



Air Pollution from Ships

EMSA's Role & Tasks

Ricardo Batista

Project Officer Marine Environment and Capacity Building

EISAP Annual Meeting

Lisbon, 15 May

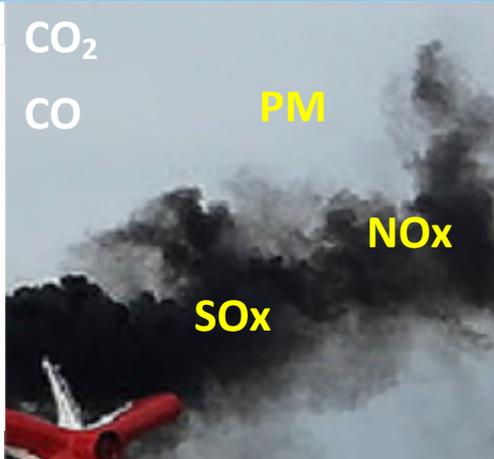


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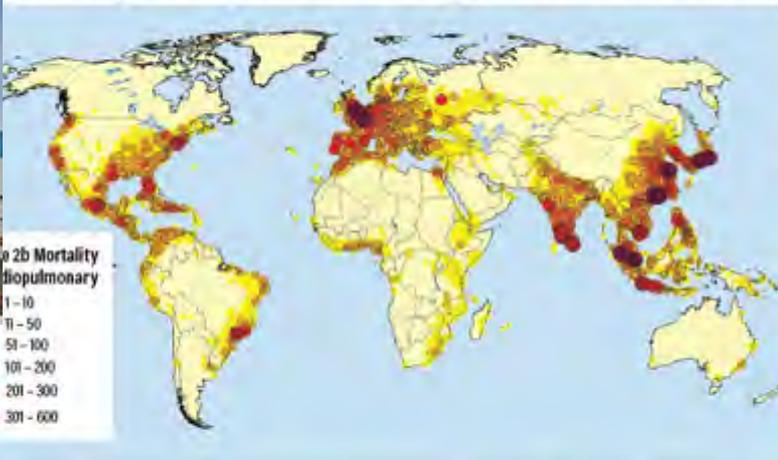
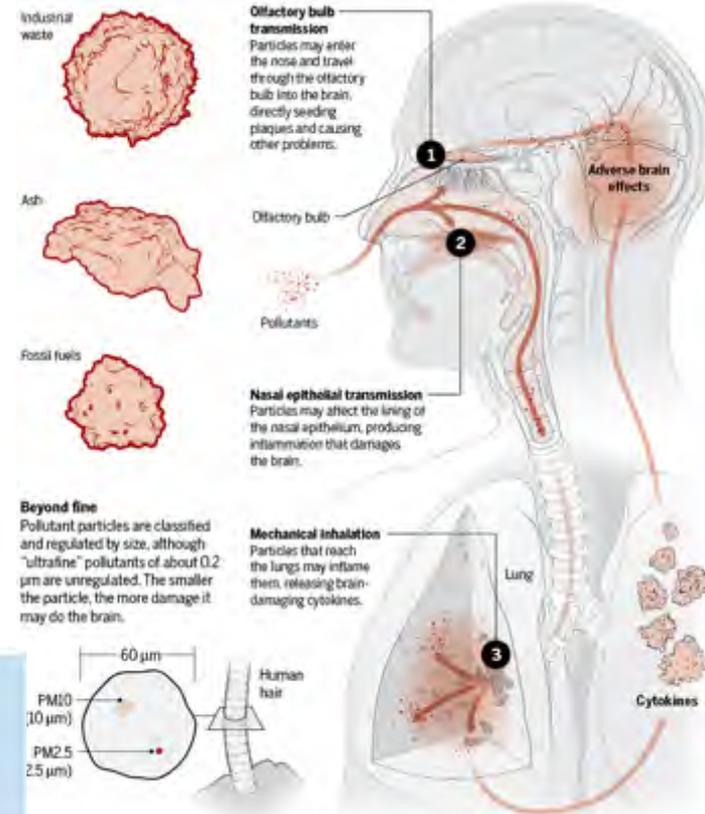


Air Pollution from Ships

- **Sulphur Oxides or SOx:** come from burning the sulphur present in fuel oils. Corrosive and harmful to life.
- **Particulate matter (PM) or soot:** consists of unburned fuel or incombustible elements in the fuel. Highly carcinogenic. The very small or ultrafine particles are the most harmful ones.



