LNG infrastructure in the Baltic Ports

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Plan of the presentation

- Introduction to BPO
- LNG in the Baltic Sea Ports
- SECA and getting prepared for LNG bunkering
- Shipowners’ compliance strategy
- Summary
Baltic Ports Organization

The BPO's mission is to contribute to sustainable development of maritime transport and the port industry in the Baltic Sea Region, thereby strengthening its global competitiveness.

- active industry organization inspiring and supporting its members while cooperating pro-actively with relevant partners
- established on October 10, 1991, in Copenhagen
- 45 members of the most significant ports in the nine countries surrounding the Baltic Sea
- well-recognized within the BSR, in EU bodies and other European regions
- registered in Estonia (Port of Tallinn headquarter) and operates according to the Estonian Law on Non-profit Associations
### Baltic ports’ turnover by countries, 2013 vs 04

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Russia</td>
<td>118</td>
<td>142</td>
<td>154</td>
<td>174</td>
<td>175</td>
<td>171</td>
<td>177</td>
<td>186</td>
<td>207</td>
<td>216</td>
<td>+4%</td>
<td>+83%</td>
</tr>
<tr>
<td>Sweden</td>
<td>167</td>
<td>178</td>
<td>180</td>
<td>185</td>
<td>188</td>
<td>162</td>
<td>180</td>
<td>177</td>
<td>173</td>
<td>162</td>
<td>-7%</td>
<td>-3%</td>
</tr>
<tr>
<td>Finland</td>
<td>102</td>
<td>95</td>
<td>105</td>
<td>109</td>
<td>109</td>
<td>88</td>
<td>102</td>
<td>107</td>
<td>100</td>
<td>101</td>
<td>+1%</td>
<td>-1%</td>
</tr>
<tr>
<td>Denmark</td>
<td>88</td>
<td>100</td>
<td>108</td>
<td>110</td>
<td>106</td>
<td>91</td>
<td>87</td>
<td>93</td>
<td>88</td>
<td>88</td>
<td>+/-0%</td>
<td>+/-0%</td>
</tr>
<tr>
<td>Latvia</td>
<td>57</td>
<td>60</td>
<td>59</td>
<td>62</td>
<td>64</td>
<td>62</td>
<td>61</td>
<td>69</td>
<td>75</td>
<td>71</td>
<td>-6%</td>
<td>+25%</td>
</tr>
<tr>
<td>Poland</td>
<td>53</td>
<td>55</td>
<td>53</td>
<td>52</td>
<td>49</td>
<td>45</td>
<td>60</td>
<td>58</td>
<td>59</td>
<td>64</td>
<td>+9%</td>
<td>+21%</td>
</tr>
<tr>
<td>Germany</td>
<td>51</td>
<td>52</td>
<td>56</td>
<td>58</td>
<td>60</td>
<td>50</td>
<td>55</td>
<td>54</td>
<td>52</td>
<td>52</td>
<td>+/-0%</td>
<td>+1%</td>
</tr>
<tr>
<td>Estonia</td>
<td>46</td>
<td>47</td>
<td>50</td>
<td>45</td>
<td>36</td>
<td>38</td>
<td>46</td>
<td>48</td>
<td>44</td>
<td>43</td>
<td>-1%</td>
<td>-6%</td>
</tr>
<tr>
<td>Lithuania</td>
<td>27</td>
<td>28</td>
<td>29</td>
<td>32</td>
<td>39</td>
<td>36</td>
<td>40</td>
<td>46</td>
<td>44</td>
<td>42</td>
<td>-3%</td>
<td>+56%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>709</td>
<td>757</td>
<td>794</td>
<td>827</td>
<td>826</td>
<td>743</td>
<td>808</td>
<td>838</td>
<td>842</td>
<td>839</td>
<td>+/-0%</td>
<td>+18%</td>
</tr>
</tbody>
</table>

2013: **839 mln tn** handled in Baltic ports

approx. 30% rise in intra-Baltic transports

Port volumes grew by **18%** during 2004-13;

**84 mln tn** (2/3 of the added volume) comes from Russian ports in the Gulf of Finland
Investments in LNG infrastructure in ports – main driving forces

- Energy source (import terminals):
  - Security of energy supply
  - Weak gas pipeline network

- As a bunker fuel:
  - A consequence of new Sulphur limits for emission from shipping
LNG Terminal in Nynashamn

In Nynäshamn near Stockholm, Sweden, Linde has designed and constructed a mid-scale LNG terminal, selling and distributing LNG to various municipalities without direct access to the gas grid in the Eastern parts of Sweden. The LNG terminal, which is fully owned and operated by AGA, a subsidiary of Linde, commenced operations in March 2011 and is the first of its kind in the Baltic Sea region.
**LNG Terminal (FSRU) in Port of Klaipeda**

