

TERMINALAS

In the future terms could breed close

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Secured energy independence



Lithuania is the first of the Baltic States that made a step towards energy independence – the Seimas nearly unanimously adopted the Law on Liquefied Natural Gas (LNG) Terminal creating the solid legal basis for Lithuania and other Baltic States to have an alternative gas supply source by sea and obtain energy independence from the sources supplied from Russia.

Having implemented the project and built the gas import terminal Lithuania will be able to decide

independently on a most efficient way to obtain natural gas that in Lithuania is one of the most important energy source used in the heat sector, energy generation, for household and industry purposes. The Klaipėda LNG terminal will also contribute to the strengthening of energy independence of all Baltic States – by its technical capacities the terminal may operate as a regional facility and help provide gas also to Latvia and Estonia.

For these countries the project is of specific benefit especially that the Riga and Tallinn seaports freeze in winter therefore it would

be difficult for the ports to receive LNG carriers.

The Law established that not less than one quarter of the entire amount of natural gas consumed in Lithuania will be supplied through the LNG terminal. During the first year of its operation the LNG terminal is estimated to tranship about 1 bn m³ of gas, and in the future the terminal's annual capacity is projected to reach up to 4 bn m³, sufficient to meet Lithuania's annual demand for natural gas and partly the need of Latvia and Estonia.

The LNG terminal is projected to be put into operation not later than 3 December 2014.

President Dalia Grybauskaitė
 That is an actual step towards energy independence. By implementing this LNG terminal project Lithuania starts creating the gas market that will eventually provide an alternative to the expensive gas from Russia and competitive prices to consumers'.

Prime Minister Andrius Kubilius
 After the twenty years of our independence it is only now that we are actually starting to move towards energy independence'.

Speaker of the Seimas Irena Degutienė
 We currently are at a stage of our energy project without the implementation whereof talking about energy independence is virtually impossible'.

Minister for Energy Arvydas Sekmokas
 These are the decision of historical significance – from an isolated and energy dependent State Lithuania is turning into part of the European energy infrastructure. This means that we together are creating a transparent and competitive European energy market'.

Signed agreement with the port

The Klaipėda Seaport Authority and AB Klaipėdos nafta implementing the LNG terminal project signed the cooperation agreement providing for the procedure of financing of the installation of the embankments of the terminal and other infrastructure.

About LTL 180 million of the total investment will be funded from the port charges that, according to Rokas Masiulis, should increase in the future in view of the prospect to start providing ship bunkering services.



Upon the agreement with the Port Klaipėdos nafta announced a tender for the construction of the embankments.

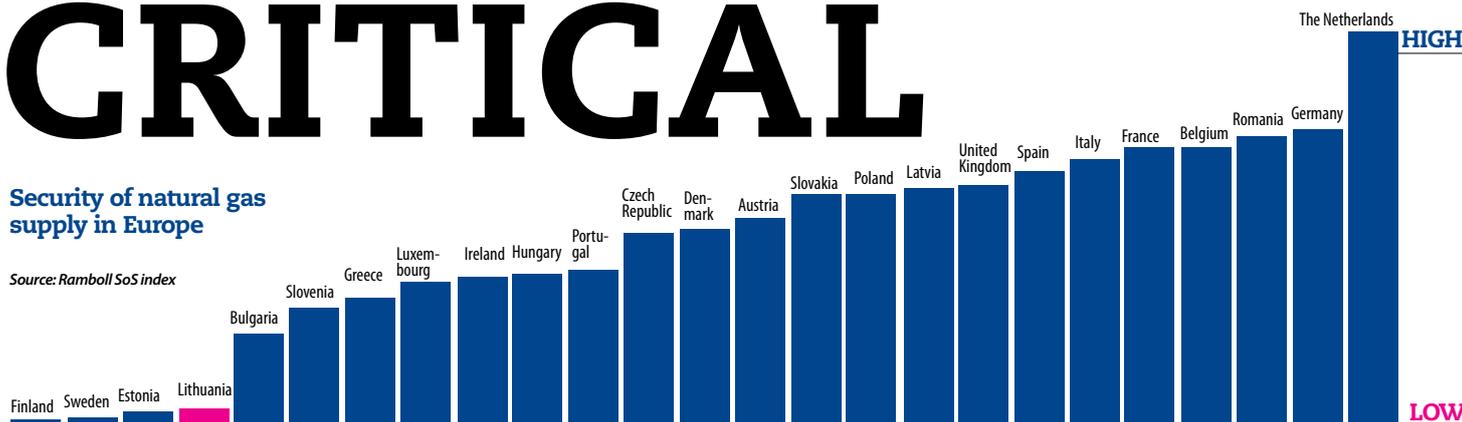
The Cooperation agreement signed by **Eugenijus Gentvilas**, Manager of the Klaipėda Seaport Authority and the **Rokas Masiulis**, General Manager of AB Klaipėdos nafta. *Klaipėdos nafta photo.*

