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CEP Conversations:
Les Evans, Kansas Electric Power Cooperative (KEPCo)

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Les Evans is currently the vice president of power supply for the Kansas Electric Power Cooperative, or KEPCo. KEPCo is a nonprofit generation and transmission (G&T) cooperative. Its membership is made up of nineteen rural electric cooperatives that sell power in predominantly rural areas of eastern and central Kansas.

An electrical engineer by training - "I went to K-State! I bleed purple!" - Evans has been in the power utility industry since college. He has a long perspective on how the power industry works.

Nancy Jackson, CEP: Why don't you start out by telling us a little about yourself, what your background is, and what you have done in the industry over time.

Les Evans (LE): I grew up on a farm in south-central Kansas just north of Wichita – my hometown is Valley Center. I started out with the predecessor to Westar, the old Kansas Gas and Electric Company, KG&E. When I left Westar in 2001 I went to work exclusively in the renewable energy business. Then I had a chance to come back here to my roots and work with KEPCo.

NJ: You're the vice-president of power supply – could you describe exactly what that means?

LE: It means I have responsibility for providing a reliable and economic power supply for KEPCo's member cooperatives. Doing that can be a challenge because we don't own all of our power generation resources. We also buy a significant portion of our power supply through long term purchase power agreements (PPA's). KEPCo's nineteen members are all distribution companies that take the power we provide and then provide it to retail customers – or in our case, also our owners.

A rural electric cooperative works differently than an investor-owned utility. We don't have shareholders versus customers. In a cooperative, they are one and the same.

NJ: What does KEPCo's power supply mix look like?

LE: It's very diverse. I like to use an analogy here - different utilities will have different

philosophies about how to put a power supply together. It's just like different people have different preferences, or different risk tolerances, for their own personal investing strategies.

So for power supply, there is no one set of right answers. The power supply mix is also based on your members' desires, needs, and tolerance for risk. What various aspects do they give significant weight to? So, in the case of KEPCO…

N: Sorry to interrupt – but how do you know your members' tolerance for risk? How do you judge that?

LE: They tell us, through our board. Each of our member cooperatives has a trustee that sits on our board of trustees. We meet ten times annually, usually on a monthly basis.

NJ: Back to the mix. Don't you all own a portion of Wolf Creek?

LE: A relatively small portion – 6%. Kansas City Power and Light and Westar each own 47%. However, that 6% represents approximately one-third of the total energy supplied to all of our nineteen member cooperatives.

KEPCo also owns a small peaking plant called Sharpe Generating Station, adjacent to Wolf Creek. Sharpe is ten Caterpillar generating units which are relatively small - two megawatts each. We use that only for peak demand situations, and it runs very infrequently, just a few days a year.

But that is what is takes - for those very few hours out of the year in the middle of July or August when everyone is running their air conditioning, we have to ensure reliable service. You have an obligation to meet that last hour of peak demand when every customer wants to have their particular device on.

Another really important part of our power supply is hydropower. We purchase it from the federal government's power marketing agencies – roughly 100 MW through the Southwestern Power Administration and about 14 MW out of the Western Area Power Administration. Combined, that contributes on an average about 18-20% of our annual energy requirements.

Between nuclear and hydropower – these have no greenhouse gas emissions - that makes up over 50% of KEPCo's power supply on an energy basis, which is pretty significant. And it has been that way for a long, long time.

NJ: So does KEPCO buy the rest of its power?

LE: Our peak load currently maxes out around 425 megawatts (MW). For someone as relatively small as we are, it is difficult to go out and build generation economically in small increments to match up with our load growth. Economies of scale make it much more cost effective to go out and build a 600 or 700 MW baseload plant or a 1000 MW nuclear plant.

It is not very cost effective go out and build a 30 MW or a 50 MW power plant for baseload operation. So, what we do is either buy into a larger project, like we did with Wolf Creek, or we have to buy our power through PPA's.

If you look at the cooperatives, our members are in the less densely populated, sparsely

populated areas of the state. And there is reason for that. Years ago, the investor-owned utilities (IOUs) basically served the more populated areas. They didn't serve the rural areas, where it wasn't profitable.

Rural cooperatives came about to fill this gap. The end result of that is that our members tend to be remotely located and at the end of an IOU's distribution lines. Our members are located within IOU control areas. What that means is it is convenient and advantageous for us to buy into the IOU's power systems, or to buy from them through purchase-power contracts.

KEPCo has several power purchase agreements. For example, we are embedded within the Westar system and we purchase power from Westar. Where our system is embedded in the KCPL system, we purchase power from them. Part of our system embedded in the old Aquila system which is now being operated by MKCE / Sunflower Electric Cooperative. And we also have power supply contracts directly with Sunflower.

NJ: And the benefit of your nineteen members banding together to form KEPCo- that is to get better prices on power?

LE: Yes, absolutely.

NJ: Now, one of the hats that you wear is as a KETA (Kansas Electric Transmission Authority) commissioner. So I wonder if you could talk a little bit about what your own dreams are for a robust transmission system in Kansas.

