GoLNG Blue Corridor Strategy

Strategy for the development of LNG-powered transport corridors in the Baltic Sea Region

A COLLABORATION BY THE PARTNERS OF THE GO LNG PROJECT
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WORLD MARITIME UNIVERSITY
The project consortium consists of 18 partners from 6 different countries and gathers all major LNG stakeholders in the BSR.

- It is a response to the ever-changing situation on the LNG market

- It is focused on the development if demand and accessibility of LNG in the BSR

- The project activities are aimed at the implementation of the EU Clean Fuel Strategy and EU Directive in Deployment of Alternative Fuel infrastructure in order to establish a strategic approach for the development of LNG infrastructure and promote its usage in the transport industry

- The BSR already is one of the leaders in LNG USAGE, with LNG being one of the most relevant options in achieving environmental regulations (SECA, NECA), not only in Europe but worldwide.

- Having an advantageous position the BSR needs a value chain able to provide worldwide LNG services
Project Funding and partners

Baltic Sea Region
Aims and objectives of the Blue Corridor Strategy

• **Aim**
  – Provide a strategy for the development of LNG-powered transport corridors in the BSR.

• **Objectives**
  – Analyse the framework of policies and legal instruments which affects LNG development
  – Describe the development of common technology standards for LNG
  – Identify the infrastructure requirements for successful LNG-powered corridors
  – Define the critical mass of business partnerships in clusters
  – Evaluate possibilities for an extended value chain for LNG
  – Define useful incentive schemes for the development of LNG
  – Provide a plan for education and training development for LNG
Policy and legal instruments

• International conventions, directives, and standards

  IMO
  SOLAS, MARPOL, IGF code

  EU
  DIRECTIVE 2014/94/EU

  ISO
  ISO 28460:2010

• National laws implementing the above legislation in individual states

Initial IMO Strategy on Reduction of GHG emissions from ships CO2 emissions by from international shipping by 40% by 2030, and by 70% by 2050, with respect to the 2008 emissions level.
Existing LNG infrastructure

Heine, N. LNG fuel distribution strategy for the BSR v5. 2018
Other LNG infrastructure

- LNG infrastructure for heavy duty road vehicles

Heine, N. LNG fuel distribution strategy for the BSR v5. 2018
The extended LNG value chain in the BSR

- Shipping
- Road transport and rail
- Industry
- Power generation
- Innovation and technology
Cluster analysis

- Factors influencing the success of LNG in the BSR.
## SWOT analysis

<table>
<thead>
<tr>
<th>STRENGTHS</th>
<th>WEAKNESSES</th>
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<tbody>
<tr>
<td>✓ Comply with EU regulations</td>
<td>✓ Differences (geographical, socio economic etc) between BSR countries</td>
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<tr>
<td>✓ Gas characteristics: large quantities available, competitive costs etc.</td>
<td>✓ High capital costs</td>
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<td>✓ Less polluting than petroleum, eco friendly</td>
<td>✓ Needed implementation of joint actions</td>
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<td>✓ Greater energy independence for BSR countries</td>
<td>✓ Public consciousness on safety and environmental risks</td>
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<tr>
<td>✓ Important Role in BSR Energy Mix</td>
<td>✓ Oversupply risk due to total size of global LNG small market</td>
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<tr>
<td>✓ Strong gas demand and supply growth in the BSR countries</td>
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<td>✓ Best practices on LNG in the BSR (Norway, Sweden etc.)</td>
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<td>✓ Increasing of the liquefaction and regasification capacity of the LNG</td>
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<tr>
<td>markets in the Baltic Sea countries</td>
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<tr>
<td>✓ Good scientific knowledge in the BSR countries</td>
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<tr>
<td>✓ Accomplished safety record along supply chain</td>
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<td>✓ Viable in different areas not reached by pipeline (for example Norwegian</td>
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<td>fjords)</td>
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<td>✓ Regas/storage sites planned to increase the supply on BSR market</td>
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<td>✓ Forecast Subisies and/or Tax cut in the BSR</td>
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<tr>
<td><strong>OPPORTUNITIES</strong></td>
<td><strong>THREATS</strong></td>
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<td>✓ Stricter regulations come in place</td>
<td>✓ Uncertainty over gas price, unsure about the market situation</td>
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<td>✓ More jobs for the people living in the area</td>
<td>✓ Security aspects: terrorism, cyber security attacks etc.</td>
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<td>✓ Improving LNG education in BSR countries to increase awareness and</td>
<td>✓ Accidents: increasing on public perception of LNG safety</td>
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<td>future innovations within the area: skilled personnel will be</td>
<td>✓ The development of alternative technologies</td>
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<td>able to sustain rapid growth</td>
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<tr>
<td>✓ Economic development in the area</td>
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<td>✓ Sharing risk and reducing the risk level</td>
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<td>✓ Good conditions for new competitive LNG cluster development</td>
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<tr>
<td>✓ Attraction element of human, industrial and financial resources to be</td>
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<td>allocated to technical innovations</td>
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<tr>
<td>✓ Supply in new markets</td>
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<tr>
<td>✓ Implementation of economies of scale</td>
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<tr>
<td>✓ Improving operating, procurement and contracting procedures</td>
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<td>✓ Increasing price competitiveness</td>
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Business case

- **LNG coverage** in the Baltic Sea Region for 741 km radius.

Distribution of “additional distance worth travelling for LNG” for a bulk carrier at 14 knots and 14400 kW on a 1000 M route

- MGO 0.1%: 17.29 $/MMBTU
- LNG: 10.79 $/MMBTU

Examples of Blue Corridors

LNG coverage in the BSR using existing facilities, 30 August 2017

LNG coverage in the BSR using planned facilities, 30 August 2017
Incentive schemes

- Clean Shipping Index – focus LNG
- Norwegian NOx-tax and the NOx-fund
- Zero Vision Tool
- Environmentally differentiated port and fairway dues
Infrastructure examples

• Klaipeda FSRU Independence LNG terminal

• Świnoujście LNG terminal
1. After inserting all bullet text on the slide, select
2. Click on bullet button from top menu and make the text

Future Blue Corridors

Map adapted from: Heine, N. LNG fuel distribution strategy for the BSR v5. 2018
Outlook for LNG in the BSR

- EU gas demand according to the IEA World Energy Outlook 2017.
Summary and conclusions:

1. LNG is a necessity for the BSR in meeting policies on alternative fuel deployment and emissions regulation.

2. Minimum infrastructure requirements are largely met by existing infrastructure.

3. Incentive schemes such as Clean Shipping Index or the Norwegian NOx fund are expected to be useful in assisting the development of LNG in the BSR.

4. The BSR is well placed in terms of LNG business development.

5. Outlook for LNG in the BSR is promising until 2040.
Thank you!