

CIREC MONTHLY news

Chemical Industry Reporting for Russia, regional partners, and Central Europe

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**Russia-Ukraine-Belarus-Kazakhstan-Uzbekistan-Azerbaijan
Czech Republic-Hungary-Poland-Romania-Serbia-Slovakia**

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Key points from this issue:

Central European petrochemical markets

- PKN Orlen intends to offload refinery assets in Lotos to Saudi Aramco and retail outlets to MOL
- NIS (Gazprom Neft is the majority shareholder) finally took control of HIP Petrohemija on 24 December, increasing its stake in capital from 20.86% to 90%
- PKN Orlen has set intermediary markets for 2030 for reducing CO₂ emissions from its current refining and petrochemical assets by 20% and emissions from power generation by 33%.
- Imports of methanol into Poland totalled 647,039 tons in the first eleven months in 2021 against 681,905 tons in the same period in 2020
- PTA exports from Poland fell from 373,512 tons in the first eleven months in 2020 to 332,425 tons in the same period in 2021

Russian chemical production

- Russian chemical production rose 6.4% in the first eleven months in 2021 over the same period in 2020, with the largest rise seen in the output of mineral fertilisers
- Russian ethylene production totalled 3.995 million tons in the first eleven months in 2021 against 3.825 million tons in the same period in 2020
- Russian styrene production fell from 671,600 tons in the first eleven months in 2020 against 659,700 tons in January to November 2021
- Isopropyl alcohol production has been given a major boost by the start-up of the Omsk Kaucuk plant transforming Russia into a net exporter
- Russian benzene production amounted to 1.137 million tons in the period January to November 2021 against 1.202 million tons in the same period in 2020

Russian chemical trade

- In January-November 2021, imports of polyethylene into Russia fell by 7% to 544.600 tons against 586,300 tons in the same period in 2020
- Russian exports of methanol dropped in the first eleven months in 2021 to 1.700 million tons from 1.974 million tons in the same period in 2020
- Export shipments of Russian paraxylene totalled 75,900 tons in January to November 2021 against 134,000 in the same period in 2020
- Values of Russian TDI imports increased from a total of \$70.758 million in January to November 2020 to \$143.239 million in the same period in 2021

Project news

- Titan-Polymer expects to launch of the first line of the BOPET film at its Pskov site in 2022
- Lukoil-Permnefteorgsintez plans to build and commission a new catalytic cracking complex by the end of 2026
- Gazprom started work in January a new gas pipeline section connecting the main gas trunk to the Baltic coast for the transportation of ethane-containing gas to Ust Luga

CENTRAL and SOUTH EAST EUROPE

PKN Orlen-Lotos asset sale

PKN Orlen has laid out asset sale agreements with Aramco Overseas Company, Unimot Investments, Rossi

PKN Orlen-carbon neutral targets

As part of the group target to achieve emission neutrality by 2050 PKN Orlen has set intermediary markets for 2030 for reducing CO₂ emissions from its current refining and petrochemical assets by 20% and emissions from power generation by 33%. The emission neutrality strategy announced by PKN Orlen focuses on four pillars: comprising energy efficiency in production, zero and low-emission power generation, and alternative fuels and green financing.

PKN Orlen intends to invest more than zł 25 billion in projects by 2030 that will promote environmental impacts and open the group up to new business models. One target is to increase the production of biofuels by around 500,000 tpa by 2030, with major investments to be undertaken at the Trzebinia and Jedlice refineries.

Due to investments undertaken so far in the energy efficiency at refineries at Plock, Litvinov and Mazeikiai over 80% of PKN Orlen's CO₂ emissions are now covered by free allowances. The group is also in the preparatory phase for the construction of a 600 kg/h hydrogen hub at Wloclawek, which is aimed to give the company the leading position on the Polish market for hydrogen fuels used in transport.

