Atmospheric
Chemistry
and Physics
Discussions

Interactive comment on "Emission inventory of air pollutants and chemical speciation for specific anthropogenic sources based on local measurements in the Yangtze River Delta region, China" *by* Jingyu An et al.

Anonymous Referee #1

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This paper provided a comprehensive emission inventory for Yangtze River Delta region for 2017, with a bottom-up methodology. It is an updated work of Huang et al., 2011 and Li et al., 2012. In general, the paper is clearly organized and easy to follow, and provided detailed emission data for the region. In its current writing format, the paper was focused more on local issue. I encouraged the authors to expand the scope of the paper and to discuss more on the progress of emission inventory development, even at a regional/city scale. Some more detailed information should also be provided and discussed, before the paper can be accepted for final publication. Details follow.

1. As mentioned above, my main concern is that the scope of the paper could be expanded a little bit, and would be focused more on the recent progress of method and data. That might be more helpful for the whole research community instead of local scientists. It invites more review on published work for the YRD region, and more comparison and discussion with other inventories. Some examples include:

NMVOC emission estimation: As major source of NMVOC, there are many working procedures involved with VOC release for given type of chemical plant. Some more detailed methodologies were suggested and applied in the region. How did the authors evaluate the quality and feasibility of the more complicated methods for the regionïij§

NH3 emission estimation: Similarly, different methods have been conducted for the region (Atmos. Chem. Phys., 20, 4275–4294, 2020), and how did the authors analyze the advantage of various methods?

Some more examples include agricultural machines (Environmental Pollution 266 (2020) 115075). It might not be necessary for the authors to recalculate the emissions, but a more careful review and discussion for the method choice and further improvement should be sufficient.

2. Another issue is the comparison between inventories. Different data and methods resulted in discrepancy in emission estimation, as well as the spatial distribution. The authors compared the emission levels of this work compared with the national inventory MEIC in particular, but how about some other information, like temporal and spatial distribution? Moreover, as the authors indicate in the introduction, the region experienced dramatic change for the past years, how did they evaluate the data for 2017 compared to earlier years?

3. Some data sources were unclear. For example, the environment statistics did not provide all the information used in the emission calculation for point sources. Did the authors make more on-site investigations or surveys? Biomass burning was not reported, how did the authors estimate the activity data "based on statistics" ? Could the

authors also provide the emission contribution of point sources by species and region (province) ?

4. Please provide more information on the method of uncertainty analysis. How did the authors evaluate the bias of each category of parameters? At least the information needs to be given in the Supplement.

5. It is great that the authors made detailed evaluation (validation might not be a proper word) with CMAQ modeling and provided the results in the supplement. However, the discussion in the main text seems descriptive. Could you be more specific on the reasons for the relatively big discrepancy due to emission data, and also suggest the possible direction for future improvement on emission estimation?

6. Language should be improved as well. Some English expression is not correct.