The company is developing projects grouped into large clusters on the Yamal Peninsula, in Eastern and Western Siberia, in the Orenburg Oblast, as well as through joint ventures with foreign partners.

In 2019, Gazprom Neft expanded its resource base primarily through organic growth at its existing assets. This involved drilling 59 exploration wells (including joint ventures). The total drilling in 2019 (including joint ventures and projects) reached 167.7 kilometres. According to Russian assessment standards, the success rate for exploration drilling in 2019 was 76%.

Two-dimensional (2D) seismic surveys covered 15,757 linear kilometres in 2019 – a 2.9-fold increase on 2018 – including 14,377 kilometres offshore, with a record volume of seismic surveys undertaken in the Arctic (the Chukchi Sea) using only one vessel without icebreaking support and covering 8,377 kilometres. Three-dimensional (3D) seismic surveys covered 3,886 square kilometres, including 515 square kilometres offshore.

The “Yuzhny Yamal [Southern Yamal]” is one of the key exploration projects in the YaNAO initially comprising the Suroy and Yuzhno-Novoportovskoye licence blocks. In December 2019, the scope of the project was expanded following Gazprom Neft’s success in the licensing round for the Khambateysky licence block. In 2019, 2D seismic investigations were undertaken at the Yuzhno-Novoportovskoye licence block. In 2020, a 2D seismic survey will be conducted at the Suroy licence block and, in 2021, field geological exploration will start at the Khambateyskoye field.

More than 12 million tonnes of ARCO (Arctic) oil have now been produced over the six years in which the Prirazlomnaya platform has been in continuous operation, with 19 wells having been drilled. Three further wells will be built and commissioned at Russia’s first ever project on the Russian Arctic Shelf in 2020.

12 mt
of ARCO oil produced

19
wells drilled

A key area in Gazprom Neft’s development strategy is its engagement in oil-rim development. The company has both the latest technologies and extensive competencies, as well as valuable experience in developing such complex reserves.

The reporting year of 2019 marked an important milestone in the development of Gazprom Neft’s projects at the assets of its parent company, Gazprom Group. Currently, Gazprom Neft-Zapolyarye LLC is developing nine fields on the basis of long-term risk-based operator agreements with Gazprom subsidiaries; these have enabled the company to start developing the Achimovsky strata at the Yamburgskoye field and Achimov gas-condensate deposits at the Pestsovoye field.

Of those projects mentioned above, Yamburg is set to become the largest new project in the Arctic; estimated oil reserves of the Achimov deposits within the licence block exceed four billion tonnes. Gazpromneft-Zapolyarye LLC has concluded long-term risk-based operatorship agreements with Gazprom subsidiaries; these have enabled the company to start developing the Achimovsky strata at the Yamburgskoye field and En-Yakhinskoye fields, as well as oil-rim deposits at the Pestsovoye and En-Yakhinskoye fields. The company plans to start developing oil-rim deposits at the Pestsovoye and En-Yakhinskoye fields at the end of 2021, and the start of commercial hydrocarbon production from the Achimovsky strata at the Yamburgskoye field is scheduled for 2024 or 2025. Annual production volumes could reach up to 10 mtoe.

In Eastern Siberia, Gazprom Neft is developing a new production cluster where a key element will be an oil deposit at the Chayandinskoye oil and gas-condensate field in the Sakha Republic (Yakutia). This field is unique in terms of the size of its reserves in place, estimated at 263 mt. The Chayandinskoye field, at the same time, is characterised by a complex geological structure,
Over the past few years, the company has significantly expanded its portfolio of exploration projects, in terms of both volume and value. The portfolio structure has also changed a great deal. Currently, the portfolio includes projects with a whole new level of risk and complexity for the company. In the industry, projects of this kind are called frontier exploration projects.

Yuri Masalkin
Director for Geological Prospecting and Resource Base Development, Gazprom Neft

Gazpromneft-GEO has put in place a matrix-based organisational model that best matches the specifics and challenges of geological exploration. This structure enables Gazpromneft-GEO to manage employees' workloads efficiently, form project teams quickly when initiating new exploration projects, and apply accumulated knowledge and best practices in all exploration projects in the company portfolio.

