

MINNESOTA WIND ENERGY LANDSCAPE SYMPOSIUM

WORKSHOP REPORT



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MACALESTER COLLEGE



ACKNOWLEDGEMENTS

This symposium would not have been a success without the contribution of energy and enthusiasm from our partners. First, we would like to thank the 21 panelists who contributed their time and thoughtfulness. We extend thanks to the Clay County Board of Commissioners for sponsoring this effort. A special thanks to Tim Magnusson, Dwight Mickelson and Karen Lauer for their local leadership and logistical support. We also thank Robb Siverson for his photography, and Asa Diebolt for his graphic design assistance. Additionally, we would like to thank Joe Rand for his presentation on wind energy during our questions and answers session. Finally, we would like to acknowledge Ann Esson at Macalester College for her assistance throughout the project.

WIND ENERGY SYMPOSIA

This symposium is part of a broader research project aimed at better understanding the role of public deliberation in the siting of wind energy projects. The research is funded through a National Science Foundation grant (# SES 1027294) to Dr. Roopali Phadke at Macalester College.

This report was prepared by a research team from Macalester College. Throughout the symposium, the research team collected demographic data about participants, gauged their familiarity with wind energy, and elicited their perceptions about landscape impacts. This was done through the use of interactive keypad polling, photographic analysis within focus groups, open-ended writing exercises and a final evaluation. The data were brought back to Macalester College for coding and analysis. This summary was prepared as a way of reporting back to local participants, informing local policy makers about community perceptions, and developing a symposium model for the future.

For more information about this project and previous research visit www.macalester.edu/windvisual

This poem was written by a participant during the symposium.

I have seen the grasses rustle
Exposing creatures I'd not seen
And I have felt the blown dirt sting my cheeks
As, the wind, blows across my fields of green

Wind: It moves the snow
Changing directions at its whim
Sometimes blowing with such force, that
I am glad, I am not slim!

The wind was here before the settlers
And continues to blow strong.
It defines the word: Renewable
Unless my definition is all wrong!

Whenever I pay the energy bill
It seems the dollars blow away
Could it be, my old foe: The wind
Might return a future dollar, my way?

Renewable and constant
Harnessed by blade and tower
Wind: Holds a bright future
As a major American power!

I. INTRODUCTION

Concerns about energy independence, climate change and rural economic development have driven state governments to enact laws requiring electric utilities to increase renewable energy generation. Consequently, many rural communities across the country now host wind farms and others have pending project proposals, leading to a number of challenges and opportunities regarding wind development. As communities debate wind energy, the need for clear communication between citizens, government agencies, and wind companies has become increasingly evident. Rural governments and residents must decide the best process to manage wind energy development so that policy comprehensively addresses the concerns of all involved.

Clay County is one such area where wind energy is an important topic to residents, government officials, and developers alike. Located in west central Minnesota on the border with North Dakota, this region has been identified as having high wind energy potential for future electricity generation. While Minnesota ranks fourth in the nation for installed wind energy capacity—and Clay County itself is in an area with relatively high potential—only small-scale wind projects have been built in the county. Two large-scale projects have been permitted by the Minnesota Public Utilities Commission (PUC), but construction has not begun. Given this reality, there is an opportunity for citizens to explore their landscape preferences and express their concerns about pending and future development.

The Minnesota Wind Energy Symposium was organized by a Macalester College research team in partnership with the Clay County Board of Commissioners with the goal of encouraging such deliberation about appropriate wind energy development. At the event, participants were charged with providing guidance to county officials about their hopes and concerns related to wind energy development. The symposium also attempted to explore how a deliberative process could build consensus and influence wind energy development practices.

The participants were selected from a pool of applicants by the Macalester College research team. The team worked with local partners to recruit across a range of demographic census based criteria, including occupation, age, income, gender, and level of education. Everyone who attended received a \$100 stipend in compensation for their time. Before

the event, participants were mailed a dossier with background information about wind development in Minnesota. The symposium was facilitated by Patrick Field from the Consensus Building Institute based in Cambridge, Massachusetts.

Figure 1 shows the demographic breakdown of the group of participants who attended the symposium. Of the twenty-one participants selected for the symposium, the majority was between the ages of 50 and 64, and were mostly male. Additionally, most participants were from more rural districts in the county, with 71% from District 3 in the southern half of the county; very few people came from Districts 1, 4, or 5, all of which are located closer to the regional urban center of Fargo-Moorhead. Much of the proposed wind development will occur in District 3. Most of participants (67%) had been residents of Clay County for more than 20 years.

The symposium was designed to engage participants in a number of participatory exercises throughout the day, including interactive polling, visual simulation analysis, and mapping. The day included two small group discussions framed by activities with the larger group. Throughout the day, participants explored which landscapes they valued in Clay County, and how different configurations of turbines influenced their landscape preferences. They also discussed how landscape impacts may be mitigated.

Figure 1.
Demographic breakdown of participants present at the symposium.

Demographic Variables		Participant Breakdown	
		Percentage	number of people
Gender	Female	38%	8
	Male	62%	13
Age	16–29	14%	3
	30–49	14%	3
	50–64	52%	11
	65+	19%	4
District	District 1	5%	1
	District 2	19%	4
	District 3	71%	15
	District 4	5%	1
	District 5	0%	0

The day began with a photo essay composed of images of Clay County and nearby areas, including examples of agricultural, industrial, and recreational land use. Next, a keypad poll gauged participants' level of exposure to wind turbines, attitudes towards wind energy development and perceptions of the impacts and benefits associated with wind energy. Following this full-group session, participants broke up into three smaller groups to discuss landscape values, visual impacts of wind energy and mitigation techniques. After a lunch break, the large group reconvened for a question and answer session with a wind energy educator. Next, participants broke into small groups again but with different members than in the morning session. This afternoon session was a more structured discussion about how local concerns about wind energy could be translated into policy guidelines or "best practices" for wind development. Finally, the day concluded by reconvening the full group of participants to discuss the best practice recommendations that emerged from the smaller groups. After a second opinion survey identical to the morning keypad poll, the recommendations from each of the small groups were compiled into a larger list, which was voted on by all participants to determine which principles were considered most important to the group as a whole. The findings from the symposium exercises are further described in Section III.

