Newsletter

Interreg Italy - Croatia ECOMOBILITY
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ECOlogical supporting for traffic Management in cOastal areas By using an InteLlIgenT sYstem

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Introduction

The aim of this third newsletter is to report the last activities carried out within the ECOMOBILITY (ECOlogical supporting for traffic Management in cOastal areas By using an InteLlIgenT sYstem) project, co-funded by the Interreg V Italy-Croatia CBC Programme, ending in September 2019.

ECOMOBILITY developed an innovative traffic management system by collecting the environmental data from monitoring stations located around the cities, with the aim of sharing this information, in form of maps, to traffic management bodies in real time. This information is also used to feed an application for mobile devices for planning ecological trips. The application is freely downloadable from the Play Store.

At the same time, the scientific part of the project, consisting in chemical analysis for raising the knowledge about the shipping impact on the air quality, have been carried out. This newsletter is mainly dedicated to these last results.

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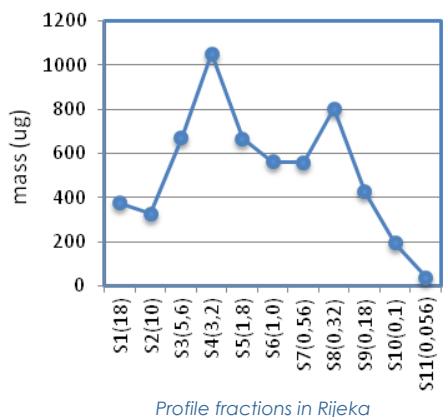
Involvement of public

The involvement of public have been an important phase of the project. On one hand, the partnership informed people about the project results using newsletters, flyers and organising events, such as the thematic events and the workshops in Venice and Rijeka. On the other hand, within ECOMOBILITY public actively participated to the project activities, downloading and using the EcoMobility application for portable devices. The EcoMobility application has been downloaded by over 350 people. We thank all the users and we invite them in completing the evaluation form. Feedbacks are really important for us!

Download the EcoMobility application and fill in the form!

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Size distribution of air particulate

Profile fractions in Rijeka

Based on the results from the previous project POSEIDON, dealing with the impact of maritime traffic to urban air quality in various cities in the Adriatic-Ionian area, one of the aims of ECOMOBILITY is to further characterize physical and chemical properties of the different fractions of airborne particulates collected with 10-stage cascade impactor. The nominal cut-off sizes are: 18, 10, 5.6, 3.2, 1.8, 1.0, 0.56, 0.32, 0.18, 0.10 and 0.056 μm.
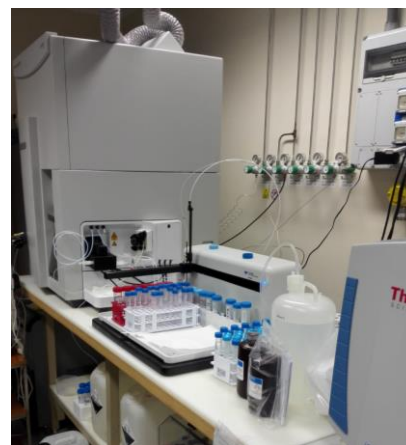
In the two involved cities the sampling periods have been a bit different, because of meteorological and organisation reasons: we collected samples during summer-fall seasons in Venice and fall-spring seasons in Rijeka. In both cases we collected weekly samples, with the same kind of sampler. Despite some minor practical difference, the watchword has been homogeneity: of sampling techniques, analysis and methods for data elaboration!

In both cities the results of the size distribution showed a bimodal distribution with peaks of particles at around 3-10 μm and 0.3-1.0 μm, with no significant seasonal difference. Generally in Venice the concentration of particulate matter was higher than in Rijeka, with the exception of the first week of monitoring in Rijeka, showing an exceptional concentration of over 130 μg/m^3 as total suspended particulate in air. This week was also characterised by a different size distribution, with a higher content of nanoparticles and was associated to Saharan dust.

The watchworld has been homogeneity: of sampling techniques, analysis and methods for data elaboration

Chemical analysis

Samples were then analysed for investigating their chemical characteristics and the size distribution of the most important compounds present in particulate matter. As an examples, marine ions such as chloride and sodium were found mainly in the course particles, while secondary inorganic aerosol (nitrate, sulfate, ammonium and water soluble organic compounds) were found also (or only) in the fine fraction (<1μm), with a different distribution between the two cities. Iron and copper are mainly distributed in particles with dimension around 3-5 μm, while the anthropogenic metal vanadium has a relevant concentration below 1 μm. Polycyclic aromatic hydrocarbons were found at very low concentration in aerosol and were difficultly detected.

