

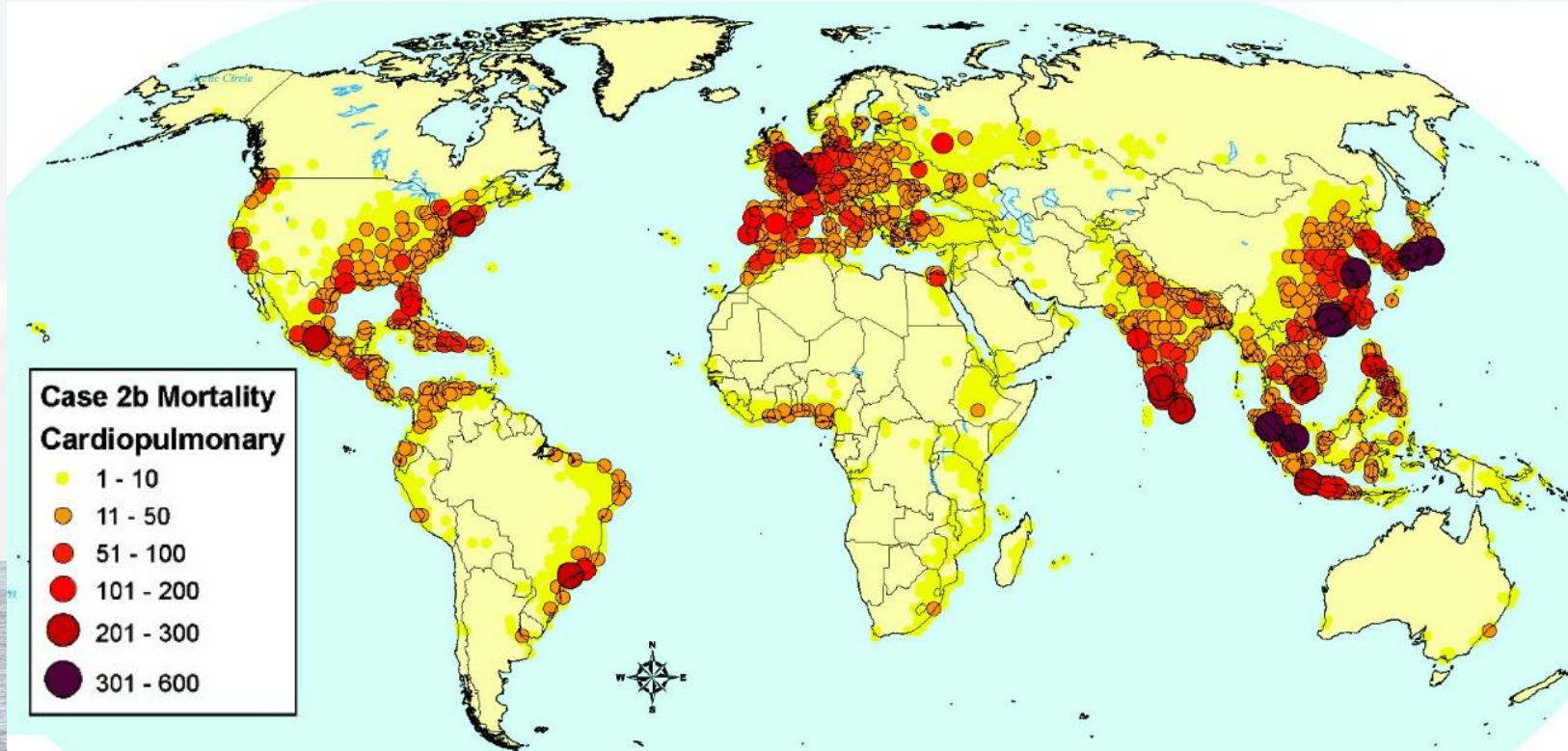


Future fuels and drives for Ships

Sönke Diesener

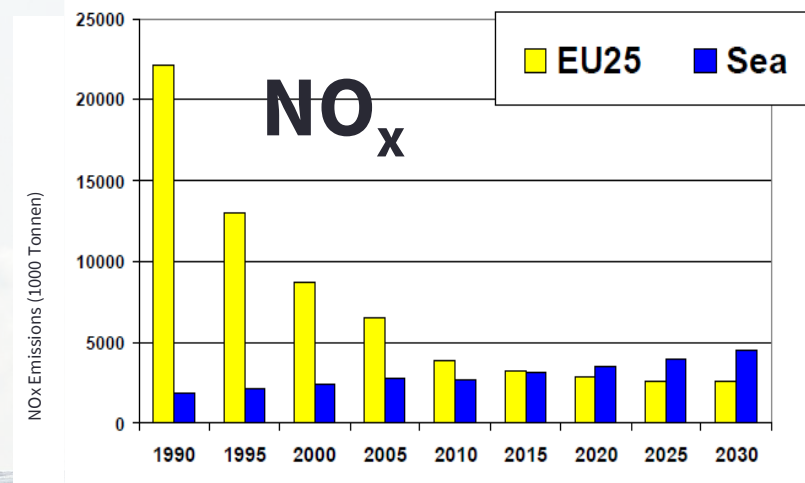
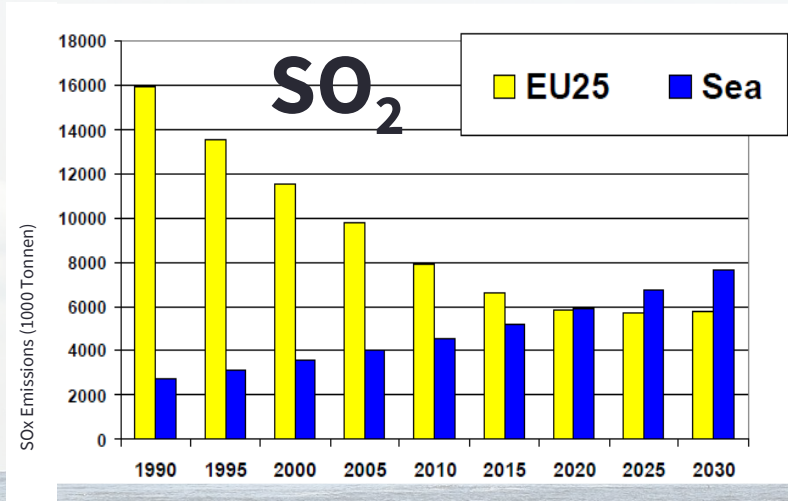
