NC CLEAN ENERGY TECHNOLOGY CENTER

Carolinas Development Assistance and Siting Hub

OPINIONS ON LARGE-SCALE RENEWABLE ENERGY DEVELOPMENT

Among Community Members in North and South Carolina

U.S. DEPARTMENT of ENERGY | Awardee

energywerx

INTRODUCTION

NC State University conducted a telephone survey of community members in North and South Carolina to get an understanding of their opinions on solar and, to a lesser degree, wind development.

The survey was conducted as part of the NC Clean Energy Technology Center's (NCCETC) Carolinas Development Assistance and Siting Hub (DASH) project, funded by the United States Department of Energy's Reliable Energy Siting through Technical Engagement and Planning (R-STEP) program.

NCCETC will use these results to determine what information communities and local governments will benefit from in the siting and permitting process for large-scale solar and wind developments.

SURVEY PROCESS

SURVEY PROCESS

The Center for Urban Affairs and Community Services (CUACS) at NC State University conducted the Community Member Survey from December 2024 through March 2025. CUACS conducted the survey by phone using samples of phone numbers it obtained from a vendor company. The overall target was to reach 1,100 respondents across North and South Carolina.

NC State University elected to target only non-urban counties (defined as counties with at least 10% rural population according to 2020 U.S. Census data) for phone calls, as urban counties have little large-scale solar development, and targeting non-urban counties ensured that the survey was reaching rural Census tracts. The team identified target numbers of calls for each county in order to reach the required number of respondents using an assumed response rate. However, actual response rates were lower than anticipated, so a larger number of calls than originally planned had to be made to reach 1,100 respondents. Overall, CUACS made 35,354 calls and reached 1,152 respondents. A total of 878 calls were completed in North Carolina, and 274 calls were completed in South Carolina.

SURVEY QUESTIONS

The survey included 19 questions: 7 substantive questions and 12 demographic questions.

1. Are you aware of any solar developments that have been sited in and/or proposed for your community?
2. If yes, how close is the nearest solar or proposed solar development to your property? Would you say less than 5 miles, 5 to 10 miles, 11 to 15 miles, or 16 or more miles?
3. I am going to read you a list of possible impacts of a solar farm development on your community. Please tell me if you think each item I read has a strong positive impact, a slightly positive impact, no impact, a slightly negative impact or a strong negative impact?
4. Do you have any other concerns with solar development in your community?
5. If yes, please tell me your primary concern.
6. Are you aware of any wind developments that have been sited in and/or proposed for your community?
7. Do you believe that wind farms would be feasible and/or beneficial for your community?

SURVEY QUESTIONS

8. Would you describe your residence as rural, suburban, or urban?
9. Do you rent or own your residence?
10. Do you work in an agriculture-related job?
11. Do any of your family members or friends work in an agriculture-related job?
12. Do you have rooftop or ground-mounted solar panels at your residence?
13. What is your ethnicity?
14. What is your age?
15. What is your gender?
16. What is the highest level of education you have completed?
17. Which of the following best describes your current employment status?
18. What is your income?
19. What is your political party?

SURVEY RESULTS

DEMOGRAPHIC RESULTS

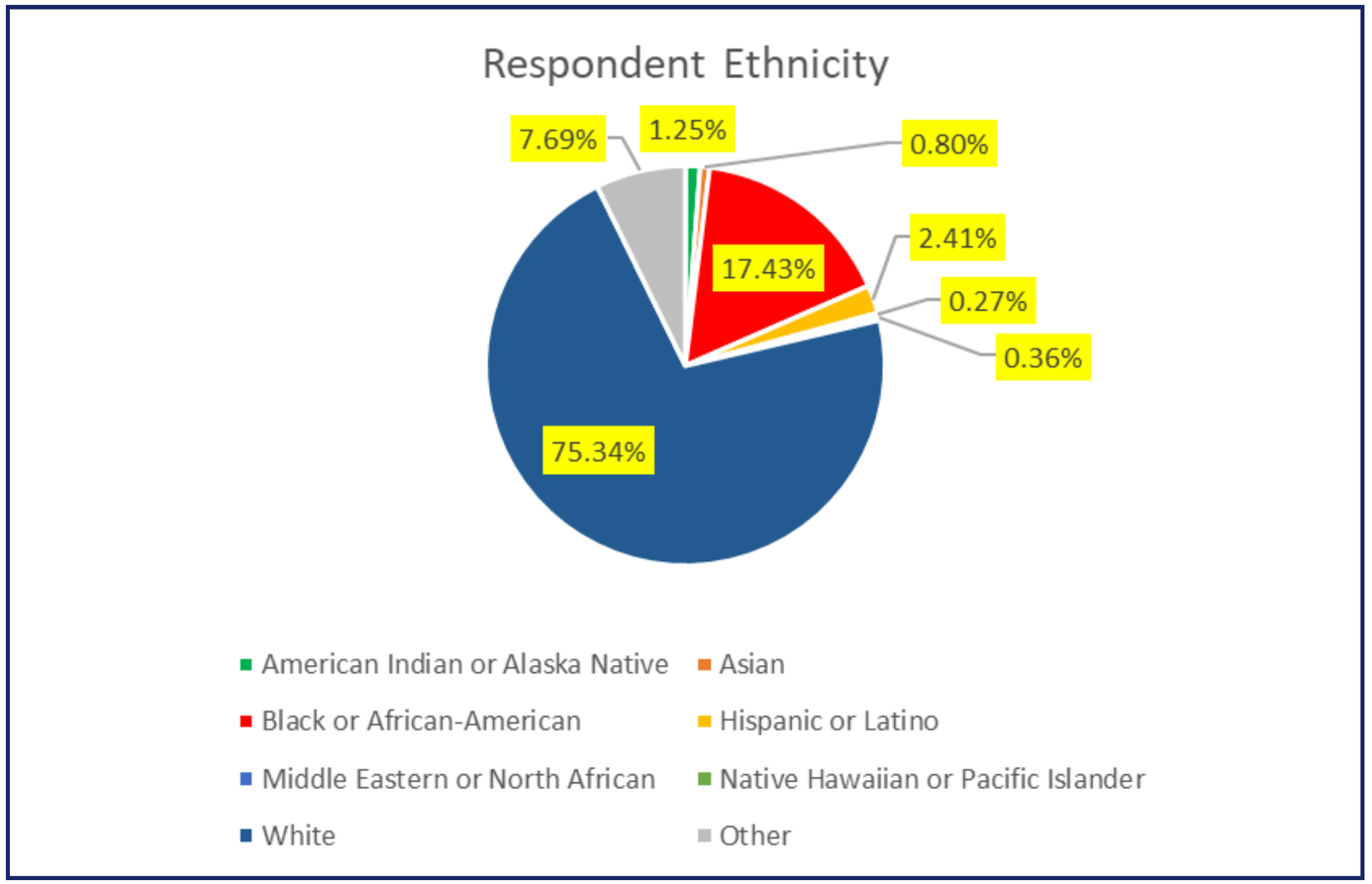
A total of 1,152 respondents completed the survey, although not all of them were willing to answer every question. On the question about area of residence, 47.31% of respondents reported that they lived in a rural area, 40.89% reported that they lived in a suburban area, and 11.81% reported that they lived in an urban area. This is somewhat unexpected, given that the survey was targeted at exclusively non-urban counties, but may be explained by respondents having different perceptions of what qualifies as an urban area than the Census definition.

Other notable demographic results include:

- 21.53% of respondents reported that they rented their residence, while 78.47% reported that they owned their residence.
- 9.55% of respondents reported that they worked in agriculture, while 90.45% reported that they did not.
- 29.25% of respondents reported that they had family or friends who worked in agriculture, while 70.75% reported that they did not.
- 3.47% of respondents said that they own roof or ground-mounted solar panels.

DEMOGRAPHIC RESULTS

Respondent ethnicity is shown in the chart below:

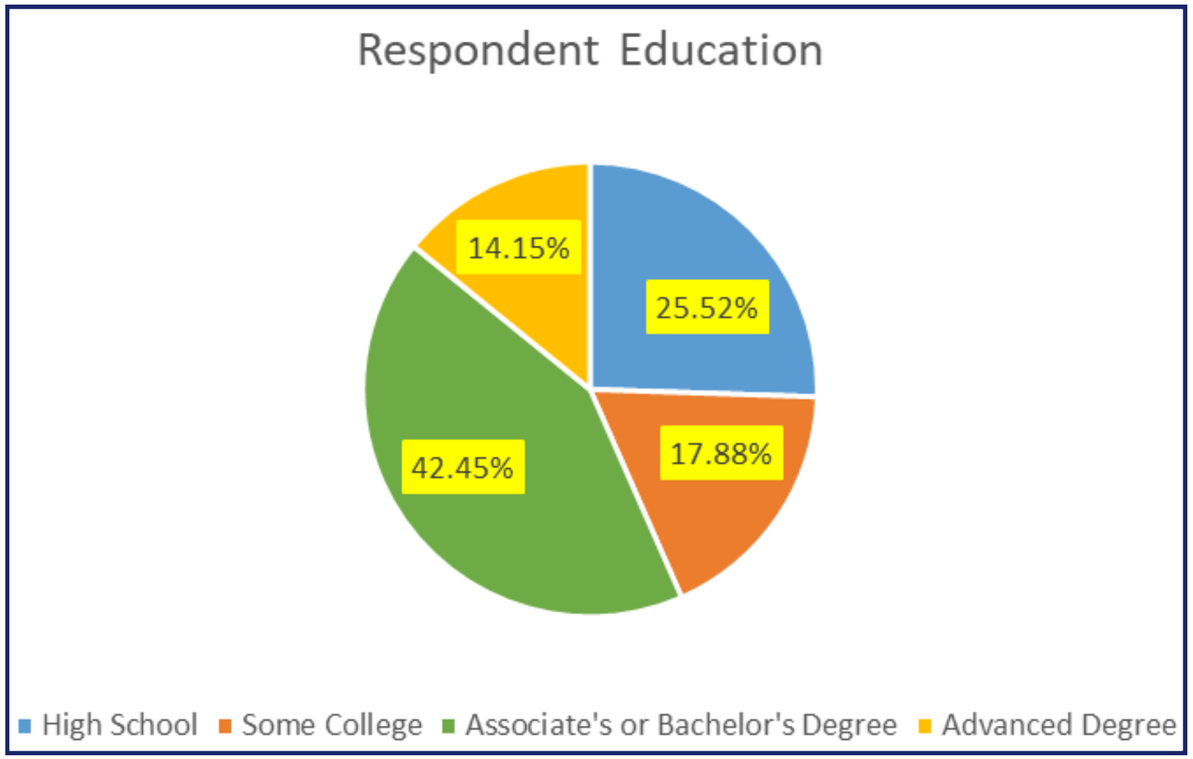


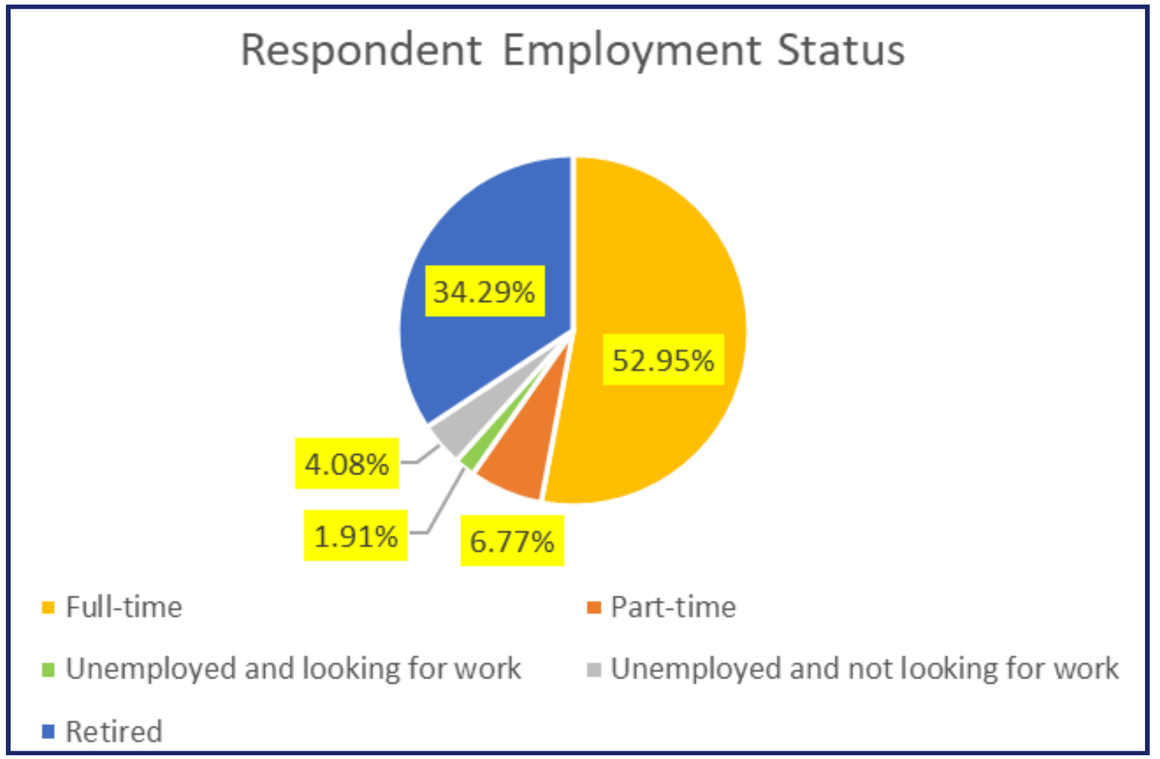
DEMOGRAPHIC RESULTS

The mean age of respondents when answers of zero were removed was 53.2, with a minimum of 15 and a maximum of 94. Respondents were 53.3% male and 46.7% female.

