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Golyashev, Alexander; Telegin, Andrey

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**GAS INFRASTRUCTURE  
DEVELOPMENT  
IN THE COUNTRIES  
OF EAST BALTIC  
AS A WAY TO INCREASE  
ENERGY SECURITY**

**A. Golyashev\***

**A. Telegin\*\***



*In the context of regional gas infrastructure development this paper considers the issue of energy security of the countries of East Baltic, which depend heavily on a single energy supplier — Russia. In recent years, the countries of the region have announced several LNG terminal construction projects. The European Union will provide political and financial support to only one of these projects. The paper explores the role of gas and energy in the economy of the Eastern Baltic countries. The author concludes that the countries mostly dependent on Russian gas are Lithuania and Latvia. The announced LNG terminal projects are being reviewed in detail. Their necessity is estimated from the perspective of the current and future demand for natural gas, including the terms and conditions of contracts concluded with OAO Gazprom. Different scenarios and prospects for individual LNG terminal projects and associated pipeline infrastructure are evaluated. It is shown that the inability of countries to find a political compromise on this issue and the terms of existing contracts for Russian gas, as well as low domestic demand for gas hamper the implementation of a regional LNG terminal project even in the long term.*

**Key words:** Baltic region, East Baltic, the Baltic States, Russia, the European Union, energy sector, energy security, natural gas, LNG, gas pipeline, regasification terminal

**Introduction**

In the present article the term “countries of the Baltic Sea region” is used to refer to an aggregate of all countries having access to the Baltic Sea (except for Russia), namely, Finland, Estonia, Latvia, Lithuania, Poland, Germany, Denmark, and Sweden. We do not include Russia in this list due to a number of reasons. First of all, it is too large in terms of its territory, and in this respect, it is a player of a greater scale compared to other countries of the Baltic Sea region. Secondly, all other Baltic countries are members of the European Union and

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\* Lomonosov Moscow State University; Russian Energy Agency of the Ministry of Energy of the Russian Federation GSP-1, Leninskie Gory, Moscow, 119991, Russia

\*\* Institute of Far Eastern Studies of the Russian Academy of Sciences; Russian Energy Agency of the Ministry of Energy of the Russian Federation 32, Nakhimovsky Prospect, Moscow, 117997, Russia

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thus have similar political and socioeconomic development objectives, which do not always coincide with those of Russia. Thirdly, the key issues considered in the article relate to the sphere of energy, where the tension between Russia and the European Union is particularly palpable.

We will also use the term “countries of East Baltic” in a broad sense. In certain documents<sup>1</sup>, the EU brings together its members situated on the eastern coast of the Baltic Sea — Finland, Estonia, Latvia, and Lithuania — under the term “Eastern Baltic Sea area” as opposed to West Baltic (Poland, Germany, Denmark, and Sweden). On the other hand, a number of researchers, for example, L. M. Grigoryev in his work entitled “Competition and cooperation: the economic prospects of East Baltic” include Estonia, Latvia, Lithuania, and Poland into the region. This is explained by the similarities in the socio-economic development of the four countries in the 20<sup>th</sup> century as a part of the “socialist camp” which resulted, in particular, in their late accession to the EU (all four countries entered the EU in 2004) [1]. Thus, without any reservation, only the former countries of the USSR — Estonia, Latvia, and Lithuania — can be classified as countries of East Baltic. In this article, the concept “countries of East Baltic” will be interpreted in a narrow sense according to the above definition of the European Union, since the development of political decisions in general and those in the field of energy security in particular for all countries of the region is closely connected with the position of the European Union, voiced by the European Commission. Nevertheless, in a broad sense, we also consider Poland as a country of East Baltic. Only these EU countries border Russia; it is the fact that facilitates active development of transboundary cooperation and, at the same time, results in heavy dependence of the states of East Baltic on Russia’s energy resources.

Energy is one of the key sectors of the economy of the Baltic States. Issues relating to energy security are widely discussed both by the expert community and politicians. We consider the problem and prospects of energy security of the Baltic Sea region countries, especially, of its eastern part, from the perspective of natural gas supply. The focus of our study is the development of gas infrastructure (in this case, the projects of LNG terminals and gas pipelines construction) in the states of East Baltic and its capacity to ensure energy security of the aforementioned countries and the region in general.

In the present study we aim to identify the main features of the gas infrastructure development projects implemented in the region and assess their prospects. We suppose that the number and uncertain nature of the announced projects, alongside with the insufficient economic consideration employed to justify political ambitions, make the implementation of these projects and as well as regional compromise impossible in a short-term perspective.

