Thank you very much Chris. Another question for you, "Do you know enough about the IPP contract to know whether it has an escalator on it for CPI or some other index?"

Chris Rose: Yes, it does not have an escalator.

Charles Newcomb: Wow, that's value. Okay, last question, "Did you, or do you know if anybody, looked at vertical axis turbines, if anybody could find credible utility scale vertical axis?" Or was that it, you guys took a look and said, "We're going to go for the lowest risk machine we can find out there where there's several - many thousands of them installed and so we'll be able to get service." How did you - do you know how they made that decision?

Chris Rose: Well I don't think anyone seriously looked at any vertical axis turbines up here. And I don't know whether people are doing that in the lower 48 yet either. I know that the technology center there in Boulder is not necessarily finding the same efficiency.

But one of the reasons that they picked the 1.6s, the GEs, is because Kodiak already has the GEs and I think there's some economies of scale and continued to work with GE on those turbines. And I think that was part of the thinking for the selection of those GEs.

Charles Newcomb: Yes, I guess the other part of the GEs is that they value engineer the installation itself so well that they're very efficient to put up if you have people who know what they're doing. And when you have weather delay exposure, like you might in Alaska, minimizing that exposure through a really efficient build process can be pretty important.

Chris Rose: Yes, absolutely.

Charles Newcomb: Very good. Well thank you Chris. And we invite you to stick with us as long as you can. But we understand that you've given us what you can, and thank you very much for your time.

Chris Rose: All right, thank you. Appreciate it.

Charles Newcomb: So joining David will be Dani in the wings, and ready to fill in some color if - as needed. And Dani is another person - I love these stories.

Dani is someone who came out of - you know, she's a psychologist who said, "I think I'd rather be growing things." And so it's nice to see, exciting to see people who have that kind of passion for sustainability, embracing the renewable energy revolution if you will. So with that David, I invite you to join us.

David Belding: Okay, well it's great to be here. Dani and I started Cross Island Farms in 2006. And we are a small-scale, highly diversified organic farm. We grow over 200 varieties of certified organic vegetables as well as organic free range eggs, and chickens, ducks, turkey, pork, beef and goat.

And we decided at the very beginning that we wanted to focus on sustainability, and that we were looking for - to produce high value specialty produce in direct market to the end consumer, and do it in a very sustainable way. See if I can do this, okay.

And one of the first points that we wanted to talk about is, you know, "Why are we interested in sustainable energy?" And it has to do with the fact that sustainability is our mission. And our vision is to build an ecologically, economically and socially sustainable farm. And in holistic farm management they talk about those three things as being the three legged stool of the triple wing goal.

So if you're not sustainable ecologically or environmentally, then you're not going to be around for the long-term. If you're not sustainable economically, you're not going to be able to afford to continue to do what you're doing. And

if you're not sustainable socially, which includes your neighbors and your customers and your suppliers and your workers and everybody who you contact with then ultimately you're not going to be around for the long-term.

So those three goals really tie into the whole alternate energy thing because fossil fuels are a non-renewable resource, and we're concerned about polluting the atmosphere and global warming.

And so by being able to generate our own electricity in a fashion that is environmentally friendly, we're approaching the ecological sustainability. And by controlling our electricity cost over the long-term, we're approaching economical sustainability. And by doing it in a way that fits in with the environment, we're approaching our social sustainability.

One thing that's important to note is that we are in a tourist area. This is the 1000 Islands Region, and there are actually 1864 islands here, as well as the Saint Lawrence - or the Lake Ontario. Lake Ontario enters into the Saint Lawrence River about 20 miles up-river from us. And so there's a lot of vacation people here and the aesthetics of the area are really important.

And large-scale wind projects have been proposed in local towns like Cape Vincent and Clayton and Orleans and have been highly controversial. In the Cape Vincent it's almost like the civil war with brother against brother and father against son, with people on different sides of the industrial wind issue.

So we were concerned when we did our project that we not get drawn into that conflict. And our small-scale wind definitely is a lot more socially sustainable, and we - it really hasn't generated a whole lot of conflict from what we've been able to determine.

So - Dani do you want to speak a little bit on your interest in getting started with wind?

