Reducing emissions from a cruise port

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GREEN PORT CRUISE 2017, AMSTERDAM

Port de Barcelona

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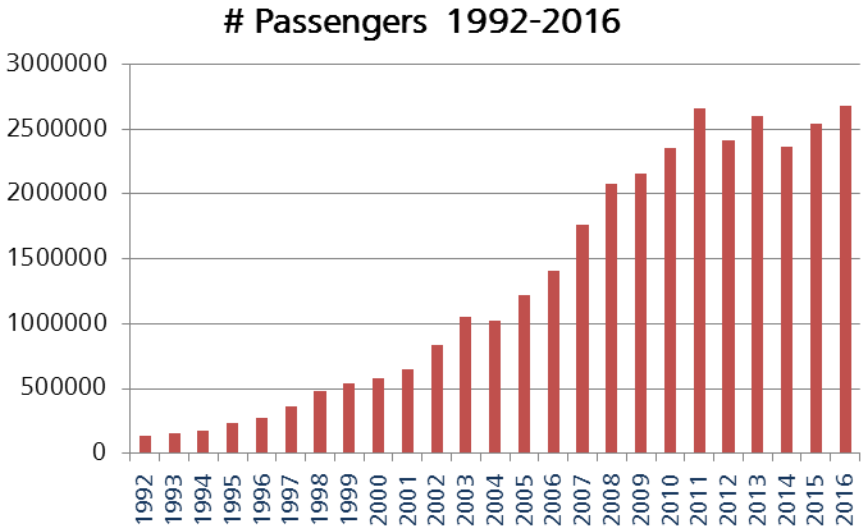
1. **Barcelona Cruise Port**
2. Emissions of the port cruise activity in Barcelona
3. Contribution to air quality of the city
4. The commitment of the Port of Barcelona
5. Conclusions

1. Barcelona Cruise Port



- Barcelona is the **European leader and the Mediterranean turnaround port par excellence**
- **2,6 million annual passengers** (60% in turnaround and 40% in transit)
- **In 2016, a total of 121 cruise ships (with more than 750 calls) visited Barcelona**

1. Barcelona Cruise Port

For the city, cruise activity is a source of wealth because of the high-spending tourism.

Annual billing in **Barcelona: 620 million €**

- Daily level of expenditure for **transit passenger: 53 €**
- Daily level of expenditure for **turnaround passenger: 202 €** (with overnight stay)

Study source: Laboratory in Applied Economics of the University of Barcelona (UB . AQR-Lab), 2014

