

Review of: "Research on the uncertainty of low-carbon environmental governance system and its impact on the dual goals of carbon emission reduction"

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Potential competing interests: No potential competing interests to declare.

The manuscript illustrates the impact of low carbon governance on carbon emission reduction from a new perspective, i.e., the uncertainty of the environment, and the obtained findings (correlation mechanism and impact analysis) are of some theoretical and practical value. However, in order to further improve the quality of the manuscript, I personally believe that the following revisions are required.

1. The abstract can clearly state the research methods, the purpose of the study, and the conclusions of the study, but it should also reflect the contribution and significance of the manuscript to the field of study.
2. A more logical way of writing the introduction, combining it with the literature review, is available for authors to consider: First, discover and point out the problems in the area to be studied (the authors are able to do this well); second, identify the measures that have been implemented and the efforts made by foreign and domestic governments (the author focuses on describing the measures in China, but fails to summarize the relevant measures abroad); third, summarize and conclude the domestic and foreign literature in an organized and categorized manner (the author is able to do this well in the literature review); fourth, regarding the above summarization and conclusion, the shortcomings of the existing literature and the knowledge gaps in the related fields are organized and the contribution and significance of the study are described in a targeted manner; finally, if necessary, the structure of the paper can be briefly introduced.
3. It is widely accepted that the twin goals of carbon reduction refer to carbon peaking and carbon neutrality. In Part II, the author shows the relationship between low carbon governance system and the reduction of total carbon emissions and carbon intensity in terms of low carbon policy, low carbon economy, low carbon technology and trading market, but does not explain in detail the mechanism of its association with carbon peaking and carbon neutrality. If the author's intention was only to investigate total carbon emissions and carbon intensity, it should be explained in the beginning of the paper. At the same time, Figure 1 is too simple and should continue to be improved, and it would be better to show the specific pathways and methods of low-carbon policies, low-carbon economy, low-carbon technologies, and trading markets to influence total carbon emissions and carbon intensity.
4. Carbon emission reduction is closely related to the Sustainable Development Goals (SDGs), and the relationship between each indicator and the SDGs should be clearly indicated when constructing the indicator system to reflect the relevance of the study to current research trends and hot spots.

5. The number of indicators in criterion layer “A4” is only four, which may lead to the phenomenon of low weight of this criterion layer when the entropy value method is used to correct the indicator weights. An additional indicator can be considered to make it consistent with the number of indicators contained in the remaining three criterion layers to increase the accuracy of the results.
6. In the paper, the author investigates the linear and non-linear effects of environmental uncertainty in low-carbon governance on total carbon emissions and carbon intensity. However, from my personal point of view, the linear and non-linear impacts, although independent of each other, are not in parallel. Moreover, compared with the linear impact, the non-linear impact can more accurately describe the impact of uncertainty in the low-carbon governance environment on total carbon emissions and carbon emissions intensity. Under the premise that the existence of nonlinear impacts has been clarified, then there is no need to analyze the linear impacts.
7. In the policy recommendations, the author should closely integrate the content of the recommendations with the research findings, and propose targeted measures to better guide the practice according to the impact of environmental uncertainty of low-carbon governance on total carbon emissions and carbon intensity.
8. The manuscript is too long and should be appropriately streamlined. For example, the principles of indicator system construction and the introduction to the research methodology.
9. There are many language problems in the essay, such as inaccurate expressions and lengthy sentences, so the language should be improved.