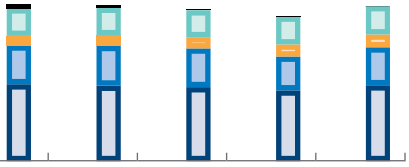
OIL REFINING

Oil refined (mt)



Source: Company data

	2014	2015	2016	2017	2018
	43.48	43.07	41.89	40.11	42.91
Omsk Refinery	21.28	20.90	20.48	19.58	21.00
Moscow Refinery	10.76	11.00	10.71	9.37	10.50
NIS[1]	2.61	2.94	3.10	3.34	3.55
Slavneft-YANOS[2]	7.65	7.63	7.47	7.74	7.86
Mozyr Refinery[2]	1.17	0.60	0.13	0.08	0.00

Following the completion of upgrades and capital repairs at Russian refineries of the Group in 2017, the volume of oil refined in 2018 increased 7.0%. The growth was observed at all refineries of the Group in Russia and at Pančevo Refinery in Serbia.

In 2018, the Group continued implementing the second phase of its environmental compliance and technology upgrade programme. It pursues strategic goals in oil refining and aims at increasing oil refining depth to 99% by 2025.

[1] Gazprom Neft holds a 56.15% stake in NIS (Serbia) operating two refineries in Pančevo and Novy Sad.
[2] Gazprom Neft's equity share.

2018 MILESTONES

- The Company continues upgrading and expanding capacity of its refineries, including Slavneft-YANOS and Mozyr Refinery in Belarus and NIS Pančevo Refinery in Serbia:
  - Omsk Refinery – the process condensate treatment unit and the automatic on-spot loading unit (AOLU-2) constructed; phase 1 of the delayed coker unit (DCU) upgrade completed;
  - Moscow Refinery – major construction and installation operations at Euro+ refining unit completed, outdated refining units overhauled;
  - NIS Pančevo Refinery – construction of a new deep conversion facility based on delayed coking technology continuing;
  - Slavneft-YANOS – a number of technology upgrade and efficiency improvement projects underway;
  - Mozyr Refinery – construction of a heavy residue hydrocracking unit continuing.
- Products of the Company meet the growing demand on the Russian market:
  - Some of Gazprom Neft's petroleum products, including gasolines, bunker fuel, lubricants, etc., won awards of the nationwide contest Russia's 100 Best Products.

Gazprom Neft's fuels and oils named among Russia's 100 Best Products

Plant for the city: Moscow Refinery (coverage by Russia 24 TV Channel)

"Continuous efficiency improvements at refineries are an important outcome of our refining capacity upgrade programme. Following the second phase of the programme, Omsk and Moscow Refinery will increase oil refining depth and light product yield while reducing environmental impact."

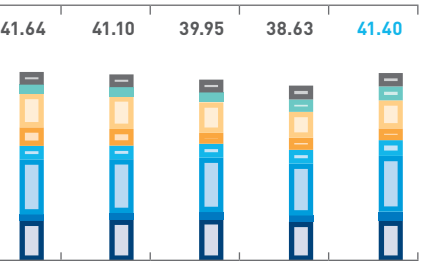
Anatoly Cherner
Deputy CEO for Logistics, Refining and Sales
Gazprom Neft

The year 2018 saw a sizeable growth in the light product yield (gasolines, diesel fuel and jet fuel) on the back of technology optimisation and an increase in the volume of oil refined. The output of gasolines and diesel fuel increased 3.0% and 7.6% respectively. The output of jet fuel grew 14.1% y-o-y.

Production of naphtha was increased year over year to meet the existing conditions on the gasoline market and improve the refining efficiency.

A 14% increase in bitumen production was associated with growing domestic demand and export growth.

Production breakdown by petroleum product (mt)



Source: Company data

	2014	2015	2016	2017	2018
Motor gasoline	8.84	9.08	9.18	8.60	8.86
Naphtha	1.36	1.45	1.56	1.38	1.95
Diesel fuel	12.15	11.87	12.02	11.45	12.32
Jet fuel	2.99	3.00	3.04	3.04	3.47
Bunker fuel	4.08	3.67	2.41	2.67	2.58
Fuel oil	7.39	7.20	6.72	5.70	6.20
Bitumen and coke	2.03	2.02	2.19	2.73	3.07
Other	2.80	2.81	2.83	3.06	2.95

Made in Russia: construction of Euro+ refining unit at Moscow Refinery (coverage by RBC TV)

Gazprom Neft's Omsk Refinery makes production of Euro-5 gasolines more efficient

Made in Russia: Gazprom Neft's high-tech bitumen (coverage by RBC TV)

Efficiency Control Centre: see **p. 76**

First needle coke production in Russia: see **p. 81**

Technology

Efficiency Control Centre

Gazprom Neft's Downstream Division operates a dedicated Efficiency Control Centre

The purpose of the Efficiency Control Centre (ECC or the Centre) is performance management across the value chain (from crude oil logistics to customer sales) through a single digital platform. The platform uses predictive analytics tools, neural networks, artificial intelligence and digital twin technology.