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Lithuanian gas sector: energy safety level – CRITICAL

Security of natural gas supply in Europe

Source: Ramboll SoS index



Lithuania's ability to ensure stable and safe supply of gas is the lowest among all other energy sources and is actually verging on critical. The most efficient way to improve the situation is to build the LNG terminal – the numbers were first presented by the scientists from the Energy Security Centre of the Vytautas Magnus University (VMU) and the Lithuanian Energy Institute (LEI), inventors of an integrated energy security assessment method.

Questions of 'Terminalas' answered by Prof. Juozas Augutis, Head of the research, Pro-rector for research of the VDU, and Head of the VMU and LEI Energy Security Centre.

The overall level of Lithuania's energy safety is low being assessed at 45% out of 100%. What is your view of the results?

In the course of the past year Lithuania's energy safety level decreased by 6% as compared to the level of 2007 before the decommissioning the Ignalina Nuclear Power Plant (INPP). The energy safety of Lithuania may be enhanced by implementing a number of major energy projects – building the LNG terminal, the Visagi-



nas NPP power bridges with Poland and Sweden, or by using more renewable energy sources.

What are the weak sides of our energy safety?

The weakest point in our energy security is the supply of gas and party, as related to that, the heat production sector. The security level of the latter may be assessed as critical. The conclusion was also confirmed by the research carried out by an international company RAMBOLL having concluded that Lithuania's energy security is by several times lower than the European Union (EU) average.

What can help strengthen the security of the Lithuanian gas sector?

Energy safety concerns not only the physical ability to suspend the supply of energy or gas, it also includes prices that are compared to the free market price levels. Currently Lithuania pays for gas probably the highest price in the entire EU. The most efficient way to alleviate the

problem is to build the LNG terminal – the cost of the facility is not excessively high, it can be constructed in two to three years and Lithuania can do it independently. Naturally that will not solve all the issues related to energy security – however, could increase its overall level by about 11%.

The energy security level of the gas sector, and in turn that of the entire energy sector could be increased also by implementing other projects such as the NABUCCO gas pipeline, gas bridge with Poland, extraction of shale gas or an increased use of biofuel for heat production, these however being more time requiring undertakings.

Compare Lithuania's energy security with that of other countries

The energy security of the Lithuanian gas sector is lower than that of all other EU States, except Estonia, Sweden and Finland. More specific estimations will be available only in the future since the other task with the project is a comprehensive evaluation of the effect of all energy projects upon the energy security of Lithuania, and, using the developed methodology – though to an extent simplified – estimation of the level of energy security of other EU States in relation to that of Lithuania. The project will also include the formation of the criteria for the acceptability of the energy security level of Lithuania. One of such criteria could be the average energy security level in EU States.

In what respect will any further and

more detailed research in energy security be valuable?

Lithuania could with not much difficulty enhance the level of its energy security should it have unlimited financial resources. However, in real life we have to seek a compromise solution. The research in energy security is one of the tools that will facilitate decision makers in evaluating different energy development projects and select the most efficient.

What determines a country's energy safety?

The energy security perspective depends not only on the decisions we make, but also to a large extent upon the development of energy sector in Europe as well as on the global scale. As of today we stand on a crossroad of a number of roads and paths to which we may turn. There are some significant achievements also in the area of renewable resources: the use of wind, sun, water energy and biofuel is increasing, giant scale smart energy networks integrate energy resources ranging from the African sun to rivers in Norway. Encouraged by the successful example of the USA in the extraction of shale gas some European countries perceive the area as a path to their energy safety and independence. Focused research efforts in other types of energy is also moving ahead: research on-going in the area of the thermonuclear synthesis reactors alongside with the improvement of the technology for hydrogen conversion into electricity and designing of new batteries for vehicles.

Negotiations with Azerbaijan

Lithuania has initiated negotiations with suppliers from Azerbaijan concerning the procurement of gas. According to Arvydas Sekmokas, Minister for Energy, gas from Azerbaijan could be supplied on a barter basis. *BNS*

The new pipeline building launched

The main pipeline of major importance to the future LNG terminal from Tauragė to Klaipėda will be built by construction companies Alvora, Kauno dujotiekio statyba and Šiaulių dujotiekio statyba operating on the basis of a joint activity agreement. Within 20 months the companies will build the pipeline from the Tauragė distribution station to Klaipėda – the venue for the future second distribution station. The gross value of the project is LTL 107.569 m. *BNS*

The Energy Independence Strategy adopted

The Seimas of the Republic of Lithuania approved the National Energy Independence Strategy. The largest-scale energy projects in Lithuania include the new nuclear power plant, the LNG terminal, the commissioning of the Lithuanian – Polish power link, which will also ensure synchronous operation with ENTSO-E networks of continental Europe in future, the gas link with Poland and the underground gas repository. During the next decade Lithuania plans an investment of LTL 22-27 bn which will enable it to save as much as LTL 3-4 bn every year.