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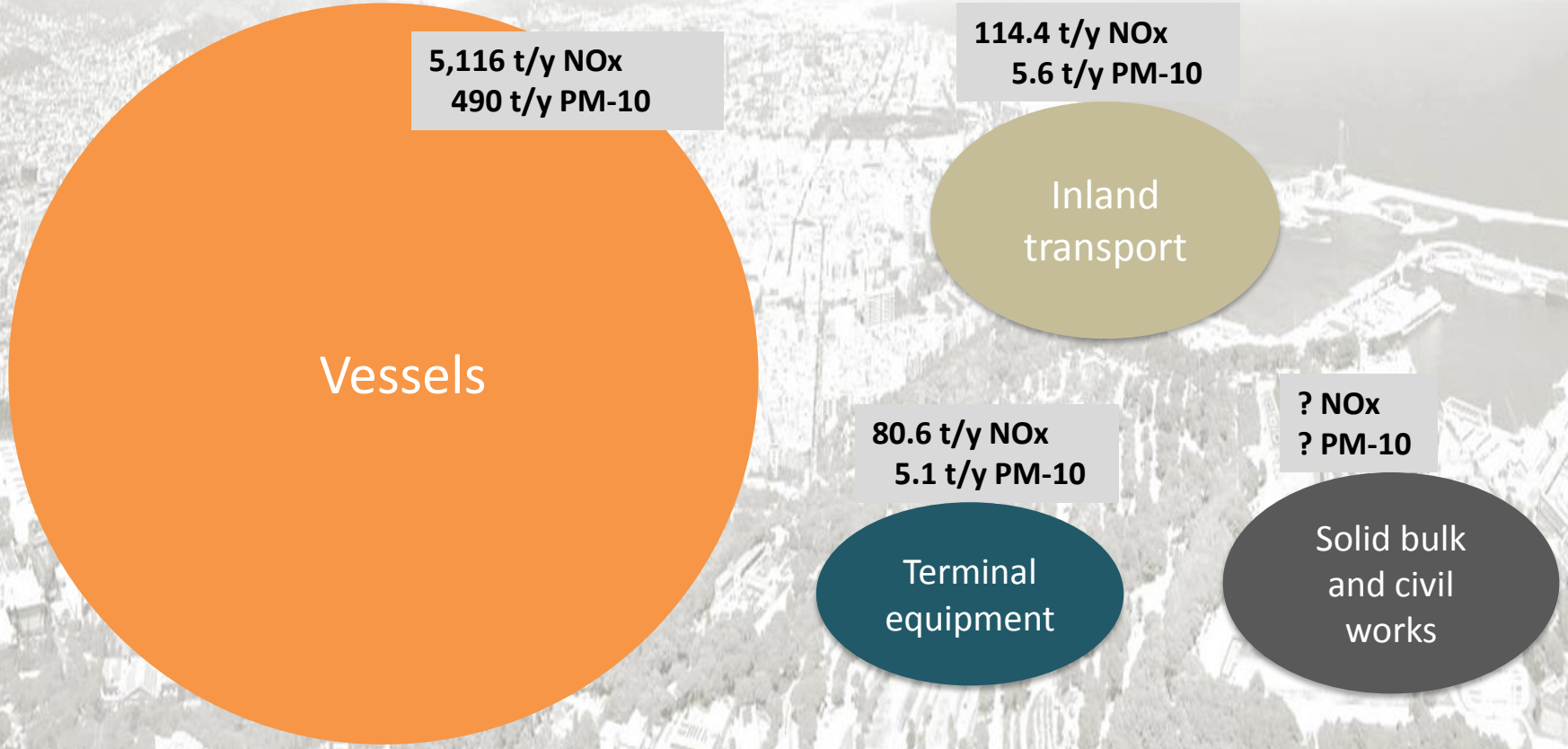
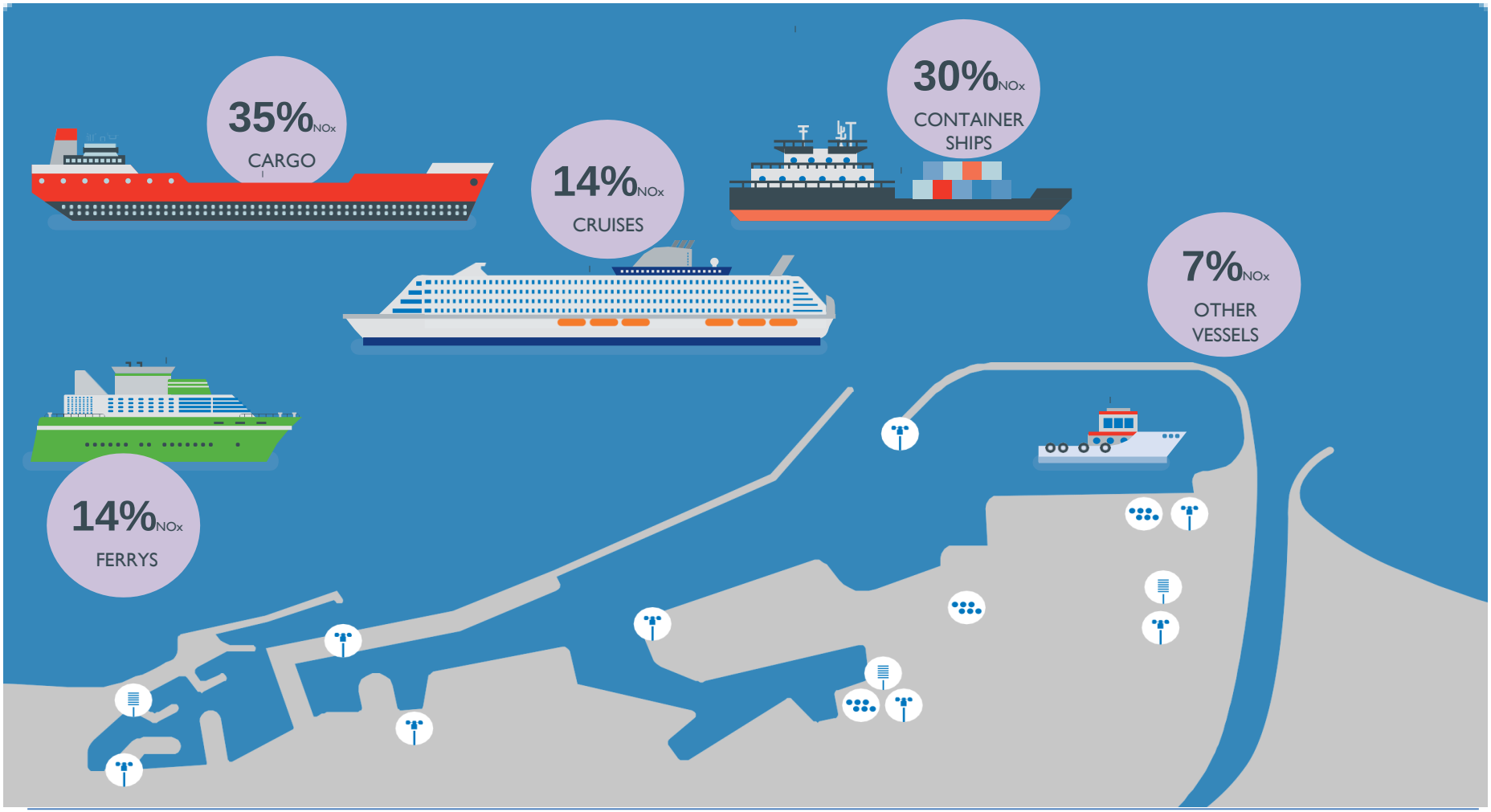
2. Emissions of the port cruise activity in Barcelona

Emissions from Barcelona Port Activity are estimated to be 5,545.8 t/y of NO_X and 505.68 t/y of PM-10.



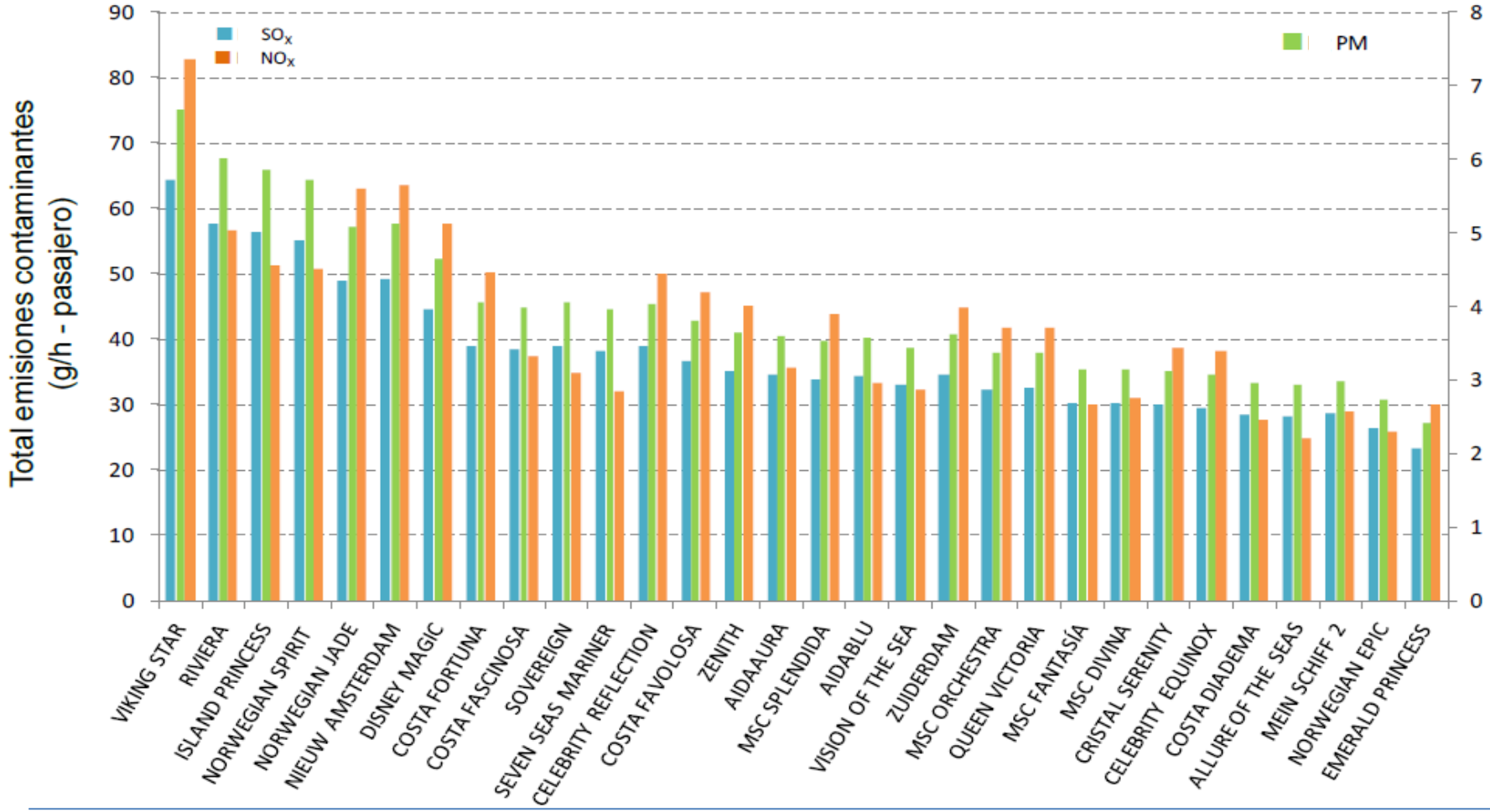
2. Emissions of the port cruise activity in Barcelona