Respondent education level is shown in the chart on the next page. Overall, respondents were slightly more educated across the categories than the U.S. average, according to the Education Data Initiative. This is a somewhat surprising result given that education levels are generally lower in rural areas (see the National Center for Education Statistics). This could reflect a greater tendency to participate in the survey among people with higher education levels.

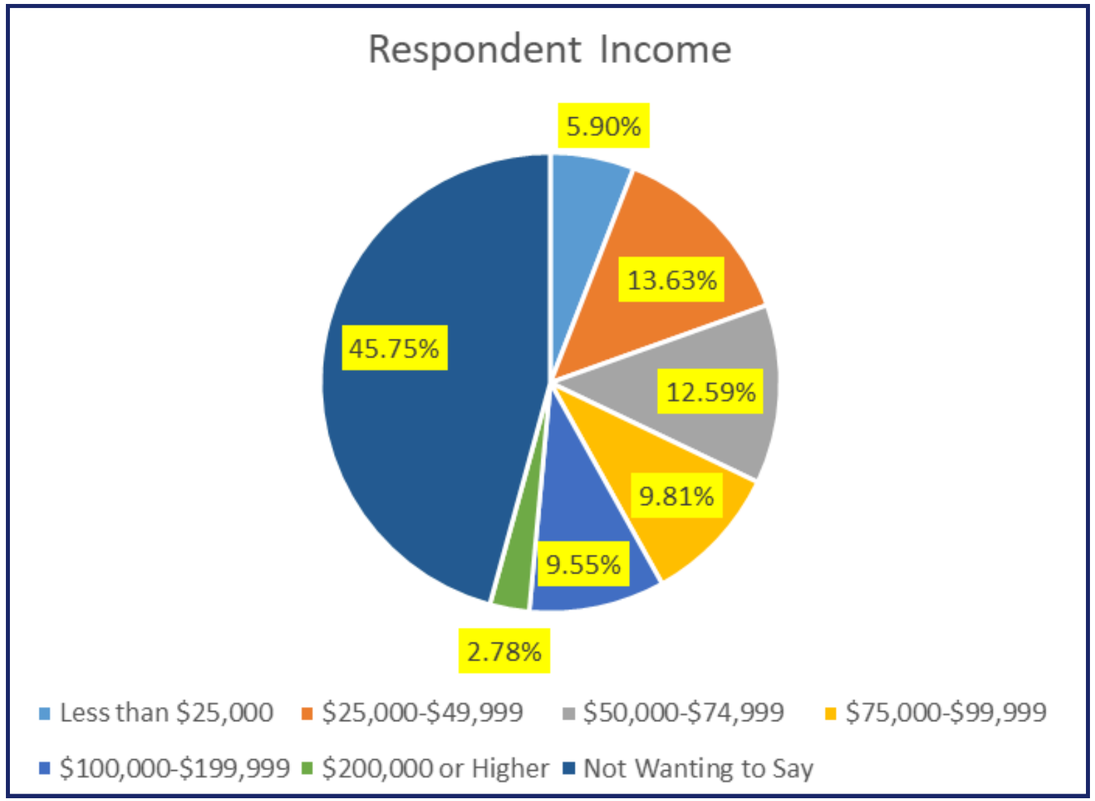
DEMOGRAPHIC RESULTS

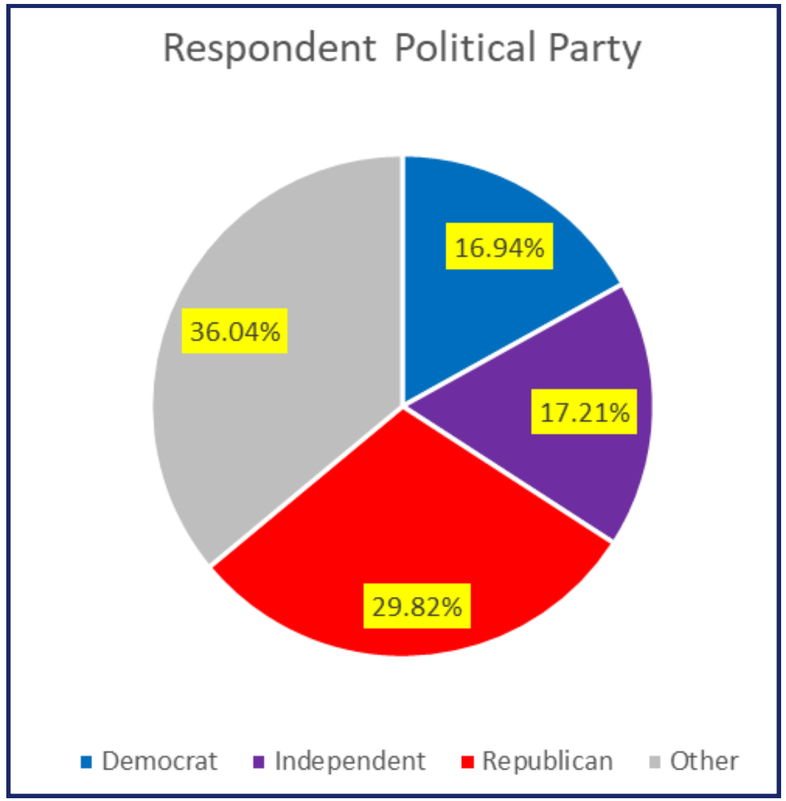




DEMOGRAPHIC RESULTS

The large percentage of respondents answering “other” in the chart below may reflect respondents not wishing to answer the question.





