

Summer 2009

# Nebraska Wind Power: A Comparative Study of Knowledge and Attitudes

Cameron Helgren  
*University of Nebraska at Lincoln*

Follow this and additional works at: <http://digitalcommons.unl.edu/envstudtheses>

 Part of the [Natural Resource Economics Commons](#), [Natural Resources Management and Policy Commons](#), [Oil, Gas, and Energy Commons](#), [Other Environmental Sciences Commons](#), and the [Sustainability Commons](#)

---

Helgren, Cameron, "Nebraska Wind Power: A Comparative Study of Knowledge and Attitudes" (2009). *Environmental Studies Undergraduate Student Theses*. 25.  
<http://digitalcommons.unl.edu/envstudtheses/25>

This Article is brought to you for free and open access by the Environmental Studies Program at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Environmental Studies Undergraduate Student Theses by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

NEBRASKA WIND POWER: A COMPARITIVE STUDY OF  
KNOWLEDGE AND ATTITUDES

By

Cameron Helgren

AN UNDERGRADUATE THESIS

Presented to the Faculty of

The Environmental Studies Program at the University of Nebraska – Lincoln

In Partial Fulfillment of Requirements

For the Degree of Bachelor of Arts

Major: Environmental Studies

With the Emphasis of: Sociology

Under the Supervision of Dr. J. Allen Williams Jr.

Lincoln, NE

August, 2009

NEBRASKA WIND POWER: A COMPARITIVE STUDY OF  
KNOWLEDGE AND ATTITUDES

Cameron Helgren, B.A.

University of Nebraska, 2009

*Advisor:* Dr. J. Allen Williams Jr. / University of Nebraska-Lincoln / Department of Sociology / Professor of Sociology

*Reader:* Dr. Susan Wortmann / University of Nebraska-Lincoln / Department of Sociology / Professor of Sociology

**Abstract**

The goal of this project is to assess the knowledge and attitudes of Nebraskans on the issue of wind power. The point of this research is to learn whether the presence of wind power has a positive effect on a person's knowledge about and attitudes toward wind power and wind turbines. Using mail surveys, qualitative and quantitative data were collected from the towns of Pierce and Ainsworth Nebraska. The surveys aided in seeing patterns of knowledge about wind power and wind turbines and positive and negative attitudes and major concerns regarding wind power.

## Table of Contents

<b>Acknowledgments</b> .....	
<b>Chapter I. Introduction</b> .....	
<b>Chapter II. Research Problem and Literature Review</b> .....	
<b>Chapter III. Materials and Methods.</b> .....	
<b>Chapter IV: Results</b> .....	
<b>Chapter V. Discussion</b> .....	
<b>Chapter VI. Conclusions</b> .....	
<b>References</b> .....	
<b>Appendix I.</b> .....	
<b>Appendix II.</b> .....	

## **Acknowledgments**

I would like to extend my thanks and gratitude to my thesis advisor and reader, Dr. Al Williams and Dr. Sue Wortmann for their guidance, insight and support throughout the design and implementation of this survey and upon the completion of this thesis. Thank you to the survey participants of Pierce and Ainsworth Nebraska for taking the time to share their viewpoints with me. I would also like to extend my thanks to the faculty, staff and students at UNL for providing a great learning environment and a strong academic foundation, critical to the completion of this thesis and of my undergraduate degree.

## **Introduction**

Using wind as a tool for gaining resources goes back to 500-900 A.D. when it was first used as a means to pump water (Darrell M. Dodge 2006). In 1888, Charles F. Bush was the first person to build a windmill and use it to generate electricity (Dodge 2006). The idea of bulk wind power was first thought of in Russia in 1931 (Darrell M. Dodge 2006). In Russia the Balaclva wind generator produced 100 kilowatts of electricity. Soon after the Balaclva generator technology was used in other countries such as the United States, France, Germany, Great Britain and Denmark (Darrell M. Dodge 2006).

Today, wind turbines have been constructed and used all over the world to create electricity for millions of people. In the United States there has been a concerted effort to develop renewable energy resources, particularly wind power, in an attempt to reduce the nation's environmental impact resulting from burning fossil fuels to generate energy and to reduce the dependency on foreign energy sources. In an attempt to accomplish these goals for energy, the United States has stated that it wishes to meet 20 percent of its energy needs through wind power by the year 2030 (United States Government Accountability Office 2008).

