An Outlook for the Maritime Industry Towards 2020

Future Development in Maritime Shipping

Kenneth Vareide
2013-02-28
Topics

- Background and Key Drivers for the Maritime Industry
- A Outlook Towards 2020
- Current Trends
Background – Environment and Stakeholders

Norwegian fjord
Geiranger

Tourists expect to see clean and unspoiled nature

An outlook for the maritime industry towards 2020
2013-02-28
© Det Norske Veritas AS. All rights reserved.
Emissions to air is governed through IMO

Requirement
2012: SOx < 1,0%
2015: SOx < 0,1%

Compliance option
• HFO + scrubber
• Distillate fuels
• LNG

Existing fleets

Requirement
2011: NOx Tier 2
2016: NOx Tier 3

Compliance option
• Scrubber + SCR
• LNG, NOx abatement

Newbuilds
Megatrends and External Drivers for the Maritime Industry

REGULATORY AND STAKEHOLDER PRESSURE
- Global or local regulations?
- Further requirements on GHG emissions?
- Rating schemes and requirements from charterer and public

ECONOMIC GROWTH AND DEMAND FOR TRANSPORT
- Boom or bust?
- Growth level and level of contracting
- Overcapacity of vessels?

FUEL TRENDS
- Sustained high fuel prices?
- LNG cheaper than HFO?
- Development of LNG infrastructure
- Impact of sulphur regulations
The Maritime Industry at a Crossroad

An outlook for the maritime industry towards 2020
2013-02-28
© Det Norske Veritas AS. All rights reserved.
“SHIPPING 2020”

TECHNOLOGY INVESTMENTS IN THE NEW MARKET REALITY
Scenarios have been created to capture uncertainties

**METHODOLOGY AND ASSUMPTIONS**

**SCENARIO A: FULL STEAM AHEAD**
- High economic growth
- High fuel prices
- Little regulatory or stakeholder pressure on the environment

**SCENARIO B: KNOWING THE ROPE**
- High economic growth
- Cost of CO₂ emissions up and on the rise in 2020
- LNG prices decoupling from oil price and significantly lower

**SCENARIO C: SINK OR SWIM**
- Low economic growth
- Limited implementation of MBM results in a medium price on CO₂ emissions
- Low fuel prices in general, but high demand keeps the MGO price up

**SCENARIO D: IN THE DOLDRUMS**
- Low economic growth
- LNG price decoupling from oil prices
- Little regulatory or stakeholder pressure on the environment
The process – the big picture

- Scenario A: Environmental regulations
- Scenario B: Fuel trends (price, mix)
- Scenario C: World economy and demand for transport
- Scenario D

Technology trends
SIMULATION MODEL
Investment profile and ship characteristics

RESULTS
More than 1 in 10 new buildings in the next 8 years will be delivered with gas fuelled engines.

In 2020, the demand for marine distillates could be as high as 200-250 million tonnes annually.

Newbuildings in 2020 will emit up to 10 to 35% less CO2 than today’s ships. The EEDI will be a driver for more than half of this reduction.

Scrubbers are a significant option after 2020.

Ballast water treatment systems will be installed on at least half of the world fleet.

At least 30-40% of newbuildings will be fitted with EGR or SCR by 2016.
More than 1 in 10 new buildings in the next 8 years will be delivered with gas fuelled engines

- LNG price, sulphur limits and EEDI are the main drivers
- From 2012-2019 the LNG price is the main contributing factor
- When approaching 2020, EEDI and sulphur limits will create additional motivation for LNG as fuel
  - In Scenario D, 35% of new buildings will be delivered with LNG engines
- In scenario D, we foresee about 1,000 new buildings from 2012-2020 and some 6-700 retrofits
In 2020, the demand for marine distillates could be as high as 200-250 million tonnes annually

- A 0.1% limit in ECAs (2015) is expected to increase the demand to 45 million tonnes
  - The current annual global demand for marine distillates is about 30 million tonnes

- With a global sulphur limit HFO demand may drop from 300-350 million tonnes to only 80-110 million tonnes in 2020
  - Depends on the number of scrubbers in use
  - The use of LNG will not significantly impact the demand of other fuels
  - Energy efficiency measure will only slow the fuel demand in the short term
Newbuildings in 2020 will emit up to 10 to 35% less CO₂ than today’s ships. The EEDI will be a driver for more than half of this reduction.

