



# SMOOTH PORTS

**ADSP MTS**

**NORTHERN TYRRHENIAN SEA PORT AUTHORITY  
SYSTEM**

**GOOD PRACTICE**

**PORT CARBON FOOTPRINT ASSESSMENT AND  
METHODOLOGY**

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### **(2) Organisation in charge of the good practice**

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### **(3) Good practice general information**

The Carbon footprint report, firstly released in 2019 for the Northern Tyrrhenian Sea Port Authority System, has unveiled a methodology to assess the port related emissions of harmful gases. This methodology is based on the local Port Monitoring System, which accounts for updated statistics on naval and land operations, along with the IMO inventory of emissions for vessels calling at the port. The Carbon footprint report has also provided, for the first time, an insight on emissions from industries settled within port boundaries.

### **(4) Good practice detailed information**

#### **Short summary of the practice**

The Carbon footprint methodology stems from the combination of naval traffic and operations control data, from the local Port Monitoring System, with data from industry related inventories.

#### **Short description of the local situation**

The ports of the Northern Tyrrhenian Sea, notably Livorno and Piombino, are home to several factories and are called by more than 34 thousand vessels per year. There was subsequently a huge need for a throughout assessment of carbon footprint related to port activities.



### **Detailed information on the practice**

The Carbon footprint assessment follows national and international Guidelines for determining the environmental impact of the seaports, especially in relation to NO<sub>x</sub>, SO<sub>x</sub>, CO<sub>2</sub>, CO, N<sub>2</sub>O, CH<sub>4</sub>, PM<sub>10</sub> e PM<sub>2.5</sub>.

What here is considered as good practice is the methodology, which combines data from the Port monitoring platform, already operational, called MONICA (Monitoring and Control Architecture), with information from vessels and factories emissions. In this respect, the methodology that has been followed ensures that both maritime as well as land operation are thoroughly assessed. Moreover, the model can be deployed by all seaports and can be validated also with environmental sensors, to be installed within port boundaries.

The methodology is based on the following classifications:

- Classification of the ships under study;
- Calculation of the time durations of the various port movements of each ship;
- Calculation of the powers of the main engines and of the auxiliary generators of each ship during each port movement;
- Calculation of the energy absorbed by each ship during the various movements;
- Calculation of pollutant emissions during the various port movements.

In so doing, the Methodology can determine both energy consumptions, as well as environmental impact of vessels' traffic within port waters. Databases such as HIS Market and the IMO ships emissions toolkit are used for retrieving information related to ships calling the seaports. Data for terminals and plants settled in the ports are calculated from operators' data.

Beneficiaries and users of this practice are public authorities, such as the Regional and City Government, environmental Agencies and the local communities in general. The information provided can help in better drafting port policies and planning.



## **How does the good practice contribute to a reduction of CO2 emissions by road transport in the port**

As for the Port Carbon Footprint, it cannot support directly sustainable port operations. However, knowing how much trucks and road traffic in general contribute to CO2 emissions is a power policy tool to better steer decision making towards a more sustainable approach.

### **Resources needed**

Roughly said, a full time human resources for at least on year is needed for developing this methodology and calculation. Of course, the Port Monitoring System implies additional costs as well. The basic (core) components of MONICA platform costed up to 100,000 euros in the early implementation stages.

### **Timescale**

On going, started beginning 2019.

### **Evidence of success (results achieved)**

The Carbon footprint analysis has been the first CO2 and other harmful gases calculation, that has globally determined the environmental impact of the Port System based on actual data. This practice has been already successfully shared with local stakeholder in September 2019.

### **Challenges encountered (optional)**

Even if guidelines and international benchmarks were already available, the setting up of this methodology at local level was quite challenging in collecting all data and calculating in particular land based emissions. Cooperation from private operators has been not always an easy task.

### **Potential for learning or transfer**

This methodology can be used also in other ports or port systems. Formulas, as well as the deployment of the Port Monitoring System (MONICA in this case) follow international benchmarks that are built up on standard practices, that led to measurable results. In this sense, the transfer of both the methodology as well as the conditions conducive to the CO2 calculations are needed, first of all the availability of a Port



Monitoring System, that releases reliable data on maritime and land operations. The combination of ICT tools and direct observations for determining environmental data represents a good compromise for launching such an analysis in ports, that have never investigated before the environmental impact of operations.

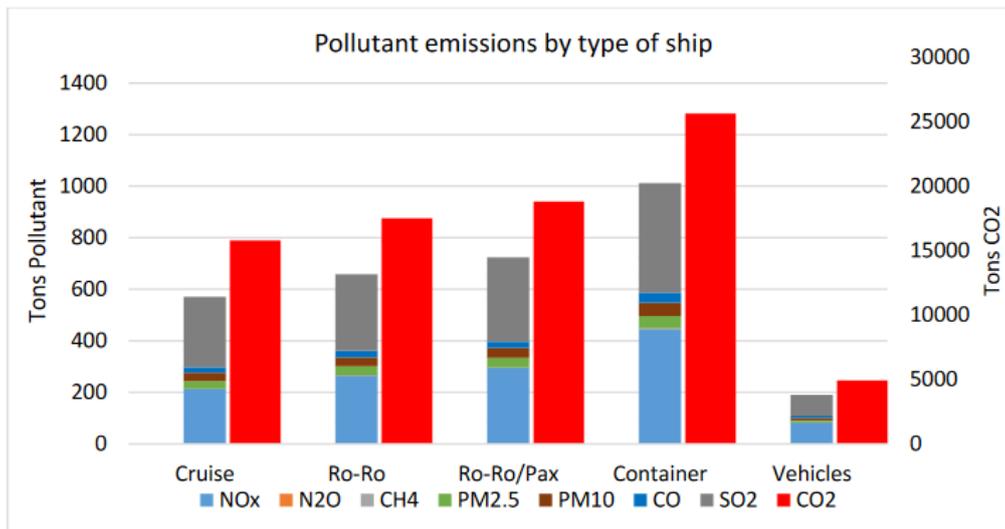


Figure 5: Pollutant emissions by type of ship (Livorno)

What is meaningful also for other ports and territories is the comparison with yearly harmful gases emissions made by cars in the city of Livorno, which has shown that vessels pollute much more than cars (some 3.8- 4 times, except for CO<sub>2</sub>). Some insight on potential benefits for the environmental from mitigating measures, such as cold ironing, have been also investigated. It has been pointed out that cold ironing to all berthed ships could curb emissions up to 99% for NO<sub>x</sub>, SO<sub>x</sub> and PM<sub>10</sub>, 57% for CO<sub>2</sub>.

### Recommendations for implementation in other ports

For developing this good practices, an essential preliminary step is the setting up of a Port Monitoring platform, that delivers data on maritime and port operation real time.

### Further information

<https://altotirreno.soluzionipa.it/open-web/trasparenza/pagina.php?id=70&CSRF=09cee37540625531e0444e735e0c20f2>

### Keywords related to your practice

Ports, environment, low carbon, Emissions