In the United States, wind power has been widely embraced however, popularity and opinions regarding wind power vary from state to state. Nebraska currently is ranked as 23rd in the nation for wind energy production, but the state is believed to have considerable potential and thus is not using its wind energy production potential (American Wind Energy Association 2006). In fact, Nebraska has the potential to

produce 99,100 megawatts of electricity from wind power technology each year, which would then rank Nebraska as 6<sup>th</sup> in the nation for wind energy production. Even though the state could produce 99,100 MW of energy, Nebraska is currently only producing 73 MW of energy or 0.0737% of what it is thought to be able to produce (American Wind Energy Association 2006). However, in a study that was conducted by the Mellman Group in 2003, 70% of Nebraska voters were in favor of requiring power companies to obtain 20% of their power from renewable resources (Nebraska Energy Office, 2003).

Even though Nebraska is producing an extremely small percentage of wind energy from only three wind farms, this 73 MW is enough energy to power 57,000 homes each year (American Wind Energy Association 2006). The largest of the three wind farms is in Ainsworth. This farm has 36 wind turbines with each turbine producing 1.65 MW of power. The Ainsworth wind farm produces 60 MW of power which is enough to provide 19,000 homes with electricity (Nebraska Energy Office, 2003). Although Ainsworth's wind farm is the largest in terms of the number of wind turbines, Elkhorn Ridge wind farm is the largest in terms of energy production. This wind farm produces 80 MW of electricity which is enough for 25,000 homes. The increased capacity of power at the Elkhorn Ridge wind farm is due to the use of 27 Vestas V90 wind turbines, which are each able to produce 3.0 MW of electricity. The third wind farm is in Crofton Hills which utilizes the Vestas V90 wind turbines. With 13 turbines it can produce 42 MW of power which can power 13,000 homes (Nebraska Public Power District, 2004).

As discussed above Nebraska is not utilizing its wind energy potential. I believe that this may be due to the public's attitudes and knowledge of wind power. If the

public's attitudes are negative then companies will be less likely to try and place wind farms in the state. Are these attitudes and knowledge determined by the proximity to wind power generation? To answer this question I created a survey and sent it to two communities in Nebraska to ask them about their attitudes and knowledge of wind power generation.

### **The Research Problem and Review of Literature**

In a United States opinion survey, 42 percent of Americans thought that renewable energy sources should be the highest priority for continued federal funding of research and development (Breglio 1995). A Canadian questionnaire which asked a representative group of Canadians if they would like to see their power utility be wind generated received a 79 percent positive response (Omnibus Report 1995). There is a similar pattern of high percentages of the population being in favor and having positive attitudes towards wind power in Denmark, Netherlands and United Kingdom surveys.

There are some common attitudes towards wind power that span countries. People not living around wind power believe that the noise produced from the turbines is louder than others who live by the turbines (Holdninsundersogelse 1993). Men compared to women believe that turbines produce a lot of noise. A Danish survey found that people in favor of wind power are more positive about local wind turbines and do not see them as noisy or intrusive to the landscape (Gipe, 1995). An opinion study done in Sydthy Denmark, which is one of the places with the highest concentration of wind turbines, found that people with a high degree of knowledge about energy generation and renewables tend to have more positive attitudes about wind power than people with little knowledge (Andersen et al. 1997). In this same study



it was found that the distance to wind turbines has no effect on people's attitudes of the wind turbines. However, in Sydney, 58% of the households have one or more shares in a co-operatively owned wind turbine. This had a significant affect on their positive attitudes of wind energy.

In the United Kingdom there have been many before and after surveys dealing with attitudes of wind energy. One research report measured the before and after attitudes for three wind farms. 40 percent of the people supported the three projects, while 70 percent supported the general development of wind power. This was found to be due to the "not in my back yard" mentality (Bishop and Proctor, 1994). "Not in my back yard" is a theory that people will support some sort of idea in the general sense, but if a local project is proposed that support will diminish because of expected consequences. In this study when they compared the before and after results they found that support for wind turbines was larger than the opposition. Also they found that 36.2% of the population that was unsure or not interested in the three projects before the installation moved towards supporting the projects after the installation.

As mentioned, the question explored in the research is whether the attitudes and knowledge of wind turbines and wind power generation are based on proximity of the wind power generation. On the one hand people living close to a wind farm would be expected to have more knowledge of wind power. This could lead to a more favorable attitude. On the other hand, it is possible that people may have the "not in my back yard" mentality. Also the concerns may be larger in small farming towns. For example, people may fear the possible impact of wind turbines on livestock or crops, on or near their property. They also may be concerned about their effect on property values.

I believe that people have fears of the negative consequences of having wind farms near their homes. These fears may be the reason why Nebraska has not implemented as much wind power as it could. After having these wind energy facilities installed, I think that the public's fears will diminish and they will realize that there are many positives to wind power and near to none negatives. Because of this theory I believe that Ainsworth will have higher positive attitudes and knowledge of wind power compared to Pierce.

