



Natural Gas in Danish shipping

- Commissioned by Partnership for Cleaner Shipping

- Danish Shipowners' Association
- Danish Environmental Protection Agency
- DONG Energy A/S – Danish oil and natural gas provider

- Consultants:

- Litehauz Aps
- Incentive Partners Aps
- Technical University of Denmark
- Norske Veritas
- Ramboll Oil and Gas A/S



DANISH SHIPOWNERS' ASSOCIATION



Main conclusions

- Natural gas is a feasible substitute for current marine fuels

- Technical barriers are minor

- Economy fair, but LNG/CNG price difference uncertain

- Liquid natural gas is more promising than compressed gas

- In the long term biogas could be fed into the existing Danish CNG pipelines.
- Synergies with CNG ashore may be possible on a case by case basis
- CNG for cars only feasible due to political will and subsidy



DANISH SHIPOWNERS' ASSOCIATION

Danish ferry and short sea cargo sector



75 % of fuel consumed by 65 ferries calling in 41 ports

25 % of fuel consumed by 78 short sea cargo vessels calling in 14 ports



DANISH SHIPOWNERS' ASSOCIATION

Business case for the 10 busiest ports

- 27 ferries calling in 9 ports
- 20 short sea cargo ships calling in 4 ports
- 83 % of total fuel consumption (361,000 tonnes gas annually)
- Positive business case – subject to LNG/MGO price difference
- Public intervention may be needed to reduce uncertainty



DANISH SHIPOWNERS' ASSOCIATION



Ways to overcome barriers

- Infrastructure ashore

- Most important
- Provide funding for developing filling stations

- Technical

- Few
- Develop tank design to take up less space

- Political

- Public tenders could require or reward natural gas solutions
- Concession periods should be longer than pay-back time

- Regulatory

- Safety measures should be developed to allow bunkering operations while passengers are on board