**Technical characteristics of the terminal**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal's technological capacity <em>(LNG regasification and LNG reload)</em></td>
<td>Up to 10.244.300 m³ of natural gas per day</td>
</tr>
<tr>
<td>Total capacity of LNG tanks</td>
<td>170.000 m³</td>
</tr>
<tr>
<td>Maximal LNG filling level</td>
<td>98% at 70 kPag</td>
</tr>
<tr>
<td>Minimal operational LNG heel level</td>
<td>3.500 m³ LNG</td>
</tr>
<tr>
<td>Maximal LNG load/reload rate</td>
<td>9.000 m³ LNG/ h</td>
</tr>
<tr>
<td>Maximal LNG regasification rate</td>
<td>428.398 m³/ h</td>
</tr>
<tr>
<td>Nominal LNG regasification rate</td>
<td>214.199 m³/ h</td>
</tr>
<tr>
<td>Minimal LNG regasification rate</td>
<td>57.089 m³/ val.</td>
</tr>
<tr>
<td>Maximal capacity of an LNG carrier performing LNG load, unless agreed otherwise</td>
<td>160.000 m³</td>
</tr>
<tr>
<td>Minimal capacity of an LNG carrier performing LNG load, unless agreed otherwise</td>
<td>65.000 m³</td>
</tr>
<tr>
<td>Maximal capacity of an LNG carrier performing LNG reload, unless agreed otherwise</td>
<td>65.000 m³</td>
</tr>
<tr>
<td>Minimal capacity of an LNG carrier performing LNG reload, unless agreed otherwise</td>
<td>5.000 m³</td>
</tr>
</tbody>
</table>

http://www.sgd.lt/
LNG Terminal in Świnoujście

The vessel with first ever delivery of Liquefied Natural Gas (LNG) cargo arrived on December 11th, 2015.

LNG terminal in Świnoujście:
- re-gasification of 5 bln m³ annually
- capacity of 320 000 m³

http://www.polskielng.pl/
News from Finland: The Ministry of Employment and the Economy granted EUR 65.2 million in three new LNG terminals

On 18th September 2014, The Ministry of Employment and the Economy announced that it has committed a total of EUR 65.2 million in energy subsidies for three liquefied natural gas (LNG) terminals. With the help of this support, Manga LNG Oy, Skangass Oy, and Oy Aga Ab will build LNG terminals in Tornio, Pori and Rauma respectively. These new terminals will help facilitate a move to significantly reduce the industrial use of fuel oil and liquid petroleum gas (LPG) in Finland.

Plus other projects (e.g. Turku, Kotka)
LNG Ports in the Baltic Sea: LNG Terminals

Legend:
- existing
- planned
- large scale import terminal
Sulphur Directive and LNG as fuel for shipping

BPO has been very concerned about the impact of Sulphur Directive
- Cancelation of routes
- Modal shift from sea to land
- Competitiveness of the BSR

but
- BPO has been taking pro-active approach.
Sulphur Directive and LNG as fuel for shipping

Therefore; BPO has initiated development of LNG bunkering infrastructure in the Baltic ports

and

In September 2011 the project LNG in the Baltic Sea Ports was delivered to TEN-T EA for co-financing by EC within TEN-T/MoS Program 2011 and accepted after evaluation.

In March 2014 the project LNG in the Baltic Sea Ports II was delivered to TEN-T EA for co-financing by EC within TEN-T/MoS Program 2013 and accepted after evaluation.
Baltic Ports Organization has initiated the development of LNG bunkering infrastructure in 7 ports within the Baltic Sea Region.

- Focus on pre-investment studies such as environmental impact assessments, feasibility analyses for LNG terminals or bunkering vessels, project designs, regional market studies, safety manuals, etc.

- Activities include a ‘stakeholder platform’ that facilitated discussions among port authorities, shipowners, gas infrastructure providers, energy traders and bunkering companies.

The sequel initiative has been developed by the BPO and it is a continuation and extension of a well-established ‘LNG in the Baltic Sea Ports’ - TEN-T Motorways of the Sea Project.

- Project was developed as a result of the co-operation among the Baltic Region Ports and the action addresses one of the main challenges to maritime transport – air emission from shipping

- The Global Project is focused on the harmonised pre-investment works and development of facilities for LNG bunkering infrastructure in Baltic Sea ports.

Project: LNG in Baltic Sea Ports:

Objectives:

Development of the infrastructure in the ports for LNG bunkering, thus making possible to use LNG as fuel for the shipping industry in the future. This will decrease the emission to the atmosphere and make sea transport more environmental friendly.

The project will result in jointly developed operational ships bunkering installations in ports that can serve as objects of reference to other ports in the Baltic Sea region and to other regions in EU.
Activity 4
LNG in port of Helsinki

Activity 5
LNG in port of Stockholm

Subactivity 5.1
Feasibility study

Subactivity 5.2
Bunkering arrangements of LNG in Stadsgården

Subactivity 5.3
Safety manual bunkering and use of LNG

Subactivity 5.4
Project study for all port sections

Subactivity 5.5
Project- and investments plan

Activity 6
LNG in port of Tallinn

Subactivity 6.1
Feasibility study with CBA

Subactivity 6.2
General plan for LNG facilities in Muuga Harbour

Subactivity 6.3
Environmental Impact Assessment reports

Subactivity 6.4
Layout options and basic projects report

Subactivity 6.5
Tender documents for constructions phase

Activity 8
LNG in port of Turku

Subactivity 8.1
Bunkering arr. of LNG in passenger harbor for Viking Line

Subactivity 8.2
Area arrangements caused by LNG terminal in Pansio harbor

Subactivity 8.3
Safety manual for bunkering and use of LNG at port areas

Activity 9
Harmonisation and Stakeholder Platform

Co-financed by the European Union
Trans-European Transport Network (TEN-T)
Activity 8: Harmonization and Stakeholders Platform

**Harmonization** will be secured among the pre-investment studies in the different ports and the **Stakeholder platform** will be initiated to gather the key actors around the same table from the Baltic but also form out-side the Baltic regions securing the dialogue process and dissemination of the project results.