### **Materials and Methods**

A self-administered mail survey was sent to Pierce and Ainsworth Nebraska. As discussed Ainsworth is home to the largest wind farm in Nebraska. The objective of this research is to discover the attitudes and knowledge of wind turbines and wind power generation and if they differ depending on first hand experience. To answer this question, I selected a Nebraska town, Ainsworth that has close proximity to the largest wind farm in the state. I also selected a town that is very similar to Ainsworth in size, demographic characteristics and location, Pierce, which has no wind power farm near it. These two towns are similar in terms of population, male and female demographics, and racial/ethnic demographics. The population of Ainsworth is 1657 people. The percentage of males is 46.3 and the percentage of females is 53.7. The race/ethnic makeup of Ainsworth is 98.2 percent White Non-Hispanic and 0.6% two or more races (City Data 2008). The population of Pierce is 1652 people. The percentages of males is 48 and females are 52. The race/ethnic makeup of Pierce is 98.6 percent White Non-Hispanic and 0.7% Hispanic (City Data, 2008). The main difference between these two towns, besides location in Nebraska, is the presence and absence of a wind farm.

The participants were selected using systematic random sampling from the most recent local phone book of each town. I sent an invitation to participate in the study along with a survey to every fifth person. In total, there was 454 surveys sent; 230 to Pierce and 224 to Ainsworth. The surveys had either the exact same questions, or questions that would give the same information. There were 4 questions that were a yes/no response and a write in response if the respondent answered yes. I waited three weeks after mailing before analyzing the surveys to allow for maximum return. I entered the survey information into an Excel database and divided the survey information into qualitative and quantitative data.

I received 94 completed surveys from Pierce and 81 completed surveys from Ainsworth, which equals a 36.3% return rate. There were 11 surveys that could not be delivered in Pierce and 7 in Ainsworth. Three surveys were returned and not completed from Pierce and 3 from Ainsworth. Thirty-six females and 44 males responded from Pierce, 40 females and 51 males responded from Ainsworth. The average age of the respondents from Pierce is 58 years old with a median age of 57 years old and for Ainsworth the average age is 63 years old and the median age is 61 years old. The average length of time the respondents have lived in Ainsworth or Pierce were the same, which is 21 years with both having a median of 18 years. Forty-nine respondents from Pierce live in town, 22 live on a farm or ranch and 22 live in the open country or acreage. For Ainsworth 60 respondents live in town, 10 live on a farm or ranch and 10 live in the open country or acreage. The majority of respondents in both towns were White. Fifty respondents in Pierce stated that their religious preference was Protestant, 25 were Catholic, 10 were Christian, 7 were left blank and 2 stated none. Fifty respondents in Ainsworth stated that their religious preference was Protestant, 7 were

Catholic, 13 were Christian, 6 were left blank and 5 stated none. For both towns the average and median number of people in the respondent's household is 2. Education was broken down into 6 categories; (1) less than high school, Ainsworth: 4, Pierce: 5, (2) high school diploma, Ainsworth: 26, Pierce: 27, (3) technical/vocational school, Ainsworth: 6, Pierce: 11, (4) some college, Ainsworth: 16, Pierce: 13, (5) college degree, Ainsworth: 18, Pierce: 27, and (6) post graduate degree, Ainsworth: 9, Pierce: 8.

Table 1 and 2. Demographics of the total population of Ainsworth and Pierce compared to the samples of the two communities.

	Ainsworth	Sample of Ainsworth
Gender	Male: 46.3% Female: 53.7%	Male: 56% Female: 44%
Race/Ethnic make up	White Non-Hispanic: 98.2% Two or More Races: 0.6%	White Non-Hispanic: 98.7% Asian: 1.3%
Median Age of Residents	43.3 Years	61 Years
Education	High School: 81.9% Bachelor's Degree: 18.1% Graduate or Professional Degree: 4.1%	High School: 33% Bachelor's Degree: 22.7% Graduate or Professional Degree: 11.4%
Average Household Size	2.1 People	2 People
Religion	Catholic: 22% Protestant: 62% Other: 17%	Catholic: 9.5% Protestant: 68.5% Other: 22%

Table 2

	Pierce	Sample of Pierce
Gender	Male: 48% Female: 52%	Male: 55% Female: 45%

Race/Ethnic make up	White Non-Hispanic: 98.6%	White Non-Hispanic: 98.9%
	Hispanic: 0.7%	Hispanic: 98.9%
Median Age of Residents	37.8 Years	57 Years
Education	High School: 81.8%	High School: 29.6%
	Bachelor's Degree: 13.7%	Bachelor's Degree: 29.6%
	Graduate or Professional Degree: 4.9%	Graduate or Professional Degree: 8.8%
Average Household Size	2.5 People	2 People
Religion	Catholic: 22%	Catholic: 29.4%
	Protestant: 68%	Protestant: 58.8%
	Other: 10%	Other: 11.7%

