

LNG 2016 congress RUSSIA

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VOSTOCK CAPITAL

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Road map to success

Report on LNG industry in Russia, October 2015

"LNG Congress Russia is becoming an authoritative platform for the exchange of views on issues related to the development of LNG projects in Russia"

Victor Timoshilov, Head of the East-Oriented
Project Coordination Directorate, **Gazprom**

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About the Research



Dear Colleagues!

Many thanks to all the participants of the research. Your comments, expert opinions and knowledge undoubtedly play an important role in the development of Russia's LNG industry.

*I hope that the results of the research will help you to estimate the risks and capabilities of the industry and provide a tool set for your company, enabling it to **achieve sustainable competitive advantage in rapidly changing market environment**.*

*The discussion of the industry's key challenges will continue at the "LNG Congress 2016". This event has already become a high-profile venue for the LNG industry that **brings together heads of all Russian LNG projects**, both implemented and planned.*

If you indicated in the questionnaire the capacity in which you would like to participate in the forum (speaker, participant, exhibition member, sponsor or media partner), our project team will shortly contact you to discuss the details of your participation.

I sincerely hope to see you at the Congress in Moscow, March 16-18, 2016.

Best regards,

Inessa Shahnazarova

Congress Producer

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Methodology

The methodology of this study was underpinned by the combination of qualitative and quantitative methods. It included a survey carried out with the help of a questionnaire and in-depth interviews with industry experts. It helped to gather the most recent and often publicly unavailable information from those who largely shape the future of Russia's LNG industry.

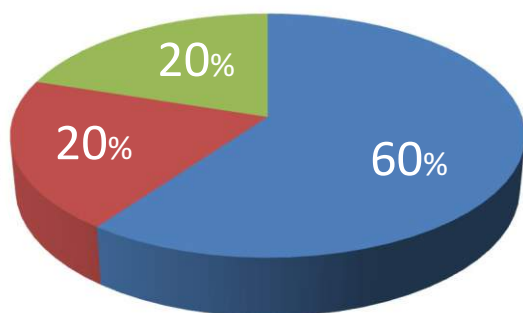
A total of 126 respondents – LNG project managers and leading experts, main contractors, technology and equipment developers and suppliers, consultants and researchers – took part in the study.

Among the companies that participated in the study:

- Yamal LNG
- Pechora LNG
- Rosneft
- Shell
- Arctic LNG 2
- Gazprom LNG Saint Petersburg
- Gazprom Export
- Cryomash-BZKM
- Emerson
- GE
- GEA
- ICIS Heren
- Industeel
- Rochester Institute of Technology
- Sheldon B. Toibb, Esq
- Yamata Yatirim
- Rubin Central Design Bureau for Maritime Engineering
- Caterpillar Eurasia
- and many others

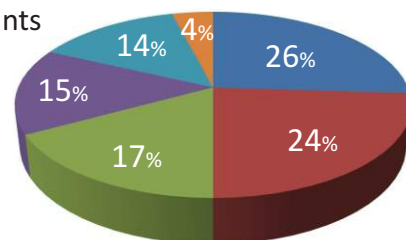
Geography of survey participants:

- 60% Russia
- 20% Europe
- 20% Asia



Classification of survey participants:

- 26% Foreign suppliers of technology
- 24% Operators LNG projects
- 17% Russian oil companies
- 15% Foreign oil companies
- 14% Russian technology providers
- 4% Consultants



Key Findings

According to the respondents, the main challenges and development risks of the LNG industry include:

- Technological dependency from foreign companies
- Slow development of internal LNG market
- Decline in gas prices

Most promising large-capacity LNG projects in Russia:

- Arctic LNG 2
- Baltic LNG
- Far East LNG
- Pechora LNG
- Sakhalin-2 – construction of the third process train
- Yamal LNG

Most promising medium and small-capacity LNG projects:

- LNG Gorskaya
- Regions where gasification projects are being implemented: Astrakhan Oblast', Vologda Oblast', Kirov Oblast', Perm Krai, Pskov Oblast' and Tomsk Oblast'

Most in-demand international technologies by:

- Siemens
- Technip
- Linde
- GE
- Kvaerner
- GEA

Most in-demand national technologies by:

- Cryogenmash
- Geliymash
- Cryomash-BZKM
- Rubin
- Ekip
- NTL

Analysis of the Survey and In-Depth Interviews

Which topics should be covered more to help you develop your business?