**LNG Guidebook** (how to develop LNG infrastructure in the sea port). The LNG Guidebook would be used by other ports (that are not project partners) in the Baltic Sea region but also in other EU regions after project is completed.
GLOBAL PROJECT: Development of an LNG bunkering network in the seaports of the Baltic Sea region as an element of the Baltic Motorways of the Sea Programme

LNG in Baltic Sea Ports

LNG in Baltic Sea Ports II

Future projects (new LNG ports)

Baltic LNG bunkering network

ADDED VALUE:
Coordination & Harmonisation
Best practice identification
Stakeholder Platform
LNG Handbook
LNG training scheme
Baltic Ports LNG Forum

Constructi on of infrastructure
Equipment and facilities
LNG bunkering fleet

PHASE I: Pre-investments studies & analysis

PHASE II: Real investments

PHASE III: LNG market availability

Future projects (new LNG ports)
HEKLA Project – Helsingborg & Klaipėda LNG Infrastructure Facility Deployment

GLOBAL PROJECT: *Development of an LNG bunkering network in the seaports of the Baltic Sea region as an element of the Baltic Motorways of the Sea Programme*

- **PHASE I**: Pre-investment studies & analyses
- **PHASE II**: Real investments
- **PHASE III**: LNG market development
- **Future projects**

- **HEKLA action** – second phase of the Global Project’s implementation
- Real investment;
  - Helsingborg – Construction of LNG liquefaction plant
  - Klaipeda – Construction of on-shore LNG reloading station
- An important step forward towards creating the LNG bunkering infrastructure network in the BSR.
Overview of projects and infrastructure within BSR

**TEN-T, MoS Programme**

- The MOS Wider benefit / protection of the environment – sustainable shipping projects;
  - Number of completed projects: 3
  - Number of ongoing projects: 16
  - Total investments: €M 516.2
  - Total EU funding: €M 145.3
These projects will end with network of Baltic ports with LNG bunkering
Shipowners’ compliance strategy
Report: SECA is real now | BPO, April 2015

SECA is real now
A short report on implementing the EU Sulphur Directive and the first market reactions
Price for maritime transport after 1st January 2015

<table>
<thead>
<tr>
<th>Service Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotrata ekolog. SECA, dorosły</td>
<td>6.00 PLN</td>
</tr>
</tbody>
</table>

Total price: 615.00 PLN

Paid: 615.00 PLN

Remaining to be paid: 0.00 PLN
Fleet operating exclusively or mostly within SECA

<table>
<thead>
<tr>
<th>Type</th>
<th>No of ships</th>
</tr>
</thead>
<tbody>
<tr>
<td>ferries</td>
<td>240</td>
</tr>
<tr>
<td>ro-ro</td>
<td>147</td>
</tr>
<tr>
<td>container ships</td>
<td>237</td>
</tr>
<tr>
<td>bulk carriers</td>
<td>600*</td>
</tr>
<tr>
<td>tankers</td>
<td>300*</td>
</tr>
</tbody>
</table>

- estimations

Range of operation:
Ferries, ro-ro, container ships – exclusively in SECA

Bulk carrier and tankers- exclusively or mostly in SECA
Fuel prices - IFO

March 2014-March 2015

March 2015-March 2016
Fuel prices – MGO (0.1% of sulphur)

March 2014-March 2015

March 2015-March 2016
Ships powered by LNG

- 27 of LNG fuelled vessels (cargo or passenger ships) within European SECA area at the end of 2015 (24 newbuilds, 3 conversion projects)
- 1.8% of total short sea shipping fleet within European SECA

Number of cargo and passenger ships powered by LNG operating in North Sea, Baltic Sea and English Channel (domestic and international traffic).

Number of ships operating in each sub region of SECA area (including routes between North Sea and Norwegian Sea).
...some ship-owners go for LNG

Source: Ports of Stockholm
and Helsinki

Source: Port of Helsinki
Next LNG fuelled ships to come:
Next LNG fuelled ships to come:
Summary:

- LNG is a new cargo in the Baltic;
- There are many investments in LNG facilities in the Baltic ports (at different stages);
- Ship-owners go mainly for MDO, quite many go for scrubbers, some go for LNG;
- Energy prices (fuels, LNG) are impacting the investment decisions (LNG infrastructure, LNG fueled ships);
- Baltic ports are getting prepared for LNG bunkering (incl. EU co-financed projects).
Thank you!

Bogdan Ołdakowski
Secretary General, Baltic Ports Organization

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