**Table 3.** List of characteristics with percentage.

Characteristics	Percent (N= 175)	Number of responses
<b>Community</b>		
Ainsworth	46.30%	81
Pierce	53.70%	94
<b>Gender</b>		
Male	55.60%	95
Female	44.40%	76
<b>Race/Ethnicity</b>		
White	98.80%	173
Other	1.20%	2
<b>Education</b>		
Less than high school	5.30%	9
High school	31.20%	53
Technical/Vocational School	10%	17
Some college	17.10%	29
College degree	26.50%	45
Post Graduate Degree	10.00%	17
<b>Occupation</b>		
Retired	40.40%	40
Self employed	12.10%	12
Rancher-farmer	19.20%	19
Educator	15.20%	15
Truck driver	4.00%	4
Stay at home mother	9.10%	9
<b>Where live</b>		
In town	63%	109
Open acreage/open	18.50%	32

country		
Farm/ranch	18.50%	32
<b>Religious preference</b>		
Protestant	64.50%	100
Catholic	20.60%	32
Christian	15.00%	23

## Results

Appendix I and II are the exact surveys that were sent to the two communities. When asked if the respondent believed that there are benefits to wind power, 67 respondents or 82.7% from Ainsworth said yes and 13 or 16% said no. Seventy-seven respondents, 81.9% from Pierce said yes and 17, 18.1% said no. When the respondents were asked if they believed there were negatives to wind power, 15, 18.5% from Ainsworth said yes and 63, 77.7% said no. Thirty-three, 35% of respondents from Pierce said yes and 58, 61.7% said no.

	Ainsworth		Pierce	
		Percent		Percent
<b>Benefits</b>				
Yes	67	82.70%	77	81.90%
No	13	16%	17	18.10%
<b>Negatives</b>				
Yes	15	18.50%	33	35%
No	63	77.70%	58	61.70%

The respondents were asked if they would like to see other ways to generate power in Nebraska. Fifty-seven respondents from Ainsworth and Pierce said yes. Eleven from Ainsworth and 22 from Pierce said no. Respondents from both towns were asked if they lived near a wind farm and if they said yes they were to specify how far away they lived. Fifty-seven respondents, 70.3% from Ainsworth said that they did live near a wind farm with the majority living 5 to 6 miles away. Seventy-five respondents, 79.8% from

Pierce said that they did not live near a wind farm. Nineteen said that they did live near a wind farm which was 20 miles away. When the Pierce respondents were asked if they would have concerns if a wind farm would be placed near their town 82 stated that they would have no concerns and 12 stated that they would. Ainsworth respondents were asked if they were familiar with the wind farm near their town, 77 said yes and 4 said no. They were asked if they had concerns about the wind farm and to specify those concerns. There were 11 write in responses about their concerns: cost, wildlife and problems with the turbines. They were then asked if their concerns about wind power has increased, decreased or stayed about the same after the wind farm was constructed. The majority of the respondents stated that they were about the same or decreased.

There are 9 categories for the write in responses for the benefits of wind power; (1) helps save the environment, Ainsworth: 7, Pierce: 11, (2) alternative source of energy, Ainsworth: 5, Pierce: 11, (3) postpone or minimize use of fossil fuels, Ainsworth: 11, Pierce: 15, (4) saves money, Ainsworth: 12, Pierce: 16, (5) renewable resource, Ainsworth: 7, Pierce: 10, (6) helps local economy, Ainsworth: 17, Pierce: 18, (7) it is a natural way to generate power, Ainsworth: 8, Pierce: 11, (8) less dependency on foreign oil, Ainsworth: 1, Pierce: 6 and (9) clean power, Ainsworth: 9, Pierce: 16. For the write in responses for the negatives of wind power there are 6 categories; (1) cost, Ainsworth: 8, Pierce: 15, (2) reliability, Ainsworth: 1, Pierce: 4, (3) wildlife, Ainsworth: 4, Pierce: 12, (4) noise pollution from the turbines, Ainsworth: 0, Pierce: 10, (5) safety of the turbines, Ainsworth: 0, Pierce: 2 and (6) destroying scenery, Ainsworth: 4, Pierce: 9. For the question of other ways to generate power there are 8 categories, (1) solar power, Ainsworth: 15, Pierce: 13, (2) nuclear power, Ainsworth: 8, Pierce: 10, (3) Any and all

possibilities, Ainsworth: 4, Pierce: 7, (4) hydro electric power, Ainsworth: 12, Pierce: 5, (5) natural gas/methane, Ainsworth: 1, Pierce: 2, (6) biothermal/geothermal, Ainsworth: 0, Pierce: 1, (7) coal, Ainsworth: 0, Pierce: 2, (8) hydrogen, Ainsworth: 1, Pierce: 0 and (8) ethanol, Ainsworth: 2, Pierce: 3. The last write in question was the participant's occupation which has 6 categories; (1) retired, Ainsworth: 26, Pierce: 14, (2) self-employed, Ainsworth: 4, Pierce: 8, (3) rancher-farmer, Ainsworth: 10, Pierce: 9, (4) educator, Ainsworth: 7, Pierce: 8, (5) truck driver, Ainsworth: 3, Pierce: 1, and (6) stay at home mother, Ainsworth: 3, Pierce: 6.