- Phase 0 of EEDI (2013) will encourage cost-effective measures.
- In Phase 1 (2015) and 2 (2020), up to half the reductions are motivated by EEDI alone:
  - Due to short investment horizon and low fuel burden, these reductions are not cost effective for the ship owner.
  - But in the long-term these are cost-effective.
- Small differences between scenarios:
  - Fuel prices are already so high that any variation does not affect uptake.
- Operational measures not included.
Scrubbers are a significant option after 2020

- Few ships spend more than 30% of their time in and ECA justifying a scrubber before 2020
- In 2020, with the global sulphur requirements, scrubbers become a significant solution
  - Scrubbers can be retrofitted and can take 25% of the market, 15-20,000 ship
  - Still, 70% of ships will run on distillates
  - In the short term LNG can only take a small part of the market
- Uncertainty about the 2020 limit will slow technology development and uptake
Ballast water treatment systems will be installed on at least half of the world fleet

- The Ballast Water Management Convention has not yet entered into force, but
  - The schedule for mandatory treatment of BW is fixed (2019)
  - The US has decided to implement a similar scheme for all ships in US waters (2013)
  - Other countries have local requirements

- This will motivate a significant part of the world fleet to implement a treatment system irrespective of BWMC progress
At least 30-40% of newbuildings will be fitted with EGR or SCR by 2016

- Both EGR and SCR are currently under development and need more time to mature
- LNG is an alternative but does not seem to replace more than 25% of EGR or SCR installations
  - Dependent on LNG price
- Will a ship owner will opt for a Tier III engine even if the ship is initially not planned for sailing in an ECA?
  - Lower second-hand value due to the loss of geographic flexibility
LNG Vessels in Operation as of Today

An outlook for the maritime industry towards 2020
2013-02-28
© Det Norske Veritas AS. All rights reserved.
Looking Ahead for 2013 and Beyond

Number of LNG fuelled ships*

- 2012
- 2013
- 2014:
  - 63

2020:
  - 1000

An outlook for the maritime industry towards 2020

© Det Norske Veritas AS. All rights reserved.
Some vessels in Operation on LNG Fuel. Total 31

- **MF Bergensfjord**
  - 23.5 knop

- **Ferries (12)**
  - Capacity: 587 pax / 212 cars
  - Engine: Rolls Royce, Bergen KV-GE

- **Patrol Boats (3)**
  - Engine: Mitsubishi

- **Ferries (3)**
  - Capacity: 600 pax
  - Engine: Mitsubishi

- **Offshore Supply Vessels (7)**
  - Engine: Wartsila Dual Fuel
Some Vessels on Order: Total 38

2 Cruise RoPax Ferries
- Main Engine: Rolls Royce
- Capacity: 3500 Pax / 306 cabins

1 Fish Farm Product Vessel
- Engine: Rolls Royce
- Dwt: 2650 tonnes

Tug (1)
- Engine: Rolls Royce
- Bollard Pull: 65 tonnes

Ro Ro Containers (2)
- Capacity: 94 TEU
- Engine: Rolls Royce

High Speed Light Craft, 50 knots (1)
- Capacity: 1000 Pax
- Engine: GE Gas Turbine
…with visions and technologies:
DNV extraordinary innovation projects

QUANTUM, Container Ship Concept

ECORE, Ore Carrier

TRIALITY, VLCC Concept

OSHIMA ECO 2020
Further Considerations for LNG as a fuel

- Safety
- Security
- Local state and public awareness
- Supply
- Refueling methods
- Economy:
  - Ship
  - Port
  - Provider of LNG
- The LNG market

Illustration by IM Skaugen
Developing LNG Bunkering Infrastructure

Small scale LNG infrastructure can be set up in a number of ways:

1) Coastal Shore Storage Permanent or Mobile ISO tanks
   - Replenishment by trucks, rail or feeder vessels

2) By trucking or small LNG carriers (up to 200m3)
   - Subject to weather and terrain. Limitations > 200 miles is questionable.
   - DOT driver regulation: 11 hrs / day & 70 hrs per week.
   - Issues concerning confidence on supply.

3) By small scale liquefaction plants with a natural gas pipeline grid in the vicinity
   - Permitting is needed
Safeguarding life, property and the environment