What infrastructure is needed? What are the demands and what certificates are needed?

Green shipping - using LNG as fuel for vessels conference

Jonathan Abrahams
Tallinn, 31st October 2012
LNG bunker demand is expected to experience a significant increase in volume due to stricter emission requirements.

**Forecast of LNG bunker demand by 2020**

- ECA zones such as Europe and North America will dominate the LNG bunker demand until 2016 due to stricter emission control regulations.

- By 2020, there will be more regions with increasing stricter emission controls come into the picture.

- Demand of LNG bunker will increase in regions with high shipping traffic such as South East Asia and China.

**Forecast of LNG bunker demand per region by 2020**

- **Europe**
- **North America**
- **Middle East & India**
- **South East Asia**
- **China**
- **South America**
Global LNG bunker demand by 2020

What infrastructure is needed? What are the demands and what certificates are needed?

Global LNG bunker demand by 2020

Equivalent to 4 - 7 million tons of LNG

Source: DNV LNG bunkering 2020 study
Stakeholders’ challenges in the development of LNG as fuel for shipping

- LNG price
  - Bunkering operations
- Small-scaled LNG distribution
  - Risks during bunkering operations
- LNG price
- Reliability of infrastructure & equipment
  - Intermediate solutions
  - Risks during bunkering operations
- Supply and demand
  - Regulations & standards

Source: DNV LNG bunkering 2020 study
Current and forecast of global LNG bunkering infrastructure by 2020

What infrastructure is needed? What are the demands and what certificates are needed?

Existing
Planned *(Feasibility study, risk study, proposed locations, pending approval)*
Proposed *(currently being discussed)*

*See detailed map

Source: DNV LNG bunkering 2020 study
What infrastructure is needed? What are the demands and what certificates are needed?

LNG Bunkering grid in Europe by 2020

**Existing**
1. Florø
2. CCB
3. Halhjem
4. Snurrevarden
5. Risavika

**Proposed**
22. Gothenborg
23. Pori
24. Turku
25. Sillamäe
26. Helsinki
27. Paldiski
28. Riga
29. Swinoujscie
30. Lubeck
31. Rostock
32. Helsingborg
33. Copenhagen
34. Aarhus
35. Aberdeen
36. Dunkerque
37. Marseilles
38. Barcelona
39. Algeciras

**Planned**
6. Bodø
7. Mongstad
8. Øra
9. Lysekil
10. Porvoo
11. Stockholm
12. Tallin
13. Klaipeda
14. Hirtshals
15. Brunsbüttel
16. Hamburg
17. Rotterdam
18. Antwerp
19. Zeebrugge
20. Ghent
21. Vestbase

**Source:** DNV LNG bunkering 2020 study

What infrastructure is needed? What are the demands and what certificates are needed?

Tallinn, 31st October 2012

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The framework for introducing LNG as fuel

- IMO Interim Guidelines for gas as ship fuel (MSC.285(86))
- IMO - IGF Code → under development
  - Rules for the receiving ship, the ship using LNG as fuel
- IMO - IGC Code → Liquefied gas carriers
  - Rules for the bunker boat, which is a small LNG carrier
- ISO/TC 67/WG 10 PT1 → under development by IMO
- SIGGTO, OCIMF
  - Guidelines for LNG transfer and Port Operation
  - Guidelines for oil transfer, ship-to-ship oil bunker procedures
- Port regulations
  - USCG, “Green bunkering” for Port of Gotenborg
- Onshore regulations
  - EU, NFPA, FERC, DBS
International initiatives on LNG bunkering guidelines

- LNG ship-to-ship bunkering procedure
- Shell LNG bunkering installation guidelines
- ISO/TC 67/WG 10 PT1
- BunGas Joint Industry Project
- SIGGTO Natural Gas marine Fuel Safety Advisory
- WPCI (World Ports Climate Initiatives) LNG Working Group
Safeguarding life, property and the environment