

Kansas Wind Energy Sustainability

The Role of Community Engagement



Dr. Deborah Ballard-Reisch

Dr. Chuck Koeber

Jeff Fletcher

Melissa Granville



WICHITA STATE
UNIVERSITY

K-State Sustainability Conference – March 31, 2011





2 Department of Energy Grants totaling \$2.5 million

Related to sustainability in wind energy production

Primary Grant Principal Investigators:

Dr. Michael Overcash

Sam Bloomfield Distinguished Chair and
Professor of Sustainable Materials and Energy Systems

Dr. Janet Twomey

Professor of Industrial and Manufacturing Engineering

CBPR Sub-Grant Principal Investigators:

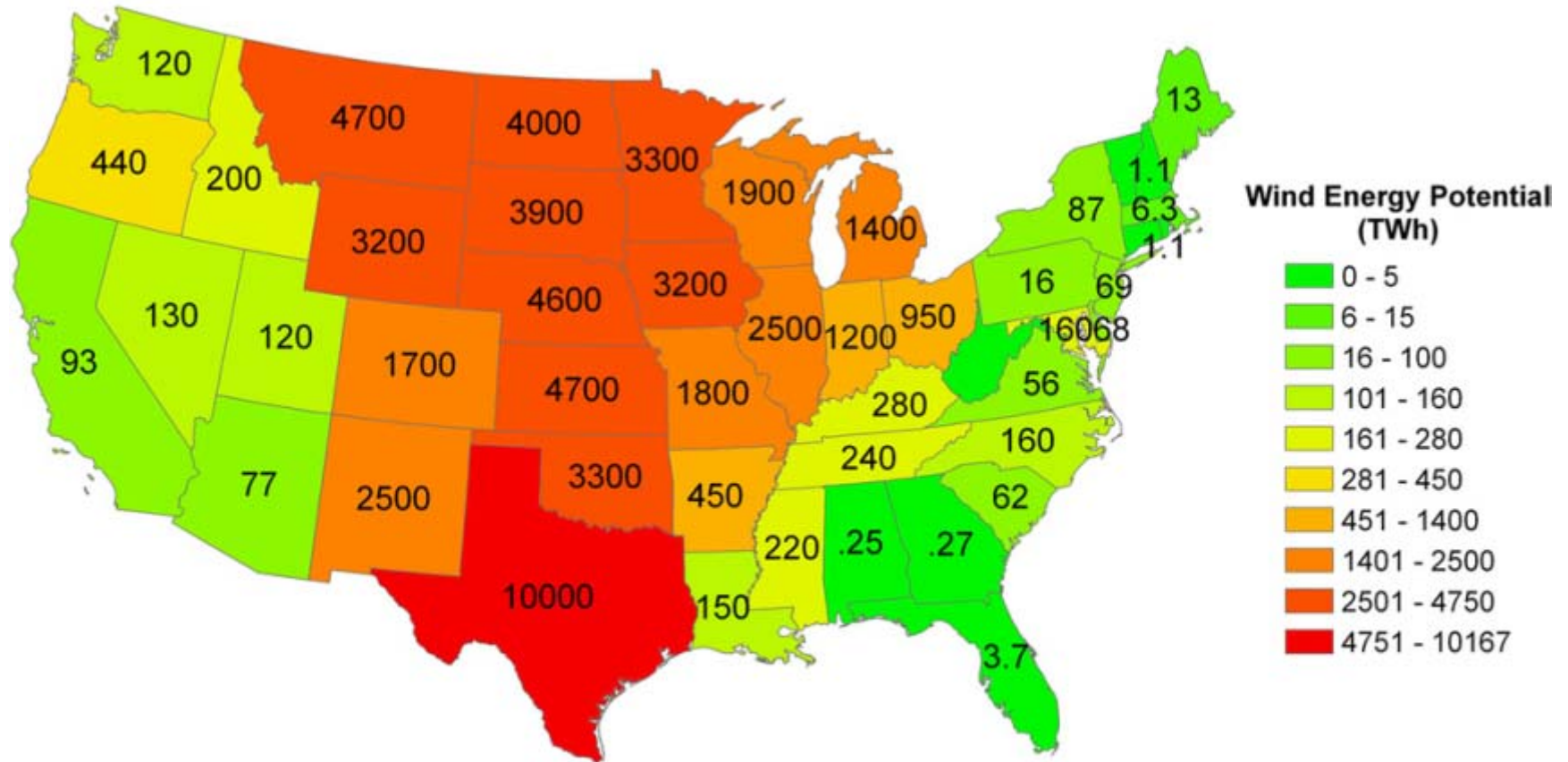
Dr. Deborah Ballard-Reisch

Kansas Health Foundation Distinguished Chair in Strategic Communication and
Professor in the Elliott School of Communication