Transport Policy Officer, NABU

Mortality from Ship Emissions (PM_{2,5})



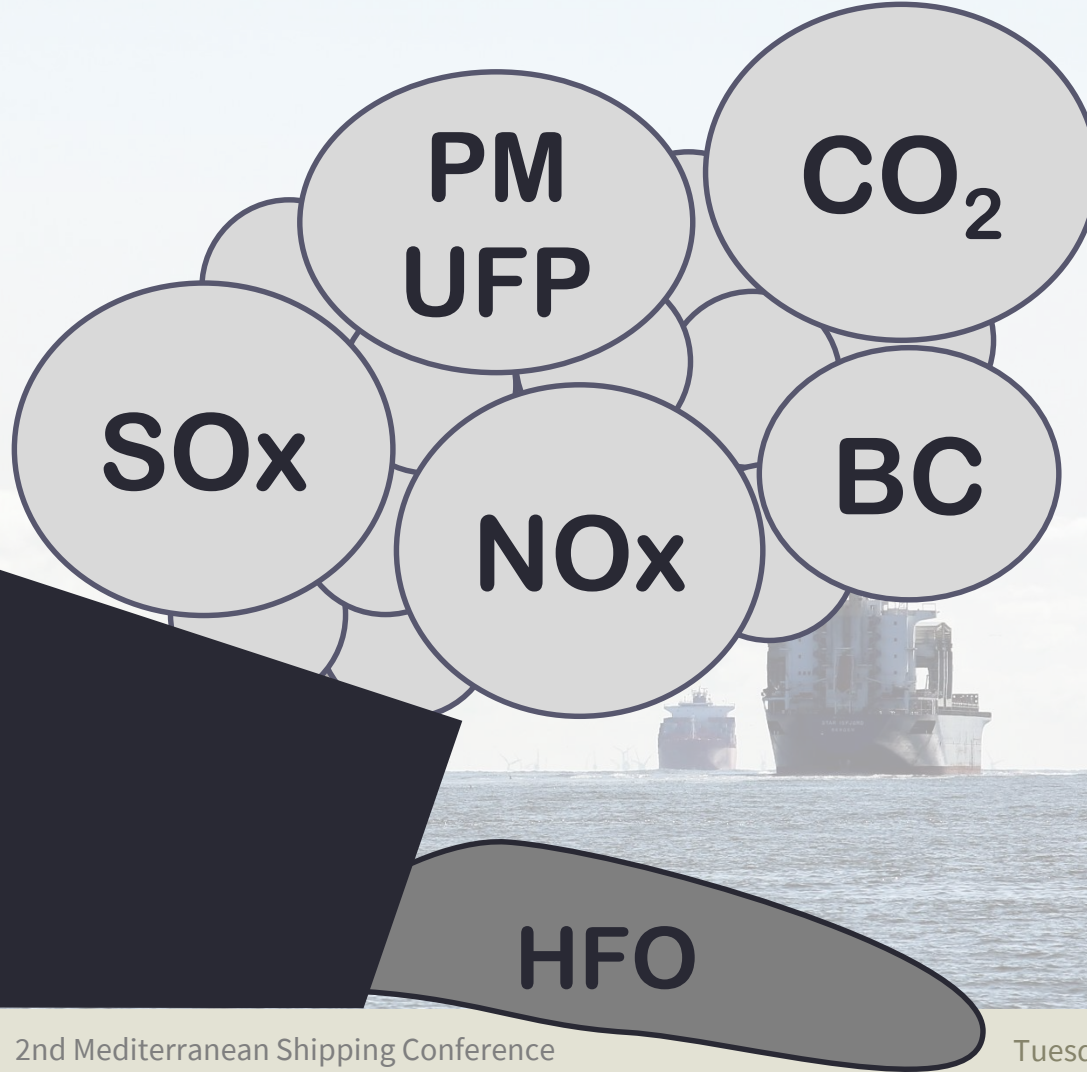
Quelle: Corbett et al (2007): Mortality from Ship Emissions: A Global Assessment