Dani Baker: Yes, just briefly. I moved here in '93 and the first thing I noticed that is I - my bedroom was in an upstairs room and there was a big maple tree hanging over the roof, and I couldn't - I moved in September. I couldn't sleep because there was so much damn wind that the tree was hitting the roof and it just kept me up. And I was worried about something happening because I wasn't used to hearing that kind of wind from where I lived before. So that's Number 1.

And Number 2, well there's three points. I've traveled in the Southwest and there these lattice towers with little windmills pumping water for the cows out in the range are just a common sight, and I think a real interesting accent to the landscape.

And then I really, really philosophically wanted to do something that would save the Earth. And I felt that, you know, wind would be not only environmentally sustainable, but it would also - we have a big agro-tourism enterprise here.

We're trying to grow that part of our farm business and having that symbol stand up 120 feet above our property, you can actually see it from the interstate. So everybody who travels across the border on this crossing between New York and Canada can see this windmill. I just thought it was a really good message to send to the public and an attraction to bring people here for tours.

David Belding: So we had this underlying interest in sustainable energy and a friend of ours invited us to a little sit down in the kitchen and meet these people who had started a sustainable energy business. And they were focused primarily on

solar, the business was called Fourth Coast, and they're based in Clayton, New York.

And Dani was really excited about wind so she kind of twisted their arm and said, "You know you guys really should get into wind and we'll be your guinea pig and then we'll help promote you." And they're like, "Well we don't know that much about it, but we're game for anything."

So they did the research, they got us through the whole zoning board project which was quite huge. As I mentioned, wind is quite controversial here and our town has a wind overlay district which it does not include our island. And we would not even have been able to up a test tower except for the fact that when we started our farm we were advised to be put into a New York State agricultural district.

And the purpose of the state agricultural district is to protect farmers from over-restrictive local zoning regulations. And so because the way the project was to supply power for our farm, that New York State ag district overrode the local zoning and we were able to through the local zoning and planning process. Fourth Coast also was able to secure a USDA REAP grant for us and there had been some New York State and NYSERDA money available, although that dried up before we got our project going.

The model - the computer model showed that we should have good wind here, but I was a little bit leery because this a big island, we have some rocky ridges and some pretty substantial forests nearby. And I really, before we spent $80,000 on the project, I wanted to make sure that we really had the resources that we thought we did. So we put up a met tower and it's a good thing we did because the wind resource was about a third of what the computer module projected. And then the New York State money went away.

And so the project went from what we thought was going to be about a 10 to 15 year payback to being more like an 80 year payback. And we were like, "What are we going to do? This is - we want to do something but we just can't justify an 80 year payback on a project." So we kept bugging them, "Isn't there something else we could do, can we do this, can we that?"

And because they're specialty was solar not wind they didn't really have a lot of alternatives to offer us. But they had really gotten us far down the road. And we're approaching the end of the calendar year and we knew that we had to spend a certain portion of the project money to avoid losing our grant funding. So in the week between Christmas and New Years I was out with a backhoe on the frozen clay digging downhill to the telephone pole which is in the front of our house. And I nearly killed myself getting the power line in, because we had to upgrade our electrical service, but I got that accomplished.

And then not long after that we got introduced to some contractors who specialized in wind, Alternative Power Solutions out of Syracuse, and they worked with Bergey and they came out and they said, "No, you have to do 120 feet and we can get a really good resource here." And...

Dani Baker: So first what happened in January, a bureaucrat working for the state agency that helps...

David Belding: NYSERDA.

Dani Baker: ...NYSERDA, New York State's NYSERDA, that helps to fund these projects called and he said, "I've grabbed this old clipping from the paper, it's two years old, saying that you were going to do a wind project. Did you ever do it?"

And I said, "There wasn't any money," to NYSERDA, which was a 50% match. And that's what went away. And he said, "Oh, well we have money now." So I was like, "Yes." So...

David Belding: So we ended up with a new contractor who had the expertise, the specific expertise, of the area that we needed. And grant funding then became available and so we moved forward. And we ended up constructing in July and August a 10 kilowatt Bergey turbine on a 120 foot freestanding tower. Because it was going to be in our livestock pasture we did not want to have a guide tower because we were concerned with the livestock and the guide wires.

And once we got going Dani was like, "Well geez, what about solar?" So we ended up adding a solar array. And we were about two-thirds of the way through the construction and we thought that if the grid went down that we would still able to make electricity. But we discovered that, "No, because this is a grid-tied system, when the grid the goes away our inverter shut down and - because they need to be synchronized with the grid."