Percentage of emissions of NOx from each typology of vessels



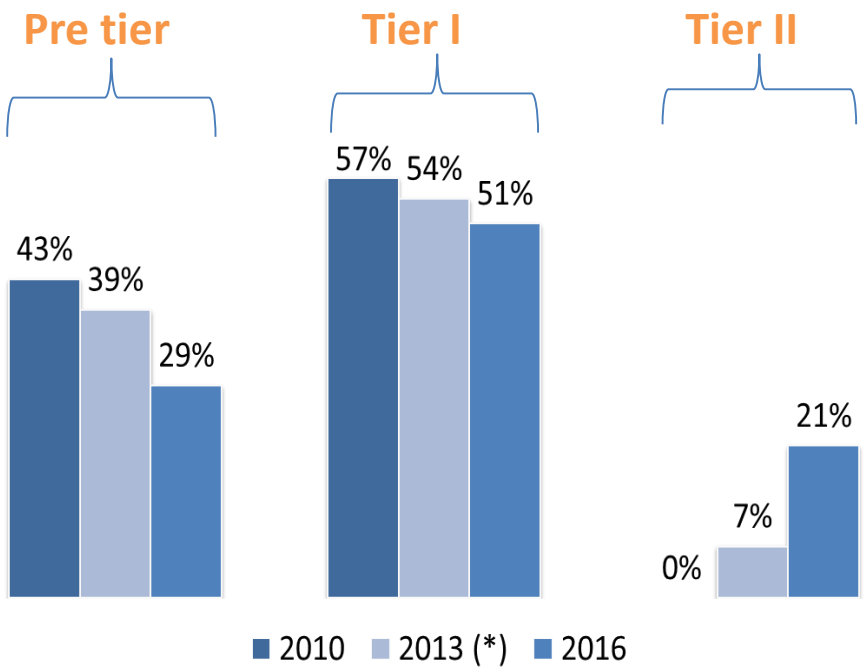
2. Emissions of the port cruise activity in Barcelona

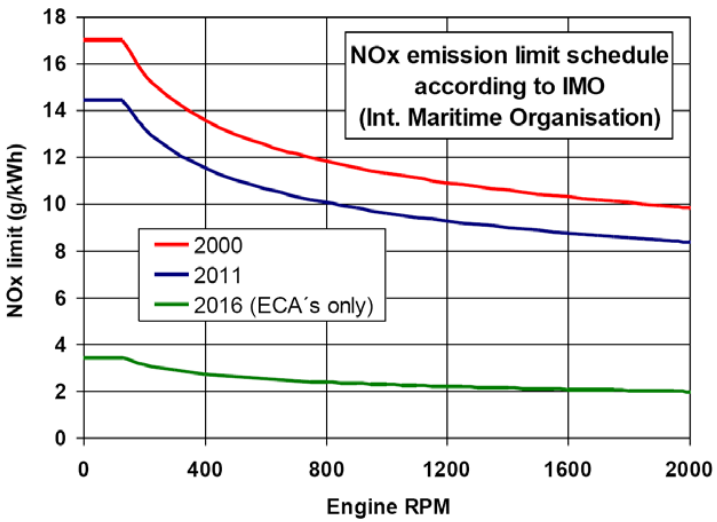
Estimated emissions of SOx, NOx and PM of the 30 most usual cruises in the Port.
Estimations in g/hour of stay and per passenger