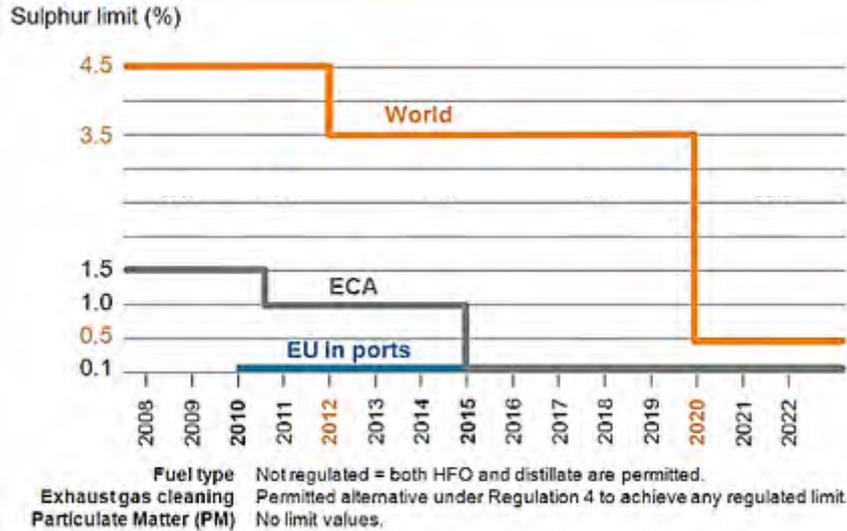
Nitrogen Oxides (NOx): are produced when engines heat up the Nitrogen and Oxygen in air. Highly toxic and dangerous form of pollution.



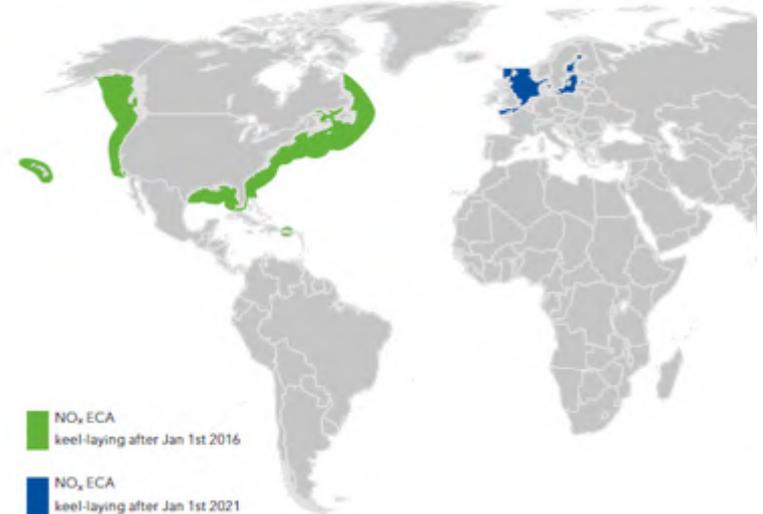
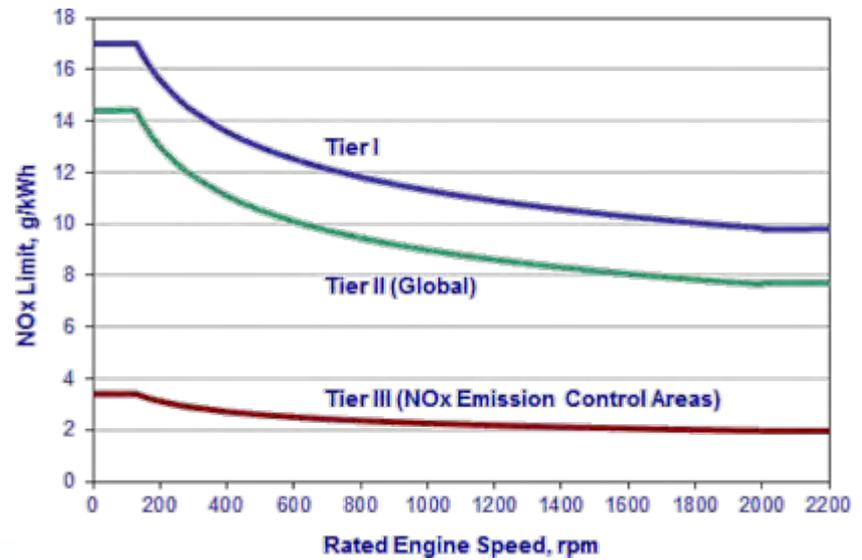
Air Pollution from Ships



SOx



NOx



* Note! China and Hong Kong may go down to 0.1% earlier than 2020.