Biofuel and MOL as part of countermeasures in connection with the planned acquisition of control over Grupa Lotos. According to Orlen's negotiations Saudi Aramco will buy a 30% stake in the Lotos refinery at Gdansk for approximately zł 1.15 billion (€250 million). The bitumen facilities at Gdansk are intended for sale to Unimot Investments and the retail division to MOL. MOL announced that it will start operations in Poland due to the acquisition of 417 petrol stations currently operating throughout the country under the Lotos brand.

PKN Orlen-petrochemical investments

PKN Orlen's concluded agreements with Saudi Aramco may open up the possibility of strategic cooperation in the petrochemical area. As part of the agreements signed with Saudi Aramco, Orlen has guaranteed itself additional supplies of Arab oil for its refineries. This does not eliminate the need for Russia crude but certainly does reduce it and this is already a concern for Rosneft and Lukoil.

The most important investment in the petrochemical division consists of the construction of the Olefin III complex. The investment at Plock

has been estimated at around zł 13.5 billion (€3.0 billion). New installations in production should start in early 2025.

Orlen Unipetrol-carbon neutral targets

Following the guidelines established by PKN Orlen, Orlen Unipetrol has established its own wants to be carbon neutral by 2050. The goal is to achieve the production of advanced biofuels from renewable sources, chemical recycling, hydrogen economy and Industry. Orlen Unipetrol is seeking partners which could help towards a responsible transition to a carbon-neutral future. The concept of cooperation involves the facilitation of start-ups, and the opportunity to verify small and medium-sized companies. The aims are to establish new ideas and technologies, gain new contacts, and seek establish cooperation along with financial support.

Orlen Unipetrol Jan-Nov 2021

Due to the introduction of the PE3 plant at Litvinov HDPE exports increased from 257,300 tons in the first eleven months in 2020 to 302,200 tons in the same period in 2021. HDPE export revenues increased from €219.8 million to €423.1 million. Polypropylene exports increased from 191,400 tons in January to November 2020 to 255,700 tons in 2021, with revenues rising from €200.2 million to €358.4 million.

Ethylene exports from the Czech Republic totalled 21,342 tons in the first eleven months in 2021 against 15,264 tons in the same period in 2020. Czech ethylene exports to Germany amounted to 12,054 tons in January to November for €12.640 million followed by 6.682 tons to Slovakia for €6.81 million. Exports to Germany are undertaken from Litvinov to Boehlen and to Slovakia by rail from Litvinov to Bratislava.

In other product areas Czech exports of ethylbenzene increased in the first eleven months to 118,700 tons in January to November 2021 against 89,211 tons in the same period in 2020, whilst benzene exports increased from 25,891 tons to 44,480 tons.

Orlen Unipetrol Polyolefin Exports

HDPE	Jan-Nov 21	Jan-Nov 20
Vol (ktons)	302.2	257.3
Value (€ mil)	423.1	219.8
PP	Jan-Nov 21	Jan-Nov 20
Vol (ktons)	255.7	191.4
Value (€ mil)	358.4	200.2

Czech Petrochemical Exports (unit-kilo tons)		
Product	Jan-Nov 21	Jan-Nov 20
Ethylene	21.342	15.264
Propylene	4.019	5.143
Butadiene	2.453	0.000
Benzene	44.460	25.891
Toluene	7.807	6.624
Ethylbenzene	118.700	89.211

Czech Petrochemical Imports (unit-kilo tons)		
Product	Jan-Nov 21	Jan-Nov 20
Ethylene	3.216	3.540
Propylene	39.482	43.801
Butadiene	69.949	57.659
Benzene	65.630	74.466
Toluene	6.648	5.808
Styrene	57.679	34.119