Table 4. Results from the write in responses to the benefits of wind power.

	Ainsworth		Pierce	
		Percent		Percent
Helps save the environment	7	9%	11	9.60%
Alternative source of energy	5	6.50%	11	9.60%
Postpone or minimize use of fossil fuels	11	14.30%	15	13.20%
Saves money	12	15.60%	16	14%
Renewable resource	7	9%	10	8.80%
Helps local economy	17	22.10%	18	15.80%
A natural way to generate power	8	10.40%	11	9.60%
Less dependency on foreign oil	1	1.30%	6	5.30%
Clean power	9	11.70%	16	14%
N	77	100%	114	100.00%

Table 5. Results from the write in responses to the negatives of wind power.

	Ainsworth		Pierce	
		Percent		Percent
Cost	8	47.10%	15	28.90%
Reliability	1	5.90%	4	7.70%
Wildlife	4	23.40%	12	23.10%
Noise pollution	0	0%	10	19.20%
Safety of turbines	0	0%	2	3.80%
Destroying scenery	4	23.40%	9	17.30%
N	17	100.00%	52	100.00%



Table 6. Results from the write in responses of other energy generation sources being developed.

	Ainsworth		Pierce	
		Percent		Percent
Solar power	15	34.90%	13	30.20%
Nuclear power	8	18.60%	10	23.30%
Any and all possibilities	4	9.30%	7	16.30%
Hydro electric power	12	28%	5	11.60%
Natural gas/methane	1	2.30%	2	4.70%
Biothermal/geothermal	0	0%	1	2.30%
Coal	0	0%	2	4.70%
Hydrogen	1	2.30%	0	0%
Ethanol	2	4.70%	3	7%
N	43	100.00%	43	100.00%

*Gender.*

When looking at the survey data I decided to first look at gender. For Pierce there were 12 respondents or 12.7% stated that they would have concerns about a wind farm being located outside or near their town. The respondents were split between men and women showing that gender was not a factor in determining these attitudes. In Ainsworth 6 respondents stated that their concerns have increased with 4 being male and 2 being female which may lead us to think that men maybe more concerned. When the respondents were asked if wind power had benefits 17 respondents from Pierce said no with 8 being male and 9 being female which could say there is no difference. Ainsworth showed the same results with 7 males and 6 females saying no. When the respondents were asked if wind power has any negative impacts males said yes more often than females. Also Pierce had a much higher number of respondents saying yes compared to Ainsworth. The respondents were asked if we should generate other sources of power in Nebraska, Pierce again had a much higher

number of male respondents say no. Ainsworth had half of the number say no and the number was equal between genders.

#### *Location of Respondent.*

The variable that best describes where the respondent lives surprised me with how it compared to the respondents concerns, their thoughts on the benefits and negatives of wind power and if other sources of power generation should be used. For Pierce there was no difference in where the respondent lived and their responses to these questions. However, for Ainsworth it did matter for their thoughts on the benefits and negatives and also if other sources of power should be used. Respondents who believe that there are no benefits to wind power, there are negatives to wind power and that there should not be other power sources generated in Nebraska were more likely to live in town instead of on a farm or ranch, or open country/acreage. I thought that people who live on a farm or ranch, or open country/acreage would have more concerns due to the possibility of being more affected by a wind farm with regard to crops, livestock, property value, etc.

#### *Distance from Respondent to Wind Farm.*

The next variable that I analyzed was the distance the respondent's lived from wind turbines. In Ainsworth respondents that lived within 12 miles of the wind farm were more likely to not have concerns about wind power and believed that there are benefits, believe there are no negatives and that other sources of power generation should be developed. Pierce was asked a similar question about how far they live from a wind farm. To my surprise 24 people stated that they lived 20 to 50 miles away from a wind farm. I am wondering if the wind power that the respondent's are talking about is

a private wind turbine, which is not owned by NPPD. Respondent's who had concerns, thought there were no benefits, that there are negatives and that other sources of power generation should not be developed were more likely to not live near a wind farm and for each question only 2 of the respondent's lived within 40 miles of a wind farm.

