

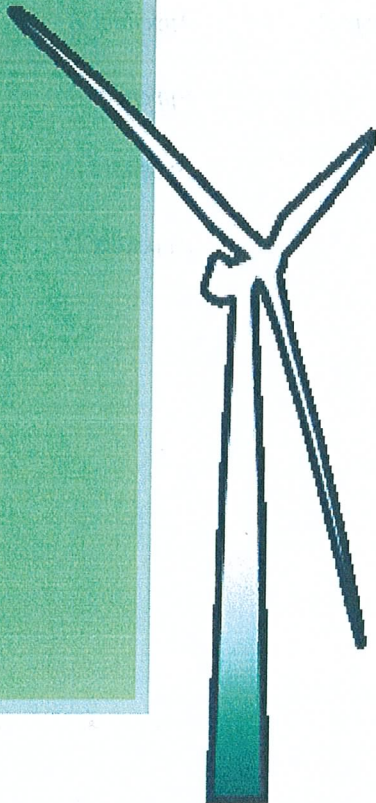
Campbell
Exhibit 1

Livingston County Environmental Association
Environmental Health Survey Pilot Project - Summer 2011

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Livingston County Environmental Association

Environmental Health Survey Pilot Project Summer 2011



Since 2003, the Livingston County Environmental Association has been working to protect the health, welfare and natural resources of Livingston County, located in the heart of Central Illinois. Our environment includes some of the richest agricultural soils in the world. The LCEA strives to protect this environment and the people who live here.

Livingston County Environmental Association
Environmental Health Survey Pilot Project- Summer 2011

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Executive Summary

Livingston County hosts the Streator-Cayuga Ridge South wind project. The project is owned and operated by a subsidiary of Iberdrola Renewables North America. It consists of 150 turbines spread over about 20,000 acres. Few studies exist concerning the impact of wind energy in the United States. In this study a survey was administered in two regions in Livingston County, one with a wind farm and one without.

Major findings include:

- Respondents' health symptoms increased as households' distance from wind turbines decreased. Control group respondents (non-wind farm residents) reported fewer occurrences of ten out of fourteen health symptoms.
- Approximately 60% of all respondents indicated they were unwilling to pay additional fees for the use of wind energy.
- As compared to 66.7% of the control group, 81.1% of respondents exposed to wind farms reported experiencing at least one of the common wind farm concerns surveyed.
- When asked about their level of awareness concerning the County's Zoning Board of Appeals hearing process, 56.8% of respondents reported feeling uninformed.
- For fourteen common wind farm concerns, an average of one-third of wind farm residents reported some experience with the concern.
- Participants receiving payments from the wind energy company were more likely to support wind farms elsewhere and to report never having experienced many concerns commonly linked to wind farms.
- These findings, while not statistically significant due to low sample size, strongly suggest the need for additional study of the human health impacts of industrial wind energy installations in populated areas.

Acknowledgements

This survey was designed, implemented, and analyzed by LCEA intern Amy Uden, an Illinois Wesleyan University alumna and graduate student at the University of Illinois at Springfield, under the supervision of LCEA board members Judy Campbell and Carolyn Gerwin. The LCEA would also like to thank volunteers Grace Gerwin and Daniel Ladage for their donations of time.

Introduction

The Livingston County Environmental Association is a citizen-based, non-profit advocacy group dedicated to identifying, assessing, and reducing environmental health concerns among residents of the county. The use of wind farms and wind energy has been popularized relatively recently in the United States, and few studies exist concerning the actual impacts of wind energy. In response to the increased use of Livingston County land for wind energy production, the LCEA commissioned a survey to gather data about health trends and wind energy awareness, among other environmental health issues facing Livingston County. The methodology and results of this survey, conducted during June 2011, are presented in this report.

Methodology

The survey asked a broad range of questions relating to environmental health. The survey was administered over a time span of slightly more than two weeks. It was conducted in two different regions of Livingston County. One region, the exposed group, lived within a wind farm area, while the other was a control group living in a similarly rural area without a wind farm.

The survey's exposed group consisted of all households within the Streator-Cayuga Ridge Wind Farm, located west of Odell, Illinois (see Appendix A, Livingston County map with wind farm outline). This geographical area is composed of portions of Union, Odell, and Saunemin Townships. From among these approximately eighty-nine households, thirty-eight households took the survey to at least partial completion, resulting in a response rate of forty-three percent. All households within the exposed group's geographical range received at least one visit, with two revisits per absent household. Surveyors attempted to visit households during various parts of the day and on several days of the week. Possible reasons for non-response included prolonged absence of household members or respondent unwillingness due to preference or legal restrictions.

Using a similar protocol, surveyors interviewed a control group from Waldo and Pike Townships, resulting in thirty-six completed control surveys (see Appendix B, Livingston County map with control area outlined). This control group was selected based on geographical considerations, including distances from rivers and the interstate highway similar to those of the exposed group, and the lack of any existing or proposed wind farms in that area. In the northwestern corner of Waldo Township (Sections 5 and 6), where three turbines from the proposed Minonk Wind Farm will be located, surveys were not administered.

Waldo and Pike Townships are comparable in rural character to the exposed area. Furthermore, income levels are comparable, with average household incomes in Waldo and Pike Townships of \$58,321 and \$54,376 respectively, whereas average household incomes for Odell and Union Township are \$48,563 and \$ 61,582 (2000 Census Data). In spite of some variation in these figures, the groups' average are relatively similar given that each group combines two of the townships' demographics. There were, however, differences in educational attainment rates among the two groups. The percentages of those with a bachelor's degree or higher in the control group surpass those in the exposed group. In Waldo and Pike Townships, 20.2% and

28.2% had obtained bachelor's degrees. In Odell and Union Townships, the figures were much lower at 11.6% and 2.0%. Because this study's primary emphases in selecting a control group were geographical and environmental factors and rural makeup, it did not ask respondents about education levels.

Respondents answered survey questions verbally in three distinct sections. Section One asked basic environmental questions of interest in the county, including items related to water quality and radon testing. The survey then proceeded to an in-depth examination of the existence of health symptoms commonly linked to wind farm residence. Survey protocol required that respondents were not informed of the wind-related focus of the survey before or during the health-related section of the survey. If asked about the nature of the survey or the survey's sponsoring organization, surveyors used language concerning the overall environmental health of Livingston County, and the "current environmental questions" facing the county.

The survey was administered orally, with questions and answers given in a precise order. This served to prevent respondents' general health answers from being influenced by awareness that wind energy was among the environmental health concerns being surveyed. In Section Two of the survey, respondents answered a series of questions about opinions toward renewable energy. In Section Three, respondents were overtly questioned about their personal experiences with wind energy. This section entailed considerations such as respondents' levels of information about and personal experiences with wind energy. A complete list of survey questions and answers can be found attached as Appendix C.

Survey protocol additionally required that respondents be over eighteen years of age. The respondent did not need to be the head of the household, but did need to be a resident of the household. In some households, more than one respondent answered the survey collaboratively, in which case both respondents' genders were included in the data. For these households, only one survey case is recorded.

General Statistics

Table 1: General Information

	Number of Respondents (n)	Respondent Gender*
Total	74	Male: 37 Female: 40
Exposed	38	Male: 18 Female: 23
Control	36	Male: 19 Female: 17

*For responses given by a couple working together to complete the survey, both male and female respondents are included in the data.

Water Quality

The survey began by asking respondents a series of questions related to their primary source of drinking water. The survey asked what this source was, whether respondents had had it tested (for wells), and with what frequency the source was tested. Sources of drinking water were reported as follows:

Well	Well with Reverse Osmosis	Bottled Water and Well	Bottled Water
64.8%	10.8%	10.8%	13.5%

Nearly all respondents who had used well water had not had their wells tested within the past year. Among those who did have wells tested, respondents commonly had wells tested no more frequently than once every five years.

Radon Testing

According to surveys by the Illinois Emergency Services Disaster Agency and LCEA, Livingston County is at a high risk for elevated radon levels. Previous surveys showed that approximately 75% of area homes tested over the EPA limit of 4.0 picocuries per liter. The survey asked whether respondents had had their homes tested, whether levels of radon were too high, and whether they had done anything to decrease radon levels. Of those surveyed, 71.6% had not had their homes tested for radon, 17.6% had had their homes tested, and 10.8% were unsure or had no response. Of the homes that had been tested, none reported exceeding recommended radon levels. Lack of question specificity or respondents' failure to recall results may have contributed to these responses. Surveyors distributed radon testing-related information upon completion of the survey.

Levels of Respondent Health

Section 1 of the survey focused primarily upon the general health of respondents, especially as related to health symptoms commonly linked with wind farms in other regions. Respondents answered a battery of questions including how frequently, if ever, they had experienced a number of symptoms in the past two years, and also whether or not the symptoms had developed "recently," defined as within the past year. Survey questions used these time spans in an attempt to gauge differing levels of health between the exposed and control groups, especially during the time since the Streator-Cayuga Ridge project became fully operational in March 2010.

The symptoms included in the survey were:

- Headaches
- Heart Palpitations
- Other Heart Problems
- Excessive Tiredness
- Anxiety
- Stress (Chronic or Unusual)
- Hearing Problems
- Sleep Disturbance
- Migraines
- Depression
- Vertigo
- Nausea
- Changes in Menstrual Cycle
- Other Reproductive Problems
- Other

With many of these symptoms, residents most commonly responded that they never or seldom experienced them. However, some discernable patterns occurred for individual symptoms when comparing the exposed and control groups as a whole. These patterns are described below.