The relevance of the article is explained, first of all, by the fact that the economies of the countries of East Baltic are heavily dependent on gas, which is delivered almost solely from Russia. At the same time there is no substitution for Russian gas in the Baltics — the only NPP in the region (the Ignalina NPP) has been out of operation for several years, whereas the construction of a

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<sup>1</sup> For example, in the Baltic Energy Market Interconnection Plan, (BEMIP) proposed by the president of the European Commission, José Manuel Barroso at the end of 2008.

new one is still questionable. Finland, which has two operating NPPs, and Poland, whose energy industry exploits mainly local coal reserves, are more independent in terms of energy resources. On the other hand, Russian gas supply has stably met the regional demand during the two decades of independence of the Baltic States following the collapse of the USSR. However, it does not mitigate concerns of the population and politicians of the Baltics about the need to increase energy efficiency in their countries and reduce the countries' dependence on Russia [2]. Although the aspiration towards the diversification of energy resource supply is mostly justified, it is the political aspect that serves as the driving force in case of the Baltic LNG terminals. Therefore, the regional states are actively looking for an alternative supplier of natural gas.

### **The significance of Russian gas and its import for the countries of the region**

Natural gas occupies an important, although not always crucial role in the economy of the countries of East Baltic (table 1). Its share in primary energy consumption of Poland, Finland, and Estonia is 9—13 %. In Latvia and Lithuania, the issue of stable gas supply is a question of survival (Russian gas accounts for 30 % of primary energy consumption in both countries). At the same time, in absolute terms, the three former Soviet republics consume not much more than Finland (5.6 billion m<sup>3</sup> in 2011 against 4.1 billion m<sup>3</sup>), whereas the leader in this respect is Poland with 17.2 billion m<sup>3</sup> per year. The share of gas in the electricity mix is the highest in Lithuania and Latvia — 64 and 45 % as of 2010 respectively. At the same time, Poland's electricity industry is based on coal; the Finnish one broadly uses NPPs and HPPs, whereas the Estonian one works on the local oil shale.

*Table 1*

**The share of gas in the energy industry of the countries  
of East Baltic, 2010—2011**

Year	Country	Gas consumption, billion m <sup>3</sup>	Gas share, %		Gas import to consumption, %	Share of RF in gas import, %
			Primary energy resource consumption	Electricity mix		
2010	Finland	4.7	10.5	14.0	100	100
	Estonia	0.7	10.1	2.3	100	100
	Latvia	1.8	33.1	45.1	61.8 <sup>2</sup>	100
	Lithuania	3.1	36.0	63.8	99.7 <sup>2</sup>	100
	Poland	17.2	12.6	3.1	63.5	89.5

<sup>2</sup> In effect, import accounts for 100% of Latvian and Lithuanian consumption. The deviating statistical data given in the table are explained by the injection of gas surplus into the Inčukalns underground gas storage (UGS, Latvia) in certain years (for example, 2011), and its withdrawal from the storage to meet peak demand in other years (for instance, 2010). According to the agreement concluded by the countries Lithuania has a quota in this UGS [3].

End of table 1

Year	Country	Gas consumption, billion m <sup>3</sup>	Gas share, %		Gas import to consumption, %	Share of RF in gas import, %
			Primary energy resource consumption	Electricity mix		
2011	Finland	4.1	9.8	13.1	100	100
	Estonia	0.6	9.1	1.9	100	100
	Latvia	1.6	...	...	109.4 <sup>2</sup>	100
	Lithuania	3.4	...	...	104.1 <sup>2</sup>	100
	Poland	17.2	12.5	3.6	68.7	85.7

*Source:* calculated by the authors on the basis of data collected by the World International Energy Agency (IEA).

The states of the Baltic Sea region are, in general, gas deficient; most of them have to import gas in order to meet their domestic demand. At the same time, Russia holds the leading position among countries exporting gas to East Baltic States. Only Poland buys 10—15 % of the imported gas in Germany, at the same time, the country meets more than 30 % of the domestic demand through national resources. Other countries of the region depend 100 % on Russia and interpret this situation as a threat to the sustainability of their development. It is especially true in case of Lithuania and Latvia, for which the hypothetical problems with Russian gas supply would mean serious problems for their economy.

### **The development of liquefied natural gas (LNG) trade in the Baltic Sea region**

As the international natural gas trade develops, the focus is shifting to LNG; many countries of the world — especially gas importers interested in the diversification of flexible gas supply — have already announced their plans to create the necessary infrastructure. Let us analyse the situation developing in the countries of the Baltic Sea region.

The first and, as of today, the only regasification terminal on the coast of the Baltic Sea was put into operation in Sweden in the town of Nynäshamn 50 km to the south of Stockholm in May 2011. Its capacity is only 470 mln m<sup>3</sup> per year. However, it is sufficient to meet 30—35 % of the domestic demand [4]. The terminal also makes it possible to diversify delivery routes: LNG is transported to Sweden from Norway, whereas earlier the national gas demand was met solely through deliveries from Denmark. In November 2012, it was announced that, another LNG terminal would be constructed in Sweden (this time, on the west coast, in the town of Lysekil 100 km north of Goteborg) [5]. It is scheduled to be put into operation in spring 2014 and, judging by the swiftness of construction of the first terminal (the second will be built by the same German company — Linde Group), which lasted from spring 2009 to spring 2011, the deadline seems to be quite feasible [6].