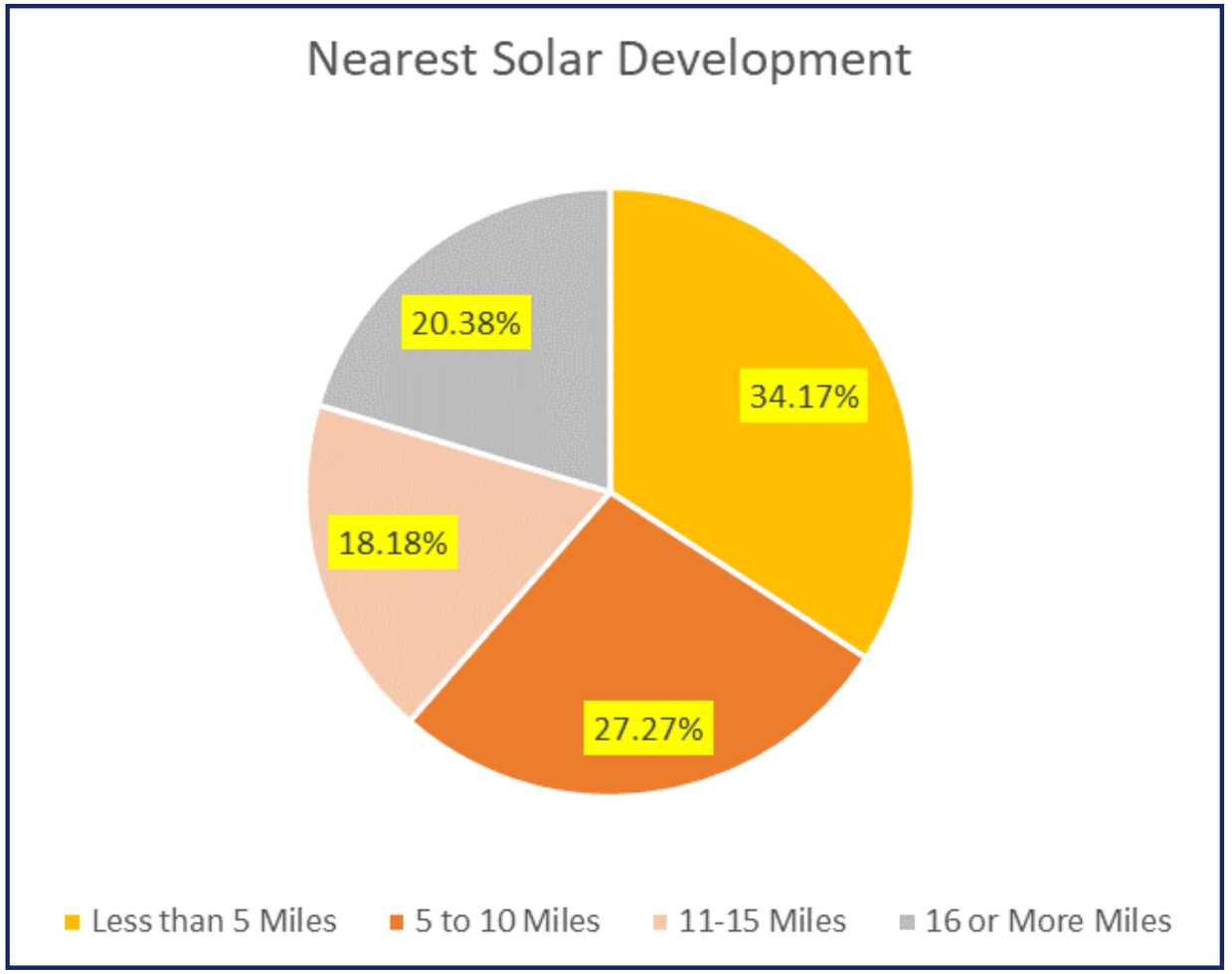
SUBSTANTIVE RESULTS - BROADER SAMPLE

Awareness of Solar Development

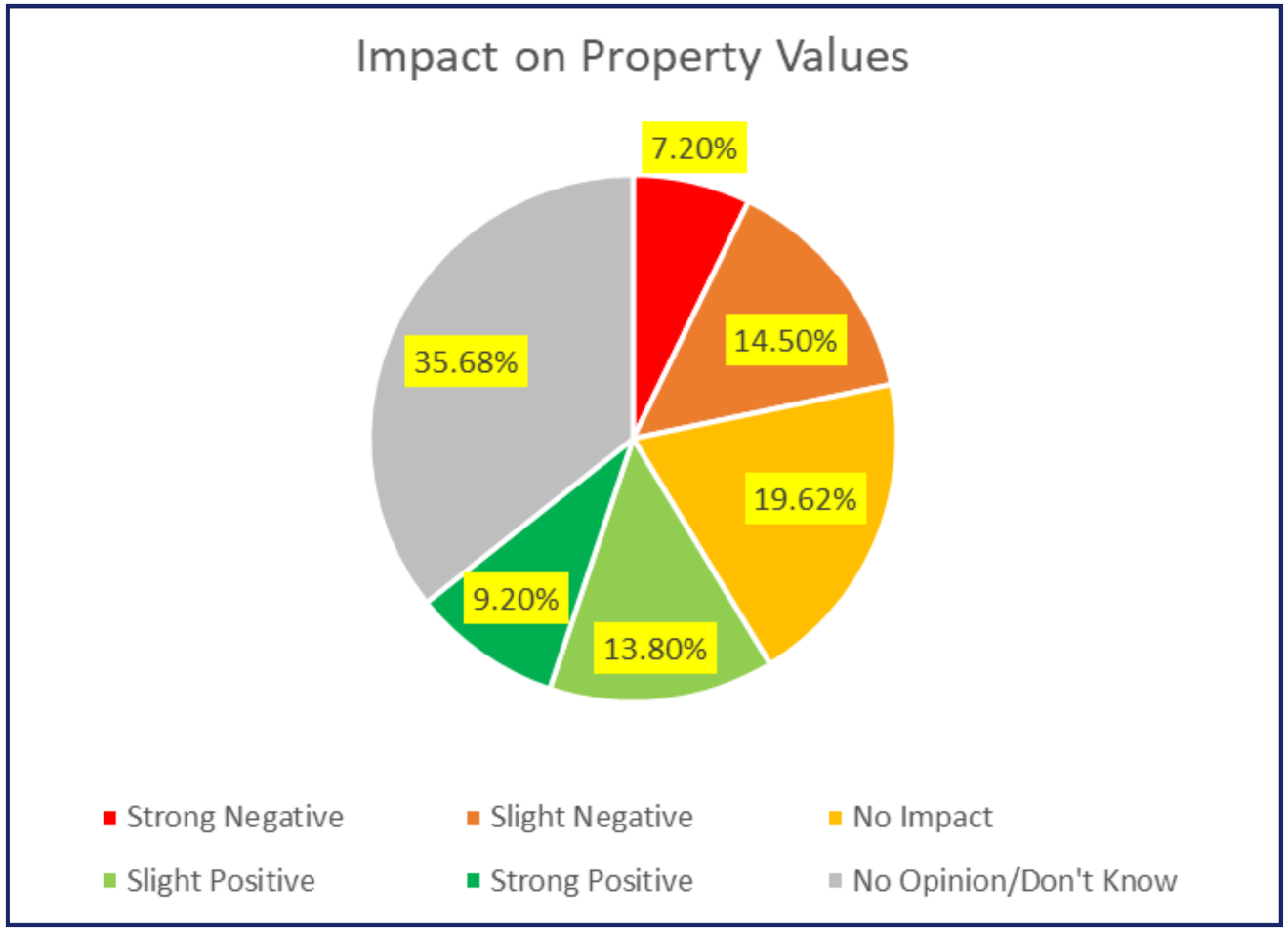
27.69% of respondents were aware of solar developments being proposed or sited in their community.

Nearest Solar Development

When asked how far the nearest solar development (sited or proposed) was from their residence, respondents answered as below. This question was only asked to respondents who said they were aware of solar developments in their community.



SUBSTANTIVE RESULTS - BROADER SAMPLE



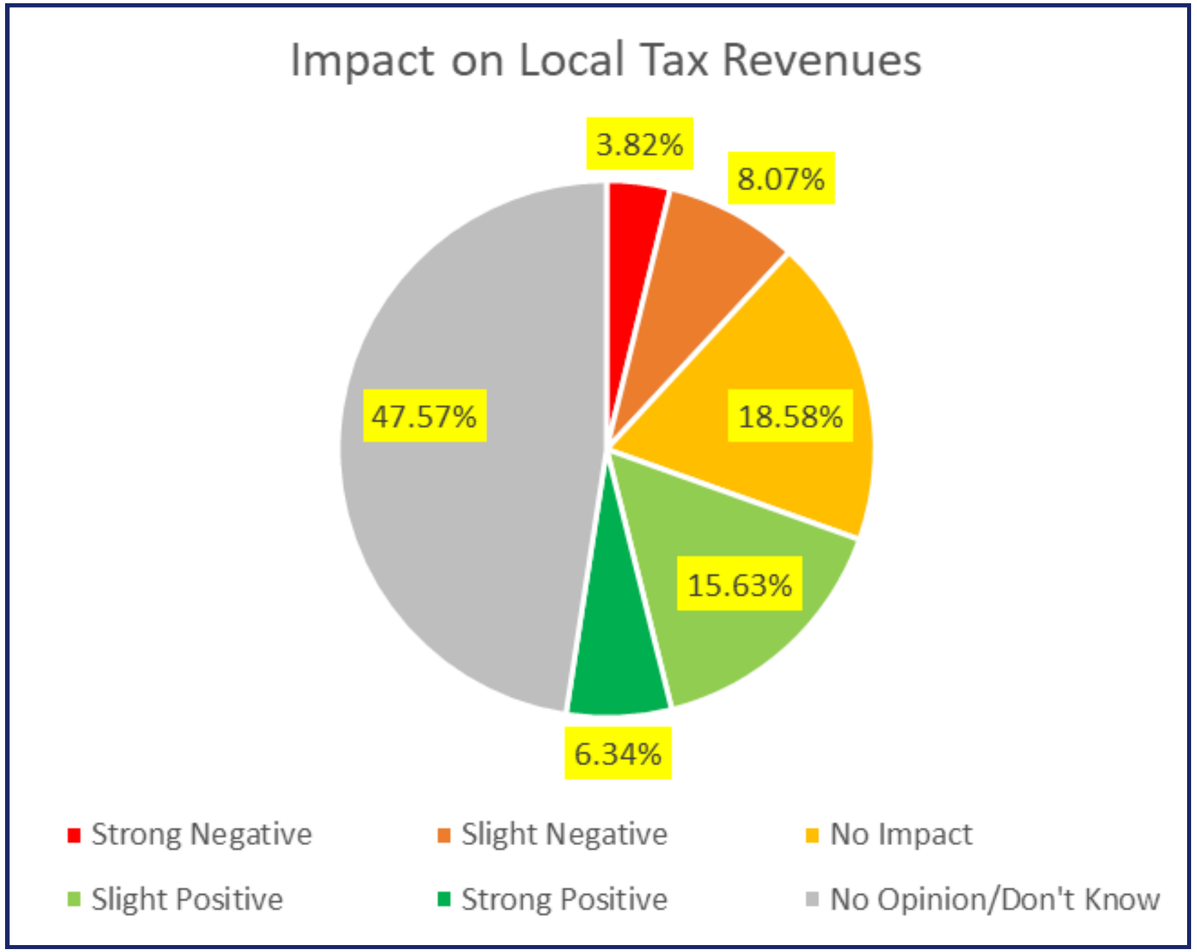
Property Values

Interestingly, more respondents thought that solar development would have a positive effect on property values than a negative one, but a majority of respondents thought either it would have no impact or had no opinion.

SUBSTANTIVE RESULTS - BROADER SAMPLE

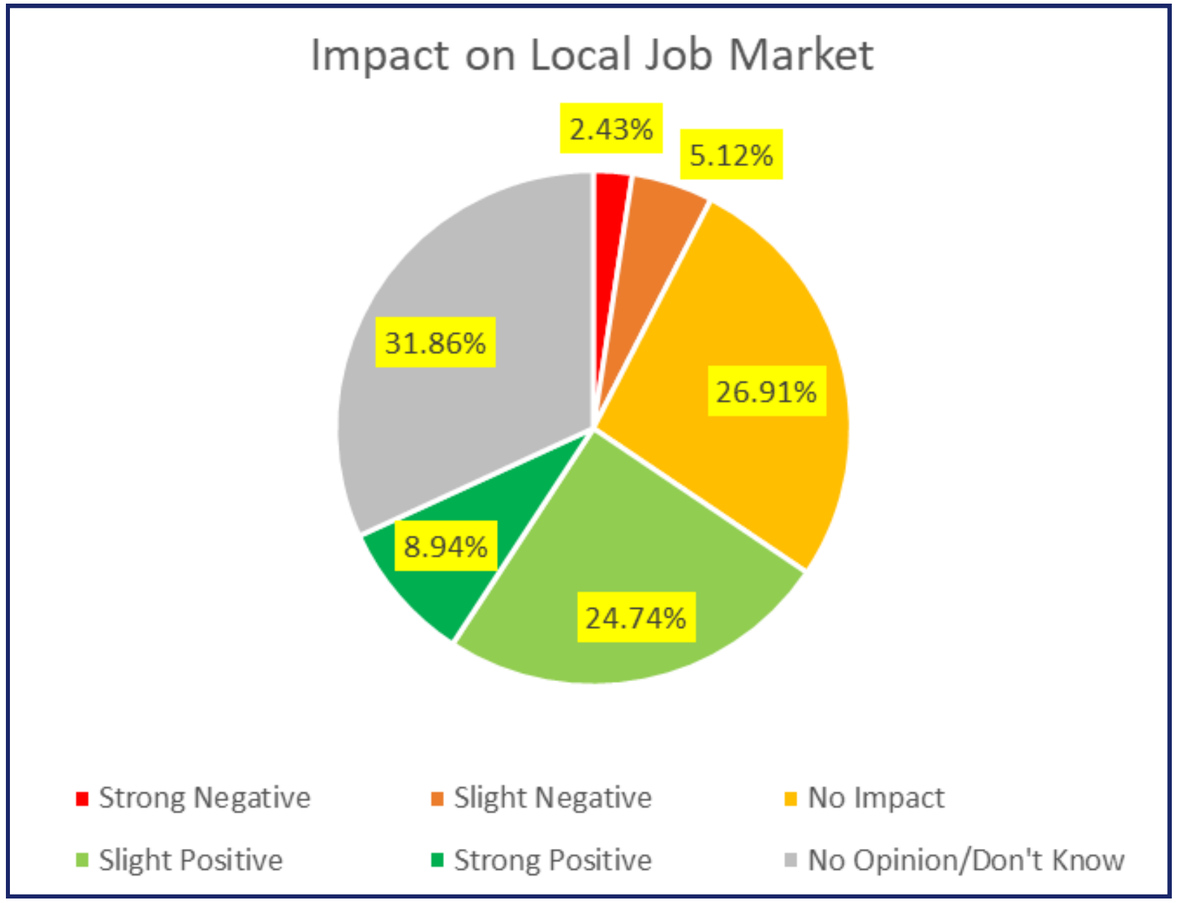
Tax Revenues

Slightly more respondents thought solar development would have a positive effect on tax revenues than a negative impact, but again most respondents thought it either would have no impact or had no opinion.