II. WIND ENERGY IN MINNESOTA

The state of Minnesota is a national leader in wind energy development, currently ranked fourth in the nation for installed wind energy capacity. The state currently has 2,518 megawatts (MW) of wind energy constructed. This is due to Minnesota's high wind resource and a state Renewable Portfolio Standard (RPS) which requires utilities to provide 25% of electricity from renewable sources by 2025. Most of the wind farms that help the state meet this standard are located in the southwestern corner of Minnesota. Figure 4 displays the wind resource map developed by the National Renewable Energy Laboratory to show the average wind speeds for the state at 80 meters above the ground.

Minnesota is also a leader in incentivizing community wind development. "Community wind" has several meanings, but is defined by the state as a class of projects that are locally-owned and usually



Figure 2. Participants introduce themselves during the morning session.



Figure 3. Participants compare and contrast three different development scenarios during the afternoon breakout session.

under 30 MW. The same legislation that established Minnesota's RPS also created the program known as Community-Based Energy Development (C-BED), which promotes community ownership of wind farms by making it easier for rural municipalities and residents to finance projects, for example by offering loans with lower interest rates.

Clay County has five stand alone utility-scale wind turbines. Two large wind farms have been permitted by the PUC and not yet built. One 201MW farm was permitted in 2010 and the other 50MW farm was permitted in 2009. The county developed a wind energy ordinance in 2009 to regulate the siting of local projects. However, in the state of Minnesota, the county and township governments have limited means to regulate larger wind projects, and residents must participate in processes led by the state-wide PUC to express their concerns about proposed wind energy project. Counties generally only regulate projects smaller than 5 MW; larger projects are under the jurisdiction of the state Public Utilities Commission. Counties can, by statute, seek the delegated authority from the PUC to regulate wind energy projects up to 25 MW.

III. FINDINGS

The following sections outline the data collected from the large and small group discussions and activities conducted throughout the day. Participants deliberated the landscapes they valued most in Clay County, the visual impact of wind turbines and best practices for wind energy development.

i. Landscape Values

The first morning small group activity asked participants to identify locations in Clay County that had significance and meaning to them. Small group facilitators presented a large aerial photograph of Clay County (see Figure 5) and gave participants pushpins and markers to identify significant points and areas. The participants then discussed why they chose different places and what the valuable attributes of those places were.

Several important themes arose from these discussions. The variation in the type of landscape and land use in the county was widely appreciated by participants. One person remarked, "We feel we live in a very good spot," noting both the urban and rural