Dr. Charles Koeber

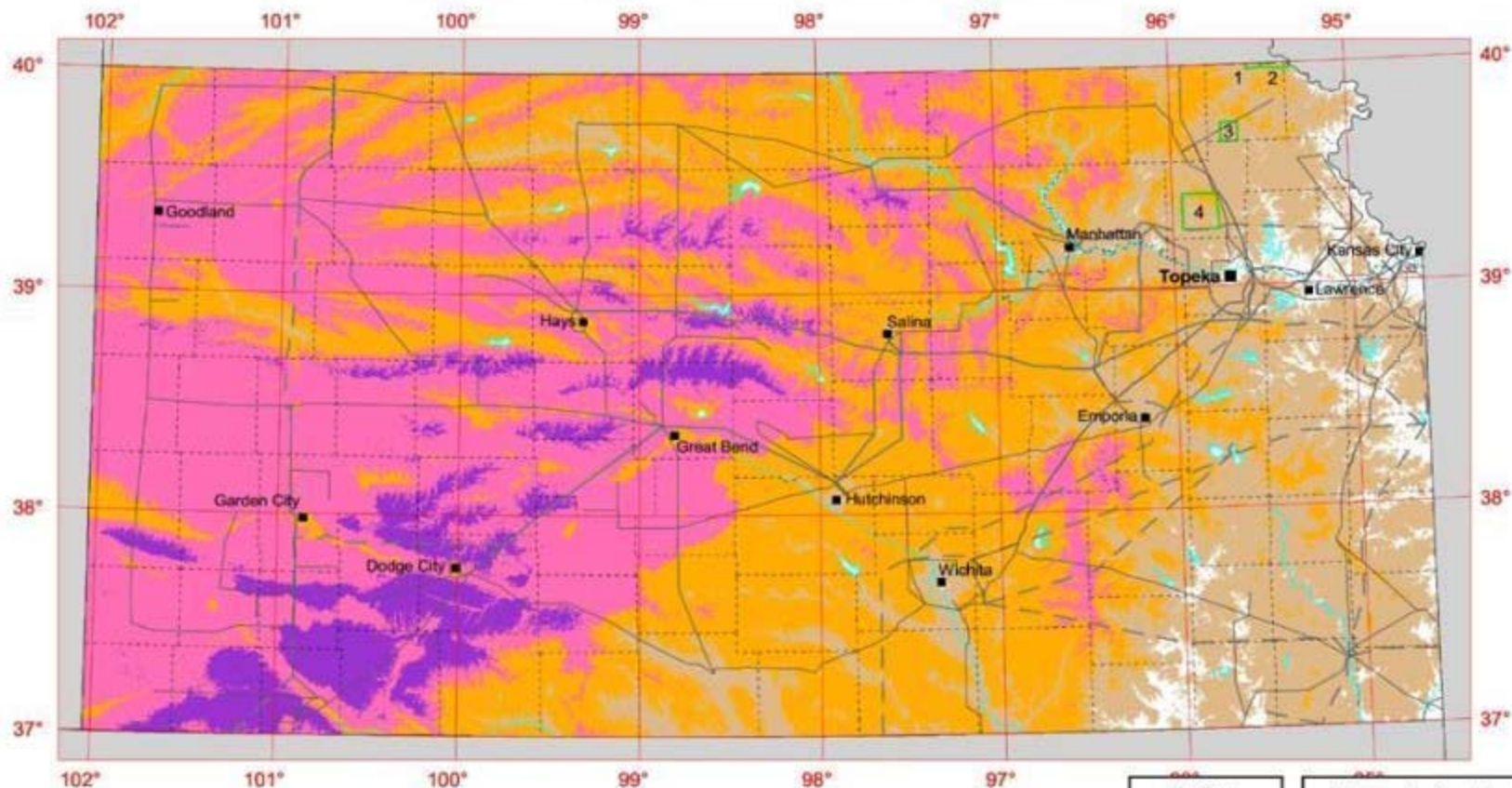
Associate Dean of the Fairmount College of Liberal Arts and Sciences and
Associate Professor of Sociology

Kansas: 2nd in Wind Energy Potential



Source: www.pnas.org/content/106/27/10933.full.pdf

Kansas - Annual Wind Power at 50-m Height

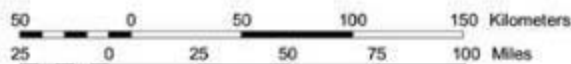


Wind Power Classification

Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m^2	Wind Speed ^a at 50 m m/s	Wind Speed ^a at 50 m mph
1	Poor	0 - 200	0.0 - 6.0	0.0 - 13.4
2	Marginal	200 - 300	6.0 - 6.8	13.4 - 15.2
3	Fair	300 - 400	6.8 - 7.5	15.2 - 16.8
4	Good	400 - 500	7.5 - 8.1	16.8 - 18.1
5	Excellent	500 - 600	8.1 - 8.6	18.1 - 19.3
6	Outstanding	600 - 800	8.6 - 9.5	19.3 - 21.3

^a Wind speeds are based on a Weibull k of 2.4 at 500 m elevation.

The annual wind power estimates for this map were produced by AWS Truewind using their Mesomap system and historical weather data. It has been validated with available surface data by NREL and wind energy meteorological consultants.



Indian Reservation

- 1 Sac and Fox
- 2 Iowas
- 3 Kickapoo
- 4 Potawatomi

Transmission Line* Voltage (kV)