In March 2011, the construction of an LNG terminal commenced in the city of Świnoujście in north-west Poland. Partially, the cost of construction will be covered by the EU subsidies. At the first stage (scheduled to be completed in the middle of 2014), the terminal capacity will reach 2.5 billion m<sup>3</sup> per year, later it will be increased to 5 billion m<sup>3</sup> (2016) and 7.5 billion m<sup>3</sup> (2021). The LNG supply (since 2014) was secured in 2009 through a 20-year agreement with the company Qatargas.

### LNG terminals in East Baltic

At the same time, in East Baltic, the situation around the development of LNG infrastructure is more complicated. In the 2000s, all the countries of the region (Lithuania, Latvia, Estonia, and Finland), whose gas consumption is fully met by the pipeline deliveries from Russia, entered into active discussion of projects for the construction of national regasification terminals (see fig.). However, the low domestic demand makes the construction of several terminals excessive, which — alongside the need for the EU financial support — gave rise to competition and conflicts between the Baltic States contending the right to build an LNG terminal that would cater for the whole region.

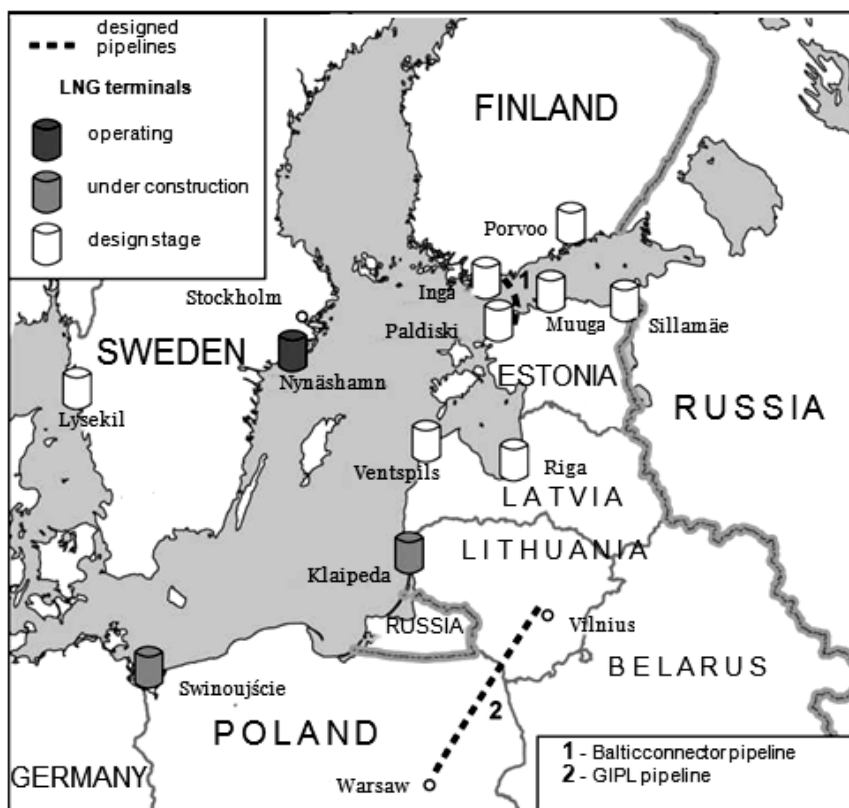


Fig. The prospect of development of gas infrastructure in East Baltic

Source: compiled by the authors on the basis of open data.

Lithuania, which started to promote the LNG project in Klaipeda as early as 2010, has achieved more in this field than the other countries. The construction of an LNG terminal in the Port of Klaipeda was identified as a priority in the National Strategy for Lithuania's energy independence approved in 2012. The project has already commenced; it is supervised by the Lithuanian company Klaipedos Nafta (70.63 % of its shares are publicly owned). The terminal development plan has been developed and approved. A floating LNG terminal — a storage vessel — and gas equipment will be leased out by the Norwegian company Hoegh LNG. The vessel of a capacity of 170 thousand m<sup>3</sup> will be leased out in autumn 2014. The capacity of a 200 mln euros LNG terminal will amount to 2—3 billion m<sup>3</sup> per year.

Estonia is considering three options of locating an LNG terminal on its territory: it is the ports of Paldiski 40 km west of Tallinn, Muuga (the largest port in the country) in the town of Maardu 10 km north-east of Tallinn, and Sillamäe in the north-east of the country in the vicinity of the border with Russia. The first two options have been largely supported by experts and population.