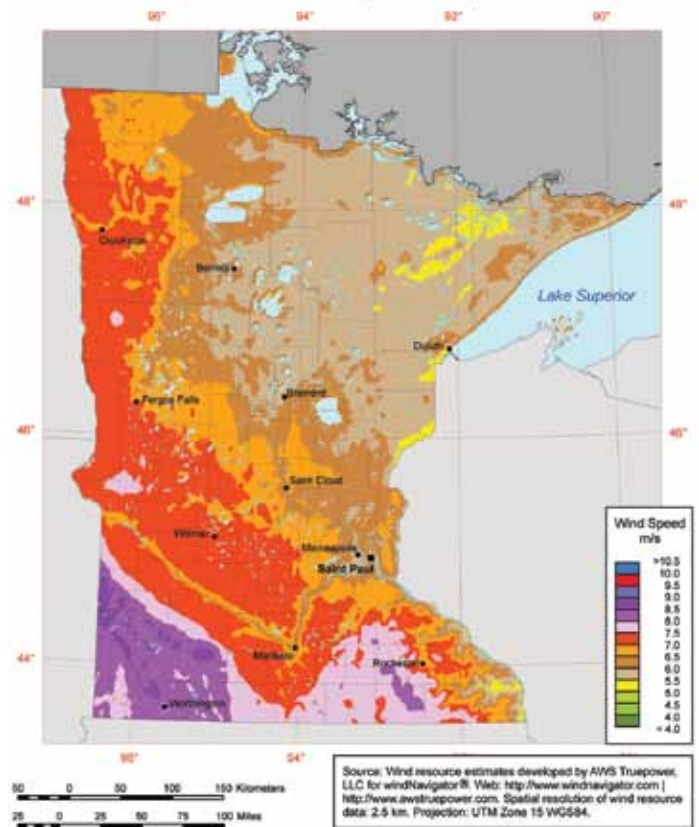


Figure 4. MN annual average wind speed at 80m

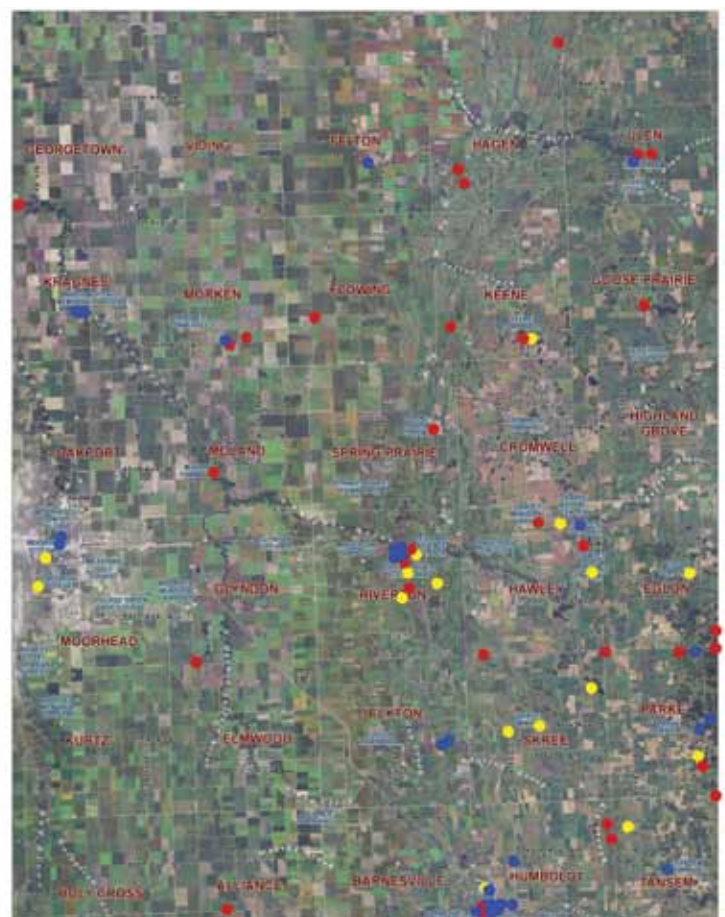


Figure 5. Map of Clay County, MN

resources the area has to offer: Fargo-Moorhead's regional center with medical, educational and cultural amenities, as well as the productive agricultural, recreational, natural spaces. Participants were also extremely knowledgeable about the natural features of Clay County, and many specifically pointed out the hilly area in the southeastern corner of the county. One participant identified the former shoreline of glacial Lake Agassiz, which created the unique hills and bluffs in the eastern part of the county, as a defining characteristic. That person stated, "Everyone who knows this county knows how flat this is, and that's the lake plane." Another participant noted "On this ridge here, there is a spot where you can see 180 degrees around the county." There was a clear appreciation for natural areas in the county, such as Buffalo State Park, and the recreational opportunities and wildlife these areas support. Participants also mentioned public swimming areas, golf courses, boating and fishing spots, and parks as being significant.

Another theme in participants' choices were places that held social and personal importance. Many marked farmland where they themselves or family members grew up. Another group of participants explained the sense of community in Clay County: "Each community has their own [annual] celebration... there are common things that everyone is aware of, everyone is familiar with the lay of the land" and another added, "And then we still have the county fair, and that pulls the whole county together." It was clear that community ties were part of what made certain parts of Clay County very special to participants.

Participants were also cognizant of the land use issues in areas outside of Clay County. One person commented on the activity by saying, "I also hold dear places that I've never seen and never will see... I think there are values that most of us have for areas that we don't necessarily see or have ever seen...to most of us it's complicated, if I could have ten wind towers put on my property and it would reduce the number of troops who are sent to Iraq, I'd say put twenty on my lot, I'm willing to give up some values in exchange for other values..." Another participant agreed, explaining, "I might not want something here but if it means we can save, preserve, reduce something there, fine, we'll give up this part." Participants expressed a clear understanding of the trade-offs involved in land-use decisions.

Throughout this activity, it was evident that par-



Figure 6. Participants discussing their pushpin placement and the places they value in the county.

ticipants highly valued many different aspects of Clay County. One participant explained that, "Part of our culture is to appreciate where we are." Regarding the idea that Clay County seemed uninteresting to outsiders, a participant remarked "Only boring people are bored. You don't have to be bored in Clay County... you can really see the scopes of the world here, it really is a diverse place." While participants choose specific places all across the county, they expressed a common sentiment that community ties and the diverse land uses of Clay County made it special. A participant aptly summarized these sentiments, saying, "The value is there for the land, the terrain, it's valuable for personal and sentimental reasons, it's rural and freedom, it is something special."

ii. Visual Impacts

The visualization exercises in the morning small group sessions provided useful information about general landscape preferences, while also exploring participants' rationales for their preferences. In addition to the mapping exercise described above, the morning session involved discussions and voting on three groups of images: photographs of two local landscapes without turbines, the same landscapes with three simulated turbines, and the two landscapes with configurations of 6 or 14 turbines (See figures on following pages). The base images were taken by a local photographer, Robb Siverson, and were chosen to be representative of the area's unique landscape, which is characterized by both flat farmland and rolling grassy hills. The simulated turbines were added

Figure 7. Landscape preferences from the first task of the exercise.



Image A. 21% (4.5 participants) preferred this image. Key descriptors included: flat, open space, farmland, familiar



Image B. 79% (16.5 participants) preferred this image. Key descriptors included: topography, rolling hills, greener, grassland, scenic activity, diversity

by a graphic designer in Saint Paul. Overall, the activity was intended to allow participants to express if certain local landscapes were more compatible with wind energy systems, and if so, at what scales and in which configurations.

The first task asked participants to compare their initial aesthetic preferences of two landscapes and revealed convergence among participants for one of two images. Although people gave a variety of reasons for their selection and had difficulty choosing a favorite, participants generally tended to prefer Im-

age B because the hills depict the “special features” of Clay County’s landscape and have “more character” and “diversity”. Meanwhile, image A appeared more “flat” and like farmland to the participants which, while productive-looking and “familiar” to many at the symposium, was not as captivating or special to the group as a whole. Figure 7 displays the photographs used, along with poll results and the main terms participants used to describe the images (note: one participant liked both so their choice was calculated as a half a vote for each).

Figure 8. Landscape simulations from the second task of the exercise.



