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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Particulate emissions from residential wood combustion in Europe – revised estimates and an evaluation" *by* H. A. C. Denier van der Gon et al.

Anonymous Referee #2

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Review of "Particulate emissions from residential wood combustion in Europe – revised estimates and an evaluation" by H. A. C. Denier van der Gon et al.

Overall: The manuscript describes a new bottom-up emission inventory for residential wood combustion accounting for semi-volatile components. This study modelled an extended scheme of the volatility basis set using nine bins including POA, SVOC and IVOC and shows the spatially resolved RWC emissions for Europe. This new method shows a dramatic increase in the modeled RWC emissions compared to the EUCAARI inventory. The manuscript is well written and contains information of interest to ACP readers.

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Interactive Discussion
Discussion Paper

The authors mention several times the formation of organic aerosol due to condensation of semi-volatile organics upon cooling of the flue gas. When hot flue gas is emitted from the chimney there are to simultaneous processes: cooling and dilution. Where cooling will lead to condensation the dilution will lead to evaporation. Although dilution is mentioned briefly separately (P. 31723 L. 25), a brief discussion of these counteracting processes should be included.

As mentioned in the manuscript, emission factors depend on burner type, operation and sampling method. Secondary organic aerosol (SOA) has been produced from the emissions of different types of burners under different conditions (Hennigan et al., 2011; Grieshop et al., 2009; Heringa et al., 2011). However, the volatility distribution of the organic emissions can vary as well as no SOA formation was observed for a pellet burner. It would be nice if the authors would touch on this as well.

Specific comments: P. 31721: Condensation due to cooling is mentioned in the abstract whereas SOA formation is not. Both processes have an influence on OA concentrations (as described in 3.3).

P. 31722, ln. 28: Please define the abbreviation EEA.

P. 31724, ln. 15: Please define RWC.

P. 31730, ln. 19: SP and DT were already defined above.

P. 31730, ln. 26: It would be nice to include the emission factors used by EUCAARI for comparison purposes (e.g. as additional column in table 2).

P. 31735, ln. 15/17: VBS has been defined before, SOA was not.

P. 31741: Some abbreviations are defined again some are not. Please make it consistent.

Fig. 4: The lower end of the scale disappears in the color legend.

Fig. 6: The figure is really hard to read because of its size.

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Fig. 9: Give a description of the bars (measured range / 95% / . . .).

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Interactive comment on Atmos. Chem. Phys. Discuss., 14, 31719, 2014.