The Paldiski LNG terminal project was selected by the Estonian company Balti Gaas as early as 2010. Detailed documentation was produced later, in July 2012; the project was approved by the local Department of the Environment; the detailed planning of the terminal, which was earlier approved by the Paldiski City Council, was discussed in autumn [7; 8]. However, the Estonian Fund for Nature (ELF) considered the environmental impact analysis insufficient and challenged the decision in court. It can become an additional obstacle for the LNG project implementation, the two-year construction works are scheduled to be commenced in summer 2013 [9].

At the same time, the Muuga LNG terminal, which is designed to be constructed in the vicinity of Tallinn, is being actively discussed. The Elering company (the operator of Estonian electric networks) and Tallinna Sadam (a network of Estonia's largest ports) signed a cooperation agreement, which covers initial works on the design of a terminal in the port of Muuga [10]. Later, Elering and Tallinna Sadam signed a memorandum of agreement with the company Vopak LNG (the Netherlands) in order to identify the possibility of project implementation; as a result, in September 2012, the Danish consulting company Ramboll Oil & Gas A/S announced that, according to their analysis, the port of Muuga is the best site for the construction of an LNG terminal in the Baltic area [11]. A little bit earlier, the terminal project was approved by the local authorities [12]. The designed capacity of the terminal, whose cost the Danish experts assessed at 221 mln euros, will achieve 90,000 m<sup>3</sup>, which will make it possible to receive 3.3 billion m<sup>3</sup> per year.

The third possible site for the construction of an LNG terminal in Estonia — the port of Sillamäe — receives least support both in the expert community and among the local population (a public discussion of the project took place in spring 2012) [13]. Earlier, in November 2011, the City Council of Sillamäe initiated an assessment of the environmental impact of

the construction of an LNG terminal of a capacity of up to 2.3 mln t per year [14].

Latvia still lags behind its Baltic neighbours. There are two prospective sites for the construction of an LNG terminal: the capital port of Riga and the port of Ventspils, which, unlike the port in Riga, is ice-free [15; 16]. Latvia's claim to the construction of a regional terminal on its territory is based on the following arguments: the geographical positions in the centre of the region and the only regional underground gas storage Inčukalns, which is used for storing gas in order to meet peak demand [17]. Sometimes Latvia returns to the discussion of the plans to construct another UGS — this time in Dobele — of a capacity of up to 5—10 billion m<sup>3</sup>. However, Latvia is increasingly inclined to support the construction of an LNG terminal in Estonia, with a reservation that it is necessary to use Latvian UGSs [18].

Finland (represented by the company Gasum), which announced its firm plan to import LNG only in spring 2012, already considered two projects of LNG terminals to be constructed on its territory — in the cities of Ingå and Porvoo (the port of Sklodvik) [19]. The construction is scheduled to be completed in 2018. The LNG terminal in Ingå is designed to import 19.2 mln m<sup>3</sup> per day (7 billion m<sup>3</sup> per year), that in Porvoo to import 9 mln m<sup>3</sup> per day (3.3 billion m<sup>3</sup> per year).

### **The Booz & Company report on the comparison of regional LNG terminals**

In 2012, the European Union, which acts as a sponsor (although only partially) and, consequently, an arbitrator in disputes between the Baltic States in order to make a well-grounded decision in favour of a certain project, had to hire the German consulting company Booz & Company to conduct a comparative analysis of all six Baltic projects. In November 2012, the European Commission published a report prepared by Booz & Company, which presented the results of the analysis. The German experts took into account such initial data as the existing capacities of the pipelines between the countries, the feasibility of the construction of the Baltic connector (Finland — Estonia) and GIPL (Poland — Lithuania) pipelines, the location of the Inčukalns UGS in Latvia, and the volume of gas required to meet the domestic demand of the region's countries.

According to Booz & Company, the best option is the construction of an LNG terminal in Paldiski (Estonia): the aggregate cost of the infrastructure development will be minimal in this case. In case Lithuania completes the GIPL project (alongside the implementation of the LNG terminal project in Świnoujście), the country's gas import will be diversified without any additional initiatives. Latvia, in its turn, already has an UGS. Its reserves make it possible to meet the peak demand in the country. Estonia is still the least secure country in terms of gas supply, although it is the least dependent state of the three. Moreover, in case of all countries of the East Baltic (including Finland), it is Estonia that occu-



pies the central position. German experts make an additional conclusion that the construction of an LNG terminal in Finland, whose demand for gas is comparable to the total demand of all the Baltics, is as attractive an option as that in Estonia (Paldiski). Moreover, Booz & Company emphasise that if neither Balticconnector, nor GIPL are completed, the strongest need for a terminal will be that of Lithuania — the largest gas consumer in the Baltics.

