



APICE: Common Mediterranean strategy and local practical Actions for the mitigation of Port, Industries and Cities Emissions

APICE News is a newsletter published by the APICE's partners, for reporting the progress of the project. The project is part of the EU MED Programme (www.programmemed.eu). Details on the project: www.apice-project.eu, [Brochure](#).

Capitalisation and Mainstreaming of APICE

The main APICE results, the Common Transnational Strategy (CTS) and the Local Adaptation Plans (LAP), have been transferred to concerned stakeholders by presenting and discussing with them the measures. In the case of Barcelona, the regional government already agreed on incorporating some of the measures into their planning. In the case of Thessaloniki, an agreement for the mitigation actions on the basis of LAP is under consideration. In Marseille, PACA region has already made use of APICE results by integrating some of the scientific results and measures into its regional air policy. In Genoa, the tools developed in APICE will be used by Genoa Port Authority to evaluate the new Port Master Plan. In Venice, the APICE analysis and insight on the contribution of the port of Venice on the air quality of the Venetian area has been integrated on the Veneto Air Quality Regional Plan currently under implementation. Therefore, APICE is being mainstreamed into regional and local policies and assuring project results being used.

Details on the project are available in the publication: "[Reducing atmospheric pollution in the Mediterranean Port Cities - The results of APICE project](#)"

APICE common transnational strategy

The Common Transnational Strategy of APICE has moved from the comparison of regional scenarios shared by all partners and local key-stakeholders, with the aim of considering the strategies/techniques to get grip on the EU environmental and maritime directives, of evaluating options for future territorial legislations (i.e. integrate existing urban master-plans and port investments plans) and possible ecofinancing incentives (i.e. blue-flags incentive, Clean Ship Project) to merge environmental and socio-economic needs of port-cities policies and pursue the EU requirements for coasts and sea sustainable management.



The actions shared by the Partnership as part of the Common Transnational Strategy are listed below:

Measures	Actions
Measure 1: Ship Emissions	Action 1.1: On-shore Power Supply (OPS) Action 1.2: Change fuel while manouvreing Action 1.3: Alternative fuel (LNG)
Measure 2: Diesel powered equipment and Cargo handling equipment	Action 2.1: Accelerated fleet turnover Action 2.2: Idle reduction programs Action 2.3: Alternative fuels
Measure 3: Road Traffic	Action 3.1: Improvement of road system (to avoid congestion) Action 3.2: Environmental excellence certification for trucks Action 3.3: Mode switching - Alternative fuels (CNG, LNG, hybrid) Action 3.4: Idle reduction programs
Measure 4: Rail Traffic	Action 4.1: Increase rail ratio through economic incentives Action 4.2: Improvement of rail system (access, avoid congestion) Action 4.3: Track electrification
Measure 5: Inventorying, Monitoring, Coordinating, Communicating	Action 5.1: Monitoring and control (protocol or agreement between stakeholders, etc) Action 5.2: Port Air Quality Steering/Working Committee Action 5.3: Data Sharing: Inventoring Emissions and Monitoring concentrations as the base for planning Action 5.4: Communication strategy

Details on the Common Transnational strategy are available in the publication [“Common Transnational Strategy to curb emissions: APICE for the Mediterranean”](#)



[APICE Local Adaptation Plans: strategies for mitigation of air pollution in each APICE Port-City](#)

The Local Adaptation Plans (LAPs) have been drafted in each project area:

In **Barcelona**, the LAP aims at constituting a guidance for reduction of 12 % for both NO_x and PM₁₀ emissions from the port, and thus supporting and complementing efforts by national and regional authorities.

In **Genoa**, the APICE project is expected to develop a model for air quality focused on harbor emissions, as this tool was missing in this area before APICE. The APICE model was applied to a selection of actions contained in the new Port Master Plan, with the aim of continuing with the overall assessment of the whole plan.

In **Marseilles**, the application of APICE inputs and scenarios is meant to support a new project of setting electric power ground supply terminal within the strategic Plan of the Port Authority and to include of APICE deliverables in atmospheric, urban and health protection plan of PACA region.

In **Thessaloniki**, the LAP will contribute in establishing a roadmap for the improvement of the efficiency of the Decentralized Administration of Macedonia - Thrace and the Region of Central Macedonia in urban development planning for Thessaloniki city and implementing environmental policies in order to improve the citizens' quality of life.

For **Venice**, the target is to investigate on possible solutions to mitigate air pollution but at the same time supporting the development of port activities, within the framework of planning guidance to drive port-district expansion (and its connection with the northeast transport poles) and of the Regional Masterplan (under revision) and coastal plans, as well as to support the promotion of agreements to mitigate emissions of docked-vessels closed to the historical islands of Venice.