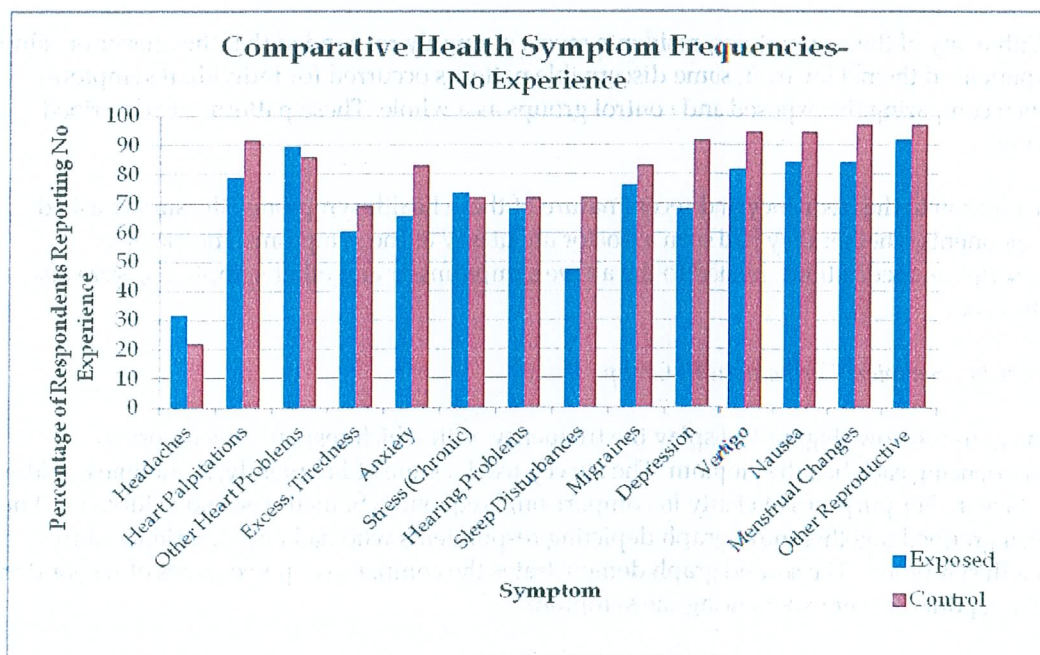
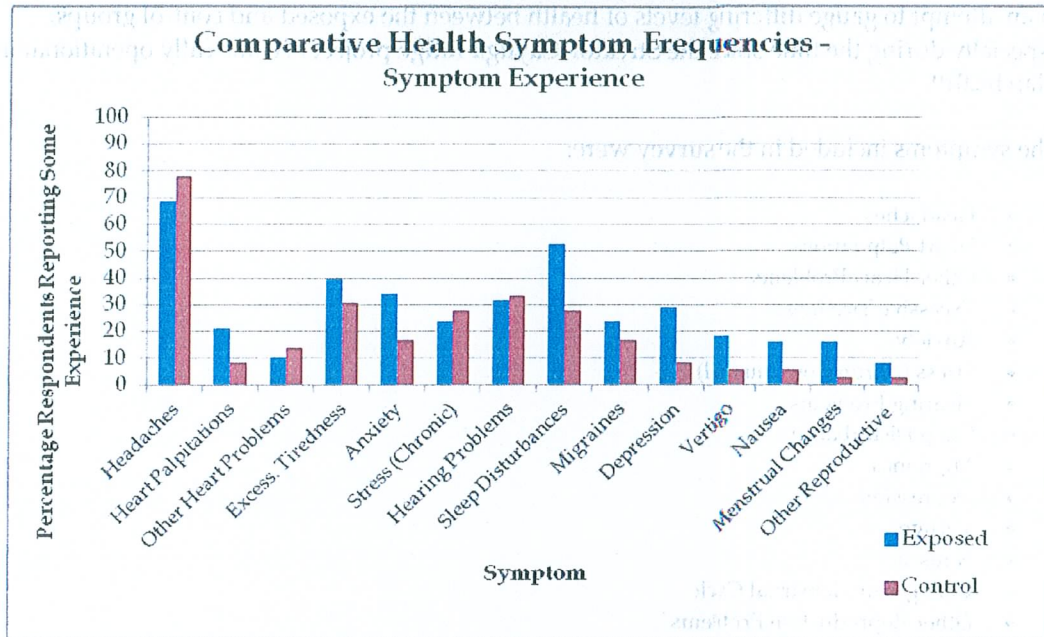
In addition to the frequency and recent nature of these health symptoms, the survey asked respondents whether they had seen a doctor about any of the symptoms. Increases in prescription medications, related to the above symptoms or any other symptoms, were also surveyed.

Individual Symptom Comparisons by Group

The graphs below (Figure 1) display the frequency with which respondents reported experiencing each health symptom. The survey used a scale of Frequently, Sometimes, Seldom, or Never. For purposes of clarity in comparison, Frequently, Sometimes, and Seldom (0-2) have been grouped together into a graph depicting respondents who had any experience of the health symptoms. The second graph demonstrates the comparative percentages of respondents who reported never experiencing the symptom.

Several interesting points of comparison arise. For ten of the fourteen symptoms, the combined frequencies for the exposed group surpassed the frequencies of the same responses in the control group. For eleven of the fourteen symptoms, more control than exposed respondents reported never having experienced the symptom. The control group had higher frequencies of Never for only three symptoms, and only in the case of Headaches was this difference substantial (9.4%).

Figure 1: Groups' Comparative Health Symptom Experiences



To examine the symptoms where a substantial gap existed between the two groups' experiences, this report includes in-depth graphs (Figure 3) for each of eight symptoms where more than a 10% difference existed between the groups' response frequency for any of the possible categories (Frequently, Sometimes, Seldom, Never). For each symptom, these four categories have been depicted, with the two series comparing the same set of information across the exposed and control results.

Figure 2: In-Depth Health Symptom Frequency Analysis

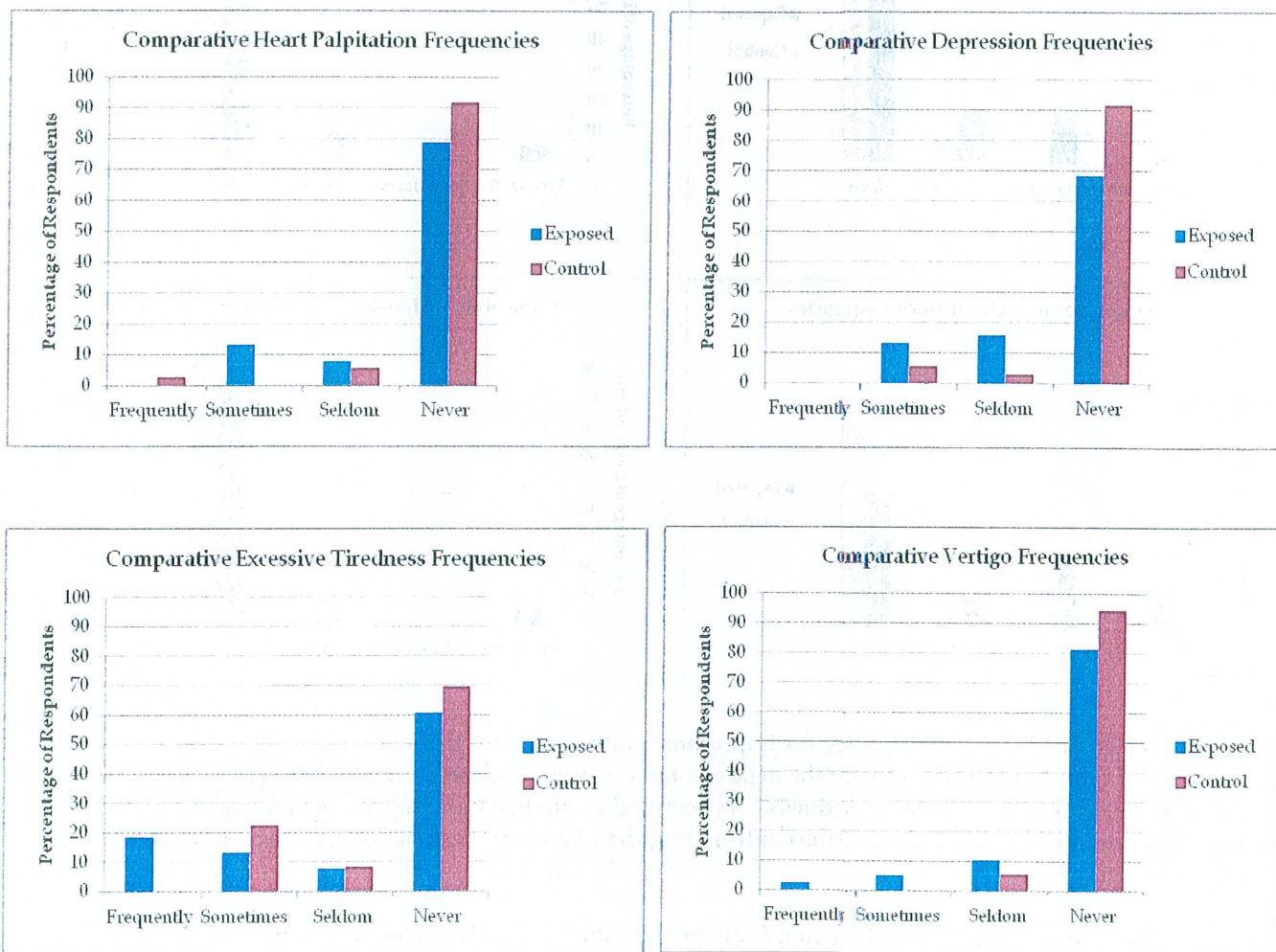
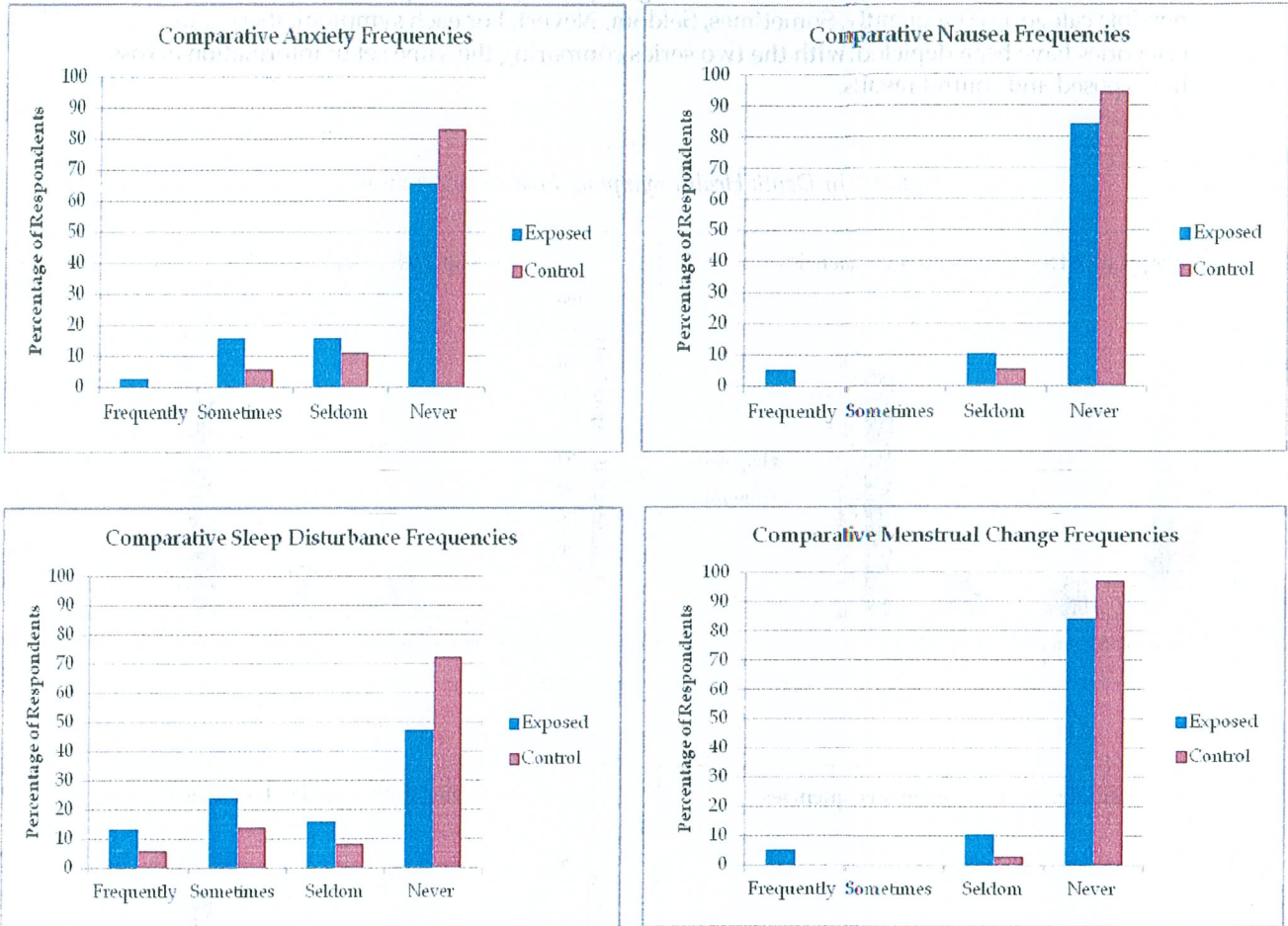


