Community Wind Workshop

June 08, 2021

Session 3 - Health & Safety

CEP
climate + energy project

Dorothy Barnett

The Climate + Energy Project
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As the Executive Director of the Climate + Energy Project, Dorothy Barnett is leading the effort to address the Heartland's energy future. Grounded in an approach based common ground solutions, Barnett has been successful in convening diverse voices in a conservative region of the country. Barnett has coordinated winning campaigns to protect the Kansas Renewable Portfolio Standard from special interest groups attacks during four legislative sessions, allowing the wind industry to grow to 40% of the state's power generation in just a decade.

Prior to her position as Executive Director, Barnett served for 4 years as CEP's Director of Energy and Transmission. This work put Dorothy on the ground in energy policy work at the local, state and regional level. Under Barnett's leadership, CEP continues to innovate and reach new audiences with projects like WEALTH: Water, Energy, Air, Land, Transportation and HEALTH, Climate + Energy Voters Take Action, the Kansas Environmental Leadership project and the Clean Energy Business Council, a multi sector business group focused on the advanced energy economy.

Community Agreements

- **Platinum Rule -** *treat others the way you want to be treated.*
- **Notice the Room -** *build awareness together.*
- **Be Curious, Open, and Respectful -** *call in, not out. Throw sunshine, not shade.*
- **Be Conscious of Your Intent vs. Impact -** *Your intentions may be good, but the impact on another may be hurtful. You are responsible for the impact of your words.*

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climate + energy project

Mission

The Climate + Energy Project (CEP) builds resilience in Kansas through equitable clean energy solutions and climate action.

Purpose

The Climate & Energy Project:

- connects people, organizations, and ideas;
- presents science-based facts;
- facilitates critical thinking and community engagement; and
- co-creates equitable and productive solutions.

