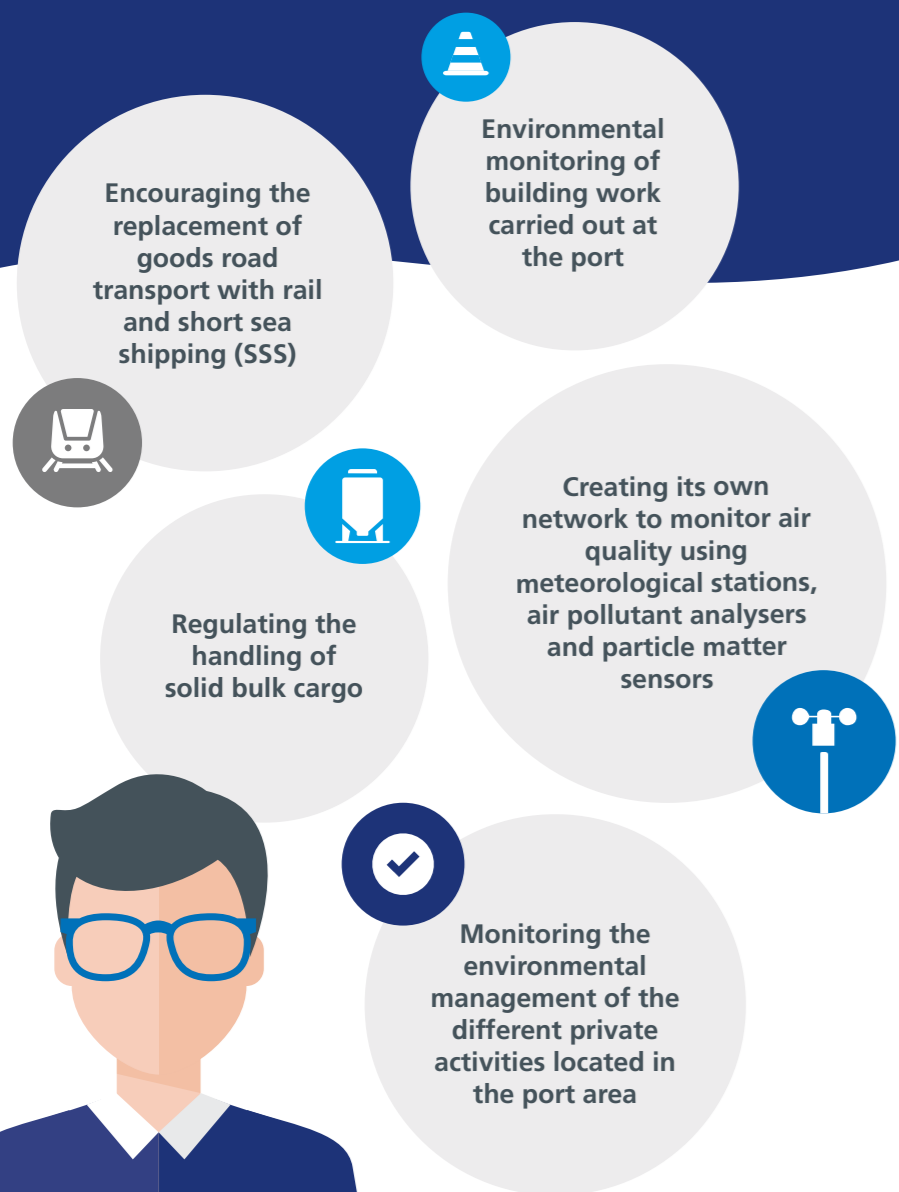


Pioneering actions to reduce impact on the environment

The Port of Barcelona is at the forefront of its sector in promoting actions to control and minimise the environmental impact of port activity, carrying out actions such as:



Port de Barcelona, heading for sustainability

The Port of Barcelona is fully aware that of its responsibility in leading the change towards a more environment-friendly model. That's why it is firmly committed to sustainability as one of the strategic lines underpinning its development over the coming years.



