



LIFE 09 ENV/GR/000289
ACCEPT-AIR

Programme Life + Environment Policy and Governance



Action 3: Application of state of the art source apportionment techniques based on the developed databases and receptor modeling

Collection of existing data concerning chemical source profiles for use in CMB source apportionment.

Collection of historical data concerning the source apportionment of $PM_{2.5}$ and PM_{10} at the three urban areas is in progress.

A review of the source apportionment studies carried out at AMA, TMA and GVA and their major findings (sources identified and source contribution estimates) has been presented in the European Aerosol Conference 2011, held in Manchester during September 4 to 9, 2011.

Application of alternative source apportionment techniques on the historical data sets is in progress.

At a next stage, source apportionment will be applied to the new datasets as well.

Application of source apportionment techniques to historical datasets has been completed.

The collection of existing data concerning chemical source profiles for use in CMB source apportionment has been also completed. Profile update for some sources (particularly for vehicular



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emissions) has been designed following the end of the cold-time sampling campaign.

An optimized CMB procedure, the Robotic CMB (RCMB), which will be employed for the source apportionment of PM₁₀ and PM_{2.5} from ACCEPT-AIR, is being tested on historical PM₁₀ data from Thessaloniki and Volos. The application of source apportionment techniques to initial chemical speciation data obtained from the measurement campaigns has started.

For the region of Thessaloniki the results of the two techniques (CMB and PMF) are in general comparable. The CMB models have more technical difficulties but they offer better resolution than the PMF for specific secondary sources.

At a next step, when chemical speciation data from the project's measurement campaigns are available, source apportionment will be applied on new databases as well. New multivariate statistical methods (Chemical Mass Balance, CMB and Positive Matrix Factorization, PMF) have been applied to historical data sets collected in the framework of Action 2.

This step has a small delay because of the delayed observed in the completion of Action 2, and in particular the chemical speciation data (the completion of the PMF analysis results) used as input in source apportionment models of phase 3 . Because of this delay, it was possible to conduct a campaign of collecting samples of road dust in Athens. There were no experimental data of the chemical composition of road dust of the city and the original plan was to use



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the available experimental data from Thessaloniki. The campaign for road dust held in the street outside the Ministry of Health, in the center of the city, using a specially designed dust collector. The samples were analyzed for organic and elemental carbon and metal ions.

By April 2013, the final database of the chemical composition was available. In addition the application of the model of the sources distribution for the acceptance or not of the data for particulate matter is in progress and is now in the final stage.

The outcome of the application of the new source apportionment techniques will be compared with the initial results reported concerning these historical datasets over the past decade.

During the reporting period, the following Milestone achieved:
Milestone M18 "Integrating PMF and CMB application in historical datasets"