## **Discussion**

Overall the results from the surveys show that Pierce respondents seem to have more negative attitudes and less knowledge about wind power than Ainsworth respondents. This is consistent with some of the literature that I found about people's attitudes of wind power. Other research has found that the farther away people live from wind turbines the more negative their attitudes are. There are 6 variables that do not determine the respondent's answers; race/ethnicity, education, number of people in the household, occupation, how long the recipient has lived in the town and the age of the recipient. The variables looking at the average and median length of time living in Ainsworth or Pierce, and the average and median number of people living in the household were not determining factors due to the fact that they were the exact same for both towns. The race/ethnicity of the respondent's did not affect the answers because all respondents, except two, said they were White. There was no pattern between the variables occupation and education and how the respondent answered the three main questions. The last variable age of the respondents was within 5 years of each other which is not a large enough gap to be able to determine whether this variable has an affect on the independent variables.

The write in responses for the benefits of wind power, the negatives of wind power and other sources that could be used were all categorized based on the write in responses of the respondents. All responses could be placed into these categories from both communities. The 9 categories for the benefits of wind power are listed in Table 3 and were: helps save the environment, alternative source of energy, postpone or minimize the use of fossil fuels, saves money, renewable resource, helps local economy (which included job creation and income for community/property owners), natural way to generate power, and less dependency on foreign oil. The negative categories are listed in Table 4 and were: the cost, reliability, wildlife, noise pollution, safety of turbines and destroying scenery. For the question about other sources of energy there were 8 categories listed in Table 5: solar power, nuclear power, any and all possibilities, hydro electric power, natural gas/methane, biothermal/geothermal, coal, hydrogen and ethanol.

There are some interesting results from the write in questions asking about benefits, negatives and other power sources. Pierce had more responses for both the benefits and negatives compared to Ainsworth. This shows that there is some variance in what the respondent's from Pierce think of wind power and may have stronger opinions compared to Ainsworth which may have a more neutral opinion. In terms of other power sources, both towns had a variety of write in responses with neither town coming out on top.

## **Conclusion**

The purpose of this study was to determine whether proximity to a wind power facility affected one's attitudes and knowledge of wind power. The survey was sent to two towns; Ainsworth and Pierce Nebraska. Ainsworth is home to the largest wind farm in Nebraska while Pierce does not have any wind facilities. These two towns are similar in population, racial/ethnic demographics and gender demographics. A total of 454 surveys were sent to the two towns with 175 surveys being returned. There are 7 of 10 variables that are not significant to the respondent's answers; race/ethnicity, number of people in the household, occupation, how long the respondent has lived in the town, the respondent's age, religious preference and education.

The three variables that affected the respondent's answers were gender, where they live, i.e. in town, farm or ranch, or open country/acreage, and how far away from wind power they live. While gender did affect certain questions it was not consistent throughout the same questions and it differed from Ainsworth to Pierce. One finding that supports my hypothesis is that more respondents who lived in town in Ainsworth had more concerns about wind power than respondent's who live on a farm or ranch, or open country/acreage and for Pierce it did not matter where they lived. There were more respondents from Pierce that had concerns, believed no benefits came from wind power, believed there were negatives and that other energy sources should not be used than in Ainsworth. My hypothesis was that people in communities that were located near a wind farm would have more positive attitudes and more knowledge of wind power. Overall respondents had positive attitudes and opinions of wind power, but Pierce did show more concerns about wind power than Ainsworth. Gender and the location of the respondent's residence affected certain questions, but not all of them also it only affect one community and not the other. Due to this, it leads me to believe

that the presence or absence of wind power is what affects a community's attitudes and knowledge.

### **Limitations**

One limitation to this survey would be the population and sample size. Due to monetary costs and time issues, the population and sample size is very small. Also due to the same reasons there was only one survey sent to the respondents with no follow up reminder card or extra survey. I think it would be interesting to do this survey or a similar survey with a larger population to see if the results would be similar. Another limitation is that my sample size is not representative of the two communities, which may have skewed the results.

### **Future Research**

A larger full scale Nebraska survey about wind power could be used to better determine whether the public's attitudes of wind power affects the amount of wind power utilized. The results of this larger full scale survey could help develop programs to educate the public about wind power and thus develop more wind power in the state.