Latitude: 41° 21' N
Longitude: 2° 10' E

www.portdebarcelona.cat



THE PORT OF BARCELONA AIR QUALITY IMPROVEMENT PLAN

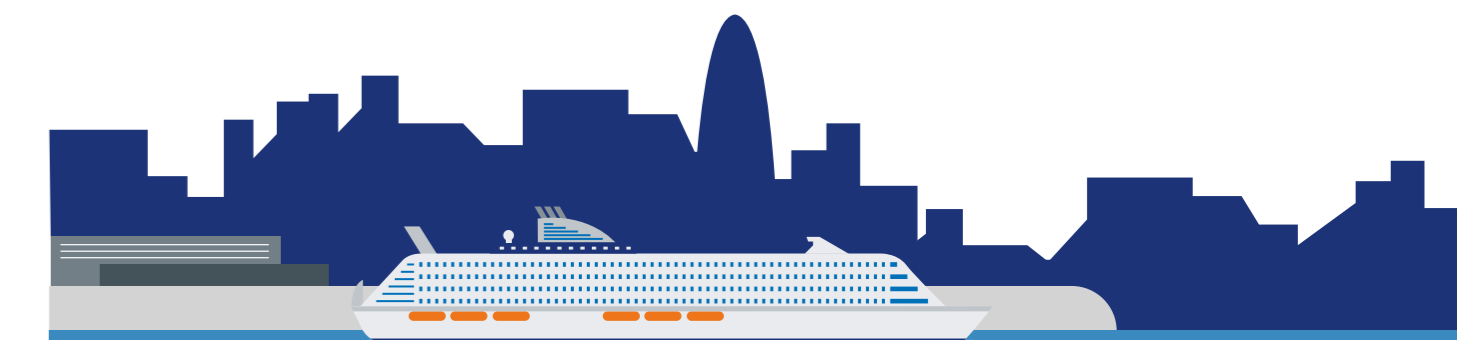
A plan in favour of the air we breathe



Decisive action to help improve air quality in the city and metropolitan region

The Port of Barcelona is committed to ensuring its activity respects the environment and, for some years now it has promoted actions to reduce its impact. A good example of these initiatives is the **Port of Barcelona Air Quality Improvement Plan**, produced as part of the metropolitan region's Action Plan to improve air quality, horizon 2020, passed by the Catalan government in 2014, as well as the Air Quality Improvement Plan of Barcelona 2015-2018, by the City Council.

The main aim of the **Port of Barcelona Air Quality Improvement Plan** is to establish tangible, specific actions that help to reduce emissions into the atmosphere produced by the Port of Barcelona's activity, especially nitrogen oxides (NOx) and particulate matter smaller than 10 µm (PM10), which are the most problematic air pollutants for the city and metropolitan region.



1 plan, 9 areas, 53 actions

The **Port of Barcelona Air Quality Improvement Plan** includes the implementation of 53 actions to reduce emissions, grouped into 9 areas.

Port de Barcelona

9 areas

Port of Barcelona Air Quality Improvement Plan

<p>BOATS Measures to promote the control of emissions from boats, encouraging the use of alternative fuels, and studies to determine the viability of supplying electricity quayside, as well as establishing a new environmental discount scheme.</p>	<p>RAILWAY AND SHORT SEA SHIPPING (SSS) Continue promoting goods transport by rail and SSS by providing new infrastructures, attracting new operators and improving services.</p>	<p>MONITORING AND CONTROL NETWORK Improve the network used to measure air pollution at the Port of Barcelona and share the data collected. Should an environmental episode be declared by the Catalan government, activate the actions agreed to reduce emissions from port activity.</p>
<p>WHEELED TRAFFIC Encourage the use of alternative fuels in goods vehicles and promote the electrification of the internal vehicle fleet.</p>	<p>PULVERANT BULK CARGO Control emissions both during quayside loading and unloading and also at special facilities.</p>	<p>NEW ACCESSES Carry out the projects for new rail and road access to the south zone.</p>
<p>MACHINERY Promote the electrification or gasification, depending on each case, of port terminal machinery (off-road vehicles).</p>	<p>SUSTAINABLE MOBILITY Promote the adoption of sustainable mobility criteria in the port zone and in companies located within the port.</p>	<p>PORT BUILDING WORK Increase environmental monitoring of building work.</p>

The Port is committed to LNG

The Port of Barcelona believes it's important to establish **liquid natural gas (LNG)** as an alternative and more sustainable fuel compared with the conventional oil-based fuels that tend to be used in the sea and road transport of goods. LNG eliminates emissions of sulphur dioxide (SO₂) and particulate matter (PM10), as well as reducing nitrogen oxide emissions (NOx) which are 5% lower than with diesel and fuel oil.

There are increasingly restrictive regulations regarding the emission of pollutants and the maritime industry is introducing LNG as a fuel for new boats because, in addition to its environmental advantages, it is also a cheaper source of energy whose prices is more stable than conventional fuels.

The Port of Barcelona is therefore involved, together with other partners, in two important European projects within the CEF programme (Connecting Europe Facility):

CORE LNGas hive

This is a very large project led by Enagás with a total of 42 members, including several ports on the Iberian Peninsula. The Port of Barcelona coordinates the following sub-projects:

- > Modification of the maritime bunkering service to incorporate the supply of LNG.
- > Conversion of two straddle carriers to natural gas, used to handle containers at the Port's two container terminals.
- > Conceptual design of a trawler to operate in the Port of Barcelona that runs on natural gas.
- > Construction of a portable generator that runs on LNG to supply electricity from the quay to RO-RO vessels.

