

## ***Interactive comment on “Global anthropogenic emissions of particulate matter including black carbon” by Zbigniew Klimont et al.***

### **Anonymous Referee #2**

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The paper by Klimont et al. describes in details an emission dataset, ECLIPSE, which is already used by the atmospheric modeling community. This paper therefore provides very useful information on the emissions provided by this inventory.

A few comments on the paper:

The title mentions that the paper focuses on anthropogenic emissions. However, the paper also discusses open fires. Since the paper is already very long, it might be better to only focus on anthropogenic emissions as stated in the title. The inclusion of emissions from fires (which come from other authors) is a bit confusing.

Abstract and line 24, page 2: the abstract claims this paper is " the first comprehensive assessment of historical (1990-2010) global anthropogenic particulate matter (PM)...". However, the EDGAR4.3 inventory described in Crippa et al. (2016) provides emis-

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sions for 1970-2010 for PM<sub>2.5</sub> and PM<sub>10</sub>. The statement about being "the first comprehensive assessment" is true for PM<sub>1</sub>, but not for the other species. Please rephrase.

Page 18, line 6: " exceptions are old vehicles running on leaded gasoline and pre-regulation 2-stroke mopeds . . . while latest gasoline direct injection engines have PM mass emissions comparable or even higher than latest diesel engines with particle filter, however, the absolute level is about one order of magnitude lower than for older generations. This sentence is not clear. What does "absolute level" refer to?

Page 26, line 20: The authors use quite old data for emission factors for agriculture waste burning. Akagi et al. (Atmos. Chem. Phys., 11, 4039–4072, 2011) have published a more recent and detailed review of all data available on emission factors. The authors should indicate why they did not use this more recent review.

Page 29, lines 1-4: these lines should be rephrased. Many recent global chemistry-transport and chemistry-climate models now include detailed aerosols schemes, and PMs distribution are calculated as the sum of the mass of all the components included in the models. Maybe a few older models use the "BC + 1.4 OC" formula to calculate the mass of PM, but the recent models are much more advanced and calculate the mass of PMs in a more accurate way.

Page 31, lines 14-15: The sentence starting with "combined . . ." is unclear

Page 25 of the supplement: the authors should add in their table the TNO-MACC and TNO-MACCII (Kuenen et al., ACP, 2014) inventories, which provide emissions of PM for Europe and neighboring countries. The TNO-MACC inventories are now becoming a reference for atmospheric modeling in Europe, and these emissions should be mentioned in the paper.

Page 25 of the supplement: The emissions provided by US EPA are given as the sum of anthropogenic and wildfires. The dataset provided by EPA (note that the last release of the emissions is 2016 and not 2011 as mentioned in the supplement) provides emis-

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sions with and without wildfires. It would be better to include the emissions without wildfires, in order to be consistent with the other data in the table.

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