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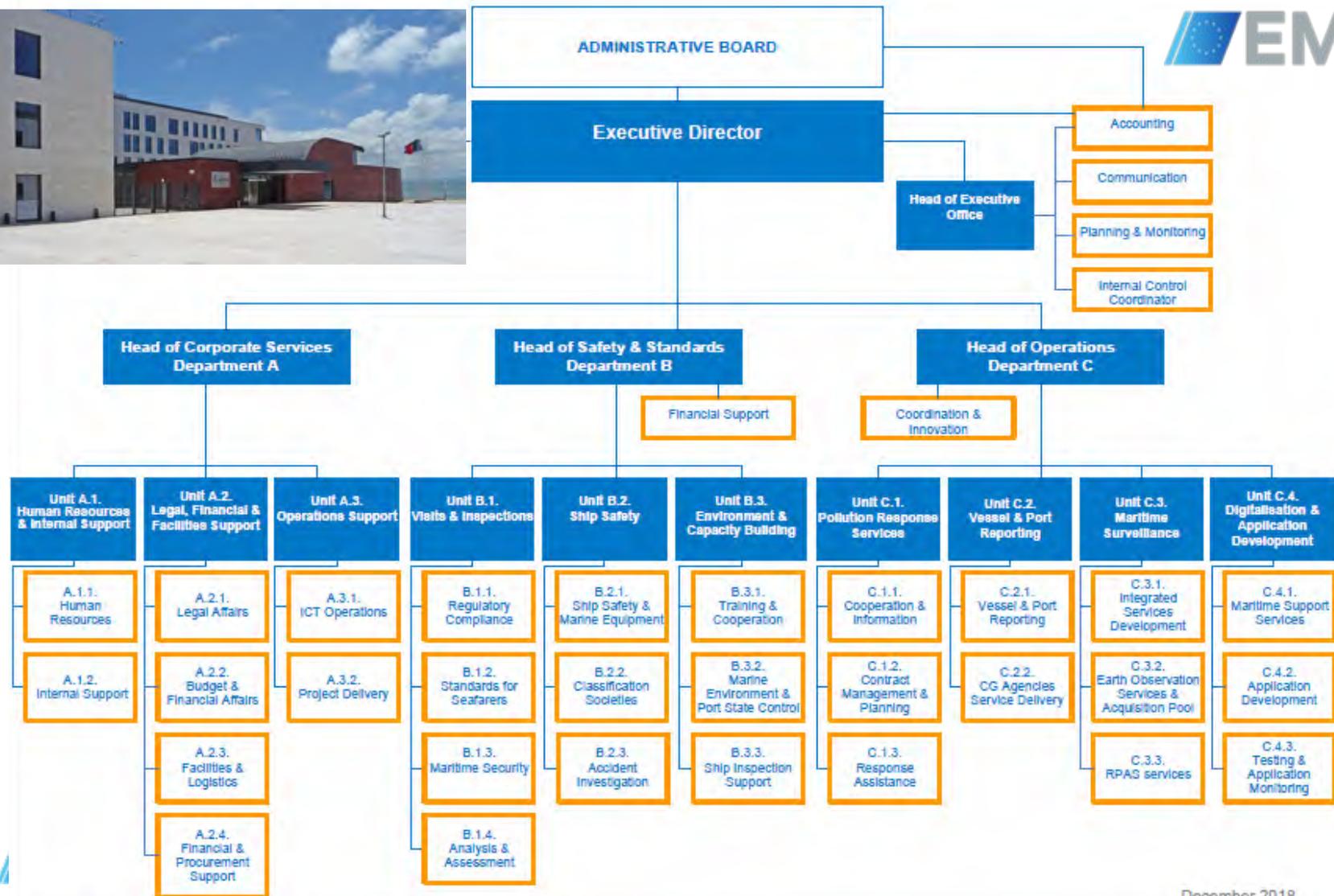
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Air Pollution

