

AIRUSE-LIFE+: Are industrial emissions inventories accurate enough to develop air quality plans?

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The AIRUSE project seeks to improve air quality levels by proposing mitigation strategies for PM emissions in Southern European countries. As industry is the second-largest source of primary PM₁₀ emissions in EU-28 (EEA, 2014), one project action focuses on the “Determination of the impact of industrial sources” by carrying out an industrial PM emissions inventory in the five AIRUSE target cities: Porto, Barcelona, Florence, Athens, and Milan.

The main activities carried out were: reporting quantitative data on industrial emissions of primary channelled and diffuse PM₁₀/2.5 (including emissions generated in ports); identifying the potential degree of improvement; and distinguishing the industrial profile that could most contribute to primary PM levels in AIRUSE cities.

The methodology followed includes a calculation method, the hierarchical structuring of information sources, selection of emission factors, and of course the hypotheses and assumptions needed where required owing to information deficiencies.

On the other hand, from a source apportionment study within the AIRUSE, on grouping the direct industrial contributions from specific sources with other industry related contributions (shipping and industrial contributions from heavy oil burning, a relevant fraction of the non-traffic and non-biomass related nitrate and also another relevant fraction from the regional secondary sulphate and OC source contributions), it was detected that the total industrial contribution to ambient PM₁₀ and PM_{2.5} exceeded 20% of the annual ambient air concentrations in most cases, indicating further efforts were needed to abate emissions of primary PM emissions and precursor gaseous species. It was therefore considered of great interest to carry out a rough estimation of the main precursors of secondary pollutant emission (SO_x, NO_x, NH₃, and NMVOCs).

During the consultation process and after compiling all the information, certain limitations were identified. Even though the existing activity and public emission data could be reliable enough to build up National and European Inventories, the emission information required to develop realistic air quality plans in relatively small areas, such as the metropolitan areas studied in the AIRUSE project, need to be more exhaustive in order to provide guidance on the effectiveness of the control actions and to indicate where greater efforts are needed.

With a view to addressing common weaknesses found in the studied areas, this communication includes the following general recommendations:

Addressed to EU regulatory and technical bodies

Emission inventories: Further standardisation and coordination of baseline information, extending information in public inventories (e.g. E-PRTR) to improve transparency, harmonising key parameters: air quality (PM₁₀, PM_{2.5}), ELVs (TSP), and E-PRTR (PM₁₀).

Diffuse sources: Developing and compiling specific PM diffuse emission factors and control efficiencies.

Channelled emissions: Developing and compiling, specific PM₁₀/PST and PM_{2.5}/PM₁₀ ratios, regulating maximum temperatures in exhaust gases and/or abatement systems, fostering control of secondary PM precursors and heavy metal emissions.

Addressed to national and/or regional environmental bodies

Primary PM emissions: Updating the ELVs adopted in the BREF documents, increasing emission control frequency to ensure proper BATs operation, including real control and quantification of diffuse emissions.

Gaseous emissions (secondary PM precursors) and heavy metals: Quantifying these in greater detail, selecting the cleanest available fuels and/or using controlled combustion systems, fostering cleaning systems in hot emissions.

Activities inventory: Periodically updating the list of industrial activities, using a bottom-up approach, including non-IED activities and diffuse emissions, controlling and quantifying shipping, harbour, and construction works emissions.

Addressed to stakeholders

Organising specific campaigns (workshops, info-days...) for industrial associations, harbour managers, local authorities, health groups, etc. Involvement of stakeholders can greatly increase emission inventories accuracy.

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References

EEA. European Environmental Agency. Air quality in Europe-2014, report 5/2014, [<http://www.eea.europa.eu>].