Polish Chemical Production (unit-kilo tons)		
Product	Jan-Nov 21	Jan-Nov 20
Caustic Soda Liquid	331.1	355.2
Caustic Soda Solid	75.7	67.2
Ethylene	307.5	449.4
Propylene	307.8	409.0
Butadiene	38.2	55.6
Toluene	10.2	9.7
Phenol	41.8	39.9
Caprolactam	147.7	142.4
Acetic Acid	4.2	5.1
Polyethylene	209.7	311.9
Polystyrene	65.2	59.9
EPS	99.6	95.8
PVC	202.5	271.2
Polypropylene	268.4	322.8
Synthetic Rubber	252.2	257.3
Ammonia (Gaseous)	2377.0	2188.2
Ammonia (Liquid)	99.5	95.0
Pesticides	62.5	60.6
Nitric Acid	2254.0	2202.0
Nitrogen Fertilisers	1922.0	1905.0
Phosphate Fertilisers	452.3	401.9
Potassium Fertilisers	325.7	338.9

Propylene imports into the Czech Republic dropped from 43,801 tons in the first eleven months in 2020 to 39,482 tons in 2021. In January to November last year imports of propylene from Germany amounted to 15,570 tons for €14.656 million, followed by Poland with 11,056 tons for €11.902 million. Other propylene suppliers to the Czech market in 2021 included Slovakia with 5,266 tons, followed by Ukraine with 3,618 tons and Romania 3,099 tons. Czech imports of butadiene rose from 69,949 tons in the first eleven months last year to 57,659 tons of which Germany supplied a total of 58,355 tons for €53.111 million and Hungary 9,572 tons for €9.338 million.

MOL-Linde steam cracker digitalisation

Linde Engineering and MOL recently signed a contract to digitalise the operation of the MOL Petrochemicals' steam cracker plant at Tiszaújváros. Linde will install the Linde Virtual Furnace software solution on MOL's steam cracker. The virtual steam cracker system is designed to help increase capacity and product quality while reducing energy consumption and emissions.

Synthos-butadiene project and other investments

Synthos is working on its contract concluded with Air Liquide Engineering and Construction last year in order to construct a new butadiene extraction unit at Plock with a capacity of 120,000 tpa. The commissioning of the butadiene extraction unit and first production are scheduled for 2024. Butadiene extraction technology uses N-methylpyrrolidone (NMP) as a selective solvent to recover 1,3-butadiene from a crude C4 stream. The new butadiene unit is a next step to safeguard Synthos' strategic feedstock position. A major advantage of the NMP Process licensed by Air Liquide Engineering & Construction is its very high reliability and plant availability.

Capital expenditures of the Synthos Group will amount to about zł 5 billion (over €1.1 billion) by the end of 2025. The largest investment under construction is the acquisition of the rubber business from Trinseo for almost \$0.5 billion and the construction of the CCGT gas-steam unit at Oswiecim for almost zł 0.5 billion. The gas-fired combined heat and power plant, which is to replace two coal-fired furnaces, will be completed by the end of 2023.

Polish propylene & butadiene imports, Jan-Nov 2021

Poland increased imports of butadiene in the first eleven months in 2021 primarily due to lower production at Plock, rising from 93,516 tons to 110,810 tons in January to November 2021. Supply sources are divided largely between Austria, Germany and Hungary.

Poland imported 97,759 tons of styrene monomer in the first eleven months in 2021 for a total value of €106.971 million. The Netherlands supplied 77,550 tons for €81.783 million followed by Belgium with 10,724 tons and Germany 9,146 tons.

Poland increased imports of propylene in the first eleven months in 2021 due largely to lower production

at Plock. Imports totalled 222,643 tons in the period January to November 2021 for a total cost of €203.504 million against 125,239 tons in the same period in 2020 for €74.831 million.

Polish Imports of Propylene (unit-kilo tons)		
Country	Jan-Nov 21	Jan-Nov 20
Lithuania	6.415	18.793
Germany	98.135	10.785
Russia	46.680	20.195
Ukraine	67.828	70.194
Others	3.585	5.273
Total	222.643	125.239

Average prices for propylene imports into Poland rose from €613 per ton in January to November 2020 to €880 per ton in the same period this year. Germany supplied 98,135 tons of propylene to Poland in the first eleven months against 10,785 tons in the same period in 2020 whilst imports from Ukraine dropped from 70,194 tons to 67,828 tons. Russia increased propylene shipments to 46,680 tons from 20,195 tons.