Abatement Tecnology

Alt Fuels + Clean Power



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EMSA's Role & Tasks



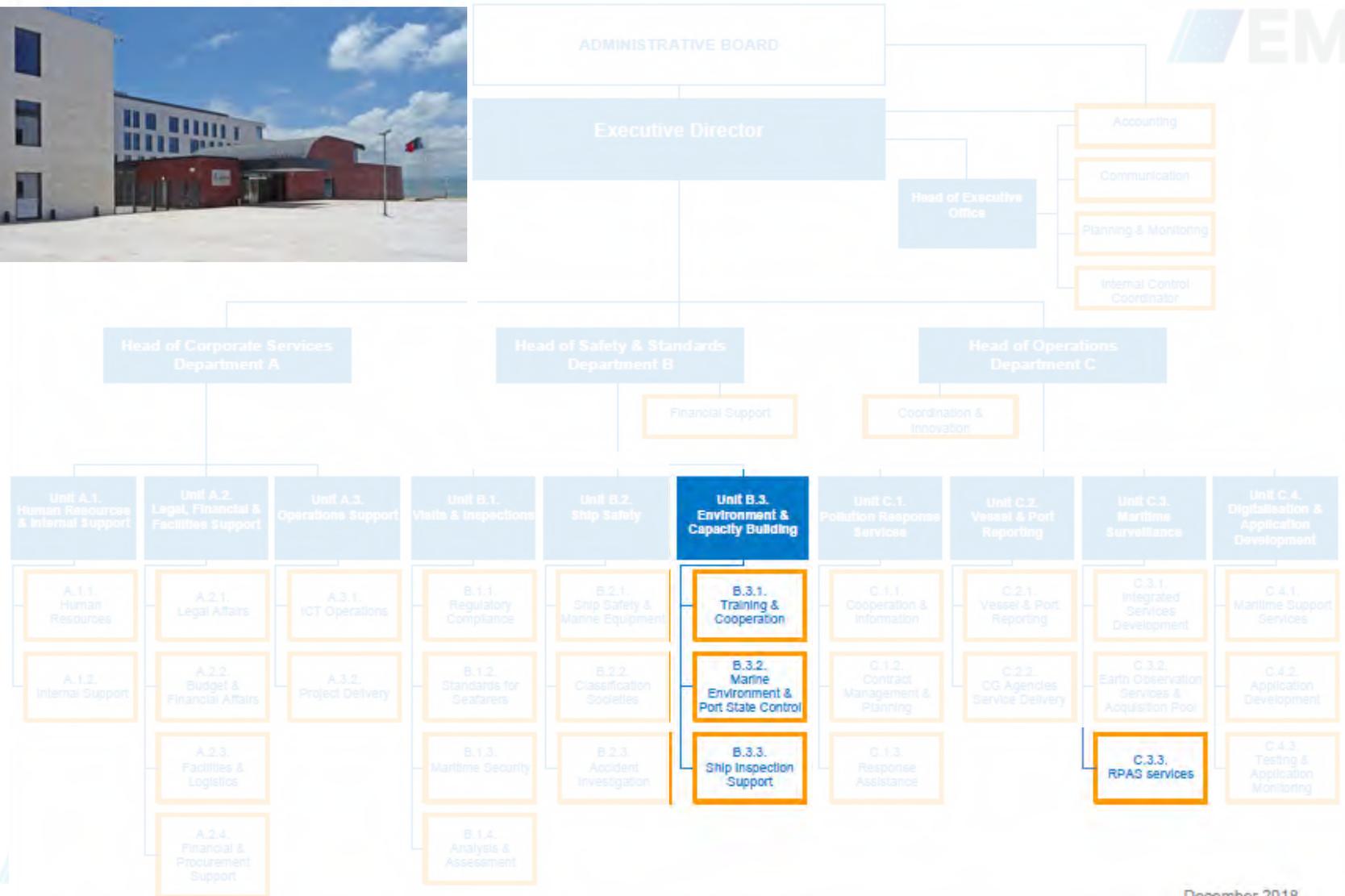
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GHG

MRV
EEDI /IMO



Air Pollution

Sulphur Emissions
Emission Abatement



Alternative Fuels

Studies - Guidance



ESSF

Technical Support
Sustainable Shipping



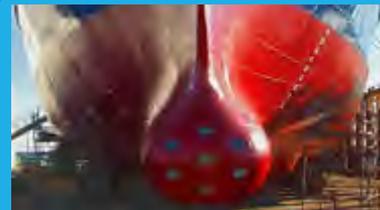
PRF

Study & Guidelines
Technical Support



Ship Recycling

IHM Guidance
Studies



AFS

Implementation
Cybutryne



Capacity Building

Tools & Capacity Building



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Air Pollution

Sulphur Emissions
Emission Abatement



Alternative Fuels

Studies - Guidance



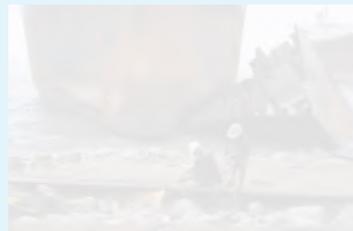
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Sulphur Inspection Guidance v.2018