Figure 2: In-Depth Health Symptom Frequency Analysis, Continued



As this series of graphs suggests, for important health symptoms that have been linked with wind farms, disparities between the exposed and control groups exist. In nearly all cases, with the exception of "Excessive Tiredness," the exposed group had more reported experiences of the symptom at each level, and the control group had higher frequencies of never experiencing the symptom.

Due to small sample sizes, these trends are not statistically significant. However, the differences between the two groups indicate a possible impact from the presence of wind farms in the exposed area. Thus, further study is needed to collect enough data to provide statistically significant results.

Other Respondent Health Questions

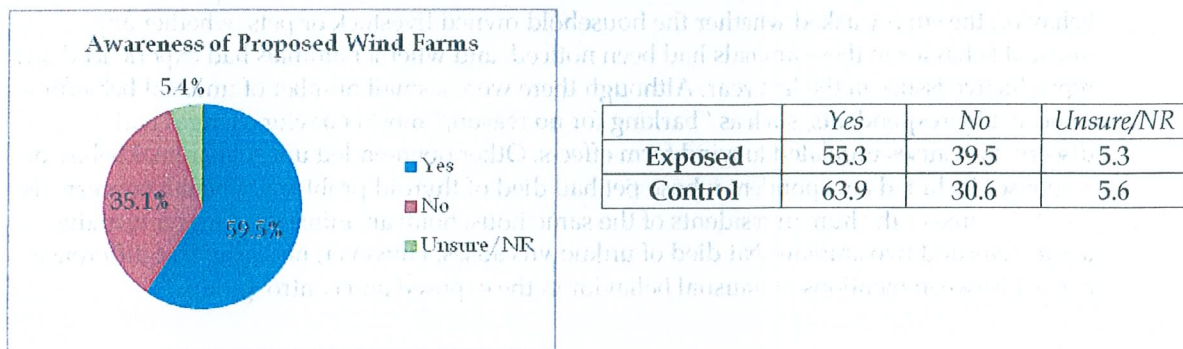
The survey included a portion of the Pittsburgh Sleep Quality Index, to be administered if the respondent noted "Sleep Disturbance" as a health symptom experienced frequently. Few respondents provided responses to this portion of the pilot survey. As an anecdotal note of interest, one respondent explicitly linked sleep disturbances to noise caused by wind turbines. In addition, several respondents mentioned waking in the middle of the night, in spite of no question about this in the survey. Future studies could explicitly ask about this phenomenon.

The survey also included questions regarding any unusual behavior in children or animals within households. Child behavior questions were asked in a series including whether or not children lived in the household, if any changes or unusual behavior had been noted, and if any changes in academic performance had occurred. No unusual behavior was reported. For animal behavior, the survey asked whether the household owned livestock or pets, whether any unusual behavior in these animals had been noticed, and whether animals had experienced any reproductive issues in the last year. Although there were a small number of unusual behaviors indicated by respondents, such as "barking for no reason," most behavior changes had discernable causes unrelated to wind farm effects. Other open-ended unusual animal behavior responses included a respondent whose pet had died of thyroid problems, a health concern also faced by some of the human residents of the same household; an animal that was unusually aggressive; and two animals that died of unknown causes. However, no significant difference existed between mentions of unusual behavior in the exposed and control groups.

Levels of Respondent Information and Awareness

Another aspect of the mission of the LCEA is to promote citizen awareness about the environmental health aspects of issues facing the county. Section Three of the survey accordingly gauged the level of information and awareness held by respondents about wind energy and its relationship to Livingston County. The questions about respondents' personal experiences with wind energy and the corresponding frequencies of aggregate responses have been recorded below. Frequencies (in percentage of respondents) are drawn from the complete sample of the study, and break-downs by control and exposed group have been provided alongside the pie graphs for relevant questions.

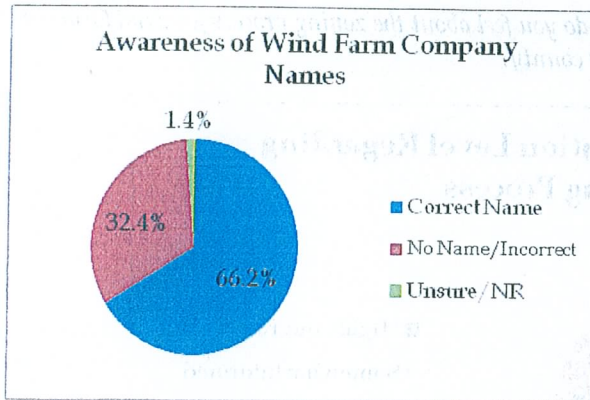
Figure 3: Response Frequencies; "Are you aware of any proposed wind farms in Livingston County?"



For this question, results demonstrated a relationship in reverse of that expected. Although about sixty percent of all respondents were aware of the existence of a proposed wind farm, exposed group respondents were less likely to have this awareness than control group respondents. It seems that respondents interpreted the question to mean wind farms that were proposed but not yet built, explaining why respondents who lived in the midst of a wind farm did not report themselves aware of a proposed farm's existence. However, the expected relationship would still be that respondents whose lives had been directly impacted by a wind farm would have higher levels of awareness. Multiple hypotheses could explain the lower level of awareness about proposed farms among the exposed group. One hypothesis is that the higher awareness of proposed farms in the control group comes from closer geographical proximity to a wind farm project proposed in Minonk, Illinois. Another hypothesis suggests that while exposed respondents already experience any negative effects of wind farms, control respondents do not, and therefore have a greater interest in monitoring whether a wind farm is being proposed in their area. Either of these hypotheses may be a viable explanation for this relationship.

The next question tested respondents' awareness through a proxy measure of whether or not they could name any company that sponsored wind farms in Livingston County. The data are presented below.

Figure 4: Response Frequencies; "Can you tell us the name of a company sponsoring wind farms here in Livingston County?"



	Correct	Incorrect	Unsure/NR
Exposed	57.9	39.5	2.6
Control	5.6	94.4	-

Other questions, such as those presented in Table 2, gauged respondents' levels of information and involvement with the wind farm process. Some of the data indicate a need for further education. For instance, fewer than half of respondents who live in a wind farm area reported being aware of a company phone hotline.

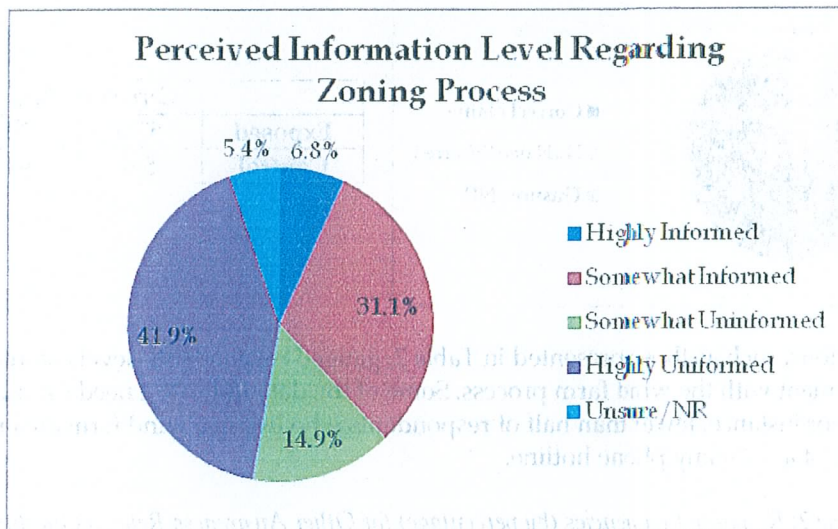
Table 2: Response Frequencies (by percentage) for Other Awareness-Related Questions

Question	Control Group Only			Exposed Group Only		
	Yes	No	Unsure/No Response	Yes	No	Unsure/No Response
Are you aware of the existence of a company phone hotline for the wind farm project?	2.8	97.2	-	47.4	47.4	5.3
Have you ever called this company hotline?	0.0	5.6	94.4	27.7*	66.7	5.6
Have you ever attended an official public hearing or a government-sponsored meeting concerning wind energy in Illinois?	5.6	94.4	-	42.1	55.3	2.6
Have you ever attended a hearing or informational meeting concerning wind energy sponsored by a wind farm company or corporation?	8.3	88.9	2.8	39.5	57.9	2.6

* The responses reported for this question indicate percentages among only those respondents who answered "yes" in the previous related question. For example, among exposed respondents, 27.7% of the 47.4% who answered that they were aware of the hotline's existence had called the hotline, a total of approximately 5% of the entire sample.

