

Oil Muscovy: In the Shadow of Western Siberia - Economic Aspects

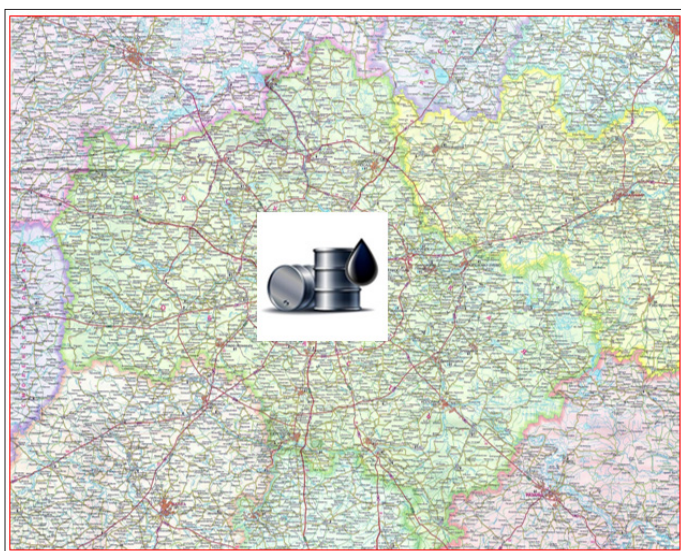
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Annotation

The current state and prospects for the development of the oil industry in Moscow and the Moscow Region are considered and analyzed, primarily in terms of the economy. The article concludes that the Moscow region, which does not have its own oil resources and is a large consumer and importer of liquid fuels, is relatively stable in terms of market development and consumption of oil and oil products.

Keywords: Oil, Oil Products, Potential Costs of Oil Production, Refining, Refineries, Motorization, Roads, Gas stations, Affordability (auto fuels), Consumption, Companies, Oil Pipeline, Imports, Moscow, Moscow Region

Speaking of Moscow, first of all, we have in mind the capital status of this city and certainly not the oil facilities located within the Moscow Ring Road or in the Moscow region. Russian oil is usually associated with a completely different region of Russia - Western Siberia, which accounts for two-thirds of the national oil production. In general, almost 21,534.8 thousand people live permanently in Moscow and the Moscow region on an area of slightly more than 46,862 km². (and this is about 14% of the total population of Russia), which produced over 31.303 trillion rubles in 2020. (US \$ 425 billion) of the gross regional product

(and even more than 28.5% of Russian GNP in 2020) [1].



Sedimentary Basins

In the European part of Russia, there are: Timan-Pechora, Volga-Ural, Caspian, North Caucasian-Mangyshlak oil and gas provinces and the Baltic oil-bearing region, in which the main hydrocarbon reserves of the Baltic are concentrated, but not related to the Moscow region, as well as Moscow and Mezen prospective oil-bearing areas. For a reason known to the reader, we are only interested in the Moscow oil-bearing region (or rather: syncline) - Figure 1.

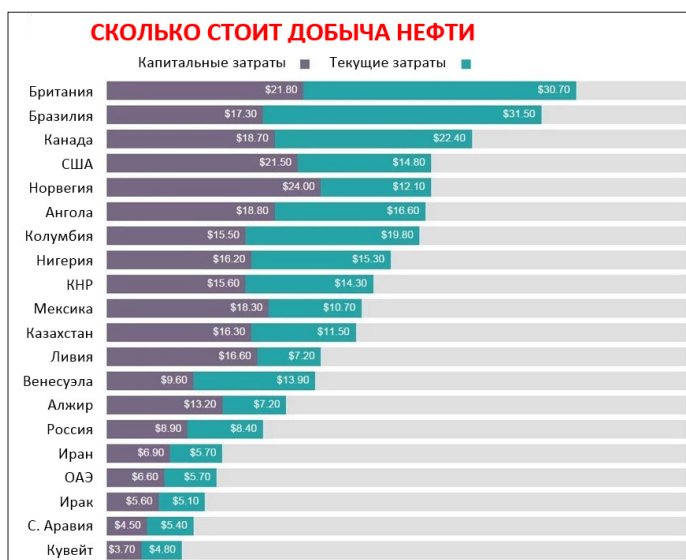


Figure 1: Tectonic Map of the Moscow Oil-bearing Syncline

However, after the Russian Academy of Sciences, together with the Moscow Geological and Geodetic Trust, in 2008-2009, by decision of the Moscow Government, implemented a large-scale research project to study the oil and gas potential of the region and processed more than 85,000 (including deep) wells drilled here in different years, the corresponding interest completely disappeared, and none of the Russian and foreign geologists even planned to make an assessment of the oil and gas resources of the Moscow Region (MO) anymore.