HIP Petrohemija-NIS and polypropylene project

NIS (of which Gazprom Neft is the majority shareholder) finally took control of HIP Petrohemija on 24 December, increasing its stake in capital from 20.86% to 90%. NIS will also invest €150 million in the development of the complex and the construction of a polypropylene plant with a capacity of 140,000 tpa. This agreement will provide new jobs, contribute to the development of the economic environment not only at the local level, but also at the level of the whole country. Petrohemija is the only producer of polyethylene polymers and rubbers in the country.

HIP Petrohemija owns petrochemical complexes at Pancevo, Elemir and Crepaja. It produces HDPE, LDPE and other petrochemical products with a total capacity of 700,000 tpa. Completion of the construction in Serbia of a gas pipeline connecting the Turkish Stream and the Hungarian gas transmission system may give Serbia new opportunities for developments in petrochemicals.

Polish PTA Exports (unit-kilo tons)		
Country	Jan-Nov 21	Jan-Nov 20
Belarus	11.1	27.0
Germany	290.3	284.9
Lithuania	20.5	13.2
Switzerland	3.8	7.4
Turkey	0.0	13.1
Others	6.6	28.0
Total	332.425	373.512

Polish PTA exports Jan-Nov 2021

PTA exports from Poland decreased from 373,512 tons in the first eleven months in 2020 to 332,425 tons in the same period in 2021. Germany remained the main customer for Polish PTA, taking 290,300 tons in the first eleven months. Lithuania was the second largest destination for PTA export shipments, taking 20,500 tons against 13,200 tons whilst Belarus reduced purchases to 11,100 tons from 27,000 tons in the same period in 2020. Average prices for Polish PTA exports in the first eleven months last year amounted to \$623.60 per ton.

Polish Paraxylene Imports 2021 (unit-kilo tons)		
Country	Jan-Nov 21	Jan-Nov 20
France	26.9	0.0
Germany	0.0	4.7
India	22.3	0.0
Russia	38.3	8.9
Total	87.6	13.6

PTA imports into Poland in the first eleven months in 2021 totalled 59,200 tons against 25,100 tons in the same period in 2020. The largest share of PTA imports this year came from the Netherlands. In addition to rising PTA imports last year Poland increased imports of paraxylene feedstocks from 13,600 tons to 87,600 tons.

Central European isocyanates, Jan-Nov 2021

MDI imports into the Czech Republic totalled 38,825 tons in the first eleven months in 2021 against 32,414 tons in the same period in 2020.

Czech MDI Imports (unit-kilo tons)		
Country	Jan-Nov 21	Jan-Nov 20
China	2.519	3.329
Belgium	11.136	8.572
Germany	12.731	11.042
Hungary	6.738	4.123
Netherlands	2.546	3.028
Others	3.098	2.150
Total	38.825	32.414

Total costs for MDI imports into the Czech Republic rose from €33.584 million in January to November 2020 to €78.817 million in the same period in 2021, with average prices rising from €1.383 per ton to €2.334. Belgium supplied 11,138 tons of MDI for €25.215 million whilst Germany supplied 13,799 tons for €32.768 million. Hungary provided 6,783 tons of MDI to the Czech market in the first eleven months for €16.935 million.

MDI imports into Poland totalled 156,631 tons in the first eleven months for a total value of €373.814 million. Average prices amounted to €2.387 per ton. TDI imports into Poland amounted to 74,944 tons in the first eleven months in 2021 against 73,900 tons in the same period in 2020. Values in 2021 amounted to €156.500 million, equating to €2.525 per ton.