More generally, the survey asked respondents in all parts of the county how informed they felt about the zoning process. Results are presented in Figure 5.

Figure 5: Response Frequencies; "How informed do you feel about the zoning process for wind farms in your county?"



A majority of respondents from both areas reported feeling somewhat to highly uninformed about the zoning process. This could indicate a need for more education about the zoning process.

For questions concerning respondents' experiences with the ZBA process for wind farms, this report provides only the exposed group's response rates. The exposed group's responses are reported in Table 3 below.

Table 3: Response Frequencies (by percentage) of Livingston County ZBA-Related Questions

Question	Exposed Group Only		
	Yes	No	Unsure/NR
Were you informed about a Zoning Board of Appeals Hearing that commenced in April of 2008?	52.6	26.3	21.0
Did you attend this hearing or any other wind-related hearings in Livingston County?	26.3	57.9	15.8
Has your opinion about wind farms changed since this occurrence	Yes*	No	Unsure/NR
	10.0	80.0	10.0
Did you testify or ask questions (either in support or opposition to wind energy) at this hearing or another in Livingston County?	Yes*	No	Unsure/NR
	10.0	70.0	20.0
Would you say this action was in support or in opposition of wind farms?	Support**	Opposition	Unsure/NR
	100.0	0.0	0.0

*Response percentages represent the spread of only those respondents who answered "Yes" to the previous related question ("Did you attend this hearing...").

** Response percentages represent the spread of only those respondents who answered "Yes" to the previous related question ("Did you testify..."). Accordingly, though 100% of respondents who attended a meeting and testified did so in support of the wind farms, this represents only 2.6% of the entire exposed group.

Those respondents who did not attend a wind-related hearing were asked about their reason for not attending. Responses have been depicted in Figure 6 below. For those respondents classified as "Other," the residents most commonly referred to being too busy to attend a hearing.

Table 4 reports the exposed group's responses on a number of other questions about their awareness and involvement with the wind farm process in their area.

Figure 6: Response Frequencies; "Since you did not attend a wind-related hearing, what would say was your reason for not doing so?"

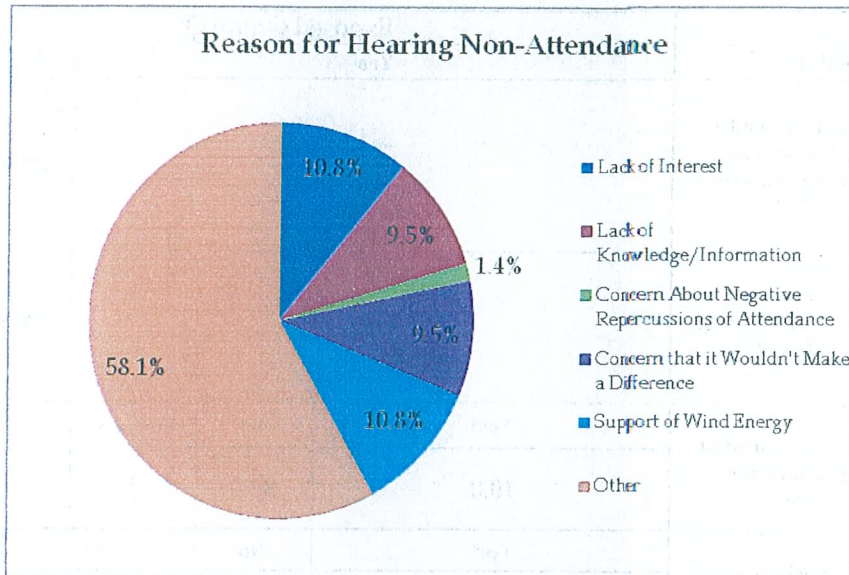


Table 4: Response Frequencies (by percentage) of Other Wind-Related Respondent Actions

Question	Exposed Group Only*			
	Yes	No	Unsure/NR	
Have you lodged a complaint concerning wind farms in any way?	26.3		68.4	2.6
Was the complaint resolved to your satisfaction?	Yes	No	Unsure/NR	
	80.0**	20.0	-	
Have you signed a "Host Agreement," Easement, "Good Neighbor" or any other agreement with a wind farm company?	63.2		28.9	7.9
Are you satisfied with the terms of this agreement and the way you entered the agreement?	Yes	No	Unsure/NR	
	79.2**	8.3	12.5	

* Responses are recorded for the exposed group only, due to lack of wind farm experiences in control group. Unless otherwise noted, all control responses are "No" or "No response."

** Response percentages represent the spread of only those respondents who answered "Yes" to the previous related question ("Did you testify..."). Accordingly, though 80.0 % of respondents who lodged a complaint felt that their complaint was resolved, this represents 21.1% of the entire exposed group.

Respondents also had opportunity to answer open-ended questions concerning the nature and method of wind-related complaints they had lodged. A synopsis of these responses is presented in the open-ended response section on page 27 of this report.

As a whole, residents of Livingston County seem moderately informed about the presence of wind energy in the county. As may be expected, this varied based upon where respondents lived. In nearly every measure of awareness, residents of the exposed group had higher levels of information and awareness than those of the control group or the combined groups. Although this was expected, some respondents still did voice a desire for more information concerning projects that might affect them in the future, particularly within the control group. Even within the exposed group, only 52.6% of respondents were aware of the 2008 Zoning Board of Appeals hearing that had direct impact on the existence of wind farms in their area.

Levels of Respondent Experience with Common Wind Farm Concerns

In other regions, the advent of wind farms has led to a number of citizen concerns regarding wind farm construction and operation. In order to discover the experiences of Livingston County residents with these possible concerns, respondents were asked to identify, on a scale of zero to three, zero being none and three being a great deal, how much experience they had with these potential concerns. Frequencies of these responses are recorded below:

Table 5: Response Frequencies (by percentage) for Common Wind Farm Concerns- All Respondents*

Concern	0	1	2	3
substantial damage to roads as a result of construction	54.1	10.8	9.5	24.3
damage to personal property as a result of construction	75.7	6.8	4.1	12.2
unreasonable construction hours	93.2	1.4	2.7	1.4
proper notice not being provided during construction periods	79.7	6.8	5.4	6.8
negative impact on farmland	56.8	14.9	14.9	12.2
interference with wildlife	77.0	10.8	8.1	2.7
interference with communications	77.0	8.1	5.4	8.1
impact from flickering shadows	75.7	12.2	8.1	2.7
nuisance noise	64.9	10.8	5.4	14.9
detrimental effects on community relationships	78.4	9.5	8.1	2.7
lack of available information about wind farm regulations	67.6	9.5	14.9	6.8
trespassing	90.5	4.1	1.4	2.7
impact on cost and availability of crop dusting	66.2	14.9	8.1	9.5
difficulty in selling residential property**	54.1	8.1	10.8	8.1

* Data do not include "No Response" answers.

** Results for the residential property variable do not represent the full sample size, but have fourteen missing cases, and should be considered in light of this limitation. A large number of respondents indicated residential property values when asked for open-ended "other" concerns, and the question was therefore added mid-way through the survey process.

These figures assist in identifying the common concerns that have been experienced more prevalently in Livingston County. Even with the inclusion of the control group, whose responses, as expected, generally trended toward the lower end of the experience spectrum certain trends surfaced. For instance, "nuisance noise" ranked highest in terms of respondent experience, with 14.9% of respondents rating this a "3." Other responses where residents reported high levels of experience included substantial damage to roads as a result of construction, negative impact on farmland, and impact on cost and availability of crop dusting. Anecdotally, four respondents (nearly 11% of the exposed group) referred to damaged tiling as their experience with negative impact on farmland, a major land quality concern.

Trespassing and unreasonable construction hours were most infrequently reported, with over 90% of respondents saying they had no experience with these concerns. In fact, several respondents expressed favorable attitudes to the construction employees working for the wind farm company.

Percentage of Respondents with No Experience with Concerns

To gauge different groups' overall levels of experience with wind concerns, this analysis examines the percentage of respondents among each group who had experienced none of the wind farm concerns. As expected, the exposed group had substantially fewer respondents who had experienced no impact, with both groups' combined percentage as a comparison.

Table 6: Percentage of Respondents Experiencing No Wind-Related Concerns

Group	Percentage of Respondents with No Experience
Both Groups	24.7%
Exposed Group	18.9%
Control Group	33.3%

Interestingly, even in the control group, two-thirds of respondents reported some sort of experience with wind farm construction and operation concerns. The question wording intentionally allowed respondents to determine what qualified as an "experience" of concern, in order not to influence the comparison by asking for direct and indirect effects in different regions.

To provide more detail, the table below also demonstrates the comparative frequencies of respondents within the different groups who reported having experienced some concern. Table 7 lists each concern, coupled with the percentage of respondents who reported no experience with the concern (0) versus those who report some experience with the concern (1-3).

Table 7: Response Frequencies (by percentage) for Common Wind Farm Concerns- By Group*

Concern	Control		Exposed	
	0	1-3	0	1-3
substantial damage to roads as a result of construction	75.0	25.0	34.2	63.2
damage to personal property as a result of construction	86.1	13.9	65.8	31.6
unreasonable construction hours	94.4	5.6	92.1	5.3
proper notice not being provided during construction periods	94.4	5.6	65.8	31.6
negative impact on farmland	52.8	47.2	60.5	36.8
interference with wildlife	80.6	19.4	73.7	23.7
interference with communications	86.1	13.9	64.8	28.9
impact from flickering shadows	86.1	13.9	65.8	31.6
nuisance noise	80.6	16.7	50.0	47.4
detrimental effects on community relationships	66.7	33.3	89.5	7.9
lack of available information about wind farm regulations	72.2	27.8	63.2	34.2
trespassing	94.4	5.6	86.8	10.5
impact on cost and availability of crop dusting	58.3	41.7	73.7	23.7
difficulty in selling residential property**	63.9	36.1	47.7 (70.8)	18.4 (29.2)

* Data do not include "No Response" answers.

