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Analysis of the anthropogenic and biogenic NO_x emissions over 2008-2017: assessment of the trends in the 30 most populated urban areas in Europe

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We use the OMI-QA4ECV-v1.1 NO₂ tropospheric columns over the 10-yr 2008-2017 period to confront satellite-based trends in NO₂ concentrations to those from the state-of-the-art regional chemistry-transport model CHIMERE and to evaluate the bottom-up anthropogenic and biogenic NO_x emissions in Europe. A focus is made for the 30 most populated urban areas in Europe. Over urban areas in Western Europe, except for coastal cities, OMI confirm the drop in the simulated CHIMERE NO₂ tropospheric columns based on the latest country emission official reporting. OMI does not show significant decreasing trends over Central and Eastern Europe urban areas. Increasing biogenic emissions helps reconciling CHIMERE and OMI trends over urban areas in Central Europe and over rural areas, confirming the importance of accounting for non-anthropogenic emissions to assess long-term trends. Over Eastern Europe, our results question emission reductions estimated for particular sectors and in particular the road transport, public power and industrial emissions.