LE: Transmission in Kansas… Let's start with just a little bit of history about utilities in general. Go back 100 years, to the development of electricity in the United States. The system started out as individual tiny generators serving very small service areas.

Over time these combined into systems, which became what we call vertically integrated – meaning a model where a utility owned all of its generation, transmission, and distribution systems. The grid infrastructure of wires and poles is expensive, so why duplicate it?

These vertically integrated utilities were given exclusive rights to serve their customers. In return for that right the law gives them an obligation to serve anyone and everyone in a reliable and economic fashion.

NJ: There is some overlap in the grid, right?

LE: Yes, parts of it overlap for reliability purposes. If one system goes down, hopefully another can back it up. It's also economic. If you have the right transmission you can buy electricity from different parts of the state. We can share our reserves. But even when you interconnect together, though, you still have a primary responsibility and obligation for serving your own load.

And the thing you always have to remember that is important about electricity – this is different than any other commodity - you always have to match customers' demand in real time. Instantaneously. Literally, anytime that customer flips on a light switch that utility needs to generate just a little bit more power. When they turn off the electrical switch you instantaneously have to reduce the power. This is real-time demand. Electricity can't be economically stored in any reasonable quantity.

Anyway. We had a vertically integrated utilities model – and then in the 1990s deregulation hit the electric utility industry. The philosophy in the United States is that capitalism and competition will ultimately drive us to what the most cost-efficient, effective price is on a large scale.

The thing is though – our transmission system wasn't designed like that. It was built up over time to primarily use local generation to serve local load, with interconnections to neighboring utilities to exchange power for emergency backup and economy. It was not designed to transmit power from the Midwest to the East Coast or from the East Coast to the West Coast or from the Canadian border to Texas. And so, in a nutshell, we are trying to use the system for something it was never envisioned or designed to be used for.

NJ: Electricity and transmission doesn't follow the same framework of most goods or commodities, where they can be traded freely without many physical constraints. Electricity has physical constraints. Such as, no storage, real time use, what you just said.

LE: Right. So now we have a semi-deregulated type of industry. Generation basically is deregulated. Anybody that wants to be a generator can be, as long as they follow certain rules. Transmission is regulated at the federal level, by the **Federal Energy Regulatory Commission** or FERC, they ensure that everyone has open and equal access to the transmission system.

But this system was built to reliably serve retail load within clearly defined territories. Those territories still exist in many states, but some states have deregulated. The utility can't choose their customers, but the customers can choose the utility. This creates competition which creates competitive retail rates. Other states like Kansas are still regulated - depending on where you live you don't have a choice in your supplier, but regulatory entities like the **Kansas Corporation Commission** serve as a proxy for competition in setting just and reasonable rates.

So transmission systems weren't originally built for competitive environments, where you can basically buy and sell power and ship it over long distances. If you want to do this, then you need a different transmission system.

NJ: So this gets back to my original question about transmission -

LE: Yes, in my mind there are two things that need to be done. One is that we haven't upgraded our transmission system in years, since the last round of baseload generation was built in the late '70's and early 80's. It was built with foresight and wisdom, but for a different market than we have now. It served our needs then but with load growth, too, we have about used up its capacity.

Second, our transmission system has to be able to accommodate a competitive, deregulated generation base where all generators can interconnect with the transmission system and have the ability to move their power to both local loads and distant markets.

So long-term, ideally if we were going to build a new system what would it look like? It would have to accommodate all the load growth and new generation types. How can we do this cost-effectively?

Some schools of thought say that maybe we should do something like what we did after World War Two with the interstate highway system – build out an interstate transmission system that would serve the nation as a whole. Then these costs could be socialized over all consumers. These questions get a lot of debate. That is what the **Southwest Power Pool** is wrestling with right now. The need for transmission is also why the legislature formed KETA – its job is to act as a catalyst to get transmission built in Kansas.

NJ: You also have background in the wind industry. What are some of your thoughts about that?

LE: Wind is one of many generation options that we have. We talked about the history of the transmission system – basically its reliability was based on conventional forms of generation, and its physical constraints and advantages.

NJ: Fossil fuels like coal and natural gas.

LE: Right. For reliability, that system evolved based on installing adequate generating capacity based on the technical attributes of the conventional fossil generating units. Rules for adequate generating reserves for example were formulated based on things like operating characteristics such as how quickly a unit could change output to follow load and historical operating performance like forced outage rates.

Wind has a lot of desirable attributes. It is very benign environmentally. It doesn't combust anything to generate power, there's no discharges or waste streams, it is very quiet, so on and so forth.

Wind also faces technical challenges. I would tell you as an engineer - every single generating technology has desirable attributes, and it also has challenges that we need to address in some fashion or another. For wind one of the most significant issue is intermittence. You will always hear that from a utility system operation perspective. That means that the wind doesn't blow all the time, so it's not producing power all the time. You also can't control the wind and make it blow on demand.

So when we do generation supply planning, we have to match generating resources with our ability to dispatch the power on demand. we also have to ask, what impact is this resource going to have on the cost to operate the system? How much control do we have over it? How reliable is it?