Taking a new approach to logistics, the Centre manages the supply chain as a single asset broken down into flow-through business processes. This approach is supported by overall digitalisation of the production assets, with over 250,000 sensors and instruments installed.

ECC processes sensor data on a continuous basis and monitors 90% of all process parameters and material flows in logistics, refining and sales. All data is accumulated in the data lake for subsequent analysis. Monitoring and analysis of the quantity and quality of hydrocarbons and finished products allow identifying variations at every link of the value chain and take timely corrective measures.

ECC features three unparalleled digital systems aimed at improving business performance.

1. One of them is the first Russian digital system that enables end-to-end flow-through 60-day planning. The planning system factors in actual production and sales figures and optimises refining volumes, feedstock supply and the output product range, thus efficiently redistributing available resources. The system improved the accuracy of planning to 95% and reduced the production planning time 16-fold. After the system is rolled out to cover 100% of the Company's downstream assets, the accuracy of planning will reach 97%, which is in line with the best global standards.
2. The second one – Smotr (Inspection) process monitoring system – monitors production process variations and covers 12,200 process parameters and 5,800 quality metrics. In addition, the system automatically selects corrective measures and enables efficient interaction between the departments involved. The Smotr system controls 100% of production facilities at the Omsk and Moscow refineries.

Efficiency Control Centre: first-year results

"We are building an efficient planning system"

Strategy of digital transformation in the Downstream Division

3. The third system, Neftekontrol (Oil Control) – Gazprom Neft, was developed by the Company to monitor the quantity and quality of petroleum products along the plant-to-consumer supply chain. Extensive data automation almost doubled the accuracy of record-keeping and halved quality and quantity losses. This system allows the Company to solve a wide range of tasks, from enhancing the overall supply chain efficiency and transparency to taking anti-counterfeiting and anti-fraud measures. Currently, all the Company's filling stations are connected to the system that monitors their operation and responds promptly to any issues which arise.

ECC highlights

95%
production planning accuracy

5+
₽ bn
cost savings from the planning system in 2018

12.2
thousand
process parameters monitored by Smotr system

2–3
minutes
to change production schedule

5.8
thousand
quality metrics

- Russia's first comprehensive value chain management system for logistics, refining and sales
- Production and energy efficiency management based on predictive modelling
- Real-time environmental impact monitoring

Transformation

Optimal workplace environment

In 2018, the Omsk Refinery adopted the Operations Management System (OMS) Code of Conduct. In particular, the refinery piloted standard operating procedures (SOPs), an essential element of the safety system, and installed visual management stands.

Employees use the 5S methodology, a lean manufacturing tool that deals with workplace organisation. Working together, employees designed an optimal layout of tools, materials and documents properly arranged and visualised with tags, outlines and diagrams. Compliance with the 5S methodology is assessed through monthly self-appraisals and quarterly internal audits.

Refining at the Company's facilities

Omsk Refinery

In 2018:

22.23
mt
installed capacity

21.00
mt
oil refined

90.89%
refining depth

71.04%
light product yield

2018 MILESTONES:

- Construction of a process condensate treatment unit completed; it will reduce environmental footprint of the refinery and new facilities yet to be commissioned
- Construction of an automatic on-spot loading unit (AOLU-2) completed; it will facilitate the rail tank filling process and reduces environmental impact
- Phase 1 of the delayed coker unit upgrade completed
- Overhaul completed at crude oil treatment, primary refining, hydrotreatment, isomerisation (Isomalk-2), petroleum coke calcination, sulphur production, and aromatics production units
- Permit obtained to use jet fuel
- New products – aromatic hydrocarbon fraction and cat-cracked gasoline – launched
- Several refinery products, including G-Drive 100 gasoline, RMD-80 bunker fuel, liquefied petroleum gas for motor vehicles (automotive propane), methyl tert-butyl ether (MTBE) grade A, etc., won awards at the nationwide contest Russia's 100 Best Products

PLANS FOR 2019:

- Construction of a crude oil distillation unit, deep conversion facility, delayed coker unit, diesel fuel hydrotreater/ dewaxer and Biosfera water treatment facility
- Retrofit of a catalytic reforming unit and commissioning of a regeneration gas treatment unit for the catalytic cracker

Omsk Refinery: one step ahead of the industry (interview)

Omsk Refinery will increase production of high-octane gasoline

"Consistent operating efficiency improvements at Gazprom Neft's refineries are achieved as part of our refinery upgrade exercise. Its second stage will secure a greater refining depth and higher output of light products at the Omsk and Moscow refineries, while also reducing their environmental impact."