<http://www.emsa.europa.eu/main/air-pollution/>



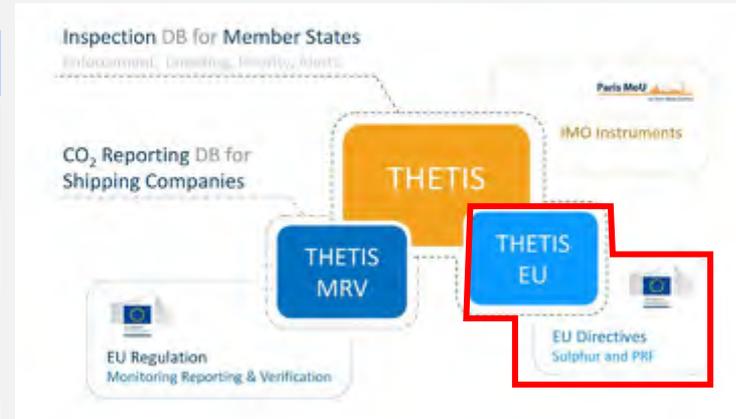
- Harmonised approach to the **Sulphur Inspection**
- Applying **control procedures** for the enforcement of Sulphur Directive.
- **Emission Abatement Methods**
- Best Practice for Fuel Sampling

SULPHUR

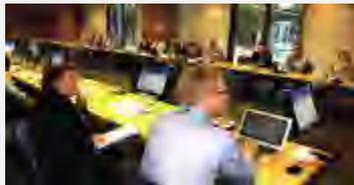
0.10% ECAs
0.50% Global 2020



THETIS EU



Training



- Training for **Sulphur Inspectors**
- **Application** of best practice
- **Fuel sampling** training onboard **real vessels**.
- Inspection of ships using **EAM/EGCS**
- **Practical cases** analysed and best practice implemented.

RPAS SOx Monitoring/ Sniffing



- RPAS Emissions Monitoring **Targetting System**
- **Sniffing**
- **Service to EU Member States**



