KLAIPĖDA LNG TERMINALS AS AN INCENTIVE FOR FURTHER DEVELOPMENT OF LNG INFRASTRUCTURE

MINDAUGAS JUSIUS
CEO of KN

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Klaipėda LNG Forum 2019
WE ARE ONE OF THE MAJOR COMPANIES OF ENERGY RESOURCES LOGISTICS IN THE BALTIC STATES SPECIALISING IN OIL AND GAS INDUSTRY
OUR EXPERIENCE ENCOURAGES US TO BOLDLY FACE NEW CHALLENGES

60 years

OIL TERMINALS
- Klaipėda oil terminal
- Subačius oil terminal

5 years

LNG TERMINALS
- Klaipėda LNG terminal
- LNG reloading station
- LNG bunker vessel “Kairos”

3 years

INTERNATIONAL LNG BUSINESS DEVELOPMENT
AND WE ARE AMONG THE FIRST ONES TO MEET THEM AND LEAD IN THE MARKET

The LNG supply infrastructure, which KN has been actively developing since 2014, i.e. the LNG terminal, the LNG distribution station, the LNG feeder vessel Kairos, created the LNG supply chain, and now it provides integrated LNG logistics services across the whole region.

WE ENSURE THE SUPPLY OF OIL PRODUCTS AND PRESERVE THE STATE RESERVE

The infrastructure managed by KN ensures the preservation of the state reserve of oil products, provides Lithuania and the neighbouring states with extensive possibilities of import and export of oil products.

WE ENSURE ENERGY INDEPENDENCE

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WE CONTRIBUTE CONSIDERABLY TO THE STATE BUDGET

In 2018, KN paid EUR 175.3 million in taxes, and it is the 4th major national tax payer and the 5th major state managed Lithuanian company paying dividends (EUR 17 million in 2017).

WE ARE ONE OF THE LARGEST COMPANIES OF THE PORT

In 2018, KN reloaded 6.7 million tons of cargo, which make up 14.4% of the total amount of cargo of the Port of Klaipėda.

WE HAVE DEVELOPED THE REGIONAL LNG VALUE CHAIN

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WE HAVE DEVELOPED THE REGIONAL LNG VALUE CHAIN
CHALLENGES FUEL OUR ACTIVITIES, AND INNOVATIONS ARE CODED IN OUR DNA
WE ARE AMONG THE FIRST ONES TO FACE THEM AND LEAD IN THE MARKET

In 2017, we were the first in the world to provide services of LNG reload from a storage vessel. The infrastructure we developed made Lithuania the 12th country in the world to re-export LNG.

The currently expanded Klaipėda oil terminal will make it possible to import and export at least 10 new oil products.

The inspection of Independence in 2019 was among the first inspections works performed in the world without suspending the operation of the vessel and placing it in the dry dock.

The construction of Klaipėda LNG terminal made Lithuania the 5th state in the world to use the FSRU technology.

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LNG VALUE CHAIN IN KLAIPĖDA
LNG INFRASTRUCTURE IN KLAIPĖDA

- LNG TERMINAL JETTY WITH EQUIPMENT
- LNG PIPELINE CONNECTING WITH GAS GRID
- LNG TRANSPORTATION & DISTRIBUTION BY SEA
- LNG RELOADING STATION
- GAS METERING STATION

Locations:
- Klaipėda
- Neringa
- Kiškénai
KN is developer and operator
Terminal based on FSRU Independence
Storage – 170,000m³; Regas ~4bcm
Average utilization in 2017 – >30%

Energy security measure for the Baltic States
Gas diversification
Full Third-Party-Access
Break Bulk

<table>
<thead>
<tr>
<th>Month</th>
<th>2019</th>
<th>2018</th>
<th>2017</th>
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<tbody>
<tr>
<td>January</td>
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<td>December</td>
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Reload operation from FSRU
- Reloading up to 5,000 m3/h
- LNG Bunker vessels capacity from 1,000 m3
- LNG quality determination with GC and sampling during reload
- Navigation in Klaipeda port 24/7

- No additional investment for reload
- 12 reloads performed since 2017
DELIVERIES

2019

2018

2017

Reload operation to SSLNG terminal
Third party access
No BOG allocation to users
Service 24/7
Up to date technology

Multi-service and flexible small scale terminal
### TRUCK LOADING

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
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<tbody>
<tr>
<td>Volume of LNG storage tanks</td>
<td>5 x 1.000m³</td>
</tr>
<tr>
<td>Maximal LNG filling level</td>
<td>90%</td>
</tr>
<tr>
<td>Annual technological capacity</td>
<td>250.000m³</td>
</tr>
<tr>
<td>Number of truck loading bays</td>
<td>2 bays</td>
</tr>
<tr>
<td>Maximal number of LNG loaded trucks per day</td>
<td>24 trucks</td>
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<tr>
<td>LNG truck loading rate</td>
<td>up to 100 m³/h</td>
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### VESSEL BUNKERING

