Benjamin Janke
Director Sales & Business Development

“LNG supply and bunkering services in the Baltic Sea”

Baltic Ports LNG Forum
23 April 2015, Klaipeda
Introduction to Bomin Linde LNG

Overview Bomin Linde LNG Operational Developments

Global Outlook and LNG Demand and Supply in Baltic Sea
Bomin Linde LNG is a 50/50 JV between The Linde Group and Marquard & Bahls to supply marine LNG

The Joint Venture

The Linde Group
- Revenue: 16.7 bi. Euro
- FTE: 63,500
- 130+ years of experience in
  - Industrial gases
  - Cryogenic engineering

Marquard & Bahls
- Revenue: 17 bi. Euro
- FTE: 9,280
- 60+ years of experience in
  - Fuel storage
  - Bunkering
  - Trading
Bomin Linde LNG has a unique network of sister companies

The network
**Bomin Linde LNG in Europe**

<table>
<thead>
<tr>
<th>Location</th>
<th>Details</th>
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</table>
| Stockholm | 20,000m³ Terminal operational (AGA)  
First LNG Bunker Vessel „SEAGAS“ |
| Cuxhaven | LNG supply of MS Helgoland  
(LNG fuelled newbuild) |
| Hamburg | LNG small scale terminal (under development) |
| Emden | LNG supply of MS Ostfriesland  
(first German LNG fuelled ferry) |

**Facts**

- **Stockholm**
  - 20,000m³ Terminal operational (AGA)
  - First LNG Bunker Vessel „SEAGAS“
- **LNG Bunker & Transport Vessel**
  - MoU with Klaipedos Nafta
  - LNG bunkering and LNG supply of small scale terminals
  - Operational 2017

**Impressions**

- Stockholms Terminal
- First LNG Bunker Vessel „SEAGAS“
- MoU with Klaipedos Nafta
- LNG bunkering and LNG supply of small scale terminals
- Operational 2017
Topics

- Introduction to Bomin Linde LNG
- Overview Bomin Linde LNG Operational Developments
- Global Outlook and LNG Demand and Supply in Baltic Sea
Bomin Linde LNG inherits the unique experience of LNG storage and ship-to-ship bunkering in Sweden (1/2)

Case study: Nynäshamn Terminal

- 20,000 m³ terminal in operation since 2011
- Full containment atmospheric tank with concrete outer shell
- Terminal located next to the Nynas refinery
- Used for both industrial and marine supply

Source: Bomin Linde LNG, AGA
Bomin Linde LNG inherits the unique experience of LNG storage and ship-to-ship bunkering in Sweden (2/2)

**Case study: Seagas LNG Fueling Vessel**

- World’s first LNG bunker vessel in operation: “Seagas”
- Bunkering of “Viking Grace” six times per week in less than 40 minutes
- 600+ ship-to-ship fueling operations without an incident
- Unique experience

*Source: Bomin Linde LNG, AGA*
Bomin Linde LNG is the exclusive supplier to the first sea-going LNG-fueled vessel in Germany

**Impressions**

**Comments**

**LNG deliveries**

- First LNG fuelled vessel in Germany
- Ferry: Emden – Borkum
- Supplied by Bomin Linde LNG
- Starting in Q2/2015
- Truck-to-ship fueling, location: Emden
Bomin Linde LNG has secured a contract for LNG deliveries to the new Heligoland ferry from AG EMS

Germany's first LNG-fueled newbuilt

Comments
- Route: Heligoland - Cuxhaven
- Regular departures from Hamburg planned
- Operations starting June 2015
Partnership to develop LNG market in the Baltic Sea

MoU signed between Klaipedos Nafta and Bomin Linde

Key Facts

Role of Bomin Linde LNG:

- Capacity holder of Klaipedos Nafta Terminal
- LNG Import
- Investing jointly with KN in the LNG Bunker Supply Vessel
- Provide LNG bunkering and supply services

Press Release

Bomin Linde LNG and Klaipedos Nafta to jointly develop LNG fuel market

Hamburg/Klaipeda, 18th of February 2015

Klaipedos Nafta, operator of the first full scale LNG terminal in the Baltic Sea region, and Bomin Linde LNG, Germany-based provider of liquefied natural gas (LNG) as marine fuel, have signed a Memorandum of Understanding (MoU). In close cooperation both companies aim to jointly develop the LNG fuel market including the necessary infrastructure in Baltic Sea.