Image A1. 48% (9.5 participants) preferred this image. Key descriptors included: belong there, affected by people, less intrusion, more farm-like, less disruptive



Image B1. 48% (9.5 participants) preferred this image. Key descriptors included: blends in better, more improved, camouflage

The second task helped distinguish the landscapes participants thought may be suitable for wind development. This part of the exercise generated significantly less agreement among participants than the previous set of images, with equal numbers of participants choosing Image A1 and B1, and one preferring neither. It is important to note that several participants felt that choosing between the two was difficult because they did not prefer one over the other or they liked both equally, so again, some participants voted for both images. Many also pointed out that they didn't change their preference from the first task to the second because the turbines didn't substantially impact their opinion of the landscapes. In general, however, image A1 was popular among some because the turbines "looked like they belong there" or seemed "less disruptive" to the already farmed and "human-altered" landscape. Image B1, on the other hand, was noted by many because the turbines "blended in better". Figure 8 displays the simulations, poll results, and key descriptors from worksheets (note: 20 out of 21 participants responded and three voted for both images so their choices are all calculated as a half a vote for each image, and one liked neither so their vote makes up the remaining 4%).

Finally, the third set of simulations led to a discussion of what participants felt was the most acceptable density and layout for turbines on a landscape. This task required people to choose their favorite image among six simulations –two images with 3 turbines, two images with 6 clustered turbines on the landscapes, and two images with 14 turbines scattered on the two landscapes. Many chose more than one as their favorite. During this exercise, participants' aesthetic preferences varied significantly, leading to a range of reasons given for their preferences during the discussions of the images. Overall, Image B1 was the most widely favored image and people maintained their rationale from the previous task that the turbines seemed to blend in best with this landscape. However, votes were distributed widely across all simulations, with a variety of explanations provided for the choices made. Figure 9 displays the images used in this task (note: one participant liked none of the landscapes so their vote makes up the remaining 6%, and three people did not vote).

This image exercise allowed participants to think about the design of wind developments across various landscapes. As participants discussed turbine configurations, many comments arose about preferences for scales of projects and the distribution of

turbines within them. Many noted the usefulness of clustering turbines when farming equipment needs to navigate around them, while others liked the clustered look because they felt that building them close together in high density would potentially help limit the visual and environmental impacts of wind projects while also efficiently producing energy. Still others preferred the symmetry and "less-dense" look of the scattered turbines. Another important topic of discussion was the need to think about scale, especially when considering potential nearby landowners and their viewsheds weighed against the electricity generated by larger projects. One common feeling was that if there was already development, it might as well be large enough to generate a lot of electricity: "If you put up 3 you might as well put up 14," said one participant. However, there were a significant number of people who expressed the desire to keep projects small-scale and scatter turbines because they found those aesthetically acceptable; as one person succinctly put it: "Why did I pick [Image A1]? Simple: fewer turbines". Overall, while the activity revealed a range of opinions about scale, placement, and density, it did establish some common values among participants.

iii. Mitigation

Throughout the morning breakout session, many participants expressed a desire to understand the practical application and impacts of wind energy in their community. Though two projects have already been permitted in Clay County, neither have been built. Therefore, participants were eager to discuss ways to mitigate the social, aesthetic, and economic impacts of wind energy as the county prepares for future development.

After discussing the aesthetics of wind energy development in the morning breakout session, participants were asked to consider the configuration and design preferences to lessen the visual impacts of wind energy in Clay County. Participants were given eight options and asked to vote on their preferred mitigation strategies. In total, more than three quarters of participants chose limiting the total number of turbines in natural and scenic areas as one of their top mitigation goals. Support for other mitigation options was more varied. Some of the more popular strategies included placing turbines in clusters and limiting the overall height of turbines.

During the symposium, participants expressed a tension between the rural areas where wind en-

Figure 9. Layout simulations (see Appendix A for larger versions) from the third task of the exercise.



Image A1. 16% (2.83 participants)



Image B1. 25% (4.5 participants)



Image A2. 14% (2.5 participants)



Image B2. 8% (1.5 participants)



Image A3. 16% (2.83 participants)



Image B3. 16% (2.83 participants)

ergy is produced and the urban areas where most electricity is consumed. Some participants suggested that turbines be placed closer to cities and are more appropriate in areas of intense land and energy use. As one participant said, developers should “[site turbines] closer to cities and towns and already developed areas.” Additionally, a participant commented that developers should “not justify project locations by low population densities” and should disperse turbines between rural and urban areas so that their impacts are shared. Further, some participants commented that turbines also embody a more urban aesthetic and would blend better in that landscape. For example, one participant stated: “I think the cities... need more turbines not less... they are much less visually detracting from the environment to have them located by Moorhead... because we already have all of these ugly tall buildings, what’s a couple more?”

In addition to design and siting strategies, many participants felt that the environmental benefits of wind energy made turbines tolerable on the landscape. As one participant commented, “Are wind turbines nice looking? No they are not. But when you talk about better air and a better environment... I can put up with having to look at turbines.” Another participant expressed a similar idea: “If my choice is to have wind farms located next to Buffalo State Park or to build another coal generating plant in North Dakota that’s going to pollute my air, I will say build the wind towers.” This practical, calculated perspective shaped conversation throughout the day as individuals considered the environmental and visual trade-offs of wind energy.

While a majority of participants felt that mitigating the aesthetic impacts of wind energy was important in Clay County, there were others who felt that mitigation was either unnecessary or ineffective. Some individuals commented that wind turbines made landscapes more attractive, making viewshed impacts a nonissue. A few participants had the opposite reaction. They felt that turbines dominate the landscape and their impacts on the local area would be too disruptive to mitigate. As one participant explained, “It’s not a virgin landscape. There are a lot of communication towers... But, I think there is a qualitative difference with wind turbines– the way that they draw the eye and change the visual experience. Whatever the configuration, a viewscape that is filled with towers is not a place that I would like to inhabit.”

