Europe's most extensive research yet into the impact of aerosols

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The battle to curtail the global impact of aerosols has taken a step forward with the most extensive aerosol research project conducted in Europe so far.

The project EUCAARI ('European Integrated Project on Aerosol Cloud

Climate and Air Quality Interactions'), has resulted in a renewed understanding of how aerosols affect the planet's radioactive balance.

A major part of the study comprised the investigation of present-day aerosols in cooling applications, which are expected to be reduced dramatically by 2030. This has led the project to call for the implementation of more stringent air pollution abatement measures worldwide.

In order to make significant progress in this area, the project, coordinated by Professor Markku Kulmala from the University of Helsinki, gathered a consortium of 47 partners across 32 European countries. The project received funding of EUR 15 million, with nearly EUR 10 million provided by the EU.

The EUCAARI laboratory then proceeded with a series of extensive field studies in order to gain new information about aerosol and cloud properties. These were performed on ground-based aircraft and satellite platforms, not only in Europe, but also in China, South-Africa, Brazil and India.

The researchers studied the emission and formation of aerosols, how they evolve and transform during their atmospheric lifetime, and their impact on clouds. Measurements were then integrated with existing data to produce a global dataset. This approach helped the researchers to understand the effects of aerosols on air quality and climate.

Another focus area for the project was in aerosol measurement technologies and techniques, and their relation to air pollution and climate change interactions. By understanding future climate change they were able to develop strategies and implement plans for global air-quality monitoring.

They also developed new aerosol measurement instruments using some of the most complex research instruments available in the world. These included the cluster spectrometer, which can be accessed at numerous sites at the same time, including from airborne platforms. Several new instrumental techniques were also developed to observe the different properties of atmospheric aerosols.

What the project achieved was, in all, quite significant, attaining new knowledge on the whole physical background related to aerosol formation and impacts at all scales, from the micro- to the global, from milliseconds to centuries.

Additionally, the project quantified the effects on aerosol concentrations of major reductions in the emission of particles and their precursors within and outside Europe. Crucially, EUCAARI also contributed to the scientific requirements relating to the European Thematic Strategy on Air Pollution.

Overall, the EUCAARI team believe that progress in atmospheric research has received a valuable boost, thanks to the project. Its findings pave the way for more critical and informed research and assessments in the future and for practical solutions to pollution problems around the world.

More information: EUCAARI www.atm.helsinki.fi/eucaari/

Atmospheric Chemistry and Physics Journal www.atmos-chem-phys.org/special_issue111.html

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