Polish MDI Imports Jan-Nov 2021		
Country	Jan-Nov 21	Jan-Nov 20
Germany	44.403	45.500
Netherlands	21.019	11.700
Hungary	46.253	47.300
Belgium	28.931	23.900
Saudi Arabia	2.933	1.000
Others	13.090	5.274
Total	156.631	134.674

PCC BD investments into alkoxyates

PCC BD will receive a targeted subsidy from the State Treasury in the maximum amount of zł 42.12 million (€10.1 million) for the construction of a new plant for the production of alkoxyates and other chemical compounds. The value of the investment is estimated at zł 351 million. PCC Rokita and PCC Exol each have a 50% stake in PCC BD.

At the beginning of December, the companies informed that the installation will be used for the production of products manufactured using ethylene oxide, the deliveries of which will be carried out from 2024. The completion of the investment is expected in mid-2026. The initially assumed average annual new potential production capacity with the assumed portfolio will amount to an estimated 50,000-55,000 tpa.

Polish TDI Imports (unit-kilo tons)		
Country	Jan-Nov 21	Jan-Nov 20
Germany	19.844	24.300
Netherlands	8.716	11.500
Hungary	34.544	30.000
Belgium	0.978	0.500
Saudi Arabia	3.159	5.300
Others	7.703	2.300
Total	74.944	73.900

Central European methanol trade Jan-Nov 2021

Czech imports of methanol amounted to 85,921 tons in the first eleven months in 2021 against 75,432 tons in the period January to November 2021. Russia accounted for 51,523 tons in the first eleven months, according to Czech statistics. Prices

Czech Methanol Imports (unit-kilo tons)		
Country	Jan-Nov 21	Jan-Nov 20
Germany	10.108	12.686
Russia	51.523	31.520
Poland	22.247	28.443
Others	2.043	2.784
Total	85.921	75.432

per ton for methanol exports into the Czech Republic increased last year from €239 to €350. Russia supplied 51,523 tons of methanol for €17.962 million, whilst Poland supplied 22,247 tons for €8.191 million.

Polish Methanol Imports (unit-kilo tons)		
Country	Jan-Nov 21	Jan-Nov 20
Belarus	2.620	11.200
Finland	58.013	62.604
Lithuania	7.514	8.600
Germany	77.668	7.900
Netherlands	25.739	0.000
Norway	26.006	41.300
Russia	434.113	477.100
Others	15.365	73.201
Total	647.039	681.905

Imports of methanol into Poland totalled 647,039 tons in the first eleven months against 681,905 tons in the same period in 2020. Exports of methanol from Poland rose to 171,990 tons in January to November 2021 against 164,691 tons in 2020. Import prices of methanol averaged €285 per ton and export prices averaged €347 per ton.

Exports of acetic acid from Serbia declined from 52,600 tons in the first ten months in 2021 against 70,200 tons in January-October 2020 whilst methanol exports rose from 75,300 tons to 86,900 tons.

Ciech Group-decarbonisation plan

The Ciech Group is undertaking a decarbonisation plan within the framework of the ESG strategy objectives: by 2026 it intends to reduce carbon dioxide emissions by approximately 33% (compared to 2019), and in 2033 to stop using coal in energy production processes. In the most energy-intensive plants of the Group producing soda ash, i.e., at Inowrocław and Janikowo, coal-fired combined heat and power plants are currently operating. In 2021 Ciech signed an agreement with Synthos Green Energy to build small nuclear and micro modular reactors in plants producing soda ash. Currently, Ciech uses coal as fuel, but the aim is to gradually move away coal in favour of obtaining energy from natural gas, thermal waste processing or nuclear energy.

Ciech silicates-new furnace

Work is underway at Ciech's Żary plant for the construction and installation of a new furnace for smelting glassy sodium silicate. The investment will be ready in 2022 and Ciech will strengthen its position as the largest supplier of silicates in Europe. The new installation means an increase in revenues and a reduction in CO₂ emissions.