In the afternoon breakout session, participants were asked to consider the social, environmental, and economic aspects of mitigation. They were presented with three different projects of varying scale that were loosely modeled off of existing projects in Minnesota. Project 1 was a small (5.7 MW), privately owned wind farm; Project 2 was a medium (100.5 MW) community owned project; and Project 3 was a large (200 MW) privately invested and owned wind farm. For each project, participants were also given information about community compensation, land-owner lease agreements, the area the project spanned, the cost of development, and the age of the farm. This activity asked participants to evaluate project characteristics and allowed them to start thinking about what they would consider the best practices for wind energy policy and permitting. In order to



Figure 10. Small groups of participants discussing the scenario exercise during the afternoon breakout session.

do this, facilitators asked participants to imagine that they were a Clay County commissioner and had the opportunity to recommend or discourage the Minnesota PUC from permitting each of these projects. Despite this charge, many participants felt that they did not have enough information to make a final recommendation. The conversation instead focused on the particular aspects of the projects that determined their acceptability. When discussing Project 1, many participants appreciated that a small number of turbines would have a minimal visual impact on the landscape. However, they also questioned the financial viability and the environmental payoff of a small project.

While many participants appreciated the fact that Project 2, being community owned, would benefit citizens more directly, they also acknowledged the uncertainty involved in such a financial undertaking. As one person stated, “I think community development is a good thing—if it can work financially, I’d certainly be more in favor of a community than a large-scale company that we don’t know coming in.” At the same time, that individual also recognized that Project 2 would have a smaller environmental benefit than Project 3 because of its size. Project 3 was recognized by many as the most financially and environmentally beneficial, but participants expressed concern that a large-scale project would unfairly impact neighbors and disrupt the strong community ties

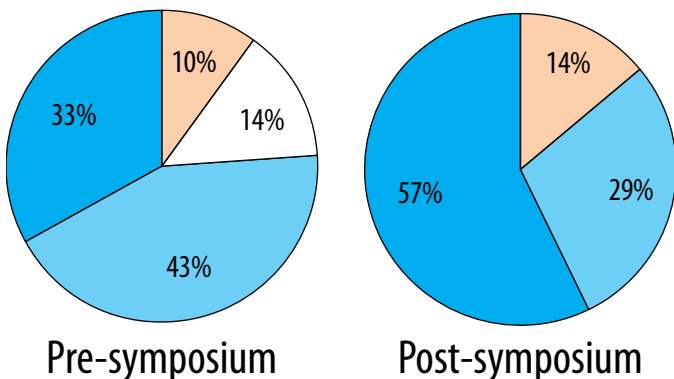
in the area.

As participants discussed the three projects, they weighed the aesthetic, environmental, financial, and social trade-offs that accompany wind energy projects of different scales. While participants’ particular opinions varied, many were concerned with the practical application of wind energy in the county. Instead of asking how they could preserve the community as it is, many individuals asked how wind energy would affect the community and how they could mitigate the negative impacts while harnessing the positive opportunities.

iv. The Deliberative Process

Another important goal of the symposium was to give participants an encouraging environment to talk about their varying and conflicting opinions about wind energy. Through a deliberative process that included information sharing, education, and thoughtful discussion, participants were encouraged to share their opinions with one another in order to better understand each other’s views. Morning and afternoon keypad polls were conducted to gauge how people’s opinions changed over the course of the day, as well as morning and afternoon questionnaires to track more nuanced changes in opinion about 23 specific impacts of wind energy. Finally, a symposium evaluation was collected at the end of the day to give

Attitude toward wind development in US



Attitude toward wind development in county

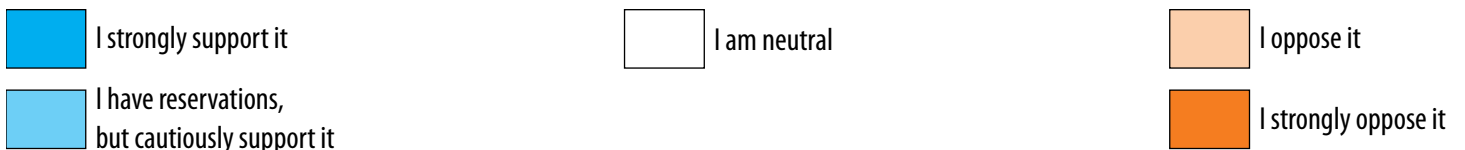
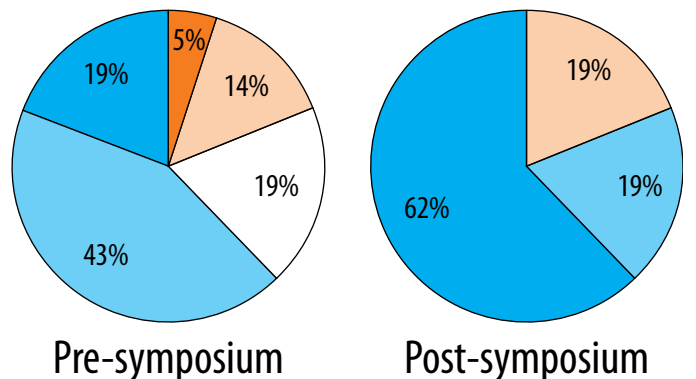


Figure 12. Changing attitudes toward wind energy in both Clay County and the U.S. were evident.

participants a chance to assess their experience with the deliberative exercises.

The keypad poll asked participants to describe their attitude towards wind energy development in the United States, giving them a chance to express support, opposition, and neutrality. A comparison of the morning and afternoon polls shows that overall participants became more strongly in support of wind energy both in their county and in the United States as a whole. In addition, those who were neutral in the morning polls took a side (either opposed or in support) by the afternoon poll. Figure 12 depicts the percent change among participants between the two polls.