So we're like, "Well wait a minute, we have to have electricity continuously for refrigeration, for electric fences, for well pumps, we can't afford to be without power." So we ended up installing a 17 kilowatt standby generator.

And so I know we're running out of time here, I'm going to advance. So that's our basic project, it's a hybrid. Next slide is going to show you the net result. When things go good we end up with an electric bill like this, of $16.54, which is basically the cost of being connected to the grid.

We're still in our first year and we're learning the ebbs and flows of the electric generation and our use, and some months we've had $150 bill and other ones...

Dani Baker: Just one.

David Belding: ...and in other months we've had carry over, so we've had credit.

The few days after turbine went up Dani called me at 5:00 o'clock in the morning, she says, "Honey look," and...

Dani Baker: Forgot the picture.

David Belding: Sorry, go ahead. You has some...

Dani Baker: No, yes, you've got the picture.

David Belding: So this is - okay so the turbine went up. And this is before it's engaged, do you notice that the tail folded to the right. And one nice thing about the Bergey system is when the winds get too strong, instead of shutting down or locking up and not making electricity, the tail just starts to pull over to the side and turn the turbine out of the wind a little bit so it continues to operate at maximum capacity.

One of the concerns we had was, "What are our livestock going to think?" And in this shot you can see the solar panel with the wind in the back and our cows. But it's turned out to be quite user friendly. Here are the cows chewing their cuds underneath the tower and the goats are looking on. And so it's worked out pretty nicely, the animals really don't seem to be too concerned about the whole deal.

Dani Baker: Yes, theoretically we should able to produce all the power we need with this combination of the wind and the solar, and it's just a matter - we haven't even gone a year, and from my point of view it's just a matter of tie trading our use, being more conservative in some ways at certain times of the year so that we maximize our gain.

In other words we don't ever have to pay a bill, and when it comes to the end of the year, which is when we settle up with Nation Grid, we will basically be net even so that they won't pay us, you know, a few cents for the excess power we produce. That's what I'm hoping for. So I think with a couple of years of experience under our belt we'll be able to do that.

And here's the shot I wanted to show from a few days after the tower went up, Dani called me early in the morning as said, "Honey look," and there - actually you can't see it in this photo, but it's a double rainbow framing our tower. So we took that as a sign that we were being blessed from above and we certainly feel that way, and thank you very much for the opportunity to present on this webinar.

Charles Newcomb: Thanks to both of you, and again we'll take questions as you go. So folks who have questions go ahead and ask them and then we'll pass them on to David and Dani at the back side of Dan McGuire's presentation. So coming up next we've got Dan McGuire out of Nebraska giving us a little update on the Wind for Schools program there.

Wind for Schools we've had a few webinars on Wind for Schools, so hopefully people are familiar with this neat program that ties the Department of Energy - ties the institutes in each of - in 11 different states around the country. And then through various facilitators and other network supporters

touch into a whole lot of K-12 schools to inspire kids in energy, inspire kids in the wind energy specifically. And also deliver on some real energy and real homegrown energy in people's back yards, which is pretty exciting.

So Dan comes to us - Dan is one of these people who believes in providing value to everybody at once. And he's one of these people who can actually pull it off. He's a key to the Wind for Schools Program in Nebraska, is their facilitator. He's the Co-Chair of the Nebraska Wind Working Group.

He's been a good friend of Wind Powering America for longer than I can remember, since the inception of Wind Powering America. He's the Project Director for a national outreach program called, Wealth from the Wind. He works with the America Corn Growers. The list goes on and on.

Dan is one of these people that in the Heartland is really galvanizing hearts and minds and helping folks to understand the benefits of wind and how it plays a role in emerging economies that are more than just making food. So Dan with that I invite you to join us please.

Dan McGuire: Well thank you Charles. Could you acknowledge you're able to hear me?

Charles Newcomb: Yes we can hear you just great, thank you.

Dan McGuire: Okay, very good. Let me first thank you, it's a pleasure to be here. I want to thank NREL, Wind Powering America, because they are the real reasons that the Winds for Schools Program is such a success. Not just in Nebraska but across the country we have - all the states that are involved are very successful. So a big tip of the hat to NREL and Wind Powering America DOE.

