A feasibility study for the implementation of an ECA in the Mediterranean sea

Laurence ROUÏL, Nadine ALLEMAND
Laurence.rouil@ineris.fr, nadine.allemand@citepa.org
While EU regulations on air pollutants led to drastic reductions of in-land SOx and NOx emissions, shipping emissions kept constant.
Impacts on air quality

Annual mean concentrations of NO2 in 2014
Source: Copernicus Atmosphere Services
INERIS simulations for the year 2005

Simulations performed with the CHIMERE model - low resolution - 25 km

SO₂ / all sectors
(μg/m³)

PM₂₅ / all sectors
(μg/m³)

SO₂ / shipping contribution
(%)
In France, the National Air Emission Reduction Plan (PREPA) under the Law for Energy Transition and Green Growth (2015) includes actions to promote, if relevant, the implementation of an emission control area in the Mediterranean Sea.

A feasibility study is necessary to assess potential impacts of such a decision.

It should review items considered by IMO within the framework of the MARPOL Convention (annex VI):

- Pollutants proposed for control
- Nature of ship traffic in the proposed ECA
- Description of populations and ecosystems exposed to ship emissions
- Assessment of impacts of ship emissions on atmospheric concentrations (+ health and environmental impacts)
- Description of potential control measures
- Cost benefit analysis
- Proposed delineation for the control areas.
A solid consortium for a detailed analysis

Detailed description of the shipping traffic

**Current status**: 2015-2016

**Projections**:
- S content reduced to 0.1% in fuel
- Cleaner engines (Tier3) to reduce NOx emissions

**Communication and concertation** with interested stakeholders to harmonize practices, share results and analyse opportunities

**Cost benefits analysis**
Methodological aspects

- Targeted domain: Mediterranean sea and Western Mediterranean area
- Reference period: 2015-2016
- Collection of data from the Sat-AIS, MARES and EMSA databases and others
- Some parts of the domain are not sufficiently documented (Greece, Libya..)
- Emissions computed and averaged to rebuild a “theoretical reference” year
- Pollutants: SO2, NOx, PM
- Concentrations simulated by the CHIMERE model (Chemistry-transport model)
- Pollutants: SO2, NO2, ozone, PM
- Resolution: 10 km to 4 km
- Meteorology: 2010
3 scenarios are envisaged:
- Reducing SOx emissions
- Reducing NOx emissions
- Reducing both

Comparison with the reference case

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<tbody>
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<td>NO SECA</td>
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Evaluation of the impacts on air pollutant concentrations with special care to:

- Ozone: a secondary photochemical pollutant resulting from NOx and VOCs emissions. Sensitive issue for the Mediterranean countries. Impacts on health and ecosystems.
- NO2 and SO2: resulting from NOx and SOx emissions. Sensitive issue for health and ecosystems (acidification and eutrophication).

Mortality and morbidity end points will be calculated and monetized thanks to the model Alpha Risk Poll (Mike Holland EMRC-UK).

Qualitative analysis of the impacts on ecosystems.

Source: Schucht et al., Env Science and Pol. 2015.

Same methodology already applied for the French air emission reduction action Plan (PREPA).
Key questions

- Key point for success: input data
  - Ship traffic and motorization: detailed description of the shipping activity in the Mediterranean area. Some datasets available but heterogeneous information
  - Population data and health data, especially outside European countries

- Key point for success: Communication and cooperation
  - Coordination with the REMPEC (Regional Marine Pollution Emergency Response Center) initiative
  - Coordination with the study conducted by the European Commission
  - Accounting for all stakeholders recommendations

- Achievement of the feasibility study: September 2018
- Mid-term analysis and communication: March-May 2018
- Simulation results available by the end of June 2018
Thank you for your attention!!

Laurence ROUÏL
Laurence.rouil@ineris.fr,

Nadine ALLEMAND
nadine.allemand@citepa.org