Along with this keypad exercise, we asked participants to take note of the three benefits and concerns that they associate most with wind energy. While the results, displayed on the next page in Figure 13, don't point to a convergence around a particular concern or benefit, they do show that people's opinions shifted over the course of the day as a result of in-depth deliberation.

There were also significant changes in individual perceptions of issues from the morning to afternoon questionnaires. Participants perceived the impact of wind energy on 14 of the issues more positively, 5 more negatively, and did not change opinions on 4 over the course of the symposium. A graph of the distribution of these votes is provided in Appendix B. As a group, opinions changed most positively about wind energy's effect on local property values and the local character of their area. Conversely, people began to think more negatively about its effect on national energy independence and air pollution (see Figure 14). Note that these results indicate that participants perceived these issues as less positively or negatively overall, not necessarily that their opinion shifted from positive to negative or vice versa. This suggests that the perception of impacts of wind energy which were considered to be very extreme, either positively or negatively, were tempered over the

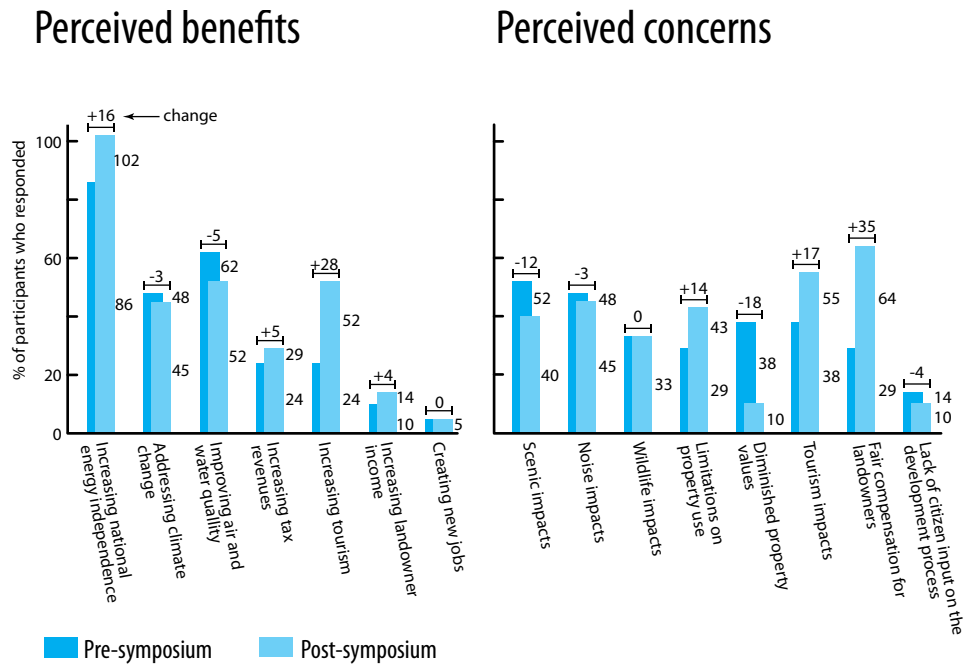


Figure 13. Participants' perceptions of the benefits and concerns of wind development shifted, but didn't necessarily converge. They were able to vote on their top three benefits and concerns (and many voted for one benefit or concern more than once), causing the total percentages to add up to more than 100%.

course of the day, but were on average more positive overall.

In a final evaluation, we asked participants about their experience with the symposium format and facilitation. The results of these evaluations indicated a very positive impression of the symposium's educational value. All 21 participants agreed that they learned something new at the symposium (52% strongly agreed that they had) and the 20 participants who responded to the question felt they had a better understanding of difficult choices as a result of the symposium (45% strongly agreed). The evaluation of the morning and afternoon sessions revealed similar feedback, with 86% rating the morning breakout as useful and 90% rating the afternoon experience as useful, and all remaining participants indicating neutrality. Several participants also added that they appreciated the opportunity to come to such an event, and many used the comments section to reiterate that they had learned something at the event.

Overall, the 20 people who reported back on the symposium evaluation (one person did not answer all questions) stated that they thought the facilitation was fair and balanced. When asked if participants felt that their opinions about some aspects of wind

Change in opinion between morning and afternoon

The six issues for which participants' average opinions changed most significantly