Improving the efficiency of geological exploration depends largely on the development of employees' skills.

2019 saw the launch of the GEO Academy, a training project for exploration specialists. This is a multilevel integrated environment for competency development; it includes a system that enables specialists, experts, methodologists and supervisors to share experience in this professional area.

With the presence of a gas cap and exceptionally low formation pressure and temperatures.

The company is developing the oil rim at this field under an operating agreement with Gazprom Dobycha Noyabrsk (a subsidiary of Gazprom that holds the licence for the field). This subsidiary is currently developing the gas portion at this asset and Gazprom Neft intends to develop the oil portion. In late 2019, Gazprom Neft moved into pilot development of the field, and dispatched the first batch of marketable oil. Full-scale development of this oil-rim will continue in 2020. The central processing facility (CPF) which has a planned capacity of one million tonnes per year, is expected to be expanded and modernised by 2022.

Gazpromneft-GEO

The Gazprom Neft Group’s projects are managed on a turnkey basis by the Gazpromneft-GEO Competency Centre, which is implementing about 20 projects. Its task is to enable the company to continuously replenish its resource base with viable reserves, and to maximise the efficiency of equity financing.

The Gazpromneft-GEO approach to exploration is based on:

- managing a portfolio of major exploration projects;
- concentrating financial and managerial exploration resources in a single centre;
- optimising the transition of prepared business cases for further development; and
- assessing each project in terms of geology and investment attractiveness, taking into account the specifics of logistics, infrastructure and technological complexity.

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‘Geological exploration of the future is a safe, technology-intensive and efficient business’

Gazprom Neft’s digital tools will improve drilling
Learn more: Gazprom Neft is starting to develop the Achimov Formation

The Achimov stratum is an oil- and gas-bearing formation overlying the Bazhenov Formation in the central part of the Western Siberian Basin. Its complex structure, great depth and abnormally high formation pressure demand the use of innovative exploration and production techniques. More than half of these reserves are concentrated in the Yamalo-Nenets Autonomous Okrug (YaNAO).

In 2019, Gazprom Neft and the Government of the Yamalo-Nenets Autonomous Okrug embarked on the establishment of a technology centre for developing Achimovsky deposits. This centre will enable cooperation between subsoil licence holders, equipment and software producers, academic institutions, research organisations and innovation centres. A test-site will be established on the basis of Achimovsky deposits of the Yamburgskoye field. The company also plans to create an integrated information platform and a data centre in order to facilitate experience sharing.

Gazprom Neft has already built the industry’s first digital model of the Achimovsky strata covering the entire territory of Western Siberia. In 2019, the company launched Achimovka NNG, a major new project involving comprehensive geological exploration of hard-to-recover reserves in the Achimovsky strata under current licences held by Gazpromneft-Noyabrskneftegaz. The project is implemented together with Gazpromneft-GEO and the Gazprom Neft Science and Technology Centre. A range of geological exploration works are to be undertaken at the four most promising licence blocks: Novoromanovsky, Sugmutsky, Sutorminsky and Severo-Yangtinsky. Processing and interpretation of 3D seismic data, core surveys, testing of existing wells and drilling of several new ones, and the building of a local geological and petrophysical model to confirm resource potential, are all due to be completed by 2023.

The “Bolshaya Achimovka” project

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<tr>
<th>million</th>
<th>&gt;60</th>
<th>20–40</th>
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<tbody>
<tr>
<td>km²</td>
<td>tonnes</td>
<td>mtoe</td>
</tr>
<tr>
<td>~1</td>
<td>reserves in place</td>
<td>hydrocarbons production potential</td>
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Top five projects in Gazprom Neft’s exploration technology project portfolio

