RAW MATERIALS BASE AND PRODUCTION

RAW MATERIALS BASE

PRMS HYDROCARBON RESERVES OF THE GAZPROM NEFT GROUP (MN TOE)

Source: Company data

	2013	2014	2015	2016	2017
Total	3,212	3,639	3,875	3,908	4,022
Developed	517	639	680	726	719
Undeveloped	827	804	838	788	803
Proven	1,343	1,443	1,518	1,514	1,522
Probable	948	1,112	1,181	1,205	1,259
Proven + probable	2,291	2,555	2,699	2,719	2,781
Possible	922	1,084	1,176	1,189	1,240
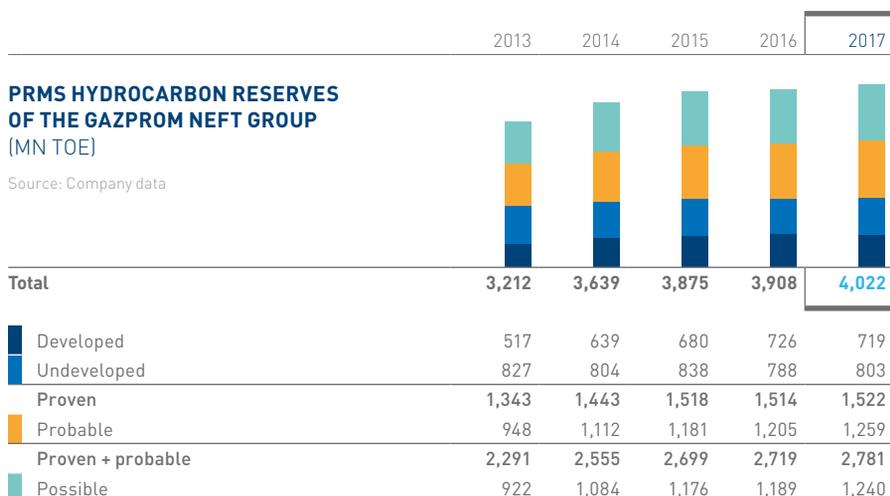
The resource base of the Company's current assets has deteriorated in terms of the remaining commercial reserves as most fields are in a late stage development. An increase in high-tech drilling and the use of tertiary methods for boosting oil recovery has enhanced the efficient development of these reserves. The Company's reserves are audited according to PRMS-SPE standards and the more conservative SEC standards. Based on the report of DeGolyer and MacNaughton's independent engineers, total proven and probable hydrocarbon reserves (including the Company's

Discovery of the Neptune field

Commissioning in 2025–2027

255 MN TOE GEOLOGICAL RESERVES

80 MN TOE RECOVERABLE RESERVES

6 MN TOE PER YEAR AT PEAK PRODUCTION

AYASHSKY LICENSED AREA part of the Sakhalin-3 project

Yuzhno-Sakhalinsk
Sakhalin

Pacific Ocean

In October 2017, Gazprom Neft Shelf LLC discovered a new hydrocarbon field after drilling and testing a prospecting and appraisal well at the Ayashsky license area on the shelf of the Sea of Okhotsk, 55 km from the coast of Sakhalin Island. The field was given the name 'Neptune'.

The field was one of the top discoveries of the year. For the Company, it provided an opportunity to enter a new region and marked the next step in offshore development.

The quality of the oil that was obtained and the results of the well tests suggest that the field can be successfully developed.
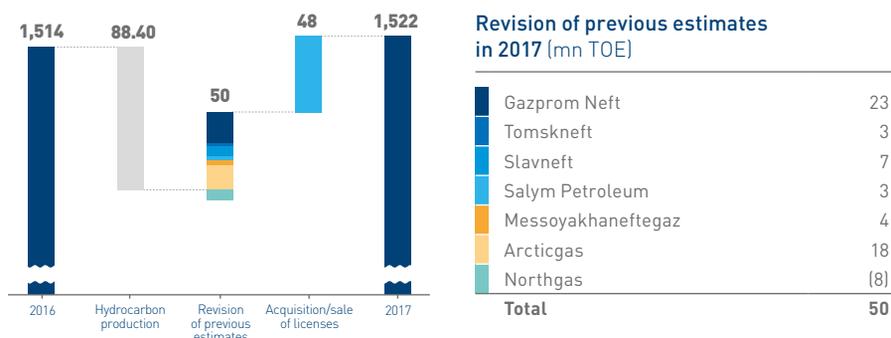
The geological reserves of Neptune are estimated at 255 million TOE, recoverable reserves could reach as much as 70-80 million TOE, and production could peak at around 5-6 million TOE per year. Existing road maps indicate the Neptune field could be commissioned in 2025-2027.

stake in the reserves of affiliates accounted for using the equity method) amounted to 2.781 billion TOE (1.875 billion tonnes of oil, 1.128 trillion m^3 of gas), excluding NIS, as of 31 December 2017.