** Results for the residential property variable do not represent the full sample size, but have fourteen missing cases, and should be considered in light of this limitation. A large number of respondents indicated residential property values when asked for open-ended "other" concerns, and the question was therefore added mid-way through the survey process. The spread of responses among only those cases where a response occurred has been provided in parentheses.

These responses demonstrate, in a similar fashion to the other data in this section, that respondents within the wind farm area experienced concerns more frequently. This would be the expected relationship between the exposed and control groups. In particular, respondents in

the exposed group had more instances of experience with construction concerns and physical effects of the wind farms, such as nuisance noise or shadow impact.

For “negative impact on farmland,” “detrimental effects on community relationships,” and “impact on cost and availability of crop dusting,” the exposed respondents reported less experience than the control respondents. This trend is the opposite of that expected. One possible explanation is that these items might be popularly anticipated as concerns that would accompany wind farm construction, yet might not actually be problems as much as they are purported to be. The control group might be forecasting indirect concerns with these responses, anticipating problems that they would expect to experience or have heard about. The exposed group, in contrast, has actual experience with the effects of turbines on these factors. Perhaps in their actual experience, fewer concerns developed than were anticipated. More likely, the control group interpreted the question broadly to include third-party reports of complaints, rather than first-hand experiences of the various concerns. The results suggest that the question needs to be clarified as applying only to the individual’s personal experience.

Reported Concern Experience and Respondent Participation in Wind Farm Project

This portion of the study examines the relationship between reported experience of wind farm concerns and respondents’ participation in the wind farm project. To measure participation, this study uses the variable of whether or not respondents reported having signed any sort of contract (“Good Neighbor Agreement, Easement, or any other contract”) with a wind farm company. Those who signed an agreement would hypothetically be more likely to report no experience with concerns, either because of their appreciation of the financial gains they have experienced, better treatment of participants by the wind farm company, their support of the wind farm, or because of a contractual obligation to support wind farms. The relationship between the variables was as expected, with a higher percentage of participants reporting no concern experiences than the exposed group as a whole. Results for the exposed group as a whole, for participants only, and for non-participants (in the exposed group) only have been reported below:

Table 8: Response Frequencies (by percentage); Wind Concern Experiences Among Project Participants

Concern	Percentage of Respondents with No Concern Experience		
	Among All Exposed Respondents	Among Participants Only	Among Non-Participants Only
substantial damage to roads as a result of construction	34.2	37.5	54.2
damage to personal property as a result of construction	65.8	75.0	70.8
unreasonable construction hours	92.1	91.7	91.7
proper notice not being provided during construction periods	65.8	70.8	79.2
negative impact on farmland	60.5	70.8	45.8
interference with wildlife	73.7	83.3	79.2
interference with communications	64.8	75.0	75.0
impact from flickering shadows	65.8	62.5	83.3
nuisance noise	50.0	58.3	66.7
detrimental effects on community relationships	89.5	95.8	79.2
lack of available information about wind farm regulations	63.2	83.3	54.2
trespassing	86.8	95.8	87.5
impact on cost and availability of crop dusting	73.7	79.2	62.5

These findings indicate that, especially in their perception of the impact on farmland, self-reported project participants differ greatly in their concerns from the whole pool of residents of the wind farm. As Table 8 suggests, for some concerns, higher percentages of participants (those receiving some type of payment from the wind farm company) reported no negative experiences, whereas for others, non-participants had higher rates of unconcern. More non-participants reported experiencing some concern on questions related to personal property damage, negative impact on farmland, wildlife, community relationships, lack of available information, and crop dusting impacts. In contrast, on questions directly relevant to turbines on property, more participants reported experience with concerns, such as road damage, nuisance noise, flickering shadows, and lack of proper notice during construction.

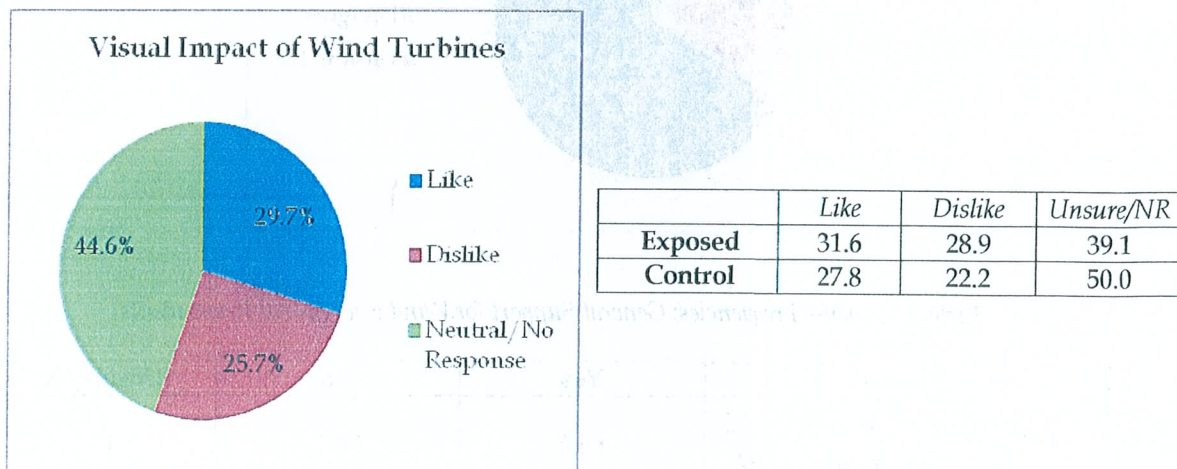
On questions where more non-participants reported concern experience, perhaps non-participants are less informed, feel victimized by concerns they experience, or have had fewer

opportunities to voice opinions. Alternatively, due to vagueness in the question wording, participants and non-participants may have interpreted the question differently, with some reporting direct experiences and others reporting second-hand experiences or concerns. For questions in which more participants reported concern experience, the unexpected relationships can perhaps be explained by the more common presence of wind turbines directly on their land. These findings represent a point of interest in the study, but more precise measurement of experiences would be necessary to fully understand the differences in how participants and non-participants perceive and experience wind farms.

Visual Impact

The survey asked respondents about their sentiments toward wind turbines' visual impact in a separate survey item. Respondents were asked if they liked, disliked, or were neutral toward the turbines. Responses varied quite a bit, with no discernable pattern of difference between control and exposed respondents regarding the aesthetic qualities of the turbines. In both groups, some found the turbines soothing, while others found them disruptive. At the time the survey was conducted, no areas of the control group had wind turbines within their household's line of sight. Control group residents were nevertheless aware of the aesthetic qualities of wind turbines from observing other areas in the county.

Figure 7: Response Frequencies; Attitudes Toward Wind Farm Aesthetics- All Respondents



Level of Respondent Support for Wind Turbines

This survey also attempted, in Section Two, to measure respondents' general opinions about renewable energy and environmental issues.

One indicator of opinion toward renewable energy used in other renewable energy surveys is respondents' perception about the possible link between global warming and human activity: Respondents were asked to agree, disagree, or remain neutral toward the statement "Human activity has a major impact on global warming." The results of this question and other opinion-related questions have been displayed in the following graphs and tables:

Figure 8: Response Frequencies; "Human activity has a major impact on global warming."

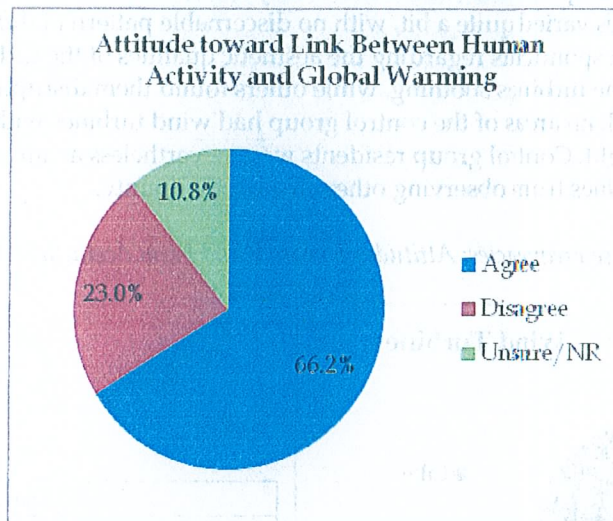
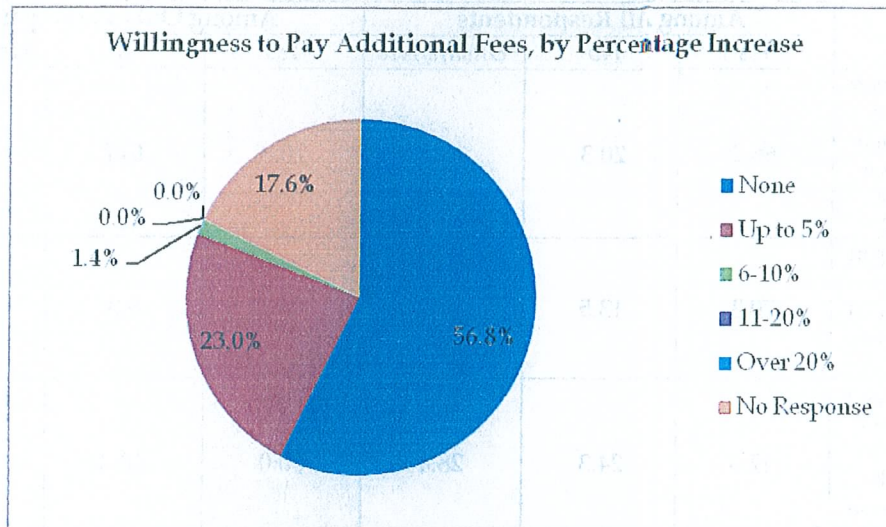


Table 9: Response Frequencies; General Support for Wind Energy- All Respondents

Question	Yes	No	Unsure/NR
Do you support the further development of wind farms in Livingston County?	66.2	20.3	13.5
Do you support the further development of wind farms in Illinois?	70.3	13.5	16.2
Do you support tax breaks or incentives to assist the development of wind energy?	47.3	24.3	28.4
Do you support building more high voltage transmission lines to accommodate wind energy production?	51.4	27.0	21.6

Figure 9: Response Frequencies; "How much, if any, would you be willing to pay in additional fees for the use of wind energy?"