Of course, the prospects for discovering large and highly productive accumulations of oil in the Moscow Region, which are rich in Western Siberia [For reference: Indeed, in the Khanty-Mansiysk Autonomous Okrug of Western Siberia (for example, at the unique Samotlor, Priobskoye, Lyantorskoye and Fedorovskoye fields) recoverable oil reserves amount to 1.5-2.7 billion tons, are simply absent due to geological reasons and if only because there is no serious area of sedimentation in this region [2].

Therefore, even if a commercial field is ever discovered within the Moscow Region, the average potential technical costs of oil production here are estimated by us (CPBS) within the range of US \$15-20/bbl, which is quite comparable with the similar indicator for Algeria, estimated by the well-known Norwegian consulting firm Rystad Energy at about \$15.5-25.5/bbl (Figure 2).



Source: <https://twitter.com/WaelMahdi/status/688614542746599424> [3]

Figure 2: Average Oil Production Costs by Country (According To Rystad Energy), in us Dollars Per Barrel



Oil Refining

The only refinery in the Moscow Region is the Moscow Oil Refinery in the southeast of Moscow, which has undergone a

large-scale modernization since 2009 and until 2020.

The largest refinery modernization project in Russia was implemented at the Moscow Refinery. The project was aimed at improving the quality of oil products, increasing the depth of oil refining to increase productivity, as well as reducing the impact of refineries on the environment.

The Moscow Refinery with a total installed capacity of 12.15 million tons of oil per year is owned and operated by Gazprom Neft. The plant provides about 40% of the demand for oil products in Moscow and nearby regions.

The long-term modernization project began in 2009 and lasted until 2020. The volume of investments in the project exceeded 130 billion rubles. (approximately \$3.4 billion). The total investment in the project in 2012 amounted to 20 billion rubles. (approximately 521 million US dollars), and investments from 2013 to 2015 reached 50 billion rubles. (approximately \$1.3 billion).

Since April 2012, the plant has started production of motor fuels of the 4th grade and higher, and in 2013 - diesel fuel of the Euro-5 standard.

The first thermal cracking unit at the plant was launched in April 1938. On April 1, 1938, the first ton of oil was processed into gasoline at the plant - this date is considered the birthday of the Moscow Refinery. By 1965, more than 20 units and process units were installed. By 1970, the plant began producing high-octane gasolines with the installation of a CDU / AVT-6 unit. At the same time, a catalytic reforming unit and a diesel fuel hydrotreating unit were commissioned. The refinery's processing capacity was five million metric tons per year.

Refinery processing volume in 1970-1995 reached 9.4 million metric tons per year. During this period, catalytic cracking units (1983), reformers (1986), diesel fuel hydrotreaters (1988), polypropylene plants and methyl tertiary butyl ether (MTBE; 1992) plants were installed.

In the period from 1996 to 2009, the ELU / AVT-6 and catalytic cracking units were modernized. The production of Euro-3 standard fuel was launched in 2003, and the refinery's refining volume during this period reached 9.8 million tons per year.

In 2012, the construction of new closed mechanical treatment facilities with a capacity of 6.7 million cubic meters was completed. m per year, at the same time the existing treatment facilities were decommissioned. In October 2017, the next stage of closed treatment facilities with membrane biological reactors was put into operation, which were integrated with existing new plants.

In 2012, the modernization of the bitumen plant with a capacity of 1.7 million tons per year was also completed. The two facilities have reduced pollutant emissions by 98% and 90% respectively. In 2013, a new catalytic cracking and gasoline hydrotreatment unit, as well as a light naphtha isomerization unit were put into operation, which allowed all fuels produced at the plant to comply with the Euro-5 quality standard. The completion of these blocks marked the completion of the first phase of the project.

The first of them has an annual capacity of 1.2 million tons and was built with an investment of 5.7 billion rubles. (about \$148.5 million). It implements technology licensed French company Axens, based in Rueil-Malmaison. Last to implement UOP

technology Honeywell, has a capacity of 650,000 tons per year and was built with an investment of 10.9 billion rubles. (about 284 million US dollars).

