

## Response to Referee #2

We very much appreciate the thoughtful comments from the referee. We have sought to address as many of the comments as possible and believe that the manuscript is much improved with these modifications. You will also find a marked-up and a clean manuscript version attached to this submission. We thank the journal editors for the opportunity to submit these revisions. Our detailed responses to referee #2's comments and changes to the manuscript are summarized in the table below.

Comment	Lines Rev artcl	Author Response
<p>This paper leverages existing data sets such as the Distributed Wind Energy Futures Study to evaluate the overlap of potential distributed wind energy generation with areas experiencing large energy burden. The study provides a novel level of spatial resolution and represents a useful step forward in understanding how distributed wind maybe deployed to benefit specific communities. The objectives, methods, results, and discussion are generally well written and easy to follow. However, I have found two major issues and a few minor issues that I would like to see revised ahead of publication.</p>	<p>NA</p>	<p>We thank the referee for their thorough review of this paper and their thoughtful comments. We have addressed all comments in the paper and responded to them below in a way we believe strengthens the paper.</p>
<p><b>Major Issue 1:</b> Given the dependence upon DWEFS AEP for many of the findings, I did not find much discussion about the methods of the DWEFS and what limitations those previous methods might impart on this study. The most significant concern I have is based on Table 7 in Lockshin et. al, 2025. In that table,</p>	<p>Lines 67-80, Table 1</p>	<p>We have clarified in the text that we exclusively use cost-viable AEP (based on the DWEFS' "economic potential") since they are more relevant to this study's focus on energy affordability and readily-deployable technologies.</p> <p>As suggested, this does arrive at one limitation of this study that results from the DWEFS AEP data, which is that these results (for the referenced Baseline scenarios) assume a 30% federal investment tax</p>

<p>Lockshin presents AEP results for two scenarios: one based on technical viability, and another based on cost viability. Which of these did you use? If you used AEP based on just technical viability, then this seems to directly conflict with the underlying focus on energy affordability. If you used AEP based on cost-viability, are these results dependent upon the status of the federal investment tax credit or incentives? If so, can you comment on the potential impact from recent changes to incentives such as the investment tax credit?</p>		<p>credit as outlined in the 2022 Inflation Reduction Act, as well as location-specific tax credit bonuses (including the energy communities bonus, low-income communities bonus and Tribal lands bonus). Due to the recent changes in federal policy, the investment tax credit and related bonuses are likely to have a reduced impact on offsetting project costs and therefore reduce cost-viable AEP unless other mechanisms are identified, although this might happen on a state, county or project-specific basis. We have included this important limitation in the text in the Methods Section 2.1 as well as the conclusion (Section 5). We have also included a second limitation arising from missing DWEFS data across counties in states such as New Mexico, Kentucky, Indiana, South Dakota, Utah, Nevada and Colorado.</p>
<p>Another related concern that I have is ensuring that the DWEFS data and publications are being clearly referenced. In Line 36 and Table 1 you reference the “Distributed Wind Energy Futures Study (Lockshin et al., 2025).” However, this specific reference is “A parcel-level evaluation of distributed wind opportunity in the contiguous united states” which is not the DWEFS report. Can you please clarify in the text how this reference and the DWEFS report are related? Furthermore, when you mention the DWEFS in the text (line 42) you also reference the DOE WETO Wind Data Hub where the data can be accessed. When I follow the link in this reference (<a href="https://wdh.energy.gov/project/dw">https://wdh.energy.gov/project/dw</a>), it does not take me to a specific data set. After some searching, I believe the link should be</p>	<p>Lines 37-47, 72-75, 482-483</p>	<p>Thank you for flagging this issue. The DWEFS refers to the multi-year research effort dedicated to modeling and exploring distributed wind generation potential in the United States, and the mentioned reports and data products are all outputs of the overarching study. The Lockshin et al. (2025) paper is the most up-to-date publication of the core study results and details the updated methodology and scenario results. The underlying data has been published in the WETO Wind Data Hub as another study output. We have corrected this link to point to the BTM dataset. We have clarified this in the text (introduction and other relevant mentions).</p>

<p><a href="https://wdh.energy.gov/project/dw/data">https://wdh.energy.gov/project/dw/data</a> or  <a href="https://wdh.energy.gov/ds/dw/btm">https://wdh.energy.gov/ds/dw/btm</a>.</p>		
<p><b>Major Issue 2:</b>  There are instances where the positive impact of DW on energy affordability is taken for granted or is perhaps just a bit overstated. For example, on line 119 you state “we generate a weighted ranking to identify states where distributed wind deployment could be most effective at improving residential energy affordability.” Another example is on line 349, where the conclusion states “Taken together, these findings enhance our understanding of how distributed wind could impact energy affordability and offer guidance on where such solutions are most likely to have meaningful impact.” In these instances, I am not convinced that you have actually evaluated how DW could positively impact affordability. To your credit, you have clearly shown the relationship of potential DW energy generation to regions where energy affordability is a challenge. However, you have not presented any metrics explicitly demonstrating that DW is more affordable than the existing energy supply. Although this is a major concern, I believe the concern could be easily remedied by removing any statements that overstate impact of DW’s affordability. Alternatively, you could provide support of DW’s affordability compared to existing energy sources, but this would require much more effort.</p>	<p>Lines  148-151,  472-473</p>	<p>We wrote in a more precise way:  <i>“After computing both parametric and nonparametric correlations, we construct rankings at the state level and then combine them into a weighted ranking to identify states where DW deployment opportunity could be most strongly aligned with EB.”</i></p> <p>Also in the conclusions:  <i>“Taken together, these findings enhance our understanding of where distributed wind deployment could be most relevant to affordability challenges and offer guidance on where such solutions are most likely to have a meaningful impact.”</i></p>

<p><b>Minor issues:</b> Line 30 – You mention that access to renewable energy technologies could be explored as a potential avenue of relief for those affected by high EB. Could you add a sentence or two explaining why you have chosen to explore distributed wind, as opposed to other technologies such as solar PV? Or perhaps a similar study for PV is also warranted?</p>	<p>Lines 32-36</p>	<p>We have chosen DW because the initial motivation for this study arises from a need to understand potential DW impacts and benefits better, which is generally understudied compared to other technologies like solar PV. We have briefly expanded this explanation and added other relevant references.</p>
<p>Multiple locations – DW acronym is used inconsistently. For example, see lines 44 and 46 where both “DW” and “distributed wind” are used.</p>	<p>NA</p>	<p>Thank you for identifying this issue, we have corrected it throughout the entire manuscript to use DW consistently after the acronym is defined.</p>
<p>Lines 120, 127, 205, and 279 – Equation numbers are not present. It seems there is likely an equation missing, or at least formatting issues with the equation references.</p>	<p>NA</p>	<p>Thank you for identifying this issue, this has been addressed throughout the manuscript.</p>
<p>Figure 1 – The caption states “County-level ((e) 2025 – (f) 2035),” but county level results are (c)2025 – (d)2035. Line 282 – Energy burden acronym is already defined earlier in document</p>	<p>Fig. 1</p>	<p>Thank you for identifying this issue, this has been addressed.</p>
<p>Multiple locations – There are many paragraphs that appear as only one or two sentences. I would combine many of these smaller paragraphs together into larger, standard paragraph lengths.</p>	<p>NA</p>	<p>Thank you for this suggestion, we have incorporated it where relevant throughout the manuscript.</p>