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Interactive comment on “High resolution mapping of combustion processes and implications for CO₂ emissions” by R. Wang et al.

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Review: Wang et al: High resolution mapping of combustion processes. ...

This is an excellent paper which I highly recommend for publication.

There are only few questions, no problems, which I like to ask:

Abstract line 11: you present a total of 11.2 PgC yr⁻¹. Was this total different from the “official” record? In the results section (page 21220 line 15 you present 7.87 PgC yr⁻¹ reported by IEA). Does this mean that your approach leads to 42% higher estimated total global emissions? Also in section 3.2 you only mention the reduction in uncertainties but not changes in the total average. I think you should compare the averages in the Abstract and in Section 3.2

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Abstract line 19-20: you interpret the difference between rural and urban areas by urbanization. In chapter 4.1 you discuss also migration. This interpretation may be true for China, but may not hold for industrialized regions, where highways pass through rural areas, heavy machinery is used in agriculture, and most country people work in town and sleep in the farm. This is not urbanization, but daily long-distance travel to reach the city. I think this interpretation may be removed from the Abstract or it needs more explanation.

Introduction page 21213, line 5: you promise to quantify emissions from diesel used by industry and vehicles. I agree that this information would be nice to know, but I do not see that you provide this information. Maybe I have overseen it.

Chapter 2.1 Combustion sources: page 21215 line 2: Why did you omit Russia? Russia has become member of the WTO, and it should provide the necessary information, and Russia is important with its large scale forest fires. In Fig. 1b you show high emissions near the arctic ocean, in Fig. 2 Russia is missing, and in Fig 3b Russia sticks out as big red area. It would be great if you could include Russia, or make clear why you did not include Russia

Results page 21220: I think you should avoid enumerations using “respectively”. This is reader-unfriendly. You should use each number with its descriptor,

Page 21220 line 24: In Fig. 1 you contrast land based emissions and aviation and shipping, but you do not present numbers on C-emissions from aviation and shipping. It would be nice if you could do so. In Fig. 4 you exclude again shipping and aviation.

Chapter 4.2: I am happy to see the map of the terrestrial carbon sink, but I recommend that you make crystal clear that the GHG-balance is different. The sink across Europe and maybe in other industrialized countries is equilibrated by N₂O and CH₄ emissions. Can you include these emissions? I am afraid that this sink-map may be misinterpreted.

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Fig. 7: what are the red dots in this map? Are this the cities? I think it would be worth it to mention this, because there was a lot of discussion whether city trees and parks would make also cities a carbon sink.

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