In May 2013, the American company Foster Wheeler was awarded the Initial Engineering Design (FEED) contract for the CORU project.

was carried out, which significantly reduced hydrogen sulfide emissions. In 2014, the Moscow Refinery also installed an automated system monitoring emission. And in 2018, the construction of a combined oil refining unit (KORU) with a capacity of 6 million tons per year was completed.

The CORU project included the construction of crude oil distillation and vacuum distillation units (CDU and VDU), a continuous catalytic reformer integrating naphtha hydrotreatment and pressure swing adsorption hydrogen recovery, a diesel fuel hydrotreater integrating Honeywell's UOP hydrotreatment solutions and the know-how of a Madrid company EMRE linking the dewaxing gas plant to the LPG treatment unit.

St. Petersburg company Armtel, a leading Russian developer and manufacturer of intelligent industrial communication systems, supplied a distributed public address and general signaling system (PA/GA) for an isomerization unit, a boiler house, water treatment and cooling, a transformer substation and a gasoline hydrotreatment unit, including an IP intercom system for central control rooms [4].



Moscow Refinery

The products of the Moscow Refinery account for 40% of the oil products market of the Moscow region. The Moscow Oil Refinery annually processes up to 10.5 million tons of oil, producing over 2.8 million tons of motor gasoline, 2.7 million tons of diesel fuel [5].



The Moscow Oil Refinery (Gazpromneft-MNPZ JSC), an oil refinery of Gazprom Neft, is one of the country's largest refineries in terms of oil refining volumes. The volume of oil refining is 12 million tons/year.

The plant is located in the Kapotnya district (Kopotnya would be more correct, since historians believe that the name of this place on the left bank of the Moskva River comes from the word

“smoke”) of the city of Moscow. The yield of light oil products was 59.3%, and the depth of processing - 81.6% (on average in Russia - 71.9%). Since 2015, the Nelson technological completeness index has been 6.6 (with an average value for Russia, including mini-refineries, of 4.31) [6].

Located within Moscow, the Moscow Oil Refinery, which has modern (though not very expensive) treatment facilities, is a constant source of harmful emissions. So, in February 2019, the Lublin Court of Moscow considered the claim of seven residents of Kapotnya against Gazprom Neft. They demanded to close the Moscow refinery and pay 5 million rubles. compensation.



The most "dirty" district of Moscow - that's what environmentalists call Kapotnya. All because of the refinery, which is located right in the city, inside the Moscow Ring Road. Regular headaches, nausea, allergic reactions, and the occasional bad smell of hydrogen sulfide. Residents, believing that the blame for the entire refinery, wherever they turned over the past years. In particular, they wrote complaints to the department of nature management and environmental protection, as well as to the prosecutor's office. But in vain.

The plant is a strategic enterprise: it provides 40% of Moscow's needs for gasoline and 50% for diesel. In 2020, the Euro+ complex was put into operation, which made it possible to double the production of kerosene - up to 1.4 million tons per year, as well as 1.5 times the production of diesel fuel - up to 3.2 million tons. It is this refinery that is the main supplier of fuel for the capital's airports. Therefore, without strong evidence of the capacity of the plant, they will not stop [7].



JSC Gazprom Neft-Moscow Refinery (JSC Gazprom Neft-MNPZ or JSC Gazprom Neft Moscow Refinery), formerly JSC Gazprom

Neft-Moscow Oil Refinery and JSC Moscow Oil Refinery, is a Russian oil refining and oil production. oil and oil products. The company's product range includes, among others, unleaded gasoline, jet gasoline, diesel fuel, heating oil, building bitumen and sour gas. JSC Gazpromneft-MNPZ operates through two 100% subsidiaries for the processing of petroleum products and the production of polypropylene: NPP Progress LLC and Korimos OJSC, as well as one subsidiary company NPP Neftekhimiya LLC.

On April 1, 1938, the first ton of oil was processed into gasoline at the plant - this date is considered the birthday of the Moscow Oil Refinery.

