



# Sustainable technologies for the cruise industry

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- Costa Group is committed to a **zero emission future**, as is the entire cruise and maritime sector.
- The **cruise sector** only represents less than **1% of shipping**, but it is a **front runner** in progressing towards this goal
  - We are a consumer business and as such we need to respond to growing concerns
  - It is the right thing to do

# Our commitment to emission reduction



**The context:** ambitious IMO objectives 2030 and 2050

**Costa Group objective:** 40% reduction in CO2 emissions by 40% by 2020 to reach zero emissions in the long term

**How: € 50 million investment to**

- Increase efficiency of the fleet improving its environmental performance
- Invest in responsible innovation and new sustainable technologies in new builds

**Our efforts are concentrated on**



**Scrubbers**



**Shore power**



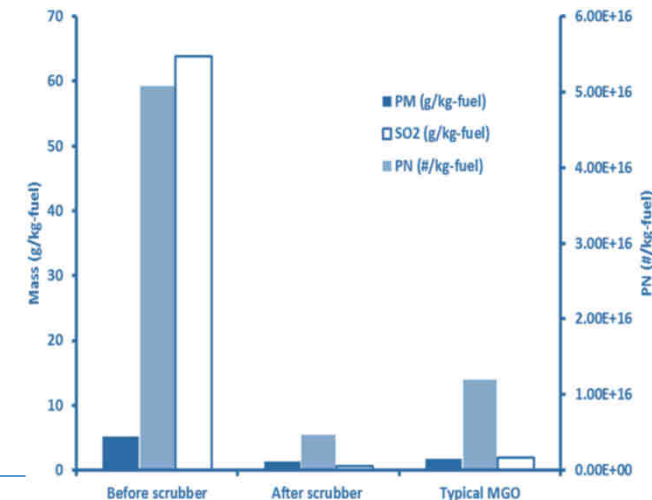
**LNG**

# Advanced Air Quality Systems



## Scrubbers

- AAQs plays a crucial role in working towards the IMO reduction targets for 2030 and 2050 and vital for the industry to comply with IMO 2020 Sulphur cap
  - best solution for air emission control and scientific evidence show that their performance is even better than with typical MGOs
  - about 75% of the total PM is captured by the scrubber



Emission factors for PM, PN and SO2 in comparison with an MGO. PM: particulate mass; PN: number of particle; MGO: marine gas oil.

- Carnival Corporation has been testing and operating AAQS systems since 2006
- Of its current 106 ship fleet, 74 are fitted with open-loop AAQS for
- Total investment of about 1 billion USD

# Shore power



## Shore power

- 14 of the 28 ships in Costa Group fleet are either already fitted with a shore power connection or technically prepared
- In Hamburg Altona our AIDAsol has been supplied with green power via a shore power facility since April 2017



## HOWEVER:

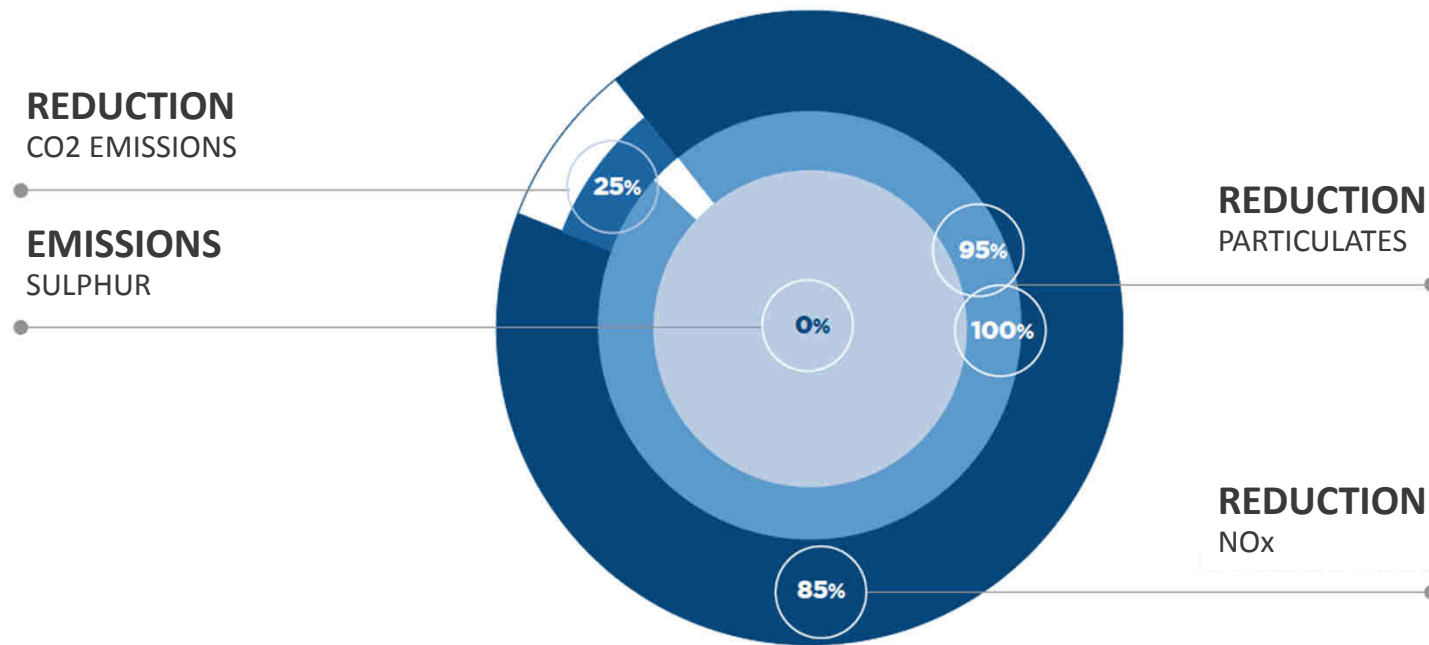
- There is an infrastructure issue, given the high quantity of power needed by a ship in port
- There is not one connecting standard system used everywhere
- In order to effectively cut emissions, shore-side power must come from clean, efficient sources and must be convenient compared to other sources

# Why LNG



LNG

- The world's cleanest fossil fuel
- High environmental performance



# The evolution: New generation ships



 LNG fuelled





# Pioneering LNG



- **AIDAnova** is the world's first LNG cruise ship, delivered in December 2018



- **Costa Smeralda**, expected by 2019 and destined to the Mediterranean, and other 3 ships between 2020 and 2023