As evidenced by responses in Section Two, moderately high support for renewable energy theoretically exists in Livingston County. Interestingly, exposed group responses were similar in support levels to those of the control group. Some respondents noted that "it didn't make a difference," but others favored continued development of wind energy.

However, very few respondents expressed willingness to pay additional fees for the use of energy. An overwhelming number responded that they would not want to pay any additional fees. Many commented that wind energy should be cheaper for those who host wind farms.

Wind Support and Respondent Participation in Wind Farm Project

Another correlation examined by this study was the relationship between respondents' support of wind farms, in terms of the measures listed above, and their current participation in the wind farm project. To measure participation, this study uses the variable of whether or not respondents reported having signed any sort of contract ("Good Neighbor Agreement, Easement, or any other contract") with a wind farm company. The correlation between the participation variable and a number or measures of wind farm support have been reported in Table 10 below:

Table 10: Response Frequencies (by percentage); Wind Support Questions Among Project Participants

	Among All Respondents				Among Only Participants			
	Yes	No	Unsure/NR		Yes	No	Unsure/NR	
Do you support the further development of wind farms in Livingston County?	66.2	20.3	13.5		70.8	16.7	12.5	
Do you support the further development of wind farms in Illinois?	70.3	13.5	16.2		83.3	8.3	8.3	
Do you support tax breaks or incentives to assist in the development of wind energy?	47.3	24.3	28.4		50.0	20.8	29.2	
Do you support building more high voltage transmission lines to accommodate wind energy production?	51.4	27.0	21.6		58.3	16.6	25.0	
	None	Up to 5%	6-10%*	Unsure/NR	None	Up to 5%	6-10%	Unsure/NR
How much, if any, would you be willing to pay in additional fees for the use of wind energy?	56.8	23.0	1.4	17.6	62.5	16.7	4.2	12.5

*All other categories received zero responses.

These results demonstrate that support for the wind farm project is higher among those who have entered an agreement with a wind farm company or corporation, in each of the measures shown. The question where participants' responses differed least from those of the entire pool of respondents dealt with tax breaks and incentives, which are generally matters of more controversial or nuanced opinion. As a whole, though, the group made up only of participants (those who have signed contracts), expressed higher levels of support than the pool of respondents at large.

Open-Ended Responses and Anecdotal Evidence

To enrich the quality of the survey report, at several points in the survey respondents had opportunity to provide open-ended responses. The first of these questions came as an introduction to the survey, where respondents were asked what they felt was the biggest environmental problem currently facing Livingston County before responses could be influenced by hearing other survey questions. Although the question was open-ended, all responses fell into one of six categories, which have been reported with frequencies in Table 11. If respondents listed more than one problem, both have been taken into account.

Table 11: Open-Ended Response Frequencies; Biggest Environmental Problem Facing Livingston County

Problem	Percentage of Respondents
Landfill	24.3%
Poor Water Quality	20.3%
Agricultural Chemical Contamination	20.3%
Wind Farms	12.2%
Littering/General Pollution	4.1%
Other	2.7%

Wind-related Complaints Lodged by Respondents

The next open-ended section of the survey concerned wind-related complaints lodged by respondents. Most respondents who had lodged complaints indicated that their method of complaint was either a phone call or an in-person visit. All open-ended responses have been paraphrased in this report for respondent privacy. Matters of concern in these complaints included the following:

- concern about potential interference with a pacemaker
- road damage
- truck fumes during construction
- crop damage
- digging on property
- a mismarked pre-construction location for a wind turbine
- noise
- the placement of phone lines on a respondent's property

All respondents indicated that complaints had been resolved, with the exceptions of one respondent who expressed concern about digging on property and one respondent who expressed concern with nuisance noise.

Concerns to Communicate to the County Zoning Board of Appeals

The next open-ended section questioned respondents concerning what, if anything, they would inform the County's ZBA regarding the wind farm hearing process. The most common responses indicated that respondents would like more information throughout the decision-making and construction process for wind farms. Other suggestions and comments included:

- one-on-one conversations needed with all property owners in the area
- insufficient setback distances from turbines to roads and homes
- tiling not repaired properly, drainage in fields damaged
- concern about long-term maintenance and cost-effectiveness
- concern that wind farms are an eyesore, and had better be "worth it"

Some respondents, however, voiced that they thought the process was fair, thorough and understandable. One suggested that the process ought to be sped up. Respondents had positive comments about the construction company being courteous, and also noted that roads seem to them to have improved after being redone.

In the control group, several respondents voiced that they did not want wind farms in their area, although they were fine with them elsewhere. Some respondents expressed concern that wind farms would not be well-maintained continually over time, whereas another simply said "Stop."

Visual Aspect of Turbines

For a more detailed account of resident impressions of the aesthetic qualities of wind turbines, respondents received an opportunity to name specific aspects of the visual impact of wind turbines that caused them to like or dislike them. The most common reason for disliking the visual impact of wind turbines was their disruption of the horizon. Respondents expressed mixed feelings about the red lights associated with turbines at night. Some respondents voiced feeling "surrounded," said the turbines were fine "at a distance," and that they were a "necessary evil." On the other hand, several respondents found the turbines "modern looking," interesting to watch, informative about wind direction, and "relaxing."

Other Concerns

At the end of the survey questionnaire, respondents were invited to express any other concerns, wind-related or otherwise, in an open-ended response section.

Those responses related to wind energy entailed the following:

- concern about the danger turbines pose should a tornado come through the area
- an anecdote about a wind construction worker who received a poisonous bite by a non-indigenous snake that had seemingly been transported to the area within a wind turbine part
- desire for more information

- request for informative open houses provided by the wind farm company
- frustration with a misunderstanding of payment structures for wind-related agreements
- small farmers have little say in the wind process
- frustration that the wind energy was not being kept for use in the area,
- wanting to “keep wind energy where it’s produced”
- questions concerning the cost effectiveness of wind energy
- the wind farm company employees were polite and respectful

Among respondents, there seemed to be general support for attempting to find renewable energy sources. These comments were as follows:

- support for use of solar panels
- desire for readily accessible information on private wind turbines for individual property
- geothermal energy is a viable and beneficial energy source

Other miscellaneous concerns noted by respondents were unrelated to wind energy. These included:

- several mentions of cancer problems in the area
- transmission lines and water quality cited in relation to cancer
- support for crop dusters in the area
- concern about the number of abandoned houses in the area; suggestion of the creation of an official record of foundations poured in the region
- food quality
- water quality
- chemical contamination
- poor housing conditions
- standing water
- concern about “fracking,” a natural gas- related process.
- detrimental effects of hog farms in the area
- landfill and its potential effects on water quality.

Conclusions

Since few studies about health effects of wind farms in America exist, this pilot study represents an important building block in a little-studied but very significant field. The results of the survey in Livingston County were mixed, with some respondents favoring wind energy and experiencing few health effects, and others the inverse. However, these findings have substantial limitations because of small sample sizes.

Most significantly, health symptom disparities between exposed and control groups merit further consideration. If these results are replicated in other regions, this study might be strengthened in validity and substantive significance.

Many of the survey's results demonstrated expected relationships. For instance, higher levels of experience with common wind farm concerns occurred within the exposed group than in the control group. However, in some cases, these relationships went in the opposite direction of that expected, perhaps due to different groups' perception of the question being asked. Depending upon the measure, these pilot data suggest that approximately three-quarters of respondents have some experience with concerns. These data also suggest, though, that a majority of respondents tend to support wind energy, with higher percentages of support among those who are wind farm project participants. Future survey research can add important numerical support to some of the anecdotal evidence currently developing around wind energy.

These data suggest an important concern regarding residents' level of information regarding the impact of wind energy in their region. Many respondents demonstrated a lack of information or a desire to know more. The results suggest that residents would benefit from additional educational resources.

Recommendations for Future Research

Future research could be strengthened by including more demographic controls, such as levels of income and education. Since these factors were not emphasized in the pilot study, the survey did not include detailed demographic questions. Another beneficial change to the survey instrument would clarify the time ranges for health symptom experience questions. It is further recommended that questions regarding concern experience be revised as limited to direct personal experience. More precise health variables and more interval-level variables may also be beneficial in statistical analysis. In future studies, surveyors should ask questions by individual rather than household, in order to achieve greater specificity and more responses.

These survey results can be compiled with other regions' data to accumulate a substantial body of information on the relatively new phenomenon of wind energy. Future studies may benefit from an increased sample size, particularly if they have fewer logistical restraints on research.

The LCEA exists to promote environmental health of all varieties, including physical health and quality of life of the county's residents. By taking the initial step of gathering information about wind energy in Livingston County, this survey lays the groundwork for better policy-making in the future.

Appendix C: Survey Questionnaire

1.1 In a few words, what would you say is currently the biggest environmental problem facing Livingston County?

1.2 First off, how long have you lived in this place of residence? _____

1.3 Are you the tenant of the home, the owner, a family member of the owner, or other?

Tenant (0)	Owner (1)	Family (2)	Other (3)
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1.4 We were wondering what you use as your main source for drinking water.

1.5 Have you had this source tested for overall safety and water purity?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

1.6 (If 1.3=0) With what frequency do you test this source?

Monthly (0)	Annually (1)	Less than Annually (2)
-------------	--------------	------------------------

1.7 Another concern faced by many Illinois Counties is the presence of radon in our homes. Have you had your home tested for radon? *If asked, surveyor may inform respondent that radon is a radioactive gas linked with lung cancer.*

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

1.8 (If 1.7=0) Were the levels of radon too high? (above 4pCi/L)

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

1.9 (If 1.8=0) Did you do anything to reduce radon exposure in your home?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

1.10 I'm going to read you a list of individual health concerns and symptoms. Let me know whether or not you or a member of your household has experienced these problems in the past one to two years, on a scale including Frequently, Sometimes, Seldom, or Never. If at any time you'd like to skip any of these questions, just let us know.