Thus, the floating LNG terminal in the port of Klaipeda (Lithuania), which is already under construction, is an outsider from the perspective of the European Union, since its construction will be more expensive and is unlikely to balance the gas pipeline network, whereas the Estonian Paldiski and the Finnish Ingå projects are the most cost-effective. The final decision on the site of construction of a regional terminal must be made by the Working Group on the Baltic Energy Market Interconnection Plan. Finally, the most important issue is that of financing — the participation of the European Union depends on the achievement of a compromise agreement by the Baltics.

The European Commission will take into account the conclusions of Booz & Company. At the same time, the final report stresses that Estonia and Finland are equally advantageous sites, which, according to experts, is indicative of the existence of a Finnish lobby [20]. However, Lithuania has already announced that Klaipedos Nafta will complete its project despite the criticism and it can be launched as early as 2014. It is important to note that the Klaipeda project decided not to wait for the EU support — it is financed from the state budget and loan funds. As a result, several LNG terminals can be constructed in the East Baltic.

### **The development of international gas pipeline infrastructure in the region**

The gas infrastructure available in the countries of the East Baltic is represented, first of all, by pipelines stretching from Russia, which — either directly or via Ukraine and Belarus — cater for all Russian gas import into the region. At the same time, if we consider the countries of the East Baltic within the European Union, the Baltics (although there are internal gas pipelines between Lithuania and Latvia and Latvia, Estonia, and Finland) resemble “islands” isolated from the rest of the European Union. Poland, which is connected by a pipeline network with Germany and the Czech Republic, is the only foreign country of East Baltic that imports gas not only from Russia, although in quite limited amounts: in 2011, Germany accounted for 11 % of Poland’s import; according to the IEA, in 2012, the country also imported gas from the Czech Republic and, before 2007, from Norway.

From the perspective of the European Union, whose logic can hardly be questioned, an increase in the energy security of the countries of East Baltic depends on the development of their gas infrastructure, which pursues two objectives:

- integration of the gas pipeline systems of Finland and the Baltics;
- connection of the Baltic States (in the best scenario, including Finland) to the gas pipeline network of Poland, which already has access to the common European gas market.

The first objective can be accomplished through the implementation of the Balticconnector project — the construction of a gas pipeline, which is expected to connect the gas transmission systems of Finland and Estonia in 2014—2015 [21]. The pipeline will cross the floor of the Gulf of Finland; its capacity will amount to approximately 2.5 billion m<sup>3</sup> per year. The project is implemented in collaboration with the Finnish Gasum, the Estonian Eesti Gaas, and the Latvian Latvijas Gāze. For the first time, Gasum announced its plans to construct a Finnish-Estonian gas pipeline in July 2006 [22]. The company aspired to gain access to the Inčukalns UGS in order to diversify and secure gas supply during the peak consumption periods. The pipeline was scheduled to be put into operation in 2010 to connect Finland and the Estonian port of Paldiski. Later, the discussion of the project came to an end. However, in connection with the discussion of the options for the construction of an LNG terminal in the East Baltic, Balticconnector became relevant once again. In February 2011, Gasum submitted a report on the preliminary engineering research on the project [21]. Two routes were proposed: the pipe will stretch to Paldiski either from Ingå or the port centre of Vuosaari in Helsinki. In the first case, its length will reach 80 km, in the second 140 km. It is likely that the first route will be chosen against the background of the construction of a large (on a regional scale) regasification terminal in Ingå to secure supply to the Baltics, whereas the second will be chosen in case the terminal is erected either in Estonia, Latvia, or Lithuania to secure supply to the capital region of Finland. According to Gasum, the project cost will amount to 96 mln euros. The financing structure and the degree of EU participation will be identified later; however, the government of Estonia lays great emphasis on it [23]. The above mentioned report by Booz & Company describes other possible routes: Ingå — Paldiski and Ingå — Tallinn, whereas the pipeline cost is assessed at 141 mln euros; in case of the construction of an LNG terminal in Lithuania or Latvia, the report considers the Balticconnector project unpractical. The final route of Balticconnector will be identified later, when the countries reach an agreement on the site of construction of a regional LNG terminal.

The second objective of the European plan for gas pipeline infrastructure development in the countries of East Baltic differs from the first one dramatically. It concerns the GIPL (Gas Interconnection Poland — Lithuania) overland pipeline, which will connect the gas transmission systems (GTS) of the Baltics and Poland via Lithuania along the Warsaw — Vilnius route [24]. According to the project presented by the companies Lietuvos dujos (Lithuania) and Gaz-System (Poland) in February 2012, the pipeline length will reach 562 km. The pipeline will stretch from one of the