- 115 - 161
- 230
- 345

* Source: POWERmap, ©2005
Platts, a Division of the McGraw-Hill Companies



U.S. Department of Energy
National Renewable Energy Laboratory

26 SEP 2008 2:11

Operational Large-Scale Projects in Kansas

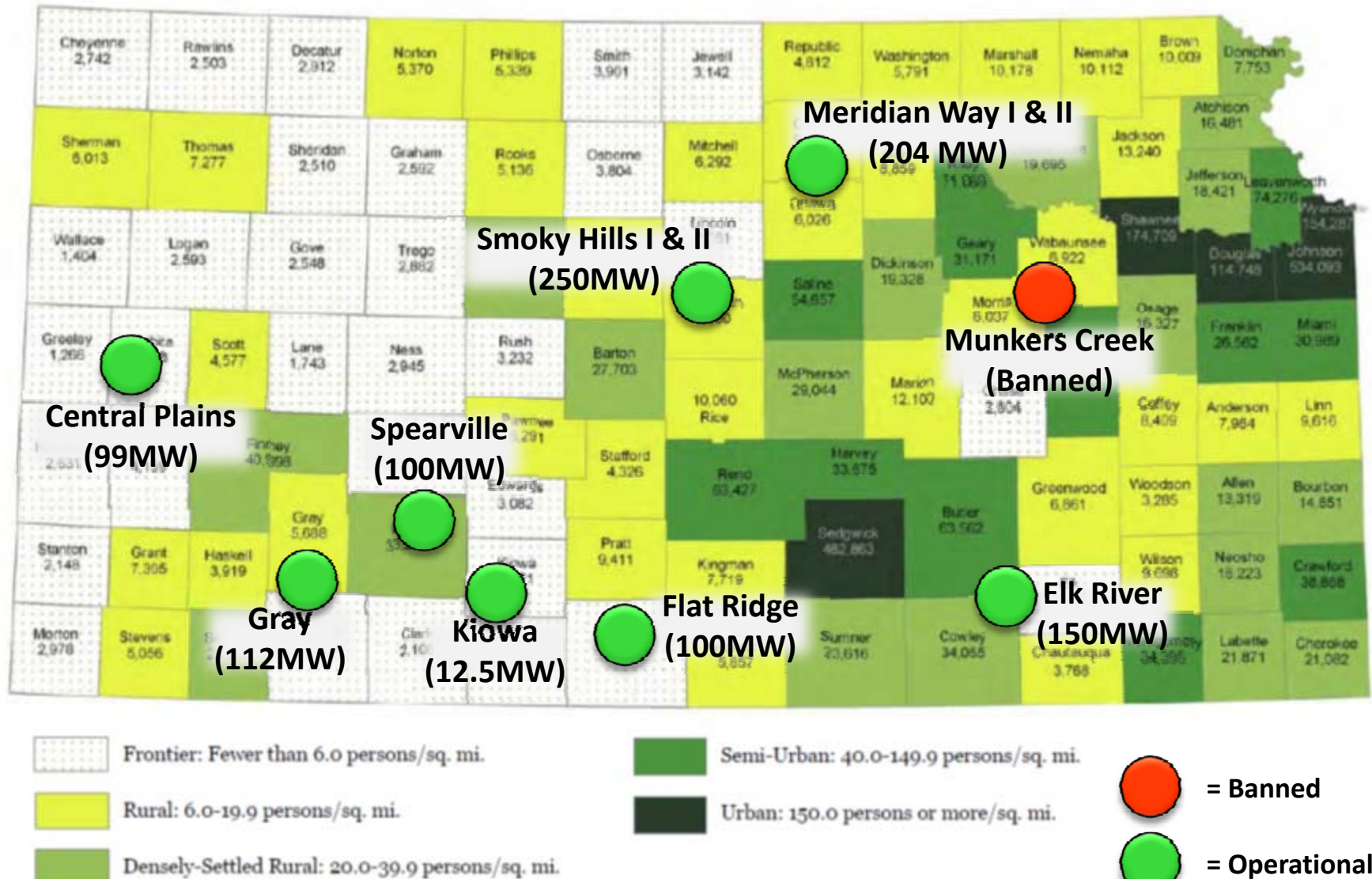
Wind Project (County)	Size (MW)	Turbine	Operational Year
Gray County Wind Farm (Gray Co.)	112	Vestas V47	2001
Elk River Wind Facility (Butler Co.)	150	GE 1.5	2005
Spearville Wind Energy Facility (Ford Co.)	100	GE 1.5	2006
Smoky Hills Wind Project (Lincoln/Ellsworth Cos.) Phases I & II	250	Vestas V80 & GE 1.5sle	2008
Meridian Way Wind Farm (Cloud Co.) I & II	204	Vestas V90	2008
Flat Ridge Wind Farm (Barber Co.)	100	Clipper Liberty	2009
Central Plains Wind Farm (Wichita Co.)	99	Vestas V90	2009
Greensburg Wind Farm (Kiowa Co.)	12.5	Suzlon	2010

1,028 MW

Source: www.kansasenergy.org

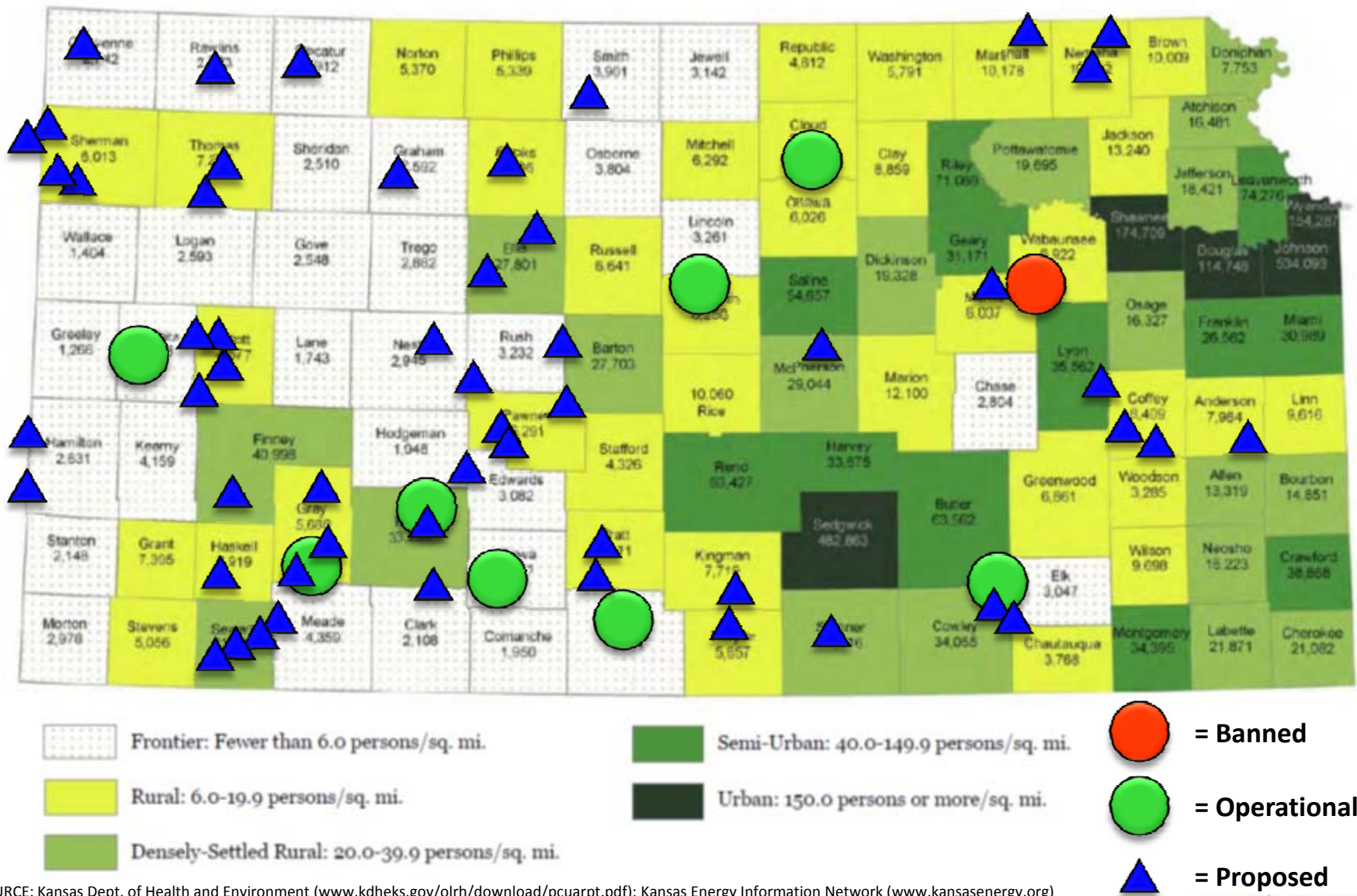
Kansas Large-Scale Wind Energy Initiatives