As of 1st of January 2015, Klaipedos Nafta has successfully started commercial operations of its floating storage and regasification unit (FSRU) named “Independence”, providing LNG regasification and reloading services on a third-party-access basis. In the next step, the company intends to construct an on-shore small-scale LNG reloading station in the port of Klaipeda. With this station Klaipedos Nafta will be able to offer small-scale LNG services, e.g. loading services for trucks, serving the increasing demand for LNG the Baltic States and in Poland.
Topics

- Introduction to Bomin Linde LNG
- Overview Bomin Linde LNG Operational Developments
- Global Outlook and LNG Demand and Supply in Baltic Sea
139 confirmed LNG fuelled ship projects + 38 confirmed „LNG ready“ newbuilds

Development of LNG fuelled fleet

Comments

Most important segments:
- RoPax ferrys
- PSVs
- Container ships

= Increasing dynamic
= A lot more potential projects under development
UBS confirming major oversupply in the global LNG market

LNG supplies +75% by 2020 (bcm)

Main driver for increasing LNG volume in the market:

- US export:
  - Sabine Pass project will begin to export 2016
  - Cameron LNG has taken FID
  - 5+ other US terminals have applied for export licences

In addition, massive export volume from diverse projects in Australia will flood the market from 2015/2016

= Impact on LNG Price?

= How to participate from a “buyer friendly” global market?
The sourcing strategy: direct imports of LNG from multiple global locations

LNG sourcing supply chain

Comments

- Global direct import enables competitive LNG pricing for the Baltic Sea
- Network of LNG export majors necessary
- As an independent supplier Bomin Linde will benefit from overcapacity in the LNG market

Klaipedos Nafta and Bomin Linde will provide access to global LNG markets what enables attractive LNG pricing for the Baltic region
Bomin Linde LNG distribution from Klaipeda

Break-bulk hub for the Baltic Sea

Stockholm

AGA

Klaipeda

Hamburg

Rotterdam

Zeebrugge

Comments

Increasing demand by offering LNG to different types of clients:

1. LNG bunkering of maritime customers
2. LNG supply of small scale terminals
3. LNG supply via truck of industrial customers

LNG onshore storage:

- LNG deliveries via truck
- Back-up solution for maritime customers
High potential LNG demand from maritime industry in the Baltic Sea

Main drivers:
- ECA zones
- Competitive LNG pricing

例证：
年均消耗量：1个集装箱喂食船：7,000-8,000t LNG

Comments
- First LNG fuelled container vessels will call Klaipeda from end 2016
- More LNG newbuild projects likely to take final investment decision soon
Joint investment from Klaipedos Nafta and Bomin Linde LNG

Bunker Supply Vessel will be based in Klaipeda

- LNG capacity 6,500 m³ & 2x6 inch LNG hoses
- LNG cooling down facility onboard
- Operational from 2017

Bunker Supply Vessel will be able to:

- Supply vessels (ship-to-ship)
- Supply small scale terminals (ship-to-terminal)
LNG Bunker Supply Vessel will be able to serve cold LNG by on-board cool down exchanger.

**LNG ship to ship transfer**

- **Principle:** Cooling down of LNG on board of the bunker vessel during bunkering process.
- **Designed developed by Linde Engineering and ready for implementation.**
### Bomin Linde bunker supply vessel timeline – operational by Q2 2017

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<thead>
<tr>
<th>Task</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
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<td>Definition of vessel specifications &amp; design</td>
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<td>Review of submitted offers</td>
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<td>Refinement of design</td>
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<td>Assessment of final offers</td>
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<td>Keel laying</td>
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<td>Outfitting</td>
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<td>Sea trials &amp; completion</td>
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<td>Delivery &amp; naming</td>
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Source: Bomin Linde LNG
LNG price competitive with Marine Gasoil – economies of scale and location essential

Fuel: Cost perspective in shipping (MWh)

Levers: Subsidies & learning effects

Cost of capital

Fuel costs

Fuel costs

MGO

LNG

Comments

Most important drivers for competitive LNG price for maritime customers:

- Bunker location
- Bunker frequency
- Small scale supply chain
- LNG volume (economies of scale)
- Long term partnership

= Early project involvement of LNG supplier recommendable in order to have a reliable calculation base and get the best LNG price possible
Differentiate yourself with LNG as a financially superior and clean marine solution.

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Bomin Linde LNG: founding member of the Maritime LNG Platform

Members of the Maritime LNG Platform

<table>
<thead>
<tr>
<th>Partners:</th>
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<tbody>
<tr>
<td>Germany</td>
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<td>Hapag-Lloyd</td>
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**Targets**

- High-level political lobbying
- Community building
- Information exchange
- Support for subsidy applications

27/04/2015 Source: OvB Consulting, Bomin Linde LNG