

Interactive comment on “Analysis of the potential of near ground measurements of CO₂ and CH₄ in London, UK for the monitoring of city-scale emissions using an atmospheric transport model” by A. Boon et al.

Anonymous Referee #2

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This manuscript evaluates the use of near-surface measurements of greenhouse (CO₂ and CH₄) gases and of carbon monoxide in London, UK, and rural areas combined with an atmospheric transport model to estimate city-scale emissions budgets.

The rationale of the work is well-defined: street-level measurements of concentrations can be cheaper, technically easier to implement and logically simpler to run than tall tower systems such as eddy-covariance ones. In addition, such street-level measurement sites offer the potential of establishing monitoring networks which could help constrain atmospheric emissions inventories.

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The manuscript is well-written, with precise terminology (see however the comments on the use of "misfits" and "signature" in the accompanying pdf) and detailed descriptions of the methodology and data analysis. The manuscript seems however "methods-heavy" which makes the results and discussion section seem a little thin at times. Interpretation of the data is sometimes too qualitative and speculative, especially for the discrepancies between measurements and model. As a result of this, the conclusions are a little disappointing (e.g. "this study strongly questions the ability to exploit a GHG network with near ground urban measurement sites alongside a state of the art atmospheric inversion system with atmospheric transport models at kilometric horizontal resolution.") and it would have been interesting to explore and report on ways to improve the results. As it stands, this work does not offer a credible alternative to more conventional bottom-up or top-down approaches for estimating greenhouse gas budgets at the city-scale.

I anticipate however that this work should be of interest to the specialist scientific community. I therefore recommend that the manuscript be reconsidered for publication in ACP once the comments detailed in the attached document have been addressed.

Please also note the supplement to this comment:

<http://www.atmos-chem-phys-discuss.net/15/C10742/2015/acpd-15-C10742-2015-supplement.pdf>

Interactive comment on *Atmos. Chem. Phys. Discuss.*, 15, 33003, 2015.