SUBSTANTIVE RESULTS - BROADER SAMPLE

Local Job Market

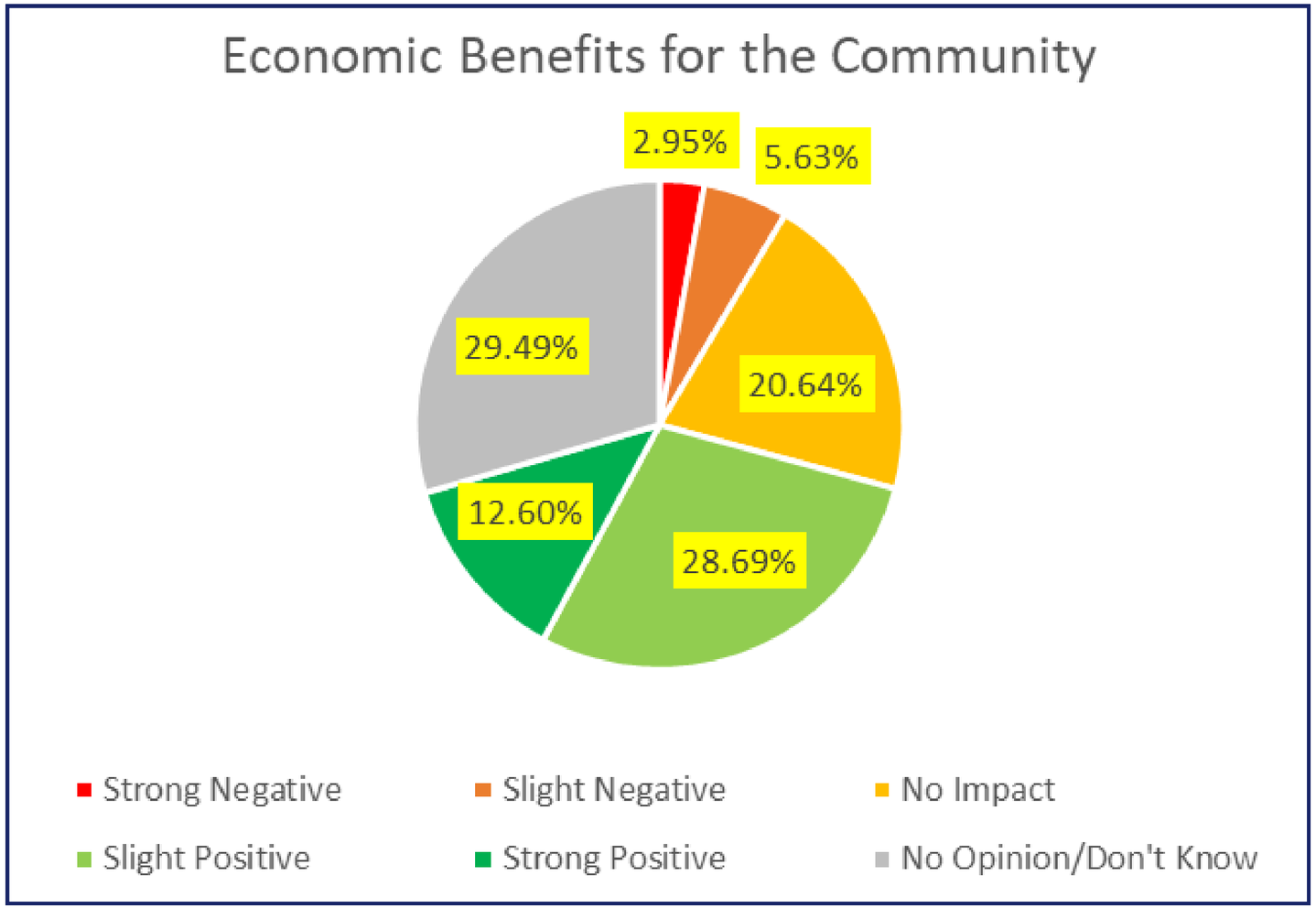


Substantially more respondents thought that solar development would have a positive effect on the local job market than a negative one. Many respondents thought that it would have no impact, and some had no opinion.

SUBSTANTIVE RESULTS - BROADER SAMPLE

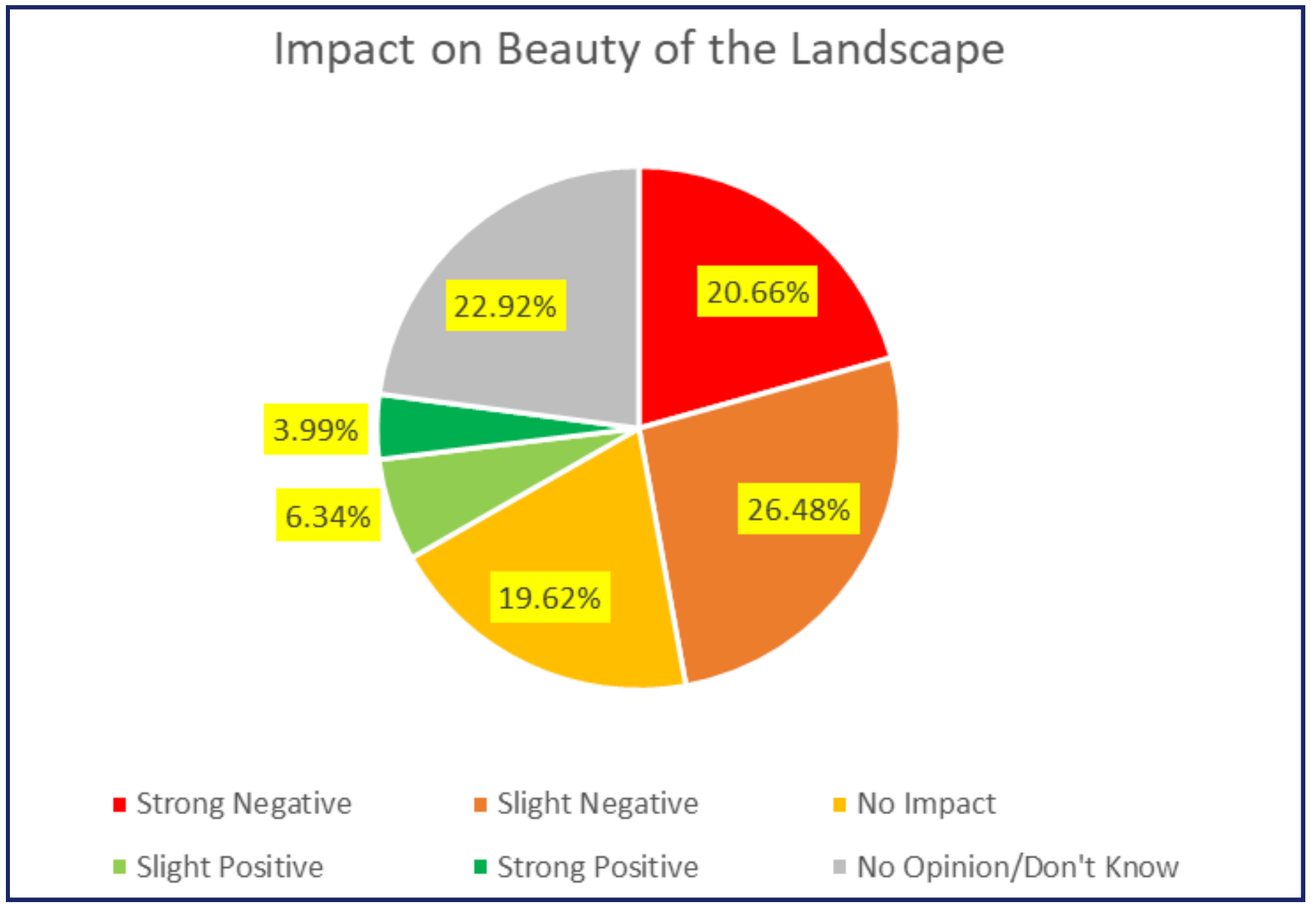
Economic Benefits for the Community

Again, substantially more respondents thought that solar development would have economic benefits for their community than thought it would have negative economic effects, but many thought it would have no effect, and some had no opinion.



SUBSTANTIVE RESULTS - BROADER SAMPLE

Beauty of the Landscape

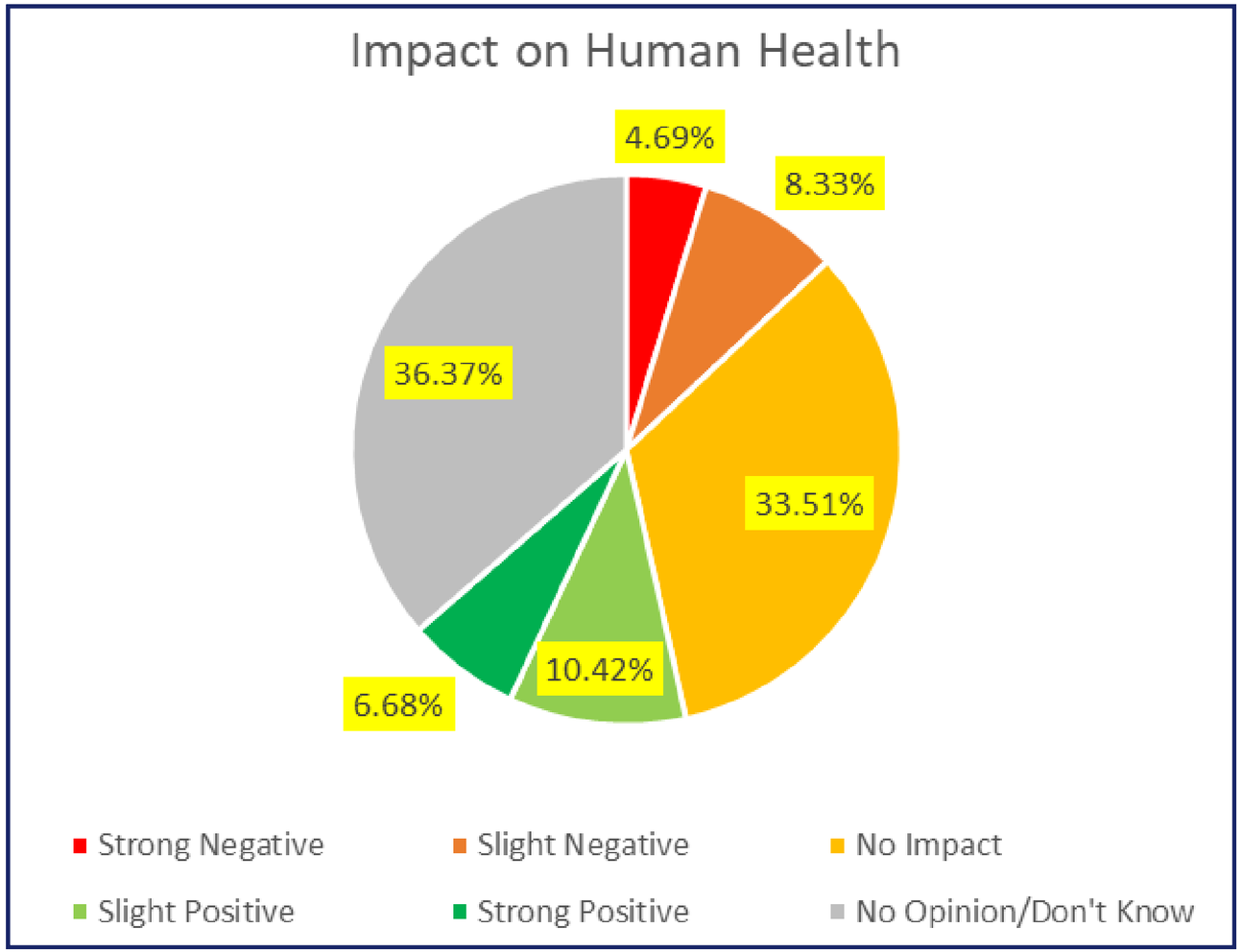


A near majority of respondents thought solar development would have a negative impact on the beauty of the landscape, and over 20% of respondents thought it would have a strong negative impact.