In the future terns could breed close to the terminal

The environmental impact assessment of the first ever in Lithuania and the Baltic States LNG terminal completed.



Questions of the 'Terminalas' answered by Vytautas Belickas, Head of the Environmental Impact Assessment Department of UAB Sweco Lietuva and of the environmental impact assessment project that lasted for more than half a year.

Was the environmental impact assessment of the terminal LNG terminal a complex task?

Despite being first ever object of the type in Lithuania, from the technological viewpoint the terminal is not a very complex structure. As an exceptional feature of the assessment that we conducted is the structure of the terminal's operations part of which will be conducted in the water (the LNG import terminal), and part – on land (pipeline), therefore the spectrum of the environment to be assessed became extremely extensive – included the impact upon water, its fauna and flora, shores, as well upon the entire land ecosystem, air, etc. Another important aspect – the

assessment was consistently carried out for the two alternative sites for the terminal – in the southern part of Klaipėda Seaport at Kialulės Nugara island, and at Būtingė. And thirdly, the environmental impact assessment applied the cross-border assessment and approval procedures. Despite the significant scope of the undertaking the assessment was performed smoothly and we were assisted by the numerous and a rather professional team of experts in the area.

Why it is necessary to examine and assess the impact upon environment prior to starting the construction work?

Will make it possible to protect the endangered bird species

Liutauras Raudonikis, Director of the Lithuanian Ornithology Society



We have determined that the impact upon birds in the area could be smaller if the LNG terminal is built at the Kialulės nugara island because this solution would require a shorter gas pipeline and hence a lesser destructive impact upon nature. Būtingė is probably the only location in Lithuania that still has wet coastal meadows – a habitat for different birds including some protected species, such as Eurasian curlew and the increasingly rare in the Western Europe Corn Crake. This year we even discovered two specifically rare species – Citrine Wagtail and Marsh Sandpiper; interestingly, the latter was not even included into the Red Data Book since had never before been found in Lithuania. Geese as well as other water birds fly to the meadows at Būtingė, as there are not so many of them still to be found in Lithuania.

The construction of the terminal at the Kialulės nugara island would not produce any direct impact upon the bird population. The island is a hatching place for Gulls and other shore birds though lately reeds have been rapidly covering an increasingly larger territory of the island. In the future a possibility could be considered to cover the island with sand it being the only marital island in Lithuania. Should the reed disappear from the island it could provide a habitat for new bird species that do not have suitable living conditions in Lithuania so far – such would be Sandwich Tern or Arctic Tern that currently hatch in the neighbouring islands in Poland or Estonia, or a living place for even rarer Common Tern. But these are issues for discussion in the future.

The main purpose of the assessment was to evaluate and compare the two alternative locations for the terminal and come up with the offer for the best option. Also we had to ascertain whether the terminal to be constructed in the selected location is acceptable, its possible impact upon the environment and the society and what should be done in order to avoid or at least to mitigate the impact. The report produced is a result of a lengthy and thorough evaluation – it will be presented to the society and the relevant institutions in charge of taking the final decisions concerning the construction of the terminal.

What are the main findings of the comprehensive environmental impact assessment performed?

We determined that the LNG import terminal from the technological viewpoint could be constructed in either of the locations – in the

southern part of Klaipėda Seaport at Kialulės Nugara island, or at Būtingė in the Baltic Sea; however the implementation possibilities and the possible impact may differ in the two options. Clearly, both alternatives have their shortcomings and advantages. Nevertheless, the summary environmental, technical and economic comparison carried out in the final stage of the assessment lead to the conclusion that the most optimal location for the construction of the terminal would be in the southern part of Klaipėda Seaport. In the course of the task each expert acting within the area of his expertise was not only assessing the possible impact of the terminal in each of the territories evaluated also indicated the issues to be prioritised, furthermore, offered some measures to avoid or at least to mitigate any possible impact. When implementing the project its executors will apply the measures and thus will be able to further mitigate any possible impact upon the environment.

