

TERMINALAS

Liquefied natural gas Terminal News No. 4 May 2012

LNG terminals are among the most demanded products in the world p.3

Sveinung Støhle, Chief Executive Officer of Höegh LNG, answers the questions of 'Terminalas'



Stick a match for its flame just to fade

Scientists assure that LNG technology is safe.



'Terminalas' launches its new section – 3 miles on the route – in which the publication will question the Klaipėda liquefied natural gas (further – LNG) project promoters on the most relevant project-related issues. We will follow the progress of the construction, the challenges faced and the accomplishments leading to the completion of the Klaipėda LNG terminal due to be launched in December 2014.



Ultimate priority

The LNG terminal under construction in Klaipėda is the main object in pursuit of energy independence, therefore the project must be completed successfully, says President Dalia Grybauskaitė.

'Verslo Žinios'

Klaipėda authorities approve

The Klaipėda Municipality Council has approved the construction of the LNG terminal and other related infrastructure objects, as well as the programme for the environmental impact assessment. The decision was approved by 21 Council members voting in favour, and 3 members against.

Will negotiate with Qatar

Lithuania intends to enter into negotiations with Qatar one of the major natural gas suppliers in the world concerning the possibility of supplying gas to the Klaipėda terminal. According to Nerijus Udrėnas, chief adviser to the President, Lithuania could procure gas from Qatar suppliers applying exchange mechanisms, while physically the gas would be transported from Norway. *BNS*

Lithuania could save about LTL 2.5 bn

By importing gas through the LNG terminal at current prices Lithuania would save about LTL 2.5 bn over 10 years, according to the estimates of the Ministry of Economy. Lithuania is currently paying USD 490 (LTL 1,280) for 1,000 m³ of natural gas, Estonia – about 11 %, and Latvia – about 20%, and European States – about USD 100 (LTL 260) less than Lithuania. *BNS*

Ungrounded criticism

Most criticism towards the Lithuanian energy projects arises either from the opposition that has not properly weighted its arguments, or from other parties representing some unspecified interest – says Nerijus Mačiulis, the Chief economist of Swedbank, one of the largest commercial banks in Lithuania. According to him the gas price in the USA has fallen to historic lows. The possibilities to import gas from elsewhere carrying it by sea to Lithuania will undoubtedly lower the gas prices. *BNS*

From now on – FORWARD ONLY



“We will be announcing the gas supply tender shortly

Rokas Masiulis, General Manager of AB Klaipėdos Nafta, who is heading the project implementation and coordination, is the first interviewee of the section

How is the progress of the terminal going?

The corner stones of the Klaipėda LNG terminal implementation project have been put in place: agreement has been reached on the acquisition of the principal part of the terminal – a vessel-storage facility from the highly reputed and experienced Norwegian company Hoegh LNG, the port is making arrangements to construct the embankments and lay the pipelines; the model for the terminal operation is becoming more specific. I believe, we have a solid foundation in place and in just over two years from now the much-needed alternative gas supply source should be

operational. This is a proud achievement encouraging us to move forward even faster.

Are we acquiring the vessel-storage facility on favourable terms?

I am absolutely assured that Lithuania is acquiring the vessel-storage facility at a reasonable price, and efficiently and reliably. The company produced a very modern, safe and sufficiently large vessel in a particularly short period of time. The present market price of the vessel is EUR 250 m (about LTL 862 m) excluding loan interest and terminal operating costs. We would not have been able to order the vessel independently until 2016 as the demand for such vessels far exceeds supply. Besides if we had waited to order the vessel ourselves, the cost – including all funding, designing, insurance, servicing and other costs would have risen to

about EUR 475 m (about LTL 1.64 bn) over a decade. According to the currently effective lease agreement and market prices the efficient, reliable vessel- storage facility will only cost Lithuania about EUR 430 m (LTL 1.48 bn). However, what is most important is that the vessel-storage facility lease term will allow us to safely absorb the experience of the State which has been working for a long time in the area, and to train our own specialists. Then later, having acquired the vessel for its residual value, we can independently develop our national LNG industry. Lithuania has a chance to become a leader in the area as we are most advanced in the construction of the Klaipėda terminal.

What's next – further steps?

We will be announcing the gas supply tender shortly, and intend to sign a gas supply contract in the second half of the year. Most probably gas for the Klaipėda LNG terminal will be procured from the United States of America (USA), Norway or Arabian States. We have already signed letters of intent with the USA company Cheniere, and the Spanish gas supply company Gas Natural Fenosa, we are also holding discussions with other companies and states in order to ensure that we are choosing the most favourable supply option.