main points of the Polish GTS — the Rembelszczyzna compressor station — to the Jauniunai compressor station in Lithuania [25]. The designed capacity of GIPL is 2.3 billion m<sup>3</sup> (it can be doubled in the future), whereas its cost is estimated at 471 mln euros (by Ernst & Youngm which conducted the project feasibility study in 2011) or 537 mln euros (by Booz & Company). Most part of the investment (approximately  $\frac{3}{4}$ ) will be made by the Polish party, since its territory will accommodate most of the pipe's length (351 km). The construction is expected to commence in 2016; the object is scheduled to be put into operation in 2018 [26; 27]. The major task of GIPL is to diversify gas supply to Lithuania; gas will be transmitted from Poland and, possibly, Germany. At the same time, after the gas pipeline is put into operation, Poland will gain access to the Inčukalns UGS in Latvia, which will also secure the functioning of the GTSs of the foreign countries of East Europe, whereas the Baltics will finally become a part of the EU GTS. According to the study conducted by Booz & Company, the construction of GIPL can be justified only in case the regional LNG import terminal is constructed in Estonia (or Finland), if another one is not built in Lithuania. If the first condition might be met, it is very unlikely in the case of the second one: the regasification terminal in Lithuania is already under construction. The effect of securing gas supply to the Baltics will be greater, if GIPL is constructed alongside a number of gas interconnections between the Baltics, as well as Balticconnector and an LNG terminal in Estonia or Finland.

It is interesting to note that four of the five companies participating in the Balticconnector and GIPL projects (without which the effect of the construction of a regional LNG terminal and other initiatives aimed to reduce the dependence of the countries of the region on Russian gas import will be insignificant) partially belong to Gazprom. So, 25 % of the shares of the Finnish Gasum, 34 % of the Latvian Latvijas Gāze, 37 % of the Estonian Eesti Gaas (Balticconnector), and 37.1 % of the Lithuanian Lietuvos dujos (GIPL) are owned by the Russian company. Apparently, the above-mentioned projects contradict its interests; their implementation may be complicated or even obstructed by the Russian company. In order to resolve this situation, the Baltics are making attempts at ruling Gazprom out of managing their national companies referring to the provisions of the EU's Third Internal Energy Market Legislative Package. So, in June 2012, the Riigikogu (Estonian parliament) adopted amendments to the Law on Natural Gas, according to which Eesti Gaas must sell the main gas pipelines [28]. The Lithuanian authorities also strive for the division of the Lietuvos dujos assets, which is planned to take place in 2014, after which the country's gas pipelines will be managed by a national operator. In view of the traditionally strained relations between Russia and the neighbouring countries of the East Baltic region (perhaps, except Finland), this process, in which an active role is played by the commercial courts of the countries, can take a long time and have an unpredictable effect on the development of the gas industry of the Baltic Sea region.

## The necessity of a LNG terminal construction

An important factor that can affect the development of gas infrastructure in the region is the existing long-term contracts on pipeline gas supply from Russia. Estonia and Lithuania assumed the obligation to buy fuel from Gazprom until 2015 inclusive, i. e., for these two countries, the problem of alternative gas supply since 2016 is already relevant today [29, 30]. Finland and Latvia are bound by obligations for longer periods — until 2025 and 2030 respectively, whereas Poland until 2022 [31—33]. Thus, in the near future, in case there is no significant increase in gas consumption in the countries of East Baltic, the demand of at least three of them will be almost completely met by Gazprom (unless the countries of the East Baltic and their companies dispute the “take-or-pay” principle — according to which they have to choose a legally binding minimum volume of gas — before the commercial court.

We see that the actual obstacles for the LNG terminal project implementation (table 2) are created by the economic situation relating to the future changes in gas consumption volumes. At the same time, the possibility that the regional gas consumption will grow significantly is rather faint. However, according to some EU estimates, all the countries (except Estonia, whose gas consumption is the lowest) will show a decrease or stabilisation in the consumption level, which relates to a complex of social, demographic, and economic factors [34]. On the other hand, the Booz & Company report considers two scenarios: the basic one suggests an insignificant increase in the regional gas consumptions, the other one — a more than 50 % increase.

Table 2

### LNG terminal and international pipeline projects in the foreign countries of East Baltic

Site	Country	Stage	Capacity billion m <sup>3</sup> /year
Ingå	Finland	Design	7
Porvoo	<<	<<	3.3
Paldiski	Estonia	<<	3
Maardu (the port of Muuga)	<<	<<	3.3
Sillamäe	<<	<<	2.3
Riga	Latvia	<<	3
Ventspils	<<	<<	3
Klaipėda	Lithuania	Construction	2—3
Świnoujście	Poland	<<	2.5
Balticconnector	Finland — Estonia	Design	2.5
GIPL	Poland — Lithuania	<<	2.3

Source: compiled by the authors on the basis of open data.

