Review 1

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 intercomparsion 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.

We agree that the method does not allow to check the quality of an inventory in an absolute way. However, the spotted inconsistencies are often so large that one (or both) inventories must be wrong. Given the magnitude of the inconsistency, it becomes very likely that the reason for this inconsistency can be found and explained, and the inconsistency corrected in most cases. This is becomes an absolute improvement. We tried to stress this point in the text at lines 172-175.

Although very large differences may result from methodological choices as well (e.g. inclusion or not of condensable emissions for the residential sector), they are more likely to be associated to errors. Given the magnitude of the differences, it will in most cases be possible to identify one best value out of the two inventory estimates, even though the truth is unknown. These large differences therefore point to a list of potential issues for inventory compilers to check and fix where applicable, opening the way to potential improvement. In this work, these large differences are named "inconsistencies" and are intended as differences that are large enough to ensure that one of the two inventory values is tenable (i.e. justifiable) whereas the other is not.

We included the sentence below in the conclusion to remind this important point:

Although this screening does not allow to check the quality of the inventories in an absolute way, the magnitude of the differences is often large enough that it is possible to identify one best value out of the two inventory estimates, even though the truth is unknown

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).

We clarified the fact that the method can be generalized to other areas than urban, for example those related to agricultural intensive or industrial intensive emissions. In fact the method can freely be designed to address sub-areas of interest, regardless of their emission characteristics.

We agree that temporal distributions are another source of uncertainty. It is however impossible to include this aspect in the current approach. We added the sentence below in section 2 (line 106-107) to stress this point.

Note that the method proposed here is designed with a focus on the spatial dimension. Other uncertainties related to emission inventories (e.g. speciation of VOC or PM, temporal distribution of the emissions) are not considered

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 microscal model is used , the emission inventory should have the same scale. Here the discussion is focused only to a certain type of applications.

We added a couple of sentences to stress the fact that the method can be used, regardless of the scale of interest (from microscale to EU or global models). The selection of the areas of interest can then be adapted to the scope of the study, ranging from specific streets (microscale modelling) to urban/industrial/agriculture intensive areas (country or EU) to regions (EU or global modelling). We also added a note to stress the need of having the relevant expertise to interpret the results of the screening for a given application. The following lines have been added in the conclusions:

Although only a particular example has been discussed here, the screening approach is general and can be used for other types of applications related to emission inventories. The approach can be applied to other inventory scales (e.g. regional or local) and can be tuned to address different sectors or areas. Intensive agriculture or industrial areas could for example be added to the urban agglomerations considered in this work. Because the type of expertise strongly depends on the type of applications, the expertise relevant to a given application is necessary to analyze the screening results and correct likely errors.