

Technology and innovation

Technological development is a core pillar of Gazprom Neft's 2030 Strategy. Technology advancements will enable the company to efficiently deliver its large-scale upstream projects and consolidate leadership in strategic areas, including the environmentally safe and reliable operation of equipment.

Priority areas of technological development

- ▶ Improving oil recovery factor at mature fields
- ▶ Production from low-permeability reservoirs
- ▶ Efficient and safe offshore development in ice conditions
- ▶ Multiphased fields development
- ▶ Effective catalysts and processes for refineries

For each focus area, the company is implementing projects to develop, test and deploy the necessary technologies.

The company is currently running an Innovative Development Programme. At the core of the programme are technology projects to enhance oil recovery from brownfields, develop hard-to-recover hydrocarbon reserves, continually improve well productivity, as well as an initiative to develop and produce cat-cracking and hydrogenation catalysts.

The Board of Directors approved the updated Innovative Development Programme in 2020. The focus area list has been significantly expanded by adding digital transformation projects, including cognitive geology, production project management centres, the Asset of the Future programme, integrated planning and operations and reliability management at refining, logistics and sales enterprises.

~40 patents
in environmental
protection and
industrial safety

Upstream Technology Strategy

The Upstream Technology Strategy covers all focus areas of the Upstream Division, including:

- exploration and resource expansion technologies;
- well drilling and completion technologies;
- enhanced oil recovery and well stimulation;
- development of unconventional reserves;
- development of oil rims;
- electronic asset development (EAD), etc.

Downstream R&D strategy

R&D in oil refining follows a long-term R&D strategy. Over 30 projects are being implemented across the following focus areas:

- increasing oil conversion rate (refining depth);
- improving operational efficiency;
- new product development, including new cat-cracking, hydrotreatment and hydrocracking catalysts.

30+ R&D
projects underway in
oil refining

 Gazprom Neft
at a glance

 Sustainable
development
management

 Customer
care

 Health
and safety

 Environmental
safety

 Employee
development

 Social
policy

 Appendices

Gazprom Neft partners with the Skolkovo Foundation's GreenTech Startup Booster

Gazprom Neft has partnered with the Skolkovo Foundation's GreenTech Startup Booster – Russia's first accelerator for tech startups in environmental protection and sustainable development, set up by the Skolkovo Foundation in conjunction with industry leaders and supported by relevant Russian ministries.

Thanks to its involvement in the programme, Gazprom Neft has been able to put together an up-to-date database of startups offering environmental technologies, and to select the most interesting solutions to develop and implement in collaboration with their developers.

STARTUP BOOSTER



Partnership with the
Skolkovo Foundation's
accelerator for
environmental startups

Technology projects in environmental protection and industrial safety

Key focus areas:

- minimising non-productive associated petroleum gas flaring;
- upgrading infrastructure and equipment to improve energy efficiency and prevent leaks;
- implementing processes to make more environmentally friendly products;
- effective waste utilisation and preservation of natural ecosystems;
- reduction of water consumption;
- environmental footprint monitoring.

Technology development at Gazprom
Neft is focused on improving
industrial and environmental safety

The most important technology projects in environmental protection and industrial safety in 2020