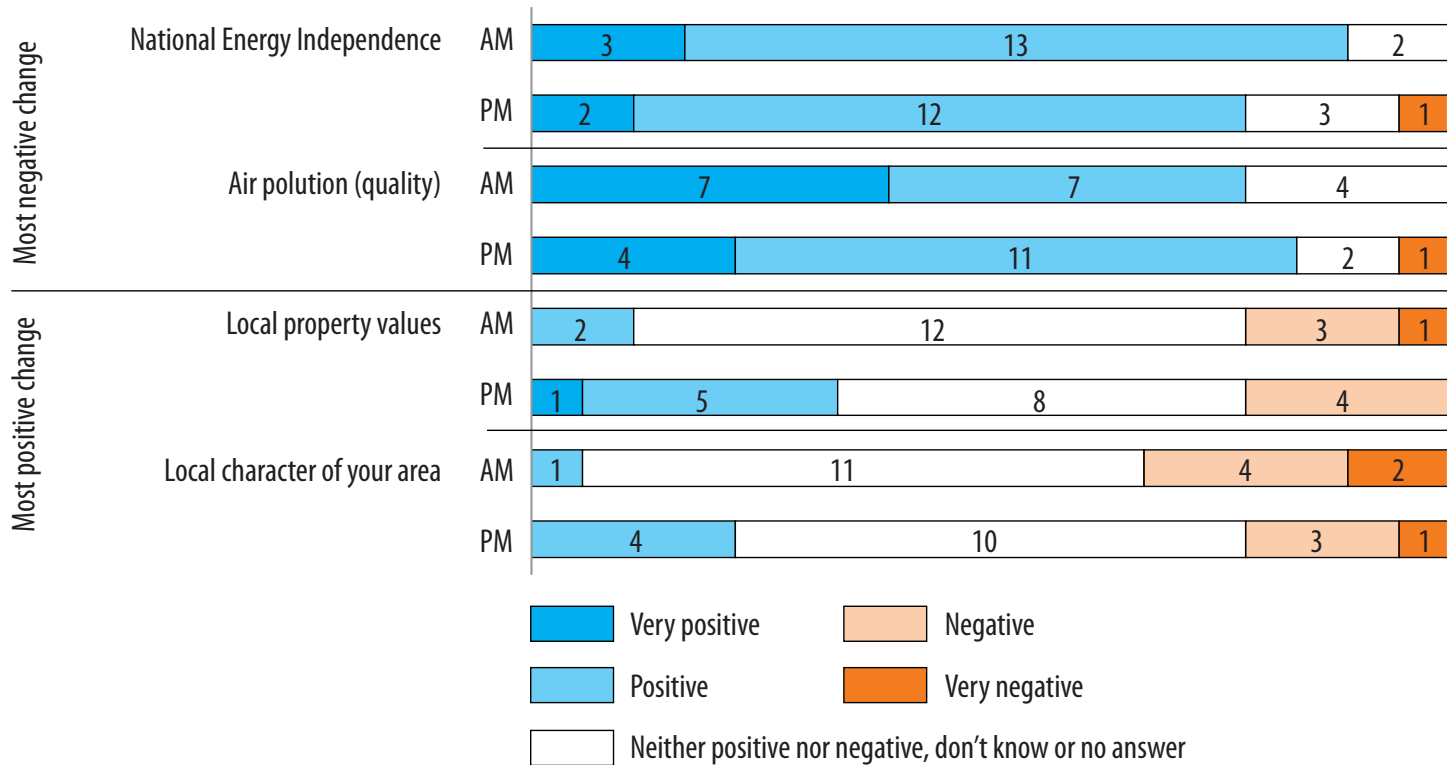


Figure 14. The impacts for which people's opinions changed most negatively and most positively over the day.

energy had changed as a result of the symposium, 67% said they had. Additionally, 90% stated that they agreed with the conclusions of the symposium, and the remaining 10% felt neutral. This points to a consensus among the group regarding best practices, although the more nuanced responses on the questionnaires concerning specific impacts of wind energy show that this consensus is limited. These observations demonstrate the ability of deliberation to help people think about a topic as complex and often controversial as wind energy, and in some cases even reach a consensus-based decision about it.

IV. OUTCOMES AND NEXT STEPS

The charge for participants throughout the symposium was to provide guidance to Clay County officials, the Minnesota Public Utilities Commission,

and wind developers about public opinion in Clay County. Specifically, participants were asked to communicate their perceptions of wind energy opportunities, challenges, impacts, and design preferences.

One way that participants did this was by generating a list of Best Practice Principles for wind development. These principles were formed and recorded during the afternoon breakout session and conversation about project scenarios. Using interactive keypad polling, participants were able to indicate their level of support for each principle, ranging from "Strongly Support" to "Strongly Oppose." Through this activity, the importance of a transparent and interactive development process emerged strongly in a number of principles, as participants asked for a "robust community process," "compensation and mitigation efforts," and "transparent and equitable developer-landowner negotiations".

Participants reaffirmed their care for the local landscape as nearly every participant supported "protecting natural and recreational areas" in Clay County. This resonates with their vote after the morn-

ing breakout session, where more than three fourths of participants chose protecting natural and scenic areas as one of their top mitigation strategies. The top ten Best Practice Principles are listed in Figure 16. All eighteen principles are listed in Appendix A.

As a deliberative process, the symposium was valuable in a number of ways. Because the Minnesota Public Utilities Commission does the majority of wind energy siting, zoning, and permitting on a case by case basis, communities rarely have an opportunity to meaningfully discuss the impacts on the county. Many participants verbalized this sentiment as well, asking county officials to be “planful” when developing wind energy resources across the county.

Organizers hope the results of the symposium can aid county and state commissioners in responding to residents’ concerns by developing appropriate wind energy policy. Scholars can also better understand wind energy development at a community level. The symposium approach also fosters a model of energy policy that is participatory and deliberative. Symposium organizers hope that county officials, scholars, citizens, and all local stakeholders continue to engage with each other and the issues brought up during the event as they look toward a future with wind energy on the landscape.

Figure 16. Top 10 Best Practice Principles

(For a list of all the principles, see Appendix C)

1. A robust community process (funded by the developer) that is prior to, and more extensive than, the public comment process on the project application
• 95% Support
2. Protecting natural and recreational areas
• 95% Support
3. Compensation and Mitigation Efforts Where Possible — such as benefit-sharing mechanisms for affected landowners
• 90% Support
4. Transparent and Equitable Developer-Landowner Negotiation
• 86% Support
5. Economic Return to the Community — for example, construction impacts on county roads, tax benefits, decommissioning costs, electricity rate impacts, etc.
• 86% Support
6. Planning that considers human health impacts (noise, etc.)
• 81% Support
7. Consider the Scale of the Project — too big or too small
• 79% Support
8. Prioritizing local materials, manufacturing, and jobs
• 76% Support
9. Public safety (air traffic, access for emergency services, proximity to roads)
• 76% Support
10. Consider impacts to other infrastructure (telecommunication)
• 76% Support

Measures of support include those who “strongly support” and “support” these principles.