Air Pollution from Ships

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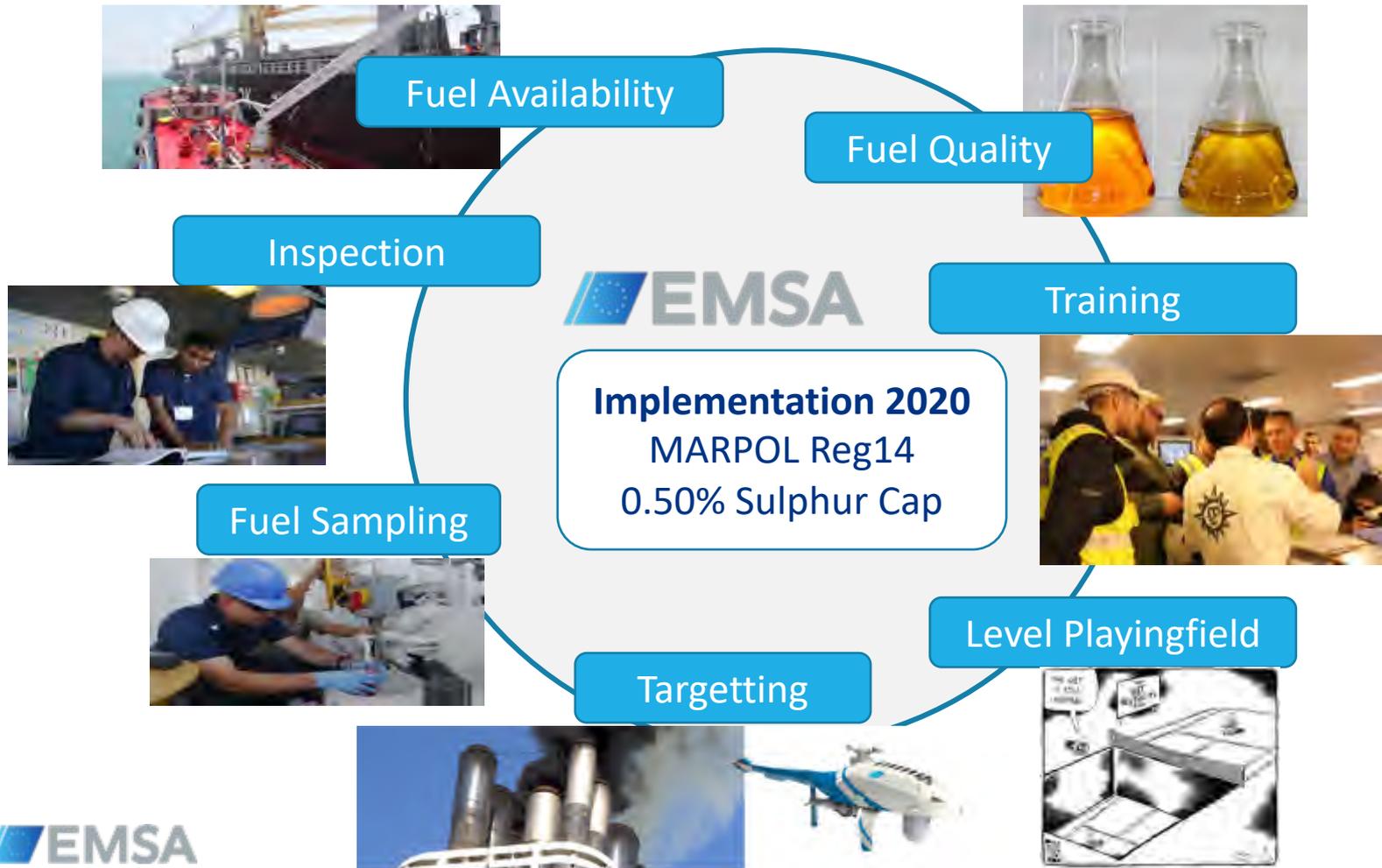
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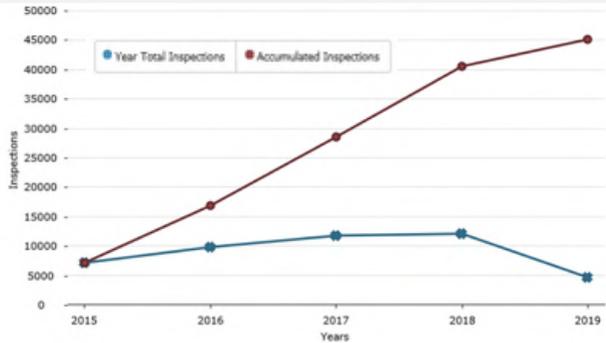
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Total Accumulated and Yearly Distribution



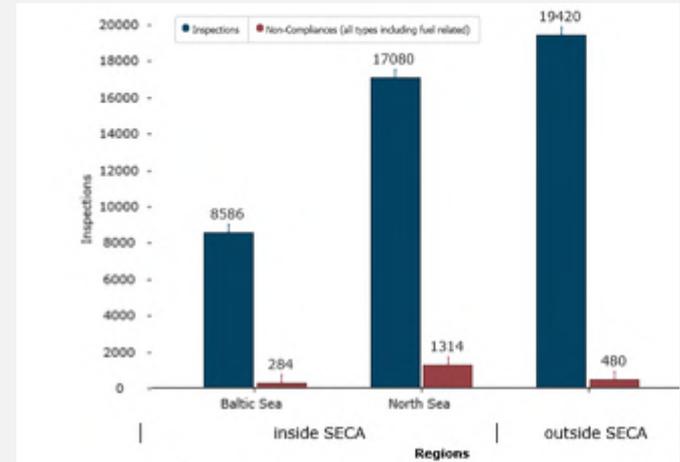
Year	2015	2016	2017	2018	2019
Year Total Inspections	7067	9735	11687	12018	4586
Accumulated Inspections	7067	16802	28489	40507	45093

SULPHUR

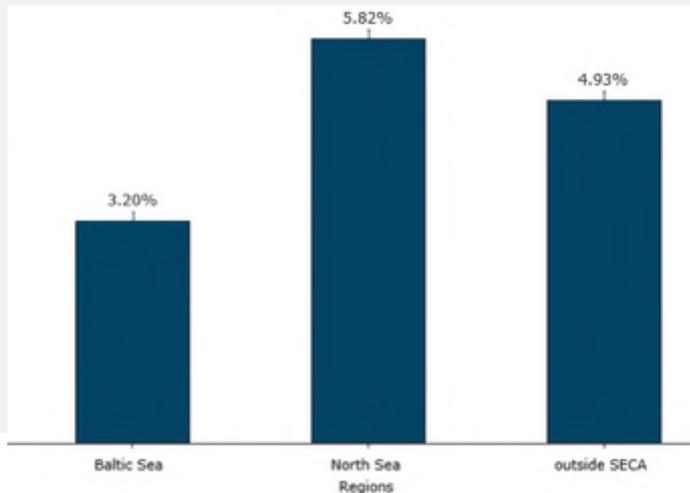
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Implementation/
Compliance Statistics