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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<tr>
<td>Length of the jetty</td>
<td>274m</td>
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<tr>
<td>Maximum vessel draught</td>
<td>12.5m</td>
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<tr>
<td>Jetty location</td>
<td>close to the port entrance</td>
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<tr>
<td>LNG bunkering rate</td>
<td>up to 500 m³/h</td>
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</tbody>
</table>

KSSA applies 70% discount for certain port dues if vessel arrives for the purpose of bunkering.
<table>
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<tr>
<th>ICE Class</th>
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<tbody>
<tr>
<td>Capacity</td>
<td>7.500 m$^3$</td>
</tr>
<tr>
<td>LNG loading rate</td>
<td>2.500 m$^3$/h</td>
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<tr>
<td>LNG discharge rate</td>
<td>from 60 to 1.250 m$^3$/h</td>
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</table>
We invest into new LNG terminals by developing LNG projects and consultations. We focus on projects, which:

- are based on floating LNG technologies;
- could be used to render terminal operation and maintenance services;
- are implemented in countries with sufficient level of investment security and physical security of employees;
- could generate a risk-adjusted return on investment.

“Strategic KN priorities include international LNG projects, which provide KN with a number of wide possibilities to establish itself as the global leader in the LNG field”.

Mindaugas Jusius, KN CEO
LNG RELATED DEVELOPMENTS IN THE BALTIC SEA REGION
SUPPLY INFRASTRUCTURE (CURRENTLY PLANNED OR UNDER DEVELOPMENT)

1. Nord Stream 2 [under development]
   55.0 bcm/a from Russia to Germany

2. Baltic Pipe [under development]
   10.0 bcm/a from Norway to Denmark and Poland, or 3 bcm/a from Poland to Denmark

3. Gas Interconnection Poland Lithuania (GIPL) [under development]
   2.4 bcm/a from Poland to Lithuania and 1.9 bcm/a from Lithuania to Poland

4. Swinoujscie LNG terminal expansion [operational, but extension proposed]
   Additional storage capacity of 180,000 cu m and 2.5 bcm/a throughput

5. Gdansk LNG terminal [proposed]
   Storage capacity uncertain and 4.1 to 8.1 bcm/a throughput

6. Kaliningrad LNG terminal [operational]
   Storage capacity of 174,000 cu m and 2.7 bcm/a throughput

7. Skulte LNG terminal [proposed]
   No storage capacity planned due to usage of Inčukalns UGS and 1.5 bcm/a throughput

8. Paldiski LNG terminal [proposed]
   Storage capacity of 160,000 to 320,000 cu m and at least 2.5 bcm/a throughput

9. Tallinn LNG terminal [proposed]
   Storage capacity of 50,000 to 320,000 cu m and 4 bcm/a throughput

10. Balticconnector [under development]
    2.6 bcm/a from Finland to Estonia and vice versa

11. Klaipeda LNG terminal [operational]
    Storage capacity of 170,000 cu m and 3.8 bcm/a throughput

Source: Gaz-system; Roland Berger

1) Publicly available information on reverse flow capacity to Poland varies between 1 to 2 bcm/a
2) Underground gas storage
Coral Energy: Capacity 18,000 m³, Status: Active

Coral Anthelia: Capacity 6,500 m³, Status: Active

TBD: Capacity 6,000 m³, Delivery time: September 2020

Pioneer Knutsen: Capacity 1,100 m³, Status: Active

Stolt-Nielsen Gas: Capacity 7,500 m³, Delivery time: 2019 Q3

Cardissa: Capacity 6,500 m³, Status: Active

Engie Zeebrugge: Capacity 5,000 m³, Status: Active

Seagas: Capacity 170 m³, Status: Active

Coral Favia: Capacity 9,900 m³, Delivery time: May 2019

Coral Fungia: Capacity 9,900 m³, Delivery time: May 2019

KAIROS: Capacity 7,500 m³, Status: Active

Shell 7,500 m³ Coral Methane relocated to Tenerife (Spain), meanwhile Gasum 15,600 m³ Coral Energy operates in Gulf of Mexico and Carribean Sea.
DELIVERY OF LNG TO OFF-GRID CITIES

- LNG as an energy source for heating
- LNG as an energy source for households
- LNG as an energy source for industrial companies

LNG AS FUEL FOR TRANSPORT

- LNG as ship fuel
- LNG as fuel for heavy duty transport

REGIONAL BENEFITS OF SMALL SCALE LNG DELIVERY

Supply from Lithuania in 2018
LNG consumption
“Around two-thirds of Norway’s LNG-fuelled marine fleet was subsidized by the Norwegian NOx Fund.”

Source: DNV GL, OIES
YEARLY DEVELOPMENT OF LNG FUELLED VESSELS

Source: DNV GL, 2019 May