LNG for transport: Shipbroker’s perspective

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LNG Market

- LNG world-wide trading in the 2011: 243 mmtpa (million of tons/year)
- Export 2011: Atlantic & Pacific area supply about 50% of global production
- Import 2011: Asia 63% – Europe 27% – North America 5%
LNG Maritime transportation was regional

- Markets separation due to contractual restriction, high transportation costs and geographic market distinctions
LNG Maritime transportation is today world-wide

- Market trend is world-wide, as per oil market:
  - LNG production increases specially in Middle East, Australia and West Africa
  - Contract flexibility
  - Transportation costs reduction
Shipping technologies

Membrane Tanks

- Membrane Tanks \ Prismatic
- Doble Hull
- Steel
- Membrane (double layer) Tanks merged to the hull
- Cargo limitation
- Not internal uniform pressure
- Minor investment costs –10/20%

Spherical Tanks

- Spherical Tanks
- Doble Hull
- Alluminium
- Self supported tanks not merged to the hull minor solicitation
- Full cargo
- Uniform internal pressure
- Limitation of gas waste for evaporation
LNG Carriers

2004 – Membrane prismatic tanks – LOA 285 m. - capacity 138,000 cbm

2004 – Spherical tanks - LOA 290 m. - capacity 140,000 cbm
LNG Carriers Size

Methane Princess & Methane Progress
Built in 1964 - 27.400 cbm of capacity, first units built for loading LNG

- Conventional 100.000 \ 160.000 cbm
- Q-Flex 217.000 cbm
- Super Flex 240.000 cbm
- Q-Max 260.000 cbm
- Med-Max 50.000 \ 75.000 cbm
- Small LNG\C 10.000 \ 40.000 cbm
- Bunkering LNG Carrier 2.000 \ 10.000 cbm
LNG Carriers fleet

- 2012 increase the capacity fleet of 20% during 2013 is expecting a ‘overcapacity’
- 2013 : 20 NB units to be delivered, 2014-32 units, 2015-16 units, 2016-2 units
- Price for a Conventional LNG Carrier about Usd 200\210 Milioni
LNG Bunkering Tanker Size

- Trading in Far East \ North Europe close to ‘Small Import \ Export LNG Plans’
- New building ‘Small LNG Carrier’ from 4,000 to 16,000 \ 30,000 cbm as ‘LNG Bunkering Tanker’ or for loading LPG – Ethylene so flexibility in commodities transportation
LNG Carries ‘Small Size’ Italian Project

- Naval project and construction with Italian ‘Know How’
- Possibility to construct a LNG Carrier in Italy
LNG Tanker Supply Trading

- Owner: Anthony Veder, NL (design and gas plant supplied by TGE)
- BOG – Boil-off gas for propulsion – Electrical propulsion (Gas, HFO)
- Project: Coastal transport in Norway
  - LNG to be used as fuel
  - HFO to be used as fuel for transportation of other cargoes
Small LNG carrier at export terminal

- 19 May 2010 “Coral Methane” loading at Zeebrugge
- First loading of a Small LNG Carrier at a large import terminal
LNG Bunkering Tanker for transhipment

30,000 m³ LNG-Carrier

• Requirements for futures operations:
  • Small LNG Carrier of 4,000 \ 7,500 \ 16,000 \ 30,000 cbm
  • High loading rates due to tight time schedule
  • Large total ammount of LNG for large vessels
  • Bunkering during cargo operation
E.U. LNG Bunkering Project - Durkirk

- Feasibility study:
  - European Union – Euros 1.5 million
  - Scope ‘LNG Bunkering Station’ Port of Durkirk

Small LNG Tanker for Ferry (intermodal transportation – Trucks \ Trains)

- The ‘LNG Bunkering Station’ is close to a Import LNG Terminal in construction
- There is a feasibility study for connecting the France railway network to the Ferriers’ port
- All Ferries from \ to U.K. will be fitted with LNG as fuel
‘Viking Grace’ LNG Ferry

‘Shipowner: Viking Line - Finland :
1. 218 m. di LOA – 2,800/880 pass\cab
2. M/E Wartsila 4 x 8L50DF – Dual Fuel
3. 1,000 m.lin. Cars\1,275 m.lin. trucks
4. Cost USD 320 Million – STX Finland

• The ferry is trading between Stoccolma and Turku-Mariehamn\Lanhnas – Finland, Viking Grace can be supplied by ‘LNG Bunkering Tankers’ and\or ‘Trucks’

Advantages: LNG Ferry
▪ Reduction emissions of CO₂
▪ Supply via trucks and via LNG Bunkering Tanker

Disadvantages: LNG Ferry
▪ Construction costs
▪ LNG Bunkering Station
▪ LNG Bunker Distributors
Propulsion technologies

The new propulsion technologies will reduce the transportation costs

- Tradizional system
  - Turbine Steam Turbine: HFO

- New propulsion Dual fuel Fuel:
  - TFDE: Tri Fuel Diesel Electric
  - DFDE: Dual Fuel Diesel Electric
  - SSDR: Marien Diesel Oil + Gas as fuel

- TV-DF: Propulsion performance

Advantages Dual Fuel:

- Increase in performance of 40%
- Reduction of specific fuel consumption of 30%
- Reduction by 30% of CO₂ emissions
- Reduction of 50% of NOₓ emissions
Develop LNG Bunkering Tanker Market

• ‘LNG Bunkering Stations’ are focusing in North Europe, Mar Baltic and English channel, as per EU and IMO’s Marine Environment Protection Committe (MEPC) Sulphur Directive from 2015 with the introduction of 0,1% $S_{max}$

• Advantages for Ferries’ Owners and Owners with vessels with conventional routes as there is the possibility to construct a ‘LNG Bunkering Station’ close to the ports of loading or unloading, more difficult for ‘tramps’ Owners as they are not following conventional routes so very hard for supplying LNG as fuel

• The technologies, for reaching the targets requested by EU and IMO’s Marine Environment Protection Committe (MEPC), are still too expensive and with a Shipping market that currently be suffering from 2008 most of the Owners cannot comply the regulation
Conclusion

- LNG Market increases approximately 13% per year
- LNG transportation from 2001 to 2012, thanks technology development and higher investments, has increased the transportation capacity by 70%
- LNG Carriers new building on delivery in 2012 are fully fixed, there are a considerable number of options of LNG Carriers for delivery 2013\2014
- Sellers\Producers are also waking up to the fact that they can earn more from spot market and beginning to move the LNG themself

- LNG spot market is expected to be in 2020 about 30-40% of the world-wide market
GNL Shipping - Midstream Sector

Thanks

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