Currently, the Moscow Oil Refinery produces:

- Unleaded gasoline AI-92, AI-95, AI-98
- Diesel fuel EURO summer, off-season and winter, grades C, E, F
- Fuel for jet engines. Brand TS-1
- Oil road bitumen BND 40/60, EN 50/70, BND 50/70, BNDU 85, BND 60/90, BND 70/100, BND 90/130, BND 100/130, EN 70/100
- Oil bitumen for construction BN 70/30, BN 90/10
- Bituminous emulsions EBK-1, EBK-3
- Liquefied gases PBA, SPBT
- Fuel oil ash 3.0%
- as well as gasoline gas stable
- Polypropylene;
- Marine low-viscosity fuel grade SMT;
- Butane-butylene fraction ($S < 0.013\%$);
- Sulfur technical gas liquid and granular [8].
- As of 18/06/2023 The Moscow Refinery sold oil products at the following prices (ex-factory tank farm, RUB/t):
- Diesel fuel Grade F (-20 C) - 43.43;
- Diesel fuel Class 1 (-28C) - 46.70;
- Gasoline AI-92 - 32.18;
- Fuel oil M-100 - 10.90;
- Liquefied gas (propane, butane) - 28.50;
- Kerosene TS-1 - 56.90 [9].

In mid-February 2019, Gazprom Neft announced the completion of planned bitumen production by the Moscow Refinery. The company's specialists further increased the reliability and efficiency of the installation in preparation for the summer period of road construction. The bitumen plant of the Moscow Refinery is one of the most high-tech and largest refineries in Europe in terms of output.



During the work, more than 1.2 thousand meters of pipelines, tanks and columns were prepared, the reliability of the technological process and the efficiency of the plant were additionally increased. All production processes are fully automated. The plant is equipped with a hermetic loading system, which allows shipment in accordance with the most stringent environmental requirements.

Technologies of the Moscow Refinery provide for the possibility of simultaneous production and shipment of several grades of bitumen, including high quality bitumen [10].

In the first half of 2019, Gazprom Neft completed 18 measures aimed at improving the production efficiency of the Moscow Refinery. The overall economic effect of the work performed amounted to 350 million rubles. The activities envisaged by the plan for 2019 were carried out at 13 technological facilities of the Moscow Refinery. In total, from 2011 to 2019, more than 300 events were held at the Moscow Refinery as part of the production efficiency improvement program. The overall economic effect of the measures taken, according to company representatives, amounted to 16.8 billion rubles [11].

In 2020, as a result of modernization, the Moscow Refinery increased the depth of oil refining to 84.1% [11].

A number of world-famous companies are involved in the modernization of the Moscow Oil Refinery. Here are just the main "aliens" from mid-2015:

Tecnimont, a subsidiary of the Italian Maire Tecnimont, in conjunction with Russian partners, has been awarded an Engineering, Procurement and Construction Management (EPCM) contract worth around £344.4m (\$540.7m) for a Euro + CORU project at the Moscow Refinery in June 2015. The scope of the contract included the implementation of a new hydrotreating section with a set of technological treatment units.

In 2016, the Moscow oil and gas company NIPIGAZ was appointed as the general construction contractor (KORU) of Euro+.

The AEM-Technology company, which is part of Atomenergomash, has manufactured a vacuum distillation column for the Euro + KORU project.

In the second quarter of 2019, Saipem, a subsidiary of the Italian petrochemical concern ENI, signed a contract for the design, procurement and construction (EPC) of a new six-line sulfur recovery unit at the Moscow Refinery.

And in March 2021, South Korean engineering and construction company DL E & C has signed an interim agreement to build a hydrocracking unit at the Moscow Refinery. The contract is valued at approximately £208 million (US\$288 million) [12].



CORU complex was solemnly put into operation. Work has begun on the delayed coking, hydrogen and hydrocracking units that

are part of the complex, which should be completed in 2025. Delayed coking with a capacity of 2.4 million tons per year will allow the plant to increase the production of road fuels and start the production of petroleum coke. The complex also includes a hydrocracking unit with a capacity of 2 million tons/year, a sulfur production unit and a hydrogen production unit. The complex will allow the plant to reach almost 100% processing depth and stop the production of fuel oil [13-14].

Although the Moscow Refinery hides in every possible way data on its profitability, according to serious Russian researchers, this is “an enterprise that is engaged in a highly profitable business” [15].

An indisputable confirmation of the high profitability of oil refining in the Moscow Region is that back in mid-2012, the management of Rosneft expressed practical interest in building a large refinery with a capacity of 12 million t / g [16].



Roads, Gas Stations and Cars

The length of public roads within Moscow and the Moscow region at the beginning of 2023 is 5,872.5 km [17]. This, of course, includes the Moscow Ring Road, that is, the ring road, which runs mainly along the border of the city of Moscow, with a length of 108.9 km (67.7 miles) and with 35 exits (including ten interchanges) and the construction of which was completed in 1962.