SUBSTANTIVE RESULTS - BROADER SAMPLE

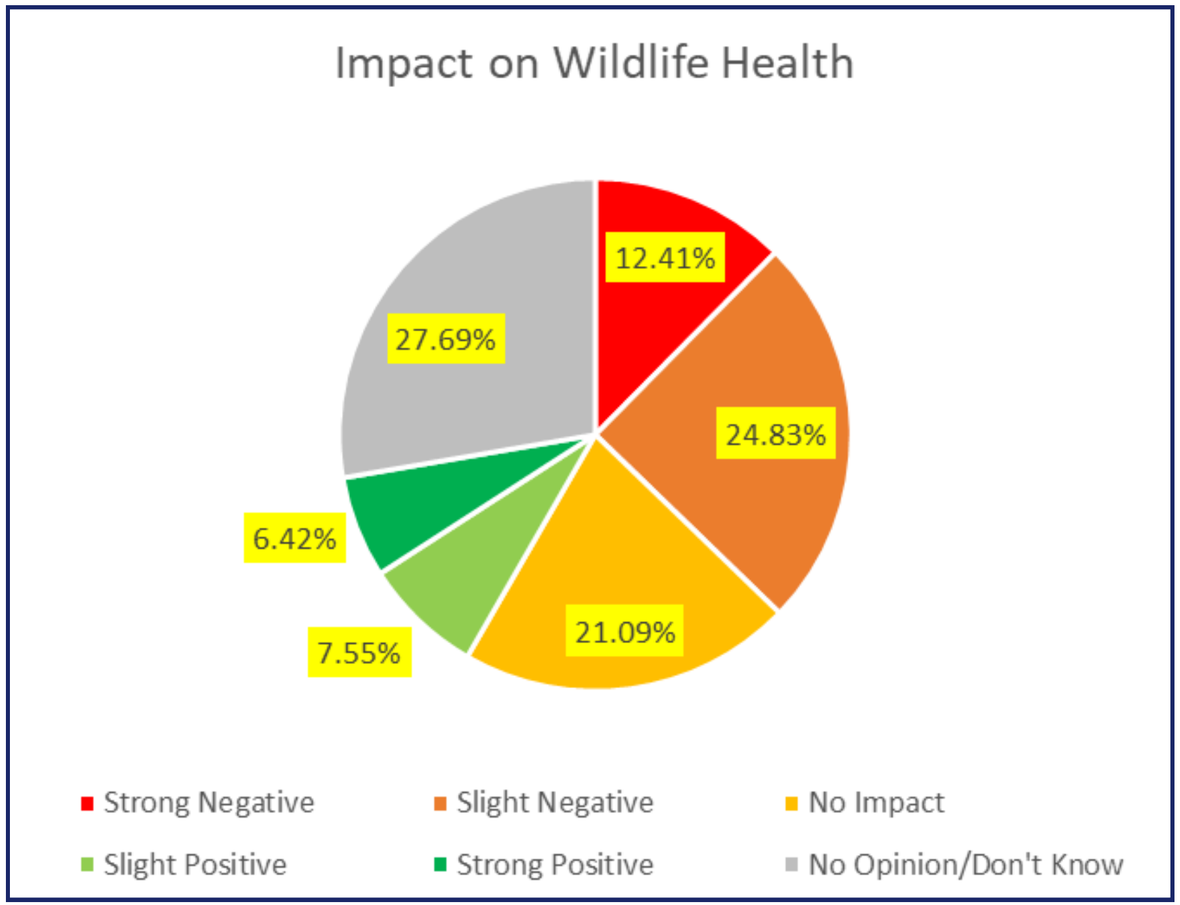
Human Health

A third of respondents thought that solar development would have no impact on human health. Relatively few respondents thought that solar development would either harm or help human health, but more thought it would have a positive impact than a negative one.



SUBSTANTIVE RESULTS - BROADER SAMPLE

Wildlife Health

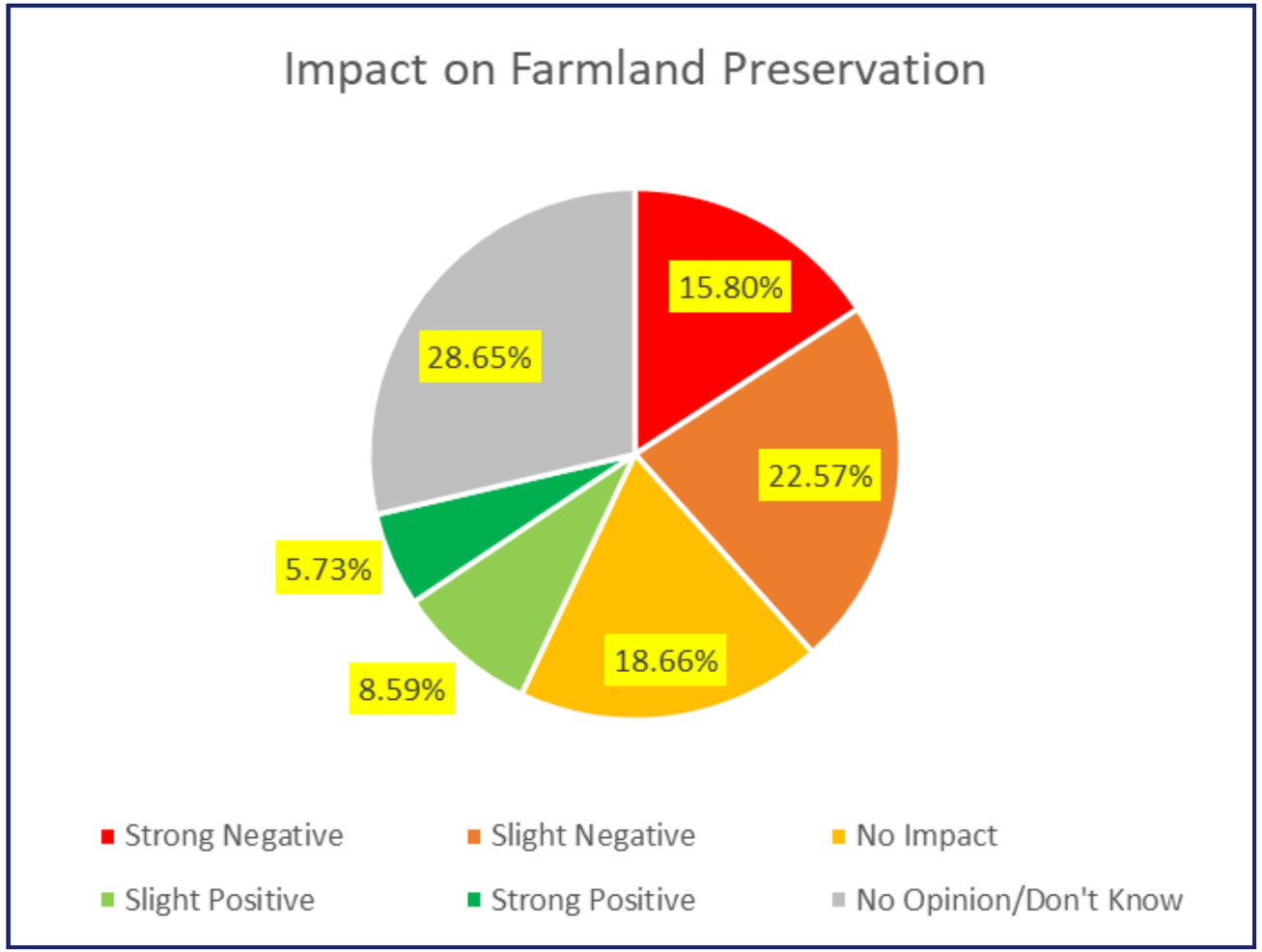


A little over a third of respondents thought that solar development would have a negative impact on wildlife health, with a slightly smaller percentage thinking it would have either no impact or a positive impact.

SUBSTANTIVE RESULTS - BROADER SAMPLE

Farmland Preservation

A plurality of respondents thought that solar development would have a negative impact on farmland preservation.



SUBSTANTIVE RESULTS - BROADER SAMPLE

Other Concerns About Solar Development

When asked whether they had any other concerns with solar development in their community, 27.6% said “Yes” and 72.4% said “No.” Among the 318 respondents who answered the question asking what their primary concern was, numerous respondents mentioned concerns about disposal of used panels and cutting down trees. Some of the respondents gave answers indicating a positive attitude toward solar development.

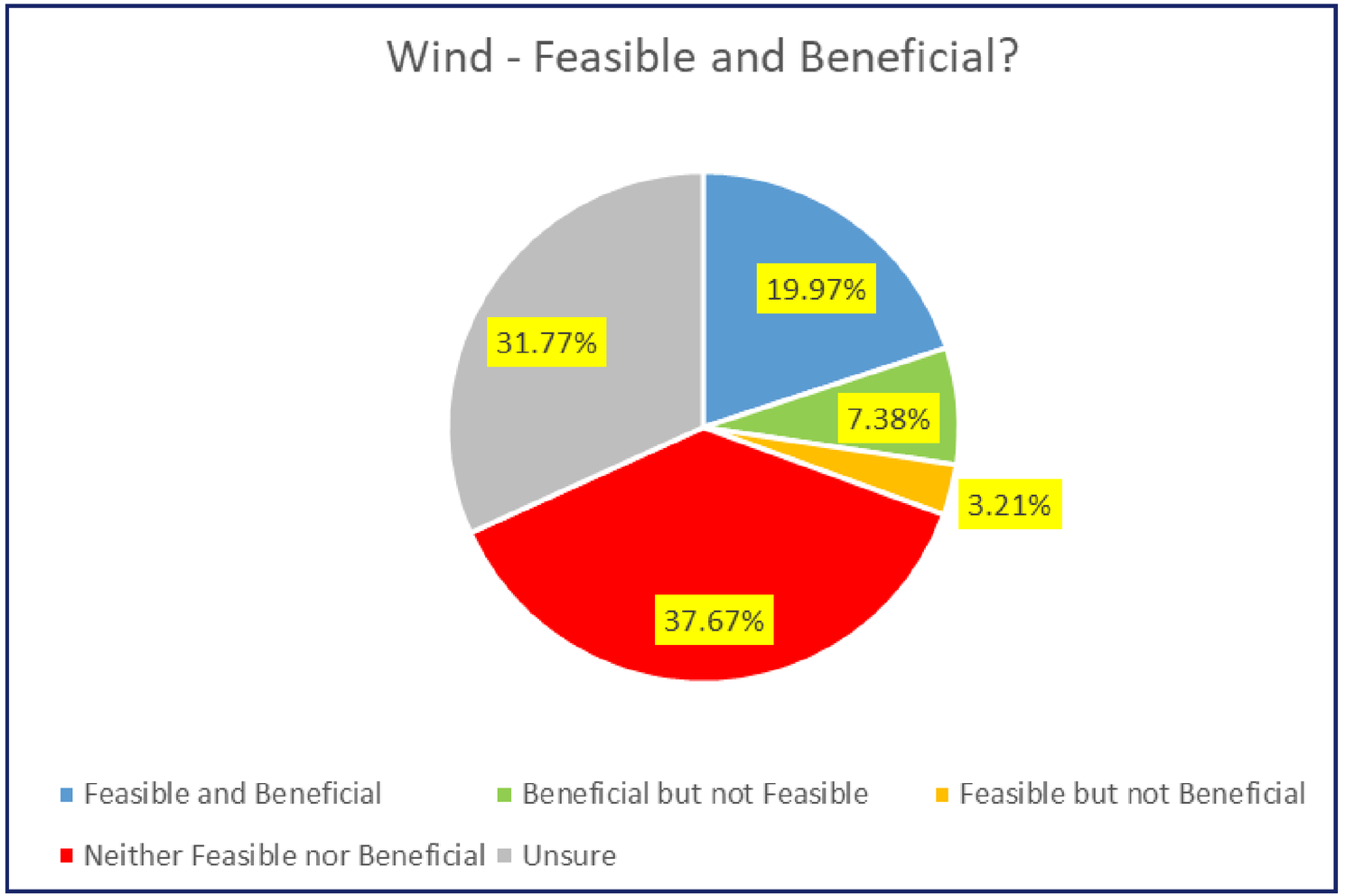
Awareness of Wind Development

Only 3.3% of respondents were aware of wind developments being proposed or sited in their community.

SUBSTANTIVE RESULTS - BROADER SAMPLE

Wind Beneficial or Feasible

A plurality of respondents thought that wind energy development would be neither feasible nor beneficial for their community. Around 20% thought that it would be both feasible and beneficial, and small percentages thought it would be either feasible or beneficial, but not both.



