Business risks and opportunities
Small scale LNG across Europe

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What is opportunity?

On 18.10.2011 Brunsbüttel Ports GmbH and NGVA Europe member Gasnor AS (LNG market leader in Norway) agreed on bunkering vessels with LNG in the Elbehafen at Brunsbüttel, Germany. With this important step they are leading the way in offering LNG fuel at Brunsbüttel and the Northern German area, at the crossing of the river Elbe and the Kiel-Canal.

In the context of generally increasing demands in environmentally conscious acting, also in shipping, eco-friendly fuel is a forward-looking issue. The fuel LNG (liquid natural gas) is an environmentally-friendly alternative for do far used ship fuels and already in use in many Countries, such as Norway, for quite some years.
What is risk?

Risk

Cost (HSE, brand, ...)

Quality (HSE, ...)

Schedule (HSE, ...)

What is risk?
This is risk AND opportunity

Source: Bild-Zeitung
June 2011, dnb nor
October 2013, Shipmanagement conference Hamburg
October 2014, MT LNG conference Klaipeda
Small scale LNG going global

2014 STATUS FOR LNG AS SHIP FUEL
DNV GL takes LNG ship fuel global

2014 Status for LNG as Ship Fuel

- DNV GL takes LNG ship fuel global
- 2011 Bit Viking is the first vessel to be converted to LNG fuel.
- 2013 Port of Antwerp contracts DNV GL to develop bunkering procedures, for seamless and efficient bunkering of LNG.
- 2013 The world’s first bunker vessel for use in operation is LNG fuel.
- 2013 The world’s first bunker vessel for use in operation is the Rolf Bøgelund.
- 2013 Tjeldsøy takes delivery of Stavangerfjord, the world’s first ship with pure gas engines not deployed in domestic trade.
- 2014 Seafield orders a LNG-fuelled Roll-on vessel, becoming the first ship to operate with LNG in Australia in 2014.

50 LNG-fuelled ships in operation
- Norway: 2
- Europe: 44
- America: 4
- Asia & Pacific: 2

69 LNG-fuelled ships on order
- Norway: 19
- Europe: 26
- America: 20
- Asia & Pacific: 4

Per 31.09.2014

LNG-fuelled ships

LNG-fuelled ships in operation

LNG-fuelled ships on order

LNG Ready ships

Ships in operation

Ships on order

Fleet mix

LNG-fuelled fleet per segment

- Ro-Ro
- PSV
- Car/passenger ferry
- Gas carrier
- Product tanker
- General Cargo
- Tug
- LEG carrier
- Bulk ship
- Container ship
- Icebreaker
- Chemical tanker
- Car carrier
- RoPax

Legend: In operation - Blue; On order - Light Blue
Small scale LNG clusters across Europe

- **Existing**
- **Planned** (Feasibility study, risk study, proposed locations, pending approval)
- **Proposed** (currently being discussed)
Step change
Enablers for LNG bunkering to develop in ports

- LNG availability, for example the nearby presence of an import terminal
- Reliable & safe logistical concepts
- Legal certainty, established legislation and regulatory framework
- Favorable investment climate & taxation regime
- Necessary competences, knowledge & skills
- Public acceptance
Opportunities in an emerging industry

VALUE CHAIN

Strategy
Feasibility
Design
Construction
Commissioning
Operation

- Full scale import and storage
- Intermediate distribution
- Intermediate storage
- Bunker / break bulk
- Marine fuel / other markets

- First-mover advantage
- Technology leadership
- Business model
- Improved local environment
- Brand
- Alliances
- Diversified energy supply
- Societal wealth
(Almost) one year ago - update
Elbehafen Brunsbüttel will Flüssiggas-Terminal

Regionale Wirtschaft sieht Elbehafen als idealen Standort für LNG-Importe. Vor dem Hintergrund der Krise in der Ukraine geht es auch darum, die Abhängigkeit von russischem Erdgas mittelfristig zu senken.

Von Olaf Preuß
Investor’s dream: on time, budget AND quality