The density of asphalt and concrete roads in the Moscow region (almost 593 km/sq. km) is more than 10,000 times higher than the Russian average (about 0.0575 km/sq. km).

Russian President Vladimir Putin, in a message to the Federal Assembly, instructed to extend the M12 Moscow-Kazan highway to Yekaterinburg and complete its construction by 2024 (see below) [18].

The roads, built mostly many years ago, are quite able to cope with the steadily growing traffic flows. About half of the roads are overloaded, and three-quarters do not meet modern requirements. Insufficient road widths and frequent repairs cause traffic jams (see below).

There are several international passenger airports in Moscow and the Moscow region: Sheremetyevo (two airports - Sheremetyevo-1 and Sheremetyevo-2, including cargo terminals), Vnukovo, Domodedovo and Ostafyevo. There is also Bykovo Airport, which is used for cargo transportation. The largest military airport is Chkalovsky (near Shchelkovo), which also receives civilian passenger and cargo aircraft.

The main highways of the Moscow region include the following:

- Minsk highway (M1 "Belarus" Moscow-Belarus) (E101)
- Simferopol highway (M2 "Crimea") Moscow - Belgorod (E105)
- Kiev highway (M3 "Ukraine" Moscow-Kaluga-Bryansk-Kyiv)
- Motorway M4 (Russia) (M4 "Don" Moscow-Voronezh-Rostov-on-Don-Krasnodar) (E115)
- Ryazan highway (M5 "Ural" Moscow-Chelyabinsk) (E30)
- Nizhny Novgorod Highway (M7 Volga Moscow-Ufa) (E22)
- Kholmogory - Yaroslavskoe highway (M8 "Kholmogory" Moscow-Arkhangelsk) (E115)
- Novorizhskoe highway (M9 "Baltic" Moscow-Riga) (E22)
- Leningrad highway (M10 "Russia" Moscow-Tver-Novgorod-St. Petersburg) (E105)
- Mozhayskoye Highway (A100 Moscow-Borodino)
- Highway M11 Neva Moscow-St. Petersburg
- Kaluga Highway (A101, Moscow-Troitsk-Obninsk-Kaluga)
- Shchelkovskoe Highway (A103 Moscow-Shchelkovo-Chernogolovka)
- Dmitrovskoe (A104 Moscow-Dubna)
- Small concrete ring (A107)
- Large concrete ring (A108)
- Central Ring Road (A113)
- Egoryevskoye Highway (R105 Moscow-Kasimov)
- Pyatnitskoye Highway (R111 Moscow-Solnechnogorsk)
- Rogachevskoe highway (P113 Lobnya-Rogachevo)
- Nosovikhinskoye Highway (Moscow-Likino-Dulyovo)
- Warsaw highway (Moscow-Podolsk-Obninsk-Roslavl)
- Borovskoe Highway (Moscow-Vnukovo)
- Rublevo-Uspenskoye highway
- Dzerzhinskoye Highway (Dzerzhinsky-Kotelniki-Novoryazanskoye Highway)
- Ostashkovskoe Highway (Moscow-Mytishchi)

In the Moscow region, preparations are underway for the construction of a new highway M-12 "Moscow-Kazan" with a length of more than 800 kilometers. The highway will connect the largest regional centers and agglomerations with the network of high-speed roads in the European part of Russia. And in the Moscow region, the M-12 will allow unloading the eastern direction, where about two million people live [19].

But, as they say, “a big family has its black sheep” - even in Moscow there are still many “killed” roads for which Russia is so “famous” ... And most of them, as compassionate Muscovites report, in We-Tishchi and Khimki, but officials, as always, “have no funds” to repair such roads (road funds are spent on the more expensive, but more requested by the supreme power, construction of new highways (see above) [20].



As of the beginning of May 2023, there were 1,551 gas stations in the Moscow region, and almost 27,470 gas stations in Russia as a whole [21]. In the Moscow region, these are, first of all, gas stations of Gazpromneft (171), Rosneft (165) and Lukoil (165), but there are also many BP gas stations, the most profitable land plots for which are provided -vila British company local mafia [22].



