GO LNG – Final Conference to the SBSR Project “Martech LNG”

Development of framework conditions looked at from an IMO and EU perspective

Klaipeda 9 December 2014
Outline

The aim: An overview
• Institutional point of departure

North Europe LNG Infrastructure project - short

European Sustainable Shipping Forum (ESSF)
• Sub-Group on LNG
• Sub-group on finance

The EU directive on the employment of alternative fuels infrastructure

IMO
• IGF Code – Gas fuelled ships

ISO - Guidelines for systems and installations of LNG

The DMA LNG Overview of Regulation

Conclusions
North Europe LNG infrastructure project 2011-2012
EU MoS project
The new sulphur regulation in North Europe
  • Competitiveness of shipping and regions
Distribution, storage and use as fuel of natural gas - LNG
From the LNG import terminal to LNG used as fuel in ships
The LNG supply chain
  • ”Hard” on maritime filling stations/infrastructures
  • ”Soft” on regulations, industry standards, etc.
The business case as a horizontal issue
How can we create this infrastructure?
  • Recommendations to central stakeholders
LNG infrastructure outlay

Large LNG terminal
- Truck
- Bunker/feeder vessel

Intermediary LNG Terminal
- Onshore, e.g.
  - Tank
  - Container
- Offshore, e.g.
  - Vessel
  - Barge

Small-scale liquefaction plant

End users
- SHIPS
  - Trucks
  - Cars
  - Industry/power generation
  - Gas grid
  - Etc.

Gas pipeline
- Liquefaction plant

Photo: Gasunie

Photo: SSPA
Recommendations

Aim: To establish a cost efficient LNG infrastructure

Grouping of 22 recommendations
- Bunkering solutions
- Economic and financial aspects
- Safety
- Technical and operational aspects
- The permit process

Basically we are discussing the same issues today
- But more informed!
- We learn from ongoing projects
- We learn from experience
ESSF - European Sustainable Shipping Forum (2013)

Tasks
- Fostering sustainable maritime transport
- Advice and technical expertise
- Facilitate exchange of information
- Deliver opinions, submit reports, develop and propose innovative solutions
  - Sustainability and competitiveness

Members around 60
- Member States, Norway and Iceland
- Industry organisations etc.

Specialized sub-groups

The immediate task
- The sulphur regulation
ESSF sub-groups
- Technology neutrality!!

LNG

Scrubbers

Implementation of the sulphur directive
  • Enforcement
  • Compliance

Financing

Research and innovation

Competitiveness

Port Reception Facilities (Under formation)
The ESSF sub-group on LNG 1/32

Assist the ESSF to advance:
• The "LNG Action Plan – Actions towards a comprehensive EU Framework on LNG for shipping”

The LNG supply chain represented

Regulation, industry standards and best practices etc
• EU
• IMO
• Industry organizations

Directive on the employment of alternative fuels infrastructure, e.g.
• Development of an LNG/CNG infrastructure
• Land, sea and inland waterways
The ESSF sub-group on LNG 2/2

Work packages
1. Hoses and connections
2. Simultaneous bunkering while
   - Passengers on board
   - Loading/unloading cargo
   - Embarking/disembarking passengers
   - Safety distances
3. Training
   - Focus onshore
4. Gas quality, heating value and CO2 reduction potential

Results up to now 2 IMO submissions – connected to the draft IGF-Code
- Standards for connectors and a bunker delivery note
Standards for connectors to be used at bunkering stations for LNG 1/3

Bunkering manifold part of the draft IGF code
- Withstand external loads

Connection at the bunkering station
- Dry disconnect type
- Additional dry break-away

Standard type stated in the draft code
- Which standard to be used?
- Clear advantages with standards

Standard I IMO submission
- Quick bunkering connector
- Up to 650 m3 an hour and up to 6"
- The open NATO standard for avionic fuelling

Standard II IMO submission
- Remote operated mechanical bunkering connector
- From 650 m3 an hour and over 6"
Standards for connectors to be used at bunkering stations for LNG 2/3

Open standard LNG connector (DN 65-150)
Standards for connectors to be used at bunkering stations for LNG 3/3

Multi-clamp/tripod connectors for AISI standard flanges
Defining a standard LNG bunker delivery note and standards of gas quality

LNG-Properties
- Methane number
- Lower calorific(heating) value
- LNG temperature delivered
- Etc.

LNG-Composition
- Methane
- Ethane
- Etc.

Total delivered
- t, MJ, m3,GJ

Liquid delivery
- GJ

Signature(s)

A commercial issue or enforcement!!!!
LNG consultancy work 1/3

1 mill Euro from the EU Parliament
• LNG Sub-group steering group for lot 1 - 3
• 4 lots overall

Lot 1. Completion of an EU framework on
• LNG fuelled ships
• Fuel provision infrastructure
• (A true global market)

Framework study structure
• Gaps and barriers
• Possible policy actions, rules, standards and guidelines
• Impact analysis
• Input to awareness campaign
LNG consultancy work 2/3

Lot 2. Creating awareness
• General public
• Industry Groups

Awareness methodology
• Overview of risks and opportunities
• Stakeholder need and perceptions
• Campaign concepts and plans
• Execute campaigns
• Measure campaign effects

