

Interactive comment on “Russia’s black carbon emissions: focus on diesel sources” by N. Kholod et al.

Anonymous Referee #1

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This paper adds important information to the effort to understand emissions of key pollutants in Russia and the Arctic. The paper is well-organized and lays out step-by-step the process the authors used to calculate the emission changes. The methodologies appear sound and assumptions are largely explained in a satisfactory way. The references are extensive and robust and the supplemental tables and charts are helpful to guiding the reader’s understanding of the material.

I would recommend the authors consider the following minor revisions before the article is published (in order of appearance):

1. The health information on p. 1 should be updated to reflect the most recently available health impact information (GBD 2013 was published in early 2016).
2. On p. 4, the authors discuss the movement to low sulfur fuel, but omit an important piece of

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information – low sulfur fuel is necessary for operation of the most effective emission control devices on diesel vehicles. This would be additional context that would be helpful to add. 3. If the information is available, it would be informative to include the share of industry that is made up of small businesses rather than the number of people employed to give a better indication of the impact of the lack of reporting. (p. 5, lines 140-150) 4. Authors should consider defining "fuel balance approach" at first mention rather than later in discussion in case readers are not familiar with this methodology. (p. 5, line 155) 5. It is not clear why there is discussion of gasoline vehicles in the section of distribution by emission standards. The authors note that they produce almost no BC, so could easily be left out or addressed with a sentence explaining that they produce almost no BC. If there is a reason the comparison of emission standards is important to the discussion, this should be clarified. (p. 6, lines 198-208) 6. For logical flow, authors should consider moving the active vehicles section (p. 7, lines 210-221) to immediately following the registered fleet section. 7. The assumptions for speed and type of road traveled would benefit from further explanation (i.e., are these based on standard speeds/distribution of roads in Russia?) (p. 9, line 285) 8. The assumptions for controls on agricultural vehicles would benefit from further explanation (i.e., who no Stage 1?) (p. 11, line 351) 9. For logical flow, recommend moving the paragraph on uncertainty regarding BC/PM ratios after the paragraph on activity data (p. 14). It appears that the BC/PM ratios are NOT a major source of uncertainty, so it would make more sense for the reader if this is discussed after the two major sources of uncertainty that are identified.

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