Document Verification and Non-compliances



Non-compliance of analysed fuel samples



- Close to **45,000 inspections** recorded
- **Average 5% non-compliant fuel samples** have been identified
- More than **250 sulphur inspectors** trained
- **Guidelines documents** prepared including Sulphur Inspection Guidance and LNG, etc
- **5 workshops** undertaken
- Visits to 14 MSs

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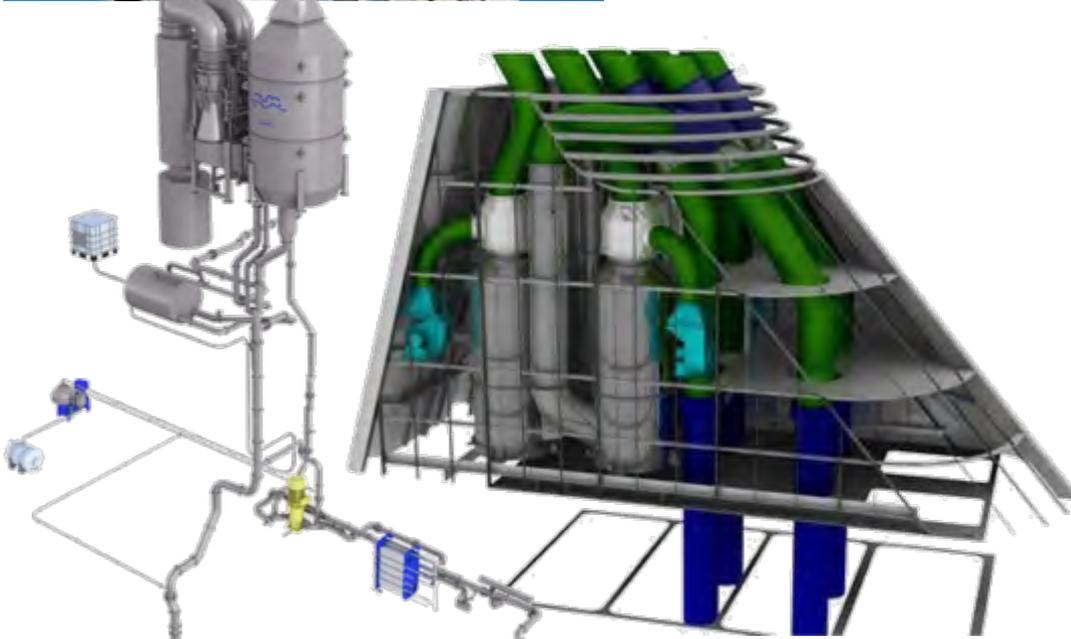
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Technical Support on Emission Abatement Methods



- Technical support to COM and Member States on Emission Abatement Methods/ Equivalents (**Reg.4 MARPOL Annex VI**)
- Contribution to Environmental Impact Assessment of Abatement Systems
- Studies on Alternative Fuels and Clean Power Systems.
- **EGCS**
- Participation in International discussions on relevant aspects related to **certification, technology deployment, safety assessment.**
- Development of **best practices for inspection** of ships with EAMs.

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Alternative Fuels/Power in Shipping



LNG



Batteries



Hybrid



OPS



Methanol

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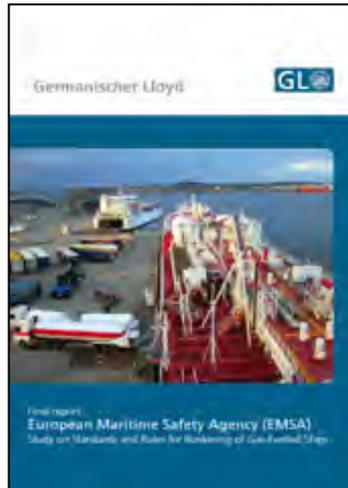
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Abatement Technology