As of the beginning of June 2022, almost 7.6 thousand new passenger cars were registered in Moscow and 2.47 thousand in the Moscow region [23]. In the whole region, this is almost 10.07 thousand - the most in the regions of Russia (where at the beginning of July 2022, a total of 53.84 million cars were registered). It turns out that with a permanent population in Moscow and the Moscow region of 12.641 million people. on average for 2022, motorization of the population of the region amounted to over 796 cars per 1,000 inhabitants. In other words, it is still inferior to this indicator for the United States (this “country on wheels”, where the motorization of the population exceeds 830 cars / 1 thousand people) and, of course, below the highest indicator in the world for San Marino, this European dwarf state on the Apennine Peninsula (1,299), but still significantly exceeds the average for Russia (306), as well as the average for the world (less than 107) [24-27].

It must be said that Moscow does not belong to the most “automobile” cities of the planet and even Russia - here only a third of the citizens have their own car, and the degree of motorization of residents is less than 321 cars per thousand, while motorization of the population, say, in Luxembourg in 2022 was 696 cars per 1,000 inhabitants - this was the highest motorization of the population in the EU). In the first place in Russia - Vladivostok. Here, there are 566 cars per 1,000 people, that is, every second person has a car. And Moscow is only in the seventh place in Russia... [28].

Moscow traffic jams are a real evil of the capital - they can piss off even the most balanced motorist. But maybe this is the information of the international company TomTom, based in Amsterdam and ranking the cities of the world by average travel time per 10 km in 2022 (Table 1). After all, Moscow, despite its monstrous traffic jams, did not even enter the top ten of the TomTom rating , and this cannot be called empty gloating.

Table 1: Characteristics of Traffic Jams in the 10 Most Busiest Cities in the World in 2022 (according to TomTom)

Place in the ranking	City, country)	Average travel time per 10 km	Average speed at rush hour , km/h
1	London, Great Britain)	36 min 20 sec	14
2	Bangalore (India)	29 min 10 sec	18
3	Dublin (Ireland)	28 min 30 sec	17
4	Sapporo (Japan)	27 min 40 sec	19
5	Milan, Italy)	27 min 30 sec	18
6	Pune (India)	27 min 20 sec	19
7	Bucharest (Romania)	27 min 20 sec	17
8	Lima (Peru)	27 min 10 sec	18
9	Manila (Philippines)	27 min	20
10	Bogota (Colombia)	26 min 20 sec	19

Source: traffic jams <https://www.tomtom.com/traffic-index/ranking> [29]

Traffic jams in the center of Moscow in the evening, when people go home after work, can reach 8 points, according to a very cautious assessment of the Moscow Department of Transport and Road Infrastructure Development. The department recommended using public transport during rush hours on Fridays. “Reasons: a short working day, a large number of trips out of town, repair work on the road, minor accidents,” says the press service of the department of transport [30].

The greatest difficulties when driving in the evening arise in the central part of the city, on the Garden Ring, the Third Transport Ring (TTK), the Moscow Ring Road, as well as on outbound highways in the direction of the Moscow region.

In Moscow, a clear preference is given to foreign cars. Thus, according to the information agency Regnum, in Moscow at the beginning of 2020 there were 3,808 million cars.

At the same time, the share of cars of domestic brands accounts for only 17.4% of the car fleet of the capital, which in numerical terms is 662203 units . So thus 82.6% of the fleet Moscow consists of from foreign cars.

The leader in terms of numbers in the Moscow Ford Focus fleet . At the beginning of the year, there were 89337 such cars.

In second place is Hyundai Solaris . There are 85 of them in Moscow 715 units. Closes the top three Kia Rio , whose number in Moscow is 79841 copies.

Fourth and fifth places belong to Skoda Octavia (73746 units) and Volkswagen Polo (65260 units).

Only the sixth place in the top ten most common cars in the Russian capital is occupied by the domestic model Lada 2109 (61031 pcs.).

In addition, this list also includes: Nissan X-Trail (54 953 units), Lada 2107 (54 928 units), Lada 2106 (54 836 units) and Toyota Camry (52 643 items) [31].

There are so many foreign cars in Moscow that in February 2023, one of the patriotic deputies of the State Duma proposed replacing the car park of the Moscow City Hall with Moskvich cars (instead of luxury foreign cars).

Recall that the model range of the Moskvich brand consists of the Moskvich 3 crossover (turned JAC JS4) and the electric Moskvich 3e (rebranded Sehol E40X), which will go on sale by the end of February 2023. In 2023, the plant " Moskvich plans to produce 50,000 brand vehicles, 10,000 of which will be electric vehicles.