The LAP of each city are downloadable here: [/content.php?ID1=49&ID2=61&ID=61&ID3=49&lang=ENG](#)

[APICE: Simulations of future mitigation scenarios in the five study areas have been run](#)

In each study area, Chemical Transport Models have been used to simulate the future development scenarios, as well as the mitigation scenarios, in order to assess the effectiveness of mitigation actions, addressed in strict collaboration with the territorial authorities involved in local working tables.

The future base scenario has been estimated on a reference year (2015 or 2020 or 2025, depending on the city), taking into account both the port development (extension of



piers, spatial displacements, increase in port traffic) and the projection of all the other emissions according to future legislation and trend drivers (for example fleet renewal for road transport or change in fuel consumptions).

In particular, future maritime emissions have been calculated considering the reduction to 0.5% for the fuel sulphur content in force as of 2020, according to the Directive 2012/33/EC.

The future base scenario was the basis to calculate the mitigation scenarios that considered specific measures to lowering or mitigating harbour emissions. The difference between the base future and the mitigation scenarios has been calculated both in terms of emissions and concentrations.

The mitigation actions evaluated are in the five cities are:

- Cold ironing for cruise ships or RO-PAX vessels
- 0.1% for sulphur content in fuels to be used also in the manoeuvring phase
- Use of LNG fuel
- Scrubbers to be used to abate emissions during the hotelling or manoeuvring phases
- Displacement of some on shore harbour activities
- Usage of wetting agents (chemical and water) to control the storage pile emissions

As for some outcomes, the PM emissions decrease ranges between 3%, for cold ironing in Marseille, to 78% for the complete vessels fleet renewal with LNG fuel in Barcelona (this action must be considered as the hypothesis of maximum reduction). Relevant PM concentration decreases have been calculated for Barcelona and Genoa in the summer: from 10% to 20% respectively. In the same season, the reduction PM concentrations has been estimated to be less significant for Thessaloniki (1-4%) and Venice (1.5%). In the cold season, the estimated impact of mitigation actions on PM levels is less substantial.

Details on the effectiveness of each measure is available in the publication: "[Reducing atmospheric pollution in the Mediterranean Port Cities - The results of APICE project](#)"

[APICE: a detailed picture of the contribution of harbour emission sources to the PM2.5 concentration in each study area has been assessed](#)

The first specific objective of APICE was to estimate the relative contribution of several pollution sources to air quality and to understand the similarities/differences among the port areas investigated. This task has been carried out by the scientific groups following two different techniques of Source Apportionment analysis, based respectively on receptor models, more suitable to pointing out the bonds between specific emission sources and specific markers, and Chemical Transport Models (CTMs) that extend their assessment on the formation of secondary aerosols, since they apportion the gas



precursor emissions, too. The focus of these techniques was the identification of pollutant emissions that mostly affect PM10 and PM2.5 concentrations.

The higher contribution of harbour activities, in terms of ships emissions and related port activities, such as induced road traffic and load/unload operations, etc., has been estimated in summer in Barcelona at the very heart of the port and in Thessaloniki at open sea (both over 50% of contribution), whereas in the other cities lower values have been estimated. Nevertheless at urban background sites more comparable results have been obtained with a contribution ranging from 2% to 17% in summer and 0% to 7% in winter.

The maritime contribution among the city partners is quite different, depending not only on the peculiarity of each study area (e.g.: socio-economic trends, meteorological and dispersion conditions, industrial and residential emission strength and composition), but also from the methodology applied by the partners.

A common feature for the five study areas is an higher contribution during the summer period, when touristic ship activities are at their maximum and residential heating is at its minimum.

Details on the source apportionment are available in the publication: [" Reducing atmospheric pollution in the Mediterranean Port Cities - The results of APICE project"](#)

[International shipping should cut air pollutants and greenhouse gases together](#)

In perfect agreement with APICE results, European Environment Agency (EEA) has published the report "The impact of international Shipping on European air quality and climate forcing"

The report underlines that the emissions of air pollutants and greenhouse gases from the shipping sector have increased substantially in the last two decades, contributing to both climate change and air pollution problems, The sector's environmental impact is significant as emissions such as carbon dioxide (CO2), nitrogen oxides (NOX), sulphur dioxide (SO2) and particulate matter (PM2.5) from shipping occurring in European waters can contribute up to 10-20 % of overall worldwide shipping emissions.

More info available [here](#)