## References

- American Wind Energy Association. (2006, June 1). *U.S. Wind Energy Projects - Nebraska*. Retrieved October 15, 2008, from American Wind Energy Association:  
<http://www.awea.org/projects/projects.aspx?s=Nebraska>
- Anderson et al. (1997). *Rapport om hvordan en dansk kommune blev selvforsynende med ren vindenergi og skabte ny indkomst til kommunens borgere*, Nordvestjysk Folkecenter for Vedrørende Energi.
- Bishop and Proctor. (1994). *Love Them or Loathe Them? Public Attitudes Towards Wind Farms in Wales*. Cardiff.
- Berglio. (1995). *Sustainable Energy Budget Coalition Survey*, Washington, 1995.
- City Data. (2008). *Ainsworth, Nebraska*. Retrieved November 21, 2008, from City Data:  
<http://www.city-data.com/city/Ainsworth-Nebraska.html>
- City Data. (2008). *Pierce, Nebraska*. Retrieved November 21, 2008, from City Data:  
<http://www.city-data.com/city/Pierce-Nebraska.html>
- Darrell M. Dodge. (2006). *Part 2 - 20th Century Developments*. Retrieved September 15, 2008, from Illustrated History of Wind Power Development:  
<http://www.telosnet.com/wind/20th.html>
- Gipe. (1995). *Wind Energy Comes of Age*, New York, 1995.
- Holdningsundersogelse. (1993). *Danish Wind Turbine Manufacturers Association*, Ringkjobing.
- Nebraska Energy Office. (n.d.). *36 Turbines in Ainsworth...State's Largest Wind Farm Begins Production*. Retrieved October 15, 2008, from Nebraska Energy Office:  
[http://www.neo.ne.gov/nea\\_online/mar2006/mar2006.01.htm](http://www.neo.ne.gov/nea_online/mar2006/mar2006.01.htm)
- Nebraska Energy Office. (2003, March). *Accelerating Wind-Power Development in Nebraska*. Retrieved October 15, 2008, from Nebraska Energy Office:  
[http://www.neo.ne.gov/reports/accel\\_wind.htm#\\_Toc445891757](http://www.neo.ne.gov/reports/accel_wind.htm#_Toc445891757)
- Nebraska Public Power District. (2004). *New Wind Facilities*. Retrieved October 15, 2008, from Nebraska Public Power District:  
[http://www.nppd.com/wind\\_generation/new\\_facilities.asp](http://www.nppd.com/wind_generation/new_facilities.asp)
- Omnibus Report. (1995). *Public Attitudes Towards Wind Energy*, Canadian Wind Energy Association and Environmental Monitor, Toronto.

## Appendix I

### PIERCE WIND POWER SURVEY

1. If you heard that a wind-generating facility was planned and would be located a few miles outside Pierce do you think you would have any concerns?

\_\_\_\_\_ 1. No

\_\_\_\_\_ 2. Yes

2. Do you live near any wind-power turbines?

\_\_\_\_\_ 1. No

\_\_\_\_\_ 2. Yes

If Yes: How far away are they?

\_\_\_\_\_ 1. Less than one mile away

\_\_\_\_\_ 2. They are \_\_\_\_\_ miles away.

3. Do you know of any benefits of wind-power facilities?

\_\_\_\_\_ 1. No

\_\_\_\_\_ 2. Yes



If Yes: What do you believe are some of the important benefits?

4. Do you know of any negative impacts of wind-power facilities?

\_\_\_\_\_ 1. No

\_\_\_\_\_ 2. Yes

If Yes: What do you believe are some of the negative impacts?

5. Do you think we should develop any other ways to generate power in Nebraska?

\_\_\_\_\_ 1. No

\_\_\_\_\_ 2. Yes

If Yes: What other way to generate power would you like to see developed?

**Now I would appreciate getting some background information about you. This information will be kept strictly confidential.**

6. What is your gender?

\_\_\_\_\_ 1. Female

\_\_\_\_\_ 2. Male

7. What year were you born? \_\_\_\_\_

8. Please mark the highest level of education you have completed:

\_\_\_\_\_ 1. Less than high school

- \_\_\_\_\_ 2. High school graduate
- \_\_\_\_\_ 3. Technical/Vocational School
- \_\_\_\_\_ 4. Some college
- \_\_\_\_\_ 5. College degree
- \_\_\_\_\_ 6. Post graduate degree

9. What is your occupation? **If you are retired or unemployed**, please indicate this and tell us what your occupation was before you retired or your last occupation before you were unemployed. **If you are a student**, please indicate your year in school and what school/college you are attending. **If you stay at home** to take care of the house, children, etc. please indicate this.

