AIRUSE. INVENTORY OF INDUSTRIAL SOURCES OF PARTICULATE MATTER IN METROPOLITAN AREAS: SPECIFIC CONSIDERATIONS.

E. Monfort[1], I. Celades[1], V. Sanfélix[1], S. Gomar[1], X. Querol[2], F. Amato[2], A. Karanasiou[2]

[1]Instituto de Tecnología Cerámica-AICE (ITC), Universitat Jaume I, 12006 Castellón, Spain

[2]Instituto del Diagnóstico Ambiental y Estudios del Agua (IDAEA-CSIC), Barcelona, 08034, Spain

1. INTRODUCTION

The AIRUSE project pursues the improvement of air quality in southern Europe by proposing an optimum mitigation strategy. With this aim, an exhaustive study has been performed of the contribution of PM10 and PM2.5 sources in five target cities (Oporto, Barcelona, Athens, Florence, and Milan), and the applicability has been evaluated in the study area of corrective measures that are highly efficient in northern Europe.

Of the different contributors to PM10 and PM2.5 levels in ambient air, the industrial sources, industry being deemed by the European Environment Agency to be the second most significant source of primary emissions of PM10 in the EU-28, were identified.

2. METHODOLOGY

One of the project actions in this sense focused on the "Determination of the impact of industrial sources". An industrial emissions inventory of PM10 and PM2.5 was therefore made in the five metropolitan areas of the target cities. The main activities conducted were as follows:

- Drawing up an inventory of industrial facilities (IPPC and non-IPPC activities) and ports (loading/unloading operations).
- Identification of the degree of implementation of corrective measures in the activities considered.
- Selection of specific PM10 and PM2.5 emission factors for the identified operations.
- Quantification of the primary PM10 and PM2.5 emissions for each inventoried facility, including channelled and diffuse emissions.
- Approximate estimation of the emission of the main secondary pollutant precursors (SOx, NOx, NH_3, and COVNM).

3. RESULTS

To facilitate data interpretation, the results of the industrial emissions inventories obtained in each studied area (Barcelona, Oporto, Milan, Florence, and Athens) are shown on a map of the area, in which the emission points and air quality stations have been located according to their coordinates, using a traffic light type of colour code. By way of example, Figure 1 shows the results obtained for PM10 emissions in the Barcelona metropolitan area, in which the most relevant industrial activities, in terms of PM contribution, were ceramics, metallurgical and energy production.

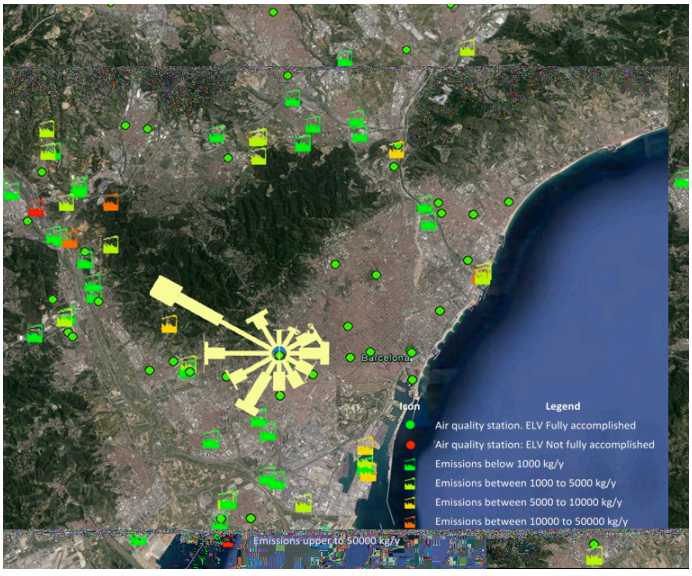

Figure 1. *Main industrial emissions and air quality stations in the Barcelona area.*

4. CONCLUSIONS AND RECOMMENDATIONS

The results obtained confirm the importance of industrial sources for PM10 and PM2.5 levels in ambient air, accounting for 20% of the concentrations recorded in most of the studied cases.

With a view to addressing the common weaknesses detected in the studied areas and to ameliorating the situation with regard to industrial emissions, a series of recommendations are proposed:

- Updating the list of industrial activities. The need has been evidenced to identify and control the activities not covered by the Industrial Emissions Directive (IED) and, in the port cities, it is deemed essential to include maritime (boat) and port activities in this inventory.
- Extension of the information in public inventories such as the E-PRTR.
- Better existing data on fugitive/diffuse emissions, particularly in certain specific activities such as the handling of particulate bulk materials in ports, quarries, and ceramics or cement facilities.
- Improvement of regional inventories of industrial PM emissions. Development of realistic air quality plans on a regional scale, applying a bottom-up approach and including diffuse emissions.
- Harmonisation of the key control parameters applicable to air quality (PM10 and PM2.5), the atmospheric emission limit values (TSP), and the E-PRTR (PM10).
- Organisation of awareness-raising actions, particularly for the industrial sector.
- Application of strategies to reduce pollutant gaseous emission, above all of those identified as secondary PM precursors and of heavy metals that exhibit high volatility.

5. REFERENCES

[1] EEA. European Environment Agency. Air quality in Europe-2014, report 5/2014, [http://www.eea.europa.eu/publications/air-quality-in-europe-2014].

[2] EEA. European Environment Agency. EMEP/EEA air pollutant emission inventory guidebook – 2013. [http://www.eea.europa.eu/publications/emep-eea-guidebook-2013].

[3] Emissions Factors & AP 42, Compilation of Air Pollutant Emission Factors. [http://www.epa.gov/ttnchie1/ap42/]