

Blowing green into Kansas

S ometime around 20 pounds ago I would drive east from Wichita to the Beaumont, Severy, Howard area to ride my bike in the southern Kansas Flint Hills. It was a strategy to arrive at sun-up, ride south on Hwy 99 until the summer heat kicked up the south wind, then turn and ride back north to my car with that persistent wind at my back.

On December 7, 2005, my first return trip to Beaumont since moving from Wichita was quite different. Arriving at sunrise with a bitter cold north wind with icy fangs that stung when peering through an open window, it was not reminiscent of arrivals in summers past. The grass airstrip by the historic Beaumont Hotel and Restaurant, on many days host to scores of visiting pilots and aircraft, on this morning was understandably quiet.

I was there to talk with rancher Pete Ferrell, one of four land-owners to lease land to the Elk River Wind Farm project, then nearing completion. Being early and quite anxious to see a sight I'd never seen, I headed out of town to locate the Ferrell Ranch front gate that directions told me was exactly five miles south of town. Wanting to look and take some pictures I was excited like many who have been driving up the road since construction began in May of 2005.



Dan Knupp
Communications

With the sun coming up through an icy sliver of eastern horizon, the cold overcast gray of a heavy wet winter wind pressed hard on the earthbound. The first I saw of turbines set by that heavy wind were blade tips turning in the middle of the road, just a little

I'd reached a turn at the transfer substation near the southern boundary. I had no idea how far I'd gone, having missed the Ferrell Ranch front gate altogether. Taking the right turn, I drove on to the southwest corner of the wind farm, took a few pictures and then drove

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south of town. Because of the steel gray day, wind and snow, I was slow to comprehend the relative size of the turbines churning on their pedestals. Going slow and craning my neck more than a little, I drove through the 8,000-acre site taking pictures, not stopping until

back to Ferrell Road and found the ranch gate. I'd overshoot by over seven miles. Memories of swathing hay on a quarter of ground don't prepare you for the scale of what is seen here – the turbine towers are as mammoth as the land they work on.



The early morning moon is seen over the tabletop of ranchland now home to wind turbines as well as cattle. This southeast Butler County location yields a good view of the 100 turbines belonging to the Elk River Wind Farm only after one turns south out of Beaumont. The east-west Ferrell Road cuts the 8,000-acre site in half and is named for the Ferrell family. They still have the 1888 homestead papers signed by Ulysses S. Grant.

Meeting Pete Ferrell at the gate I found that he is a fourth generation Kansas rancher who runs a commercial cow-calf and stocker operation on his 7,000-acre ranch that has been in the family since 1888.



Pete Ferrell warms up in the PPM sub-station, leaning on a shelf full of turbine maintenance manuals. He has watched the construction of the wind farm with a keen eye, making sure his concerns about care for his ranchland have been addressed.

“I am a custom grazer, but really run a bed and breakfast for other people’s cattle,” described Ferrell. “In the past I’ve grazed my own cattle but too many times I’ve read the morning paper to learn that my cattle were half as valuable as they were the day before.”

“Ten years ago when first approached by a wind energy company, I wasn’t 100% convinced. I was skeptical. I needed to look at wind farms and the first I saw was in Hawaii. You’d think in that sensitive topical paradise concerns about a wind farm would be the greatest. In fact, being on an island heightens concern – concern about fossil fuel toxins put into the air and water. The ranchers in Hawaii said, ‘Once the turbines are up you go back to ranching like you used to,’” explained Ferrell. “And that’s my main goal right here.”

“When I finally announced what I wanted to do with wind

energy, my family had the same reservations I did. Will it disturb the grazing? How will it look? How will it affect our lives? The closest members of my family had to go through that adjustment period. My family got used to the

caused concerns with the disturbances made by the access roads, pump jacks, sludge ponds, salt water spills and pipelines running to the tank battery. Those concerns back then were much the same as they are for Ferrell today.



Above: A concern of Ferrell’s was getting road and tower land disturbed by construction reseeded with natural range grasses. With those seed beds smoothed out the coming summer will see grass growing to the edges of the tower pads and roads seen above. **Right:** In sharp contrast, the stripper wells on the property are nearly played out but wind as a source of energy is sustainable, with technology on track to make these towers and underground grid system adaptable to ever increasing generation rates well into the future – all without harm to people or planet.

idea and now they’re entirely behind it,” he said.

Pete Ferrell went on to explain that a generation ago, the oil field that sits under these turbines

After measuring the land area of all items listed here, he determined that it took away one acre of grazing land per pump jack. “Don’t get me wrong, my

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family benefited from oil on this property during some rough times, but with this wind farm, there won't be a dried up ruined pond area where well waste was pumped and abandoned years ago.

to high voltage lines of the nationwide power grid. Those larger lines have enough excess capacity to handle the 150 megawatts generated per hour when all 100 turbines are turning

here. I feel that knowledge strengthened my position when dealing with wind energy companies," Ferrell said.