The respondents were asked to range the suggested topics on the scale from 1 to 3, where 1 is “very interesting,” 2 is “probably” and 3 is “not interesting at all.”

State regulation. Are there any plans for further liberalization of LNG export? Other measures to stimulate the industry at the legislative level.

Of all the respondents, **67%** consider this topic very interesting in light of the prospects of industry's development, **23%** thought that this could be interesting, while **10%** did not find it interesting.

Price formation. Impact of oil prices on LNG net cost, its competitiveness considering its high production cost.

Price formation issues are very interesting for **56%** of the respondents. The opinion of the remaining **44%** was divided with half of the respondents finding it irrelevant for their businesses, while other **22%** would like to receive a more detailed information about it.

LNG projects in Sakhalin. Sakhalin-2. Status of construction of Train 3. Far East LNG project implementation plans.

Overwhelming majority of the respondents (**74%**) find it very interesting. **20%** thought that it could be interesting.

Yamal LNG: news about the project and its implementation.

A record **82%** of the respondents find this topic most interesting. Only **3%** do not follow the news about this project. The remaining **15%** are partially interested.

The prospects of Baltic LNG, Pechora LNG and Arctic LNG 2 projects.

The answers to this question have also proven the commitment of all participants to implementation of Russian LNG projects. A total of **72%** of the respondents answered that this is very interesting for them.

Development of the LNG internal market: use for transportation and gas supply to the regions.

This question is relevant for the companies that are involved in small-scale LNG projects, and many respondents (judging by the answers in the questionnaire, the companies working in large-scale projects) did not find it important for the development of their business. Yet **50%** still pointed out that this issue is very interesting. Only **1%** of the respondents were neutral about it.

Analysis of the Survey and In-Depth Interviews

Main risks and challenges of Russia's LNG industry

This question did not have any predefined answers. The participants were supposed to identify 3 main problems, the elimination of which would contribute to successful development of their business. Here the opinions cannot be neatly divided into several groups, but the main trends are:

- **Western restrictive measures.** Currently the construction of an LNG plant in Russia almost entirely depends on foreign-made equipment and partnership with international companies. So far, cooperation in the gas area has not been limited by the sanctions from the EU and US. Yet foreign political situation greatly endangers the plans of Russian state companies to enter the LNG market, while the government insists that companies increase the share of Russian-built equipment in its projects already now and import substitution is one of the primary national strategies. The respondents hope that the sanctions imposed by the Western countries against Russia will not have any long-lasting negative consequences.
- The situation with **small-scale LNG projects** is precisely the opposite of the one with large-scale projects. With small national LNG market, Russian companies export their mini cryogenic plants abroad (in particular, to China). Market capacity of the Russian low-tonnage LNG production is relatively small compared with the rapidly growing foreign markets. Recently, however, the need to develop this market has become apparent and major companies began the construction of small-capacity production plants. The respondents view as promising the projects where Russian and foreign technologies can and should be used in parallel.
- **Gas prices.** As in the case of natural gas, LNG prices go down following the oil prices and changes in market environment. According to the estimates, between 2015 and 2030 LNG prices are expected to drop when it enters the market in 2020 in large volumes, potentially causing oversupply. According to some experts, rapid development of spot trade brings about the reduction of the overall gas price. On the other hand, the respondents think that this is not a matter of choosing between spot and long-term contracts; Russia should develop both approaches, benefiting the most from the contracts with included regulation mechanisms.