2. Emissions of the port cruise activity in Barcelona

NOx emissions from cruises: percentage of cruise ships that called in Barcelona (2016) built before 2000 (pre-tier), between 2000 and 2010 (tier I) and after 2011 (tier II)





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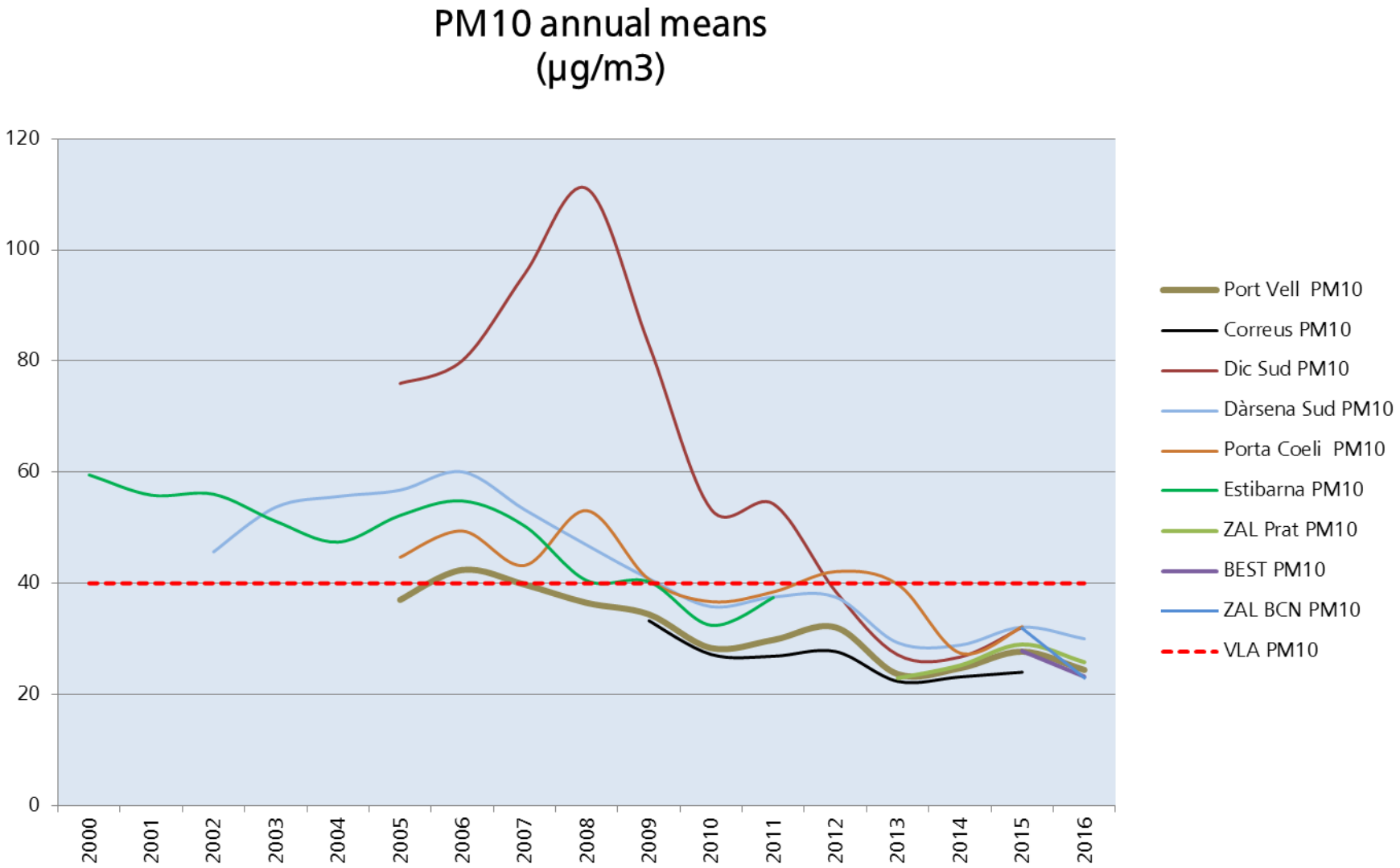
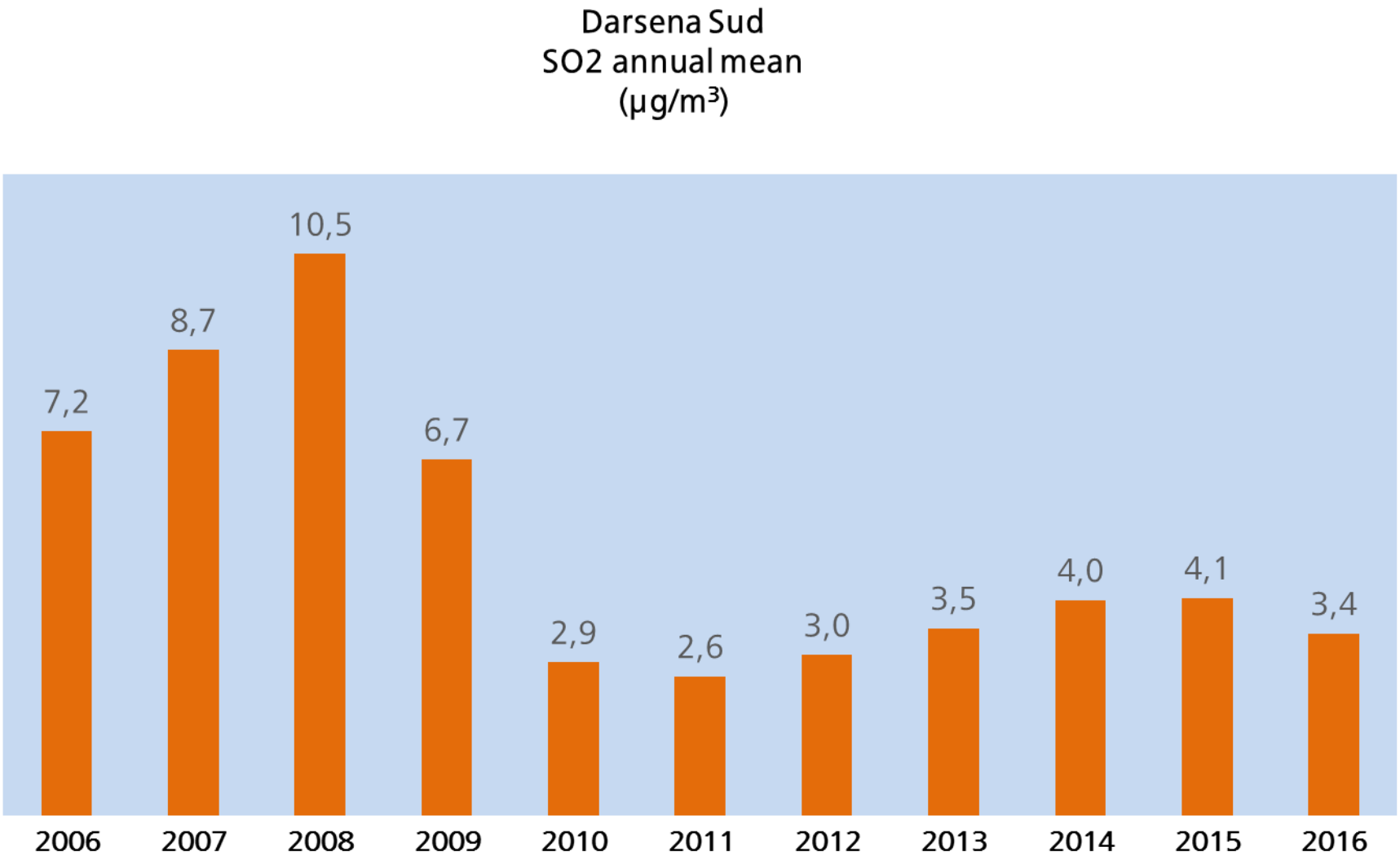
3. Contribution to air quality of the city