The first slide I'm showing you here is a map of Nebraska, the red number boxes are the 24 partner schools that we have. Now not all of them the SkyStream installed at the moment, there's a few left to do that should be done this year.

You'll see some of the more rectangular boxes out in the Panhandle, there's - that's - the community college is Western Nebraska Community College, and in the East is Southeast Community College and South-Central is Central Community College. And then the University of Nebraska Application Center is shown there in the Southeast as well.

So we were fortunate, you know we're the only 100% public power state in the country, Nebraska Public Power District is the largest wholesale public powered entity here. So they helped us in the early stages with the grants, and any kind of equipment and technical support. And in a lot of areas we also have local public power districts. And they also got involved and provided equipment and technical support.

We had local construction and electrical business that provided equipment, labor and funding. We were very fortunate I think we got the first Wind for Schools USDA grant from I believe at the time they referred to it as Section 9007, it's now known as REAP.

But we also had a one or two community facility type USDA grants, so those were involved in what we refer to as our First and Second Round. And then we were also very fortunate, in Nebraska, we have a supplemental environmental grant program called, SEP, administered by the Nebraska Attorney General's Office. And so we had 12 schools that received an average of $16,000.

And then our state energy office, Nebraska Energy Office, received some ARRA grant funding, stimulus grant funding, Reinvestment Act funding, and so that was very helpful as well. And the Nebraska Energy Office has been another very good ally and partner in making this program successful.

Some of the projects actually had some donations from individuals and businesses. And local community foundations as well.

So it was a good mix of the community involvement across the board and the utilities as well. Now this slide is not very readable - I don't expect on the screen - but it is the list of the 24 schools. And it also - it shows the date of install or estimated install in the case of those that are left.

And then the (K-12) school - the name is in (that) next column. And then over further is the enrollment of the school, and the city, and then the population. So I expect that those could be enlarged on your screen to see or printed off (and maybe) - and be more visible.

And then at the bottom is a - are the community colleges mentioned as well. At the beginning, Nebraska Public Power District was involved in a couple of different ways.

I mentioned the funding and the grants. They would - if they were to retail a - electricity provider to various schools like Elkhorn Valley (there) was our first school. In that city, that school NPPD is the retail provider.

In that case, NPPD provided - $3000 grant and then also provided equipment and help - technical help and so forth. That second school is a good example of a local public power district - that's Loup Public Power District.

And in that case, they are the retail provider. So NPPD sells power to them. They sell it to the local customer. So in that case, NPPD, provided - $1500 grant and the local public power district, I remember December of '08, it was the windiest day of the year.

And the Loup Public Power folks had three or four trucks out there. And they stood that SkyStream up on the windiest day of the year. Then you can see Southwest Public Power and North Public Power, Cuming County Public Power and so forth - Custer Public Power.

Those - in those cases they - NPPD provided $1500 grants. Now one of those schools in towns that - (O'Lester Darryl Neil) did withdraw their application. They had a lot of other things going on. They had a big school bond issue for a new school building and so forth.

So they couldn't take on another project so they withdrew. And you'll see on your right-hand column that it says, "Not installed," on some of those. That was a 2010 spreadsheet provided to me by NPPD. All of those are installed now. Okay so our strategy from the beginning.

The program began in 2007. We were fortunate in Nebraska that NREL identified Nebraska as one of the priority states. Again, the first school was Elkhorn Valley District Schools in Tilden. Once that project was up and going, there was press coverage, news stories and so that made some of the schools (aware).

And then word of mouth among the K-12 school network generated additional requests from schools that wanted to become partner schools. Then in February of '08 and Larry Flowers was still with NREL then.

And so he was with us on this Nebraska wind working group tour where we started in Scotts Bluff on the far West (panhandle) and made a sweep across the state, ended up at the state capital in Lincoln.

Five workshops describing the wind working group and the Wind for Schools was on each of those programs. Now, that gave a lot more people a lot more awareness.

Another thing that we did in (Merit Corn Growers) foundation - we have had a booth at Husker Harvest Days which is a (farm) - large farm trade show here in Nebraska. It is a big show - largest operating irrigated farm show in harvesting and so on.

We've had a booth there for about ten years. And part of the information I had there was Wind for Schools information. And we did radio interviews and that was heard across the state.

