

Interactive comment on “Uncertainties in estimating mercury emissions from coal-fired power plants in China” by Y. Wu et al.

Anonymous Referee #1

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The manuscript assesses mercury emission uncertainties from coal-fired power plant in China. This is an important area in the ongoing efforts of estimating the emission inventory of mercury in China. The technical approaches of the study are generally sound and the manuscript is organized. On the other hand, there are quite a few touchups needed for further improving the overall quality of the paper. These are summarized below. 1. Abstract. Some remarks regarding the implications of the uncertainties will be helpful. 2. Introduction. Year 2003 was used the base year in this study. This is not in sync with the two primary databases for coal consumption in China (the 2005 China Energy Statistics and the 2004 China Power Industry Yearbook). Some justifications along the line is needed. Are there more recent data available? In one of the co-author's recent studies (Streets et al., 2009), the base year is 2006. Use of more updated data will greatly improve the significance of the work. 3. Methodol-

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ogy and Tables 1&2. Some clarifications are required. The assignment of distribution function sounds somewhat arbitrary. I recommend that the statistics relating to the goodness-of-fit be presented in the paper as well (which should be readily available from a sophisticated statistical package). For some of the key characteristics, it is not clear that how the distribution functions were determined when the sample size is small (as small as 2!). It is also not clear that how the subjective distribution functions were determined. Because Monte Carlo method heavily depends on the probability distribution of sampling domain, clarifications in these regards are important. Also, lognormal distribution function was selected to represent the distribution of mercury content and the authors stated that the P50 values are "significantly lower" compared to those in their previous work. What is the impact of such low values when compared to their earlier estimates? Finally, an overall description on the data sampling scheme used in the Monte Carlo simulation will be helpful - this will affect the distribution shapes shown in Figures 3&4.

4. Results and Discussion. The authors attributed the majority of the uncertainties to the mercury coal content and control technology's efficiency. However, the data directly supporting this conclusion cannot be found in the manuscript (using the shape of the resulted distribution is not strong enough because the shape of distribution can be affected by sampling scheme, which was not discussed in details in the text). Perhaps a figure or two can be used to illustrate this? I am not sure what is the usefulness of Figures 3&4. A bit more discussion regarding their implications will be helpful.

5. Conclusions. Given the wide range of uncertainties reported in this study, the on-going work (or what can be done) to reduce the uncertainty is of great interest. Some concluding remarks regarding this is important.

6. Editorial cleanups throughout the manuscript are needed to improve the article's readability. All the main messages are clear, though.

7. Figures. The figure quality can be greatly enhanced. Instead of using the print-screen view, high-quality graphics should be used, particularly for Figures 1-4. In addition, the labels and units of the axes of Figures 1-4 are not shown. This is a problem because it makes it difficult to understand the probability distributions shown in the figures. There is probably a mistake in the y-axis in Figures 1-4. It looks

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like "probability density" instead of "probability" based on the shape of distribution.

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