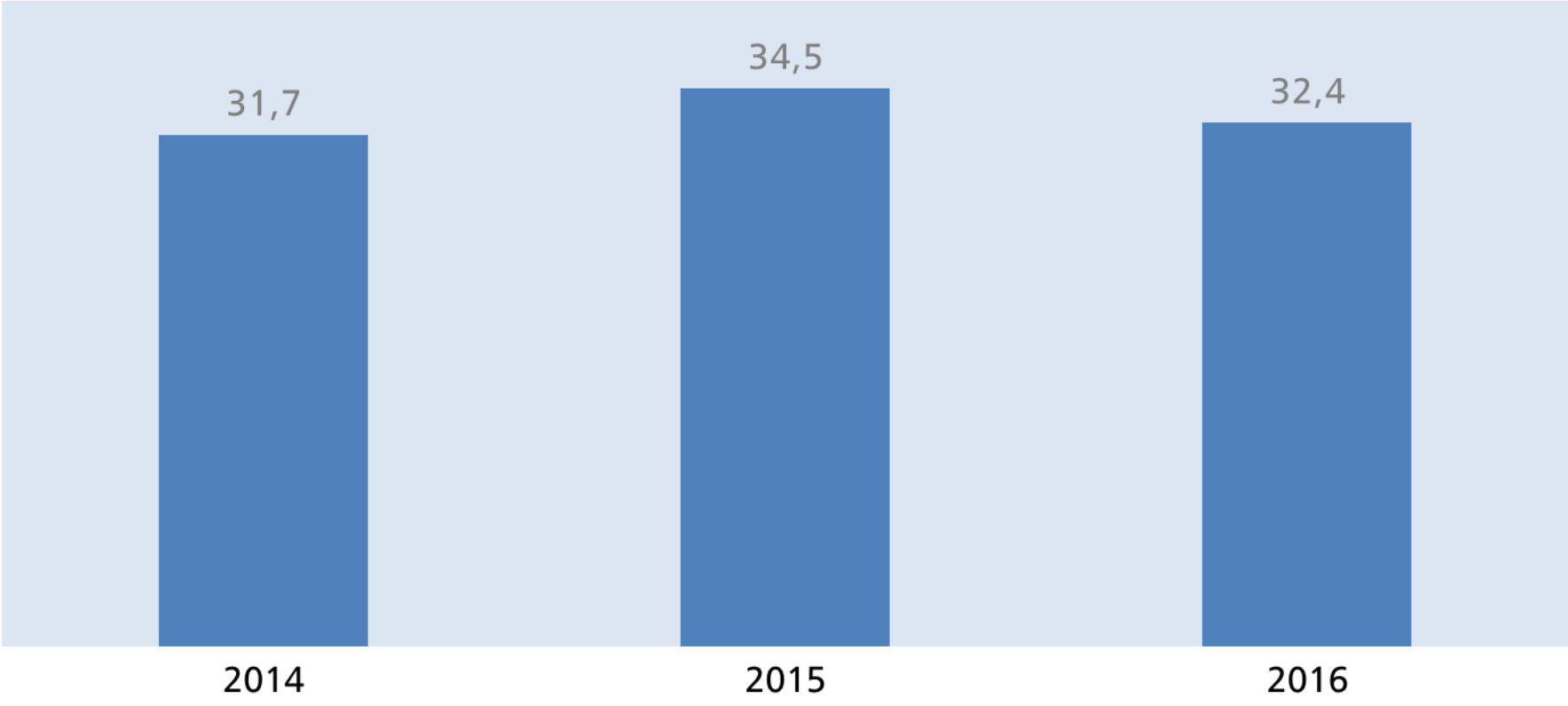


3. Contribution to air quality of the city



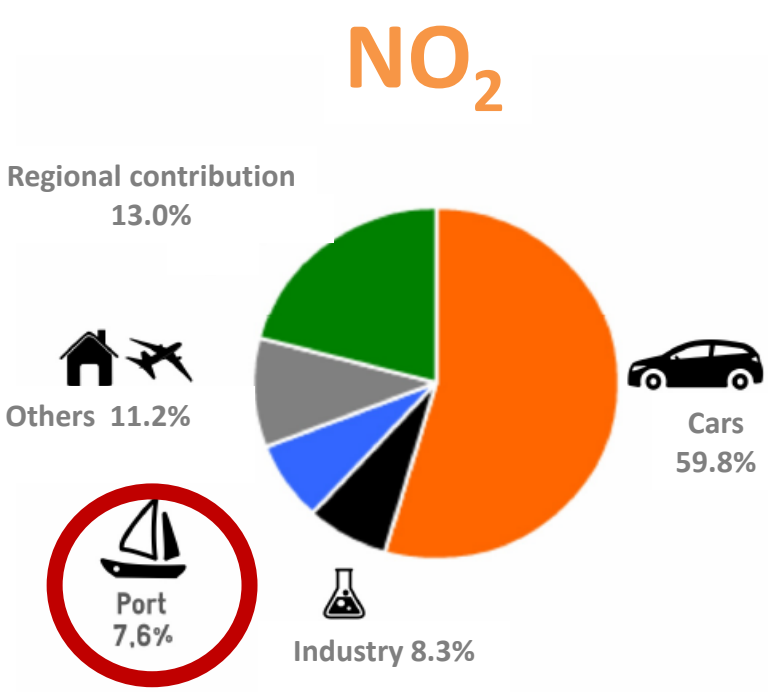
3. Contribution to air quality of the city