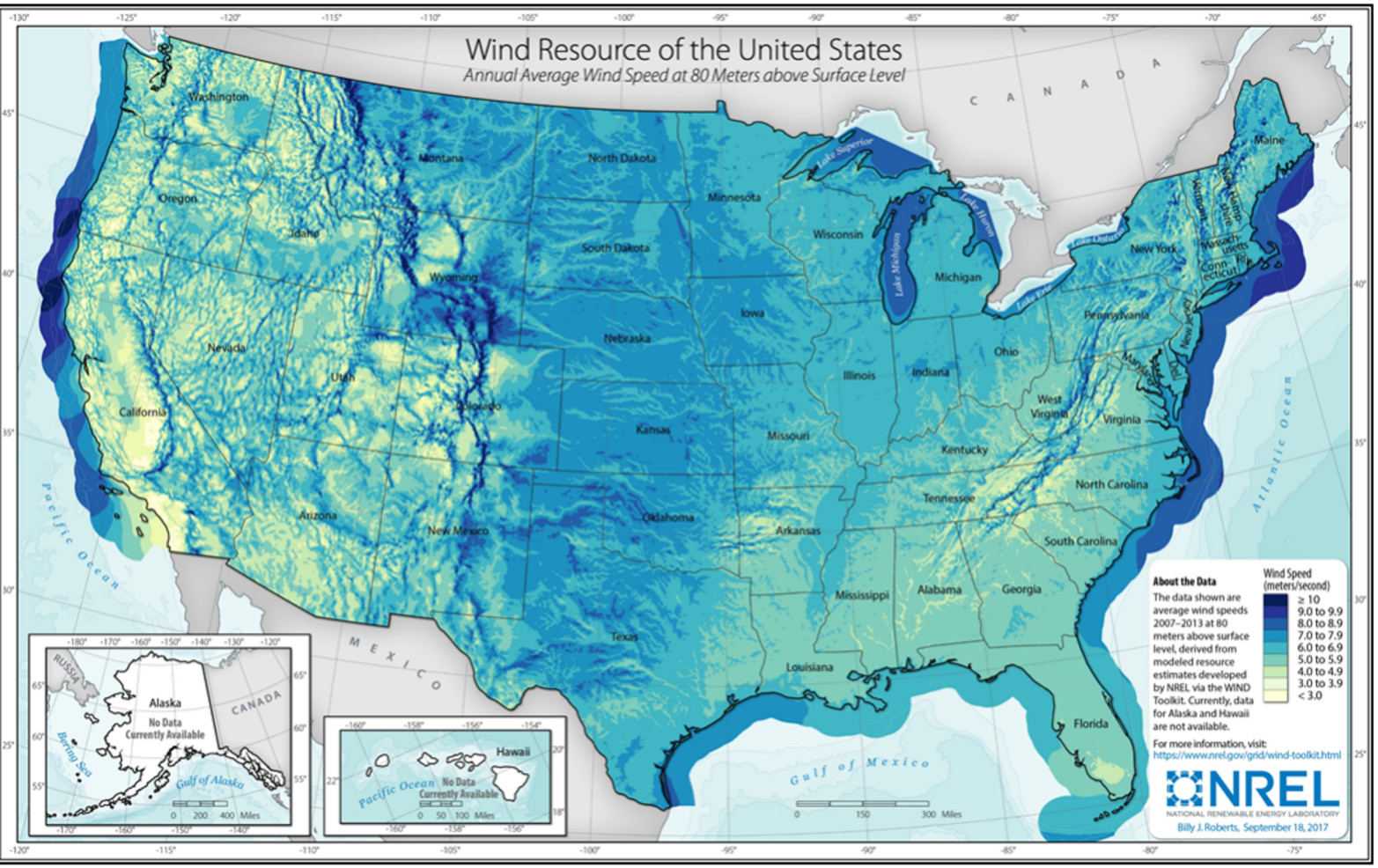
Kansas WEALTH HEALTHY + RESILIENT

CLEAN ENERGY BUSINESS COUNCIL
powered by the Climate + Energy Project

Kansas Environmental Leadership

CLIMATE + ENERGY VOTERS TAKE ACTION

U.S. WIND CORRIDOR



Central Location
Strong wind resource

