

## ***Interactive comment on “The carbon emissions of Chinese cities” by H. Wang et al.***

### **Anonymous Referee #2**

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#### General

The paper addresses a very relevant problem of carbon emissions from Chinese cities, which is definitely within the scope of the journal. It presents new data and - taking into account limitations caused by data availability - applies a correct methodology. In majority of cases the assumptions adopted are clear. Some questions are outlined in the further part of this review.

The results are interesting and as far as I know this is the first attempt to compare the emissions in China at a city level. Also comparisons with carbon emissions calculated in other studies for other cities in the world are interesting.

Performed regressions identify major factors contributing to carbon emissions and indicate significant relationship with city GDP and population. However, because of different structure of energy consumption in the cities, industrial emissions play a much

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greater role in total emissions in China than in other cities in the world. Thus proper treatment of industrial emissions in the analysis presents a major challenge. I understand that this issue could not be analyzed in more detail within the current paper but I encourage the Authors to explain how they plan to analyze industrial emissions in more detail. Also, emissions from manufacturing industries should be separated from total city emissions when comparing with other cities in the world.

#### Other comments

1. I don't like the term "global cities" used across the paper. Better say that emissions from Chinese cities were compared with emissions from ten cities in the world as published in the paper on greenhouse gases emissions from global cities (Kennedy et al., 2009). Then use the term "ten cities in the world".
2. Table 1: explain if the GDP is in PPP or in MEX (not every reader will read the supplementary material).
3. Paper requires careful language editing. Suggestions for (some) improvements are given below.
4. Table 2: re-formulate footnote (c) so that it is clear that the assumption on 30 percent contribution of industry to total emissions is valid only for ten cities in the world used for comparison.
5. Figure 2b: not ...contribution rates but ...contribution shares.
6. Figure 3 – change the unit to million tons.
7. 7986, from line 10: say that the average contributions of sectors to per capita emissions for all Chinese cities were 64.3% for industrial energy consumption, ..., and 2.5% for waste processing. However, these shares are characterized by large variability due to city-specific factors.
8. 7987, 13 – 17: re-formulate, divide into two sentences.

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9. 7987, 25: intensity per unit of what?
10. 7990, 1: delete “our published paper”.
11. 7990, 13: say ...excluded from this sector.
12. 7992, beginning of the page: It is not clear how the emissions from electricity production and use within the boundaries of each city were calculated. Were the emissions from the final electricity use calculated with an average carbon intensity of electricity produced in a given grid? Was it assumed that the emissions from power plants located at the city territory contribute to the average emission factor for a given grid and thus have been ignored in calculations for the city? Was the approach different? Please provide a better explanation.
13. 7996, 17: Comparison with other cities in the world (not mega cities).
14. 7998, 26: key industrial processes should include mineral products industry. (cement). Explain if emissions from cement production are included.
15. Replace Section 3.5 with three sub-sections: uncertainties, conclusions, further work. Conclusions part should be expanded. Most important findings described in other parts of the paper should be put together here.

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 7985, 2012.

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