

The DFDS experience

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- ❑ 1st scrubber installed in 2009
- ❑ 4 scrubbers installed
- ❑ 8 scrubbers will be installed in 2014
- ❑ Further plans for 2015
- ❑ Euro 100 mill. investment
- ❑ Far from suitable to all operated tonnage



□ Cleaning better than MGO

□ Up to 70% better

□ PM, PAH, NO_x also reduced

□ 70% of PM captured

□ HFO more friendly on CO₂ than MGO



- ❑ Consumes abt. 1.5% more fuel
 - ❑ CO₂ consequences
- ❑ "Open loop" restrictions
- ❑ Port receiving facilities for sludge
- ❑ Wash water issues
- ❑ Not suitable for all vessels
- ❑ High investment incl. off service time
- ❑ Consumes commercial space
- ❑ Economic life uncertain
- ❑ Front heavy investment
- ❑ What about 2020



- ❑ Scrubbers are only part of the solution
- ❑ Scrubbers are not saving cost
- ❑ Technically complicated installations
 - ❑ Not "plug & play"
- ❑ Many legislative open items
- ❑ Uncertain payback period