In 2017, the Group obtained the right to develop the Tazovskoye field (recoverable reserves of 72 million tonnes of oil, 4.6 million tonnes of condensate, and 183.3 billion m^3 of gas) and the North Samburgskoye field (recoverable reserves of 90.5 million tonnes of oil) in the Yamalo-Nenets Autonomous District.

MOVEMENT OF PROVED RESERVES IN 2017[1] (MN TOE)

Source: Company data

	2016	Hydrocarbon production	Revision of previous estimates	Acquisition/sale of licenses	2017
	1,514	88.40	50	48	1,522

Revision of previous estimates in 2017 (mn TOE)

Gazprom Neft	23
Tomskneft	3
Slavneft	7
Salym Petroleum	3
Messoyakhaneftegaz	4
Arcticgas	18
Northgas	(8)
Total	**50**

1 — Data does not include NIS reserves.

Electronic Asset Development (EAD)

Technology A.1

100–200
SAMPLES
WILL INCLUDE THE FULL BASE
OF THE DIGITAL CORE

+15%
INCREASE IN THE SERVICE
LIFE OF WELL EQUIPMENT
AS A RESULT OF EAD

−12%
REDUCTION IN ENERGY COSTS
DUE TO THE INTRODUCTION
OF EAD

Electronic Asset Development (EAD) is a development strategy for Gazprom Neft's IT projects in exploration and production.

Nine IT projects were implemented in 2017 and more than 30 are in the development stage. The projects that were implemented include ERA: ISKRA (an integrated design system that helps to make decisions on field development), ERA: GRAD (a digital workstation for field development engineers), ERA: VEGA (a platform for the probabilistic geological and economic valuation of stocks and assets), and ERA. REPAIRS (automated well repair control).

The Company also utilizes GeoMate, a platform used to analyse and process all geological and geophysical information on fields. The 'Digital Core'[1] project will be implemented on its core. It will make it possible to use machine learning to build 3D models of a core on which mathematical experiments can be conducted, thus reducing the need for lengthy laboratory research.

1 — The core is a sample of rock, usually in the form of a cylindrical column, which is extracted from a well using a special type of drilling. It allows for studying the rocks cut by a borehole and determine the mineral reserves. For this purpose, the core is subjected to chemical, spectral, petrographic, and other analyses in a laboratory.

Licenses were also obtained for the Novosamarskoye field in the Orenburg Region, the Parabelsky exploration site in the Tomsk Region, the Ayashsky section on the shelf of the Sea of Okhotsk (where the new Neptune field was discovered with estimated geological reserves of roughly 255 million TOE), and the West Chistinny section in the Khanty-Mansi Autonomous District-Yugra.

The average size of the discoveries in 2016-2017 expanded to 26 million tonnes of production potential, which is several times higher compared with 2010-2015. These achievements are largely due to the introduction of new geological exploration approaches and technologies.

The Group also acquired a 25.02% stake in the company Evrotek-Yugra, which owns seven exploration and production licenses in the Khanty-Mansi Autonomous District-Yugra, from the Spanish company Repsol and has the right to increase this stake to 50%.

Exploratory drilling at the Group's subsidiaries resulted in the discovery of 31 new hydrocarbon deposits and 4 new fields, namely: the Alexander Zhagrin field (Khanty-Mansi Autonomous District-Yugra), Novozarinskoye (Orenburg Region) as well as Kumane and Begeytsy-X in Serbia. Tomskneft discovered the Melimovskoye field (Tomsk Region).

Total proven and probable hydrocarbon reserves in 2017

2,781
MN TOE

Cognitive technologies

Technology A.2

−75%

TIME SAVED
ON INFORMATION ANALYSIS

Cognitive technologies involve the use of artificial intelligence and the analysis of big data to solve production problems. Gazprom Neft not only seeks out such technologies on the market, but also develops its own unique products.

For example, at present a geologist spends more than 70% of the time required to assess a field on processing data. The 'Cognitive Geologist' project involves creating a self-learning model for a geological object. This will reduce the analysis time from two years to several months, create thousands of options for developing the field, and choose the best one. In addition, it takes

"Today we are creating road maps for the transformations that are changing the actual paradigm of the field: from the automation of processes to their intellectualization, where most of the work is performed by artificial intelligence".

Maxim Shadura

Head of the Information Technologies, Automation, and Telecommunications Office of the Upstream Unit of Gazprom Neft PJSC

into account all possible risks and uncertainties in the input data.

Machine learning in drilling offers enormous potential. One of the main tasks that Gazprom Neft specialists are working on is to create a digital assistant that will collect all the information from sensors located both on the drilling rig and on underground drilling equipment in real time, analyse this information, and draw conclusions about drilling conditions along the entire wellbore. This will help take the efficiency of drilling management to a new level.