That first lease did not produce a wind farm but it started a



The long abandoned pumper shed above was hit by lightning and burned years ago. Pete Ferrell plans to raze it and construct a sheltered viewpoint where visitors can see both wind turbines and Flint Hills panoramas, much like the view at the right. Owners of the Beaumont Hotel and Restaurant are thrilled to date with the many visitors coming to see the turbines that also stop there.



An eastern view from just north of the highest point in the Flint Hills (1,685 ft.) shows a faint shadow that delineates the "breaks" or ridges mentioned in the article. Locating turbines on ridgelines like these, or too close to sharp drop-offs seen on Ferrell property in the center of the picture, causes turbulence that puts undue strain on a turbine's shaft and bearings.

The Ferrell Ranch portion of the wind farm contains 50 turbines, half the total. In it I gave up 50 grazing acres, one acre per turbine. All the land seen here right now scratched by construction will be completely reseeded with natural range grasses. It will grow right up to the edge of these access roads," noted Ferrell.

Why build here and not there?

The primary reason Elk River Wind Farm is now up and running at this location lies four miles to the south where transfer lines connect from the substation hook

optimally. The yearly output from Elk River is enough electricity to serve 43,000 homes, that are customers of the Empire District Power Company around Joplin, Missouri. Other reasons to locate at the site are very important but without this one checked off, it would be a showstopper.

Pete Ferrell's early planning for wind energy on his ranch makes him unique among landowners thinking about wind energy. "I paid for consulting in '95 when I first started looking at this. I had five years of data before I ever signed with an energy company. Everyone then knew the quality of the wind

relationship with Dr. Gary Johnson, retired K-State electrical engineer, who had made wind energy research part of his scientific milieu since 1973's Arab oil embargo. He has since devoted his professional life to wind energy and is a noted national expert on the subject.

Although Dr. Johnson started work at Ferrell Ranch for the first wind energy company in 1995, he and Ferrell continued collecting data from three meteorological towers sited on the ranch until March of 2005, giving them 10 years of wind data for the area. Between 1998 and 2001, Ferrell

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approached or was approach by no less than six companies, all being rejected because they would not negotiate to his project concerns. The seventh, Green Light Energy, Inc. of Charlottesville, Virginia was the one that satisfactorily answered all his questions. The culmination of this work in December of 2004 resulted in PPM Energy, Inc., of Portland, Oregon, agreeing to build the 150 megawatt Elk River Wind Project for Green Light Energy. PPM Energy later purchased that lease to become the developer/owner of the wind facility.

“I have long maintained that the Elk River site is a superior site, as good as any other site in Kansas and better than most,” stated Dr. Johnson in his book, *Wind Energy Systems*.

The reason that wind energy is located in prairie or ocean sites worldwide is because they need a smooth undisturbed surface. Experts note that there are more than 100 qualities to wind. Much the same as Inuit peoples of the far North have a multitude of words to describe snow, wind experts deal with their environments in minute detail. In the case of the Ferrell Ranch, pertinent wind qualities are that its wind is steady and not turbulent.

“The reason that this wind farm is located here on the flatland and not over there to the east on the breaks, is that those canyons create turbulence. What is needed in wind quality is wind that blows at the same speed at the top of a turbine blade throw as at the bottom of the throw – so there is no torque or undue pressure put on the turbine shaft and bearings. You can imagine if you spent more than \$1 million on a machine you don’t want the most vital parts under stress all of the time.”

The prevailing wind at the Elk River site is from the south. The site also includes the highest point

in the Kansas Flint Hills at 1,685 feet. This high point spawns four area creek and river drainages. One of them, Grouse Creek watershed, flows to the south creating a physical characteristic

designated, “Heart of the Flint Hills Tall Grass Protection Area,” have similar or even good wind energy locations. The same is true for the balance of the state. “If \$190 million or more is to be

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similar to that of an airplane wing. Falling away southward it makes a long, smooth natural venturi or air tunnel effect for the south wind. A 10 mph constant, steady wind measured in Cambridge actually can increase to an 18 mph accelerating wind when it gets squeezed over this gradually sloping higher ridge where the turbines are located. This geographic feature is a sweet spot in an already great site for a wind farm.

Not all areas in the balance of the Flint Hills outside the perimeters of the Governor’s

invested on a project like this, location selection should be made for the greatest return on investment,” explained Ferrell. “Why for example, would an energy developer settle for a 20% return on a so-so site when 30% might be realized at a prime location? For the long term, it’s essential for them to do the research to find the right site.”

Just as energy developers must know the numbers before investing in a wind farm site, landowners should do their planning by working with wind experts, local,

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Despite a 20-degree below zero wind chill on December 7 and a 262-ft. tall wind turbine overhead, ranching goes on. Cattle are fed. The truckdriver checks the bin levels as the auger empties a semi-load of feed into the overhead bin.

state and national officials in developing short and long term goals for their property's wind potential. A land owner shouldn't succumb to the temptation to sign with the first energy company that knocks on the door as so many did in the first wave of oil leasing that swept through Kansas decades ago. An energy developer shouldn't be chosen only for financial reasons, but also on performance in construction and site management.

Wind rights above ground are going to be as valuable as, or more so, than mineral rights and water below ground. With this in mind, those wind rights should not be considered lightly.

