The effect of the Standard Nomenclature for Air Pollution (SNAP) categories on ozone and PM2.5 concentrations over Europe

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The objective of this study is to estimate the contribution of different anthropogenic emission sources on ozone and PM2.5 concentrations over Europe since anthropogenic activities (and the related emissions) are the reason of air quality degradation. Gridded yearly averaged anthropogenic emissions for the year 2006 over Europe are provided by TNO at a 0.1×0.1 degree resolution. Emission sources have been classified into different activities according to the Standard Nomenclature for Air Pollution (SNAP). The available data include annual total emissions of CH4, CO, NH3, NMVOC, NO_x, PM10, PM2.5, and SO_2 for both area and point sources in ten (10) SNAP categories: power generation, residential-commercial and other combustion, industrial combustion, industrial processes, extraction distribution of fossil fuels, solvent use, road transport, other mobile sources, waste treatment and disposal, agriculture. Mobile sources and road transport are the major sources of NO_x emissions followed by power generation units. Power generation is also the major source for SO_2 emissions followed by mobile sources. Agricultural activities dominate NH3 emissions while combustion sources followed by mobile sources and road transport are the main sources for primary PM2.5. Emissions are processed by the Sparse Matrix Operator Kernel Emissions (SMOKE) v2.6 modeling system to convert their resolution to the resolution needed by the air quality model The Community Multiscale Air Quality (CMAQ) v4.7 Modeling System with the Carbon Bond mechanism (CB05) is used for the regional air quality modeling over Europe at 35km grid spacing. Results quantify the contribution of each SNAP category on ozone and PM2.5 concentrations, locally, across Europe.