GAZPROM

Vladivostok-LNG

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Pioneer Aerial LNG carrier

Liquefied natural gas

Natural gas cooled down after purification from admixtures to the condensation temperature (–161.5°C) turns into a liquid called liquefied natural gas (LNG). The volume of gas is reduced 600 times during liquefaction, and it is one of the main advantages of this technology.

LNG can be transported in specially designed cryogenic tanks: sea vessels (LNG carriers) or road tankers. This permits to deliver gas to the areas located far from gas pipelines that are traditionally used for conveying conventional natural gas.

LNG plant in Sakhalin

Gazprom in global LNG market

Global LNG consumption grows rapidly. To date, Gazprom supplies LNG to 10 countries worldwide. The Company's share in the global LNG market (with consideration for LNG shipments from the Sakhalin II project and as part of trading operations) is 5 per cent.

Gazprom aims to speed up its new LNG projects. The Company's goal is to supply around 15 per cent of the global LNG market. The Vladivostok-LNG project will be a crucial step in accomplishing this objective.

3D model of LNG plant in Vladivostok

Vladivostok-LNG

Under the Vladivostok-LNG project, a liquefied natural gas plant will be built in the Khasansky District of the Primorye Territory (Lomonosov Peninsula, Perevoznaya Bay). The plant will have three process trains with an annual capacity of 5 million tons of LNG each. The first train will become operational in 2018.

The LNG plant (first two trains) will be fed with gas from the Sakhalin gas production center as well as (third train) from the Yakutia and Irkutsk centers. The Asia-Pacific region will be the target market of the project.

In February 2013 the project entered the investment stage. Gazprom compiled a list of potential strategic partners, whose overall stake in the project might amount to 49 per cent, provided they purchased at least 6 million tons of LNG to be produced as part of the project. Talks are underway with potential LNG buyers.

Onshore processing facility at Kirinskoye field

Resource base of Vladivostok-LNG project

The Sakhalin III project, where Gazprom holds four licenses for the Kirinsky, Ayashsky, Vostochno-Odoptinsky blocks and the Kirinskoye field, will be one of the main gas supply sources. Sakhalin III resources estimated at around 1.1 trillion cubic meters are mostly concentrated within the Kirinsky block.

Polyarnaya Zvezda drilling rig

Kirinskoye gas and condensate field

In 2009 Gazprom started developing the Kirinskoye field discovered in 1992 and located in the Sea of Okhotsk, 28 kilometers off the coast. Geological exploration was completed in 2011. All reserves are within the C1 category (explored) and amount to 162.5 billion cubic meters of gas and 19.1 million tons of gas condensate.

In 2012 Kirinskoye saw the construction of production wells with the use of the Polyarnaya Zvezda (Polar Star) semi-submersible drilling rig. After reaching full capacity in 2013, the field is projected to annually produce 5.5 billion cubic meters of gas. For the first time in Russia gas will be extracted by a subsea production facility.

Severnoye Siyaniye drilling rig

Yuzhno-Kirinskoye gas and condensate field

In September 2013 Gazprom discovered a large Yuzhno-Kirinskoye field in the Kirinsky block. As of today, its C1+C2 reserves (proven and provisionally estimated) amount to 564 billion cubic meters of gas and 71.7 million tons of condensate.

In 2013 two exploratory wells will be drilled in the field, one of which – with the use of the Severnoye Siyaniye (Northern Lights) semi-submersible drilling rig. In 2014 another two wells are expected to be drilled. In 2015 geological exploration will be completed and the field will be prepared for pre-development.

Gas will be produced from the field by a subsea production facility. Gas extraction is expected to exceed 13 billion cubic meters. The field is planned to be brought onstream in 2018.