APPENDIX A: PHOTOSIMULATIONS

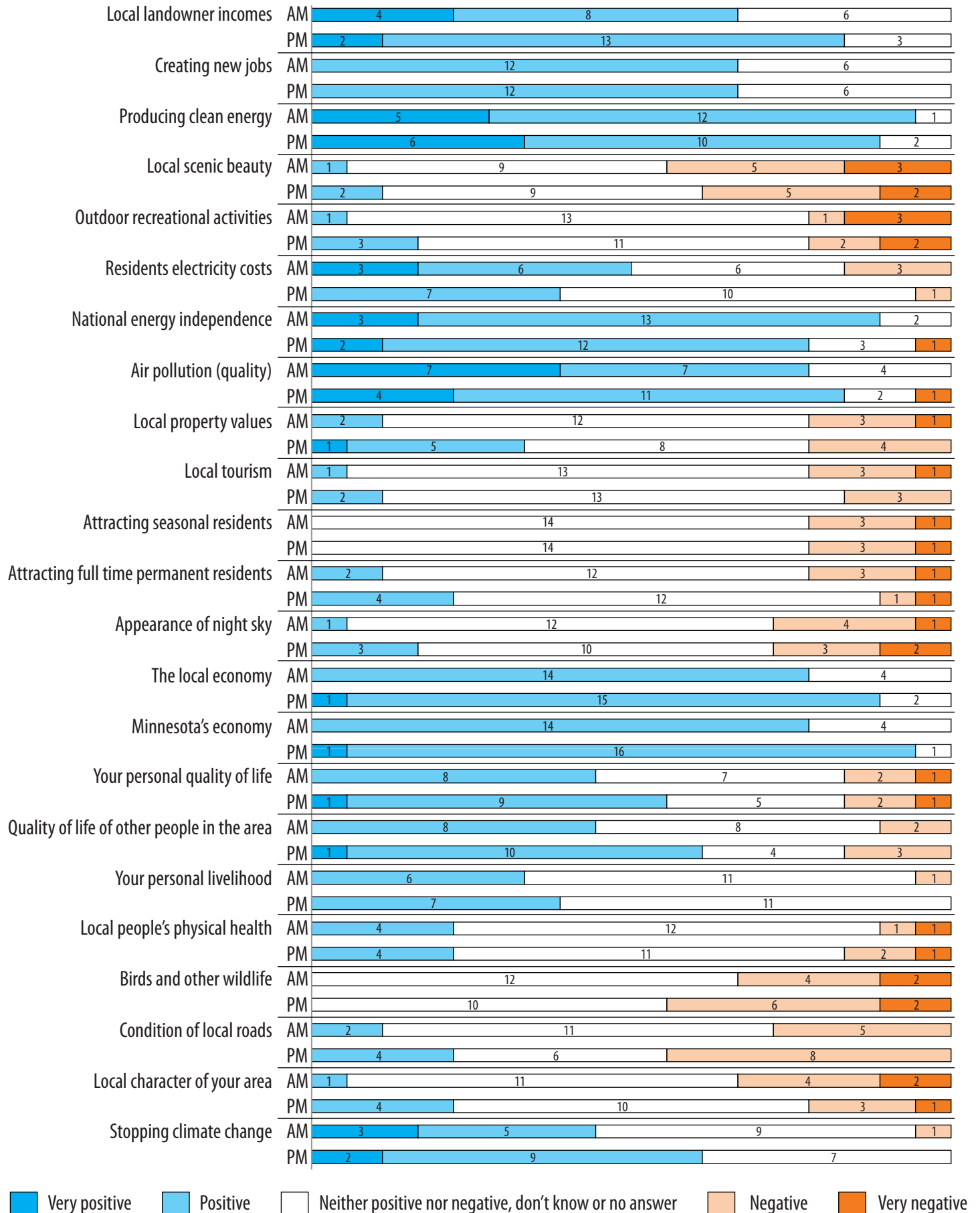






APPENDIX B: CHANGE IN OPINION BETWEEN MORNING AND AFTERNOON

Based on participants' response to 23 issues commonly associated with wind energy



APPENDIX C: BEST PRACTICE PRINCIPLES

1. A robust community process (funded by the developer) that is prior to, and more extensive than, the public comment process on the project application
 - 95% Support
 2. Protecting natural and recreational areas
 - 95% Support
 3. Compensation and Mitigation Efforts Where Possible—such as benefit-sharing mechanisms for affected landowners
 - 90% Support
 4. Transparent and Equitable Developer-Landowner Negotiation
 - 86% Support
 5. Economic Return to the Community—for example, construction impacts on county roads, tax benefits, decommissioning costs, electricity rate impacts, etc.
 - 86% Support
 6. Planning that considers human health impacts (noise, etc.)
 - 81% Support
 7. Consider the Scale of the Project—too big or too small
 - 79% Support
 8. Prioritizing local materials, manufacturing, and jobs
 - 76% Support
 9. Public safety (air traffic, access for emergency services, proximity to roads)
 - 76% Support
 10. Consider impacts to other infrastructure (telecommunication)
 - 76% Support
 11. Project Financial Viability
 - 75% Support
 12. Developer approaching county with project proposal before approaching land-owners
 - 72% Support
 13. Prioritize projects that have a higher megawatt/project area ratio
 - 72% Support
 14. Preference for community ownership
 - 67% Support
 15. Proximity to Existing Transmission
 - 62% Support
 16. Prioritize projects with the minimal number of affected landowners
 - 62% Support
 17. Minimize or mitigate impacts to local agricultural economy
 - 62% Support
 18. Consider a threshold for a total number of projects or turbines across the county
 - 57% Support
- Measures of support include those who “strongly support” these principles and those who “support” these principles.