And some schools - a couple of them - actually came to that booth - got the Wind for Schools information as a result, ended up being a Wind for Schools partner school.

So part of the outreach succeeded in that way. And then we've had four annual Nebraska Wind conferences where we've always had a Wind for Schools component.

And so that has been a critical part as well and providing awareness and schools have attended there and students have attended there so that's been very good.

So our approach was (Neo)'s facilitator make the initial site visits and evaluations - took a lot of photos, wrote up (a - and) presented the Wind for Schools program to the school leadership - superintendents, teachers, principals, whoever.

And sometimes to the school board and I would help write resolutions supporting the program et cetera for the school boards. And then I would give a comprehensive written report to Dr. (Huggins) at the University Wind Application Center.

And then the - and the WAC then Dr. (Huggins) and (Joel Jacobs) would provide the technical support and assistance to the K-12s. Whether that be curriculum or career development or actually (Joel Jacobs) was at the installation (of) every one of these installs at these 24 schools.

Except the last one, I think, where there was a SkyStream dealer was actually involved in that installation at the choice of the school which we have now given them that opportunity to take that approach.

So we've had a real coordinated approach and it's worked very well. This was a slide taken at our teacher training in 2011 in Kearney, Nebraska. Left to right there that's (Doug) from the NEED project, myself pointing out the NREL Wind for Schools poster, Dr. (Huggins), and then (Joel Jacobs) both with the University Wind Application Center.

Now, we had about 1/2 of the schools that are partner schools represented at that event. Dr. (Huggins) is shown here giving a slide on wind turbine physics to a number of those K-12 teachers and officials.

And this one Dr. (Huggins) and (Joel Jacobs) had a SkyStream then the cell was right there on top of the table. It was taken apart (so) teachers and the school officials could analyze it - look at it - answer - have a lot of questions addressed and so forth.

So that was a very useful event of project information as a result of that as well. So the future Wind for School program challenges as I (unintelligible) them here in Nebraska.

And we have a lack of (USDA) grant funding. It's not as available as it used to be and there's a lot more competition for it. And many of you might know that the farm bill is being debated at this moment in the Congress.

There have been amendments to wipe out renewable energy funding completely - doubt if they'll survive. Hopefully those things won't pass and but we've always had that challenge. Then the SEP grants - the attorney general's office has not - they go from one priority area to another.

We were very fortunate that they liked the Wind for Schools program and it fit their mission. And so we were lucky with that. That's not the case now. They're on to other things. I don't rule it out completely but it's not going to be as logical - likely as it was before.

NPPD is no longer providing grants and funds as they have devoted resources to energy. They built a new energy education center in Norfolk, Nebraska with three SkyStreams up there on various heights.

Now this is not just about wind energy although they also have interactive data with wind farms and those three SkyStreams, the center also covers all

conventional and renewable sources so that's what that's about and they've devoted their resources to that.

Now, the challenge now as I see it as identifying new sources of funding for the UNL Wind Application Center. And that's a big deal and we really need to focus on that and try to get it funded.

Not sure where those funds will come from. But - so as a final thought, and I know I've used about my 10 or 12 minutes now - so the Wind for Schools program is absolutely an exciting valuable program - provides a world of educational opportunity for K-12 schools across the country.

The first school again, Elkhorn Valley. They have this billboard that's on the slide now. East of Tilden on Highway 275 and the students designed this billboard. And as you're going West on 275, you'll see that. You'll see the SkyStream - the power of green.

In about another mile up the road, you'll see the SkyStreams spinning next to the highway and a big hiker - biker trail and it is a very exciting program. I - tip of the hat again to DOE - NREL for doing this. And I'll stop there Charles.

Charles Newcomb: Dan, thank you very much for that overview of that exciting program, you know, one of the (fun) statistics is that we're trying to figure out exactly when we crossed this threshold.

But nationally, we're somewhere right around 99 to 101 (turbines) installed at K-12s. So we're (hitting our 100 turbine) around now. And we'll only know by looking backwards and kind of being fair and saying, "Okay what - when did that (kilowatt hour flow)," - kind of perspective.

But so you're a big part of that important program so thanks again very much for that.

Dan McGuire: Well thank you for the opportunity and best wishes to all.

Charles Newcomb: Great, okay so onto some questions. One question for Dave and Dani was did you look at other machines? And how did you settle on the Bergey? Was that expertise of your local provider or was that the best match?

Woman: Actually, the first contractor we worked with had selected a different kind of machine.

Man: A re-driven.

Woman: Yes, a re-driven. (And) it's a very good thing that - and they thought we going to - they were proposing an 80 foot high hub of the tower. And it's a very good thing that it didn't work out because I think they've had a lot of lawsuits filed against them because they're product isn't living up to its expectations.

But anyway, no we didn't - we trusted the company. They told us that the (burgee) was developed in Oklahoma in tornado alley and that the company had been around for 50 years. And that persuaded me that they knew what they were doing.

Plus the company we hired to do the actual installation had already installed a number of them and they hadn't had any problems with them.

Charles Newcomb: You know, (my favorite) story about the (burgee) is looking at the, you know, when hurricane Keith came into the Yucatan, it spent three days

hammering sort of the Southern Yucatan with 114 mile an hour sustained winds.

And there was a neat little farm of five (burgees) down there and they kind of wiped out every dock from somewhere down in Guatemala all the way up. And pretty - kind of leveled the town of (Easterlac) and we came back down there and those five (burgees) were still just in one piece - it's amazing, yes.

Woman: That's a great story, thanks for sharing that.

Charles Newcomb: Yes, they're pretty tough. Can you share any thoughts on what the cost per kilowatt hour is in upstate New York? What was it? What kind of cost were you offsetting?

Man: I think with electricity and delivery that it's somewhere around 14 - 15 cents a kilowatt hour.

Charles Newcomb: Okay.

Woman: (Right), it keeps going up every year.

Charles Newcomb: Not anymore for you.

Woman: I mean, the delivery charges are more than the cost of the power itself.

Charles Newcomb: Yes.

Woman: (Right, we) no, go ahead.

Charles Newcomb: Well, I was going to ask, you know, there's a nice question here. You know, you went through this. You - it was something you thought about for a while. You had a near miss with another turbine company that doesn't sound like you mentioned - doesn't sounds like (their) performing as folks had hoped.

But what kind of lessons, you know, if you had a top four lessons or three lessons for other farmers or small business owners or individuals that were thinking of developing a project like this, what would your advice be?

Man: (After all) - I guess the first one is, do your research on the contractor and choose somebody that has a proven track record with the technology that you want to use.

Woman: Yes, I agree with that. I don't think you - I think you have to go at least three years before you have an idea of how you're system is performing compared to projections.

And you have to be able to write big checks because I know that, you know, if you have some grant support - I know the U.S. grant was reimbursement grant. So I had to come up with a big check in order to get the project moving and then I got reimbursed after it was complete.

It's a big investment. I - personally, I think you have to have a passion for doing it. If you're just looking at the numbers, you're probably going to be disappointed because the payback period is not, you know, it's significant.

Charles Newcomb: Where you are - let's be clear on that. So there are - there (may be other locations) where there - (a resource is low).

Woman: Right, yes, that's good - yes.

Charles Newcomb: Yes, okay very good. I think you mentioned that there is about $80,000 pricing ticket - price tag for this whole project, is that right?

Woman: Well the project - the company who actually installed it - it was a $73,000 project.

Charles Newcomb: Okay.

Woman: But we had done the preliminary work. We put up the test tower and we had paid the other company for, you know, getting the grant written and all that. So it was about $82 total.

Now the company that installed the project based on (their) $73,000 quote estimated a seven year payback. But with the additional cost that we had (expended) beforehand, I think it was, you know, I don't know how do the math for that to say how many years it would be. I don't think it's - you don't just add it on - maybe 10 to 12.

Charles Newcomb: Very good. Dan?

Dan McGuire: Yes.

Charles Newcomb: Question for you. I know that funding for Nebraska is coming to a close. What are - can you share some thoughts, I mean, we saw the state of Illinois come to the table with a Wind for Schools program that was absent DOE funding - Department of Energy funding.

And I know that AWEA has been working hard to coach and facilitate discovery of new funds to help programs such as yours as they sunset off of the contract period with the Department of Energy.

Can you share a few thoughts on how that's going? What the climate looks like? And have you spoken with the folks at Illinois to know what they did? I think they're supported by the state so maybe that's a different picture.

Dan McGuire: (Yes), right and so, you know, there was a bill introduced a couple of years ago. One state senator here in Nebraska thought (now) this was a great a program and introduced some funding - was going to get - I think it was $50,000 in for the program for schools. But that bill did not move on through and pass through the legislature.

I, you know, I haven't visited specifically with Illinois. But if it's state funded, good for them. That's a - that is great that their state is doing that. They have a lot of commercial wind development there and that might have some influence on it here.

I'm looking at foundations as possible sources of funding - maybe some of the (agri-business) type - big companies where we have so many of them here in Nebraska or (agri-related) foundations.

I'm not sure if the climate is ideal for that, you know, the economy - these uncertainties with the economy and then the federal budget and all of the rest of it. And states are having their challenges.

So I - I'm not certain where - what kind of response I'll get. But my intention is to start approaching some of the foundations. I did approach a couple last

year but they - they're response was it's not in their mission statement or doesn't fit into their mission.

So I'm optimistic but I really can't give any certain predictions here (Charles).

Charles Newcomb: Fair enough. Well, you know, one of the things that I've - and I think it speaks to, you know, coalition building. And we've talked to various universities who have made a very successful pitch to their administration that the activities of the K-12s go a long way towards garnering enthusiasm.

Not just for clean energy and sustainability and local economic development, but also towards getting kids excited about science, excited about energy, sort of thinking back to the development of the National Energy Education project - NEED - and the - how universities have begun to view this very much as a recruiting effort.

So that the Wind for Schools program is leaving behind a tangible reminder that that (university) has been there and they're part of that community - they're connected.

And they're even piping data up to (central)'s data warehouse where other people can see how the school is doing. So when we can - (we'll) leverage those kinds of coalitions that's an exciting thing.

Dan McGuire: Yes, and Charles if I could add that - and I should have mentioned - our, you know, the first - the classes at Northeast Community College in Norfolk - the wind technician classes filled up. Now it's a couple of - it's been a couple of years going now.

Southeast Community College - absolutely filled up with their new energy training program. I think the fact that we were tied in at the same time - there was a career development or I should say utilities scale wind development here in Nebraska that required a change in the law here in '07.

But Wind for Schools came in at the same time and it captured the imagination. It was a lot of interest in the schools and potential careers. And so that tied in very nicely - fit perfectly.

Charles Newcomb: Well, it's vital that we get people excited about energy and get people into engineering. There is a tremendous cliff coming in terms of a lot of people are retiring out of the energy operation side of the world and we need more people in there so we really appreciate the effort that you're doing on the ground.

So as we think about - the slide that's up right now, is thinking about the next couple of webinars. Coming up next month again, we have these on the third Wednesday of each month so you can write them down on your calendar for the next many months and know that we'll be there for you.

Coming up on July 18, we'll be talking about the 30 meter high resolution wind map really targeting the distributed and small wind space. But we're going to be talking about how (around) - it's not a number you take to the bank, it's a prospecting number.

And there's a fair amount of work that I think and (David) and (Danny) described nicely that it's also about micro-siting and just because there's a number on a wind map, what's the next step?

And so we'll definitely be digging into that and a little bit about performance estimation and production estimation there.

On August 15, we'll be providing kind of the mid-year social acceptance of wind energy update where we talk about what are some of the latest barriers from a social acceptance standpoint? What kind of research needs to be done? What we're doing to address those barriers? What we're learning?

So we'll be excited to deliver those to you through the rest of the summer. Until then, I think there's another slide - one more - make sure - correct. I always need this - a reminder - that special thanks to the Department of Energy.

The Department of Energy's long lasting support of this program has been instrumental in the success of the wind powering America and the market deployment program here at the National Renewable Energy Laboratory.

Without their support, there would be a little bit less wind out there I think most of us would agree. So it's very exciting to see them continuing to support us.

And there's a few contacts for you if you have questions, Jonathan Bartlett is our Department of Energy headquarters lead. He and (Barring Goul) is our technical lead.

And I'm one of the guys that is along for the ride and try to do my best to keep up with the guys. Again, if you have questions, please feel free to reach out to us.

Wind Powering America website is there and through that website you can get to our webinars and this and all of the content from this - from today's webinar will be available typically within a week or ten days.

And thank you all and thank you again to our speakers. We most appreciated your sharing of your field experience with us.

Man: Thanks.

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