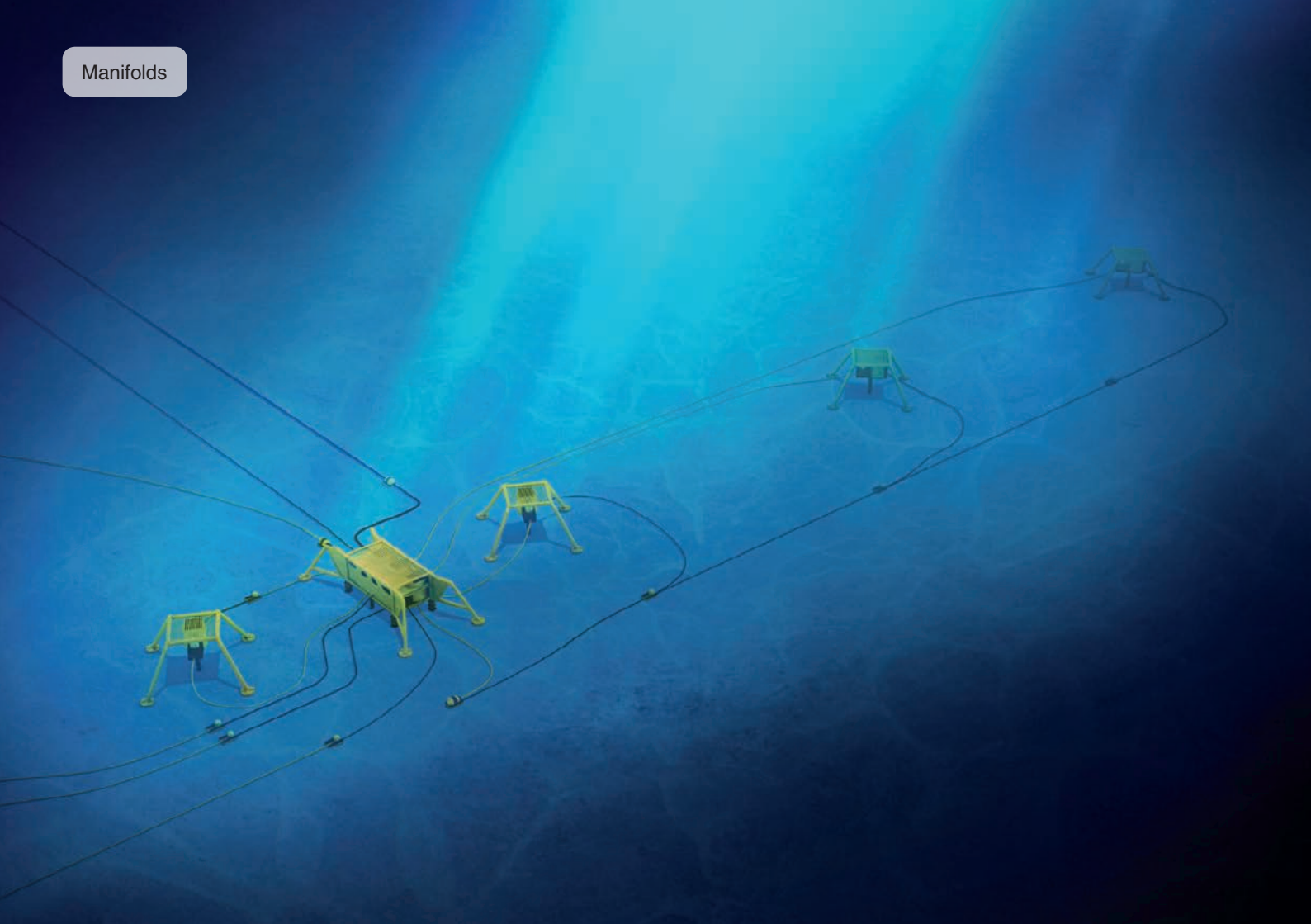
The Yuzhno-Kirinskoye field will be the main resource base for the Vladivostok-LNG project.

Severnoye Siyaniye drilling rig

Polyarnaya Zvezda and Severnoye Siyaniye semi-submersible drilling rigs

Polyarnaya Zvezda and Severnoye Siyaniye semi-submersible drilling rigs were manufactured on Gazprom's order by Vyborg Shipyard in 2011. The platforms are designed for operation under the Arctic conditions and can perform exploration and production drilling as well as testing of oil and gas wells down to 7,500 meters at water depths between 70 and 500 meters. The length of the deck is 84.48 meters, its width is 72.72 meters, the height from the deck level – 54.64 meters and the height to the top of the drilling rig – 128 meters.

Manifolds



Gas production technology

Natural gas to be produced from the Kirinskoye and Yuzhno-Kirinskoye fields (in future – from other fields as well) will be fed to manifolds and then conveyed via subsea pipelines to an onshore processing facility (OPF) for treatment purposes.

Processed gas will be moved via a 139 kilometer pipeline from the OPF to the Sakhalin main compressor station at the Sakhalin – Khabarovsk – Vladivostok gas transmission system.


Sakhalin offshore fields
RUSSIA
KOMSOMOLSK-ON-AMUR
SEA OF OKHOTSK
YUZHNO-SAKHALINSK
KHABAROVSK
ЯПОНИЯ
PACIFIC OCEAN
CHINA
SEA OF JAPAN
VLADIVOSTOK
NORTH KOREA
Existing gas pipelines
Sakhalin – Khabarovsk – Vladivostok gas transmission system

Sakhalin – Khabarovsk – Vladivostok gas transmission system

The gas transmission system (GTS) route starts in Sakhalin, crosses the Nevelsky Strait, passes near Komsomolsk-on-Amur and Khabarovsk and ends in the vicinity of Vladivostok. Gazprom has constructed the GTS sections from Sakhalin to Komsomolsk-on-Amur and from Khabarovsk to Vladivostok with a total length of 1,354 kilometers (diameter – 1,200 millimeters, operating pressure – 100 Ata). The existing gas pipeline connecting Komsomolsk-on-Amur to Khabarovsk (diameter – 700 millimeters, length – 472 kilometers) is also a part of the GTS. The total GTS length exceeds 1,800 kilometers.

Sakhalin main compressor station

Sakhalin main compressor station

The Sakhalin main compressor station located in the northern part of the Sakhalin Island is a starting point of the Sakhalin – Khabarovsk – Vladivostok GTS. The station has two gas compressor units with an aggregate capacity of 32 MW.