10. How many people are in your household? \_\_\_\_\_ Number

11. Which among the following best describes where you live?

- \_\_\_\_\_ 1. In town (within city limits)
- \_\_\_\_\_ 2. Farm or Ranch
- \_\_\_\_\_ 3. Open country (such as an acreage)

12. How long have you been living at your present residence?

- \_\_\_\_\_ 1. Less than a year
- \_\_\_\_\_ 2. More than one year: Please indicate number of years \_\_\_\_\_

13. What race or ethnic group do you consider yourself?

- \_\_\_\_\_ 1. Black or African American

- \_\_\_\_\_ 2. White, non-Hispanic
- \_\_\_\_\_ 3. Hispanic or Latino/a
- \_\_\_\_\_ 4. American Indian
- \_\_\_\_\_ 5. Asian
- \_\_\_\_\_ 6. Other: Please specify \_\_\_\_\_

14. What is your religious preference?

- \_\_\_\_\_ 1. Protestant
- \_\_\_\_\_ 2. Catholic
- \_\_\_\_\_ 3. Just Christian
- \_\_\_\_\_ 4. Jewish
- \_\_\_\_\_ 5. None
- \_\_\_\_\_ 6. Other: Please specify: \_\_\_\_\_

**This concludes the survey. Thank you very much for your time and cooperation in participating in this study. A postage paid envelope has been included with the questionnaire. I look forward to hearing from you. Thanks again!**

APPENDIX II

AINSWORTH WIND POWER SURVEY

1. Are you familiar with the wind-generating facility operated by the Nebraska Public Power District that is around six miles south of Ainsworth?

\_\_\_\_\_ 1. No

\_\_\_\_\_ 2. Yes

If Yes:

A. Did you have any concerns about the wind-power facility before it was developed? If so, what were your concerns?

B. Would you say your concerns have increased or decreased since the facility was developed?

\_\_\_\_\_ 1. Decreased

\_\_\_\_\_ 2. About the same

\_\_\_\_\_ 3. Increased

If your concerns have increased, please indicate why this is the case.

2. Do you live near any wind-power turbines?

\_\_\_\_\_ 1. No

\_\_\_\_\_ 2. Yes

If Yes: How far away are they?

\_\_\_\_\_ 1. Less than one mile away

\_\_\_\_\_ 2. They are \_\_\_\_\_ miles away.

3. Do you know of any benefits of wind-power facilities?

\_\_\_\_\_ 1. No

\_\_\_\_\_ 2. Yes

If Yes: What do you believe are some of the important benefits?

4. Do you know of any negative impacts of wind-power facilities?

\_\_\_\_\_ 1. No

\_\_\_\_\_ 2. Yes

If Yes: What do you believe are some of the negative impacts?

5. Do you think we should develop any other ways to generate power in Nebraska?

\_\_\_\_\_ 1. No

\_\_\_\_\_ 2. Yes

If Yes: What other way to generate power would you like to see developed?

**Now I would appreciate getting some background information about you. This information will be kept strictly confidential.**

6. What is your gender?

\_\_\_\_\_ 1. Female

\_\_\_\_\_ 2. Male

7. What year were you born? \_\_\_\_\_

8. Please mark the highest level of education you have completed:

\_\_\_\_\_ 1. Less than high school

\_\_\_\_\_ 2. High school graduate

\_\_\_\_\_ 3. Technical/Vocational School

\_\_\_\_\_ 4. Some college

\_\_\_\_\_ 5. College degree

\_\_\_\_\_ 6. Post graduate degree

9. What is your occupation? **If you are retired or unemployed**, please indicate this and tell us what your occupation was before you retired or your last occupation before you were unemployed. **If you are a student**, please indicate your year in school and what school/college you are attending. **If you stay at home** to take care of the house, children, etc. please indicate this.

10. How many people are in your household? \_\_\_\_\_ Number

11. Which among the following best describes where you live?

\_\_\_\_\_ 1. In town (within city limits)

\_\_\_\_\_ 2. Farm or Ranch

\_\_\_\_\_ 3. Open country (such as an acreage)

12. How long have you been living at your present residence?

\_\_\_\_\_ 1. Less than a year

\_\_\_\_\_ 2. More than one year: Please indicate number of years\_\_\_\_\_

13. What race or ethnic group do you consider yourself?

\_\_\_\_\_ 1. Black or African American

\_\_\_\_\_ 2. White, non-Hispanic

\_\_\_\_\_ 3. Hispanic or Latino/a

\_\_\_\_\_ 4. American Indian

\_\_\_\_\_ 5. Asian

\_\_\_\_\_ 6. Other: Please specify\_\_\_\_\_

14. What is your religious preference?

\_\_\_\_\_ 1. Protestant

\_\_\_\_\_ 2. Catholic

\_\_\_\_\_ 3. Just Christian

\_\_\_\_\_ 4. Jewish

\_\_\_\_\_ 5. None

\_\_\_\_\_ 6. Other: Please specify:\_\_\_\_\_

**This concludes the survey. Thank you very much for your time and cooperation in participating in this study. A postage paid envelope has been included with the questionnaire. I look forward to hearing from you. Thanks again!**