Luftschadstoffquellen im Vergleich



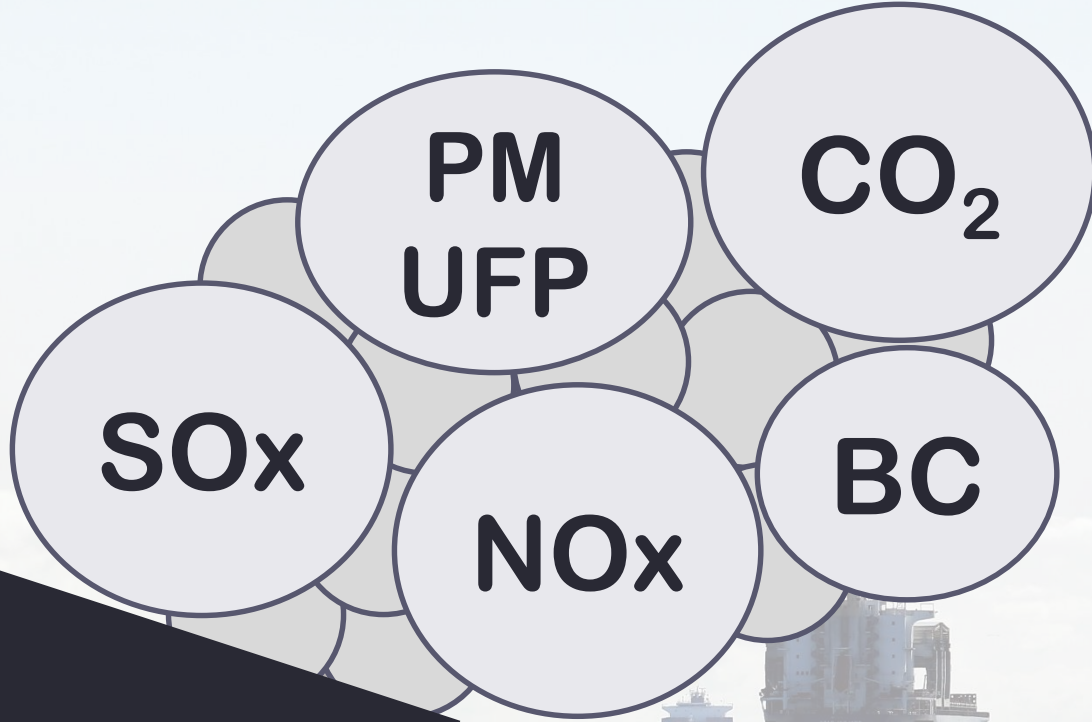
Datenquelle: Luftreinhalteplan 2017

Problem



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