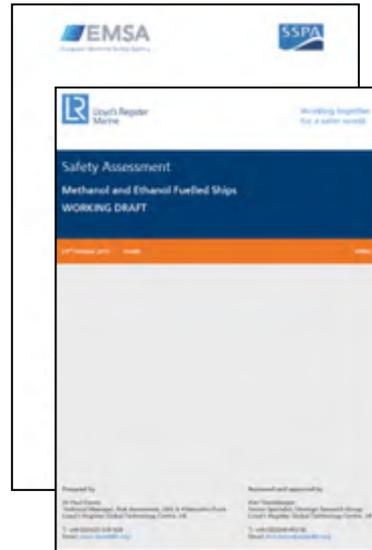
Alt Fuels + Clean Power



Potential of Biofuels in Shipping



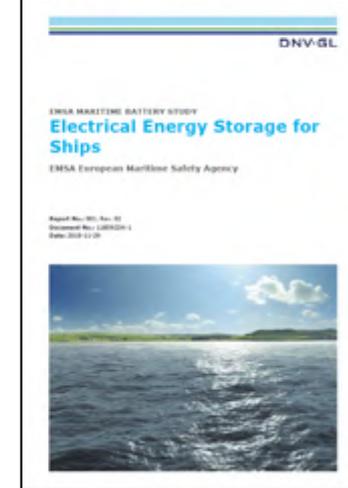
Study on Standards & Rules for Bunkering of LNG fuelled ships



Study on the use of Ethyl-Methyl alcohols in shipping



Study on the use of Fuel Cells in shipping



Study on Electrical Energy Storage - Batteries

All EMSA Studies available:

<http://www.emsa.europa.eu/main/air-pollution/alternative-fuels.html>

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Alternative Fuels/Power in Shipping – Common Areas in EMSA Studies



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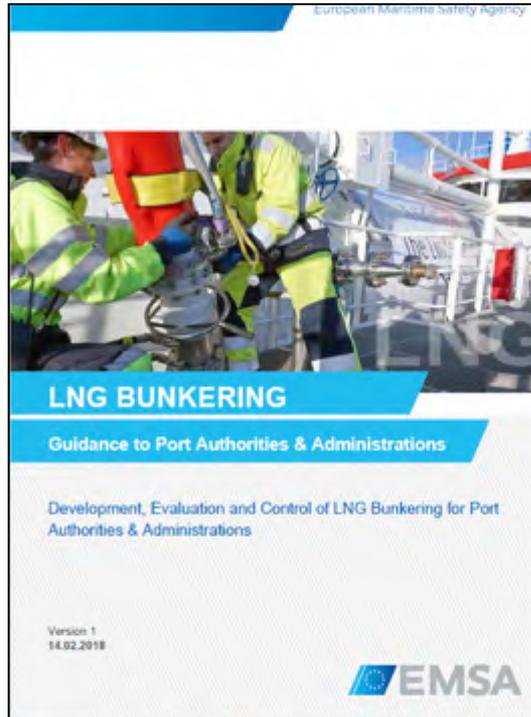
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EMSA Guidance on LNG Bunkering to Port Authorities & Administrations



- **Development, Evaluation and Control of LNG Bunkering**
- **Best practice** elements for Port Authorities and Administrations.
- Support to **Port Regulations** development
- Support in the **implementation of Directive 2014/94** (Alternative Fuel Infrastructure)
- **Open document** – Promoting continuous update of LNG Bunkering Good Practice.
- Promoting **collaborative environment** between different relevant Competent Authorities and Industry in the **regulatory framework development.**

Available at :

<http://www.emsa.europa.eu/main/air-pollution/alternative-fuels.html>

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EMSA Guidance on LNG Bunkering to Port Authorities & Administrations

Key Challenge Areas to Address

Regulatory Context

- Identify the **applicable regulatory instruments** relevant to different LNG bunkering/fuelling operations.

Permitting Process

- Define a standard **General Permitting Process Diagram** for LNG bunkering facilities and operations.

Safety Distances

- **Define a standard Good Practice approach to the definition of Safety Distances for Meaningful Protection** in different LNG bunkering operations.

Simultaneous Operations

- Devellop an **approach to facilitate the consideration, authorization and control of SIMOPs**.
- Takinf into account technical and operational elements.

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Future Challenges



- **Decarbonization** will shape technological changes and Business opportunities
- **Sustainable Fuels and Power Systems** with significant impact on Ship Design
- **Holistic approach to Air Emissions** increasingly necessary (both air pollution and GHG to be addressed)
- **Shore Side Power**
- **Digitalization, Monitoring, Artificial Intelligence** with impact on more Energy Efficient ships and Operations
- Port Operations – **Integration Automation and improvement of Ship-Shore interface**



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