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Interactive comment on "Modelling street level PM₁₀ concentrations across Europe: source apportionment and possible futures" *by* G. Kiesewetter et al.

G. Kiesewetter et al.

kiesewet@iiasa.ac.at

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We thank the Referee for his/her constructive comments and suggestions on how to improve the manuscript. Below we provide detailed point by point replies to the questions. Referee comments are quoted in *italicised* font.

One key limitation of this study is that it only provides concentration projections for monitoring stations for which data are available for 2009 and indeed only for a subset of stations for which various data criteria have been met.

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The methodology is indeed limited to the stations operational in 2009 which fulfil certain data coverage criteria. However, the model covers around 1870 stations, among them 445 or 80% of the stations which violated the limit value on daily mean PM_{10} in 2009. Every model has its limitations, and setting up a model for every street in the whole EU is currently out of reach. It is a characteristic of our approach that it avoids going into the details of physically describing the individual streets (building layout, wind speeds etc) but is based on past monitoring data instead – thus inevitably restricting the set of locations that may be covered.

Page 18325 line 19. I am not clear how delta PM10 has been defined or how this value is used in the calculations.

$\Delta[PM_{10}]$ refers to the PM_{10} roadside increment. It is defined in Equation 4 on p. 18323 (here the ACPD manuscript was updated from the originally submitted version). The modelled PM_{10} roadside increment is constrained by the observations in the base year. We use the observed base year NO_x roadside increment $\Delta[NO_x]$ at the same station to derive the base year $PM_{2.5}$ roadside increment $\Delta[PM_{2.5}]$, and the coarse PM roadside increment $\Delta[PM_{coarse}]$ in the base year is the residual $\Delta[PM_{10}]-\Delta[PM_{2.5}]$.

Page 18330 Line 10. It is not clear whether these scaling factors of 8 and 4 have been applied to the domestic emission or not. Page 18326 line 19 implies that a method was derived to assign the residual to specific sources. Page 18330 Line 10 implies that the emission inventory was adjusted, so I am not clear what was done.

In fact, both steps were necessary. The scaling factors for emissions in coal mining areas (applied flat across the whole provinces concerned to represent the use of low-quality coal) improve the average, but for individual stations the allocation of residuals is still undertaken. This is done consistently throughout Europe using the methodology described on p. 18326.

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