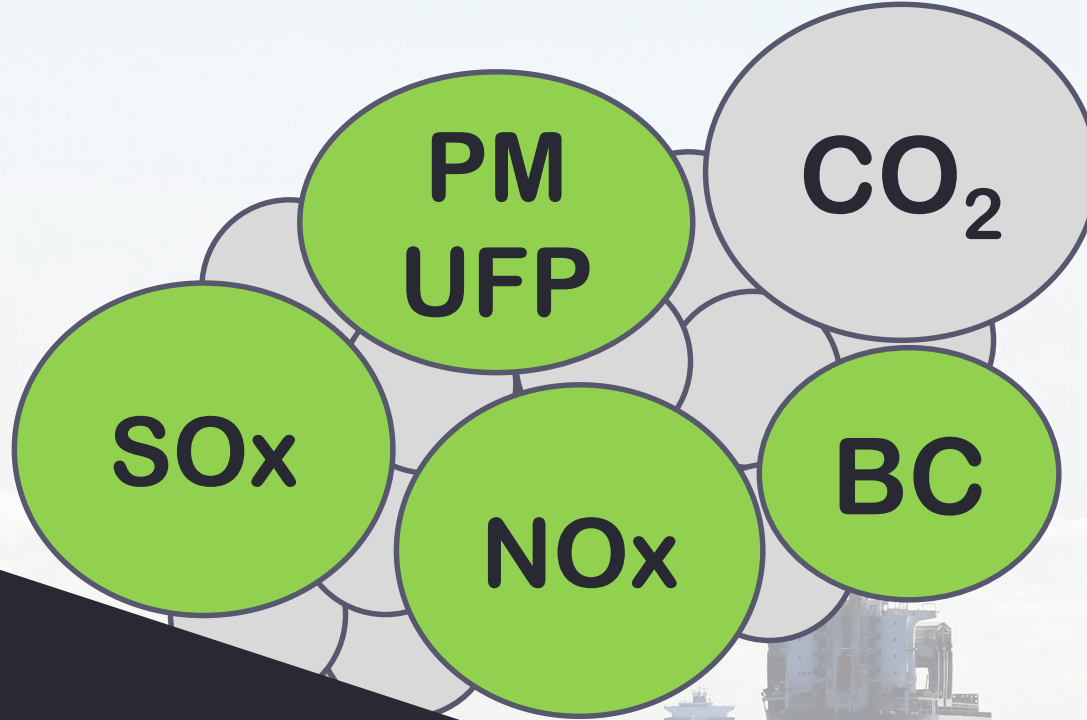
Solution



Efficiency

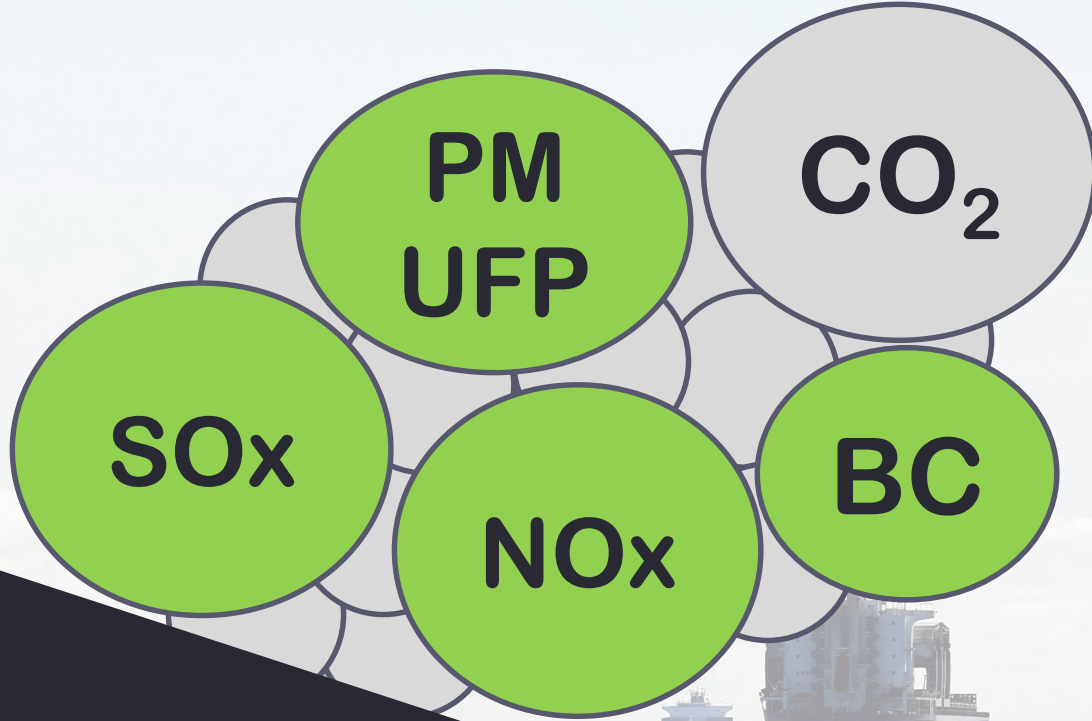
EEDI, slow steaming, hull shape etc.

