

Interactive comment on “A high-resolution emission inventory of primary pollutants for the Huabei region, China” by B. Zhao et al.

Anonymous Referee #1

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General Comments:

Air pollutant emission inventories are fundamental information for investigating pollution formation mechanism and formulating pollution control policy, and the work associated with emission inventories should be always encouraged given the fact that fundamental emission data compilation, analysis and sharing in China generally do not cause enough attentions. From this point of the view, I would like to give my favorable considerations of this manuscript. In this manuscript, the author presents a high-resolution emission inventory of primary pollutant for the Huabei region, one of several regions with serious air pollution in China, the work shown here is important for further analysis of identifying and characterizing atmospheric environmental issues in this region. However, I do have some serious challenges on this manuscript, which are shown in

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the Specific Comments below. Therefore, a major revision has to be made if this paper could be finally accepted for publication.

Specific Comments:

1. Basically, the work shown here is the development of a regional emission inventory for the Huabei region, however, in the “Introduction” part, the authors do not provide enough description or summary how the current status and progress associated with emission inventory work are going in this region, and why this work is important and worthy for publication. In fact, a few of inventory work for the Tianjing and Shandong in this region has been published, though they do not cover the whole Huabei areas.
2. The inventory takes the year of 2003 as a base year, it seems too old. Since emission magnitudes and characteristics may have changed a lot due to large changes in energy structure, control levels, largely increased economy and energy consumption, therefore, I have a serious doubt if or not the data can be used to support future air quality modeling, control policy formation and atmospheric environment research, given the fact that there may be a dramatic change in emission characteristics and magnitudes from 2003 to 2011.
3. For the “Methodological” part, I would like to ask authors to clearly describe how you classify emission sources, and thus a relatively detailed source clarification table with sub-sector information is needed, this will be helpful for the use of the inventory and for readers to better understand if or not the inventory can reasonably cover different emission sources and assess its potential values, not just show that there are some advantages for this work, as shown in the Lines 15~ 24 on Page 20337. In the mean time, methods for estimating source-based emissions are not detailed, and more information in this part might be needed.
4. For the “Fertilizer application”, some emission factors used in this manuscript may be too obsolete, some new studies have been done recently, and may be referred to use the updated results. See Dong et al (2009) *Acta Scientiae Circumstantiae*, 29(8),

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1611-1617 (In Chinese) and others.

5. For the "Traffic" section, vehicle type-based emission factors are given in Table 10, since gasoline and diesel vehicles have different NO_x, VOC and PM emission characteristics, however, emission factors are utilized based upon vehicle size, are not differentiated on fuel types, such classifications may not be reasonable, may lead to high uncertainty.

6. For "Comparison" part, the authors claim that EDGAR-CIRCE and INTEX-B inventories are underestimated in some areas. Are there any evidences to justify your claim? The authors should be cautioned in making such comparisons since "underestimated" or "overestimated" are built upon which one you assumed is more accurate. In fact, this assumption may not be correct given the fact that there are generally very high uncertainties in current inventories including this inventory.

7. For the "Uncertainty Analysis" part, I do not think that this is a good and correct uncertainty analysis work. Please note that the purpose of performing uncertainty analysis in inventory work is not to just show how your work is better or more reliable, but to analyze which sources may lead to uncertainty in emission estimates, to qualitatively or quantitatively characterize uncertainty ranges, and to identify key uncertainty sources for guiding future emission inventory improvement. Authors are suggested to refer to the work done by Zheng (2002), Ph.D dissertation, North Carolina State Univ., NARSTO emission inventory assessment report (<http://www.narsto.org>), Zheng et al (2009) (*Atmospheric Environment*, 43(32): 5112-5122), Zheng et al (2010) (*Atmospheric Environment*, 44, 1960-1969) for uncertainty analysis in emission inventory.

8. There are many English grammatical errors in current manuscript, obviously a native English editor is needed to help refine and improve the English of this manuscript.

Interactive comment on *Atmos. Chem. Phys. Discuss.*, 11, 20331, 2011.

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