Fuel prices and impact on LNG prices

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Sund Energy helps navigate into the energy future…

In the small-scale LNG area, clients include:

- Sellers
- Buyers
- Ports
- Shipping companies

Typical assistance:

- Strategy and business model
- Market analysis
- LNG contract negotiations
- Partner search
- …and more

…by understanding the full picture of stakeholders
Bunkering: Fastest growing market for LNG

Early development of LNG bunkering: Ferries in Norway
- Largely driven by environmental support (NOx-tax and -fund)

Northern Europe rules on sulphur emissions (ECA)
- There are three main ways to comply:
  - Use gas turbines or dual fuel engines with LNG as fuel – mainly new ships
  - Install scrubbers – allows for fuel oil, but sulphur needs to be managed
  - Use MGO – lighter, more expensive oil product

Lower LNG prices and better availability: Growth accelerates
- With more competition and infrastructure, the choice of LNG is easier
- Several ship owners have chosen LNG for economic reasons
- Different contract preferences: Term, pricing mechanism etc

Lower oil prices… What happens?

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LNG uptake in the marine sector is accelerating

LNG as marine fuel is taking off
- Three environmental drivers
- But economic potential is key!

Over 50 LNG-fuelled ships in traffic
- 77 confirmed newbuilds
- Potential for 1000 ships in traffic globally by 2020
- Both dual fuel and LNG only

Deep Sea vessels are next…
- Expect significant volume here
- Potential for liquefaction plants
  - Higher margin than typical exports – worth additional cost

…and river ways
- Large environmental benefits

Source: DNV GL, Jan 2015
Wholesale: No more Asian premium on LNG price

Global LNG prices have fallen significantly
- Gas is struggling in the competition with coal
- Reduced netbacks led to LNG project delays and cancellations

In the bunkering market, LNG competes with oil products
- Higher payability even with falling oil price

Data: Montel, Sund Energy analysis, April 2015
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Global LNG prices are lower and converging

Still several way of pricing

- Oil link is much lower after the slide in crude
- Henry Hub forward curve * 115% + $3.00 + $1.25 shipping to Europe
  - Now around $7/mmbtu
- European hubs (NBP/TTF) + premium
  - Although an increasing number of cargos sold at spot prices
- What premium for transferring to small-scale, for transport, for profit/incentive?

World LNG landed prices - April 2015 (FERC)
Retail prices – evolution of small scale pricing

First generation of small scale LNG was mainly sold on cost plus deals
- Gas at cost + liquefaction + transportation + margin
- Generally quite long contracts – 10 years
- Often exclusivity in return for terminal

Cost of natural gas (for liquefaction) was initially indexed to oil
- Resulting in customers getting oil link + cost element
- Increasingly, the main sellers are able to offer spot links

What do the buyers want from new sales?
- Faster price discovery - level of price, most important
- Indexing to suit business or in that area expected most competitive
  - More want spot link now than earlier – with better liquidity in spot markets
- Quicker negotiations and shorter terms
  - Especially ship owners find it unreasonable to negotiate for several years
  - Most buyers are finding it less attractive to commit to 10 years now
Retail pricing in the bunkering market today

Overall, HFO has been the fuel of choice
- But to become IMO-compliant, SOx scrubbers need to be installed

**MGO could be an easy fix to SOx emissions, but can be perceived as expensive and scarce**
- However, over 90% of shipowners in ECA zone chose this solution, at least short-term

**LNG: Now two main pricing models**
- “MGO – X” to compete with MGO
- “Cost plus” with hub-based gas

**Main problem for LNG**
- No transparency in pricing
- LNG contracts normally secret
More competition will reduce margins

Small scale LNG two main sources
- Gas – Liquefaction – transportation
- LNG at hub – reload - transportation

Illustration of the LNG pricing mechanisms

<table>
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<th>Pricing mechanisms for LNG as a bunker fuel</th>
<th>Traditional bunker fuels</th>
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<tr>
<td>LNG wholesale price</td>
<td>Low sulphur fuel (MGO)</td>
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<td>Feed-in gas + liquefaction</td>
<td>HFO+scrubber</td>
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<td>Wholesale LNG + break bulk</td>
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<td>LNG sold at a discount from alternative fuel (MGO)</td>
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</table>
Impact of lower oil prices – a bit tougher to compete

Bunker prices: LNG vs other fuels

Source: Montel, Bunkerworld, Sund Energy analysis; April 2015
From ferries to cargo

Kvitbjørn, longest journey from China to Norway solely on LNG
Bunkering LNG to ships opens for sale to trucks, too

CNG/ LNG sales to road traffic could give good margins
- Alternative is oil products, particularly (polluting) diesel
- Buses, trailers/ fleet traffic and private cars, often in synergy with larger volumes delivered to other clients
- Technology is well known and currently being standardised
- Tax incentives from several governments

Blending with biogas can create portfolio synergies
- Sales of «green certificates» and mutual flexibility (enhancing security of supply)
Synergies with the other uses of ssLNG

Several uses and several sources of LNG – could be optimised!

Demand
- Direct use as a ship fuel
- Direct use as a HDV fuel
- Users with own LNG storage
  Delivered by truck/virtual pipeline
- Cleaner offgrid industry
- Mid-small scale

Supply
- LNG cargo
- BioLNG

Gas system
- Normal gas use

LNG Storage

Regasification

Small liquefaction plant

BioLNG

Biogas
We are happy to discuss further!

We offer strategic and commercial advice + partner selection

- Small and large buyers, producers, investors, governments, TSOs
- Gas, electricity, environment and more

Selected recent work

- Sourcing strategy and gas contract (re)negotiations in Nordics/ Baltics
- Small-scale LNG value chain and market potential analysis
- Gas price scenarios for 2020

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