The floating LNG terminal is scheduled to be completed in 2014, whereas the Lithuanian and Estonian gas contracts with Gazprom expire in 2015. There is a rather realistic assumption that in a couple of years, the total gas consumption in these countries will remain at a level of 4 billion m<sup>3</sup> per year. Considering the above, the Klaipeda terminal, having a projected capacity of 2—3 billion m<sup>3</sup> per year, will meet at least a half of the demand.

Taking into account the absence of a common border, the low level of gas consumption in Estonia, and Lithuanian, rather than regional character of the project in Klaipeda, one can assume that after the construction of the terminal, Lithuania will successfully solve the problem of supply diversification through the maximum utilisation of its capacity. The country will be able to halve the import of Russian gas.

In a longer-term perspective, provided a successful implementation of the local LNG terminal, Balticconnector, and GIPL projects, as well as a better connection between the Lithuanian, Latvian, and Estonian GTSSs, Booz & Company estimates the level of diversification of gas supply to the Baltic States (i.e. the share which will be bought outside Russia) at 63%. The share of Russian gas in Polish import will see the smallest reduction (even in case the LNG terminal project in Świnoujście is successfully implemented), just as a result of high consumption. Finland, in its turn, if the regional terminal is constructed beyond its territory, will receive not more than a half of its current consumption volumes via Balticconnector.

## Conclusion

The countries of the East Baltic region see the major problem of their gas industry in the total dependence on Russia, resulting from the configuration of the industry's infrastructure. This situation — as a potential factor of the instability of economy and energy — is inadmissible both for these countries (especially Lithuania and Latvia), and the European Union, which does not want to put up with the infrastructure isolation of a large part of its territory.

A specific feature of natural gas as a commodity is based on the complexity of supply diversification. It results in the fact that the development of a large number of gas infrastructure objects, especially the international ones, comes to a standstill at the design stage. This article describes more than 10 LNG terminal and pipeline projects developed in the countries of East Baltic. At the same time, it is clear that less than half of them will be implemented. So, only on the territory of Estonia, there are three projects for the construction of LNG terminals, each of them can not only meet the national gas demand, but also ensure the satisfaction of peak demand in the neighbouring countries of the region (of course, except Russia). It is evident that in the conditions of limited internal demand in the region, in the best case scenario, only one of these projects will be implemented.

Alongside strengthening energy security of an individual country and the region as a whole, the implementation of the LNG terminal project is economically beneficial. For instance, it can result in a stronger standing of a state when it comes to energy price regulation, satisfaction of peak gas de-

mand, an increase in the investment attractiveness of gas-intensive industries, etc. Unfortunately, the selection of a site for the implementation of a regional LNG terminal project is likely to be driven by purely political considerations. Almost all of the abovementioned projects employed professional analysis and consulting companies that confirmed the feasibility of each project. The report of the Booz & Company analysts, which was considered above, seems to be the most objective. However, even this analysis is not void of politicising and subjective opinions.

The problem of the gas infrastructure reconstruction and the redirection of fuel flows within the whole region cannot be solved only by the countries of East Baltic. A rather significant factor is political and, even more importantly, financial support of the European Union. However, the united Europe, which is affected by the ramifications of the world financial and economic crisis, strives to reduce costs and imposes strict conditions, for instance, the achievement of a compromise on a single LNG terminal. However, political tension and the desire of each country to have a LNG terminal is a significant obstacle in the pathway to such an agreement. This resulted, for example, in Lithuania's virtual sabotage: the country began the construction of its own terminal and thus put in jeopardy the regional project.

At the same time, one should not forget that the construction of an LNG terminal is not sufficient to solve the problems of the countries of East Baltic. Its effect will be minimal without the development of transport infrastructure within the Baltic Sea region, including the construction of an underwater pipeline between Finland and Estonia.

When making forecasts, one should take into account actual facts and economic interests of the countries<sup>3</sup>. So, a hard fact is that the Republic of Korea is already constructing a floating LNG terminal, which will be leased out to the Lithuanians and installed in the port of Klaipeda. Moreover, Klaipeda — Jurbarkas gas pipeline is being built in Lithuania (it may be extended to reach Vilnius). All of these aspects as well as the capacity of the terminal, are indicative of the fact that whole project is focused on the satisfaction of the national needs. It is very likely to be successfully implemented. After the closure of the Ignalina NPP and the emergence of additional obstacles to the construction of the new Visaginas NPP (which were demonstrated by the referendum held in autumn 2012), the country is plagued by electricity supply problems much more than the other countries of the region.