LNG terminals – one of the most demanded goods in the world

There have been forty years of growth in line with the rapidly growing LNG market. Such are the experience and prospects of the Norwegian company Høegh LNG – one of the Pioneer players in the global market.

Chief Executive Officer of Høegh LNG Sveinung Støhle answers the questions of 'Terminalas'



Your company works with LNG infrastructure for many years across the world – how has the situation changed during that time?

HLNG has been in the LNG industry since the company took delivery of its first LNG carrier in 1973. At that time LNG was a small industry with few players and all LNG cargos were going in fixed trades. The last 10 years the industry has experienced an enormous growth in all parts of the value chain. With this growth we also see that the industry has become more flexible and cargos are now going to the market that pays the highest price instead of the fixed route.

Another huge change is the development in technology that has led to floating regasification units and liquefaction solutions, the latter is still not in operation. The floating solution makes LNG available to more markets as it makes LNG economically viable also in small to medium volumes and construction time is reduced by at least 2 years. Also it has less environmental impact as less construction works are carried out on land and the FSRU can be readily relocated.

» The regasification unit at the Klaipėda terminal will be the most state-of-the-art facility that we have ever built.

What were the main factors that have caused the changes?

There were several reasons actually. First, the market development was largely promoted by the growing supply of LNG driven by the high energy prices. The price of LNG was by far more attractive in relation to other oil products, such as fuel oil. Environmental concerns, the need to diversify energy resources and the tsunami that shattered Japan last year caused the upswing in the global LNG by 10 MTPA.

What are the innovative features of the terminal under construction in Lithuania?

The regasification unit at the Klaipėda terminal is the most advanced FSRU our company has ever built. It will be employing such innovative technologies as the steam based regasification in winter and the seawater based processes in the summer season. However, the vessel

itself is characterised by its ultra low fuel consumption and emissions of pollutants. The capacity of the unit is sufficient to supply Lithuania the entire winter demand in case the pipelines gas should be shut-off, while in the summer season the terminal could be used for supplying gas for export.

In your opinion, what is the LNG market outlook – for how long this boom can last?

The global LNG carrier fleet is currently highly utilized with record high spot rates. Current day rates for modern tonnage has been reported at USD 150 000 per day for short term employment and higher. The shipping market is expected to remain tight for the next couple of years. Looking further ahead, the existing fleet including new building orders will likely not be sufficient to cover the incremental increase in LNG trade if the planned additional liquefaction capacity is added to the market. The main providers of new LNG supply will be Australia and the US. The LNG supply is expected to come online during 2014/2015. The anticipated US export of LNG is alone expected to create a further surge in demand for shipping tonnage due to the increased average shipping distance to premium markets.

What are your views towards Lithuania's decision to start the construction of LNG terminal in Klaipėda?

This was an extremely economically efficient solution as the project will make it possible for Lithuania to get access to the world market for LNG. Even in the present tight market, LNG in Europe is priced below the pipeline gas at the Lithuanian border.



Capacity – 170.000 m³ of liquefied gas



Tanker draught – 12.6 m



Tanker width – 46 m

The LNG terminal operating in Klaipėda will be constructed at Hyundai Heavy Industries in South Korea. As ordinary in relation to the construction of any ship the schedule was launched with steel cutting and block assembly, as well as the keel laying (bottom wales connecting the two parts of the vessel) followed by the collection of modules on the dry dock that will last for about 4 months. Further, the equipment and the vessel body will be assembled on the water. The Vessel will also be tested outside the Yard including sea trial and gas trial with LNG, before sailing to Klaipėda. Major stages of the vessel building:

2012	2013	2014
<ul style="list-style-type: none"> ◀ Q 1 2012 – beginning of the construction of the vessel-storage facility ◀ Q 3 2012 – manufacturing of the draught ◀ Q 4 2012 – manufacturing and laying of the pipeline system for the vessel-storage facility ◀ Q 4 2012 – construction of the engine unit ◀ Q 4 2012 – construction of the deck ◀ Q 1 2013 – assembly and installation of the principal engines of the vessel-storage facility 	<ul style="list-style-type: none"> ◀ Q 1 2013 – installation of the piping system for the vessel-storage facility ◀ Q 1 2013 – production and assembly of the anchor system ◀ Q 1 2013 – assembly of the storage units for the vessel ◀ Q 2 2013 – production of the body units to assemble the vessel-storage facility; total five units ◀ Q 2 2013 – installation of the regasification system 	<ul style="list-style-type: none"> ◀ Q 4 2013 – launching of the vessel-storage facility into water ◀ Q 4 2013 – first testing of the vessel-storage facility in the sea ◀ Q 4 2013 – first testing of the LNG systems
<ul style="list-style-type: none"> ◀ Q 1 2014 – certification of the vessel-storage facility, obtaining of permits and the final hand-over 	<ul style="list-style-type: none"> ◀ Q 3 2014 – floating of the vessel-storage facility to Lithuania ▶ 	

