

Geosci. Model Dev. Discuss., referee comment RC1
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Comment on gmd-2021-390

Anonymous Referee #1

Referee comment on "A multi-pollutant and multi-sectorial approach to screening the consistency of emission inventories" by Philippe Thunis et al., Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2021-390-RC1>, 2022

The theme discussed in the paper is of clear interest: the quality of the emission inventory (in relation to total quantity of emission, sectors of emission and spatial distribution of emissions) is of primary importance in the scenarios studies, that should be the starting points of all the plans but also of all the sustainability or integrated analysis. The quality of the emissions inventories is essential for the reliability of the studies driving policies and, so, to the effectiveness of the policies. So, the proposal methodology can be a valid instrument for validating the emission inventories.

On the other hand, it should be underlined that the methodology is not able to check the quality of an emission inventory in an absolute way but also as intercomparison of results. If the same methodological mistake affects both the emission inventories evaluated, the method is not able to point out them. The methodology, furthermore, permits to find differences but it is not able, alone, to show what inventory is better. In any case it can help the analysis.

Going to more specific questions, the idea to focus the analysis only to urban areas is another weakness of the work. For some areas ammonia is one of the key factor of the scenario analysis. It would be interesting also to develop methods in relation to temporal distribution of emissions (that can be another factor of uncertainty very important in scenario analysis, normally not faced by emission inventories).

In the discussion it should be deepened also that the quality of an emission inventory is related to the spatial (and temporal) scale of the studies undertaken: i.e. if a microscale model is used, the emission inventory should have the same scale. Here the discussion is focused only to a certain type of applications.