Population Density Peer Groups 2008 Census Estimates



SOURCE: Kansas Dept. of Health and Environment (www.kdheks.gov/olrh/download/pcuarpt.pdf); Kansas Energy Information Network (www.kansasenergy.org)

Population Density Peer Groups 2008 Census Estimates



SOURCE: Kansas Dept. of Health and Environment (www.kdheks.gov/olrh/download/pcuarpt.pdf); Kansas Energy Information Network (www.kansasenergy.org)

2011 K-State Sustainability Conference

Assessing Community Engagement As a Factor of Wind Energy Sustainability

Community involvement in rural project development:

- **Enhances project sustainability**
- **Improves project efficiency and effectiveness**
- **Empowers community members**
- **Builds social capital**
- **Strengthens governance**
- **Complements market and public sector activities**

Owen (2007)

Communication is the medium in which these processes occur

Significance

This area of research is significant because:

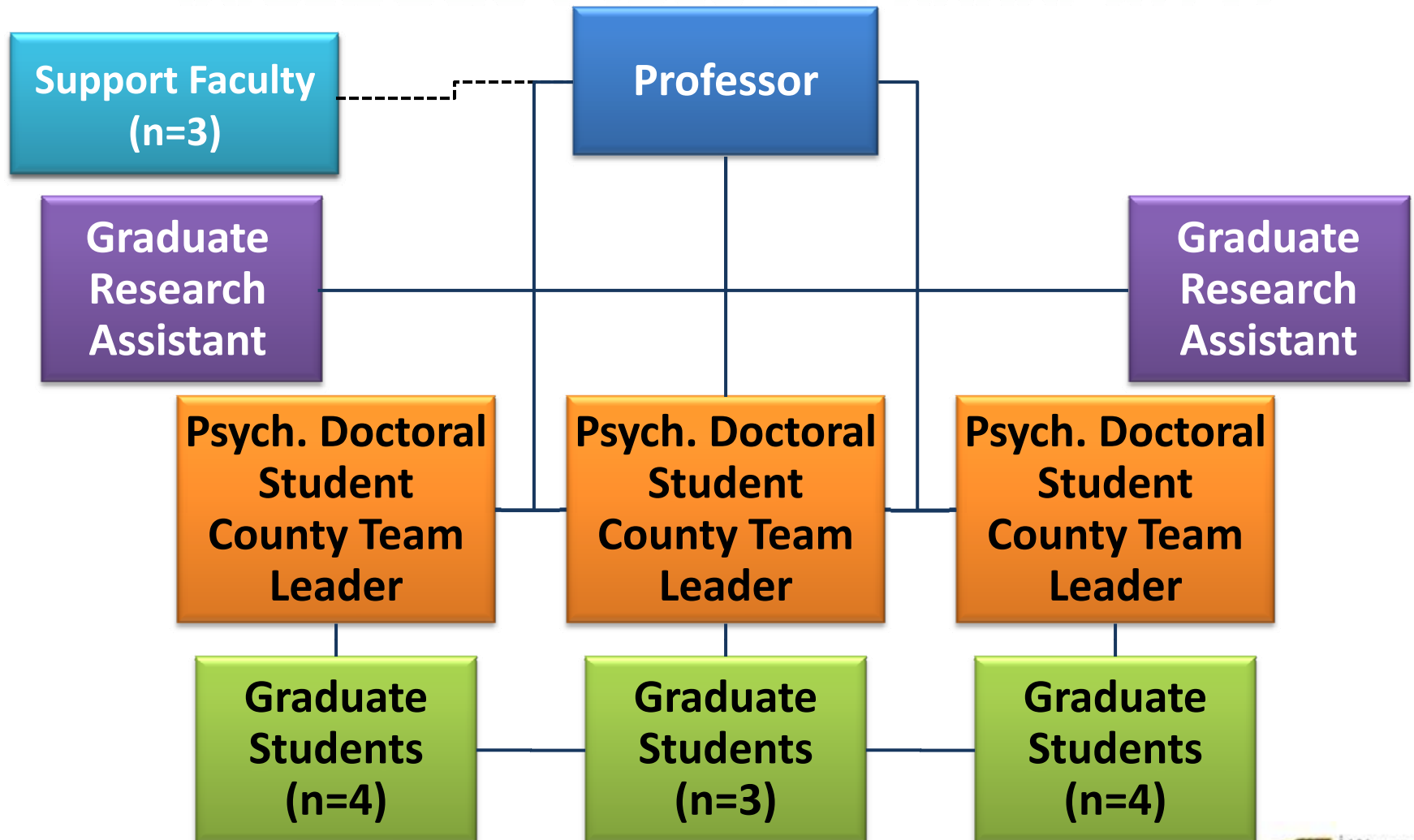
- **Renewable energy is increasingly necessary due to the cost of fossil fuels and concern about climate change**
- **The 2009 Kansas Renewable Energy Standards Act mandates that by the year 2020, Kansas utilities must generate 20 percent of their energy from renewable sources.**
- **There is also much to be discovered about the opportunities and challenges that confront stakeholders in the development of renewable energy sources, such as wind power.**
- **We can learn more about how to balance the interest of developing wind power with the interests of the communities in which the projects are located.**