Kansas Rankings (AWEA Market Report)

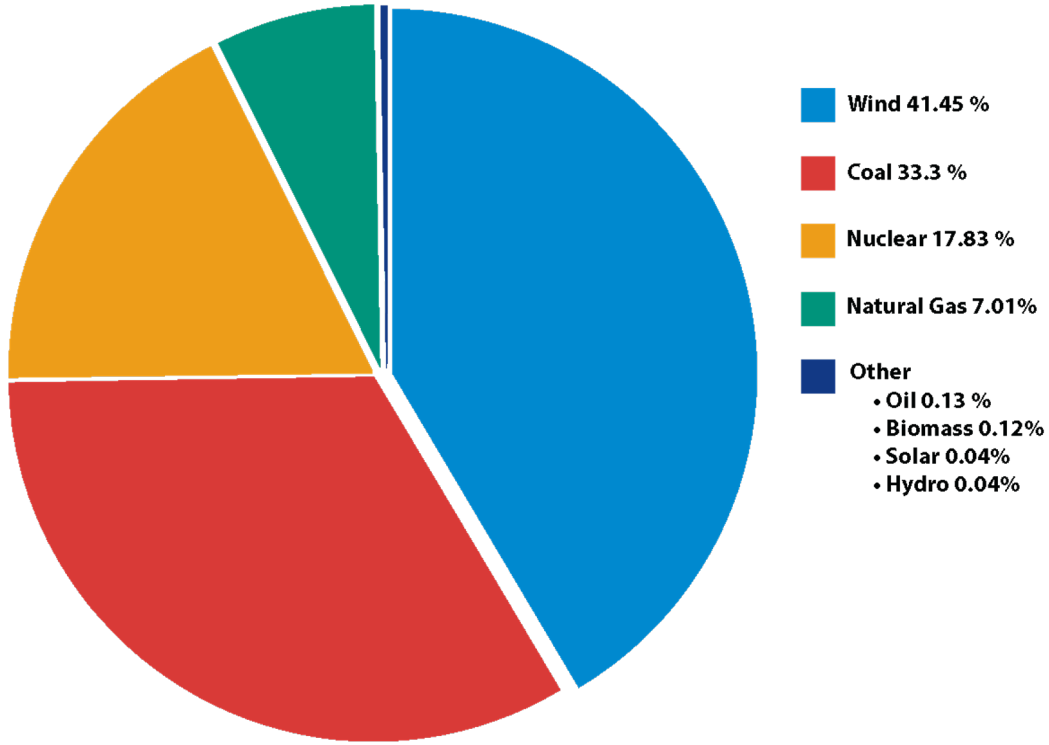
- **#2** – Wind as % of total generation
- **#3** – **Corporate wind purchases**
- **#4** – **Wind power installed capacity**
- **#4** – Wind power generation
- **#5** – **Wind turbines installed**

