Development of LNG solutions in the Baltic States

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WE GIVE LOCAL IDEAS GLOBAL OPPORTUNITIES

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We are where the Norwegian companies are ...
...and we are where the clients on the markets are
LNG in the region
Energy security and need for alternative energy sources are drivers

- Alternative gas sources are prioritized by governments
- Alternative/greener energy sources are looked for in the industry
- New regulations for shipping industry

<table>
<thead>
<tr>
<th>Category</th>
<th>Activities</th>
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| Oil/gas terminal operators        | • Governments pushing  
• Private players exploring |
| Harbours                          | • Reserving space  
• Serving customers |
| Gas trading companies             | • Importing and trading  
• New business models |
| Project developers                | • Investigating profitability  
• Solutions for industry |
| Bunkering companies               | • Investigating  
• Monitoring |
| Shipping companies                | • Passively waiting |
| Industry                          | • Alternative energy sources |
Fuelgarden LNG AS

- Independent LNG Services company
- Specialist in small-scale LNG market
- Founders has several years of experience from shipping and in building up complete LNG value-chains
- Services provided:
  - LNG Sourcing services to shipping, transport and industrial companies requiring LNG as fuel
  - LNG Distribution services to LNG producers, wholesalers and traders
  - Independent Consultancy services
- Head office in Bergen, Norway
Paldiski Terminal
- Regional import terminal project
- Small scale distribution (vessels and trucks)
- Bunkering
- Gas network connection

Sillamäe Terminal
- Import and export terminal project
- Gas network connection
- Re-gasification and liquification plans

Saaremaa Ferries bunkering
- Potential project if LNG driven ferries are purchased

Muuga Harbour
- Small scale import terminal project
- Bunkering main focus for LNG
- Also sales of LNG

Jetgas
- Building industry solutions
- Importing LNG via trucks from Russia
- Sees potential in bunkering
Atmospheric, independent LNG tanks
for bunkering vessels/infrastructure and LNG fuelled vessels

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Ventspils port
• Small scale import
• For local industry using diesel today

Skulte/Incukalns
• Underground gas storage

Riga port
• Area for LNG terminal reserved
• Lacks profitable business model

Liepaja port
• Potential location for terminal
• Lacks profitable business model

Map with markers indicating under construction, planning in final stages, preparations done, potential terminal project, and other notes.
Kanfer Shipping’s small scale LNG transportation and terminal facility

- Kanfer Shipping is presenting a cost efficient, mobile and flexible small and medium scale LNG solution with far less financial risk
  - We can provide solutions from 1,000-30,000 cbm of LNG

- The transportation mode has a lower CAPEX and OPEX compared to ordinary LNG ships

- The terminal solution has a considerable lower CAPEX as well as financial risk than ordinary small scale onshore facilities.

- Kanfer Shipping has teamed up with influential cooperation partners
  - Large shipping companies
  - Large oil majors
  - An influential designer
  - Global and well known suppliers

- You do not need to investing in the solution as we can facilitate to charter it to you for a period of time

- No need to invest in land based property

- The solution is scalable and

- The solution could easily be used as a bunker solution to marine industry

- Regasification system could be installed in case of need

- A long term, reliable, financially viable and attractive solution
Bunkering?
- FSRU to ship?
- Stationary solution?
- Truck to ship?

Distribution via sea?
- To other terminals?
- Within port?
- Inland waters?

Transferring LNG?
- FSRU to ...

Selling LNG?

Klaipeda Terminal

Storage of gas?
- Storage of LNG?

Distribution via land?
- By trucks?
- By trains?

Transferring LNG?
- To trucks?
- To trains?

Today

FSRU → Jetty → Gas pipeline

Distribution via sea?

Transferring LNG?

Selling LNG?

Storage of gas?

Distribution via land?

Transferring LNG?

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Deepwater Norway AS - Part of Deepwater Corrosion Services
Specialists in offshore and marine corrosion control

Cathodic Protection design, modelling, cathodic protection systems, monitoring and inspection

Sacrificial and Impressed Current Cathodic Protection Systems

Smart solutions for pipelines and shallow water structures

Computer Modelling of Cathodic Protection (Case from LNG terminal - protection of pile sheets)

I-ROD pipe supports eliminates corrosion at pipe supports

Permanent Monitoring Instruments for corrosion control

www.stoprust.com

December 2014 | swigen@stoprust.com | stoprust.com
Current and possible sources of deliveries as per 2014

- LNG Terminal - planned (from 2015) Polskie LNG, daughter company of Gaz System
- LNG from terminal LNG Zeebrugge (Belgia)
- Liquefaction plants belonging to PGNiG (Polish Oil and Gas Company – ref. slide 22): Grodzisk Wielkopolski KRIO Odolanów
- 2013 r. new deliveries from Kaliningrad liquefaction plant ZAO* Kriogaz Gasoil, Gazprom’s daughter company (GAZPROMBANK)
- LNG from Russia (liquefaction plant ZAO Kriogaz Kingiseppie - St. Petersburg)
- De-metanization of JSW coal mine Suszec – LNG Silesia

*LNG – Current deliveries of LNG
- Potential future sources of LNG

*ZAO – limited liability company
LNG market in Poland - 2014

1. **Production** => Polish Oil and Gas Company (PGE)
   Odolanów and Grodzisk Wielkopolski Nitrogen
   Removal Plant – total output
   * 2010 – 26 600 T LNG
   * 2011 – 29 600 T LNG
   * 2012 – 30 000 T LNG

2. **Import** => mainly from Russian Federation 7000-8000 T LNG (estimation) and from EU (incidentally)

3. Remaining Polish producers operates on a very small scale e. g. LNG Silesia - Suszec

LNG is a by-product of helium production (cryogenic processing of low-methane natural gas coming from domestic wells is optimized for production of: liquid helium LHe, gaseous helium GHe, liquid nitrogen LIN.

Practically 100% of LNG used in Poland (ca. 37 000 T LNG = 51 millions m³ of natural gas – what constitutes only 0,3% of the natural gas market in Poland) is regasified and used for households heating or industrial processes.

1 ton LNG = approx. 2.3 m³ LNG = approx. 1380 m³ of natural gas (after regasification)

37 000 T of LNG = approx. 51 millions m³ of natural gas
Contact Innovation Norway Baltic team:
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Thank you! Takk!