Symptom	Frequently (0)	Sometimes (1)	Seldom (2)	Never (3)	Recent (0=Y)
a. Headaches					
b. Heart Palpitations					
c. Other Heart Problems					
d. Excessive Tiredness					
e. Anxiety					
f. Stress (Chronic/Unusual)					
g. Hearing Problems					
h. Sleep Disturbance					
i. Migraines					
j. Depression					
k. Vertigo					
l. Nausea					
m. Changes in menstrual cycle					
n. Other reproductive problems					

o. Other:

1.11 Have any of these symptoms developed within the past year?

1.12 Have you or anyone in your household approached a doctor about any of these symptoms?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

1.13 Have you or anyone in your household had an increase in prescription medications over the past year related to any of these symptoms?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

1.14 Have you or anyone in your household had an increase in prescription medications over the past year related to any other medical symptoms?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

1.15 Thank you for those responses. I'm now going to move on to a few questions related to the quality of your sleep over the past six months. (*Pittsburgh Sleep Quality Index- asked only if respondent notes Sleep Disturbances*)

a. During the past six months, how long (in minutes) has it usually taken you to fall asleep each night?

Minutes _____

b. During the past six months, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.) Hours _____

c. During the past six months, how often have you had trouble sleeping because you cannot get to sleep within 30 minutes?

Not during the past six months (0)	Less than once a week (1)
Once a week (2)	Three or more times a week (3)

d. Do you or does anyone in your household take OTC or prescription sleep aids?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

1.16 Thank you. Next, do any children live in this household?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

1.17 a. (If 1.16 = 0) In the past year, have you noticed any unusual or changed behavior in your children?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

b. Would you be willing to describe this behavior?

1.18 In the past year, have you noticed any major changes in your children's academic performance?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

1.19 I have a couple questions concerning the health of our county's animal life as well. Do you own any livestock or pets?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

1.20 In the past year, have you noticed any unusual behavior in your animals?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

1.21 Could you briefly describe this behavior?

1.22 Have any of your livestock or pets had reproductive issues in the past year (for example, miscarriages, stillbirths, etc.)?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

Section 2: Now we're going to ask you a few questions about your sense of environmental health in our county and nation at large.

2.1 Do you agree or disagree with (or remain neutral toward) the following statement:

Human activity has a major impact on global warming.

Agree (0)	Disagree (1)	Unsure/NR (2)
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2.2 Do you support ...

	Yes (0)	No (1)	Unsure/NR(2)
a. Further development of wind farms in Livingston County?			
b. Further development of wind farms in Illinois?			
c. Tax breaks or incentives to assist the development of wind energy?			
d. Building more high voltage transmission lines to accommodate wind energy production?			

2.3 How much, if any, would you be willing to pay in additional fees for the use of wind energy?

None (0)	Up to 5% (1)	6-10% (1)	11-20% (2)	Over 20% (3)
----------	--------------	-----------	------------	--------------

Section 3: We have just a few more questions regarding your personal experiences with the environment and renewable energy.

3.1 Are you aware of any proposed wind farms in Livingston County?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

3.2 Can you tell us the name of a company sponsoring wind farms here in Livingston County?

Name: _____

3.3 Are you aware of the existence of a company hotline for the wind farm project?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

3.4 Have you ever called this company hotline?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

3.5 Have you ever attended an official public hearing or a government-sponsored meeting concerning wind energy in Illinois?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

3.6 Have you ever attended a hearing or informational meeting concerning wind energy sponsored by a wind farm company or corporation?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

3.7 a. Have you lodged a complaint concerning wind farms in any way?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

b. Method of Complaint: _____

c. Nature of Complaint: _____

d. Was the complaint resolved to your satisfaction?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

3.8 Have you signed a "Host Agreement," Easement, "Good Neighbor" or any other agreement with a wind farm company?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

3.9 (If 3.8=0) Are you satisfied with the terms of this agreement and the way you entered the agreement?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

3.10 How informed do you feel about the zoning process for wind farms in your county?

Highly informed (0)	Somewhat Informed (1)	Somewhat uninformed (2)	Highly uninformed (3)	Unsure/ No Response (4)
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3.11 Were you informed about a Zoning Board of Appeals Hearing that commenced in April of 2008?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

3.12 Did you attend this hearing or any other wind-related hearings in Livingston County?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

3.13 (If 3.12=0) Did you testify or ask questions (either in support or opposition to wind energy) at this hearing or another in Livingston County?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

3.14 (If 3.13=0) Would you say this action was in support or in opposition of wind farms?

Support (0)	Opposition (1)	Unsure/NR (2)
-------------	----------------	---------------

3.15 Has your opinion about wind farms changed since this occurrence?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

3.16 (If 3.12=1) Since you did not attend a wind-related hearing, what would say was your reason for not doing so?

Lack of Interest (0)	Lack of Knowledge/ Information (1)	Concern About Negative Repercussions of Attendance (2)	Concern that it Wouldn't Make A Difference (3)	Support of Wind Energy (4)
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Other (5) Describe: _____

3.17 If you could inform the county's ZBA of anything concerning the wind farm hearing process, what would it be?

3.18 What is your impression of the visual impact of the wind turbines?

Like (0)	Dislike (1)	Unsure/NR (2)
----------	-------------	---------------

What aspect of the turbines in particular gives you this impression? _____

3.19 Next, I'm going to list a couple of potential concerns about wind farm construction and operation. On a scale of zero to three, zero being none, how much experience do you or a member of your household have with these potential concerns?

	0	1	2	3
a. substantial damage to roads as a result of construction				
b. damage to personal property as a result of construction				
c. unreasonable construction hours				
d. proper notice not provided during construction periods				
e. negative impact on farmland				
f. interference with wildlife				
g. interference with communications (radio, etc.)				
h. impact from flickering shadows				
i. nuisance noise				
j. detrimental effects on community relationships				
k. lack of available information about wind farm regulations				
l. trespassing				
m. impact on cost and availability of crop dusting				

n. difficulty in selling residential property				
---	--	--	--	--

o. other: _____

Demographics: Finally, we have a few questions about demographics with your survey. Remember, these surveys will not be connected with your name in any way.

Age Range of Youngest Member of Household:

Under 15 (0)	16-25 (1)	26-40 (2)	41-55 (3)	56-70 (4)	Above 70 (5)
--------------	-----------	-----------	-----------	-----------	--------------

Age Range of Oldest Member of Household:

Under 15 (0)	16-25 (1)	26-40 (2)	41-55 (3)	56-70 (4)	Above 70 (5)
--------------	-----------	-----------	-----------	-----------	--------------

Gender:

Male (0)	Female (1)
----------	------------

How many people live at your place of residence? _____

Open-Ended: Before we finish up, do you have any other concerns about the environmental health of Livingston County that you'd like to share with us?

Observations:

Does house description match that provided on assessor's listing?

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

Distance to nearest wind turbine from house: _____

Observable presence of metal sheds/barns for livestock:

Yes (0)	Yes, but no Livestock (1)	No (2)	Unsure/NR (3)
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Proximity of other Industrial Intrusion (railway, highway, etc.):

Yes (0)	No (1)	Unsure/NR (2)
---------	--------	---------------

Other Observations:

Appendix D: Standardized Survey Instrument

In order to facilitate future research, Appendix D provides a standardized instrument that incorporates suggested changes based on the pilot project. A standardized data reporting form is also available for groups' future use.

Revised Survey Questionnaire (11.1.11)

Protocol:

- Attempt survey for entire population (or randomized sample) of residents within wind farm perimeter.
- Control group sample should be an equivalent number of respondents, randomly selected from nearby area, similar in geography but without exposure to wind farms.
- Control and exposed group survey should be administered in the same fashion, and during a limited time span.
- If respondent is not home, two retries should be attempted.
- Include as respondents: adults (18 year or older), not children, not those with cognitive disabilities. Respondent need not be "head" of household, but must live on property in question.
- For households with more than one adult, all adult residents can be surveyed as individual respondents, but should not be present for the administration of the survey to another respondent before or during the completion of their own survey. If only one adult respondent is willing to take the survey, he/she should answer for his/herself personally, not for all members of the household.
- Every respondent MUST fill out the permission/consent form.
- Surveyors may give their own first and last name/position if asked.
- Surveyors should administer the survey with a polite tone, and respondents should be informed of their freedom to skip any questions or terminate the survey at any time if they should so choose.
- Do NOT suggest that the survey is wind-oriented before administering Section 1 of the survey.

Preliminary Dialogue:

Begin survey by informing respondents of organization and general goals of survey project. Do not refer to wind energy specifically before administering Section 1 of the survey. Sample language, used in the pilot project (Summer 2011) is presented below:

Hi, we're with the Livingston County Environmental Association, which is a non-profit, non-governmental environmental advocacy group. We've put together a brief survey on environmental health in our county. Would you have about fifteen minutes to chat with us about some of the environmental issues facing this area? Survey responses will be maintained separately from identifiable information about respondents. The survey will be used for informational purposes only, as a guide to assist our policy-makers in protecting the health and welfare of the County.

If respondent refuses to take part in the survey, ask the following:

Respondent ID: _____

Would there be a better time for us to return?

Time: _____

If concerns exist regarding the exposed groups' inability to respond to the survey for legal reasons related to wind farm participation, surveyors may include the following question:

Would you mind telling us why you would not like to participate in the survey? Is this a matter of preference, or are you legally unable to do so for any reason?

Preference (0)	Legal (1)	Other (2)
----------------	-----------	-----------

****Before beginning the survey, surveyor should also administer a consent form to the respondent. A sample consent form is included as an appendix to this study.**

Consent Form Administered: _____

Respondent ID: _____

Primary Surveyor ID: _____

Section 1: As we mentioned, we're hoping to touch upon a couple of different environmental issues in _____ County.

1.1 In a few words, what would you say is currently the biggest environmental problem facing _____ County? *Keep this question short, and try to prevent respondents from giving too much detail or multiple responses.*

1.5 How long have you lived in this place of residence? _____ years

1.6 Are you the tenant of the home, the owner, a family member of the owner, or other?

Tenant (0)	Owner (1)	Family (2)	Other (3)
------------	-----------	------------	-----------

1.7 What do you use as your main source for drinking water?

1.8 Have you had this source tested for overall safety and water purity?

No (-1)	Unsure (0)	Yes (1)	NR/System Missing (9)
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1.7 (If 1.3=0) With what frequency do you test this source?