The prospects of the construction of a new regional LNG terminal are rather vague until the expiration of Gazprom's long-term contracts with Finland, Latvia, and Poland in 2022—2023 (unless the countries succeed in disputing the “take-or-pay” principle or the gas consumption increases). The tough competition between the Baltic Sea region states for the right to construct the terminal on their territory, alongside the inability to reach an

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<sup>3</sup> A vivid example of a political project is the Amber gas pipeline stretching from Russia to Poland and Germany via the Baltics, which was actively discussed a few years ago.

agreement on the project, which is expected to be beneficial for the whole region, is indicative of the fact that benefits from turning into a regional gas hub are still put by the countries of the Baltic Sea region above their concerns about the dependence on Russian gas, which is emphasised as the main reason behind the project implementation. The geographic disunity of the region (Finland and Estonia are divided by the Gulf of Finland) reduces the possibility of its swift implementation almost to zero, at the same time, forcing the Finnish party to consider the option of a smaller LNG terminal for domestic needs.

As for the development of the gas pipeline system in the region, a failure to implement the project of a common East Baltic LNG terminal can also result in a failure of the Balticconnector project. Moreover, if the European Commission acknowledges the Finnish project as the optimal one and provides financial support for its implementation, Finland will have to invest in the Balticconnector construction to justify the regional ambitions, if they are really important for the country.

GIPL, in its turn, is based on more pragmatic considerations — the aspiration of Poland to gain access to the Inčukalns UGS to satisfy the domestic peak demand and that of Latvia to buy a certain share of gas at lower spot prices on the European gas market. For Latvia, whose gas infrastructure will undergo the least changes in the region, GIPL will be of great significance in a mid-term perspective as a means to diversify supply. In case of a failure to implement the regional LNG terminal, Balticconnector, and even GIPL projects, Estonia will be least affected, since its energy sector does not strongly depend on gas, whereas the country has significant oil shale deposits. In this case, it will be more reasonable to speak of lost profits from gas transit.

We believe that the most rational location for the regional LNG terminal is Riga. There are several factors in its favour. Firstly, a common LNG terminal is meant to primarily solve the problems of Latvia and Lithuania. So it should be located on the territory of one of these countries. Secondly, Riga lies at a distance of a mere 40 km from the Inčukalns UGS (and that of 75 km from Dobleme, where another one might be built), whereas the cost of constructing the infrastructure necessary to transmit LNG from the port to the Baltic GTSSs will be rather low. Thirdly, the construction of a large gas hub (and LNG terminal and an UGS in the geographical centre of the system) can create a cumulative effect and, alongside the implementation of the Balticconnector and GIPL secure gas supply to the East Baltic.

However, in our opinion, there is another — rather viable — option of gas infrastructure development in East Baltic. One can expect a successful implementation of the floating LNG terminal project in Lithuania, and the Estonian or Finnish projects that will be supported by the EU. In this case, the GIPL project is not likely to be implemented for the following reason: within the plan of diversifying gas supply to Lithuania, it competes with the terminal project, which has two significant advantages over the former. Firstly, it is already under construction and, secondly, there is a wide range

of LNG suppliers, which does not hold true for the pipeline from Poland (even in view of the liberalised internal market of the European Union). As shown above, the implementation of the Balticconnector project largely depends on the construction of an LNG terminal on the coast of the Gulf of Finland, which, in its turn, will be oriented towards the Finnish and Latvian markets. Thus its implementation period depends on the development of the situation around the current contracts with Gazprom.

If we take no notice of the political component of the problem and consider only the need to satisfy the peak demand for gas, the best decision could be the development of UGSs, which is often brought up by Latvia and, more seldom, by Lithuania. So, during the design stage of the Nord Stream project, Latvia proposed the construction of an overland diverging route so that the country could build several large UGSs with a total capacity of tens of billions of cubic metres [35].

Today, in disputes over the location of a regional LNG terminal, its capacity and the necessary infrastructure, economic and economic-geographical arguments are mentioned much more rarely than the political ones. Objective reasons hampering the supply of gas to the countries of East Baltic by Russian Gazprom simply do not exist. There are long-term contracts, which are very likely to be renewed. A terminal (in case it is build) will make it possible to insist on better gas supply conditions. These considerations, as well as a limited internal market (if one does not take Poland into account) explain the calm reaction of Gazprom to these developments. At the same time, owning shares of national gas companies, Gazprom has an opportunity to influence the implementation of their projects, even blocking them. The actual situation makes it possible to say that the project of a regional LNG terminal will remain at the stage of discussion and arguments for more than one year.

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### ***About the authors***

*Alexander Golyashev*, PhD student, Faculty of Geography, Lomonosov Moscow State University; Specialist, Division for Coordination of Research in Global Energy, Department for the Coordination of International Projects, Russian Energy Agency of the Ministry of Energy of the Russian Federation, Russia.

E-mail: [golyashev@gmail.com](mailto:golyashev@gmail.com)

*Andrey Telegin*, PhD student, Institute of Far Eastern Studies, Russian Academy of Sciences; Specialist, Division for Multilateral cooperation, Department for the Coordination of International Projects, Russian Energy Agency of the Ministry of Energy of the Russian Federation, Russia.

E-mail: [teleandy@gmail.com](mailto:teleandy@gmail.com)