Anatoly Cherner
Deputy CEO for Logistics, Refining and Sales
Gazprom Neft

Moscow Refinery

In 2018:

12.76
mt
installed capacity

10.50
mt
oil refined

83.06%
refining depth

59.62%
light product yield

2018 MILESTONES:

- Construction of Euro+ oil refining unit completed
- Construction of a power distribution substation completed; it will supply power to the product loading facilities
- Outdated refining units (crude oil distillation, catalytic reforming, hydrotreatment, viscosity breaking, and gasoline re-distillation units) overhauled
- Production of G-Drive 100 gasoline launched
- Several refinery products, including AI-92-K5 and AI-95-K5 unleaded gasolines, Euro-5 DT-L-K5 grade C summer diesel fuel, DT-E-K5 grades E and F inter-season diesel fuels, eco-friendly (urban) DT-Z-K5 types 2 and 1 diesel fuels, base road bitumens, grades 90/130 and BND 60/90 in accordance with GOST 22245-90 and grades BND 50/70, BND 70/100, BND 100/130 in accordance with GOST 33133-2014 etc., won awards at the nationwide contest Russia's 100 Best Products

PLANS FOR 2019:

- Commissioning of the unparalleled Euro+ oil refining unit
- Commissioning of the light product loading rack for motor vehicles
- Construction of the automated on-spot loading rack for rail tanks
- Site preparation for the construction of a deep conversion facility and a kerosene hydrotreater

"Gazprom Neft invested over ₽ 160 bn to upgrade the Moscow Refinery. We converted the refinery to manufacture Euro-5 fuels, constructed the Biosfera innovative bio-treatment facilities, and introduced the industry's first automatic environmental monitoring system. Our upgrade programme has not been finished yet as we are going to decommission the outdated processing facilities and prepare the site for the construction of a deep conversion facility."

Alexander Dyukov
Chairman of the Management Board and CEO
Gazprom Neft

Pančevo Refinery (NIS, Serbia)

In 2018:

4.6
mt[1]
installed capacity

3.55
mt
oil refined

88.0%
refining depth

76.38%
light product yield

2018 MILESTONES:

- Pančevo refinery celebrated its 50th anniversary
- Construction of a deep conversion facility based on delayed coking technology continued
- Trial batch of Iranian Heavy crude refined

PLANS FOR 2019:

- Completion of the delayed coking unit; after it is commissioned, Pančevo refinery will join the best industry players in terms of oil refining depth

Pančevo refinery: producer of the future

[1] Installed capacity of Pančevo Refinery. Novy Sad Refinery is under upgrade and does not refine oil currently.

Refining at joint-venture facilities

In addition to its in-house refining facilities, Gazprom Neft has access to capacity of Slavneft-YANOS Refinery and Mozyr Refinery located in the Republic of Belarus.

Slavneft-YANOS

In 2018:

15.0
mt
installed capacity

7.86
mt[1]
oil refined

66.58%
refining depth

55.25%
light product yield

2018 MILESTONES:

- Construction of Wet Catalysis-2 hydrogen sulphide removal unit continued; hydrogen production units converted to natural gas; vacuum column at VT-6 unit upgraded
- Deep conversion facility configuration and vendor selected
- Commercial production of EN 100/150, EN 70/100, EN 50/70 bitumen grades and petroleum asphalt launched
- Several refinery products, including Euro-5 DT-L-K5 grade C summer diesel and BND 70/100 petroleum bitumen, won awards at the nationwide contest Russia's 100 Best Products

PLANS FOR 2019:

- Completion of Wet Catalysis-2 hydrogen sulphide removal unit
- Construction of an aromatics loading rack
- Replacement of feedstock for the hydrogen production unit and conversion of process furnaces to natural gas
- Upgrade at VT-6 vacuum column to continue
- Deep conversion project to continue

[1] Share of Gazprom Neft.

Mozyr Refinery

In 2018:

14.03
mt
installed capacity in 2018

0.0
mt[2]
oil refined

78.8%
refining depth

63.4%
light product yield

2018 MILESTONES:

- Construction of a heavy residue hydrocracking unit continued
- Product range expanded with methyl tert-butyl ether (MTBE) and alkylate

PLANS FOR 2019:

- Construction of the heavy residue hydrocracking unit to continue

[2] The volume of oil refined by Gazprom Neft at Mozyr Refinery depends on the oil supply schedule approved by the Russian Ministry of Energy. The Company may process up to 50% of oil supplied to the refinery. The actual volume of oil refined depends on economics of the process. In 2018, the Company did not refine its oil at Mozyr Refinery.

Technology

First needle coke production in Russia

2021
Upgraded DCU to be commissioned

38.5
ktpa
design capacity of the needle coke production unit

Needle coke, a substance with a high graphite content, specific gravity and thermal resistance, is used in the production of top-grade graphite electrodes

In 2018, Omsk Refinery completed the first phase of the delayed coker unit (DCU) upgrade project. When the project is finished, Omsk Refinery's DCU will be the first in Russia to produce needle coke, a strategic material for the steel-making, nuclear, chemical and space industries, which is currently imported to Russia. In addition to the new product, the upgrade will further reduce environmental impact of the refinery.

As part of the project, Omsk Refinery will install new reactors, a new feedstock refining unit and an additional tank farm, with process furnaces replaced and a vapour recovery unit upgraded.

The DCU upgrade will be completed in 2021. When ramped up to its design capacity, the unit will produce 38.5 ktpa of raw needle coke.