A Model for Sustainability Education at the Graduate Level

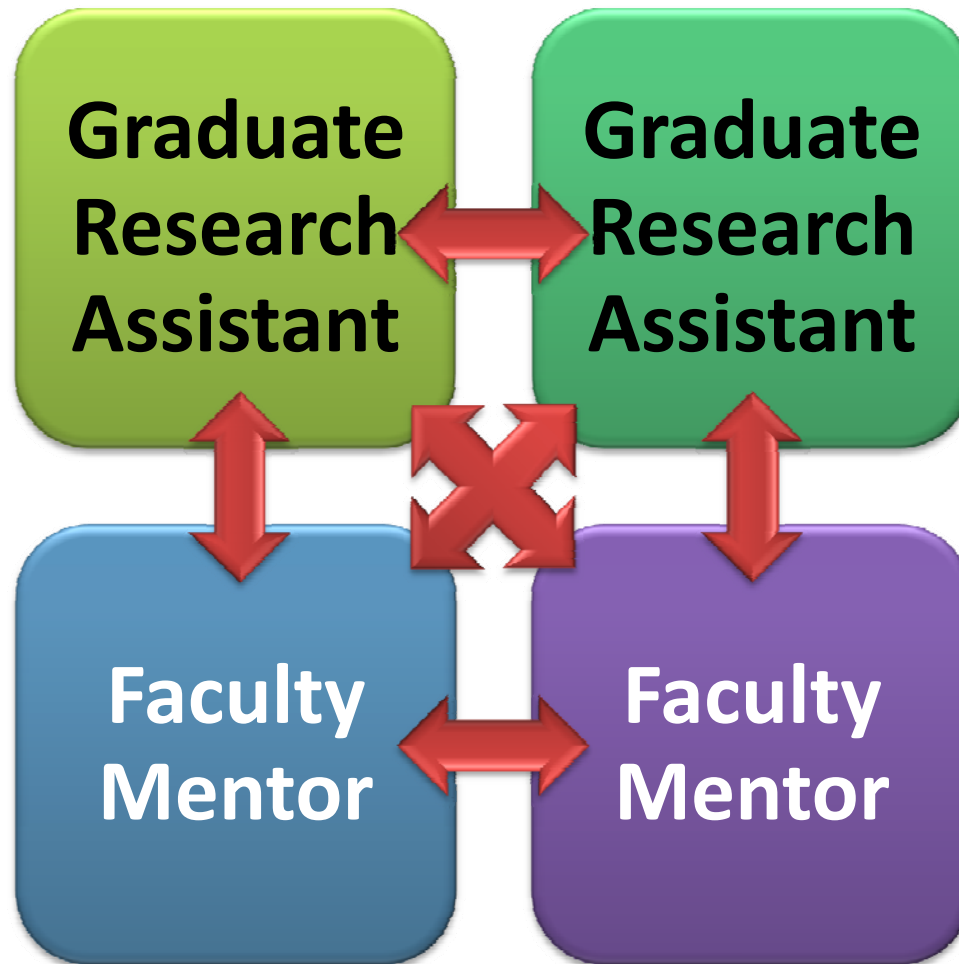
Assumptions About Student Involvement

- **Students are full partners in all aspects of the research process**
- **Student skill development is a cornerstone of this type of engagement**
- **Student training in engaged scholarship process and methods is critical**
- **Student empowerment**