<table>
<thead>
<tr>
<th>Project</th>
<th>Description</th>
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<tbody>
<tr>
<td>“Cognitive Geologist”</td>
<td>an AI-based platform designed to speed up geological data analysis and support decision making.</td>
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<tr>
<td>Vega 2.0</td>
<td>a system designed to support decision making during geological and economic assessments of new projects.</td>
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<tr>
<td>Exploration Designer</td>
<td>a project to enhance the efficiency of exploration and eliminate geological uncertainties.</td>
</tr>
<tr>
<td>Digital Twin for Seismic Modelling</td>
<td>a project for building digital twins of fields that shortens lead times along the full cycle of processes, from an investment decision to creating a geological model.</td>
</tr>
<tr>
<td>“The 365”</td>
<td>a project enabling year-round prospecting and exploration drilling.</td>
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A technology centre for developing Achimovsky deposits

The “Bolshaya Achimovka” project

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<tr>
<td>total area</td>
<td>1 million km²</td>
</tr>
<tr>
<td>reserves in place</td>
<td>&gt;60 billion tonnes</td>
</tr>
<tr>
<td>hydrocarbons production potential</td>
<td>20–40 mtoe</td>
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</table>
Use of UAVs for hydrocarbon prospecting

Gazprom Neft is the first company in Russia to use unmanned aerial vehicles (UAVs) successfully in multilevel magnetometrical surveys, allowing the company to obtain initial information on rock structure by measuring the geomagnetic field at the surface.

Magnetic prospecting is traditionally performed both on the ground, and from the air using aeroplanes and helicopters. UAVs that enable the company to conduct prospecting surveys in hard-to-reach areas throughout the year have been tested at the Novoportovskoye field. The UAVs can operate at temperatures ranging from −30 to +40°C; they have made flights of up to 90 minutes, covering 35 to 55 kilometres. It is expected that this technology will be used further in exploring northern territories of Western Siberia: in the Yamal, Taymyr and Gydan Peninsulas.

10× speed improvement compared to on-ground methods

2× cost reduction compared to piloted aerial surveys

100 km² covered by testing

New enhanced oil recovery techniques for the Bazhenov Formation

The “Bazhenov formation” refers to a specific geological stratum identified in the centre of Western Siberia, running to depths of 2,000–3,000 metres and with a thickness of 30 to 80 metres, covering an area of approximately one million square kilometres. Best-case estimates suggest that oil reserves at the Bazhenov formation [categorised as non-traditional reserves] could amount to as much as 18–60 billion tonnes. One of the largest research consortiums in Russia was established in order to explore the Bazhenov formation, with Gazprom Neft acting as a production partner.

In 2019, specialists from the Bazhenov Technology Centre (a Gazprom Neft subsidiary) successfully tested a unique new enhanced oil recovery technique at the Bazhenov Formation, using a xanthan-gum-based fracking fluid. This is a water-soluble polysaccharide produced through bacterial fermentation of any high-sugar material, such as corn, wheat, dairy waste, etc. Using this new technology has facilitated a 66% increase in hydrocarbon production at those wells on which it was tested.

Xanthan gum is an alternative to traditional guar-gum gels. It dissolves completely in water after hydraulic fracturing is completed.

+66% hydrocarbons production increase at the well

19-stage high-speed hydraulic fracturing

12 m³ injection rate per minute

For more information on the Bazhenov Technology Centre p. 108
PROJECT PORTFOLIO – FUTURE OUTLOOK

Current projects
(2019–2023)

Medium-term projects
(2024–2026)

Long-term projects
(2027+)

Southern Yamal
101 mtoe

Meretoyakha
332 mtoe

Yenisei
306 mtoe

Southern Orenburg
36 mtoe

Ouryinskoe field
47 mtoe

Zima
60 mtoe

Otdalennaya group of fields (OGF)
20 mtoe

* Under long-term risk operatorship agreements with Gazprom.
Russia develops a new oil blend from West Siberia’s “tight” reserves

Non-traditional reserves
- Bazhenov
- Domanic
- Palaeozoic

550 mtoe

Oil rim reserves
- Pestsovoye
- En-Yakhinskoye
- Zapadno-Tarkosalinskoye
- Orenburgskoye
- Chayandinskoye

145 mtoe

Neocomian-Jurassic deposits
- Kharasaveyskoye
- Bovanenkovskoye

766 mtoe

Achimovsky strata
- Urengoyskoye
- Yamburgskoye

787 mtoe