"The wind business right now is for all intents and purposes an agribusiness. That's what it is. We're not building these projects on federal lands, state lands, or

residential sites. Over 90% of it is either rangeland or cropland. Farmers and ranchers are getting the benefit from leasing," said John Hueston, PPM Project Director at the Elk River Wind Farm.

In it for the long haul

Along with its large scale, a driving characteristic about the Elk River Wind Farm is the high technology. "By working for 10 years before completing our project, the financial benefits of the site actually increased," explained Ferrell. "When we first looked at this, turbine technology was pegged at a 640 kilowatt maximum. Our new GE units each generate 1.5 megawatts – or twice the power total for 100 turbines of 10 years ago."

The site's pedestals and underground power collection grids are all constructed to be compatible with technological advances anticipated in the years to come. More efficient, higher megawatt turbines being designed now will fit the pedestal and wiring systems engineered and built into the present Elk River Wind Farm project.

"If the numbers would be there, we'd replace the 1.5 megawatt turbines before our 20-year contract with Empire Energy expires, with new higher capacity units – but only if customers and transmission capacity were found," said Hueston. "This project will keep seven full-time professional employees busy through out the project lifespan, which will be for 20 plus years."

Subsidies make it possible

It will take the continually progressing technology described above to advance wind power. Because when industry's tax breaks and other federal aid to wind farms are figured in, the subsidy per unit of energy produced is more than double the subsidy given to nuclear and fossil-fuel power plants,

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according to Thomas Tanton a Fellow at the Institute for Energy Research.

Many believe this is the price a nation needs to pay as an investment to get an energy source of the future off the ground today. When oil supplies to the United States are reduced for whatever reason, wind energy will help provide a soft landing instead of the devastating crash that America can ill afford.

With the escalating price of natural gas, wind farms coming online in 2005 are producing energy that as far as price goes, looks better every day.

Back to Beaumont

At my home office north of Wamego in front of my computer, I look out the window to see Westar's Jeffrey Energy Center some 10 miles away. It sits on top of a hill north of Belvue in Pottawatomie County and at night it's lit-up like a small city. It is a comfort knowing that the plant's

there, generating affordable and reliable energy from our country's 250-year supply of coal reserves. The company's service is second to none when wind downs a line or lightning strikes a transformer.

Also, when I look toward Jeffrey and holding up a hand, the three stacks I see reaching for the sky are not as tall as my little fingernail. When I conjure up the thought of a hundred wind turbines on that same hill, a much larger area is involved but wind turbines wouldn't be as large visually as the Jeffrey Center. But far and away the largest difference would be that wind turbines don't produce a long brown plume of human and planet toxins that trail to the north horizon in the hot summer wind.

In the coming years that same wind will be part of Kansas's future energy mix – for all the best reasons.



The derelict silo standing among the turbines is a testament to the trials of farming on the ranch. Pete Ferrell's great-grandfather built it at the turn of the century but the lack of rain and searing heat with a steady wind ruined the corn crop intended for storage. Subsequent attempts at raising corn were abandoned without a kernel ever being stored in the structure.

One of my priorities will be a visit to Beaumont again this summer to spend a day bike touring and checking out the grass planted around those turbines. It'll also be a day when the southern Flint Hills have never been greener.

Kansas Creates Special Joint Committee on Energy

Rep. Tom Sloan

Chair, Special Joint Committee on Energy



Late last fall, House Speaker Doug Mays, Senate President Steve Morris, House Majority Leader Clay Aurand, and other legislative leaders created the Special Joint Committee on Energy. The Committee's charge was to examine how the state should address supply, price, and development problems and opportunities within the broad energy field. The Committee members adopted a policy of: 1) developing and adequately funding a formal energy data collection/analysis capability with policy recommending responsibilities; 2) proposing both short and long term public policies to increase the supply of energy produced in Kansas; and 3) addressing all of the state's energy sectors – electric generation, natural gas and oil production, renewable energy generation, bio-fuels production, and energy conservation and efficiency issues. During the five days the Committee met, the challenge was to think "big" as "business as usual" within the energy sectors would not be sufficient to

provide long term economic benefits to Kansans and help prevent energy crises.

The Committee recommended that 16 bills be introduced. Among the most significant are: 1) a recommendation that \$1.2 million (One percent of the Severance Tax revenues) be invested through energy research programs at KU annually to develop new techniques and technologies to recover more oil and natural gas from existing fields; 2) that the state provide incentives to develop unit train (110 sole purpose train cars) terminals to transport bio-fuels (ethanol, bio-diesel) to refineries and terminals in the higher population states, thereby helping our agriculture and bio-refining sectors compete more successfully in the national markets; and providing incentives for the development of additional wind energy capabilities in Kansas; and 3) that state tax credits be made available for persons investing in additional attic insulation, energy saving windows and doors, and energy efficient furnaces (especially those serving multi-family dwelling units).

While not all of the bills will pass in 2006, the Special Joint Committee on Energy's comprehensive policy recommendations will stimulate broad discussion in the Capitol about energy opportunities in Kansas, this year and in future years. The future of our state depends on the wise use of energy, developing new energy sources, and exporting energy to other states.