Solution



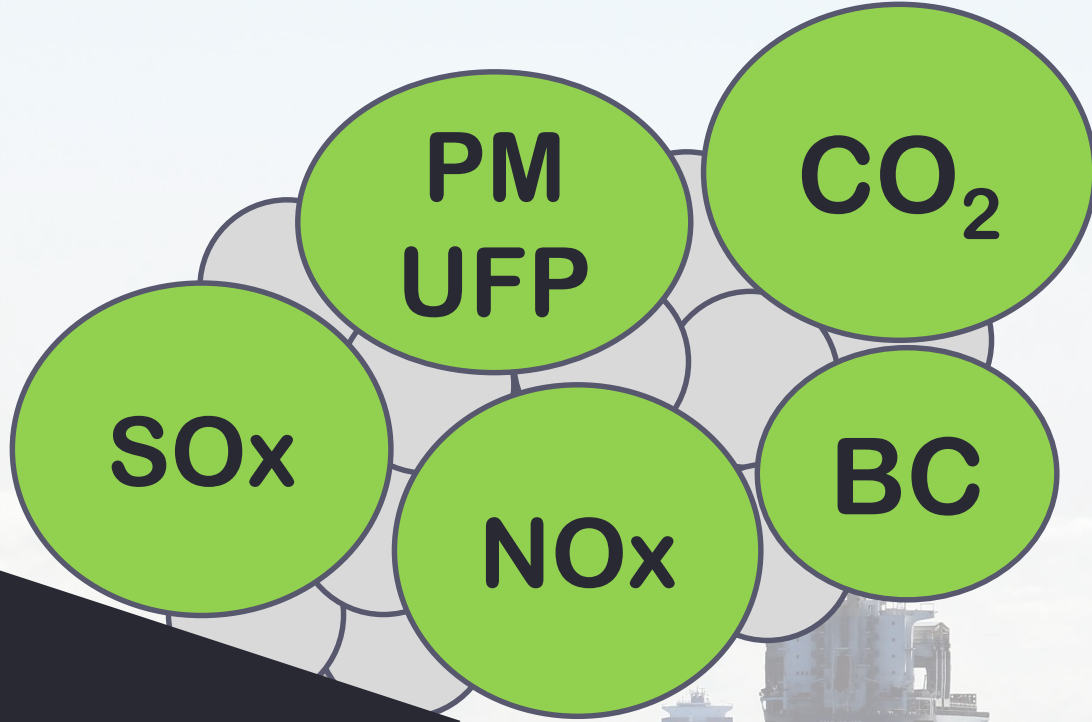
SCR + DPF

Solution



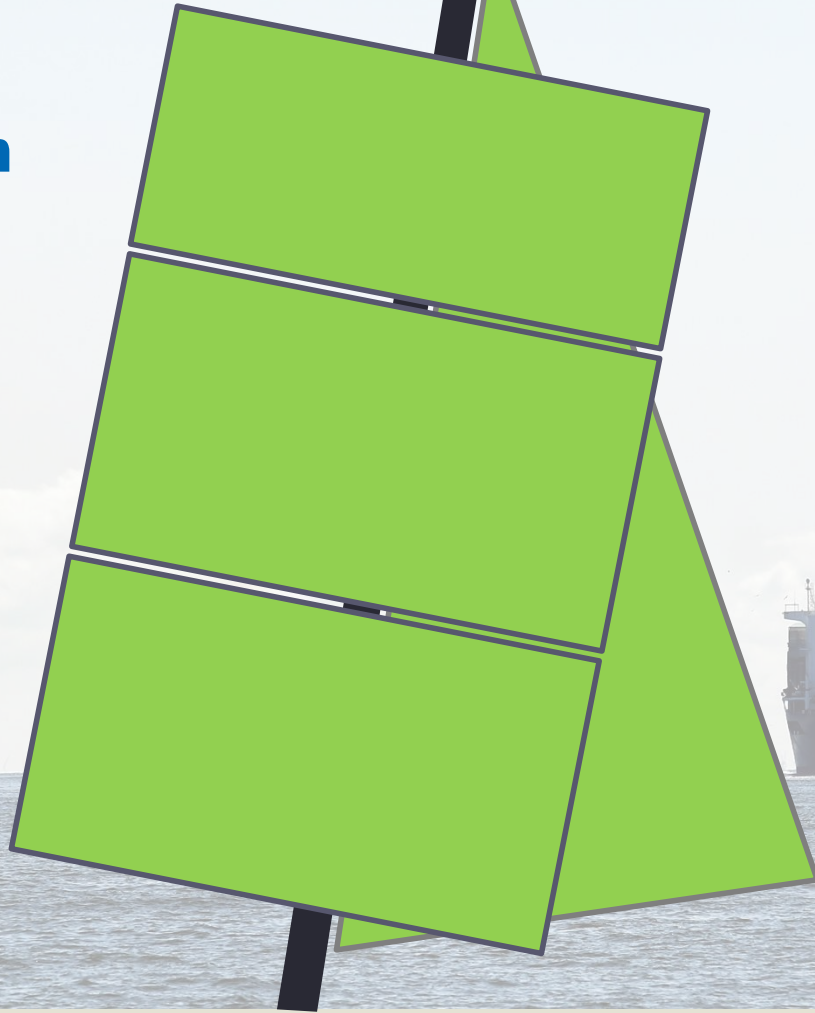
LNG

Solution



**Renewable
Energy**

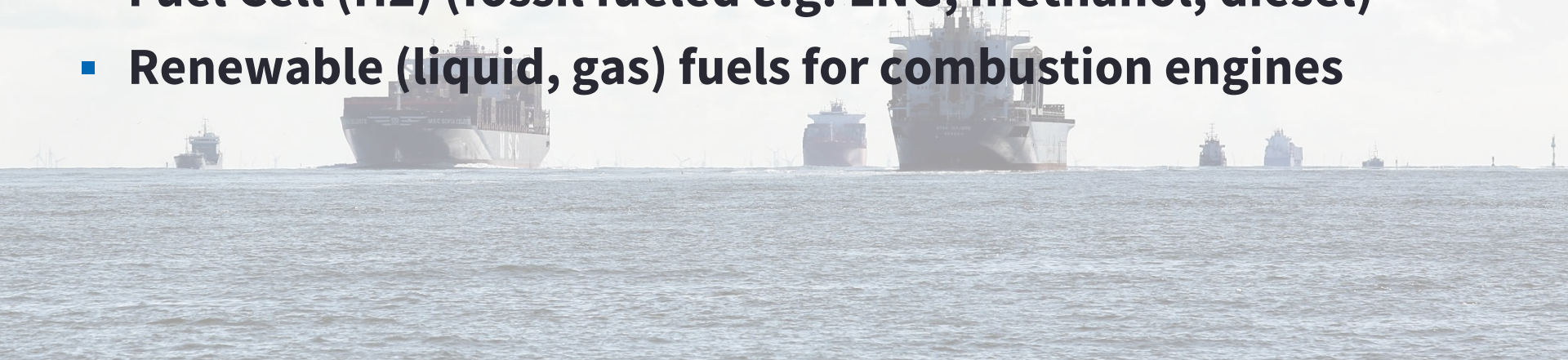
Solution



Wind

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!

www.NABU.de/shps

www.NABU.de/ports



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