Analysis of the Survey and In-Depth Interviews

Most promising large-scale LNG projects in Russia:

- **Arctic LNG 2** holds a license for Salmanovsky (Utrenniy) land area with the field of the same name. It is located in the northern Gydan and is considered the largest on the peninsula with proven reserves of 235 bln m³ of gas and almost 9 m tonnes of liquid hydrocarbons. Based on these riches, Novatek plans to build the second LNG plant in this region.
- **Baltic LNG** is an LNG plant construction project in Ust-Luga in Leningrad Oblast'. Plant's capacity is 10 m tonnes with the possibility of expansion to 15 m tonnes; first shipments of LNG are scheduled for the fourth quarter of 2020. To ensure gas supply for liquefaction, 360 km of gas main needs to be built from Volkhov with line capacity of 25 bln m³. In September 2015 Aleksei Miller, Gazprom's CEO, announced the start of commercial talks about the construction of the plant.
- **Far East LNG.** Rosneft, together with its Sakhalin-1 project partners, is giving consideration to implementation of Far East LNG project onshore, since they have not obtained access to Sakhalin-2 project infrastructure.
- **Pechora LNG** is a large-scale development project in Kumzhinskoye and Korovinskoye fields in Nenets Autonomous Okrug. It includes the construction of gas transportation infrastructure, LNG production plant, gas processing facility and marine terminal. To this end, Rosneft and ALLTECH Group have signed the updated commercial parameters for cooperation.
- **Sakhalin-2** project is the only operating large-scale LNG plant in Russia. Project operator is Sakhalin Energy (50% plus one share held by Gazprom). Currently there are plans to extend the project by adding a third process train.
- **Yamal LNG** is an integrated LNG production and liquefaction project in Sabetta. It includes 3 gas liquefaction trains with the capacity of 5.5 m tonnes each to be commissioned in 2017, 2018 and 2019.

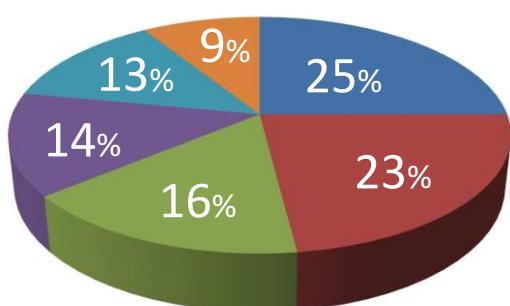
Analysis of the Survey and In-Depth Interviews

Most promising medium- and small-scale LNG projects in Russia:

- LNG Gorskaya** project that includes the construction of a “floating LNG plant” with the capacity of 1.26 m tonnes, fleet of 9 bunkering vessels, pier, loading rack, gas pipeline and the establishment of several gas terminals abroad: in Finland, Germany and Sweden. Production will consist of 3 trains each with processing capacity of 656 m³ per year that will be commissioned in stages: in 2016 (stage 1), 2018 (stage 2) and 2020 (stage 3).
- In 2014, **Gazprom** started up its gasification pilot project in Perm Krai. The project involves the construction of LNG plant in Kanyusyata (Karagaisky district) and 3 intake, storage and regasification stations in Ilyinskoye (Ilyinsky district), Nerdva (Karagaisky district) and Severny Kommunar (Sivinsky district). The project was commissioned by Gazprom Gazenergoset. The plants are constructed in Astrakhan and Pskov Oblasts. In Tomsk Oblast' Gazprom plans to implement a project of an autonomous LNG gasification plant that includes the construction of a mini plant as well as LNG intake, storage and regasification stations in 4 settlements. Similar projects are being discussed in Vologda and Kirov Oblasts.

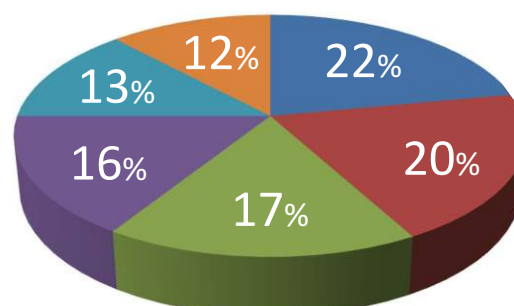
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- 16% Linde
- 14% GE
- 13% Kvaerner
- 9% GEA



Most in-demand national technologies by:

- 22% Cryogenmash
- 20% Geliymash
- 17% Cryomash-BZKM
- 16% Rubin
- 13% Ekip
- 12% NTL



The results of this study and most promising Russian LNG projects will be discussed at:

LNG 2016

16-18 March
Moscow

congress RUSSIA

Road map to success

If you have any questions regarding participation at the Congress, please contact:

To become a speaker or member of the committee



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