Response to referee #3

The paper provides a useful description of the MIX inventory. The paper could be enhanced by providing additional detail for the data and inventory construction methodologies.

Response: We thank the constructive comments given by the referee #3 in improving our manuscript.

In addition to the suggestions from other reviewers I suggest the following: It appears that the mosaic inventory was constructed using the five sectors: power, industry, residential, transportation, and agriculture. This should be explicitly stated.

Response: In the abstract and the Sect. 2.1 of the revised manuscript, we clarified that the MIX inventory includes five sectors: power, residential, transportation, and agriculture.

The definition of these sectors should be provided (this could be in the supplement). Some of the issues that are potentially inconsistent between inventories include the sector assignment for: auto producer industrial emissions, mobile residential and commercial emissions, and off-road mobile emissions. A mapping between the summary sectors and IPCC/NFR categories would be useful.

Response: In the supplement of the revised manuscript, we provide the sub-sector information of different inventories and the mapping table between those sub-sectors and the five sectors of the MIX inventory. A mapping table between the five sectors and IPCC/NFR categories are also provided.

Some discussion of how consistent the sector definitions are across the different inventories used in MIX would also be helpful. For example, do all the inventories define these sectors in the same manner and include all sub-sectors?

Response: We agree with the referee that inconsistencies are always existed across different emission inventories. In the Sect. 2.1 of the revised manuscript, we added a paragraph to discuss the differences of sub-sectors in the component emission inventories.

It appears that some emissions, although somewhat small, may be missing (For example there are no emissions from agriculture listed except for NH3. I would expect NOx emissions, for example.)

Response: Some specific sources are excluded from the MIX inventory as they are not estimated in all of the component emission inventories. We clarified this in the Sect. 2.1 of the revised manuscript.

Section 4.2.1, line 24 ˇ 30% is a fairly large difference for China. I'm not sure this can be classified as "good" agreement.

Response: We revise the statement as follows:

For SO_2, and CO_2, MIX and REAS2 agreed well in power plant emission estimates over China (differences within 10% for 2008), implying similar estimates in energy consumption and emission factors in the two inventories. For NO_x, PM_{10}, and $PM_{2.5}$, REAS2 estimates are lower by more than 20% compared to MIX, mainly due to the differences in the emission factors.

Table 3 should clarify that the last line in each section is the sum for that set of countries.

Response: Revised as suggested.

Table 4 is appropriate for the main paper. A similar table by country with emissions by sector should be provided in the supplement in order to more fully document the dataset.

Response: Considering the size of the table is large, we put the table into the MIX online repository and added the link to the table in the revised manuscript.