Wind to me looks and has characteristics a lot more like load than it does a generator. Wind backs down other traditional generation when it is blowing, but does not replace the need for the conventional generating capacity. From a policy standpoint, looking at the next fifty years, for us to incorporate more wind in the U.S. grid, we need to quit looking at wind like it is a traditional generator. We need to value it for what it is – wind provides energy, not capacity (**CEP**: capacity means power that is readily available anytime).

Then I think we could get past a lot of the strife relating to the integration of wind into the power supply. We have those who say, why do we need to build another conventional power plant that burns any type of fossil fuel. Then we have those of us who are charged with having a very reliable and economic system, and intermittent generating sources make it very

hard to operate with all the existing rules and regulations about electricity. It's very hard to balance load when you start trying to forecast an intermittent resource.

This is a personal view of the world from a very big picture viewpoint.

NJ: What are some of the possibilities for Kansas and wind energy?

LE: Well, I've seen **NREL (National Renewable Energy Lab)** projections that go up to 7,000 megawatts of wind from Kansas to meet the national goal of 20% power from wind by 2030. The total peak demand in Kansas is 10,000 megawatts. We have maybe 11,000 megawatts of total generation in the state.

Because of intermittency, Kansas can't absorb all that wind locally. We'll have to ship out a significant portion to larger load centers. But in order to move the wind to another region we will have to have adequate transmission.

So is this 20% goal reasonable? From an optimistic point of view and as an engineer – my job is to solve problems. How are we going to roll up our sleeves and get that one solved? We should look at what is realistic, what type of transmission is required, and then what the load profiles would have to be.

NJ: Do you see KEPCO doing much in terms of wind energy?

LE: First, look again at the load for the entire state of Kansas – 10,000 megawatts. KEPCo's peak is about 425, 430 megawatts. We serve a small, relatively rural load that is fairly sparsely spread out. We don't run what we call a real time desk that matches up generation to customer demand on a real time basis. We contract for that scheduling service just like we contract for part of our power supply.

And so to the extent that we have to deal with intermittence of wind, it makes it much easier for KEPCo to piggyback on a larger utility system. They integrate wind into their system, and then we buy a small portion of that wind.

NJ: Like Westar, for example?

LE: Westar is committed to putting in 295 megawatts of wind over the next couple years. I acted as a technical consultant to them. And KEPCo buys a significant amount of our power from Westar - we essentially buy a slice of their system. And by that I mean I don't buy rights to an individual generation unit. I buy the right to a slice of their entire generating system.

And for wind - part of our new power supply agreement with Westar will allow us access to the new wind they are incorporating. It is much more economic for my members to bring wind in to KEPCo through Westar.

NJ: Okay. I've got one last question for you, Les, and then you are a free man. Energy efficiency is quite the buzzword in energy circles these days. Does KEPCo have plans or policies in this regard or do you leave that to your individual member co-ops?

LE: KEPCo's members set our policy through the board. When it comes to energy conservation and reducing demand, we work together. First there's operations. We offer our members real

time load management. We advise them of potential system peaks, when it would be advantageous shift loads to an off peak time.

They all have their own policies on how to deal with that. Some have agreements with their customers to shift load off peak – like irrigation. They might offer special tariffs that incent commercial users to run their operations during off-peak times, when power is less expensive. There are also interruptible customers that are willing to interrupt their delivery of electric service during peak use times for a favorable rate during other times.

There's also incentive programs for residential consumers – rebates for more efficient water heaters, ground source heat pumps also. We're also looking at programs with CFL lightbulbs and how that might work.

NJ: So you see a lot of potential in energy efficiency?

LE: Any megawatt that does not have to be generated is a megawatt hour saved.

I would say one thing. I think there is a bit of a misperception sometimes amongst the general public - some people almost have the feeling that, well, we really shouldn't have to build any more generation because, you know, between conservation and efficiency we should just be able to make do with what we've got. We will just continue to use less and less and we will find ways to do things more efficiently, more reliably.

But the reality is that as a society - first of all we are pretty blessed in the United States. We have a society that is technologically advanced, one of the greatest societies on Earth. Certainly we have a very modern society and with a lot of conveniences we have become very accustomed to. I don't think that is going to change any time soon.

I look back a generation - one generation back from when I was a kid - and then I look at what my kids have today… they don't know what an 8-track player was. We never dreamed of MP3players, cell phones, laptop computers or big screen TV's. These things didn't exist one generation back, but they all consume electricity and create an electrical demand that didn't exist previously.

So the reality is that with our continued technical advances come an increased demand for electricity. Conservation and energy efficiency programs are a key piece to moderating the increased demand but they will not replace the need for new additional generating capacity. We all need to strive and do what we can, but there is not a single solution to meeting our future electricity needs.

It is kind of like the concept that CEP talked about at your town hall meetings. There is no one silver bullet. It really is a whole host of things. We are going to have to implement everything in order to get where we need to be.

Added later *– Continuing a CEP tradition, Les was kind enough to tell us by email one of his favorite country music songs! And it's a true classic - Robert Earl Keen, "The Road Goes on Forever and the Party Never Ends."*