AEROSOLS

Air Quality and Health Impact of Primary Semi-volatile and Secondary Particles and Their Abatement

Press Release

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European Funded AEROSOLS Project aims to define the impact of primary semi-volatile and secondary particles on the air quality and health.

Athens, Greece - The transport sector is responsible for 23% of CO_2 emissions, remains dependent on oil for 92% of its energy demand and their emissions are one of the main contributors to air quality problems, particularly in urban areas. Fine particle emissions from transport and the formation of secondary aerosols significantly impact the environment and public health. However, the underlying mechanisms remain incompletely understood.

The **AEROSOLS** project aims to define robust and transparent measurement and modelling methodologies to quantify the currently disregarded volatile/semi-volatile primary and secondary emissions, assess their associated risks/impacts, and propose technological and legislative monitoring/abating mechanisms to help improve air quality and public health.

The complex organic fraction of particle emissions from transport can derive from thousands of hydrocarbons (HCs) in fuels and engine lubricating oils. The presence of some heavier HCs called intermediate-/semi-volatile organic compounds (I/SVOC) can result in uncertainty in physico-chemical characterisation of particle emissions when using conventional methodologies. Therefore, it is needed to develop robust methods to characterize these compounds, their behaviour, climate, air quality, and health impacts, and how to abate them.

The novelty of the concept relies on the provision of new understanding of emissions dynamics within the engine, exhaust and atmosphere under conditions relevant to Real Driving Emissions (RDE). The main benefit of **AEROSOLS** approach is the integration of online and offline emissions characterisation techniques to develop and implement the robust unified emissions measurement methodology that underpins the definition of the equivalent total particle emissions indices considering the air quality, climate and health impacts.

The **AEROSOLS** methodology is a stepwise process to prevent smog episodes by classifying non-regulated V/S-V and SA according to their quantities and air quality, human health and climate impacts, understanding their formation and atmospheric evolution and proposing abatement solutions, including:

- Primary and **Secondary** emissions characterization
- Taxonomisation and prioritization of primary and secondary emissions according to their health, social, air quality, and climate impacts, thanks to LCA studies
- Development of robust measurement, analysis, and modelling methods for improved quantification of transport ‘total’ externalities (emissions), including disregarded volatile/semi-volatile and emergent emissions

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- Proposal of technological and legislative monitoring/abating mechanisms to support future legislations/policies on emissions, “polluter pays”, and preventing smog episodes.

The new knowledge that will be gained by the **AEROSOLS** consortium on volatile and semi- volatile particles as well as the new analytical tools that will be developed for the monitoring of the RDE can be used to update the current standards directives and to support the EU policies for a greener and more sustainable future. Apart from the technological importance, the **AEROSOLS** project is expected to increase the public awareness on air pollution. This will enable citizens to understand the risks associated with gas emissions, rendering the environmental policies to more acceptable. It can also trigger changes in their social behaviour, facilitating the shift from private cars to public transport, as well as adopting car-sharing and car-pooling initiatives.

Project Information

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Project Website	https://aerosols-project.com/

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