Cleanport

This project consists of incorporating a natural gas-propelled auxiliary motor into a ferry that runs the Barcelona-Palma route every day. While at both ports, the ferry can use this auxiliary gas engine instead of its diesel engine. This is refuelled every week using the tank at the Port of Barcelona.

The Port of Barcelona is also a partner in another sub-project to modify a mooring at the LNG terminal so that this fuel can be loaded onto the bunkering boats and then refuel other small vessels.



Barcelona will become the first Mediterranean port able to supply LNG to any boat requesting it



Environmental discounts for "cleaner" boats

Another of the key actions to reduce boat emissions which the Port of Barcelona is also working on is to change the current environmental discount policy by **incorporating internationally renowned discount schemes** for those boats whose environmental performance is above the level required by law.

The Port is also working on bringing about a change in legislation so that such environmental discounts can be increased **up to 40% of the boat's fee**, in order to attract cleaner boats and reduce emissions.

A Port network to monitor air quality

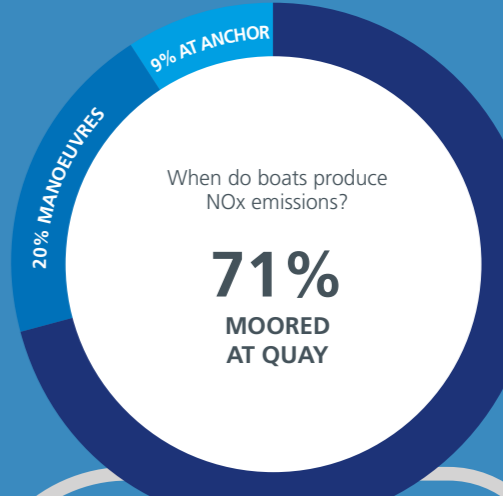
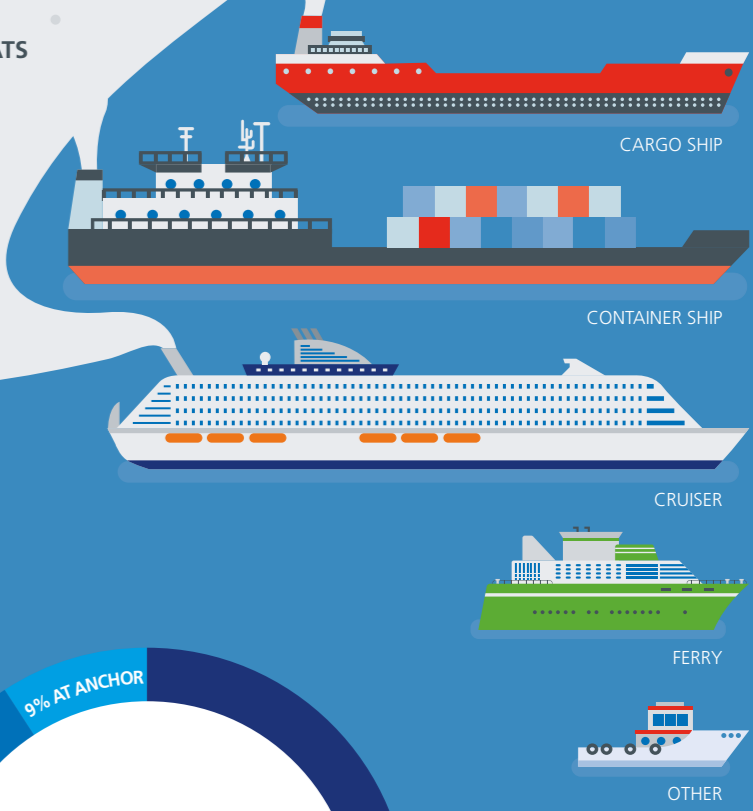
The Port of Barcelona has a **network of 11 meteorological and air quality monitoring stations** which measure particulate matter, SO₂, NOx, benzene (C₆H₆) and tropospheric ozone (O₃). This network is one of the pioneering measures introduced since 1996 to determine the port's environmental impact as it provides information on air quality and meteorological conditions which is of huge use for navigation and also in the handling of goods.

The network is made up of the following devices distributed throughout the port zone at 11 sites:

- 8 AUTOMATIC METEOROLOGICAL STATIONS
- 5 STATIONS WITH PARTICULATE MATTER SENSORS (PM10 & PM2.5)
- 3 AUTOMATIC AIR QUALITY STATIONS (NOx, SO₂, OZONE, BENZENE)

PORT ACTIVITY ACCOUNTS FOR 7.6% AND 1.5% of the average annual concentration of NOx and PM10, respectively, in the air of Barcelona city

90% of the NOx y PM10 emissions are **PRODUCED BY BOATS**



10% of the NOx and PM10 emissions are **PRODUCED BY TERMINAL MACHINERY AND WHEELED VEHICLES**