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Ensured a secure source of clean, competitive and safe energy

The Ambassador of Spain in Lithuania Miguel Arias Estévez

In view of the on-going growth in energy consumption and the economic forecasts in Spain, at the beginning of the 70s, the Spanish authorities decided to develop the gas infrastructure in the national territory of Spain. Enagás was the company in charge of the development of the gas infrastructures. In this sense, the Enagás LNG Plant, in Barcelona, was the first terminal in Spain and in Europe. It started operating with two tanks, each one with a storage capacity of 40,000 m³. Today, 40 years later, it has eight tanks with a total storage capacity of 840,000 m³ LNG. After Barcelona LNG Plant, Enagás continued constructing

and operating other terminals in Spain (Cartagena and Huelva). The company also owns a 40% share of the terminal in Bilbao, operates one under construction in Gijón (El Musel LNG terminal) and two in the Canary Islands. Time has shown that the decisions taken concerning the construction projects proved to be right and have been shown to be correct and Spain now has a secure source of clean, competitive and safe energy. The construction of these LNG terminals has contributed to the diversify of energy sources and the increase the security of supply in our country. In fact, Spain's natural gas supply is one of the most diversified in the world, as in 2011 our gas terminals were receiving gas from twelve different countries.



Captain: I am absolutely sure about my crew and safety

Igor Toncic, the Croatian captain of the LNG carrier with the regasification unit GDF Suez Neptune tells us about the routine operation of the vessel and the challenges that the crew of the vessel will face after the vessel arrives to Klaipėda two years later.

What does it mean to be the captain of LNG regasification ship – what are you responsible for?

The captain has the overall responsibility for the safe and efficient operation of the entire vessel including cargo operations, navigation and crew management. The captain also has to ensure and oversee that all international regulations, Flag state requirements and internal Company policies are properly followed and implemented.

How does it differ from being a captain of a large freight or passenger ship?

It is similar in many ways, as we have to follow the same procedures as on any other ships. The difference is that on the regasification ship we spend more time on cargo management and ensuring that all safety procedures are properly complied with.

How many years do you work as a captain of LNG regasification ship? Do you feel safe?

I have been serving on GDF Suez Neptune since January 2010. She was the first regasification vessel in our company.

I do feel that we are safe, all operations were carefully planned and executed in a safe manner. Vessel is technologically very advanced, equipped with the most modern and reliable safety equipment. And maybe most important, the entire crew is well trained with sufficient experience in the LNG trade industry.

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Business, schools and kindergartens – on the rise

The Ambassador of Norway in Lithuania Leif Arne Ulland

Norway is a producer and exporter of LNG since the production started on the Snøhvit field in the Barents Sea in 2007. The gas from Snøhvit off shore field is transported on the seabed by pipeline to Melkøya outside Hammerfest in northern Norway where it is processed and liquefied to LNG. From Melkøya it is transported by special tankers to the market. The Snøhvit field has a design capacity of 5,75 BCM/year and is the first export facility for LNG in Norway and Europe. A motivating factor to build LNG facilities was access to the world market. Trade in LNG is a commercial matter, and access to the best paying global markets is

desirable. The Snøhvit project was approved by the Norwegian government and parliament. Impact assessments were made in order to map consequences of environmental and socio-economic character. A big project like this will always create debate and discussion, but the construction and development of the Snøhvit/Melkøya LNG facility benefited from major political support both locally and on the national level. The development of the Snøhvit field/ Melkøya facility has brought substantial changes to the nearby city of Hammerfest. More business has been created, tax revenues grow, and so do property prices, and investments in schools, kindergartens, infrastructure.

Stick a match for its flame just to fade

The first ever in the world vessel-storage facility with a regasification unit Methane Princess – the predecessor of a ship shortly arriving to Lithuania was built in 1959. About 360 gas carriers sail the oceans and seas around the globe, 70 are still under construction, in addition to the 100 LNG import terminals of which 57 operate in Europe.

The entire well-developed liquefied gas infrastructure is constantly improved and is one of the safest

branches of industry in the world with very few accidents recorded during the fifty-year history of its operation; thus any probable adverse effect is much lower than in any other branch of industry.