- Miscible gas displacement projects (petroleum gas injection to improve recovery) were included in Gazprom Neft's 2030 Strategy. This technology will reduce associated petroleum gas (APG) flaring and cut emissions. The company is building infrastructure for pilot miscible gas displacement projects at Gazpromneft-NNG and Gazpromneft-Yamal.
- Trubodetal (Chelyabinsk) produced the first Russian modular plant for NGL removal from APG (joint development of Gazpromneft STC and Bauman Moscow State Technical University). This technology recovers liquid hydrocarbons (C3+) from APG, which are then returned to the crude oil stream. The use of "dry" gas after such treatment will significantly reduce air pollution.
- Since 2014, Gazprom Neft has been developing Green Seismic technology, which, thanks to its more compact size, significantly reduces the number of trees felled for seismic lines and cuts fuel consumption for seismic surveys, all while improving safety.
- A patent was granted for technology to produce Brit man-made soil from locally-available materials and treated cuttings. This product can be used in road construction, and pilot tests have confirmed its high performance. The company intends to put this technology to use on a much larger scale in the next few years.
- A new Euro+ combined oil refining unit (CORU), replacing five older units, was commissioned at the Moscow Refinery. The Euro+ CORU will reduce the refinery's environmental footprint.
- The Omsk Refinery is continuing the construction of Biosphere wastewater treatment complex, which will improve pollutant removal efficiency to 99.9%. The Moscow Refinery has been running the Biosphere complex for over three years now. The complex recycles over 90% of water, with a more than threefold decrease in river water withdrawal by the refinery.
- The company has developed an environmental monitoring system for prompt identification and prevention of above-limit pollutant concentrations at a facility's buffer zone boundaries. It also evaluates the facility's contribution to these above-limit concentrations. Legal protection for the system was obtained in 2020. It is planned to be rolled out to Gazprom Neft's refineries in the next few years.
- Gazprom Neft is using and developing unmanned technologies. Unmanned aircraft are used in exploration, industrial site monitoring, and cargo delivery. Self-driving vehicle testing is in progress in conjunction with truck manufacturers KAMAZ and GAZ. The use of unmanned technologies improves process safety.

4.5+ million
trees saved in
2016–2020 thanks
to the Green Seismic
technology

99.9% of
pollutants removed
from water using the
Biosphere complex



Advanced oil refining
products



Unmanned technologies



Testing KAMAZ self-driving
trucks

Technology partnerships and import substitution

The Gazprom Neft Department for Technological Partnerships and Import Substitution is tasked with systematically monitoring the Russian goods and materials market to find domestically produced replacements for imported products.

Gazprom Neft is testing state-of-the-art Russian-made equipment, and creating unique products to replace foreign counterparts. The company also supports developers' applications for external financing, including subsidies from the Industrial Development Fund.

Gazprom Neft also seeks to cooperate with foreign companies in order to localise production of their products in the Russian Federation.

In 2020, five leading engineering universities of St Petersburg (SPbPU, ITMO University, SUAI, LETI, and SMTU)¹, with support from Gazprom Neft, set up energy clubs – student associations offering career guidance and support for new high-tech projects. An inter-university accelerator was launched for these energy clubs, with over 15 student projects joining the programme in an attempt to address the technology challenges faced by the company.

In 2020, Gazprom Neft co-founded the Institute for Initiatives in Oil and Gas Technologies. The organisation was created to harmonise the efforts of Russian and foreign oil and gas companies to develop and approve uniform industry standards for use in engineering, design, procurement and the evaluation of potential contractors. Gazprom Neft continued its work under an agreement with the Administration of St Petersburg to develop a world-class R&D and technology centre for the energy sector in the city. The company also continues to work in joint working groups with Gazprombank and HMS Group.

Gazprom Neft has approved 37 substitution strategies for product categories where the company relies on imports. These strategies should result in about 220 new Russian products.

Thanks to the progress made by the company so far, including the provision of facilities for piloting (over 130 piloting runs completed), import substitutions in 60 product categories have already been made possible.

New import-substituting products include unique exploration, production and refining equipment as well as cross-functional items (communication equipment, instrumentation and personal protective equipment).

Creating new competitive production facilities in the Russian Federation, and supporting existing domestic manufacturers is a focus area for Russia's social and economic development

15+
student projects joined the inter-university acceleration programme

37 replacement strategies approved

60 product categories with possible import substitution

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¹ – SPbPU – Peter the Great St Petersburg Polytechnic University; SUAI – Saint-Petersburg State University of Aerospace Instrumentation; LETI – Saint Petersburg Electrotechnical University; SMTU – State Marine Technical University.