$11.4+ billion – **Total investment**

1.97 million – Equivalent homes powered

Kansas Electricity Generation

2019



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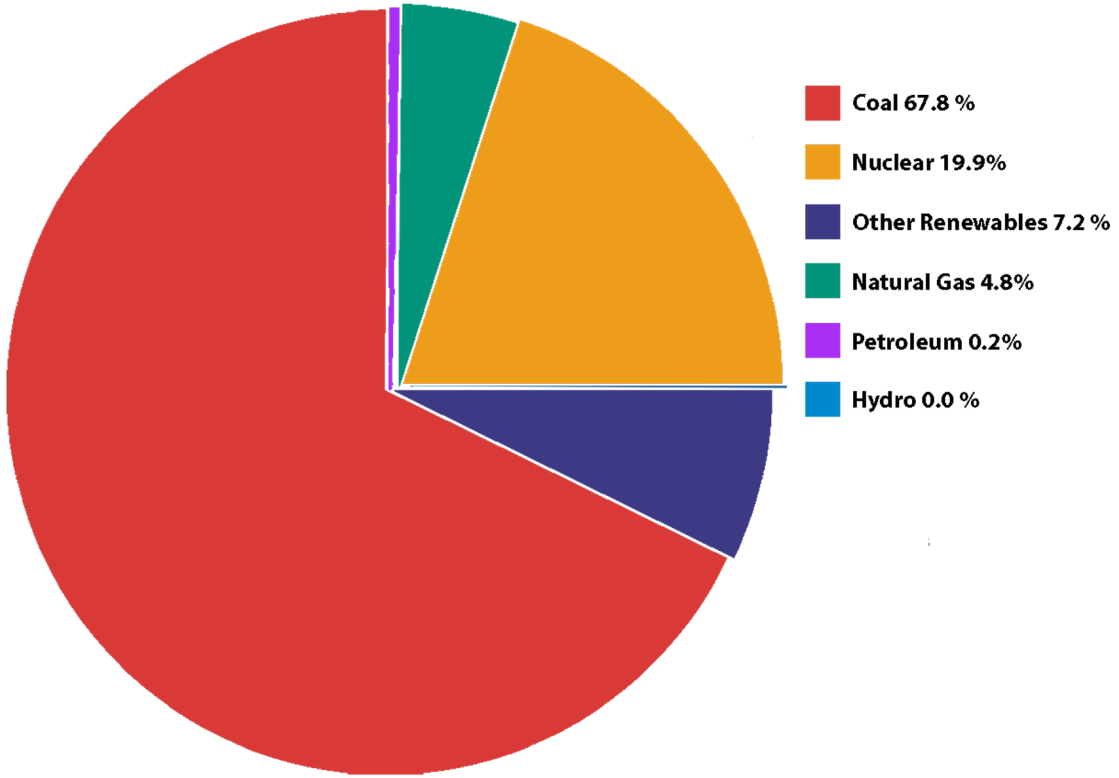
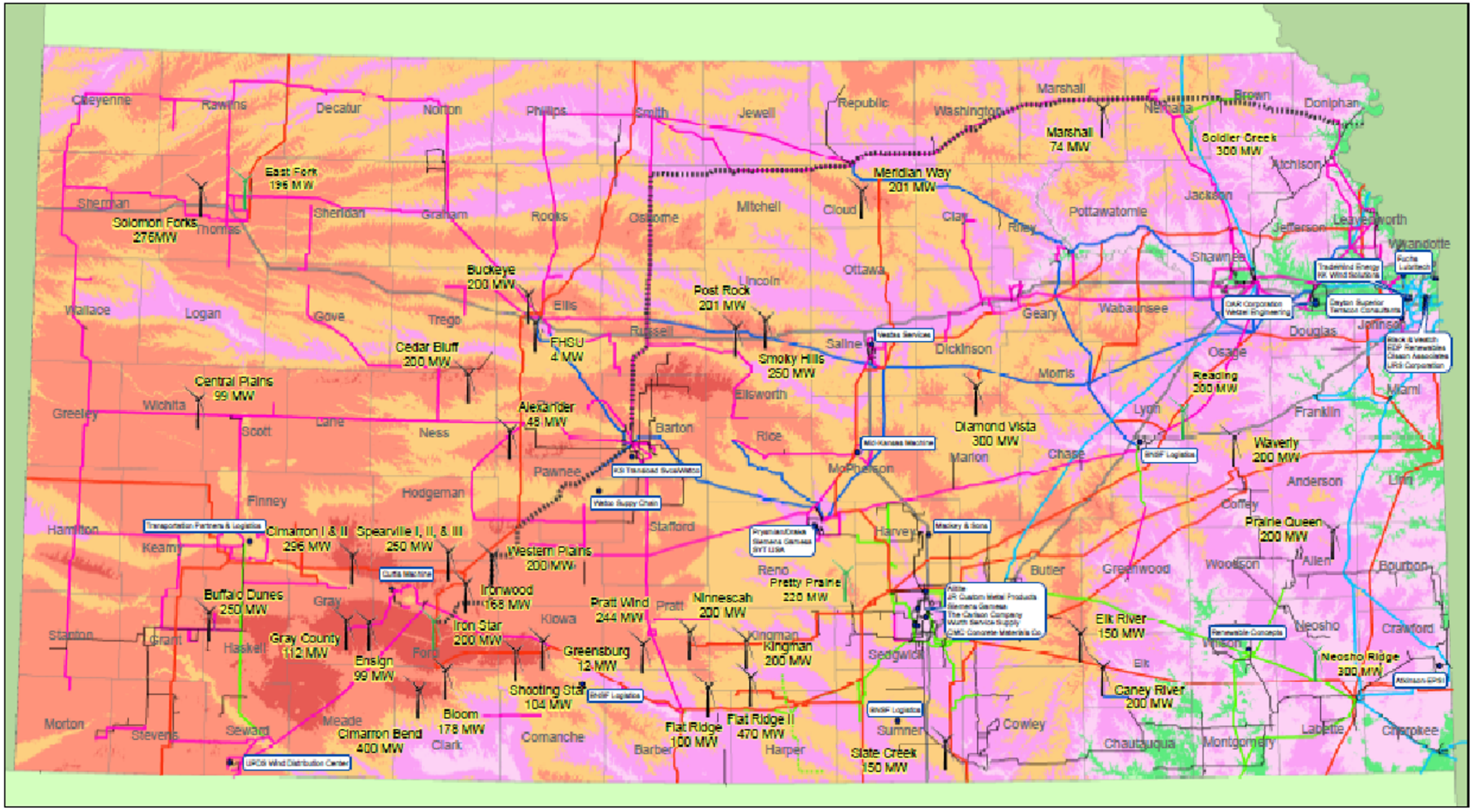
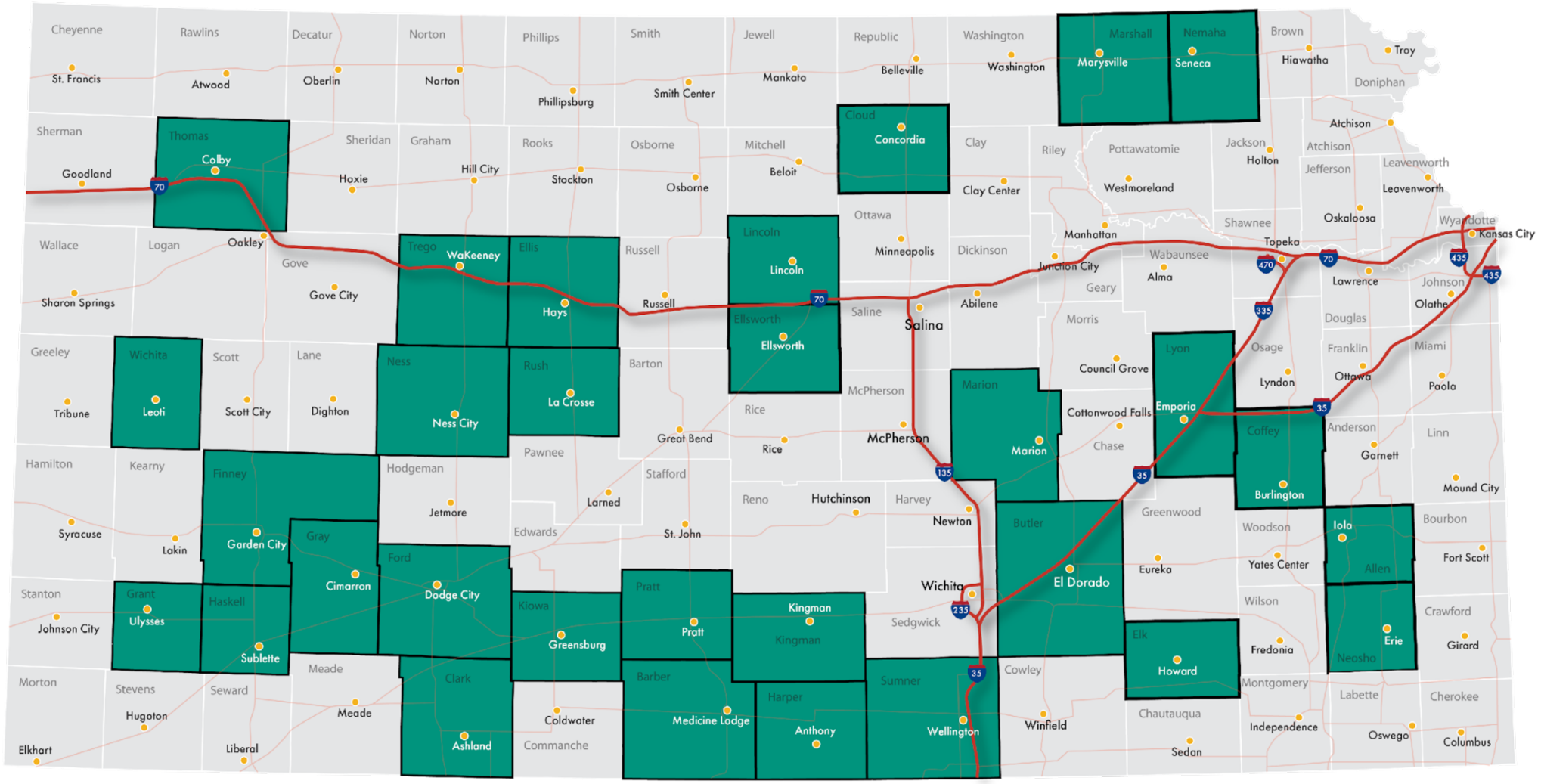


KANSAS WIND MAP WITH OPERATING AND UNDER CONSTRUCTION WIND FARMS AND RELATED BUSINESSES



KANSAS COUNTIES WITH WIND FARMS



Amanda Miller

Olsson

Senior Consultant

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Amanda Miller currently serves as a senior client consultant at Olsson. She works with renewable energy clients throughout the continental U.S., working through state and federal policies related to renewable energy and connecting project developers with the right engineers and scientists to implement compliance programs during project planning, design, and construction phases.

To do this effectively, she is not only knowledgeable regarding current policies but has remained informed about renewable energy projects, from coast to coast, both wind and solar, ranging from design stage through full operation.

This effort gives her a unique perspective on what a project needs at each stage of development, from field surveys to stakeholder public engagement to operation and maintenance; and every consulting process in between.

HEALTH AND SAFETY

Relative to Wind Energy Development

September 2020

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Agenda

- Definitions Overview
  - Setbacks
  - Sound
  - Shadow Flicker
- Mitigation Strategies

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Definitions Overview

- Defining a setback – the minimum distance a turbine can be built from a structure – is meant to mitigate the impacts of sound and shadows caused by blades passing.
- Federal, state and/or local or state ordinances/permits sometimes include more specific provisions related to sound level and shadow flicker.

Setbacks

- Aggregate Project
- Property Line
- On-site vs. Off-site
- Participating parcel vs. Non-participating parcel
- Sensitive structures
- Total Height

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Typical Setback Classification

Structure Classifications and Minimum Setbacks	
Structure Classification	**Minimum Setback**
Property lines*	Based upon total height
Participating existing occupied structures **	Based total height and may identify a minimum
Non-Participating existing occupied sensitive structures **	Based total height and may identify a minimum
Non-Inhabited structures	Generalized
Public road, highway, or railroad right-of-way	Based upon total height
Above-ground public electric power lines or communication lines***	Based upon total height

* Setbacks to property lines, not road right of way lines, may be less when adjoining property owners are within the same aggregated project. The setback for occupied structures shall be reciprocal in that no proposed occupied structures shall be constructed within the same distance required for a commercial/utility Wind Energy Conversion System.

** Landowners shall have the right to waive the respective setback requirements through appropriate easements.

*** Measured from the outer boundary of the public utility right-of-way or easement [or from existing power line or telephone pole

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Definition of Sound

- Wind turbine noise can come from two sources: 1) mechanical noise from the turbine components, and 2) aerodynamic sound from the air flow over turbine blades.
- Advancements in turbine technology have reduced mechanical noise.
- Aerodynamic noise can also be reduced with turbine advancement, but typically remains constant at a given point.
- However, sound levels in general also increase with increasing wind speed with or without the presence of wind turbines

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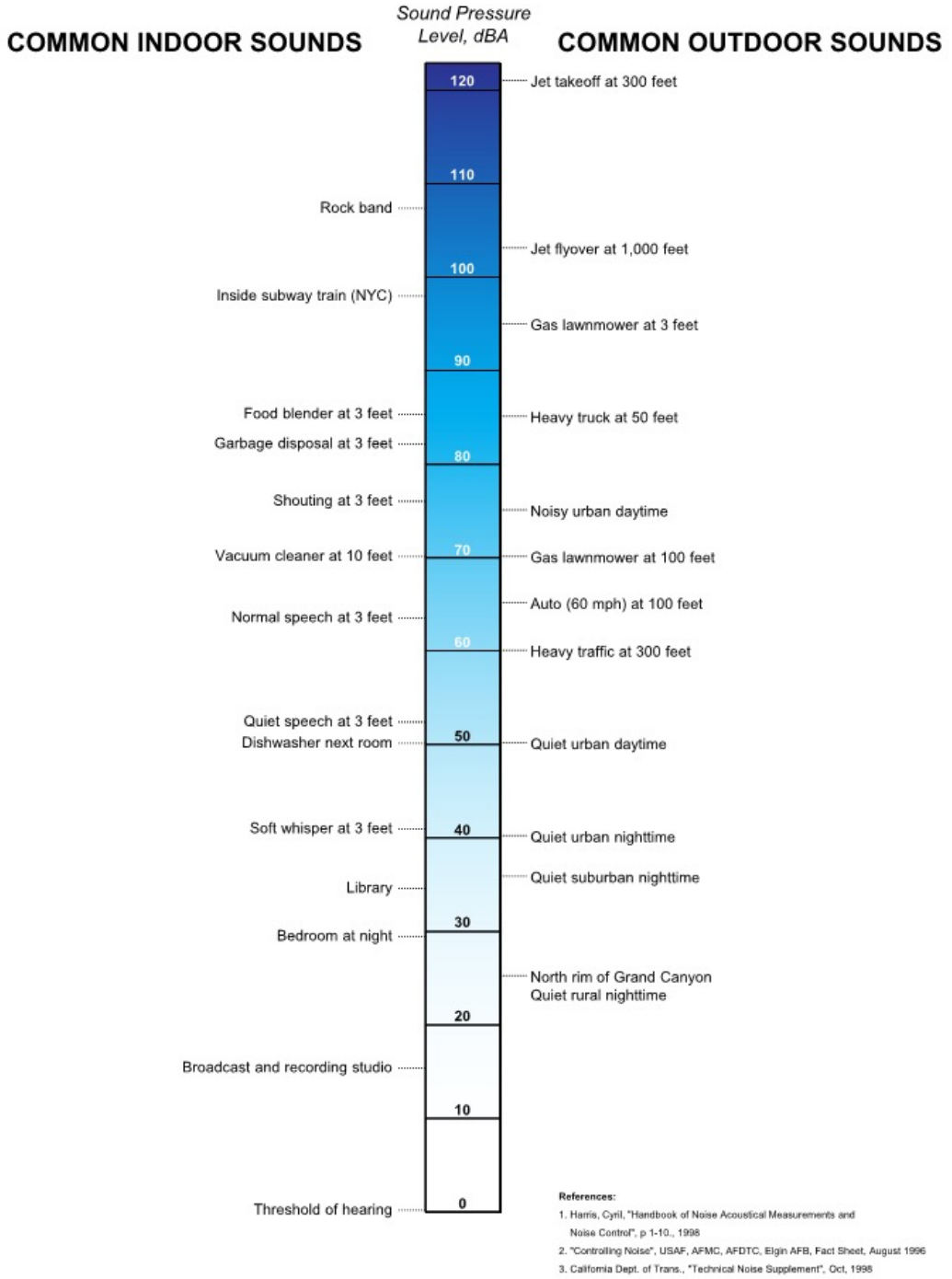
Quantifying Sound

- Sound is quantified using the logarithmic decibel (dB) scale.
- A sound level meter (SLM) that is used to measure sound is a standardized instrument.
- A-weighting is the most accepted network for community sound level measurements, as it is approximate to what the human ear responds to.



Definition of Shadow Flicker

- Rotating wind turbine blades may cast shadows when the following conditions are met:
  - The sun is shining with no cloud cover present.
  - The turbine is operating.
  - The turbine blades are positioned on a line between the sun and the sensitive receptor.
  - The receptor is close enough to the turbine to distinguish the shadow created by the blades.

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Quantifying Shadow Flicker

- Shadow flicker is quantified as hours per year or minutes per day a sensitive receptor is impacted by turbine operation.
- A computer model, such as EMD WindPRO, is used to calculate shadow positions and orientations in one-minute intervals for a calendar year.

Mitigation Strategies

- Management of an operational complaint database to track resolution efforts.
- Prepare site-specific assessment of shadow flicker impacts, noting the time of day, season, and expected duration of future noise/shadow flicker impacts.
- Meet with landowner to discuss site-specific assessment, educate landowners on landowner driven mitigation strategies (e.g. modification of interior lighting or sound proofing) and discuss concerns.
- Assess the residence to determine if on-site mitigation measures, including but not limited to, installation of exterior or interior screening, are appropriate for the level of impact and effectively address the concern.
- Work with landowner to develop a mitigation plan and,
- Implement the mitigation plan.

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Thank You & Questions

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Pete Ferrell

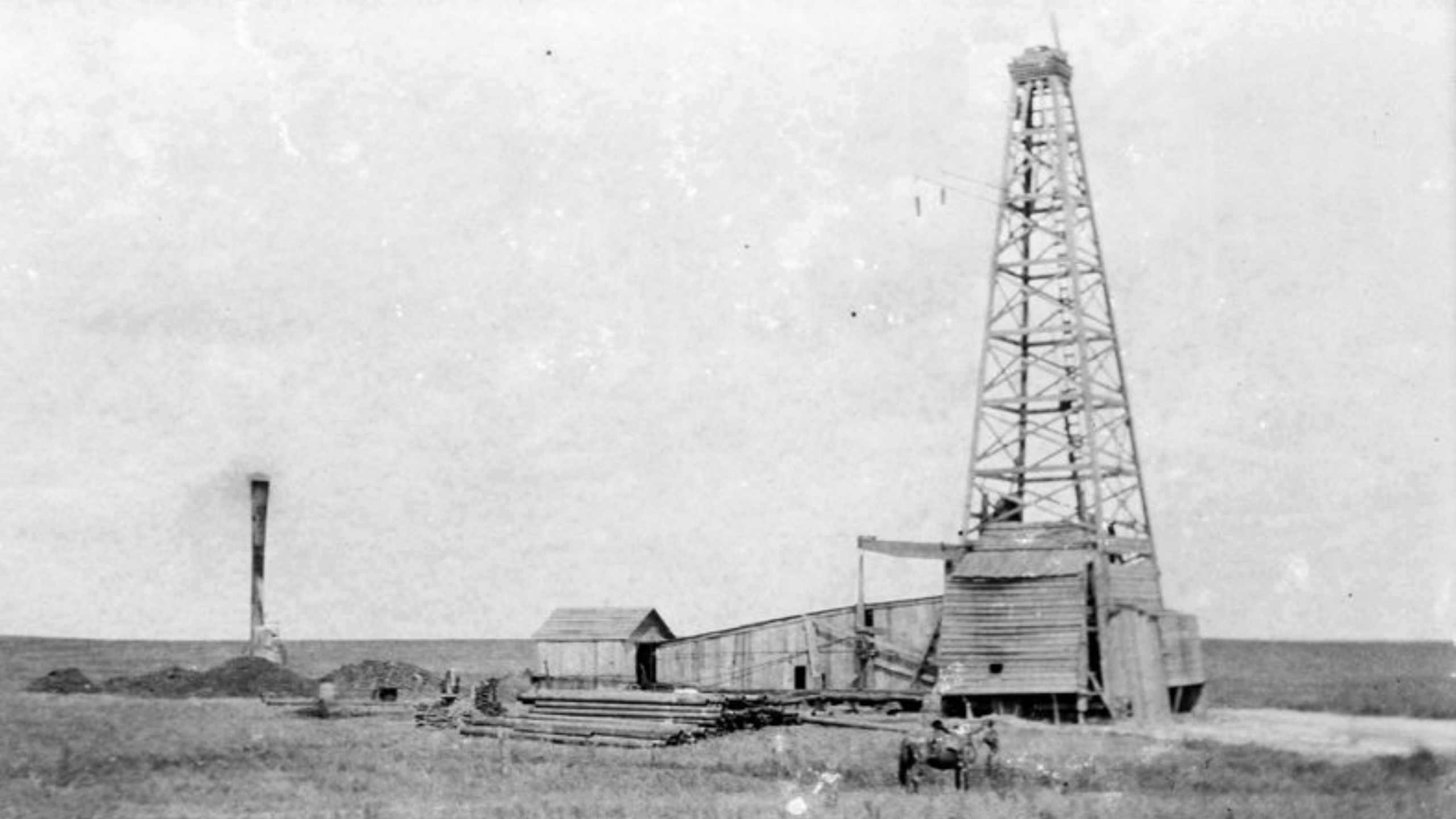
Elk River Wind Farm
Landowner
gpferrelliii@sktc.net

Pete Ferrelll graduated from Grinnell College with a BA in Anthropology specializing in archeology of the desert southwest.

He was a full-time ranch hand from 1974 to 1980 then served as general manager until 2017.

In 1995, he co-founded and was president (2000) of the Tallgrass Prairie Producers Cooperative, a rancher-owned business for marketing forage-finished beef.

He was the initiator of and primary landholding member in the development of the Elk River Wind Farm constructed on the Ferrell Ranch in 2005.




FERRELL
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RANCH

Next Workshop Dates

June 22nd - Property Values with Mike Busch and Mary Fund

July 13th - Wildlife with Zac Eddy and Pete Ferrell

To register visit

https://bit.ly/2021KSWindWorkshops

COMMUNITY WIND WORKSHOP 2021