Earlier, Autonews.ru reported that in 2023 Moskvich will supply 3,000 cars to taxis and car sharing. [32].



Consumption of Petroleum Products

In the absence of official statistics on energy use in the Moscow region, we (GAPMER) estimate the consumption of liquid petroleum products in the Moscow Region (including Moscow) in 2020 at the level of about 1 million barrels per day, or more than 1.8 exa joules (EJ), or more than 43.2 million tons of oil equivalent (toe).

We also estimate the annual use in Moscow of gasoline , which is consumed almost exclusively by road transport, and diesel fuel , which is intensively used in the transport sector, at about 32% and 28% of the consumption of liquid petroleum products in the city, respectively). Kerosene , used in the Moscow Region mainly for refueling civil and military aircraft at 7 capital airports (approximately 1.4 million tons in 2020), accounts for at least 3% of the regional consumption of liquid petroleum products . In this case, we do not take into account LPG , which is used mainly for cooking in the region and the production of chemical products, and fuel oil , used by the Moscow Oil Refinery (see above) as refinery fuel. It is also important to keep in mind that the consumption of motor fuel (i.e. gasoline and diesel) decreased markedly in the Moscow region in 2020 in the context of the coronavirus pandemic, and jet kerosene began to be used more sparingly in order to avoid a serious shortage in 2011.



Gas station Prices and Affordability

In January 2023, the average prices for AI-92 gasoline in the regions of Russia ranged from 41.88 rubles/l to 63 rubles/l (with an average all-Russian level of 47.18 rubles/l). At the same time, the regional differentiation of household incomes also remained high, and the burden on the family budgets of ordinary drivers depended not so much on fuel prices at gas stations, but on the ratio of the retail price of gasoline to wages in each particular region. Recently, there has been a trend towards an increase in wages (which is successfully "eaten up" by inflation), which led to an increase in the availability of gasoline, but the availability itself remained significantly different in different regions.

To assess the situation, experts from the RIA Novosti agency calculated the amount of gasoline that residents (drivers) of Russia can purchase with their average monthly salary, and ranked the regions of the Russian Federation in terms of the availability (price) of gasoline for the population of Russia.

The rating was based on the volume of the most common brand of gasoline in the country, which residents of the regions (including the Republic of Tatarstan) could purchase with their average monthly salary. The number of liters of fuel available for wage purchase was determined by dividing the average net monthly salary in the region (excluding personal income tax) for the period from December 2021 to November 2022 by the average gasoline price in the region in January 2023 [33-34].

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Table 2: Availability and Average Prices of Filling Stations for AI-92 Gasoline in Russian Regions in January 2023

Place in the ranking	Region	How much gasoline AI-92 can be bought for an average monthly salary, l	Average price of AI-92 gasoline at gas stations in January 2023, rub/l
1	Yamalo-Nenets auton. county	2685	41.88
2	Moscow	2219	47.69
3	Chukotka Autonomous Okrug	1935	63.00
4	Khanty-Mansi auton. county	1 871	44.58
5	Nenets Autonomous Okrug	1 794	50.44
6	Magadan Region	1 768	57.90
7	Sakhalin region	1 608	55.38
8	Kamchatka Krai	1 572	55.99
9	Saint Petersburg	1 508	48.07
10	Murmansk region	1463	50.53
eleven	The Republic of Sakha (Yakutia)	1442	56.77
12	Krasnoyarsk region	1 312	46.13
13	Komi Republic	1 300	44.74
14	Moscow region	1 292	46.73
15	Amur region	1 153	49.08
16	Arhangelsk region	1 138	48.03
17	Tyumen region	1 137	46.29
18	Irkutsk region	1 133	47.99
19	Khabarovsk region	1 118	49.48
20	Kemerovo region	1 086	44.60
21	Primorsky Krai	1 080	49.57
22	Tomsk region	1 078	44.95
23	Leningrad region	1 052	47.84
24	Sverdlovsk region	1 011	46.71
25	The Republic of Khakassia	1 009	45.82
26	Kaluga region	999	45.45
27	Republic of Karelia	994	48.04
28	Transbaikal region	988	51.25
29	Chelyabinsk region	983	43.53
thirty	Novosibirsk region	982	45.81
31	Republic of Tatarstan	972	45.98
32	Jewish Autonomous Region	965	50.03
33	Tyva Republic	956	45.98
34	Vologda Region	953	47.73
35	Perm region	949	46.76
36	The Republic of Buryatia	936	47.95
37	Tula region	901	47.02
38	Samara Region	901	45.68
39	Omsk region	884	44.91
40	Republic of Bashkortostan	884	46.78
41	Yaroslavl region	880	45.31
42	Krasnodar region	859	47.83
43	Kursk region	858	45.77
44	Belgorod region	852	47.87
45	Novgorod region	848	47.38
46	Lipetsk region	844	46.87
47	Ryazan Oblast	838	46.34

