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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Modelling carbonaceous aerosol from residential solid fuel burning with different assumptions for emissions" *by* Riinu Ots et al.

Anonymous Referee #1

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This is a very useful contribution to an ongoing and important debate on the impacts on PM concentrations of wood burning.

Abstract: It doesn't mention the Redist analysis. Wouldn't it be worth saying that a simple redistribution of emissions according to population is not correct?

Comment on whether the degree day factors actually reflect the use of these wood burners would be useful.

Whilst there is an under prediction at K&C and the Waters paper (3x the emissions) - most experiments are using base emissions of NAEI, why is this? I have read the Waters paper and it not only gives the 3x factor but also the wood use in different

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UK regions. You did not use these data but could you comment on how the different scenarios you did run compare?

P13 line 3-4 - What about European assumptions bearing in mind the results in Belgium. Could you comment on how important the long range transport of these emissions are and could be if the results in Belgium and UK are reflected more widely in Europe?

It would be good to provide a quick comparison of the Marylebone and Kensington site results. Looking at the map they are close to each other and I guess they have very similar SFOA concentrations. Is this the case? In addition, whilst I realize that you have used what data is available for the UK, could you say something about the limitations in addressing the wood burning emissions inventories UK wide using a small number of sites close to each other in the SE of England.

Page 11 line 9 - where it says for more discussions see Ots 2016a, why not just add a sentence discussing the measurement uncertainty?

Page 11 fig 7 - it is clear that the diurnal profile of SFOA is similar at all sites and not reflected in the currently used emissions profile for this source. I have read the work of Fuller in London which showed there to be a strong evening peak in emissions from domestic wood burning, especially at weekends. It would have been good to test an alternative emissions profile, which better reflects the burning of wood and would have been helpful for other model users.

Fig 8. results - 14th-15th Jan was also a weekend could you comment on the likely weekday to weekend use of wood burners as well as the weekend evening use. What was the evening temperature during these events?

Fig 11 - Comment on Detling daily data. The daily average measurements around the 17th Jan doesn't seem to be reflected in the plot. Is this because of <75% data capture?

Figure 13. I don't really see much point in comparing the results of the model at Marylebone Road, so you should remove this plot.

Figure 14. Could you rescale these plots? You can barely make out the modelled EC in many of them?

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