'The terminal cannot cause any major threat especially that of fire – we are dealing here with liquefied gas – you can stick a burning match into the gas and its flame will fade' says Dalius Tarvydas, a research fellow of the Lithuanian Energy Institute, the co-author of the research paper on LNG terminals. According to Tarvydas, modern LNG storage facilities are complex engineering facilities

accumulating decades of expertise. 'An LNG storage facility operates like a thermos retaining cold of -161 degrees and containing the liquid – says the energy specialist. According to him such storage facilities are ordinarily manufactured with an additional protective shell so that in the highly unlikely case of the principal storage being damaged, the second layer would prevent gas release to the environment. The ultimate security in the storage facilities is ensured by the integrated physical, as well as electronic control and protective measures and protective valves.

The researchers agreed to respond to the inquiries and concerns of Klaipėda residents related to the construction of the LNG terminal.

Evaldas: We need to ensure proper supervision over the construction process – to prevent theft of construction materials. It goes without saying that fire risk in such objects is always higher.

D. Tarvydas: Nobody will be able to steal any construction materials as the storage facility, as well as the regasification unit are actually a vessel that will be floated to Klaipėda Port already constructed. Besides, if you do not trust your countrymen you should be aware that at least during the first year the facility will be served by a team composed exclusively of Norwegians.

True, any object operated on gas or oil is related with an increased risk

of fire. But since we are aware of the risk, it is fully manageable.

Aleksandra: If gas prices decrease – I am for the construction, though if the gas is going to increase in price – I am against.

D. Tarvydas: If we were able today to purchase liquefied gas on global markets at the spot prices, it would most probably be much cheaper. Whether this will be the case a year from now – nobody can be sure of that today. The terminal is necessary not only in the expectation to procure less costly gas but also with a view to triggering competition in the gas sector. In this case we will be able to pay realistic market prices for the gas rather than just any price thought of by the sole monopolistic supplier.

Audrius: The city will be in the immediate vicinity of the terminal. Imagine any possible

consequences should the terminal explode.

D. Tarvydas: The probability of explosion is more or less negligible and eventually what explodes is the gas, not the terminal – and we use gas in every house, and even every older child knows how to start a gas stove.

Milda: If the decision has been taken to build it nevertheless, it should be located as far from the city as possible. Why? For the sake of human health.

D. Tarvydas: The LNG import terminal does not create any hazard to human health; it is not more dangerous than any other object in the port. Considering that the LNG vessels in the sea are also fuelled with gas rather than much more polluting fuel oil, any additional polluting effect on the environment will be negligible. The LNG import terminal should not be perceived as some kind of giant plant, as actually it is only a floating barrel.

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Darius Tarvydas, a research fellow at the Lithuanian Energy Institute: **The gas is stored in the facility with one atmospheric pressure which means that the vessel-storage facility is not in itself a pressure vessel which would be much more dangerous. Of course, LNG – which in this case is nearly pure methane, is a flammable substance, however, the threat of fire is not big – natural gas is not combustible. For an explosion to take place the methane concentration in the air must be in the region of between 5% and 15%. Furthermore, methane is lighter than air – therefore in the event of any leak in the open the gas will rise high in the air and disperse. Much more hazardous is the liquefied gas used for vehicles: this is heavily pressurised, heavier than air, therefore in the case of a leak the gas would stay close to the ground surface and is hardly dispersed – hence the risk of fire and explosion is much higher. As evidenced by the findings of the survey of the American LNG sector carried out in 2007 by Texas University researchers (the USA is a pioneer in the use of the LNG currently operating the most developed LNG infrastructure with 113 operating objects including terminals, storage facilities, liquefying plants, etc.) within the past 40 years as few as 8 accidents were recorded at sea (an accident is defined as an event causing a spill of LNG). Within that time only 3 LNG-related accidents took place in the USA. The most recent accident was recorded in 1979; therefore it may be justifiably concluded that LNG technology is safe.**

Residents are interested in and supporting the construction of the terminal

Findings of the opinion poll showed that the majority of Lithuanians – more than 60% support the construction of the LNG terminal. As few as 8% of respondents believed that Lithuania does not need

such terminal. The strongest support for the concept of the LNG terminal was expressed by residents of Kaunas, Šiauliai, Klaipėda and Panevėžys – a total 71% of respondents. Residents expect

that construction of the terminal will lead to cheaper gas (39%) and Lithuania will become an energy independent State – according to the opinion of 34% of the respondents.

The survey was conducted in 17 towns and 56 villages in Lithuania. The survey was carried out by the independent opinion poll and market research institution Vilmorus.