SUBSTANTIVE RESULTS

PERSPECTIVES OF PEOPLE AWARE OF SOLAR DEVELOPMENT IN THEIR COMMUNITIES

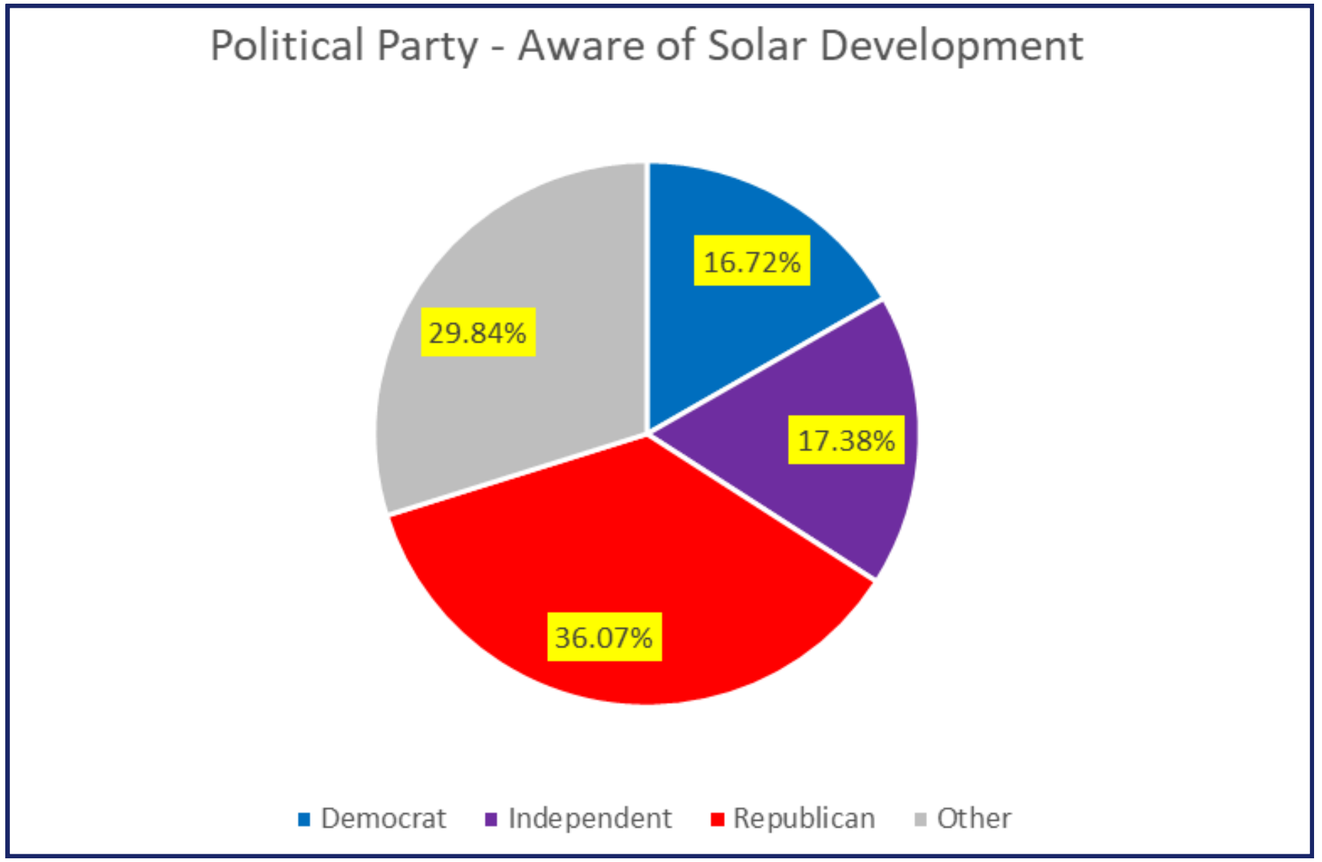
Responses were somewhat different among the 319 respondents who were aware of solar developments in their communities.

These respondents were more likely to live in a rural area, with 57.37% living in a rural area, 34.8% living in a suburban area, and 7.84% living in an urban area. They were also more likely to work in agriculture (15.05%) or have family or friends who work in agriculture (38.87%). Interestingly, this sample of people actually had higher education levels across the board than the full sample. Employment and income levels were similar to the full sample.

The political party affiliation of people in this group is shown below. Respondents in this group were more likely to be Republicans and less likely to say “Other” or give a third party; the Independent and Democratic percentages were about the same as in the full sample.

SUBSTANTIVE RESULTS

PERSPECTIVES OF PEOPLE AWARE OF SOLAR DEVELOPMENT IN THEIR COMMUNITIES

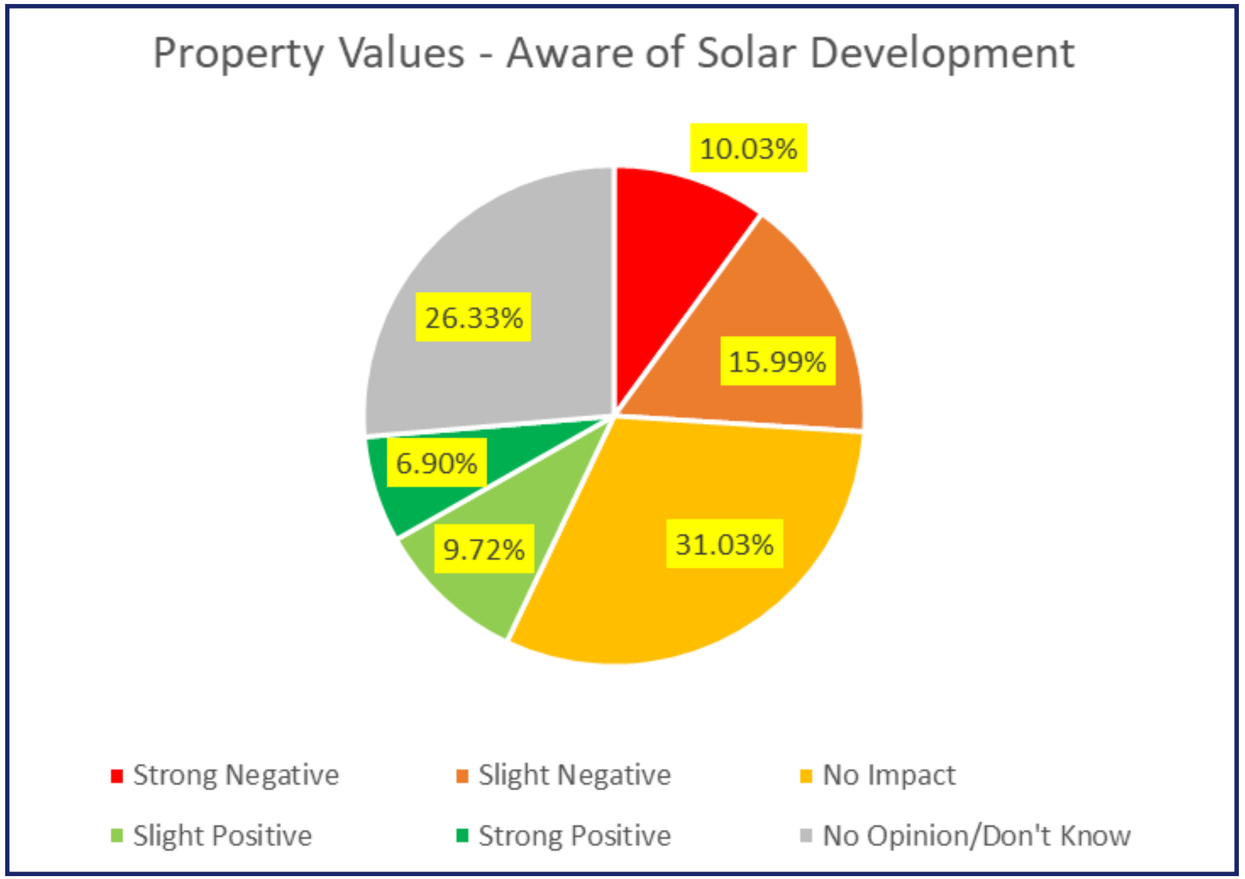


SUBSTANTIVE RESULTS

PERSPECTIVES OF PEOPLE AWARE OF SOLAR DEVELOPMENT IN THEIR COMMUNITIES

Property Values

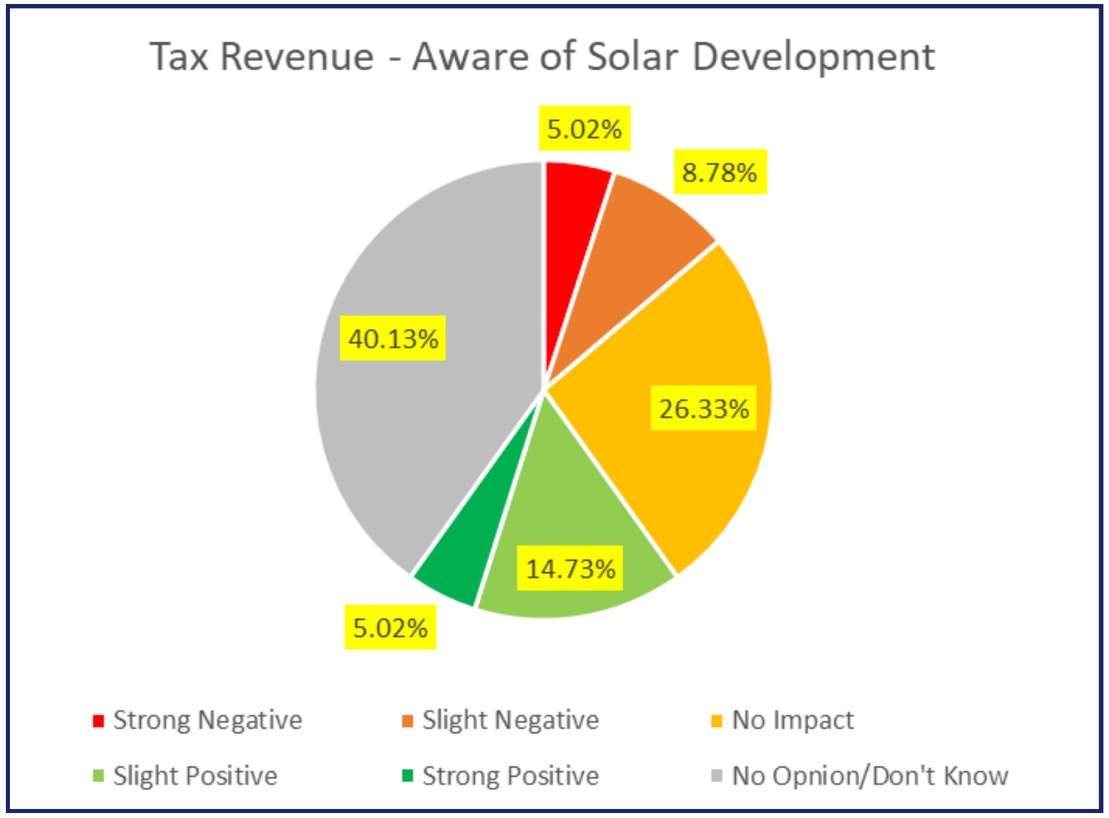
Respondents aware of solar development in their community were more likely to think solar development would have a negative impact on property values.