48	Nizhny Novgorod Region	837	47.49
49	Voronezh region	828	47.89
50	Vladimir region	820	46.69
51	Astrakhan region	820	48.64
52	Tver region	812	47.27
53	Udmurtia	811	47.07
54	Rostov region	803	47.68
55	Kaliningrad region	798	50.58
56	Orenburg region	798	46.72
57	Altai (Republic)	796	46.76
58	Kurgan region	771	44.64
59	Saratov region	767	47.24
60	Ulyanovsk region	763	46.17
61	Kirov region	758	45.78
62	Volgograd region	758	48.04
63	Chuvashia	758	46.40
64	Mari El Republic	757	45.19
65	Penza region	749	47.10
66	Bryansk region	748	46.55
67	Smolensk region	745	47.08
68	Oryol Region	738	46.96
69	Stavropol region	729	48.66
70	Kostroma region	728	46.37
71	Mordovia	726	46.60
72	Altai region	725	44.72
73	Sevastopol	714	50.94
74	Adygea	706	48.98
75	Pskov region	701	47.65
76	Crimea	700	51.09
77	Tambov Region	700	47.43
78	Ivanovo region	665	46.75
79	Resp. North Ossetia-Alania	654	47.67
80	Kalmykia	654	47.57
81	Dagestan	646	46.79
82	Karachay-Cherkessia Republic	640	47.63
83	Kabardino-Balkarian Republic	620	47.66
84	Chechen Republic	597	49.50
85	Republic of Ingushetia	586	48.22
-	Russian Federation	1 166	47 , 18

Source: <https://riarating.ru/regions/20230306> and <https://lprime.ru/gasoline/20230306/839979331b> [33-34]

The leaders of the rating were the Yamalo-Nenets Autonomous Okrug (YaNAO) and Moscow, where the average monthly salary could buy more than 2,000 rubles . liters of AI-92 at the all-Russian level of 1,166 liters. In the Chukotka Autonomous Okrug (CHAO), Khanty-Mansiysk Okrug (KhMAO), Nenets Okrug (NAO), Magadan and Sakhalin regions, Kamchatka Territory and St. Petersburg, residents could buy more than 1.5 thousand liters of this gasoline. As for Moscow, which took an honorable 2nd place in the ranking, at an average retail price of a little less than 47.7 rubles per liter, Moscow motorists could purchase almost 2,220 liters of motor gasoline with their average salary in January 2023 AI-92.



Pipelines

Only one MNP passes through the territory of the Moscow Region, feeding the Moscow Oil Refinery (see above). This is the Yaroslavl-Moscow oil pipeline, operated since 1938, owned by the Transneft pipeline company, operated by its subsidiary Transneft-Upper Volga, with a length of 332 km, the internal diameter of the pipes used is 720 and 1,020 mm and the throughput 12 million tons of oil per year. Oil enters this pipeline from the north of the European part of Russia (Komi Republic) (see Figure 3).

Import. In January 2022, oil and oil products were by far not the largest (although the largest) import items of Moscow, the value of which amounted to almost \$69 billion and \$33 billion, respectively (almost 34% and over 16% of imports, expenses of the city budget) - mainly from China and the Netherlands (which accounted for almost half of the cost of oil imports) and Finland and South Korea (19.3% each for oil products), which were transported by rail. At the same time, both in terms of cost and especially in country plans, the situation has changed little over the past months and years [36].

Conclusion

We can conclude that the Moscow region, which does not have its own oil resources and is a large consumer and importer of liquid fuels, is relatively stable in terms of market development and consumption of oil and oil products.

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Figure 3: Major Oilfields in Moscow and Its Surroundings

In mid-2023, the Transneft oil pipeline company completed repairs and put into operation a section of the Yaro- Slavl-Moscow, passing through the Losiny Ostrov National Park [35].

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