Overall comments

- The core contribution of the paper – a preliminary investigation into how LROE for a wind farm can be calculated to aid in design, PPA calculations, etc – is very interesting. However, weaknesses in how the method is presented, lack of justification for key analysis decisions, incomplete reporting of the results, and inadequate grounding of the work in prior art mean that major revision is still needed.
- The paper structure needs work
    - It needs significant improvement in this work builds from and extends the state of the art – i.e. the contribution beyond the past efforts.
    - The methods section jumps right into details without providing a good overview of the approach and most importantly WHY such an approach has been taken and how it differs and improves upon past efforts
    - The results section provides one results of one type for scenario A and another type for scenario B. This mix and matching tells an incomplete story. Both scenario results need reporting in order to properly build to the conclusions
    - Outlook is insufficient in addressing key paper limitations
- The overall paper needs to be edited for grammar before final publication. At many points it is difficult to interpret the author's intent without re-reading sentences several times.
    - I could not even get through the second page without spotting a large number of syntax and grammar errors. I will not proceed with a thorough review of grammar but will check it prior to final publication

Abstract

- Line 7 - Consecutively incorrect English grammar – perhaps considerably? Or in the near future?
- Line 8 grammar error
- Dynamic field-in profile is odd language – you mean the hourly generation profile?
- Are the dismantling of the plants and emissions prices sensitivities you are looking at in the study? Awkward wording
- Remove last sentence of the abstract – it's an overstatement of the contribution and borderline grandiose. The sentence before is fine and speaks more directly to the potential value of the work

Introduction

- Need to qualify that you are talking about Germany rather than referring only to the title of the act. I recommend rephrasing to something like "Renewable electricity generation has increased exponentially in Germany over the last few decades due in large part to the Renewable Energy Act of (year)…"
- Grammar error in sentence 31-32
    - I will not correct grammar errors beyond this point because there are too many
- Line 42, what state of the art? Lacking a bit in terms of citations… please do not speak generically about other work. Cite a specific work or collection of works

- Line 56 – direct marketing doesn't make sense in English. Since it is key terminology, it is important to update it. Try direct merchant market participation or direct marketing of their electricity to the system, etc…
- PPAs have been the historic status quo in the US for decades. (whereas most of Europe tended towards FITs). There is some missing context here. PPAs are not novel by any means. There are tons of works out there that compare and contrast FITs, PPAs, quotas and other policy support mechanisms. It might be good to provide a bit more of that broader context before jumping to the current debate around PPAs in Germany
- Pg 115 many proprietary models are commercial. I would not call this a criticism. It's a common feature of commercial software. I also agree with the reviewer that even though PLEXOS is a commercial code, it is used extensively both by industry and the research community and should be mentioned.
- In addition, it would also be good to mention literature by Hirth and others looking at the value of wind energy. You might check the reference list of this recent paper: https://www.sciencedirect.com/science/article/abs/pii/S0960148120301531

Methodology and forecasting model

- before diving into the model, the paper is lacking an overview that describes the key structure of the model, highly level i/o, methodology used and perhaps most importantly, the assumptions and limitations of which there are many (as noted by the reviewers) and this should be front and center so the reader has a good idea of what the model is about before diving into the details.
- Also, how does your modellilng approach compare and contrast to the state of the art?
- What do you mean the model designs adds a more agent-based approach? Are you using an agent-based model? Be careful on terminology
- The assumption that the weather data and load profile do not need to be synchronized is inadequately motivated. I am not convinced per the reference to the one study. I have seen even phase shifting by a few hours can result in very different correlation statistics… for this study, you may have been limited, but again, the assumptions are what make good fodder for future work. You should be realistic about the limitations of the current work and very explicit wherever possible
- Model validation is also inadequate. What statistics can you report? How much do they different in time versus the cumulative effect that is seen in the price duration curve? You must have statistics on the errors overall between the simulated and historical time-series

Model application, results and case study

- Again, see prior recommended paper https://www.sciencedirect.com/science/article/abs/pii/S0960148120301531 . LROE is just one potential metric so it should be discussed in comparison to others… for example, sLCOE is too cumbersome for the current approach, etc. It is a good choice, but it needs further context.
- Line 251 – minimium FIXED or AVERAGE revenue…
- Where does scenario B come from? Did you make it up? If so, how did you choose which plants to dismantle? I agree scenario A is not realistic but it leads me to

believe both scenarios are somewhat ad hoc in their creation. Please provide a bit more justification for the development of the scenarios

- Figure 5 graphic quality needs to be improved
- There are a huge number of works creating future energy scenarios. Even if this work is too far along to use these, it would be good to refer to these and again explain better the choices made in this study. DNV GL, BP, IRENA, IEA etc… there are tons of organizations out there looking at future energy mix. See IEA Wind Task 25 for a relatively good source of studies, also see ESIG and their work.
- Variation in CO2 is a sensitivity analysis on carbon price. Would be good to describe it as such. However, there is a problem here as the price of CO2 will have an endogeneous effect on the long term electricity generation mix. ReEDS and other models take this into account. It is important to note this limitation. See works by Trieu Mai and others from NREL with ReEDS or again, see ther various many works by the collective research community of IEA Wind Task 25
- Explain better what you are doing in lines 299-301… fictitious??? Again, decisions in analysis need grounded explanation
- The PPA approach needs much stronger justification especially if you are going to use it in generalized conclusions based on the results as in lines 307-310
- Why do you not have a similar figure 8 for scenario A? or put both scenarios side by side on the same plot?
- And why is figure 6 only for scenario A? this is very strange. You don't need to use histograms. You could use lines and plot both scenarios on the same plots. Or alternative use two sets of plots – one for each scenario

Conclusions

- What does low data requirements and low computational cost mean? Be specific and compare to alternative approaches
    - Also, given the myriad of assumptions made I do not think you can claim this at present. Much more work is needed to establish external validity of this claim
- For conclusions on the effects of renewables, you need both scenarios to be shown and compared and contrasted (see comments above).

Discussion and outlook

- WIFO needs to be defined (no acronyms should be used).
- Again, strike the last sentence – as with the abstract, it is overly broad
- Outlook insufficiently critical of the current limitations… the outlook section is where you should circle back to what the key limitations of the current approach are. This needs to be done at the beginning of the methodology section and then the different approaches to remedy them should be discussed here.