Lot 3. LNG market development
• Price from a shipowner perspective
• Cost structures for LNG fuelled ships - compared to scrubbers and MGO
• LNG supply chain
LNG consultancy work 3/3

Lot 4. Financing opportunities for LNG infrastructures

Identify and assess the potential public and private financing mechanisms and incentives
• Successful models in other sectors

Identifying typical capital and operating costs for LNG bunkering stations
• Different needs, e.g. deep sea and small ferries

Analysis of commercial expectations on returns of investments

Financial modelling of different projects, rate of returns and risk analyses
• Financing mechanism - private and public
• Models for financing

Development of model and framework conditions for implementing optimal mechanisms and financial incentives
• Stakeholder validation
Sub-group on financing 1/3

Structural change for shipping
• The new sulphur regulation
• Overcapacity
• Energy Efficiency Design Index
• Development in ship values
• Financial stress in the banking system

EU Funds
• Connecting Europe Facility (CEF)
• LIFE – Environment and Climate Action
• Etc.
• Basically project oriented
• Evaluators and INEA (Innovation and Network Executive Agency) take decisions
• Market oriented approach?

State aid
• Limited up to now
Sub-group on financing 2/3

2 submission to the ESSF

1. Better exploitation of EU Funds
   • Targeted information
   • A vademecum on EU grants

2. A Retrofit Fund
   • Mature technologies
   • Targeting credit worthy retrofit projects/shipowners

The business case
   • The cost difference between a MGO solution and a SECA compliant solution
   • Implies a new balance between running costs (OPEX) and capital costs (CAPEX)
   • Finance is imperative for the new balance
   • Gearing with energy efficiency investments

Decisions on funding
   • Must be taken by the private sector
   • Assessment of risks a "core competence" for the private sector
Sub-group on financing 3/3

Capital sources
• Attraction of private capital via risk sharing/alleviation
• CEF offers risk sharing instruments
• Furthermore Member States and development banks etc.

Inspiration for a Retrofit Fund
• The EU Project Bond initiative
• Targeting big infrastructure investments
• Aims to build the gap between low investment grades of projects and the higher target ratings of investors

The Retrofit Fund
• A portfolio of different projects reduces risk
• More risk alleviation is needed!!!!!!!

It is possible to securitize the portfolio of a retrofit fund
• A Retrofit Bond is hereby created
• A marketable security/bond
Directive on the employment of alternative fuels infrastructure - adopted

3 infrastructures for transport
- Electricity
- Hydrogen
- Natural gas – CNG and LNG

Natural Gas
- CNG for land transport
- LNG for long haul heavy transport and ships

National policy frameworks within two years
- LNG - bunkring in core network ports at latest 2025
- A TEN-T core network view can reduce the obligation

Development of technical standards

The European Fund for Strategic Investments (315 billions EURO)
- Identifying the right projects!
- E.g. deployment of LNG infrastructures in ports
The IGF code by IMO (International Maritime Organization)

International code of safety for ships using Gasses or other low-flashpoint Fuels
- Natural gas – approved 2014 and expected adoption June 2015
- Further work – etyl and methyl alcohol, fuel cells and low-flashpoint diesel oil as start
- Up to now guidelines based on the ongoing IGF work

A safety approach
- But a framework for commercial decisions on the use of LNG/NG

Methodology for design and arrangements; e.g.
- Machinery
- Electric installations
- Storage systems
- Distribution systems
- Bunker stations on board the ship
- Ship bunkering station interface towards offshore and onshore bunkering
- Training of crew
ISO - Guidelines for systems and installations for supply of LNG as fuel for ships

To provide guidance for the planning and design of
- The bunkering facility
- The ship/bunkering facility interface
- Procedure for connection and disconnection
- The emergency shutdown interface and disconnection
- The emergency shutdown interface
- The LNG bunkering process control

LNG Bunkering Facilities
- Shore-to-ship bunkering
- Truck-to-ship bunkering
- Ship-to-ship bunkering

The mother for work with bunkering permits!!!!!!

The international dimension for LNG shall constantly be nurtured
- Important international organizations – e.g. IMO, EU and industry organizations
LNG Overview of Regulation
DMA : Municipalities etc.
Required coordination

SØFARTS STYRELESEN  KOMMUNEN m.fl.

 nødvendig koordination
The DMA LNG Overview of Regulation

A "cookbook" perspective for applicants and authorities
• Issues, regulations and authorities

The ship side - the Danish Maritime Authority, e.g.
• Technical solutions
• Procedures
• Bunker operations
• Training of ships crew

The shore side with terminals etc. – the municipality
• Safety
• Environment
• Extension of port areas
• Construction works

Other aspects (often through the municipality)
• Security
• Occupational health
• Safety in relation to carriage of LNG
• Port bye laws

Read more: http://www.dma.dk/legislation/sider/Lngasfuel.aspx
Conclusions

Comprehensive activities on LNG framework conditions are going on

- International
- EU
- National

LNG is a technical viable solution today

- More developed framework conditions
  - A bigger certainty for LNG investment
  - Will bring costs down

The EU and national approach

- Where can we do a difference?
- The "LNG Action Plan – Actions towards a comprehensive EU Framework on LNG for shipping" is on its way

Is the business case strong enough?

- A (shipowner) wait and see strategy!
- Scrubbers are chosen as retrofit!
- Up to now no game changer as the US shale gas revolution!
Thank you for your attendance