

Response to RC3 of Referee # 3

Dear reviewer,

Thank you for the comments to help improve the quality of the paper. We have revised the manuscript to address your comments and a detailed response to each comment is provided in this file. The comments are in regular font and the responses are in red.

RC3, Anonymous Referee #3

Reviewer suggestion: Accept after revision

General comments:

This study is somewhat comprehensive; the modeled output has been compared with observations adequately. I think there is enough scientific merit in the manuscript, and so I would recommend it be accepted after minor revision. I encourage the authors to pay attention to the following comments:

Major comments:

The manuscript needs to be carefully revised. In general, there are places where it is difficult to follow what the authors are trying to convey to the readers. It suffers from lack of flow, perhaps, because of typos, wrong expressions, and many grammatical mistakes. The authors may consider to pay more attention to the construction of sentences and read the manuscript carefully to avoid typos. The results section is well described; however, I would request the authors to use short sentences to avoid getting the readers lose their track of what was said in the beginning of a sentence.

Response: We have read the manuscript carefully and made correction to the typos and mistakes in the revised manuscript. We revised a few long sentences and used short sentences in the revised manuscript.

Specific comments:

1. P3L58: The first sentence of the manuscript is inaccurate. Correct English is “China has been suffering from” The authors may also want to rewrite it.

Response: In the first round of revision for ACPD, we have revised this sentence to “Large population in China has been exposed to severe air pollution....”.

2. P3L64-65: ...threatens public health in this country (Which country is this?). I am guessing the authors wanted to say ...threatens public health in China.

Response: We corrected the sentence to “threatens public health in China”.

3. P3L69: What are “central monitor” measurements? Please do not assume the readers will have an idea about it. It would be better if the authors explain it in a nutshell.

Response: we added an explanation of “Ambient air quality is usually measured at monitoring sites and used to represent the exposure of population in the surrounding areas of the sites”.

4. P3L77: Omit “the” in front of meteorological fields.

Response: Corrected.

5. P3L86-87: ..large uncertainties remain. Correct: ...large uncertainties still remain.

Response: Corrected.

6. P3L89-90: ...,and the efficiency of emissions controls and their fractional penetrations into the industries. The authors got me lost here. Please make it clear about the intent of this sentence. It is hard to get the meaning out it.

Response: We deleted “and their fractional penetrations into the industries” from the sentence to avoid confusion.

7. P5L150: It has been showed that these..., correct present particle is “shown”.

Response: Corrected.

8. P5L171-172: I see that the description of the techniques for emission estimates are somewhat referred for reading, but I would urge the authors to describe the “technology-based uncontrolled” and “penetrations of control technologies” terms in some plain language so that the readers have some understanding of these terms without having to look into the referenced materials.

Response: “technology-based” and “uncontrolled” are two separate description words for emission factors, the former means the emission factors are different for different facilities using different technologies with same fuels. Uncontrolled means before control since the control effects were added later. “penetrations of control technologies” means the fraction of pollutant not collected, in comparison to efficiency.

We have added “and” between “technology-based” and “uncontrolled” and “fractions of pollutants not collected” after “penetrations” in parentheses.

9. P5L187-188: The S1 Table contains the emissions summary for a “typical workday” in season? What about the weekend? How does the weekend emissions vary from a weekday?

Response: This table is to show the differences between inventories. Weekly factors we used to apply the emission to workday and weekend day are certain, which gives the ratios of workday to weekend day of 1.3-1.5. Thus, all inventories will have lower values in weekend day and the relative differences among different inventories do not change. We added explanation to the caption.

10. P6L212: Reference needed for MEGANv2.1 biogenic emissions processor.

Response: A reference was added for MEGANv2.1 (Guenther et al., 2012).

11. P6L218: “In-line” is a one word. Correct it in the manuscript.

Response: Corrected.

12. P6L222: Reference for WRFv3.6.1 is needed.

Response: A reference was added for WRFv3.6.1 (Skamarock et al., 2008).

13. P6L232: Maybe it will be a good idea, if the authors summarize boundary concentrations for major species and put them in a table in the supplemental.

Response: The boundary concentrations for a given species vary in locations (latitude, longitude, and altitude). It is impossible to summarize them in a table. We clearly stated in the manuscript that the initial and boundary conditions were generated using the CMAQ default profiles.

14. P9L325: REAS2 predicted O3-hr values are lower..... Needs attention, comparative sentence missing “than”.

Response: We added “than MEIC” in the sentence.

15. P15: The authors may consider using unabbreviated forms of the performance matrices so that the readers can follow easily in the conclusion section as these are defined way earlier in the manuscript.

Response: We appreciated the reviewer’s suggestion. In our previous experience, we have been advised to keep abbreviations in the conclusion to avoid duplicate definitions. Since the performance matrices have been discussed multiple times in the results section, we feel it is appropriate to keep the abbreviations in the conclusion section. But we are willing to change to use the full names if the editor also think it is necessary.