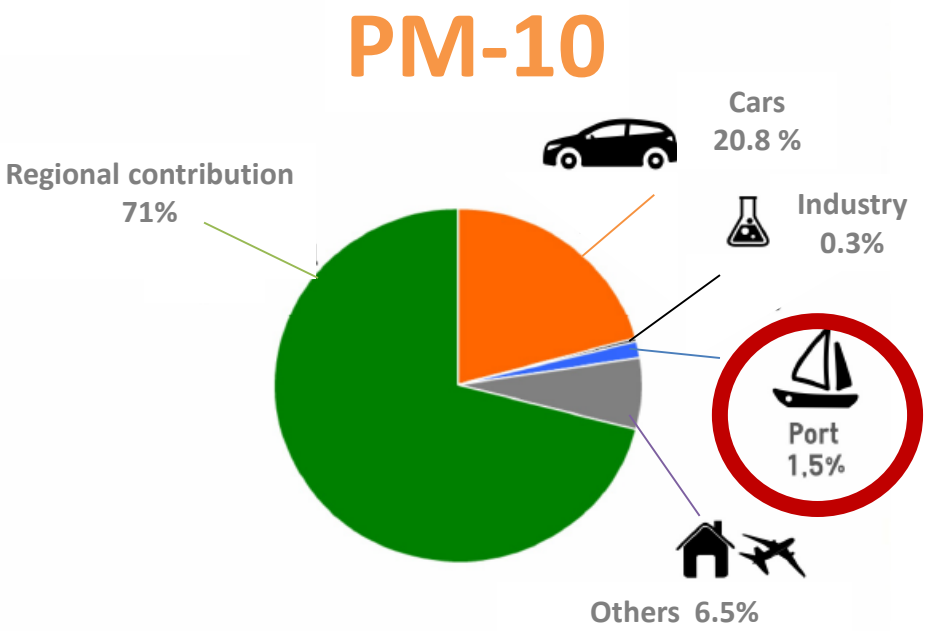
ZAL Prat station
NO2 Annual mean
(µg/m³)



3. Contribution to air quality of the city

The relative contribution played by emissions from the port to air quality in the city of Barcelona





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4. The commitment of the Port of Barcelona

Ports are key players in the use and development of gasification for mobility.
Ports are primary nodes in the logistics chain and handle all modes of transport.

4. The commitment of the Port of Barcelona

Supply infrastructure

Promotion of LNG as fuel: pilot projects to break barriers

Discounts to ships using LNG as fuel

Regulation of bunkering operations TTS and STS

4. The commitment of the Port of Barcelona

Basic supply infrastructure

Modification of the existing barge to incorporate LNG tanks, 1,200 m3 capacity, and supply mechanisms to ships

Initiative of FLOTA SUARDIAZ

Dedicated LNG berth to supply small vessels and barges

Initiative of ENAGAS TRANSPORTE S.A.U.

4. The commitment of the Port of Barcelona

Promotion of LNG as a fuel for vessels

Incorporation of an auxiliary NG engine and LNG storage tank of 30 m3 on board

Initiative of BALEARIA and GAS NATURAL FENOSA

Construction and installation of NG engine on the wharf to supply electricity to the vessel

Initiative of FLOTA SUARDIAZ in collaboration with ports of Vigo, Tenerife and Barcelona

4. The commitment of the Port of Barcelona

Discounts to ships using LNG as a fuel

Since 2015 the port has offered:

- a 20% additional discount to ships using natural gas while docked in port.
- An additional 40% discount to ships using LNG for propulsion.

4. The commitment of the Port of Barcelona

Regulation of bunkering operations TTS and STS in Port

Identification of risks for other terrestrial and maritime operations in the port

Operational requirements
(docks, timetables, berthing of barge, BOF return…)

Regulation of operations in port

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5. Conclusions

1. Ports must act to reduce emissions from port activity. Shifting to natural gas is an effective measure to reduce emissions

2. Ports are primary nodes for transport and logistic chains and therefore they are well positioned to promote gasification. For ports, shifting to natural gas requires availability of supply infrastructures and promotion actions in different segments of goods mobility

3. The Port of Barcelona is committed to promoting the use of LNG as a new fuel for cruise ships, other vessels, trucks and terminal machinery and is working to achieve this

www.portdebarcelona.cat

Thanks for your attention!