Inductively Coupled Plasma- Mass Spectrometer for the analysis of metal at Ca' Foscari University of Venice
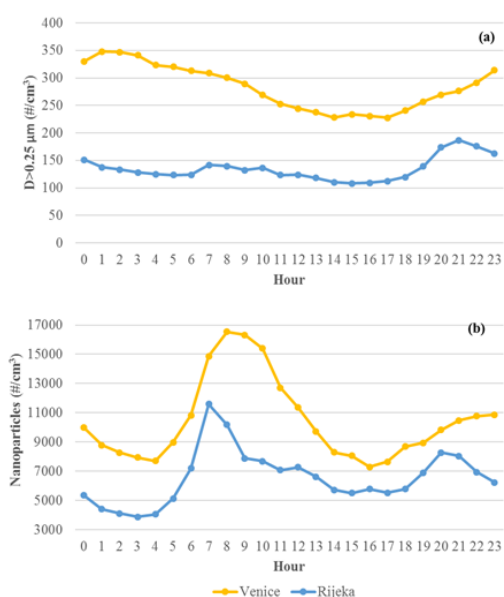

Common monitoring of CNR-ISAC and UNIRI at the terrace of the Teaching Institute of Public Health site during spring campaign.

In very last phase of the project results of chemical analysis will be used to feed a receptor model, in order to obtain information about the sources of pollutants and investigate the distribution of the impact of the various sources among the collected sizes of particulate matter.

High-temporal measurements

Daily patterns of particles with D>0.25 μm (a) and nanoparticles (b) in Venice and Rijeka.

High temporal resolution measurements from nanoparticles up to PM10, using advanced optical counters, allowed to collect a large amount of data near the harbour areas of Venice and Rijeka. Data was post-processed 5, 30, and 60 minutes averages and correlation with ship traffic was investigated to evaluate the impact of maritime activities to atmospheric concentrations in different size ranges. The analysis is almost completed.

Size distribution in number and mass obtained are similar in relative terms with absolute values slightly greater in Venice. Three main size ranges likely influenced by different sources and processes were found: nanoparticles (D<0.25 μm); fine particles (0.25<D<1 μm) and coarse particles (D>1 μm). In brief, daily patterns of nanoparticles are comparable between Rijeka and Venice with two peaks at morning hours and (less evident) in early evening (Fig. a). An evident effect of the dynamics of the boundary-layer could influence daily pattern of larger particles (D>0.25 μm) in Venice but this effect is not relevant for Rijeka (Fig. b).

Closure meeting

The ECOMOBILITY closure meeting was held in Rijeka on 12th September 2019. The partners shared their last results and discussed the activities to be carried out in the last weeks of implementation of the project. The afternoon Steering Committee Meeting has been an opportunity to assess the quality of project outputs, scientific and communication activities, as well as the management of the whole project.

Linea Verde Life, a popular TV programme in the Italian national network is preparing a reportage about ECOMOBILITY

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Pictures of the ECOMOBILITY final event

Goodbye from the ECOMOBILITY team!

Ana Alebic-Juretic, Francesco Andrea Antoniazzi, Alvise Ardizzon, Elena Barbaro, Suzana Beloševic, Alessandro Benassi, Roberto Bertaggia, Gabriele Capodaglio, Daniela Cesari, Luca Cirillo Ciricugno, Marianna Conte, Daniele Contini, Adelaide Dinoi, Aleksandar Dukic, Antonio Donateo, Federica Fasolato, Maria Pia Ferretti, Matteo Feltracco, Andrea Gambaro, Fabio Massimo Grasso, Elena Gregoris, Dario Kontošic, Giovanni Lella, Claudio Lucchese, Andrea Marin, Daniela Nardello, Mirna Hriljac Nikšic, Eva Merico, Marijana Mezlar, Boris Mifka, Elisa Morabito, Dajana Odorcic, Ozren Orlic, Manfredi Palazzolo, Emanuele Pagin, Alessandra Raffaetà, Eda Rumora, Đuro Sikiric, Srđan Škunca, Neda Suvajac, Lorella Mekic, Marijana Mezlar, Luca Soraru, Giuseppa Toscano, Filippo Zanatta, Velimir Zubak, Paula Žurga.