With increasing consumption the GTS linear section will be extended from Komsomolsk-on-Amur to Khabarovsk, and the GTS throughput capacity will be boosted through the commissioning of additional units at the Sakhalin main compressor station and the construction of another 13 compressor stations. Thus, the fully loaded GTS will be able to annually convey some 30 billion cubic meters of gas from Sakhalin.

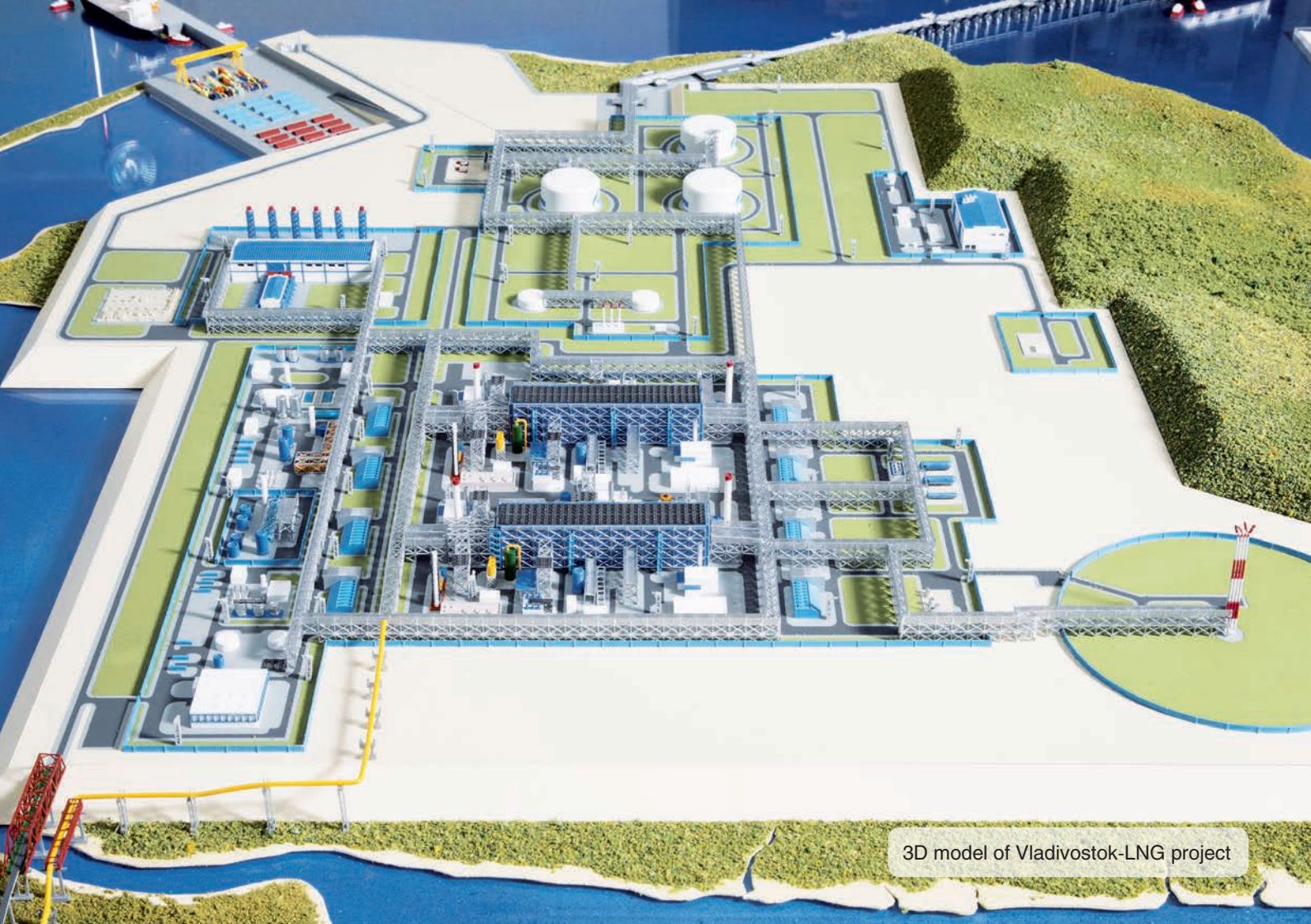
Production platform at Lunskoye field, Sakhalin II project

Successful implementation of LNG projects – Sakhalin II

The Sakhalin II project is implemented by an international consortium on the Production Sharing Agreement terms. Gazprom is the majority shareholder of the project.

Three offshore platforms produce natural gas from the Piltun-Astokhskoye oil field and the Lunskoye gas field situated in the northeastern part of the Sakhalin shelf. Hydrocarbons are supplied to an onshore processing facility. Later on, oil and gas are conveyed via a pipeline system to the southern part of the Sakhalin Island where an oil export terminal and Russia's first LNG plant are located.

In 2009 the LNG plant was put onstream. In 2010 the LNG plant not only reached its design capacity (9.6 million tons of LNG per year), but surpassed it producing over 10 million tons of LNG. Over the last couple of years LNG production has steadily exceeded 10 million tons.



3D model of Vladivostok-LNG project

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