SUBSTANTIVE RESULTS

PERSPECTIVES OF PEOPLE AWARE OF SOLAR DEVELOPMENT IN THEIR COMMUNITIES

Tax Revenues



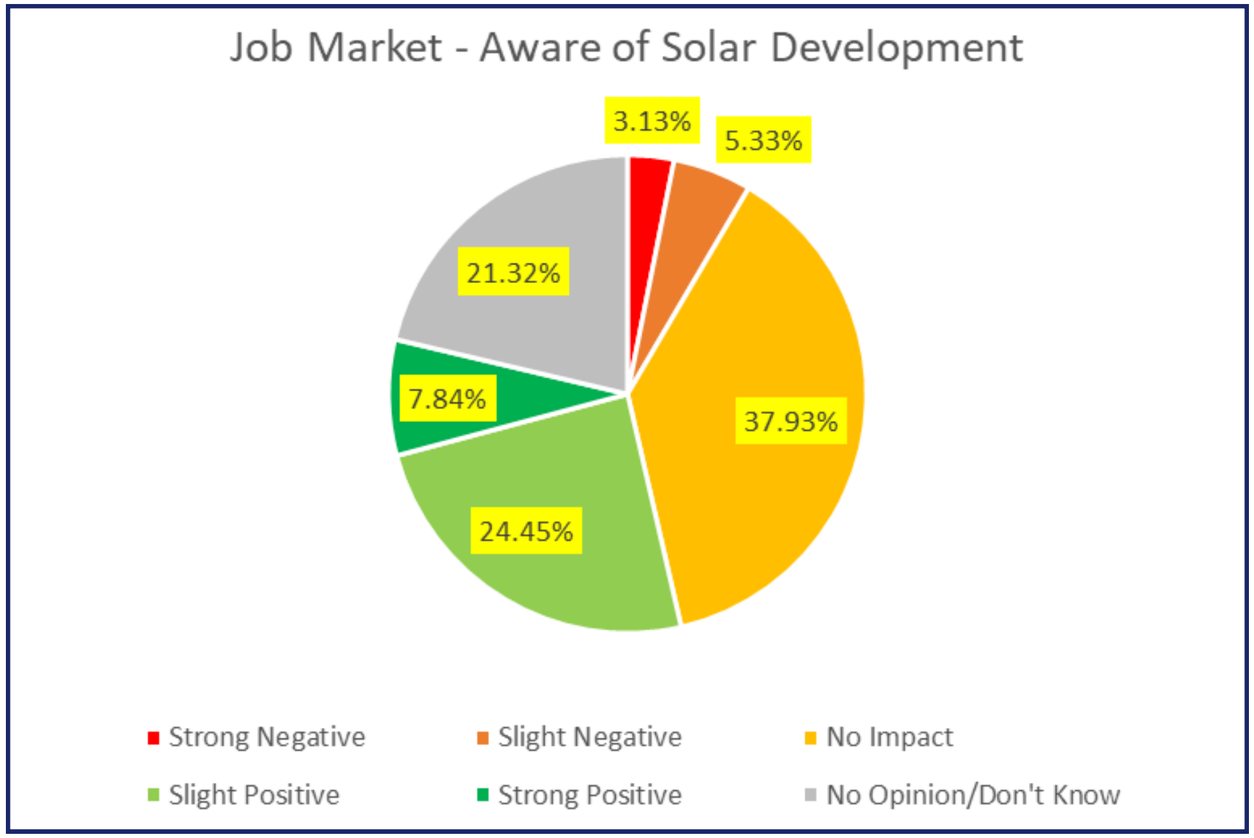
Respondents in this group were less likely to say that solar development had either a positive or negative effect on local tax revenues, and more likely to say that it had no impact or that they didn't know.

SUBSTANTIVE RESULTS

PERSPECTIVES OF PEOPLE AWARE OF SOLAR DEVELOPMENT IN THEIR COMMUNITIES

Local Job Market

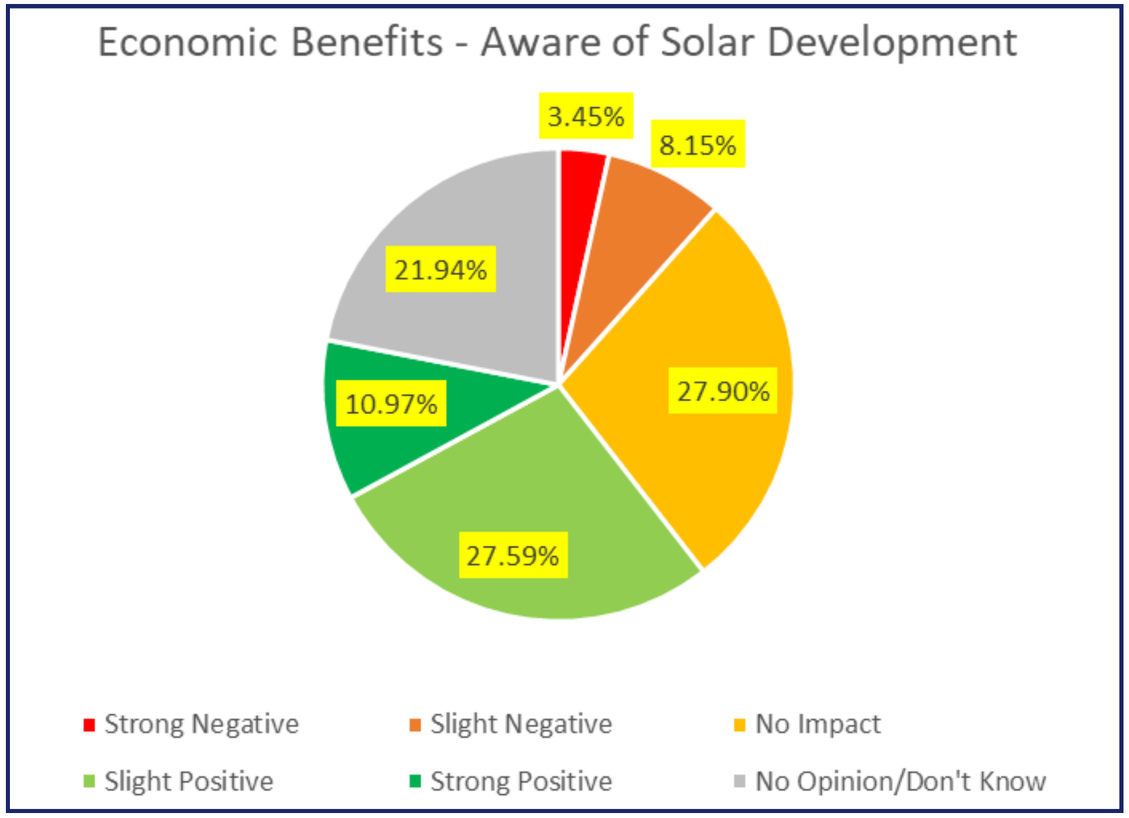
Respondents in this group were more likely to say that solar development had no impact on the local job market and less likely to say that they had no opinion or didn't know. The percentages of respondents answering that it had a positive or negative impact were roughly the same as in the full sample.



SUBSTANTIVE RESULTS

PERSPECTIVES OF PEOPLE AWARE OF SOLAR DEVELOPMENT IN THEIR COMMUNITIES

Economic Benefits for the Community



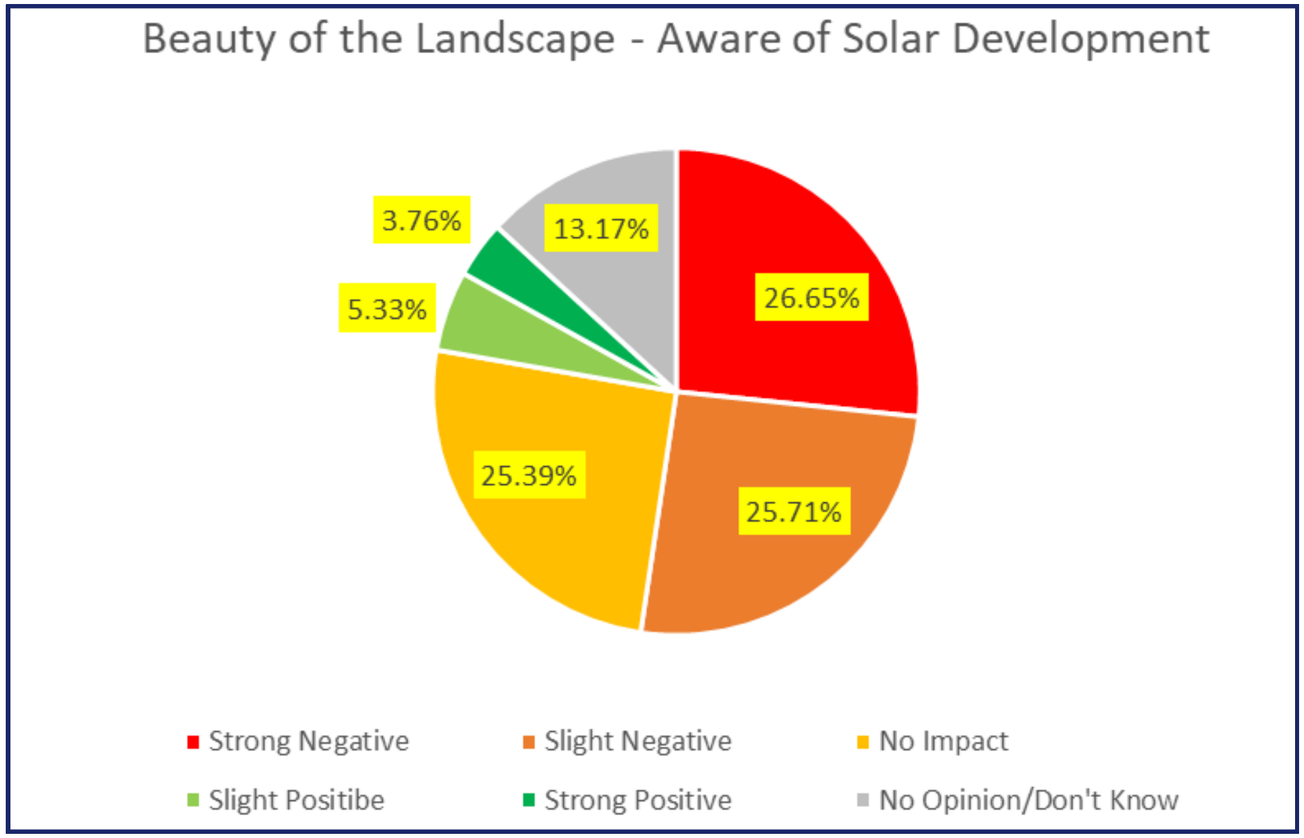
Respondents aware of solar development were slightly less likely to say that solar development had economic benefits for the community and slightly more likely to say that it had a negative impact. The most notable difference from the full sample is the larger proportion of respondents in this group saying that solar development had no impact and the smaller proportion saying they had no opinion.

SUBSTANTIVE RESULTS

PERSPECTIVES OF PEOPLE AWARE OF SOLAR DEVELOPMENT IN THEIR COMMUNITIES

Beauty of the Landscape

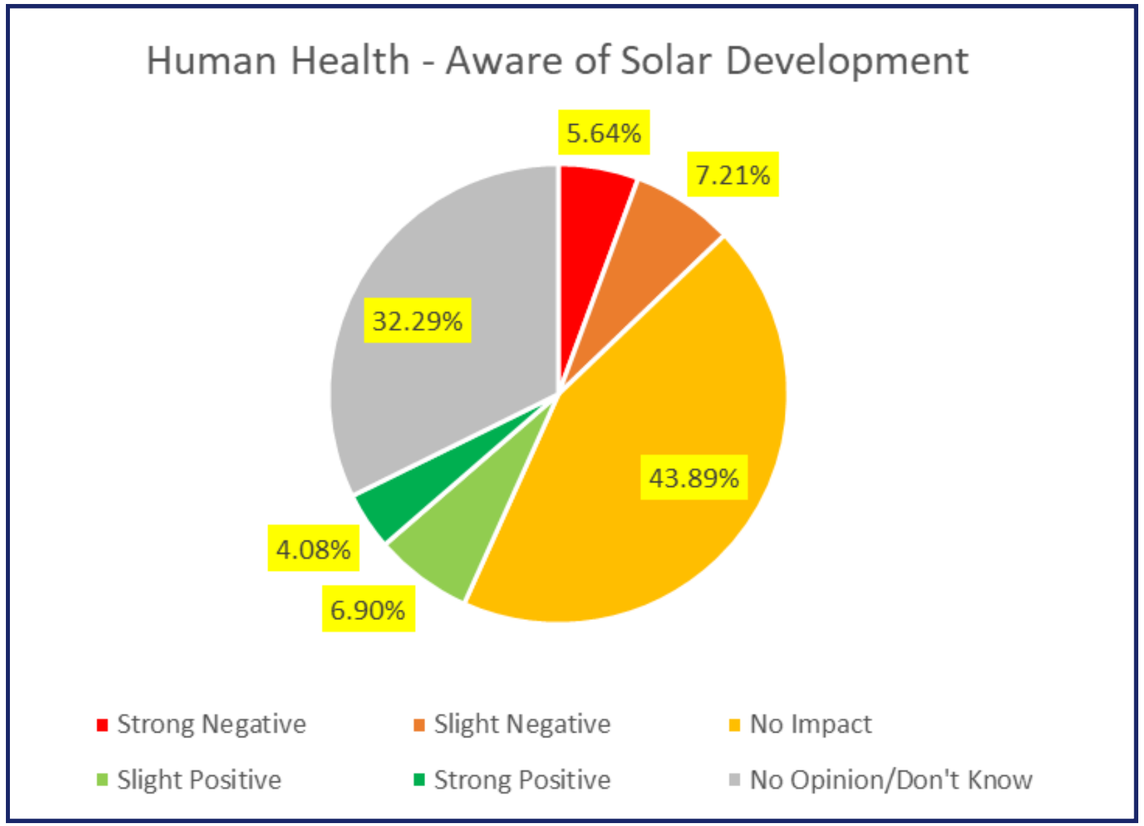
Respondents in this group were more likely to say that solar development had no impact on the local job market and less likely to say that they had no opinion or didn't know. The percentages of respondents answering that it had a positive or negative impact were roughly the same as in the full sample.