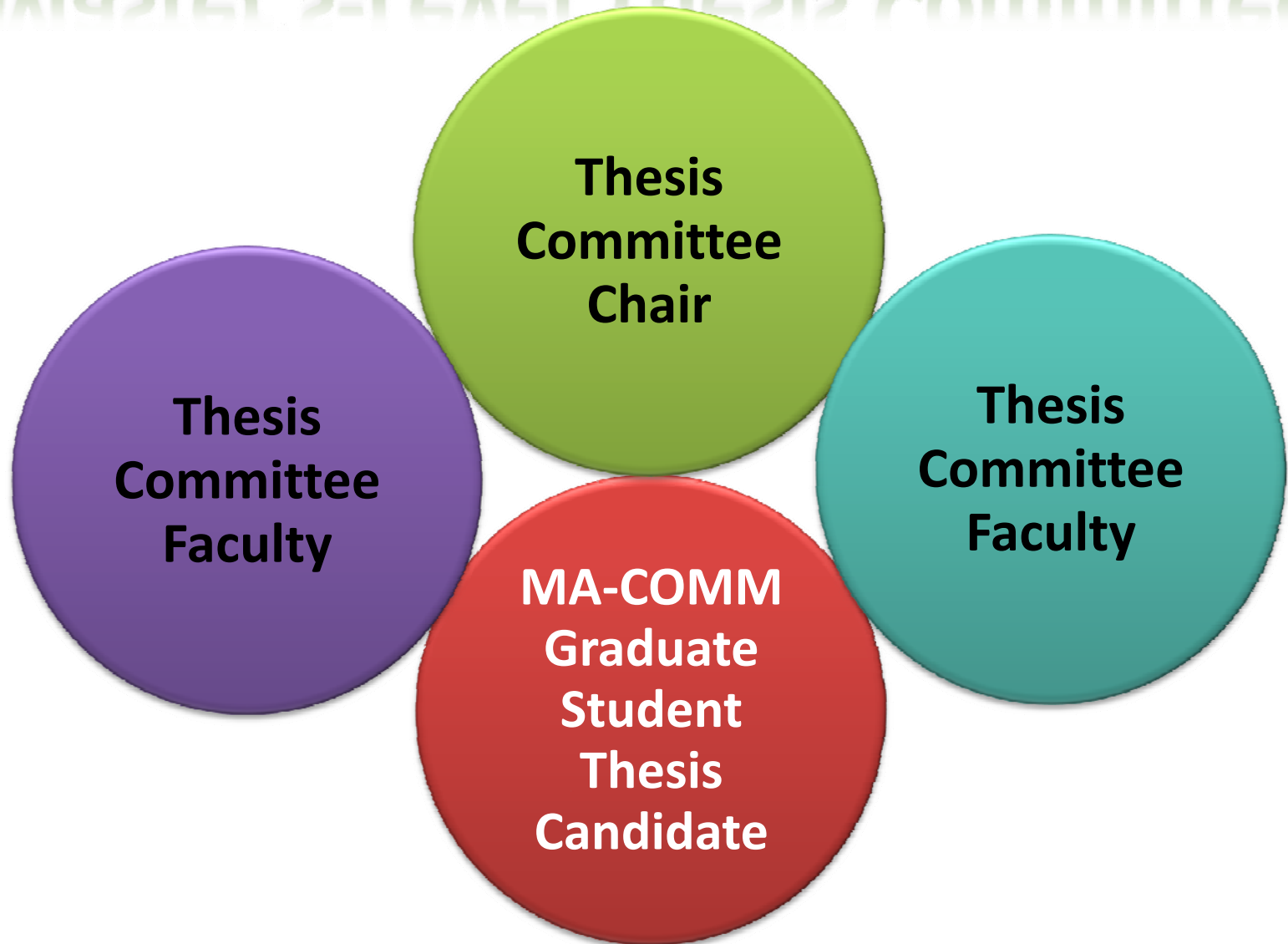
Graduate Qualitative Research Methods Class (COMM 802)

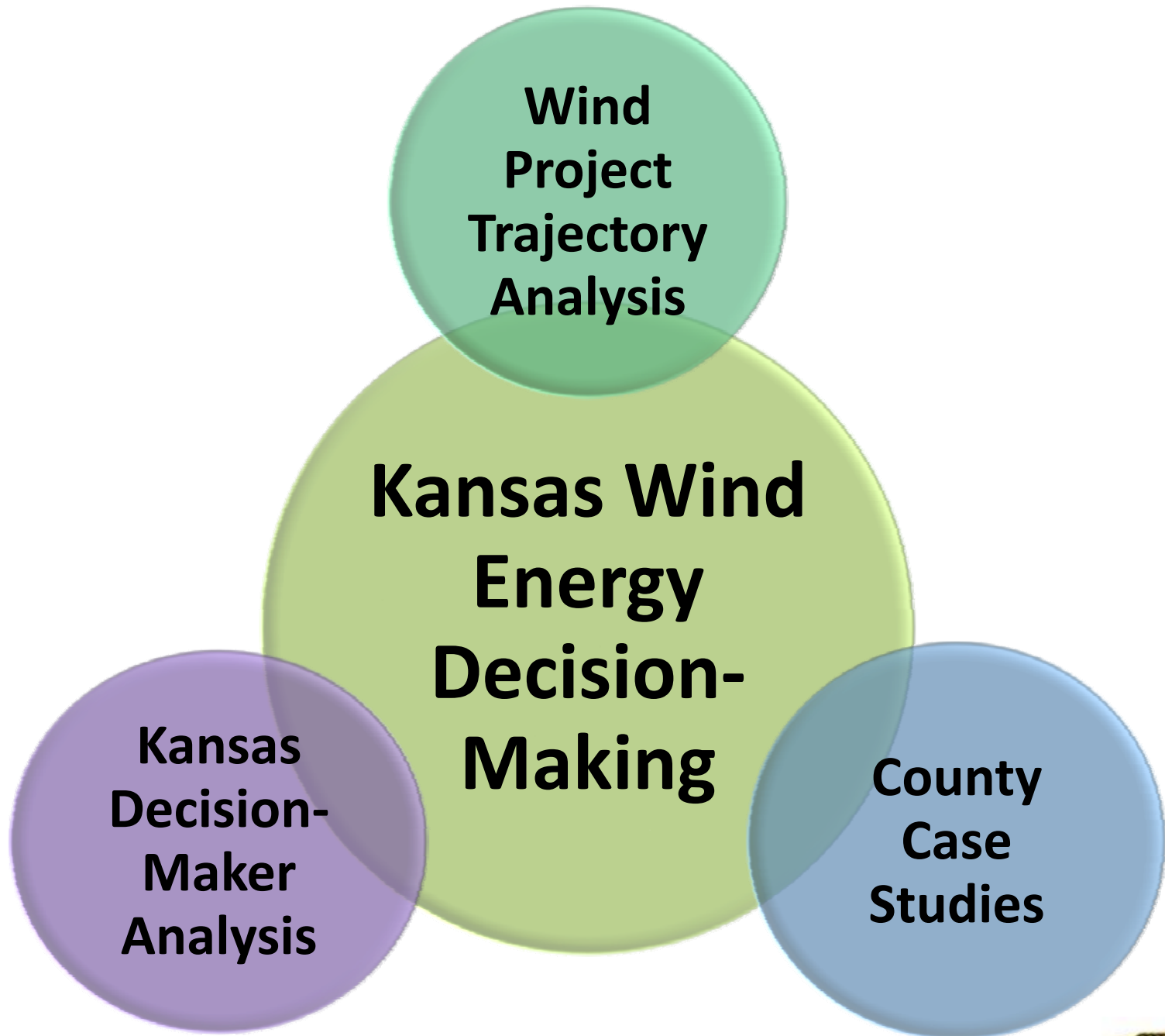


Document Analysis Research Team



Master's-Level Thesis Committee





Three Wind-Development Projects

Wind Project Trajectory Assessment:

- Trajectories & factors that facilitated or impeded wind energy project development

County Case Studies:

- Community member perceptions of wind energy project decision-making

Kansas Decision-Maker Analysis:

- Decision-maker perceptions of need / appropriateness of engaging communities in wind energy decision-making

Methods

Document Analysis: an integrated method for locating, identifying, retrieving, and analyzing documents

(Altheide et al., 2008, p. 128)

Key Informant Interviews: one-on-one interviews with knowledgeable individuals regarding the topic of interest

(Clements-Nolle et. al., (2005)

Focus Groups: semi-structured group interviews, guided by a moderator to address specific topics of interest

(Krueger and Casey, 2009)

Iterative Process of Grounded Research

- Research (ongoing document analysis)
- Engage (key informant interviews)
- Reflect
- Research
- Engage (focus groups)
- Reflect
- Outcomes (results and implications)

Thematic Data Analysis

Systematic approach to analyzing qualitative data

3 Types:

- **Deductive Theory-Driven**
- **Deductive -Prior Data /Research-Driven**
- **Inductive/Data-Driven**

(Boyatzis, 1998)

Thematic Data Analysis

These studies used a 4 step processes to analyze data:

1. Immersion in the data to become familiar with the content and recognize patterns
2. Encoding the data to reflect themes found deductively, inductively or through prior research
3. Development of a code from the themes used for analyzing the data
4. Interpretation of findings

(Boyatzis, 1998)

Document Analysis

Kansas Wind Energy Initiatives: 8 Operational & 1 Banned

4 Key Source Categories:

- Kansas Energy Information Network website
- Online databases (e.g. NewsBank, LexisNexis, etc.)
- County websites and offices
- Key stakeholder websites

4 Key Coding Variables:

- Timeline
- Contributors
- Opposition/Support
- Development Process

Goal: Identify trajectories and factors that facilitated or impeded wind energy project development

The Four Faces of Engaged Scholarship

Faces are distinct, but related:

- Applied communication research
- Collaborative learning
- Activism and social justice
- Practical theory

(Putnam, 2009)

“...a collaborative form of inquiry in which academics and practitioners leverage their different perspectives and competence in co-producing knowledge about complex problems.”

V(an de Ven & Johnson, 2006, p. 803)

Engaged Scholarship

- Engagement “involves negotiation and collaboration between researchers and collaborators in a learning community.”
(Van de Ven, 2007, p. 7)
- Researchers and practitioners co-produce knowledge about a topic of interest by drawing from their varied areas of expertise.
(Van de Ven, 2007, p. 7)
- The engaged relationship stresses reflexivity, co-learning and aims to develop “theoretical and practical knowledge.”
(Barge & Shockley-Zalaback, 2008, p. 264)

Engaged Scholarship

All projects take an engaged communication scholarship approach emphasizing Putnam's (2009) collaborative face which emphasizes:

- **Academic / Community partnership in the research process**
- **That community partners “socially construct and understand their worlds”**
- **The perspectives of all parties to co-create and engage in co-learning, conversation & partnership, from an inter- or multi-disciplinary perspective**

Community-Based Participatory Research (CBPR)

- **Research is grounded in the community
(Minkler & Wallerstein, 2008)**
- **Community members are involved in all aspects of
project development, implementation &
evaluation**
- **Emphasizes research that translates into
sustainable community-based action
(Israel et al., 2005)**

Case Study Analysis

A case study is an inquiry that seeks to understand and describe a phenomenon within its real life context

(Yin, 2009)

4 steps in case study research:

- 1. Define / select the case(s)**
- 2. Use multiple cases**
- 3. Use multiple data sources**
- 4. Analyze case study data**

(Yin, 2009, p. 254)

