LNG terminal project in Lithuania
November, 2012
Areas of activities

Klaipėdos nafta

Oil transshipment terminal

LNG Terminal
LNG Terminal Project - Background

The necessity to have an alternative energy source appear:

- Following EU requirement to ensure alternative gas supply from 3rd December 2014 – to secure an alternative gas supply source,
- After shutdown of Ignalina Nuclear Power Plant on 31 December 2009, Lithuania had became even more dependent on natural gas import,
- As an outcome of above gas is being supplied to the country by single pipeline from Russia (Gazprom) through the Republic of Belarus,

The LNG Terminal is the strategic priority project:

- Project fully driven by Ministry of Energy of the Republic of Lithuania (responsible for security of energy supply)
- strong political will and full support from Government of Lithuania, Ministry of Energy and President.
- the project is included in the National Energy Strategy of Lithuania, Baltic Energy Market Interconnection Plan, and ENTSO-G implementation plan.
LNG Terminal Project - Ownership

- Klaipedos Nafta appointed by the Government of Lithuania on July 10, 2010 for LNG Terminal Project implementation.
- Major objectives of the National Energy Strategy of Lithuania assigned to LNG terminal:
  - Supply of natural gas will be diversified and the country will not be dependent on a single gas supplier,
  - Lithuania on its own will be able to cover emergency demand for natural gas.
  - The country will gain access to international gas markets.
  - Preconditions to form both national and regional gas markets in Lithuania will be created with the possibility in the future to supply gas to neighboring countries.
  - LNG terminal will start operation on December 2014.
Development of Gas Transmission System of Lithuania
Project scope

LNG Terminal

FSRU

Port Infrastructure

Pipeline

SUPPLY OF NATURAL GAS: EXECUTION OF SUPPLY AND SALES ACTIVITIES
Lithuania LNG Project Plan

- 2011: Preparation for Territory Planning
- 2012:
  - Pre-Project Study of Pipeline
  - Territory Planning (Land for Jetty, Pipeline)
- 2013:
  - Laying of Pipeline Jurbarkas – Klaipėda (Lietuvos Dujos)
  - Port Dredging (Klaipeda Port Authority)
  - LNG Procurement
  - Environmental Impact Assessment (SEIA)
  - Risk and Safety Assessment
- 2014:
  - Pipeline Design
  - Connection of LNG Terminal to Gas Grid
  - Construction of FSRU Vessel and Delivery to Klaipėda Port
  - Approved EIA
- 2015:
  - Design and construction of FSRU Jetty (Klaipeda Port Authority / Klaipedos Nafta)
  - Commissioning Works of TERMINAL

Key Milestones:
- FID – Contract with Hoegh for FSRU supply
- Conception, receipt of permits, safety and navigation issues, project management, construction supervision

Organized by third parties
Main Parameters of LNG Terminal

**CAPACITY**
- Planned capacity of 2–3 bcm a year
- Capable to fulfil gas emergency demand approx. 1 bcm a year

**TECHNOLOGY**
- Chosen technology – Floating Storage and Regasification Unit (FSRU);
  - Launch into operation at the end of 2014
  - Storage capacity – 170 000 m³
  - Will ensure gas supply for most sensitive consumers for 14-30 days

**PLACE**
- Approved location – Southern Part of Klaipeda Port near Pig’s Back island
  - Good conditions for secure operation
  - Safe distance to living areas
## Benefit of New Technology for Energy Security

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Benefit</th>
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<tbody>
<tr>
<td>Reliable</td>
<td>Storage capacity reflects to security of supply - 15-30 d. to most sensitive consumers (citizens, heating, hospitals, etc.)</td>
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<tr>
<td>Movable</td>
<td>FSRU can serve as LNG carrier</td>
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<tr>
<td>Effective</td>
<td>New technology allows to start up regasification system immediately</td>
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<tr>
<td>Safe</td>
<td>FSRU will comply safety standard applicable in gas and oil business</td>
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<tr>
<td>Security</td>
<td>FSRU equipment designed to comply N+1 requirements</td>
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</tbody>
</table>
Offshore LNG terminal – popular technology due to time and price attractiveness

Around 30 FSRU regasification projects in pipeline

<table>
<thead>
<tr>
<th>Owner</th>
<th>Vessels</th>
<th>Customers*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Höegh LNG</td>
<td>2+3</td>
<td>GDF Suez, Perusahaan Gas Negara, Klaipėdos Nafta</td>
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<tr>
<td>Golar LNG</td>
<td>4+2</td>
<td>Petrobras (2), Pertamina, Dubai Power Authority</td>
</tr>
<tr>
<td>Excelerate</td>
<td>8+1</td>
<td>YPF (2), Kuwait Oil Corporation, Petrobras, PREPA</td>
</tr>
</tbody>
</table>

* Projects in operation or awarded

Around 30 projects in pipeline
- 16 projects in Asia/Middle East
- 6 projects in South America
- 1 project in North America
- 8 projects in Europe/Africa
- HLNG has several bids in process
Future Challenges of LNG Terminal

The gas consumption of Baltic States in 2011 was 5.6 bcm:

- Lithuania – 3.4 bcm,
- Latvia – 1.6 bcm,
- Estonia – 0.6 bcm.

Max designed capacity of LNG terminal:
- 4 bcm or 11 MMcm/day

Operating on a full load LNG terminal is capable to fulfill 75% of the whole gas market of Baltic States:

- The biggest gas consumption is in Lithuania – up to 61% of the whole gas market in the Baltic;
- Klaipeda is non freezing port, operating all year round, which is different from other ports in the Baltics;
- Underground gas storage in Inciukalns Latvia could serve as a balancing point;
- Working pressure of gas pipeline in Lithuania is higher than in Latvia and Estonia, which is an advantage to supply gas to neighboring countries;
- Being a central point of LNG/NG supply, LNG terminal could serve small scale LNG terminals.
Historical gas prices in Lithuania and neighboring country

Gas import prices in Lithuania increased 6 times since gas transmission system privatization in 2002.

Gazprom prices at Lithuania vs. Germany boarder

Gas import prices in Germany is lower by more than 15% in recent years comparing to gas import prices in Lithuania.
Based on actual gas price in 2011-2012, expected LNG price in Lithuania might be 10-20% lower than gas import price via pipeline.
Global LNG Demand and Supply

Projected global LNG supply and demand, through 2020

Billion cubic meters

Sources: International Energy Agency, BP Statistical Review, Shell, Global Data—O&G eTrack, Project Webpages; A.T. Kearney analysis
LNG export capacity in USA will increase by 113.8 mtpa by 2020, which is up to 39% of current LNG export capacity (290 mtpa).

Source: BG group, LNG journal
Shale and conventional gas
Weather Conditions in the Baltic ports
Containers may be transported by trucks and so reach the final consumers.

Potential of bunkering business

Starting with 2015 ships in the Baltic and North Seas have to use low sulfur fuel due to tightened environmental requirements. LNG might serve as an alternative fuel.

Example of small LNG containers service scheme

- Creogenic 40–50 m³ containers are filled with LNG
- Containers are loaded on the barge and floated in to neighboring harbors
- Containers may be transported by trucks by railway and so reach the final consumers

FSRU in Klaipeda 170,000 m³

Feeder vessel 7,000-20,000 m³

Serve ports in Baltic and North seas
Thank You For Your Attention