SUBSTANTIVE RESULTS

PERSPECTIVES OF PEOPLE AWARE OF SOLAR DEVELOPMENT IN THEIR COMMUNITIES

Human Health



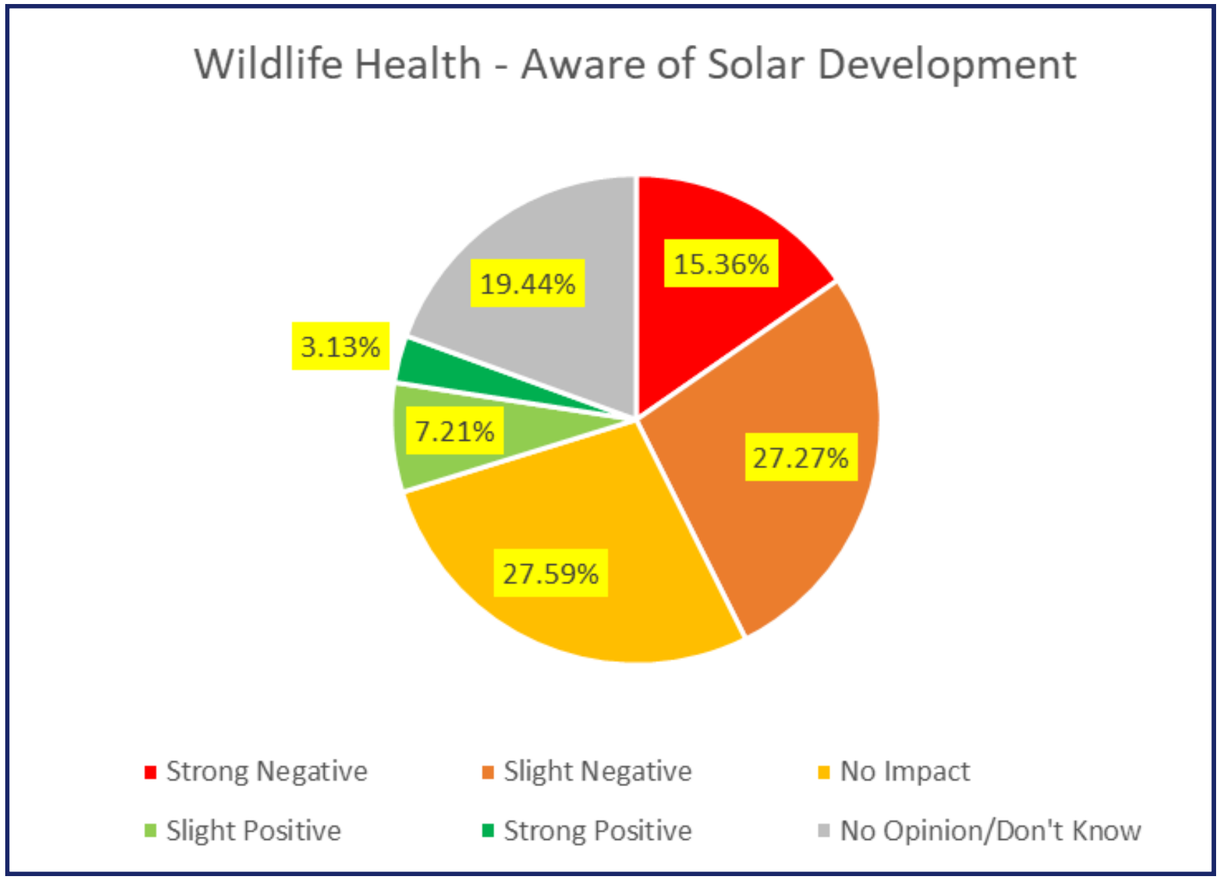
Respondents in this group were slightly less likely to say that solar development had a positive impact on human health or that they had no opinion, and more likely to say that it had no impact; the percentage saying it had a negative impact was almost the same as in the full sample.

SUBSTANTIVE RESULTS

PERSPECTIVES OF PEOPLE AWARE OF SOLAR DEVELOPMENT IN THEIR COMMUNITIES

Wildlife Health

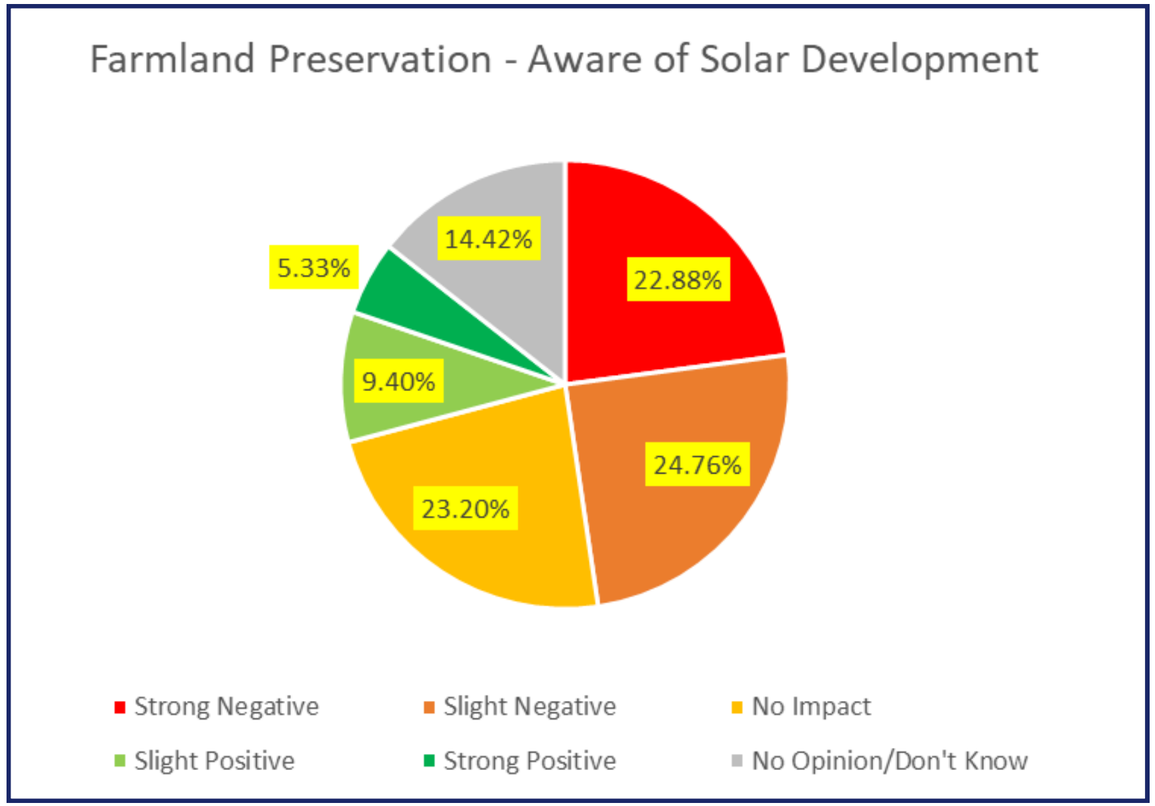
Respondents aware of solar development were more likely to either say that solar development had a negative effect on wildlife health or no impact, and less likely to say that it had a positive impact or that they had no opinion.



SUBSTANTIVE RESULTS

PERSPECTIVES OF PEOPLE AWARE OF SOLAR DEVELOPMENT IN THEIR COMMUNITIES

Farmland Preservation



Respondents aware of solar development in their communities were more likely to say that it had a negative impact or no impact on farmland preservation, and less likely to say that they had no opinion. The percentage saying solar development had a positive impact on farmland preservation was about the same as in the full sample.

DISCUSSION OF RESULTS

DISCUSSION OF RESULTS

On the economic questions, one result that stands out is that respondents overall were not greatly concerned about effects on property values. Only 7% of respondents thought that solar development would have a strong negative effect on property values, and about 23% thought that solar would actually have a positive effect on property values. This does not mean that individual community members may not have strong concerns about property values that need to be addressed, but it does imply that this issue is not generally as important as some of the other issues that the survey asked about.

Overall, respondents appeared mostly ambivalent about the economic effects of solar development, with most questions seeing the majority of respondents saying solar development would have no impact or that they had no opinion or did not know. This points to a need for education about some of these topics; for instance, solar development generally has a positive effect on tax revenues, so the fact that so many respondents answered ambivalently about the effect on tax revenues implies an opportunity for education.

On environmental issues, respondents appeared mostly unconcerned about the impacts of solar development on human health. They were more concerned about effects on wildlife health, the beauty of the landscape, and farmland preservation. Some of these concerns may be more amenable to education than others; it is possible to prepare and disseminate resources about wildlife and agricultural impacts, but it may be challenging to assuage aesthetic concerns.

The perspectives of respondents with solar developments sited or proposed in their communities were somewhat different than in the full sample. Overall, their responses were somewhat more negative about solar development. They were more likely to say that solar development had a negative impact on property values, and more concerned about aesthetic, wildlife health, and farmland preservation impacts. On most questions, respondents in this group were less likely to say that they had no opinion or didn't know, indicating that, as one would expect, people who live near solar developments are more likely to form opinions about solar.

CONCLUSION

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From December 2024 through March 2025, NC State University conducted a phone survey of community members across North and South Carolina to determine their opinions on large-scale solar and wind energy development. Through this survey, some interesting findings emerged. Across the broader sample, community members were slightly positive but generally ambivalent about solar development's economic effects, although they were not in favor of wind development. Community members did have concerns about environmental effects like wildlife health, farmland preservation, and the beauty of the landscape. Many community members do not have an opinion or lack knowledge on these issues.

Among community members that actually have solar development in their communities, responses were generally more negative, with more skepticism being expressed about economic benefits and more concern being expressed about environmental effects. These community members were also more likely to have opinions on these issues overall.

CONCLUSION

Community members indicated that very few of them had wind development in their communities, indicating a lack of familiarity with the issues around wind development compared with solar. A more focused survey among communities with wind development might be helpful to determine opinions among those impacted by wind development.

These survey results imply that there is considerable opportunity for education on issues around solar and wind development. Many community members simply lack the knowledge necessary to form opinions about these topics, so provision of educational resources could help community members get a more complete picture of the actual effects of solar and wind development. Some concerns are more easily addressed through education than others; information about tax revenues and agricultural impacts may address those issues, but it may be more difficult to address aesthetic concerns through educational resources.

ABOUT THE NORTH CAROLINA CLEAN ENERGY TECHNOLOGY CENTER

NCCETC is a public service center seeking to advance a sustainable energy economy by educating, demonstrating, and providing support for clean energy technologies, practices and policies.

ABOUT THE CAROLINAS DEVELOPMENT ASSISTANCE AND SITING HUB (C-DASH) PROGRAM

This program aims to provide education and technical assistance on renewable energy siting and permitting issues to local governments and communities in North and South Carolina. This is a three-year program supported by the U.S. Department of Energy.

ACKNOWLEDGEMENT & DISCLAIMER

Acknowledgement: This material is based upon work supported by the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy (EERE) through the Reliable Energy Siting through Technical Engagement and Planning (R-STEP) program. R-STEP is administered with support from the Partnership Intermediary Agreement (PIA) that the U.S. Department of Energy (DOE) has established with EnergyWerx.