Monthly (0)	Annually (1)	About once every 5 years (2)	Less than once every 5 years (3)
-------------	--------------	------------------------------	----------------------------------

1.7 Have you had your home tested for radon? *If asked, surveyor may inform respondent that radon is a radioactive gas linked with lung cancer*

No (-1)	Unsure (0)	Yes (1)	NR/SM (9)
---------	------------	---------	-----------

1.8 Were the levels of radon too high (above 4pCi/L)? If 1.7=-1 or 0, skip question and record as NR/SM (9).

No (-1)	Unsure (0)	Yes (1)	NR/SM (9)
---------	------------	---------	-----------

1.9 Did you do anything to reduce radon exposure in your home?)? If 1.7 or 1.8=-1 or 0, skip question and record as NR/SM (9).

No (-1)	Unsure (0)	Yes (1)	NR/SM (9)
---------	------------	---------	-----------

1.10 I'm going to read you a list of individual health concerns and symptoms. Let me know whether or not you as an individual have personally experienced these problems in the past one to two years, on a scale including Frequently, Sometimes, Seldom, or Never. If at any time you'd like to skip any of these questions, just let us know.

Symptom	Frequently (3)	Sometimes (2)	Seldom (1)	Never (0)	Recent (1=Y)
a. Headaches					
b. Heart Palpitations					
c. Other Heart Problems					
d. Excessive Tiredness					
e. Anxiety					
f. Stress (Chronic/Unusual)					
g. Hearing Problems					
h. Sleep Disturbance					
i. Migraines					
j. Depression					
k. Vertigo					
l. Nausea					
m. Changes in menstrual cycle					
n. Other reproductive problems					
o. Seizures					

p. Other: _____

1.11 Have any of these symptoms been experienced within the past _____? Time frame provided should match the span of time since the construction of the wind farm project. (Surveyor should inquire which symptoms are new, and check "Recent" space above.)

1.12 Have you approached a doctor about any of these symptoms?

No (-1)	Unsure (0)	Yes (1)	NR/SM (9)
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1.13 Have you had an increase in prescription medications over the past year related to any of these symptoms?

No (-1)	Unsure (0)	Yes (1)	NR/SM (9)
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1.14 Have you had an increase in prescription medications over the past year related to any other medical symptoms?

No (-1)	Unsure (0)	Yes (1)	NR/SM (9)
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1.15 Thank you for those responses. I'm now going to move on to a few questions related to the quality of your sleep over the past year. (Questions derived from the Pittsburgh Sleep Quality Index)

a. During the past year, how long (in minutes) has it usually taken you to fall asleep each night?

Minutes: _____ (Code as number of minutes)

b. During the past year, how many hours of actual sleep did you get at night on average? (This may be different than the number of hours you spent in bed.) Hours: _____ (Code as number of hours)

c. During the past year, how often have you had trouble sleeping because you cannot get to sleep within 30 minutes?

Never (0)	A few times a month (1)
Once a week (2)	Several times a week (3)
Unsure(4)	NR/SM (9)

d. During the past year, how often have you awakened in the middle of the night?

Never (0)	A few times a month (1)
Once a week (2)	Several times a week (3)
Unsure(4)	NR/SM (9)

d. Do you take OTC or prescription sleep aids?

No (-1)	Unsure (0)	Yes (1)	NR/SM (9)
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1.16 Thank you. Next, do any children live in this household?

No (-1)	Unsure (0)	Yes (1)	NR/SM (9)
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1.17 a.) In the past year, have you noticed any unusual or changed behavior in Child 1, Child 2, etc. (repeat series of questions for each individual child)? If 1.16 = -1 or 0, skip question and record as NR/SM (9).

No (-1)	Unsure (0)	Yes (1)	NR/SM (9)
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b. Would you be willing to describe this behavior? _____

1.18 In the past year, have you noticed any major changes in Child ___'s academic performance? *If 1.16 = -1 or 0, skip question and record as NR/SM (9).*

No (-1)	Unsure (0)	Yes (1)	NR/SM (9)
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1.19 I have a couple questions concerning the health of our county's animal life as well. Do you own any livestock or pets?

No (-1)	Unsure (0)	Yes (1)	NR/SM (9)
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1.20 In the past year, have you noticed any unusual behavior in your animals? *If 1.19 = -1 or 0, skip question and record as NR/SM (9).*

No (-1)	Unsure (0)	Yes (1)	NR/SM (9)
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1.21 Could you briefly describe this behavior?

1.22 Have any of your livestock or pets had reproductive issues in the past year (for example, miscarriages, stillbirths, etc.)? *If 1.19 = -1 or 0, skip question and record as NR/SM (9).*

No (-1)	Unsure (0)	Yes (1)	NR/SM (9)
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Section 2: Now we're going to ask you a few questions about your sense of environmental health in our county and nation at large.

2.1 Do you agree or disagree with (or remain neutral toward) the following statement:

Human activity has a major impact on global warming.

Strongly Agree (-2)	Agree (-1)	Unsure/ Neutral (0)	Disagree (1)	Strongly Disagree (2)	NR/SM (9)
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2.2 Do you support ...

	Yes (-1)	Unsure/ Neutral (0)	No (1)	NR(9)
a. Further development of wind farms in this County?				
b. Further development of wind farms in this state?				
c. Tax breaks or incentives to assist the development of wind energy?				
d. Building more high voltage transmission lines in this county to accommodate wind energy production?				

2.3 How much, if any, would you be willing to pay in additional fees for the use of wind energy?

Unsure (5)	None (4)	Up to 5% (3)	6-10% (2)	11-20% (1)	Over 20% (0)	NR/SM (9)
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Section 3: We have just a few more questions regarding your personal experiences with the environment and renewable energy.

3.1 a. Have you lodged a complaint concerning wind farms in any way?

No (-1)	Unsure (0)	Yes (1)	NR/SM (9)
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b. Method of Complaint : _____

c. Nature of Complaint: _____

d. Was the complaint resolved to your satisfaction? *If 3.1a = -1 or 0, skip and record as NR/SM (9).*

No (-1)	Unsure (0)	Yes (1)	NR/SM (9)
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3.2 Have you signed a "Host Agreement," Easement, "Good Neighbor" or any other agreement with a wind farm company?

No (-1)	Unsure (0)	Yes (1)	NR/SM (9)
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3.3 How satisfied do you feel with the terms of this agreement and the way you entered the agreement? *If 3.2 = -1 or 0, skip question and record NR/SM (9).*

Highly unsatisfied (-2)	Somewhat unsatisfied (-1)	Unsure (0)	Somewhat satisfied (1)	Highly satisfied (2)	NR/SM (9)
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3.4 How informed do you feel about the zoning process for wind farms in your county?

Highly informed (-2)	Somewhat Informed (-1)	Unsure/Neutral (0)	Somewhat uninformed (1)	Highly uninformed (2)	NR/SM (9)
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3.5 If you could inform your county's ZBA of anything concerning the wind farm hearing process, what would it be? _____

3.6 a. What is your impression of the visual impact of the wind turbines?

Like (-1)	Unsure (0)	Dislike (1)	NR/SM (9)
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b. What aspect of the turbines in particular gives you this impression? _____

3.7 Next, I'm going to list a couple of potential concerns about wind farm construction and operation. On a scale of zero to three, zero being none and three being a great deal, how much experience do you have with these potential concerns?

	0	1	2	3	NR (9)
a. substantial damage to roads as a result of construction					
b. damage to personal property as a result of construction					
c. unreasonable construction hours					
d. proper notice not provided during construction periods					
e. negative impact on farmland					
f. interference with wildlife					
g. interference with communications (radio, etc.)					
h. impact from flickering shadows					
i. nuisance noise					
j. detrimental effects on community relationships					
k. lack of available information about wind farm regulations					
l. trespassing					
m. impact on cost and availability of crop dusting					
n. difficulty in selling residential property					

o. other: _____

Demographics: Finally, we have a few questions about demographics in connection to your survey responses. Remember, responses of these surveys will not be connected with your name in any way.

Age and Gender of Household Member #1 (respondent): _____

Male (0)	Female (1)
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Age of Household Member #2: _____

Male (0)	Female (1)
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Age of Household Member #3: _____

Male (0)	Female (1)
----------	------------

Age of Household Member #4: _____

Male (0)	Female (1)
----------	------------

Age of Household Member #5: _____

Male (0)	Female (1)
----------	------------

Age of Household Member #6: _____

Male (0)	Female (1)
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Highest level of Education Achieved by Household Adult #1 (respondent):

High School/Equivalent (0)	Some College/ Associate's Degree (1)	Bachelor's/ Four-Year Degree (2)	Graduate/Professional Degree (3)
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Highest level of Education Achieved by Household Adult #2:

High School/Equivalent (0)	Some College/ Associate's Degree (1)	Bachelor's/ Four-Year Degree (2)	Graduate/Professional Degree (3)
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Highest level of Education Achieved by Household Adult #3:

High School/Equivalent (0)	Some College/ Associate's Degree (1)	Bachelor's/ Four-Year Degree (2)	Graduate/Professional Degree (3)
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What would you say is the combined annual household income for your household?

Under \$75,000 (0)	\$75,000- \$100,000 (1)	Over \$100,000 (2)	NR/SM (9)
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Open-Ended: Before we finish up, do you have any other concerns about the environmental health of Livingston County that you'd like to share with us?

Thank respondent for his or her time, and distribute informational pamphlets, etc.

Observations:

Respondent ID: _____

Does house description match that provided on assessor's listing^o

No (-1)	Unsure (0)	Yes (1)	NR/SM (9)
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Turbine Distance Questions:

Distance to nearest wind turbine from house (in ft) <i>Can be derived from scale map of wind farm project, or measured at time of survey:</i>	
Number of Turbines visible from within house (<i>ask respondent</i>):	
Number of Turbines within 1 mile:	
Number of Turbines within 2 miles:	

Observable presence of metal sheds/barns for livestock:

Yes (2)	Yes, but no Livestock (1)	Unsure (0)	No (-1)	Unsure/NR (9)
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Other Industrial Intrusion (railway, highway, etc.) within 1 mile of residence foundation:

No (-1)	Unsure (0)	Yes (1)	NR/SM (9)
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Other Observations:

