Understanding Wind Initiative

Report of Results from a Community Survey

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Acknowledgements

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I. Introduction

Across the country, proposals for wind energy development have been met with strong reactions from residents living in the vicinity of a potential project. Opponents of wind energy development cite concerns including harm to human quality of life, well-being of wildlife, and the aesthetic character of their area, while supporters point to benefits such as clean energy production and local economic development.

Manistee and Benzie counties are situated within a particularly complicated political and geographical context with respect to wind development. On the one hand, this area has been identified as a state-designated region with potential for wind power development. Within the wider state of Michigan, there is also potential wind turbine manufacturing capacity. On the other hand, this area is also renowned for sensitive protected environments and scenic beauty. As a result, tourism is an important economic driver.

The Wind Energy Community Survey was developed by a research team from Macalester College (www.macalester.edu) as part of the "Understanding Wind Initiative." The Understanding Wind Initiative (UWI) is a partnership effort led by representatives from six Manistee and Benzie County townships. The mission of UWI is to help local communities understand wind energy and its effects on people's lives and the landscape.

The survey was designed with three goals in mind. First, the survey provided an opportunity for residents to voice their opinion on local wind energy development. Second, it explores the range of opinions, and the strength of those opinions, held by people living in the area. Finally, the survey aims to examine the patterns of connections between level of support for local wind energy development, perception of the impacts of this development, and personal reactions to the possibility of this development actually occurring.

II. Methods

This report is based on the analysis of 1,268 paper surveys received via US postal mail by researchers at Macalester College between July 10 and August 15, 2011. Surveys were mailed to residents as an 8.5x13 double-sided, triple-folded enclosure in the annual tax assessment documents sent via US postal mail to all property owners in the townships of Arcadia, Bear Lake, Blaine, Onekama and Pleasanton – all in Michigan. Tax assessment documents were mailed to property owners in late June and early July, 2011. In addition, property owners in Joyfield Township, Michigan, were sent a copy of the survey as a single document (not part of a tax assessment mailing) via US postal mail. In total, 7015 surveys were mailed to property owners. Researchers received 1,268 completed original surveys between July 10 and August 15, for a response rate of 18.07%.

Survey respondents did not receive anything in exchange for completing the survey, nor were they sent any follow-up reminders or requests about the survey. All respondents filled out and returned the survey voluntarily. The survey was anonymous; there was no way to identify respondents based on their answers to questions and no personal information was requested in the survey. Surveys were marked with a colored-ink postage-paid metering machine. This not only increased the ease with which respondents could return surveys (no stamp needed), it also allowed researchers to be certain that only valid original surveys were included in the analysis (not photocopied additions).

The survey questions were divided into four sections. The first section asked people about their prior experience with large-scale wind turbines ("wind turbine farms") and their level of support for local wind energy development. The second section asked participants about their perceptions of the impacts of wind energy development on a range of issues. The third section assessed people's personal reactions to the possibility of local wind energy development; and, finally, the fourth section contained demographic questions. A full copy of the survey is included in Appendix A of this report.

Methodological Limitations. There are three important considerations with respect to the study

methods. First of all, surveys were sent to people in the six townships who received property tax assessments. Thus, only people who own property in the area received a survey. People residing in the area who are not property owners did not receive a survey via mail. The survey thus excluded renters and others (e.g., relatives or friends living on someone's property) who may also be impacted by and have opinions about local wind energy development.

Second, some survey respondents own more than one parcel in the study area and, in some cases, received an additional copy (or copies) of the survey. This was the case if (1) respondents own property in more than one township and thus received tax assessment(s) from each township, or (2) they own property in a township that does not combine multiple tax statements into one tax assessment per owner and they thus received one survey for each parcel owned within that township (for example, Bear Lake does not combine tax statements.) Approximately 17% of survey respondents indicated that they own more than one parcel (breakdown: 8% own one additional parcel, 4% own two additional parcels, 2.5% own three additional parcels, 1.5% own four or five additional parcels, and 1% of respondents own 6 or more parcels in addition to the property on which they live.)

A third consideration is that of a self-selection bias, or the tendency for certain people to be more likely to participate in a voluntary study compared to other people. As with any survey where a response is not required by law, respondents are likely to be more publicly engaged and more highly educated than the average person. F or this particular study, it is likely that people who have a strong opinion about wind energy development were more willing to mail back the survey compared to people who were less concerned with this issue.

However, an important goal of this study was simply to give each household an opportunity to anonymously voice their thoughts on wind energy development, and this goal was met. In the future, amendments could be made to the survey process to increase response rates: a survey might be given to full-time residents who are not property owners, offering financial compensation to respondents for returning the surveys, or a follow-up letter to remind residents to return their surveys.

III. Response Rate

As noted above, the overall response rate for all six townships combined was 18.07%. However, the response rate varied by township: some townships had a response rate that exceeded the overall response while other townships had much lower response rates. As discussed in the methods section, surveys were sent to all property owners in the six townships (See Figure 1).

Township	Number of Surveys Distributed	Number Completed and Returned	Percentage Completed and Returned
Arcadia	750	204	26.80%
Bear Lake	1,900	206	10.80%
Blaine	500	122	24.40%
Joyfield	465	87	18.70%
Onekama	2,600	221	8.50%
Pleasanton	800	157	19.60%

Figure 1. *Response rates from each township.*

Of all townships, Arcadia had the highest response rate, returning 26.8% of surveys that were mailed to property owners. Blaine also had a high response rate of 244%. Conversely, Bear Lake and Onekama, the two most populous townships with the largest number of property owners, had the two lowest response rates – Bear Lake property owners returned 10.8% and Onekama property owners returned 8.5% of surveys. Both Pleasanton and Joyfield had response rates that were slightly above the total average response rate.

Some respondents listed a place other than the six townships as their primary place of residence, though they also owned property within the study area. Their surveys are included in the overall response rate and in the response rate by township if the survey respondent identified the location of their vacation or rental property. If they did not identify the location of their vacation or rental property, there was no way to identify which township their property was in. Additionally, surveys returned after August 15 were not included in the response rate tabulations.

IV. Demographics

The demographic breakdown of respondents provides a general picture of who completed the survey. Note that some respondents did not respond to all of the demographic questions. Therefore, most demographic items do not total to 100% and the

difference represents the percentage of people who chose not to answer the demographic questions.

Of our 1268 respondents, 57% of were male, 37% were female, and 1% of households answered as a couple, as shown in Figure 2. The mean age of respondents was 62 year old (median age 63), and 77.3% of respondents were between 50 and 70 years old (see Figure 3). In addition, 87% of respondents identified as Caucasian or White, whereas all other race and ethnicity categories comprised 1% or less of respondents. Over 11% of respondents chose not to disclose their race and/or ethnicity.

Figure 4 shows that 61.5% of respondents identified as full-time residents and 26% identified as seasonal residents. A few respondents also listed alternative residency options, including being both a full time and seasonal resident. The survey also asked about types of property ownership, shown in Figure 5. Nearly 71% of respondents stated that they own just their home in the survey area, about 14% own their home and another property, and almost 11% do not live in a home in the study area but do own a vacant or rental property.[1] The education level of participants, shown in Figure 6, was relatively high: the fewest respondents reported having less than a high school degree and the most respondents reported having more than a college degree. In total, 0.6% of respondents had less than a high school degree, 11.1% had a high school degree or GED, 14.3% had some college, 8.2% had a two year college degree or their Associates, 23.9% had a college degree, and 36.7% of respondents had had education beyond a college degree. Shown in Figure 7, 96.8% of respondents reported having voted in the last national election. In terms of political party affiliation, 31% affiliate with the Republican Party, 22% affiliate with the Democratic Party, 31% report being independent, 10.8% chose undecided, and 5.2% chose other, (see Figure 8). The survey also asked participants to list their income, but many participants chose not to answer. Only 981 of the 1268 respondents provided an answer to this question. Figure 9 shows the income breakdown of those people reporting income on the survey.

[1] Note: While 71% of respondents indicated that they own only their own home in the study area, only 17%, as noted earlier, indicated that they own more than one parcel. The other 12% either did not answer the question or own just one property that is vacant or rental.

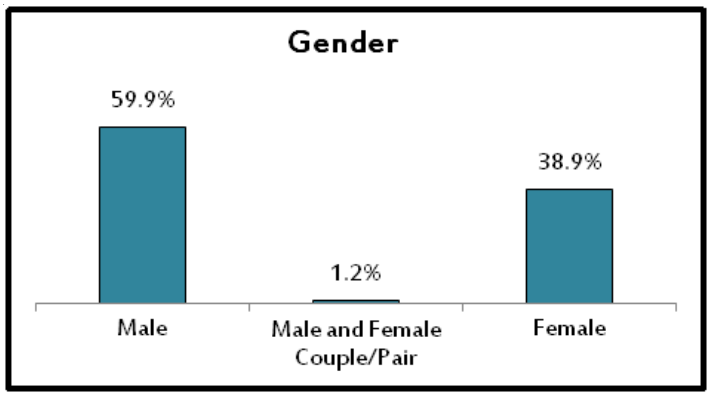


Figure 2. *Percentage of male and female respondents.*

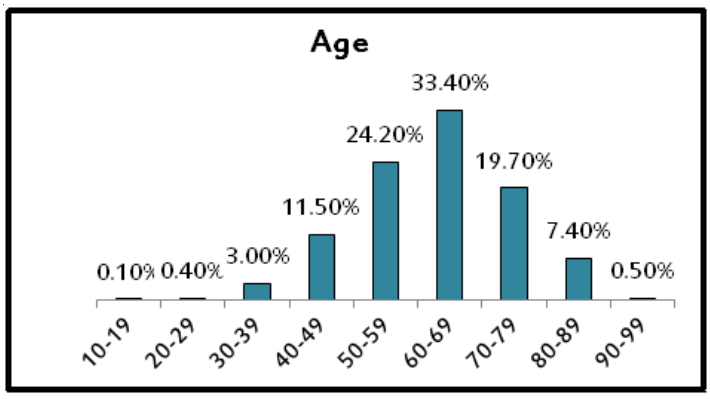


Figure 3. *Percentage of respondents in each age group.*

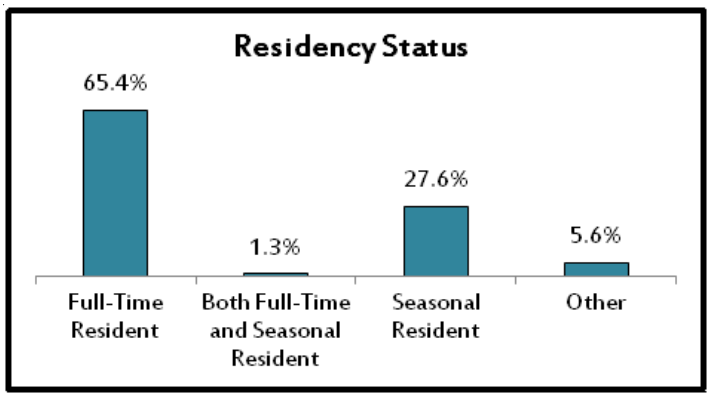


Figure 4. *Percentage of respondents by residency status.*

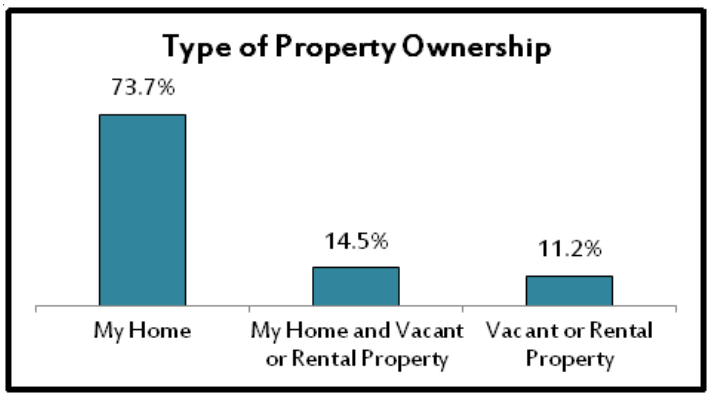


Figure 5. *Percentage of respondents owning each type of property*

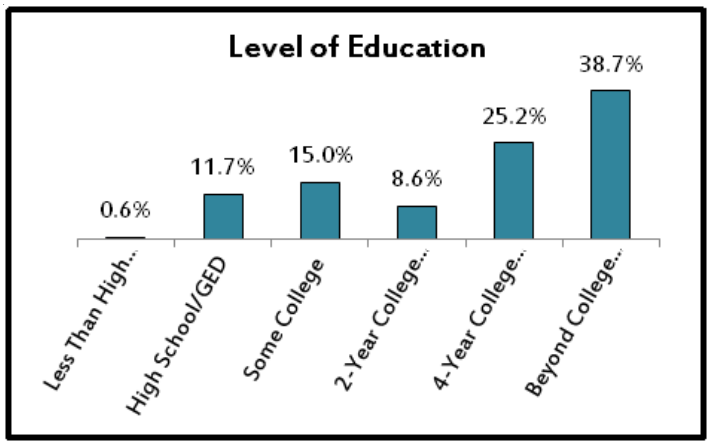


Figure 6. *Percentage of respondents by completed education level.*

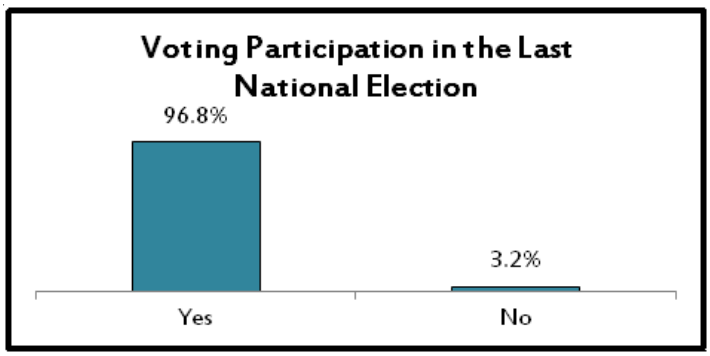


Figure 7. *Percentage of respondents who voted in last election.*

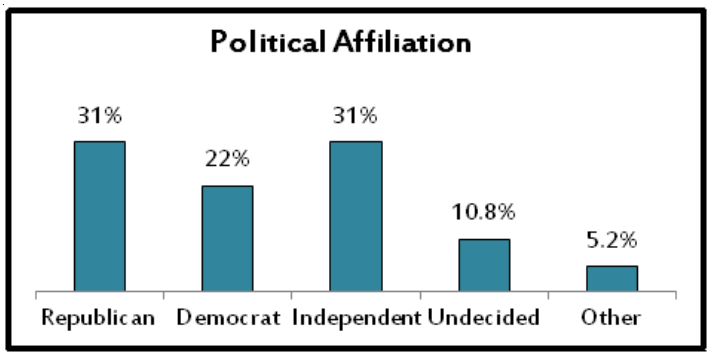


Figure 8. *Percentage of respondents by a political affiliation.*

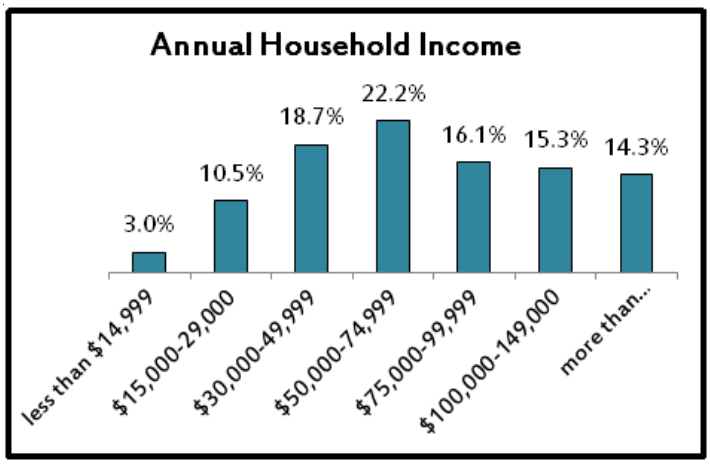


Figure 9. *Percentage of respondents in each income bracket.*

V. Opinion and Exposure

The first section of the survey asked about residents' general opinion of potential local wind energy development and exposure to wind energy projects. Figure 10 shows that the majority of respondents had heard about large wind turbines from people they knew and through the news. The majority of respondents had also seen large wind turbines both from a distance and up close, despite the fact that the only large-scale wind energy project in northwestern Michigan – Stoney Corners Wind Farm – is nearly 70 miles away and has only 19 wind turbines. Very few respondents live near large wind turbines. Less than 6% of respondents stated that they planned to host a large wind turbine.

The majority of respondents stated that wind turbines were proposed in their community. Almost a quarter of respondents either stated that wind turbines were not proposed where they lived or said that they were unsure (see Figure 11). Several wind energy development projects have been proposed in the six-township study area. The respondents who answered "No" or "I Don't Know" to this question may be unaware of pending projects, or they may consider the definition or boundaries of their "community" to be smaller than the area where projects have been proposed, or they may be unaware of the exact locations of proposed wind turbines. Seasonal residents may have based their answer on a winter residence outside of the study area.

In response to the question "Do you support wind energy development in your township?" 41% of respondents stated that they strongly oppose or oppose local wind energy development in their area, and 35% of respondents stated that they strongly support or support local wind energy development. Twelve percent were neutral (see Figure 12).

The survey also asked property owners if they thought their area was a good place for a wind farm. Results are shown in Figure 13. The results of this question are consistent with the previous question.

Figures 14 and 15 display the results from two of the above questions separately for each township. Figure 14 shows the number of people from each township who answered "Yes" to the question "Are wind turbines proposed in your community?" In four of the six townships, over 90% of respondents answered "Yes", in Bear Lake and Onekama, percentages were lower (65% and 46% respectively).

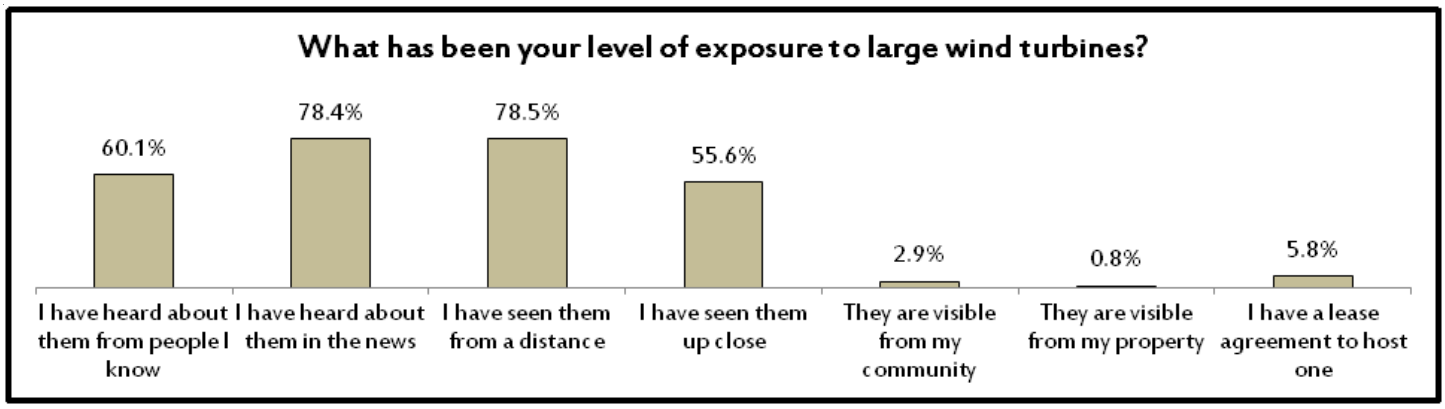


Figure 10. *Percentage of respondents by exposure to wind turbines. Note that respondents could choose more than one response. The response option "I own one or more" was excluded from this chart (the value was <.5% of respondents).*

Figure 15 shows each township's responses to the question "Do you support wind energy development in your township or city?" As noted above, Bear Lake and Onekama townships had the lowest overall response rates, and as shown in Figure 14, they had the lowest percentage of respondents who chose "strongly oppose" or "oppose" with respect to wind energy development.

Finally, Figure 16 shows the differences in support for or opposition to wind energy development among full-time and seasonal residents. Overall, seasonal residents expressed less support for wind energy development and greater opposition than full-time residents. These differences are statistically significant ($p < .05$).

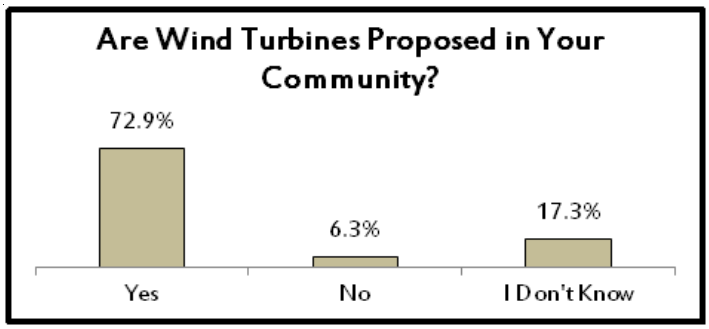


Figure 11. Percentage of respondents who answered the question (note that percentages do not add up to 100% because missing responses were not included in this graph).

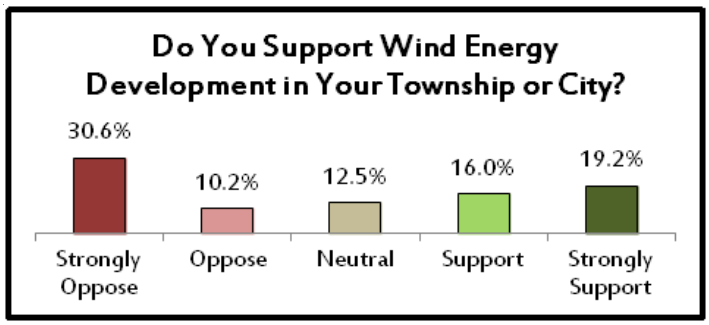


Figure 12. Percentage of respondents who answered the question (note that percentages do not add up to 100% because the category "Other" and missing responses were not included).

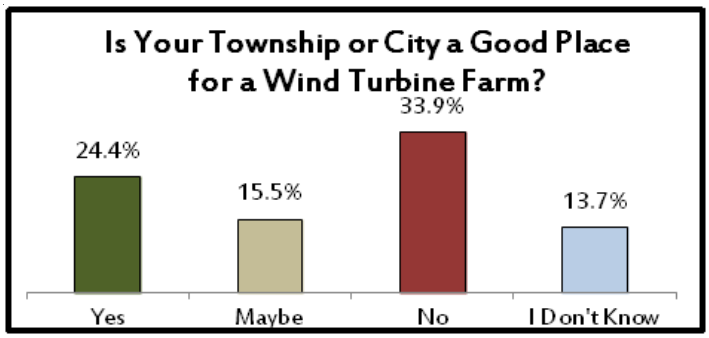


Figure 13. Percentage of respondents who answered the question (note that percentages do not add up to 100% because missing responses were not included).

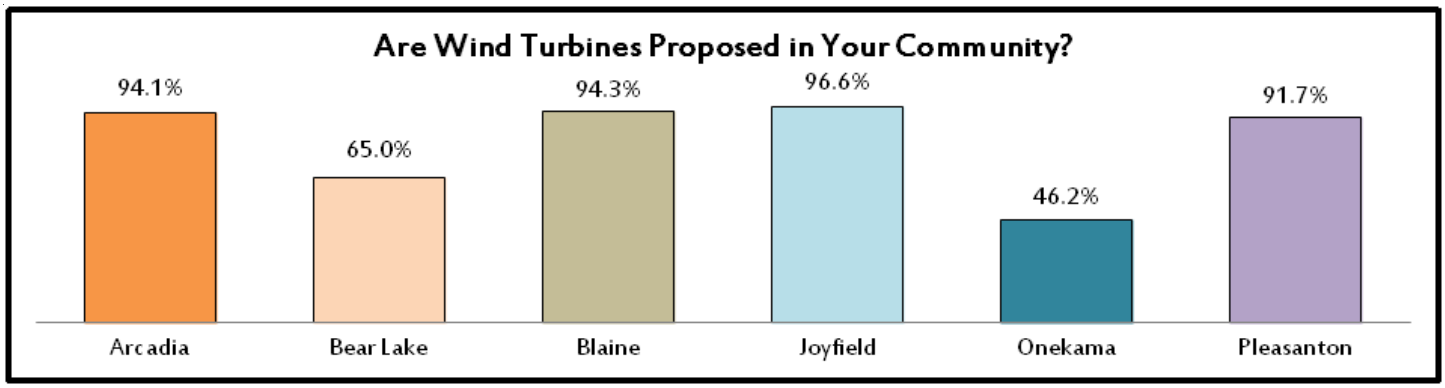


Figure 14. *Percentage of respondents in each township who answered "yes" to the question.*

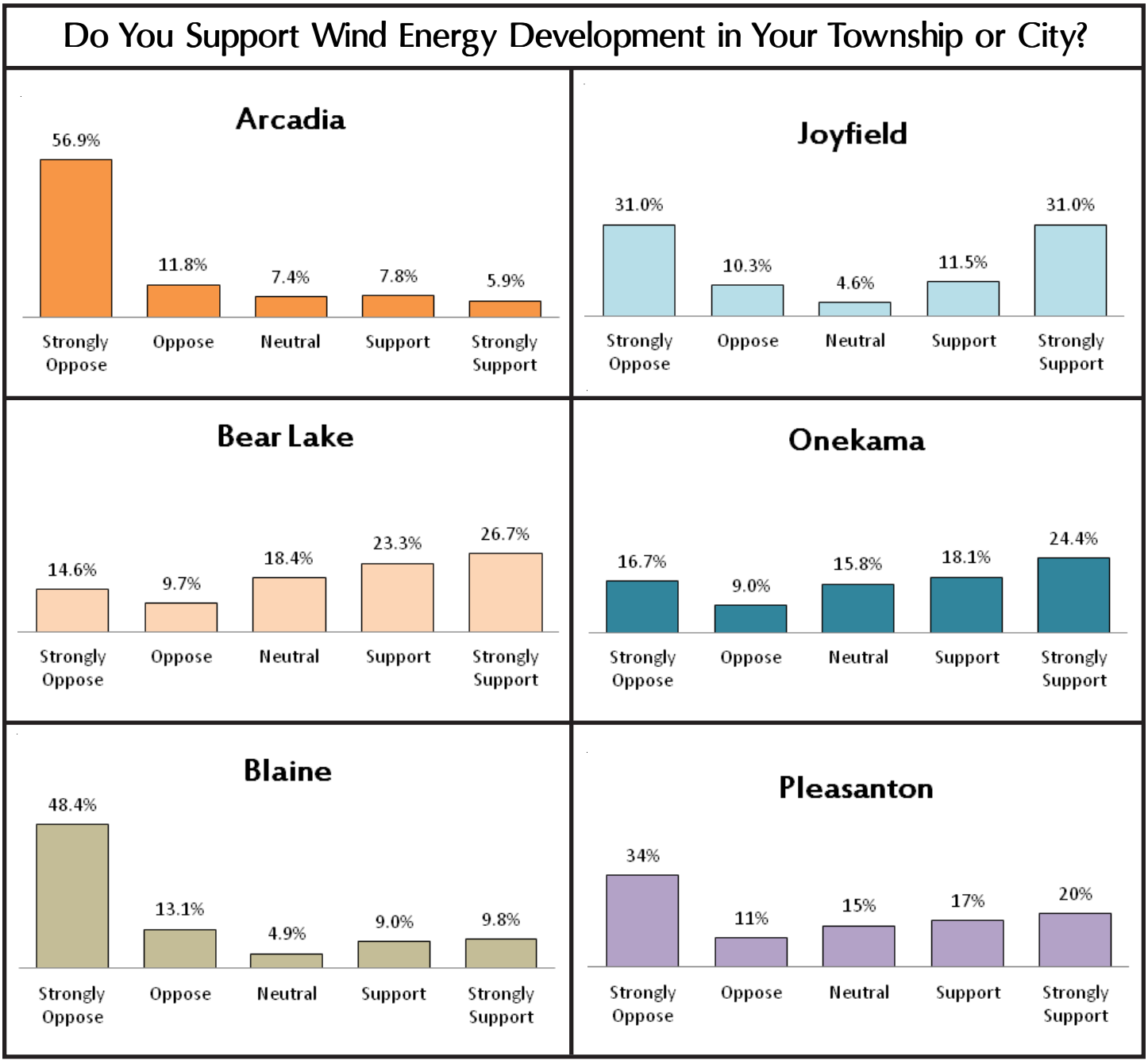


Figure 15. *Percentage of respondents who answered the question in each township (note that percentage in each graph do not add up to 100% because missing respnses were not included in this graph).*

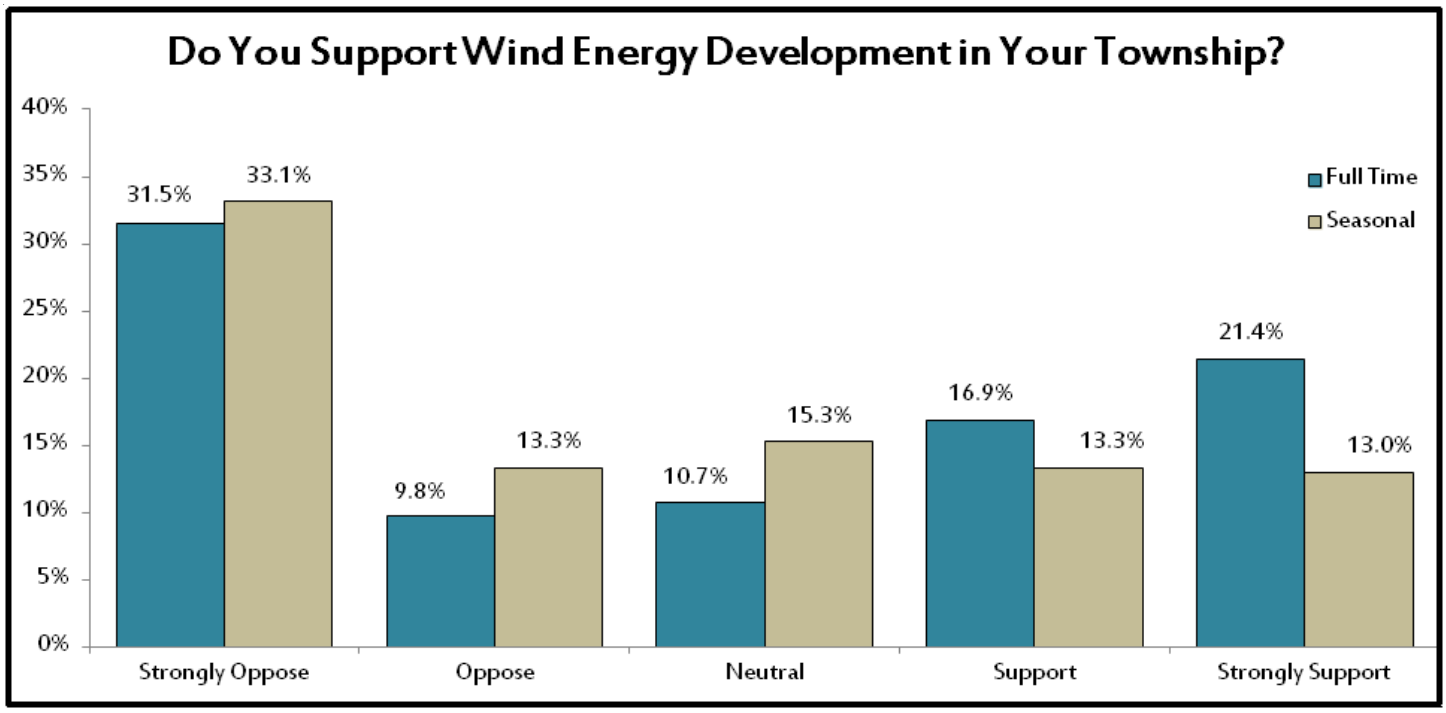


Figure 16. *Percentage of both seasonal and full-time residents who responded to the question (note that the calculations used to create this chart excludes the category "Other" to better compare the opinions of full time and seasonal residents, and for that reason percentages for each of the categories shown are slightly higher than in this figure).*

VI. Impacts of Wind Energy on 21 Issues

In the survey, respondents were asked how wind turbine farms would impact a series of 21 issues. In these questions, respondents were asked to use a Likert scale with the options of "Very Negative," "Negative," "Neither Negative nor Positive," "Positive," "Very Positive," and "I Don't Know." The results of these questions are organized in two ways. First, one set of percentages were determined excluding the category of "I Don't Know". The first set of bar charts shows these numbers: the percentage of people who expressed an opinion (very negative to very positive) toward each issue. For the second set of bar charts, we compared the percentages of respondents who answered "I Don't Know" on each issue. This bar chart shows the issues which had the highest number of "I don't know" responses (i.e., the issues that people felt the least certain about) and those issues that had the lowest number of "I don't know" responses (i.e., the issues that people felt most certain about).

For the first set of figures (percentages excluding "I don't know"), Figures 17, 18, 19, 20, 21, and 22, it is evident that participants felt the most positively about wind

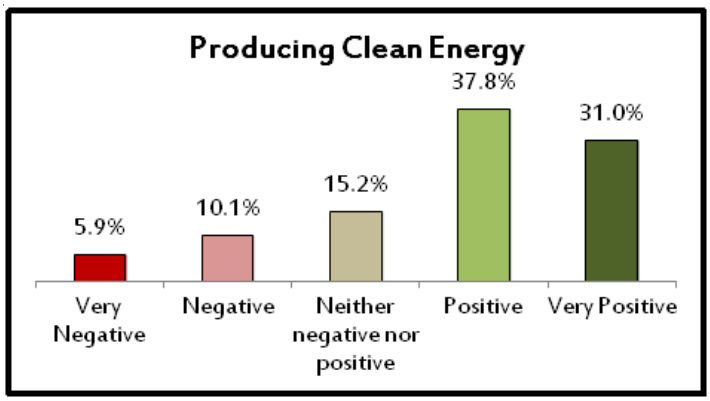


Figure 17. *Percentage of respondents by opinion about topic.*

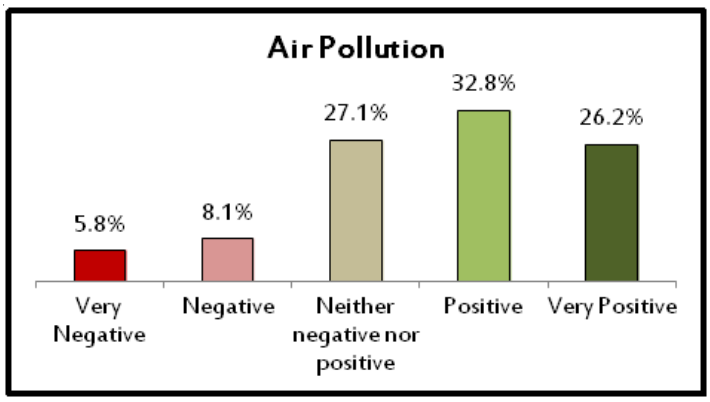


Figure 18. *Percentage of respondents by opinion about topic.*

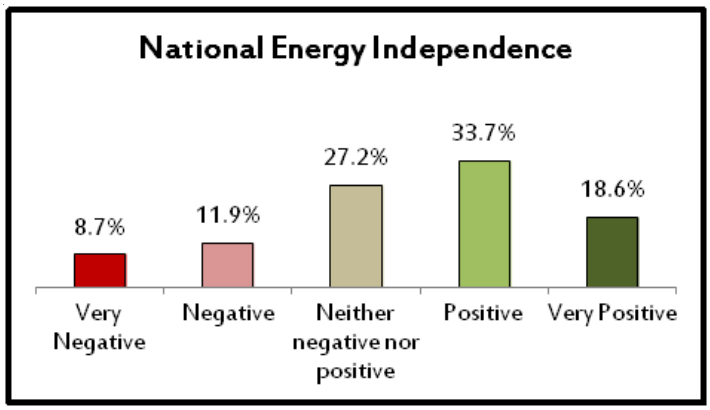


Figure 19. *Percentage of respondents by opinion about topic.*

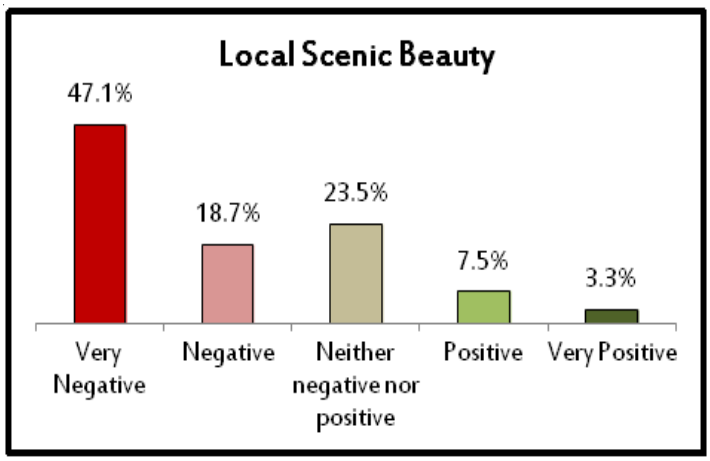


Figure 20. *Percentage of respondents by opinion about topic.*

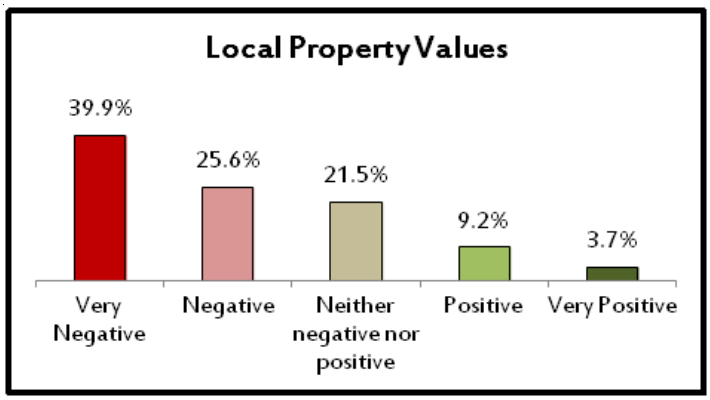


Figure 21. *Percentage of respondents by opinion about topic.*

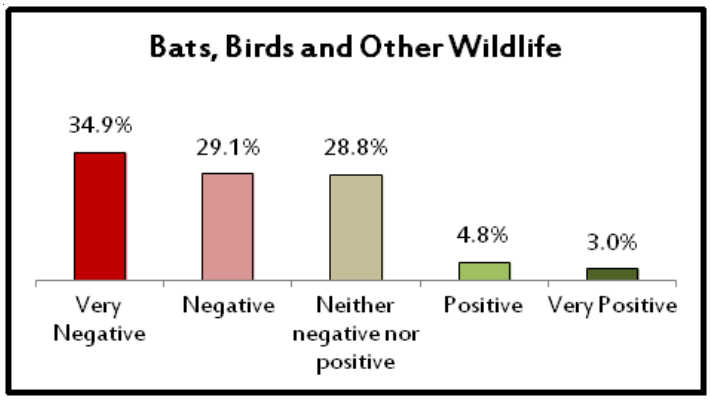


Figure 22. *Percentage of respondents by opinion about topic.*

energy development's impact on environmental and energy concerns. When asked how wind turbine farms would impact the production of clean energy, over two thirds of respondents (68.8%) chose either "Positive" or "Very Positive" whereas only 16% of respondents chose either negative or very negative. This question elicited the highest level of positive responses out of the 21 issues, as shown in Figure 17.

The question that elicited the second highest positive response asked participants to identify how wind turbine farms would impact air pollution. For this question, 59% of respondents chose either positive or very positive, meaning that many people felt that wind energy is likely to improve air quality (Figure 18).

Similarly, respondents responded positively about the ability of wind turbine farms to help create national energy independence. When asked, 52.3% of participants chose either positive or very positive to indicate their opinion regarding this question, seen in Figure 19.

On the other side of the spectrum, there were a number of questions that generated negative responses. When asked to determine how wind turbine farms would impact local scenic beauty, 65.8% of participants chose either very negative or negative, with a majority of them choosing "very negative." Very few respondents chose either positive or very positive regarding local scenic beauty (Figure 20).

The question that elicited the second highest negative response rate also dealt with issues pertaining to the character and wellbeing of the local community. When asked how wind turbine farms would impact local property values, 65.5% of respondents chose either very negative or negative to express their opinion, depicted in Figure 21.

Participants also responded negatively when they were asked how wind farms would impact birds, bats, and other wildlife; 64.1% chose either very negative or negative (Figure 22).

It appears as if respondents were most optimistic about the potential of wind energy to alleviate energy problems and improve air quality in general, while they were most concerned about the impact that wind energy would have on the local community and wildlife. Figure 23 ranks each issue by the total frequency of negative responses it generated (both "Negative" and "Very Negative") and Figure 24 ranks each issue by the total frequency of positive responses it generated (both "Positive" and "Very Positive"). It is interesting to note that the issues that generated the most negative responses are not necessarily the issues that generated

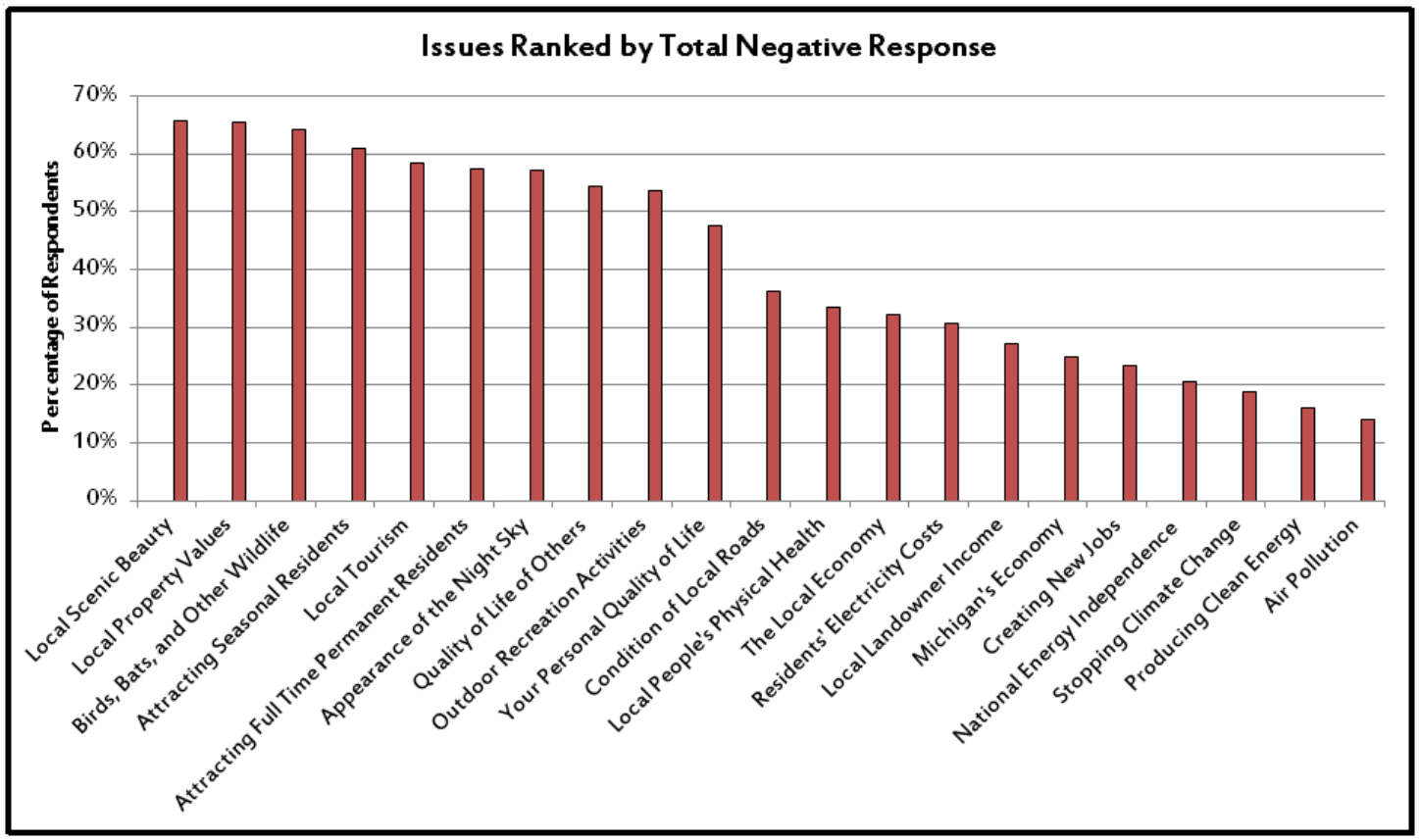


Figure 23.

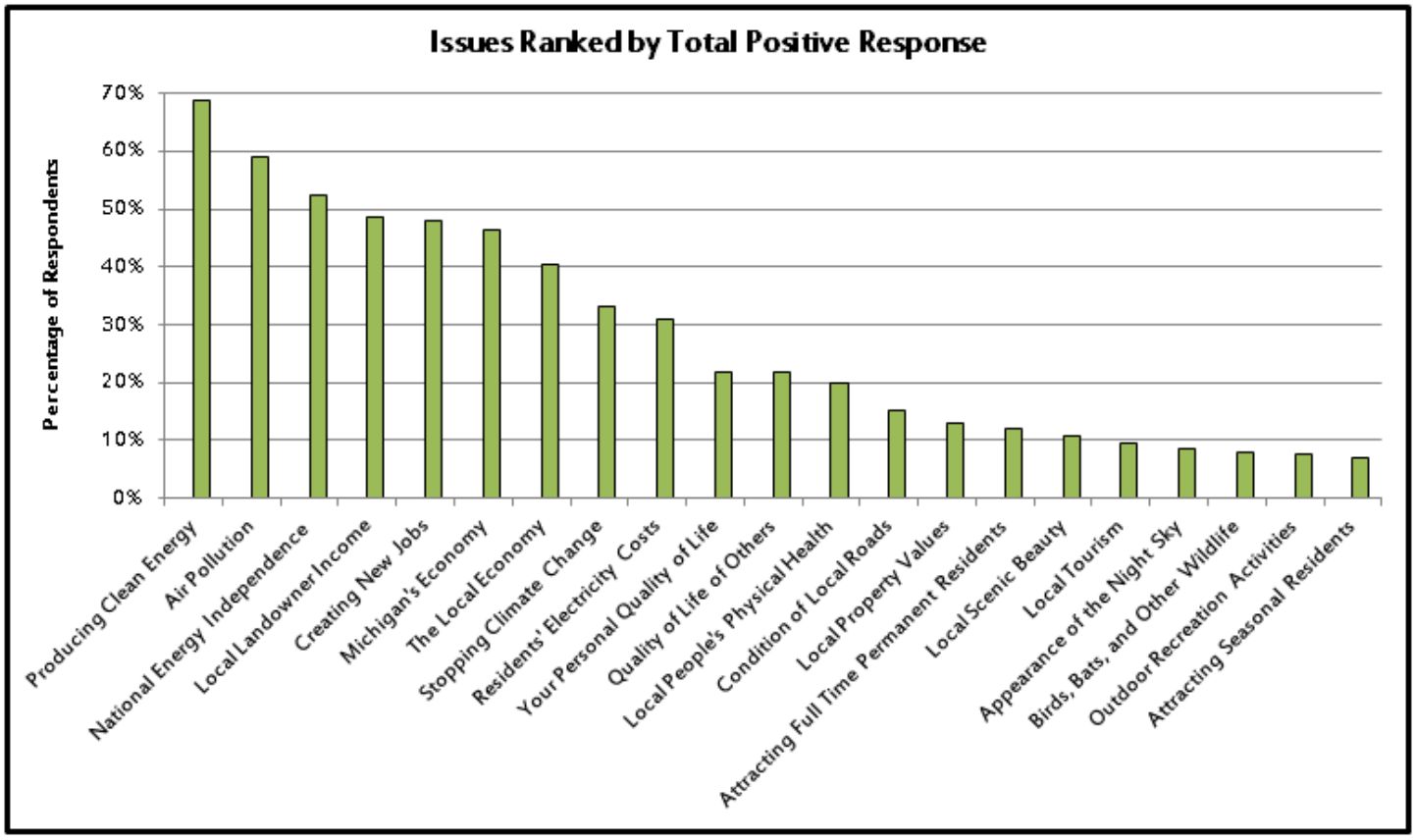


Figure 24.

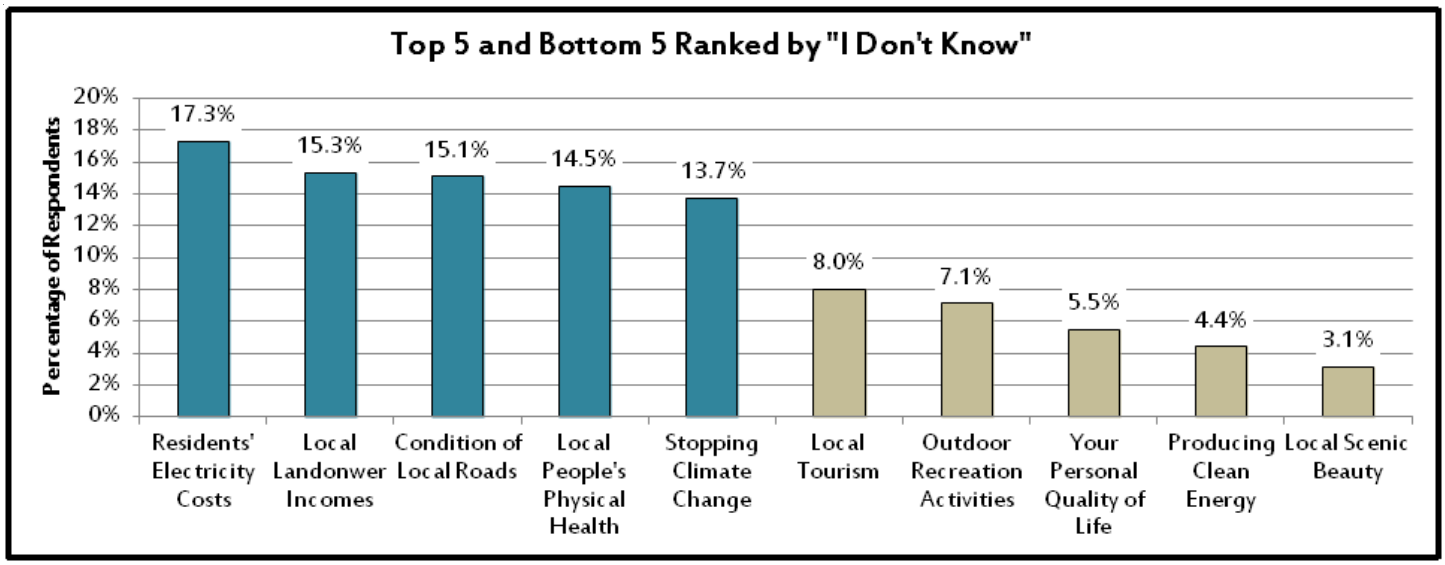


Figure 25.

the least positive responses. Similarly, the issues that generated the most positive responses did not necessarily generate the least negative responses. This is evidence for the complexity of people's perceptions of the impacts of wind energy development, and the great diversity of opinions expressed by area residents. To see the responses to each of the 21 issues, see Appendix B.

While the responses varied greatly by issue, positive responses tended to be more tentatively positive, with respondents choosing "positive" more frequently than they chose "very positive," whereas negative responses tended to fall within the "very negative" category more often than they fell into the "negative" category. For example, for all issues that generated a more positive response than a negative response, respondents tended to choose "positive" rather than "very positive." Conversely, for all but two of the issues that generated a more negative response, respondents were more likely to choose "very negative" over "negative". The two exceptions – the condition of local roads and local people's physical health – also had very high levels of "neither negative nor positive" responses.

The next figure shows the percentage of people who chose "I don't know" when asked about the impact of wind on a variety of issues. See Figure 25 for the issues that generated the five highest and five lowest levels of "I don't know" response percentages.

It is important to note that the two issues with the lowest levels of "I don't know" responses were also the two issues that generated the highest levels of either positive or negative responses. Specifically, most respondents said that wind turbine farms would have a negative impact on local scenic beauty, and for this issue there were also few "I don't know" responses. Similarly, many respondents indicated that wind turbine farms would have a positive effect on the production of clean energy, and for this issue, there were also very few "I don't know" responses.

VII. Personal Reactions to Wind Energy

In addition to assessing residents' opinions about the impacts of wind energy, this survey also asked about people's personal reactions to the idea of local wind energy development. The third section of the survey had respondents indicate their agreement to a set of 8 statements describing a response to wind energy development. Statements included, for example "I think about it a lot" and "I talk to friends about it". Figure 26 shows the average rating of each statement on a scale of 1 to 5, where "1" is "Strongly Disagree, "3" is "Neither Agree nor Disagree" and "5" is "Strongly Agree." Overall, respondents expressed the highest level of agreement with the statement "I am motivated to find out more about it" and "I talk to friends about it". The lowest level of agreement was with "I am confused about it" and "I feel enthusiastic about it."

We graphed the relationship between a respondent's opinion of local wind energy development and their personal reaction to the idea of wind turbine farms in their community. We combined the first two statements,

"I think about it a lot" and "I talk to friends about it" in a measure of personal salience of the issue of local wind energy development. We also combined the second two statements, "It makes me want to take action" and "I am motivated to find out more about it" into a measure of need to act in response to the idea of local wind energy development. These first four statements together serve as an indicator for perceived urgency of the issue of local wind energy development. As shown in Figure 27, people who express strong opposition had the highest levels of personal salience and the highest need to act (statistically significant, $p < .05$), followed by people who express strong support. People expressing moderate support or moderate opposition and people who said they were neutral had similar levels of personal salience and need to act (not statistically significantly different from each other but statistically significantly lower than those of strong opposition or strong support).

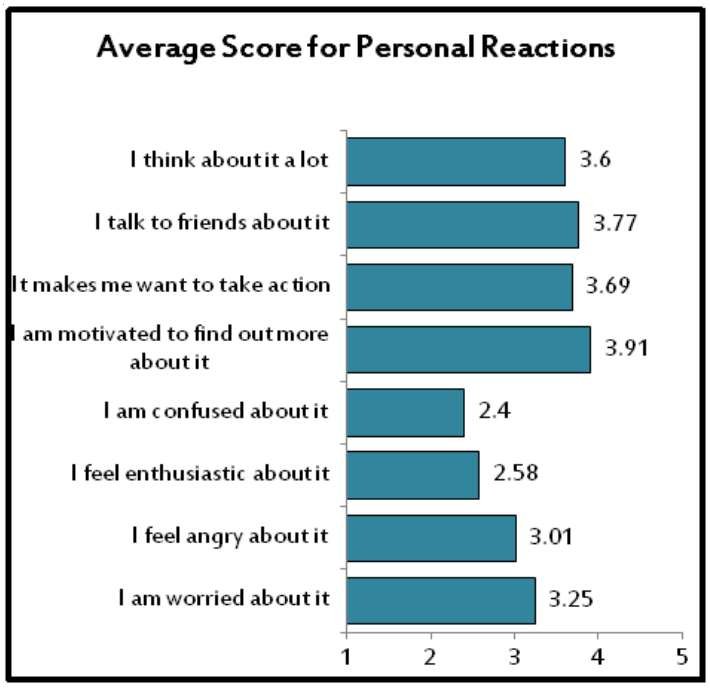


Figure 26. *Average rating of personal responses to wind energy.*

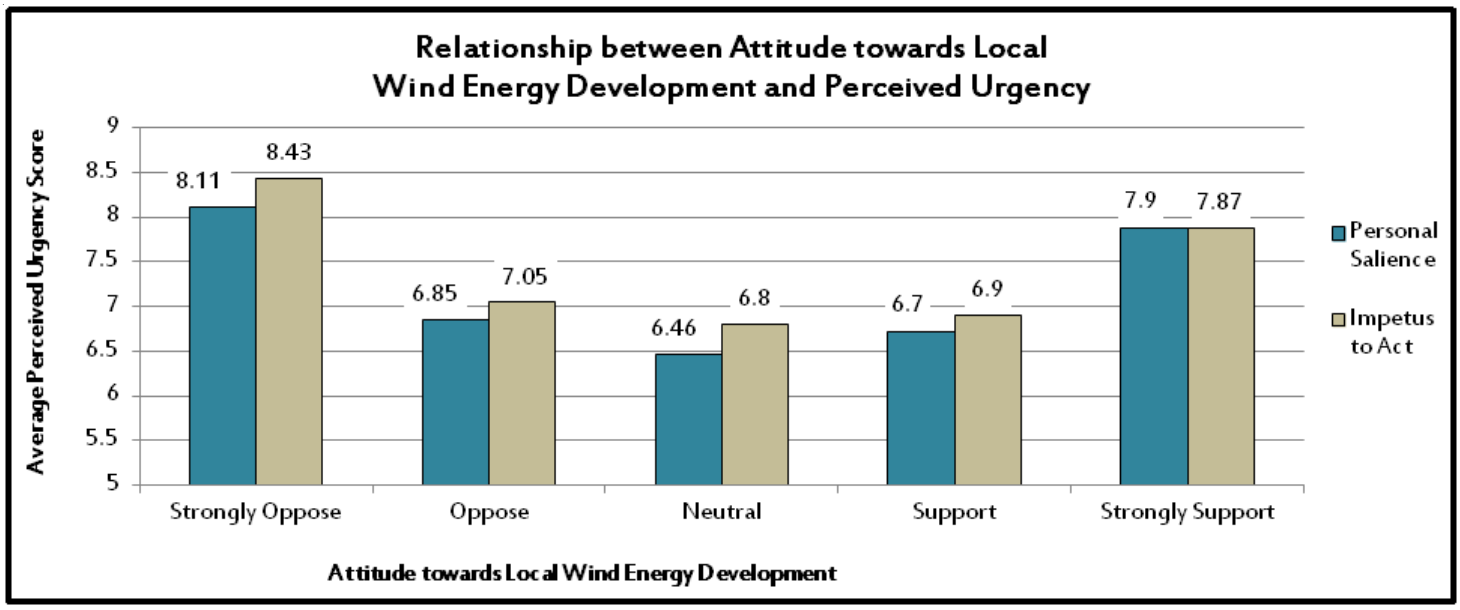


Figure27. *Attitude toward wind energy development and respondent's perceived urgency.*

VIII. Discussion of Additional Written Comments

Throughout the survey, many respondents included a number of additional written responses to supplement their answers and express their opinions regarding wind energy. These comments were unsolicited – participants wrote in the margins of the survey, at the bottom of the page, or included extra pages when they mailed in their completed form. These comments ranged in opinions but focused on a few main themes, including the scale of wind farms, the subsidies wind energy receives, the possible economic effects of wind energy, effects on the character of the community and the surrounding landscape, turbine siting and zoning, clean energy production, and current wind energy project proposals. In regards to the scale of wind farms, many respondents contend that local, residential, or communal wind energy is acceptable whereas industrial scale wind is not appropriate for the community. As one respondent stated, "I oppose industrial scale development, but welcome personal installations that are smaller." Similarly, many respondents also commented that "any energy that has to be tax subsidized is not viable," and were also concerned with the impacts wind turbines could have on property values and the local economy. Relating to scale and community benefit, one respondent expressed concern with the way a wind farm and developer distribute the benefits. This respondent wrote that wind farms "will benefit a few monetarily who sign leases, the rest of us will benefit in no way."

Many respondents also expressed concern on their survey about how wind development would alter the character of the community and the local landscape. These comments expressed concern for local wildlife, scenic beauty, and tourism. As one respondent stated: "I am angry that a 100 turbine wind farm is proposed on one of Michigan's most beautiful coastal shores. It would be adjacent to land preserved for its natural beauty and recreation. Allowing industry into that area would reverse the work of those who have worked to preserve the beautiful land we've inherited." Conversely, respondents also commented that wind turbines could become integrated into the landscape and not be visually disturbing over time.

With respect to the siting and zoning of wind turbines, respondents had varying opinions about how to appropriately legislate, place, and design wind development for the betterment of the community. While some people felt that turbines don't belong anywhere residential and should be limited in number and scale, others expressed a desire to maximize energy production if turbines were to be placed in the community. A number of participants also expressed a common concern for the distance between turbines and the shore of Lake Michigan, expressing that siting turbines near the shoreline would be objectionable.

Finally, many respondents vocalized their opinions regarding wind energy as a viable source of clean energy, a means to energy independence, and a way of mitigating climate change. While many respondents commented that wind energy would positively impact many energy and environmental concerns – "I am for wind energy 100%, we need new ways to generate energy - clean energy from natural resources," – some also expressed support for other, more traditional forms of energy development – "the electricity generated by wind is too costly as compared to electricity generated by H2O, coal and nuclear."

From these additional comments respondents offered, it is clear that the level of emotional engagement about wind energy in these six townships is high. Many citizens feel that they have an opinion to express but may not have had adequate opportunity to voice their views. For this reason, they used the survey as an opportunity to make comments.

It is vital that as wind energy development remains an issue in Manistee and Benzie Counties, community conversation is fostered and individuals are given an opportunity to engage, deliberate, and express their opinions, ideas, hopes and concerns.

IX. Final Summary

The major goals of this study were to record the range and strength of peoples' opinions about wind energy development and to report the results back to the community. Survey respondents were generally familiar with wind turbines, reporting that they had heard about them from people they knew, heard about them in the news, seen them from a distance, and/or seen them up close. Additionally, a majority of respondents reported that wind turbines were proposed in their community.

The survey found that there is a wide range of opinions about local wind energy development, with 40.8% of respondents expressing opposition to local wind development and 35.2% expressing support. The survey results also suggest that those who oppose wind energy development have stronger feelings about it than do supporters. There was significant variability between townships: Arcadia, Blaine and Pleasanton had high levels of opposition, Bear Lake, and Onekama tended toward support of local wind development, and Joyfield had approximately equal rates of support and opposition. The survey also found differences between seasonal and full time residents: full-time residents were more likely to support local wind energy development.

In general, respondents felt that wind energy would most positively impact the production of clean energy and the reduction of pollution, while they felt that wind energy would most negatively affect local scenic beauty and property values. Additionally, respondents indicated that they were most uncertain of the impacts of wind energy on residents' electricity costs and landowner incomes. They were not uncertain about the impact of wind energy on the production of clean energy (they indicated positive impact) and local scenic beauty (they indicated negative impact).

This survey also asked about respondents' personal reactions to the idea of local wind energy development. Respondents who either strongly opposed or strongly supported wind energy development were more likely to have a higher sense of urgency about the issue than respondents who said that they just opposed, just supported or were neutral.

Throughout the survey, respondents included additional, unsolicited comments regarding a variety of different issues related to wind energy development. The volume of these comments suggests respondents' high level of engagement with the issue of local wind energy development and the need for continued dialogue in the future.

Appendix

Appendix A: Original Survey

This survey is a part of the Understanding Wind Initiative, a partnership effort led by representatives from six Manistee and Benzie County townships. The state of Michigan has determined that wind-generated electricity will play an important role in providing renewable electricity but it is not clear where wind turbine farms should be built. The Understanding Wind Initiative wants to help communities understand wind energy and its effects on people's lives and the landscape. We also want to give people a chance to tell us their opinions.

Complete the following survey, refold it, tape it closed and mail it to: Dr. Christie Manning, Macalester College
1600 Grand Avenue
St. Paul, MN 55015

What has been your exposure to large wind turbines? (choose all that apply)

- O I have heard about them from people I know
- O I have heard or read about them in the news
- O I have seen them from a distance
- O I have seen them up close
- O They are visible from my community
- O They are visible from my property
- O I have a lease agreement to host one or more
- O I own one or more
- O Other_____

Are wind turbine farms proposed in your community?

O Yes O No O I don't know

Do you support wind energy development in your township or city?

- O I strongly oppose it
- O I oppose it
- O I am neutral
- O I support it
- O I strongly support it
- O Other_____

Is your township or city a good place for a wind turbine farm?

O Yes O Maybe O No O I don't know

In your opinion, what will the impact of wind turbine farms be on:

Local landowner incomes	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
Creating new jobs	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
Producing clean energy	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
Local scenic beauty	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
Outdoor recreation activities	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
Residents' electricity costs	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
National energy independence	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
Air pollution	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
Local property values	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
Local tourism	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
Attracting seasonal residents	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
Attracting full-time permanent residents	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
Appearance of the night sky	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
The local economy	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
Michigan's economy	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
Your personal quality of life	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
Quality of life of other people in the area	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
Local people's physical health	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
Bats, birds and other wildlife	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
Condition of local roads	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know
Stopping climate change	Very negative	Negative	Neither Negative Nor Positive	Positive	Very Positive	I don't know

Other issues? _____

What is your personal reaction to the idea of wind turbine farms in your community?

I think about it a lot	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
I talk to friends about it	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
It makes me want to take action	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
I am motivated to find out more about it	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
I am confused about it	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
I feel enthusiastic about it	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
I feel angry about it	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
I am worried about it	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree

The following questions will give us a general picture of who participated in the survey

Are you: O Male O Female

What is your zipcode?

What is your age?

Your city/township?

In your city or township, are you a:
- O Full time resident (how many years_____)
- O Seasonal resident (months per year_____)
- O Other_____

Do you own property in your city or township?
- O Yes, my home
- O Yes, vacant or rental properties (How many parcels?_____)
- O No

What is your race or ethnicity?
- O African-American
- O American Indian/Native American
- O Asian, Asian-American, Pacific Islander
- O Caucasian/White
- O Hispanic, Latino, or Spanish origin
- O Other_____

What is your annual household income?
- O Less than $14,999
- O $15,000 to $29,999
- O $30,000 to $49,999
- O $50,000 to $74,999
- O $75,000 to $99,999
- O $100,000 to $149,999
- O More than $150,000

What level of education have you completed?
- O Less than High School
- O High School/GED
- O Some College
- O 2-year College Degree (Associates)
- O 4-year College Degree (BA/BS)
- O Beyond college degree

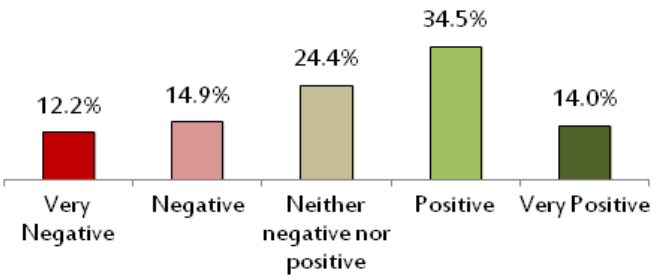
Did you vote in the last national election?
O Yes O No

What is your political party affiliation?
- O Republican
- O Democratic
- O Independent
- O Other_____
- O Undecided

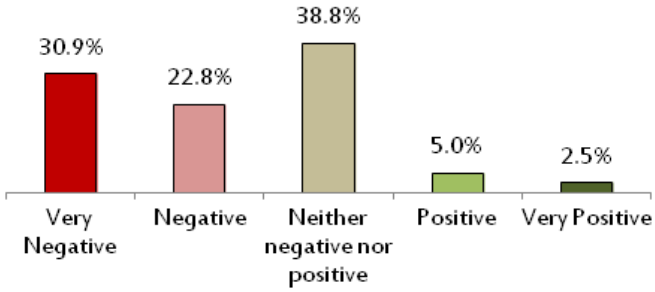
Thank you!

Appendix B: Complete Results of 21 Impacts (Including the Six Discussed Previously in the Report)

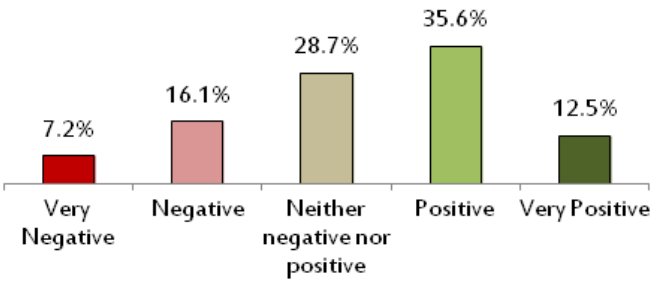
Local Landowner Income



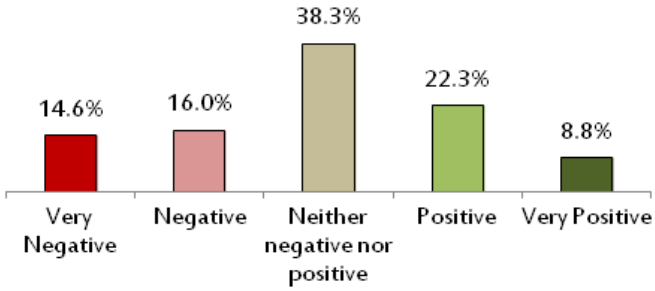
Outdoor Recreation Activities



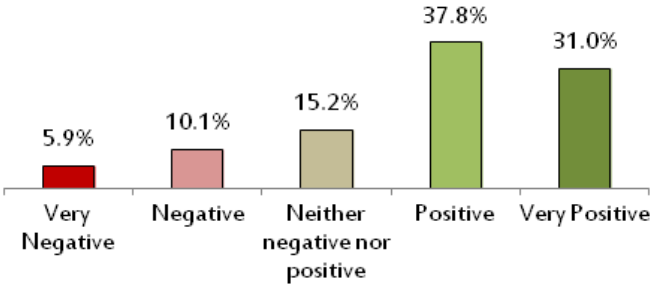
Creating New Jobs



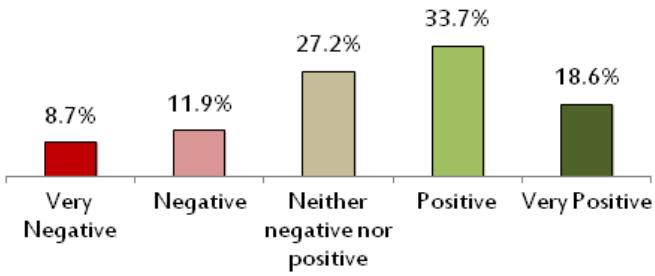
Residents' Electricity Costs



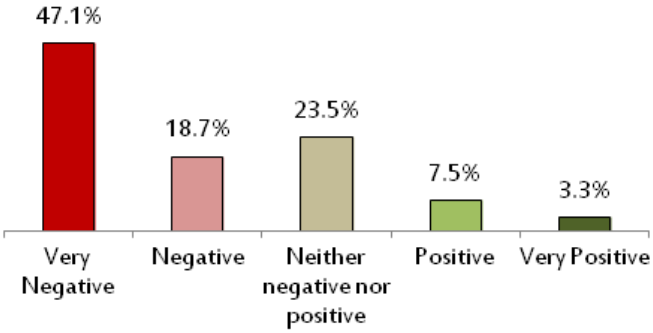
Producing Clean Energy



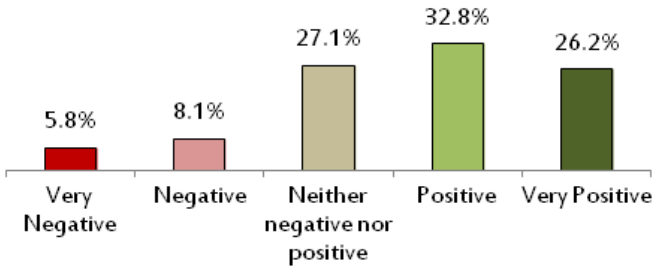
National Energy Independence



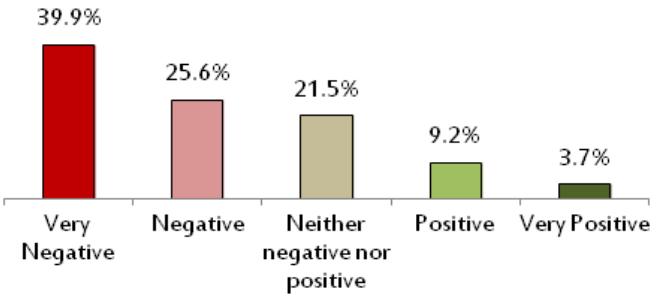
Local Scenic Beauty



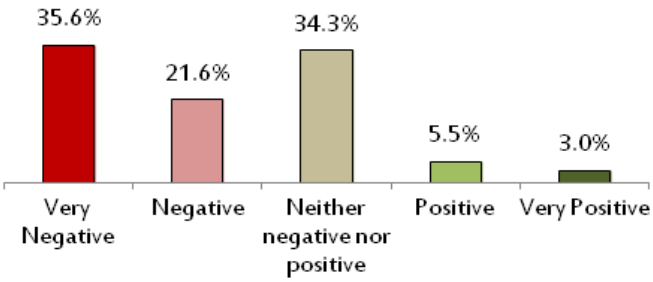
Air Pollution



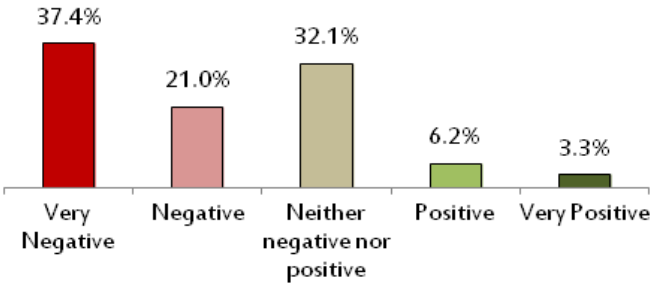
Local Property Values



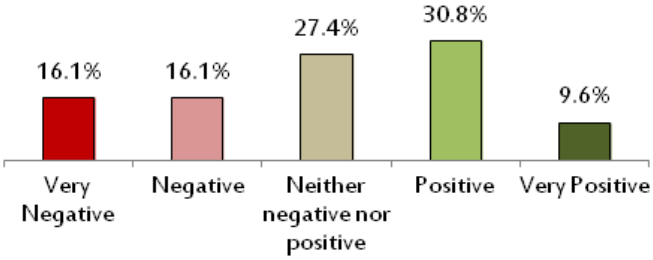
Appearance of the Night Sky



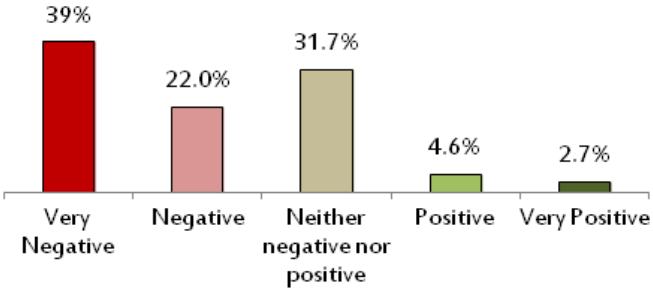
Local Tourism



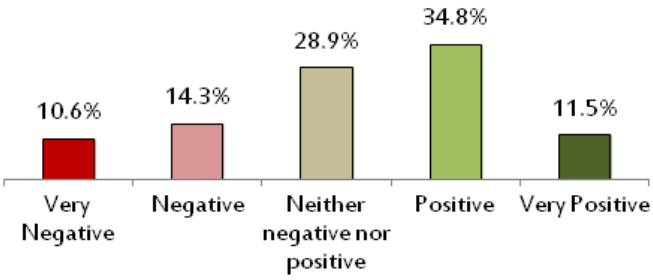
The Local Economy



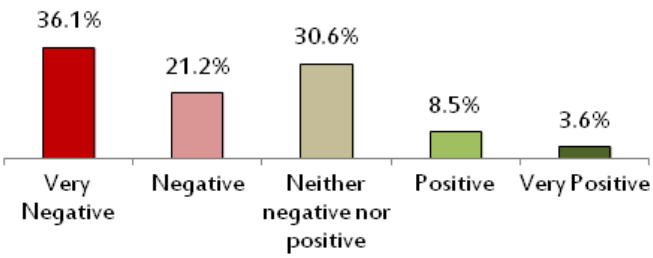
Attracting Seasonal Residents



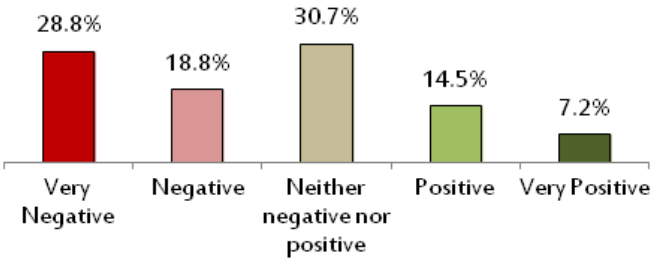
Michigan's Economy



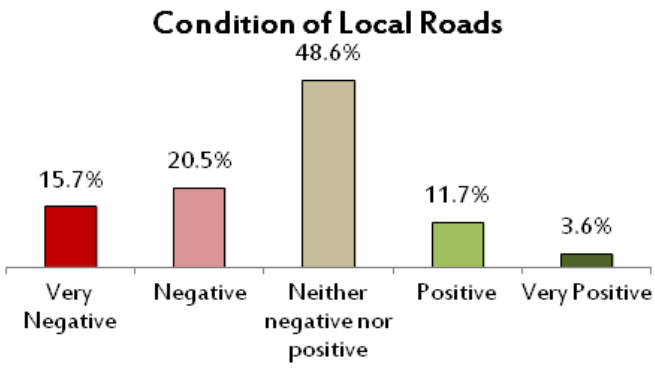
Attracting Full-Time Permanent Residents

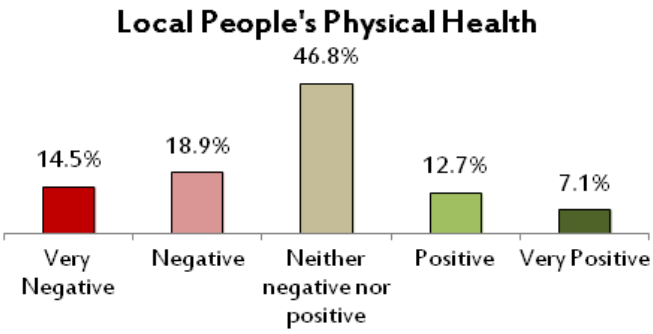


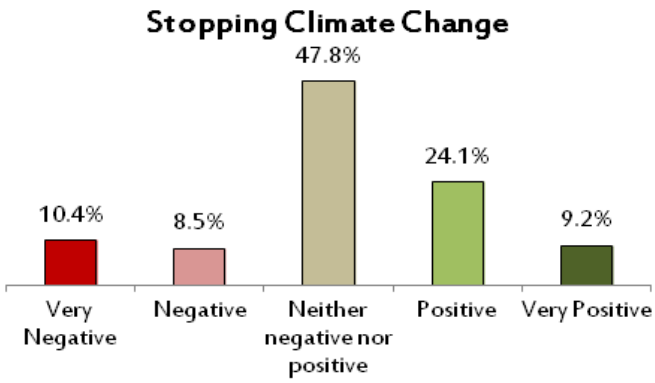
Your Personal Quality of Life

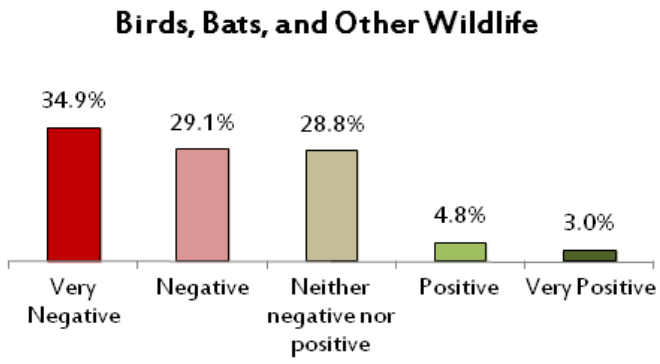



Quality of Life of Others
28.5%
25.8%
24.0%
15.5%
6.2%
Very Negative
Negative
Neither negative nor positive
Positive
Very Positive


Condition of Local Roads
15.7%
20.5%
48.6%
11.7%
3.6%
Very Negative
Negative
Neither negative nor positive
Positive
Very Positive

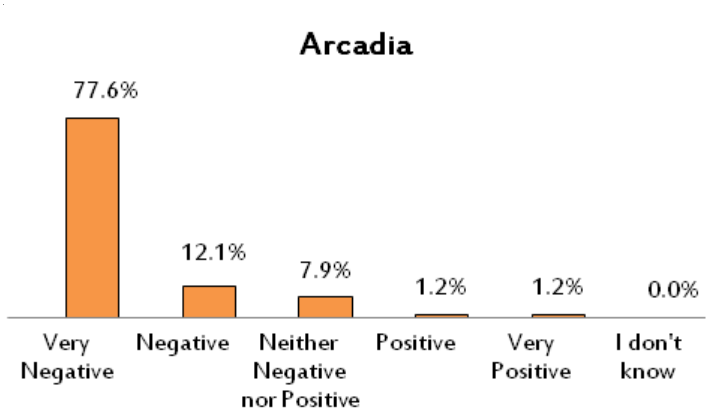

Local People's Physical Health
14.5%
18.9%
46.8%
12.7%
7.1%
Very Negative
Negative
Neither negative nor positive
Positive
Very Positive

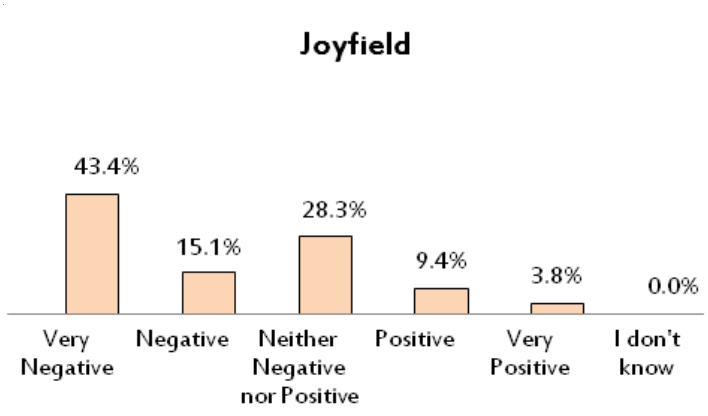

Stopping Climate Change
10.4%
8.5%
47.8%
24.1%
9.2%
Very Negative
Negative
Neither negative nor positive
Positive
Very Positive

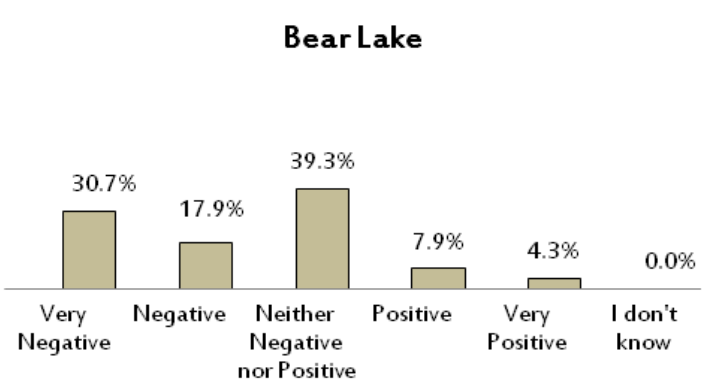

Birds, Bats, and Other Wildlife
34.9%
29.1%
28.8%
4.8%
3.0%
Very Negative
Negative
Neither negative nor positive
Positive
Very Positive

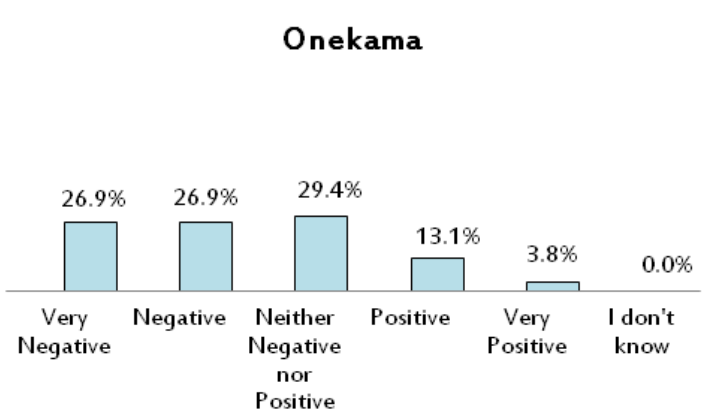
Appendix C: 6 of the 21 Impacts Broken Down by Township

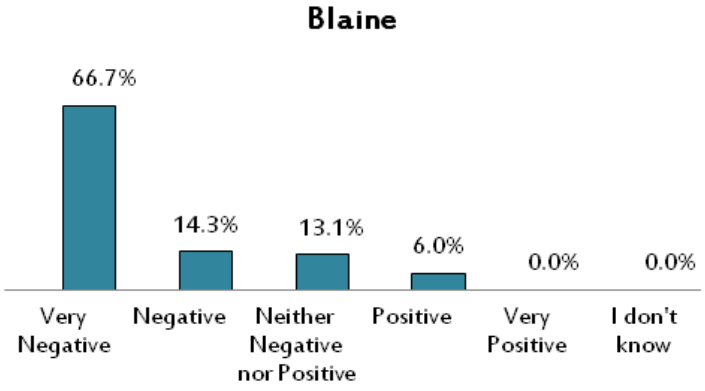
Local Scenic Beauty:

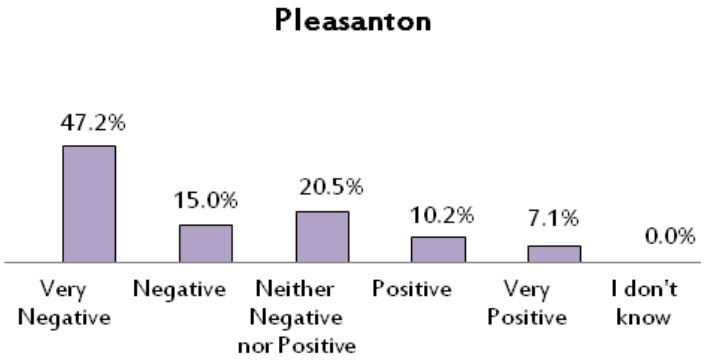




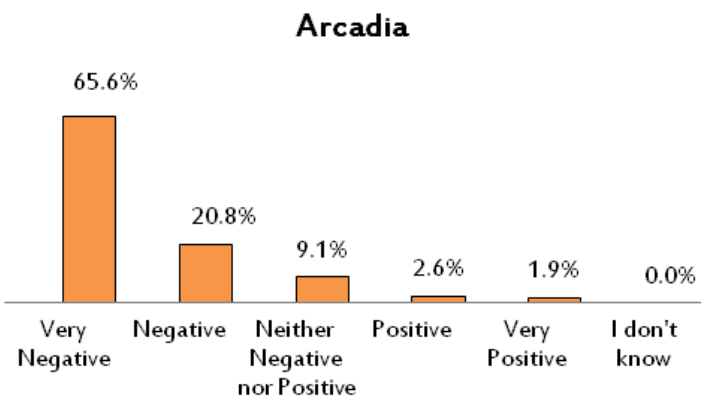


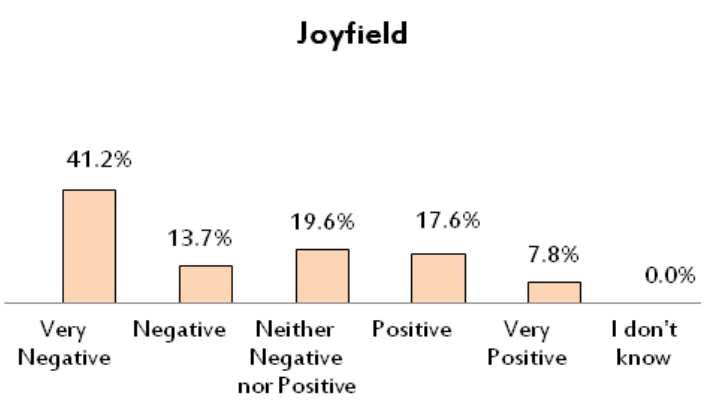


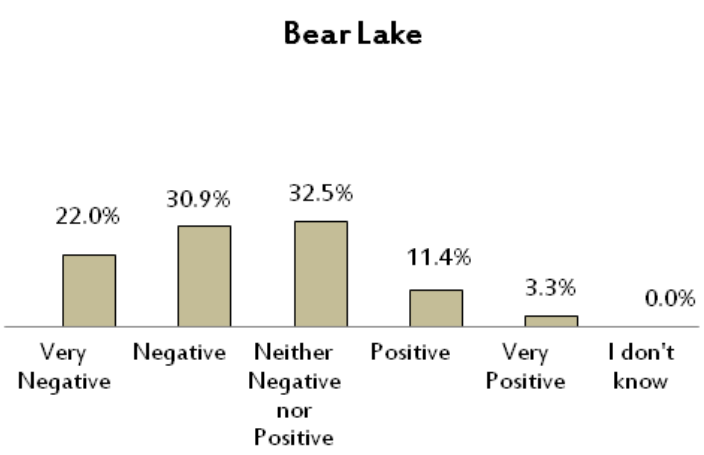


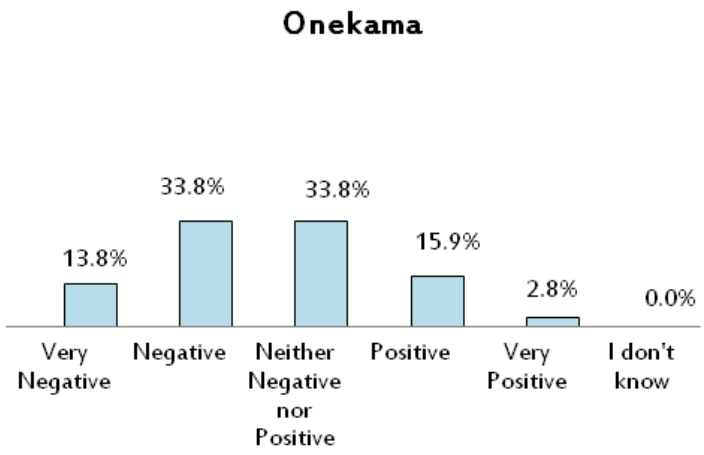


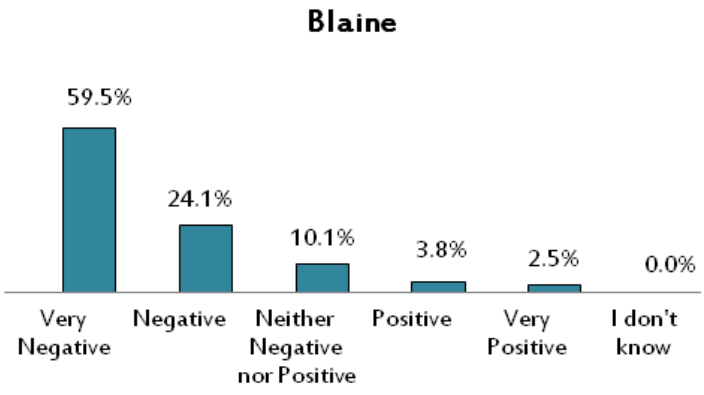
Local Property Values:

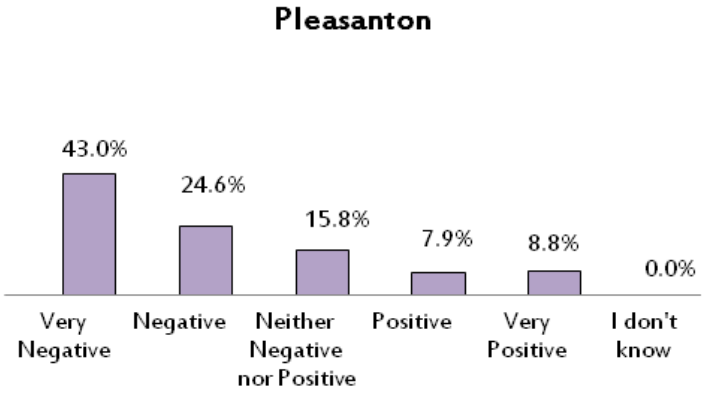




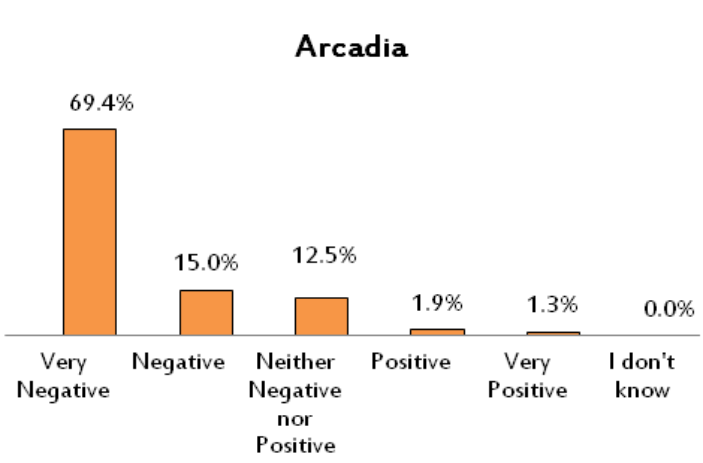


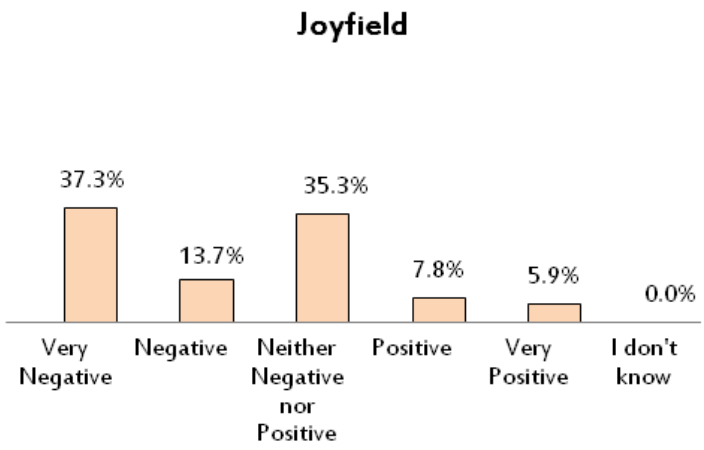


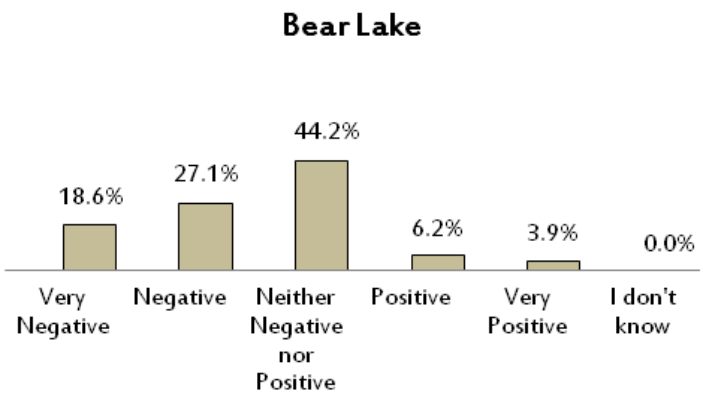


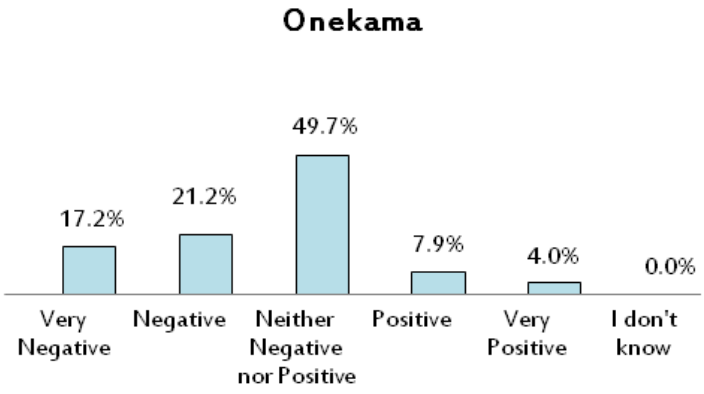


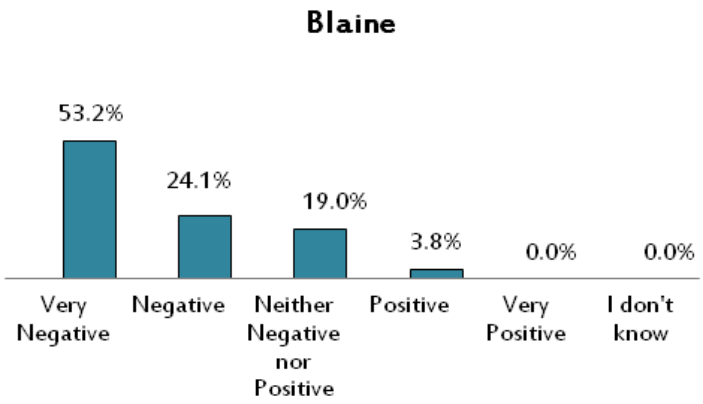
Local Tourism:

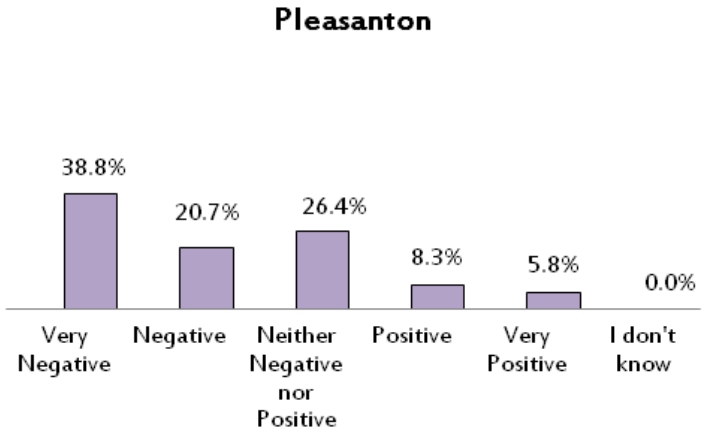




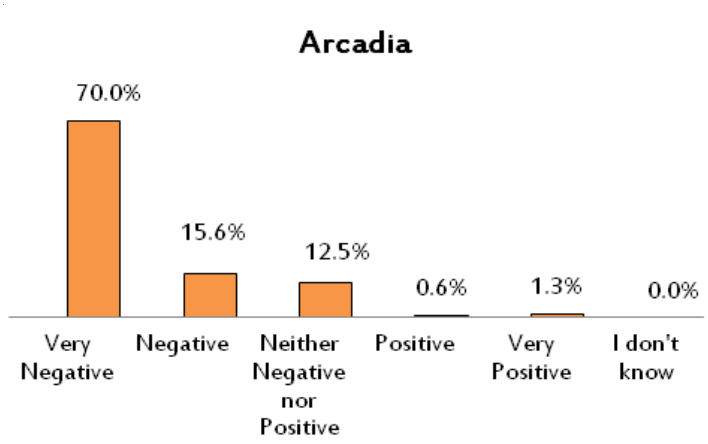


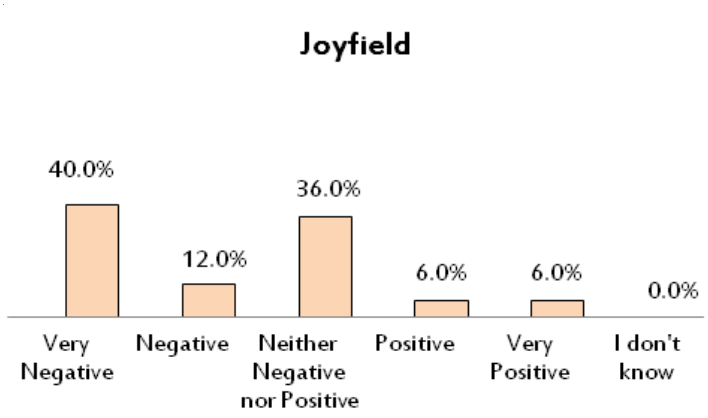


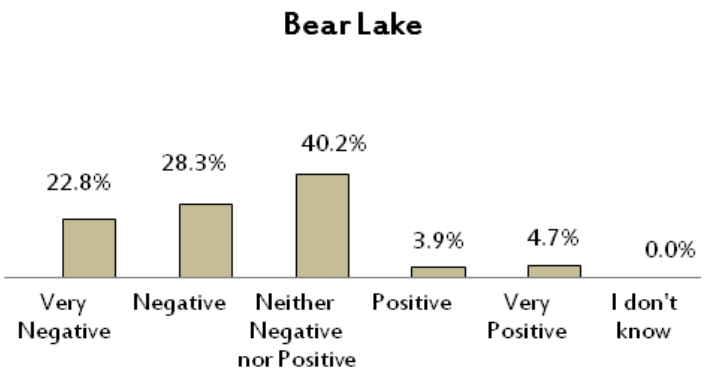


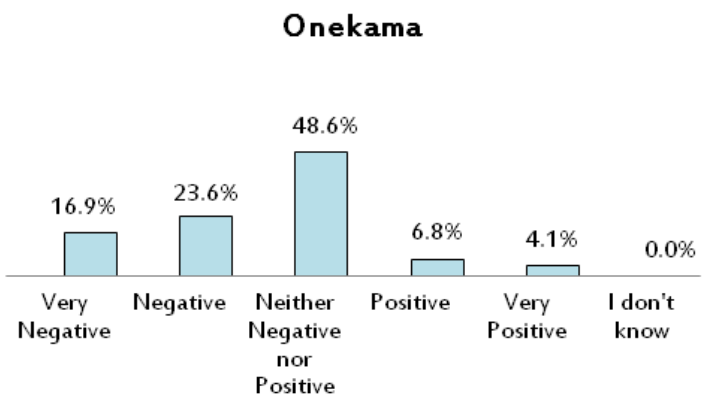


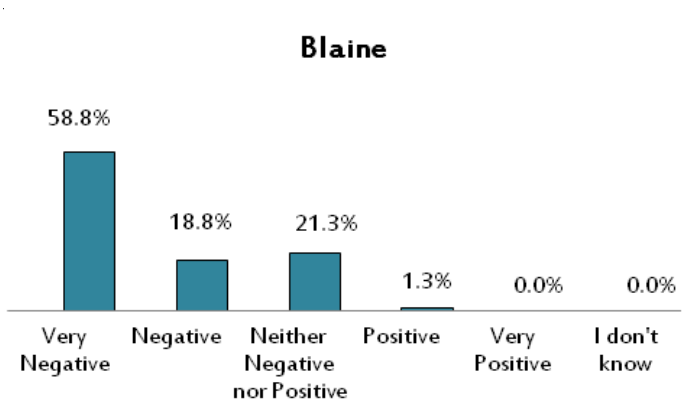
Attracting Seasonal Residents:

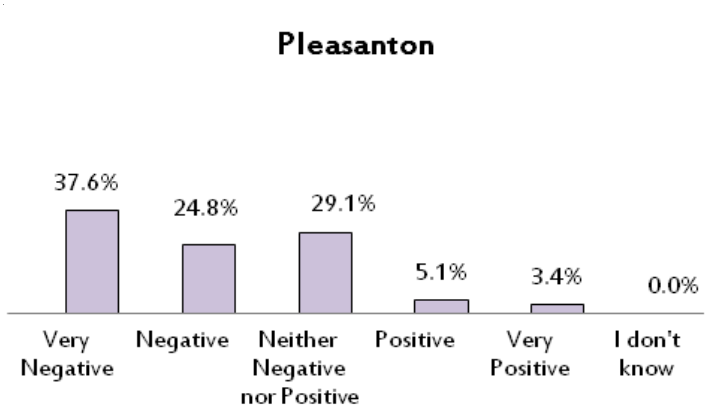




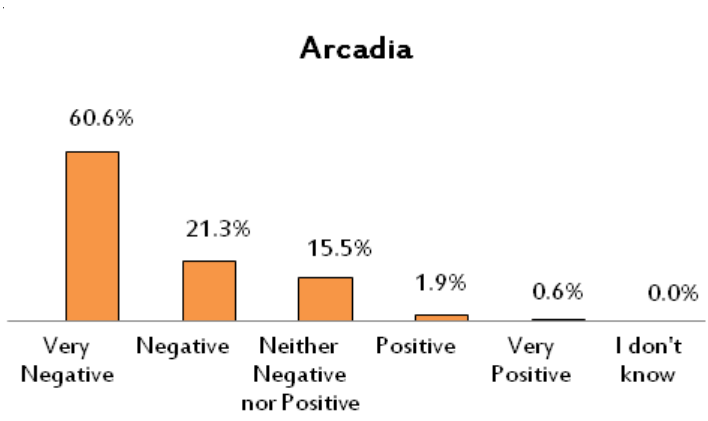


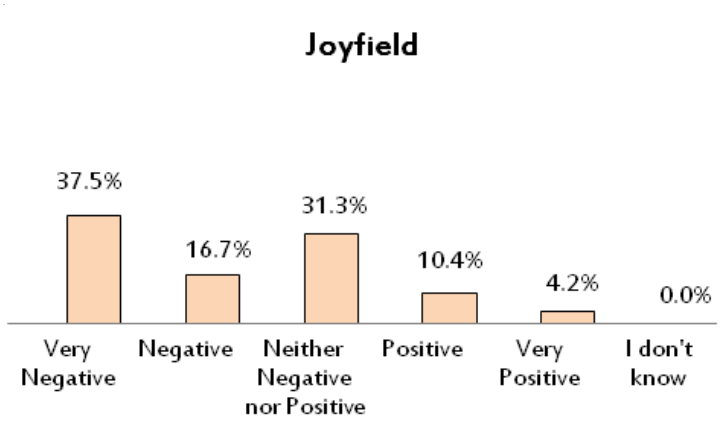


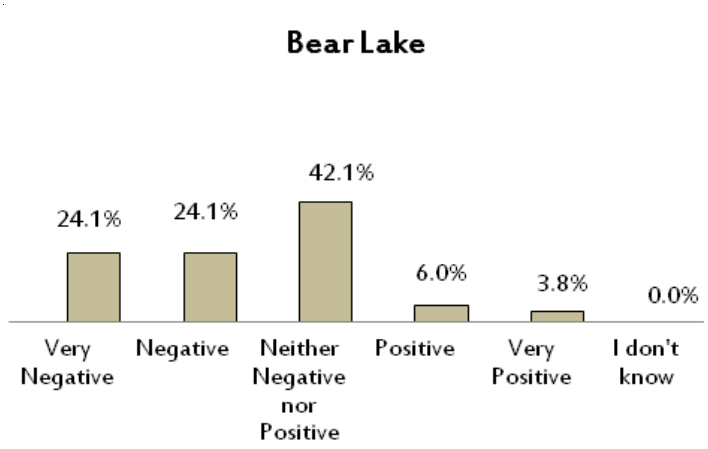


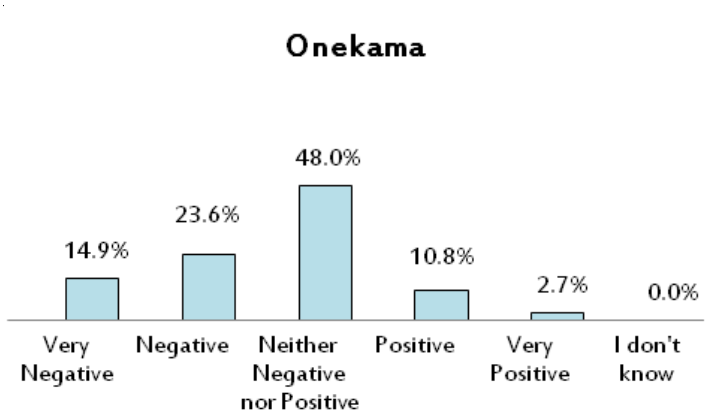


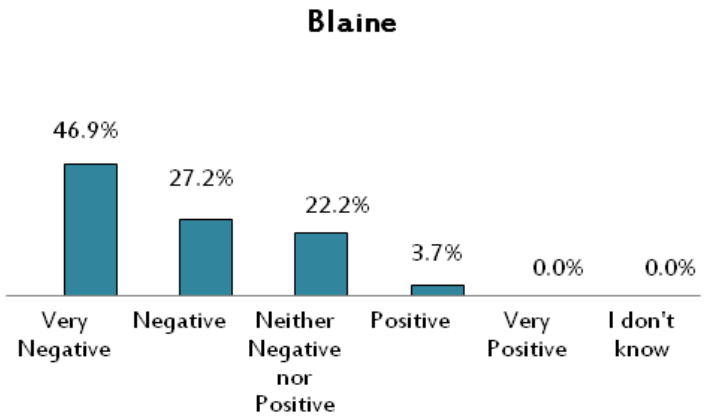
Appearance of the Night Sky:

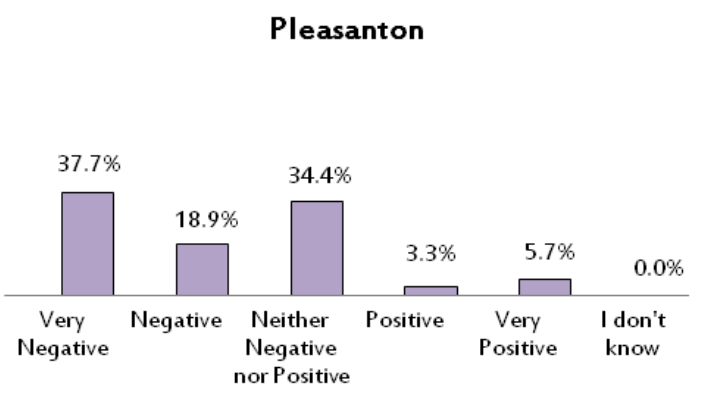






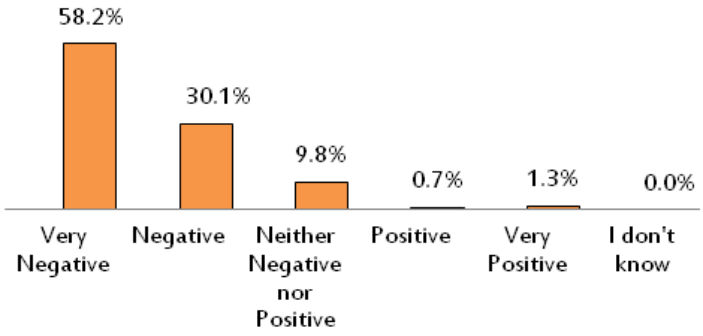




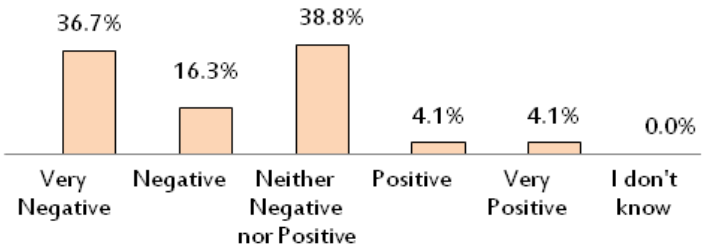


Bats, Birds and Other Wildlife:

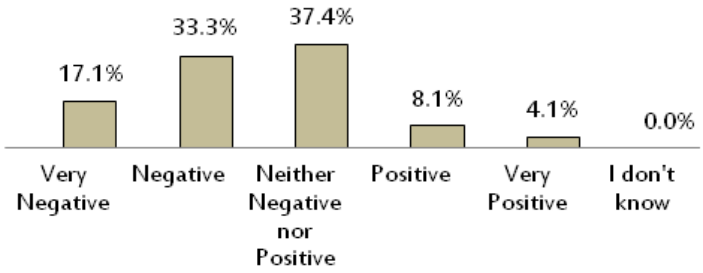
Arcadia



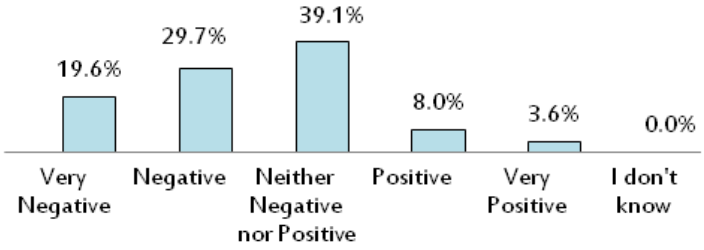
Joyfield



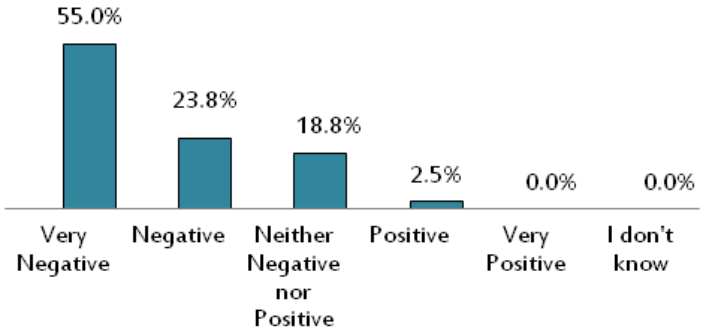
Bear Lake



Onekama



Blaine



Pleasanton