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CEP Conversations:

Dan Nagengast, Kansas Rural Center
The Potential of Community Wind

Dan Nagengast, Kansas Rural Center (KRC) Executive Director and community wind advocate, recently sat down for a chat with Maril Hazlett of the Climate and Energy Project (CEP).

This spring, KRC and CEP will sponsor community wind development workshops for six to eight interested counties in Kansas. For more information, please email info@climateandenergy.org.

Maril Hazlett: Hi, Dan. Why don't you start out by telling folks little bit about who you are, what you do for a living, and how you came to the issue of community wind.

Dan Nagengast: I have a long history of trying to figure out how to make rural areas more economically viable and trying to find opportunity for young people and existing farmers. I grew up in western Nebraska on a farm 15 miles outside of a town of 300 people and spent all my young years there. I spent many, many years in west Africa working in communities there. Then I came back to Kansas and worked on hunger programs for Church World Service, We raised money through Crop Walks for years and years.

Now I work for the KRC. A little while ago I had the good fortune to visit Minnesota with a group from the Kansas Energy Office and the Governors Rural Life Task Force, which I was chairing. We went to southwestern Minnesota -

MH: Wow. Cool stuff going on there.

DN: Yes, it's the hot bed of community wind. You can see hundreds of towers out in farmers' fields - not in grasslands. These towers are owned by farmers, as much as possible, or by municipalities or schools.

And you can just see the prosperity of the countryside. You can see the tax benefits flowing into the school system and into the bridges, into the county commissioner's office, all those sorts of things.

MH: Why wind? Why right now?

DN: Wind is a form of renewable energy, and it doesn't emit the greenhouse gases that lead to climate change. It's a natural resource-based crop.

It used to be - well, there was soil, water, feed, farmers, and we cursed the wind. And now it could be soil, waters, feed, farmers - and oh, we *like* the wind. If it is structured right, the wind could function as entirely another crop, and its harvest could help firm up rural economies.

So I am very interested in and excited about that. But Kansas is behind the ball compared to Minnesota and Iowa, and increasingly the other states around us. (MH: KS ranks third in wind development potential but 12th in actual wind development.) It's not that Kansas has bad wind policies - it's that we have no policies. And if we are going to have policies, it'd be great if they were progressive policies. Wind is a natural resource that can help Kansas become much more prosperous.

MH: What is the potential for Kansas wind development in terms of specific megawatt targets?

DN: The possibilities are ridiculous. I think the potential is somewhere around 121,900 megawatts. Of course not all that wind can be tapped, but a big chunk of it can. The Southwest Power Pool, the regional transmission authority that oversees transmission lines for this area, uses the regional figure of roughly 40,000 megawatts. Kansas represents maybe 11,000 or 12,000 megawatts.

There's other projections, too - the National Renewable Energy Laboratory (NREL) uses President Bush's target, of having 20% of the nation's electrical power come from wind by 2030. That breaks down to about 7,100 MW for Kansas. So either way you slice it, there is enormous potential.

MH: How much wind power is operating in Kansas right now?

DN: We have about 364 megawatts installed, with about another 300 or 400 coming online soon. I think we will get to 1,000 megawatts within a year, year and a half.

MH: Wind development, though, depends on developing transmission lines.

DN: You have to have a transport system for wind and electricity, just like you would for grain or any other commodity. You have to get it from the producers to the consumers. Transmissions lines are a hot topic.

MH: So to speak.

DN: Electrifying. And the Southwest Power Pool until six months ago was thinking about 13,000 megawatts of wind coming out of their general area. Now they are starting to talk about 40,000 or 50,000 thousand megawatts. They are starting to take that seriously.

There are a couple of power lines that have been approved by the Southwest Power Pool on the books right now. I've talked to some folks who know a lot more than I do about energy, and they say that even with the smaller feeder transmission lines, when these two new lines come in there would be almost no place in western Kansas that you couldn't put a sizeable wind array.

MH: Where specifically are those lines?

DN: One heads north and one heads south, both from Spearville, Kansas. The north one heads up through Hays and Philipsburg to Axtell, Nebraska. And if you think about it, energy can travel both ways on those lines. So you could feed it up there, or you can draw it down if you need it. The south one heads from Spearville down to Coldwater, Kansas, roughly, and back up to just north of Wichita, near Hutchinson.

Add the new lines to existing transmission capacity, and there's room out there for lots more wind arrays.

MH: What makes Kansas such an attractive site for wind power?

DN: We have a sparse population, lots of cultivated farmland... and it's windy as hell. Kansas has the third best wind resources in the country. However, that sparse population is a double-edged sword because it means we don't have a lot of electrical infrastructure. Wyoming and the Dakotas have that same issue.

MH: How do you site wind power? Does it depend on the layout of the land - are there surveys they have to take?

DN: Where you site an individual turbine is very important. You have to separate the turbines, too. If there is variation or relief in the landscape, then you can't just set up turbines long straight lines. You see some of that out at the Montezuma wind farm, but that is a pretty flat wind farm. If you have ridges - and often the best wind is where there are ridges - then that is where they look.

MH: How many megawatts per turbine?

DN: Most commercial turbines are now up to 1.5 megawatts each.

MH: And about how many meters tall?

DN: They are about 250 feet at the hub, and between 400-500 feet at the top of the arc.

MH: Most of the wind development in Kansas seems to be by private developers - but you support community wind. What are some of the differences?

DN: Community wind tends to be smaller to medium size arrays where the community has a substantial stake in the project, and shares directly in the benefits of producing the wind. (MH: Windustry defines community wind as where "local community members own and have a significant financial stake in the project beyond just land lease payments and tax revenue. Community wind projects can be any size, ranging from a single turbine to more than one hundred, yet typically serve local communities or consumers.")

Developers look for large spreads of contiguous acreages, and they put in very large arrays. Generally that means in grassland, not farmland. This approach has caused a lot of the problems with wind in Kansas, especially with conservationists. Grassland is where much of our wildlife thrives. The needs of wind developers have often come in conflict with those of conservationists.

MH: So the market has been meeting a need and created some problems on the way. Inadvertently.

DN: I'm not hostile towards anybody's goals, but I am also interested in a lot of people sharing in the benefits of wind power as a community. I'm also very interested in getting wind power out of the grasslands and onto farmland.

MH: Describe your perfect model of community wind energy. How would you like to see it happen? In order to get communities together in support of wind power, and get multiple owners to share in the benefits.

DN: For community wind - I would like to see it go on cultivated farmland. You'd like to see the turbines, and access roads running between fields. You'd like to see those arrays twenty miles from transmission lines, or less. There are projects that run more distance, but having them closer cuts down your costs and interconnection fees.

It would be nice to have lots of local ownership of the turbines themselves, not just developers paying rental fees to the farmers. I'm not opposed to larger arrays, but there is room for smaller arrays - 20 megawatt grids being jigsawed into regional grids, and displacing coal energy in those as much as possible. So the ideal is a mix of a lot of different sizes of wind development. Community wind is an important part of that mix.

MH: It almost sounds like a co-op model of ownership.

DN: Like a farmers' co-op, or an electric co-op. Or a municipality. Kansans or Kansas entities would own community wind arrays. The dollars would stay here. They would stick here.

There have been two studies - one of them in Minnesota by USDA, I believe. And they both say local ownership is a factor in communities benefiting from wind farms. Between six and ten times the money stays in the community if the array is locally owned.

MH: So that is one of the benefits of community wind - direct economic benefits to local communities.

DN: I think Kansas rural communities would thrive. There's also lots of jobs associated with developing wind power and maintaining the turbines. In the Minnesota model, there are farmers taking those jobs and also being hired to maintain their own turbine, which is kind of interesting.

But here in Kansas the existing arrays have had a hard time holding on to their employees because they keep getting hired away. I think it is approaching \$80,000 a year for a good wind technician, so it's hard to keep them around.

There are lots of educational opportunities. Cloud County Community College has a wind training technical course. So does the Manhattan Area Technical College. I think a lot of the other technical colleges too. It would be a cool way for people to farm, to work and to have great incomes in rural areas.

MH: I know that with the help of CEP, the Kansas Rural Center is planning on putting on several community wind development forums this spring.

DN: We are hoping to do a series of at least six summits in western Kansas, in areas where things have lined up - good wind, cultivated farm land, access to transmission, communities that really want to consider wind as an option for economic development - so far we are looking at Philipsburg. Kingman is a possibility and then down around Comanche County is another one, maybe Colby, we might consider down around Seward County.

They would be probably regional conversations, but we have the ability to bring in national experts to speak on certain issues. I would like to see each summit have a component about helping people get organized about responding to wind opportunities. I'd also like to have a county commissioner who has gone through all this from some other state. And to make sure we invited county commissioners from all over western Kansas to come hear a person like that.

MH: Voices of experience.

DN: That is right.

MH: One claim you hear a lot in wind debates - supposedly, wind advocates think wind power should just go anywhere. Do you think there are siting limitations for wind?

DN: The obvious thing is if there are lots of neighbors and they don't want wind, you are going to paralyze that project. You're going to have neighbor against neighbor, and it's just not going to work.

So there is the human factor, but then you know, we have almost 8 million acres of farmland. We really need to keep out of unfragmented grassland. There is just no reason to do that. You may have a really good wind resource in an unfragmented area - well, the Flint Hills are the prime example - but there is no need to put the turbines there. We can put them elsewhere.

MH: What about wind and wildlife? Birds and bats?

DN: The cuisinart?

MH: Yes. The bird cuisinart.

DN: A lot of that data came from the impact of an earlier generation of wind turbines on raptors out in California. It was the first huge array of wind farms, with extremely rapidly turning smaller scale turbines with lattice ladders. The birds would sit out there and they'd see a rabbit and they'd swoop down and you know, bam.

Modern wind turbines are designed much differently. They still go fast - the scale is so large that it looks like they are lazily turning in the wind, but I think it is approaching 100 miles per hour at the tip of that turbine. Yet you don't see dead birds around the turbines. Wind power still shouldn't go in major migratory corridors.

The bigger question from conservation groups: Do wind towers - especially in unfragmented grasslands - disrupt breeding patterns and the nesting grounds of prairie chickens. I think there is something to that.

Scientists will keep studying this, but just like the turnpike running through the Flint Hills probably messed up the wildlife, any kind of wind tower you put up will have some impact, too. And that is why we are encouraging wind development to happen in cultivated farmland, where the impact will be less.

MH: And compared to the impacts of fossil fuel combustion on wildlife -

DN: Wind isn't even close.

MH: Another issue that comes up a lot when people are talking about wind is variability, or intermittency.

DN: DOE and NREL have studies that have confirmed that the current grid could support up to 20% penetration by wind, with basically no problem for base load. Right now we are a long way from 20%.

Now, having said that, individual regional sections of the grid - some are better prepared for wind penetration than others.

Still - there seems to be a double standard with intermittency. Even fossil fuel power isn't always stable. For example, the Jeffries Energy Center went down during this recent ice storm. When it went down, it was backed up by the grid. The whole idea of the grid is that it is a giant swimming pool - if you want to think of it like that -

MH: Water and electricity. I don't know.

DN: - a giant swimming pool full of electrons. Many, many spigots feed in to it. If one of those goes offline the others make up for it. And that is true of wind, or coal, or nuclear or anything else. All power has ebbs and flows, not just wind.

Also. Why do we have to use wind solely for the grid? Maybe there's other uses for the electricity, and we can tell the grid "we'll sell to you when your price is right."

You know, if I wanted to look fifty years down the line, to my mind, the more independence - without getting rid of the grid, don't get me wrong, I appreciate the grid - but the more independence everyone has, from the individual to the community on up to the state, I think the better off they will all be.

I think those are all regional economy things. If you have a strong, independent regional economy, you have control over more of the variables. Like the price fluctuations of fossil fuel markets. Like bad weather. I've had conversations about all the power poles that have to go to feed this system and whether it is time to think outside the box. And I think it is. The other interesting thing is the whole idea of compressed air storage for wind. If that technology comes through, say goodbye to problems of intermittency.

MH: Say more about that.

DN: Well, Kansas is not only blessed with this godawful wind blowing all the time, but we are also blessed with our depleted gas wells. There are two existing compressed air storage projects in the world. One is in Germany, and one is in Alabama. And there is a large one slated, being looked at seriously, up in Iowa. (MH: Compressed air storage would be a way to store the power generated from wind, making it a less variable power source.) And here we are sitting on...

MH: Lots and lots of depleted oil and gas wells. Will aquifers work? What about salt mines?

DN: All those sorts of things. Part of it is the scaling, and what goes down there. There are 330,000 depleted gas wells in Kansas. There is already compressed gas storage in many places in Kansas. You have those salt mines, you could be using your aquifers to provide steady pressure to pump air down. The equipment exists to harvest electricity, as well as to harvest heating from that equipment.

I don't think there is a lot of willpower here to do some pilots. But if we had a little more guts... The interesting thing, because of the oil and gas industry we know a lot about the geology of Kansas. Much more than the lowans do, or almost any other state. And if you look at a national map you can see a pretty amazing congruence between Kansas' wind potential, and the potential of its geology for compressed air storage.

MH: Another criticism of wind energy is that wind costs more.

DN: If you look at the larger price trends, the price of wind energy is going down, down, down, and the cost of coal is going up, up, up. And I think they have already intersected, actually. New wind development is close to the same cost as new coal - and that will only be more true with carbon regulation coming.

MH: Just to clarify, you hear a lot that we can go from all coal to all wind. Do you think wind in the near future can provide 100% of our electricity?

DN: No. Not in the near future. Wind is not going to do that. That is going to take a long time to work through, but now is the time that we should start down that path.

The other thing that really interests me, is small wind - behind the meter wind, or slightly larger than the meter wind - that is owned by farmers, or schools, or small businesses or homeowners - and they are providing much of their own energy. Just as new insulation drops your energy costs, having your own solar array or your own wind turbines drops your energy costs.

Also, if a power line goes down 35 miles from you, you're not in trouble. If every power pole between you and that place goes down, you are still not in trouble. Something could still go wrong at your place, but you have a better overall chance.

MH: What would you say are some of the major barriers to wind development that exist right now? Would that be in policy, or financing, or what do you see?

DN: Transmission is an issue right now, but that is working out. Hopefully.

Most of all, though, I think we need legislative policies that promote wind. Right now we have a vacuum. Kansas doesn't have any policies really, one way or the other, about wind. But you look at surrounding states - Minnesota, Iowa, Nebraska - they've just passed community based economic development legislation. Or look at states with renewable portfolio standards. Or net metering, which encourages that small scale user, but also makes wind more acceptable in the energy landscape.

All those sorts of policy initiatives would make Kansas a place that encourages wind development. And so in many ways, we have been missing in action. That is something the legislature needs to respond to. Where have they been?

MH: I should have shoehorned it in earlier, because that would have been better... Sorry. Say someone comes up to me and asks me to sign a contract giving them the air rights to my land. What do you call it?

DN: Yeah, it's leasing.

MH: What do I do? What should I do? I have heard of people just signing these rights away for nothing.

DN: There are some bad leases out there - similar to what has happened with coal bed methane, and what used to happen with oil leases. There are speculators driving around door to door, getting people to sign for little or no money.

And it is not just those leases, it's the dollar negotiations. If they do put turbines on your land, what kind of rent do you get? Do you get a percentage of the profits? Those sorts of things. Then we have county commissioners negotiating with guys in Armani suits about how much is your county going to get. And some counties do better than others.

It would be so helpful for everyone to have an idea of what other leases are like, what other people are getting, what payments are, etc.

MH: What is your vision for Kansas? Twenty years from now, what you like to have seen happen in this critical time period? What good things would have happened, and where would we be?

DN: I would like to see a whole new layer of economy spread out over as much of rural Kansas as possible. With lots of opportunities, with people moving back out to rural Kansas. People in cities trying to catch trains so they can move out to rural Kansas, trying to figure out how they can be a part of the rebirth.

There would be another whole level of industry and jobs based on manufacturing energy technologies that don't have environmental or greenhouse gas implications. I'd like to see Kansas a much more prosperous place.

MH: It would be reversing that countryside to city trajectory. You want to turn that arrow back around. Make the good stuff flow back.

DN: Yeah. How can those people involved with the raw materials make some money.

MH: Since the 1850s we've had a drain going on the other way. The profits have moved up the chain, as the chain has gotten longer.

DN: Concentration is all about investors making a lot of money. Community wind is all about - how do we spread prosperity widely across the rural landscape. To me, that is more important than the greenhouse gas issues or anything.

MH: To wind it all up - what is your favorite country music song?

DN: Kenny Chesney. "She Thinks My Tractor's Sexy." Hard to beat that one.

Resources:

- CEP Wind Resources - <http://www.climateandenergy.org/Explore/Wind/Index.htm>
- Kansas Rural Center (KRC) - www.kansasruralcenter.org
- Database of State Incentives for Renewables and Efficiency - www.dsireusa.org
- Windpowering America - www.eere.energy.gov/windandhydro/windpoweringamerica/
- Windustry Community Wind Toolbox - www.windustry.org/CommunityWindToolbox
- Farmer's Legal Guide to Harvesting the Wind - www.flaginc.org/topics/pubs/index.php#FGWE
- Southwest Kansas Royalty Owners Association, Guidelines for Landowners in Negotiating Wind Energy Leases (.pdf) - <http://pta6000.pld.com/swkroa/gflinwel.pdf>
- American Wind Energy Association - www.awea.org

The Climate and Energy Project (CEP) is a project of the Land Institute in Salina, KS. Our goal is to help reduce the Midwest's contributions to global warming and climate change. We support the reduction of greenhouse gas emissions by increasing energy efficiency and developing renewable energies in a sustainable manner.