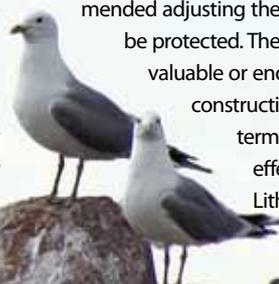
No adverse effect upon vegetation

Dr. Valerijus Rašomavičius, botanist



Differently from birds or animals plants and their natural habitats cannot move from the territory in which they grow, therefore an important factor to consider for the assessment of the impact upon the environment is the field works – a possibility

to physically survey the entire territory of planned constructions and check for any specifically valuable or endangered plant species. I am sincerely happy that when preparing the Report on the environmental impact assessment in respect of the LNG terminal this task was allocated sufficient time. The inspection of the entire designed gas pipelines determined several forest plots or small meadows that could be destroyed in the course of construction – they have been identified in the report that recommended adjusting the route of the lines to bypass the sites to be protected. The surveys did not identify any specifically valuable or endangered species of plants in the future construction locations, therefore the LNG import terminal construction will have no adverse effect upon the diversity of vegetation in Lithuania.



From the North, South or West?

In the course of the past several years the volumes of trade in LNG worldwide have been growing by more than one fifth per year – every year an increasing number of new countries become active in the market opening new import and export terminals, and the oceans are sailed by brand new LNG carriers. Thus every year more than 224 million tons of LNG are transhipped from and to different destinations.

Currently 18 countries act as active exporters of gas in liquefied form selling it to 23 countries. These numbers are increasing every year as more and more countries build liquefaction and export terminals or decide to import gas in the same way as Lithuania – by building LNG import terminals or repositories. The process is developing surprisingly rapidly – seven years ago there were 13 countries LNG exporters and 15 operated as LNG purchasers. Before long Lithuania will join the club of the importing countries – so far it has not yet been decided from which country the gas will be supplied, in any case there is a large choice of alternatives.

The LNG supply map

Qatar. The largest supplier of LNG in the world holding approximately one fourth of the global market – 26%. Qatar gained the leader's position in the field in 2006 when it outnumbered Indonesia. Since then the country managed to increase its export volumes by 150% steadily implementing new gas liquefaction facilities and building export terminals. Last spring the Lithuanian delegation headed by President Dalia Grybauskaitė visited Qatar and negotiated concerning the supply of gas from the country.

Malaysia. One of the old-timers in the LNG export market currently supplying about 10 % of the global demand. Next to rubber and tin, export of gas, oil and oil products is an important part of the economy of this South-east Asian country.

Nigeria. A country in the Western Africa meeting about 8% of the global demand for LNG. This country rich in oil resources started exporting LNG about fifteen years and has been steadily increasing the export volumes since.

Trinidad and Tobago. This little country in the Caribbean region meets 7% of the global demand for LNG.

Oman. A country in the Arabian peninsula, rich in oil and gas, meets 6% of the global demand in LNG.

Egypt. Egypt is not a significant player in the market, lately shuttered by internal unrest holds 3% of the global market.

Brunei. It is a small country on the Borneo island in the Pacific ocean inhabited by orang-outangs cared for by Biruté Galdikas meets as much as 3% of the global demand in LNG.

United Arab Emirates. Rich in oil resources the country does not pay much attention to LNG export therefore its market share decreased to 3%.

Yemen. The only country in the Arabian peninsula that has only recently established its LNG export infrastructure and now holds 2% of the market.

Equatorial Guinea. A small country in the Central Africa with slightly more than half a million of inhabitants nevertheless supplies 2% of the global LNG.

Norway. Has been exporting liquefied gas extracted on the „Snøhvit“ oil rig in the Barents sea since 2007, and currently holds 2% of the global market. One of the possible suppliers to the Lithuanian LNG terminal – independently or on a barter basis.

Indonesia. The second largest in the world exporter of LNG supplying 11% of the total volume consumed. Indonesia is one of the oldest players in the market exporting LNG since 1984. For a long time Indonesia and several other countries were sharing the LNG market as the quantities then made available could meet about 30-40% of the global demand.

Australia. The country holds 9% of the global LNG export market. Together with other countries in the Pacific – Indonesia, Malaysia and Brunei – Australia meets about one third of the global demand for LNG. Australia operates in the market for already more than twenty years and has since maintained the stable volumes of export thus playing an important role in the exporters' group.

Algeria. The largest country by area on the African continent holds 6% of the global LNG export market. Algeria manages enormous resources of natural gas those being one of the largest in the world.

Russia. Exports a small share of its gas in liquefied form thus holding 5% of the global LNG export market. The first gas export terminal built as recently as five years ago.

USA. Huge potential. 0.3% of the market – that is the share of the export market covered by the gas extracted and liquefied by the USA itself; in addition the country re-exports the gas supplied from neighbouring countries having first liquefied it. Lithuania has signed the Letter of Intent with an American energy company Cheniere concerning a possibility to supply gas.

Source: International Gas Union. The Global LNG Report, 2010.