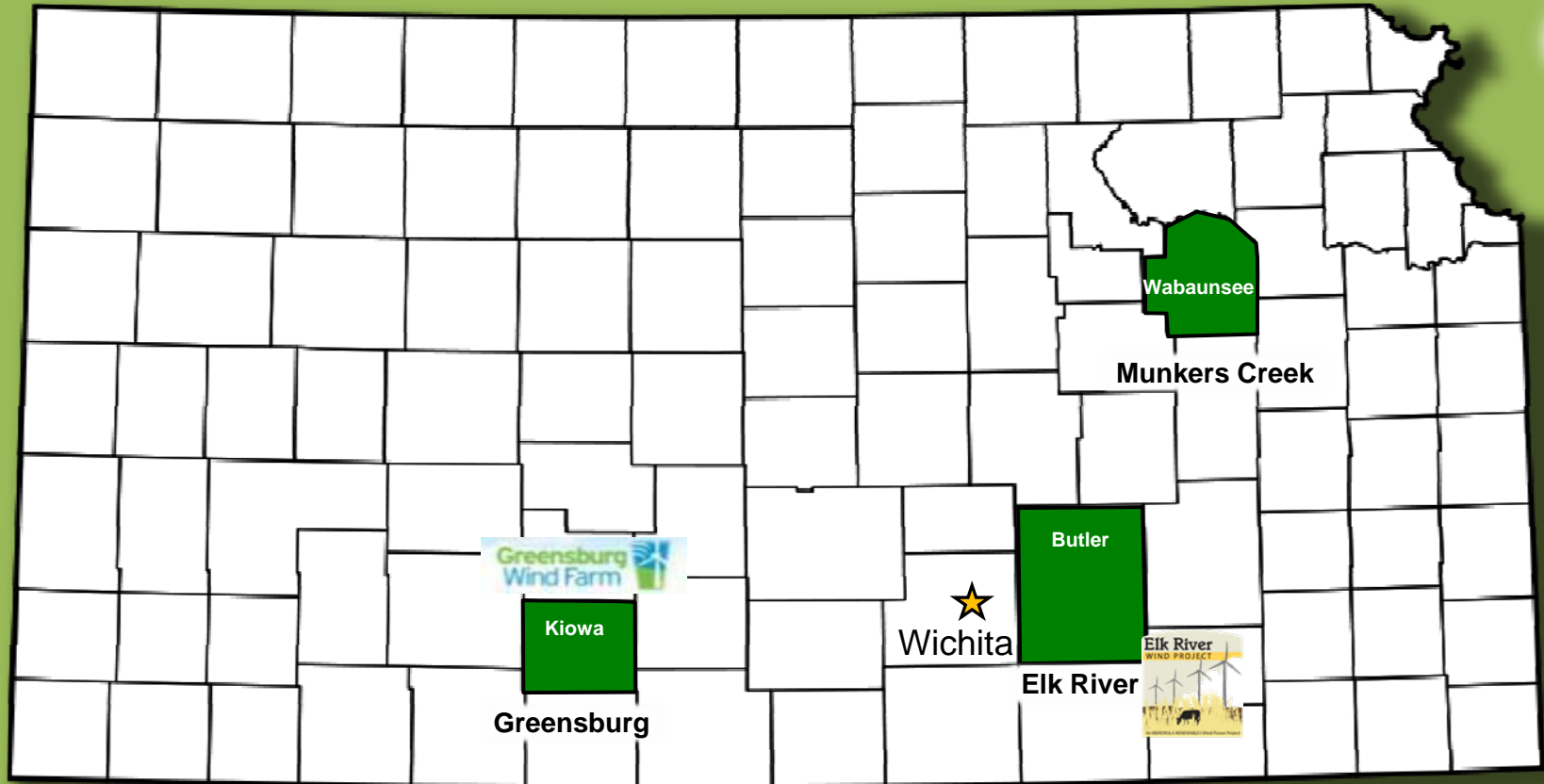
Case Studies

Cases:

- *Elk River Wind Project* (Butler County)
- *Greensburg Wind Farm* (Kiowa County)
- *Munkers Creek Wind Farm* (Wabaunsee County)
- *Key Informant Interviews (KIIs):* n=30 (10 per county)
- *Focus Groups:* n=9 (3 per county)

Goal: Identify community member perceptions of wind energy project decision-making

Three Model Counties: Butler, Kiowa, Wabaunsee



Kansas Decision-Maker Case Study

Decision-maker key informant interviews:

- Kansas government officials (n=3)
- Wind energy industry representatives (n=3)
- Wind advocacy group members (n= 4)

*Goal: Decision-maker perceptions of need /
appropriateness of engaging communities in
wind energy decision-making*

Educational Outcomes

Students conducted a community-grounded research project from start to finish

Students gained the ability to:

- Conceptualize issues and frame questions
- Conduct key informant interviews and focus groups
- Analyze data
- Write reports
- Deliver presentations to diverse audiences

Pending Master's Thesis: Granville, M.A. (2011). *Building sustainable rural Kansas initiatives: assessing community participation in wind energy decision-making* (Unpublished master's thesis). Wichita State University, Wichita, KS.

Educational Outcomes

Conference presentations (list)

Koeber, C., Ballard-Reisch, D.S., Fletcher, J.S., Granville, M., Thanh Le, K., McConnell, K.E., Rowley, R., & Tullis, C.A. (November, 6, 2010). A Wind-Wind Situation: Community Participation in the Development of the Greensburg, Kansas Wind Farm. Association for Humanist Sociology, Santa Fe, NM.

Granville, M. & Fletcher, J.S. (Feb. 2011). Comparative analysis of Kansas commercial wind energy projects and Wizelius' wind project development model. Poster presentation for "Capitol Graduate Research Summit" poster competition, Wichita State Division, Topeka, KS.

Ballard-Reisch, D.S., Koeber, C., Voegeli, C., Granville, M., Fletcher, J.S., Grant, E., Heim, C., Lee, D., Thanh, K., McConnell, K., Murphy, L., Publow, A., Rosenbaum, A., Rowley, A., Schoch, C., Sullivan, T., Tullis, C. & Winterbone, E. (Jan. 2011). Assessing Community Engagement in Wind Project Development: A Preliminary Analysis. Poster presentation for "Regional Energy and Sustainability Summit & Fair" poster competition, Student Division, first place, Wichita, KS.

Educational Outcomes (Cont'd)

Conference presentations (list)

Koeber, C., Ballard-Reisch, D.S., Fletcher, J.S., Granville, M., Thanh Le, K., McConnell, K.E., Rowley, R., & Tullis, C.A. (November, 6, 2010). *A Wind-Wind Situation: Community Participation in the Development of the Greensburg, Kansas Wind Farm*. Association for Humanist Sociology, Santa Fe, NM.

Granville, M. & Fletcher, J.S. (Feb. 2011). *Comparative analysis of Kansas commercial wind energy projects and Wizelius' wind project development model*. Poster presentation for "Capitol Graduate Research Summit" poster competition, Wichita State Division, Topeka, KS.

Grant, E. (Jun. 2011). *Community-Based Research, Program Evaluation and other Partnerships: Creating Good Outcomes with Undergraduate and Novice Students*. Symposium conducted at 13th Biennial Conference of the Society for Community Research and Action (Division 27 of the American Psychological Association), Chicago, Illinois.

Questions?

Thank You.

