Future fuels and drives for Ships

Sönke Diesener

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Mortality from Ship Emissions (PM$_{2.5}$)

Luftschadstoffquellen im Vergleich

Datenquelle: Luftreinhalteplan 2017

SO₂

EU25  Sea

NOₓ

EU25  Sea

Datenquelle: Luftreinhalteplan 2017

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Problem

- Air pollution
- Health damage
- Climate warming
- Eutrophication
- Acidification
- Heritage damage
- Oil spill risk
Solution

PM
UFP
CO$_2$

SO$_x$
NO$_x$
BC

Efficiency
EEDI, slow steaming, hull shape etc.

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Solution

PM UFP

CO$_2$

SO$_x$

NO$_x$

BC

SCR + DPF

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Solution

PM
UFP

CO₂

SOx

NOx

BC

LNG

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Solution

Renewable Energy

PM
UFP
CO₂
SOx
BC
NOx

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Solution

Wind

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Technical solutions for renewable ship propulsion

- Wind (sail, kite, flettner rotor, hull)
- Battery (short sea)
- Hybrid
- Fuel Cell (H2) (fossil fueled e.g. LNG, methanol, diesel)
- Renewable (liquid, gas) fuels for combustion engines
What to do from now?

- ECA in all EU waters
- Efficient control and enforcement
- HFO ban
- Improve efficiency (e.g. slow steaming)
- Exhaust aftertreatment or “clean fuel” retrofit for todays fleet
- Renewable fuels and drives for new ships (Wind, Battery, Fuel cell, …)
- Ecological port fee system and OPS
- Government vessels for best practice and R&D
- Zero Emission Ship
Thank you for your kind attention!

Merci pour votre attention!

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