RUSSIA

Russian Chemical Production (unit-kilo tons)		
Product	Jan-Nov 21	Jan-Nov 20
Caustic Soda	1,178.1	1,174.6
Soda Ash	3,106.0	3,046.0
Ethylene	3,994.4	3,824.3
Propylene	2,764.2	2,348.0
Benzene	1,168.9	1,224.8
Xylenes	444.6	435.7
Styrene	676.7	666.3
Phenol	241.7	241.6
Ammonia	18,300.0	17,800.0
Nitrogen Fertilisers	10,359.0	10,007.0
Phosphate Fertilisers	3,891.0	3,926.0
Potash Fertilisers	9,787.0	8,972.0
Plastics in Bulk	9,969.0	9,237.0
Polyethylene	3,075.5	3,121.0
Polystyrene	508.9	531.6
PVC	930.8	963.5
Polypropylene	1,836.7	1,580.1
Polyamide	180.7	146.1
Synthetic Rubber	1,548.0	1,388.0
Synthetic Fibres	184.7	141.7

Russian chemical production, Jan-Nov 2021

Russian chemical production rose 6.4% in the first eleven months in 2021 over the same period in 2020, with the largest rise seen in the output of mineral fertilisers. Ethylene production increased from 3.824 million tons in the first eleven months in 2020 to 3.994 million tons in 2021 whilst propylene rose from 2.348 million tons in 2020 to 2.764 million tons.

The production of polymers in Russia increased to 9.969 million tons from 9.237 million tons in January to November 2020, including a rise in polyethylene production from 3.121 million tons to 3.076 million tons. More than half of the olefin and polyolefin production in Russia is undertaken by plants belonging to the SIBUR and TAIF groups which are now in the process of a large-scale merger.

Russian plants produced 1.548 million tons of synthetic rubber in the first eleven months, which is more than 10% more than in the same period in 2020. Rubber markets have improved in 2021 in terms of volume demand although margins remain tight.

In the base chemical sector Russian ammonia production amounted to 18.3 million tons in the first eleven months in 2021 versus 17.8 million tons in 2020. Caustic soda production amounted to 1.178 million tons against 1.175 million tons in 2020, whilst soda ash rose from 3.046 million tons to 3.106 million tons.

Russian Organic Chemical Trade Jan-Nov 2021				
	Export	Export	Import	Import
Product	Ktons	\$ mil	Ktons	\$ mil
Propylene	146.1	125.4	0.2	0.5
Benzene	14.8	10.3	66.5	63.4
Orthoxylene	49.6	37.3	0.3	0.5
Paraxylene	76.9	50.4	9.1	9.6
Styrene	90.1	114.2	5.9	8.4
Cumene	24.0	22.5	6.3	6.1
Methanol	1725.0	570.1	0.0	0.2
Isopropyl Alcohol	12.1	12.7	18.9	25.8
N-Butanol	16.8	25.7	0.8	1.5
Isobutanol	54.0	49.5	0.0	0.3
Ethylene Glycol	59.4	53.8	88.5	74.8
Propylene Glycol	1.0	3.0	25.5	60.8
Phenol	41.9	41.7	0.2	0.3
Ethylene Oxide	13.2	11.0	0.0	0.3
Acetone	62.0	44.0	0.2	0.6
Adipic Acid	0.1	0.1	6.7	12.4
Maleic Anhydride	0.9	2.0	6.6	10.1
Phthalic Anhydride	59.8	62.0	13.1	14.6
PTA	7.7	7.5	268.0	191.0
TDI	1.5	4.7	55.6	143.2
Caprolactam	183.4	302.3	0.6	1.5

Russian chemical trade Jan-Nov 2021

In the commodity organic trade sector methanol remains Russia's largest export product amounting to \$570.1 million in value in the first eleven months last year. The second most important organic commodity exported was caprolactam which amounted to \$302.3 million in the first eleven months and in third place propylene which yielded \$125.4 million.

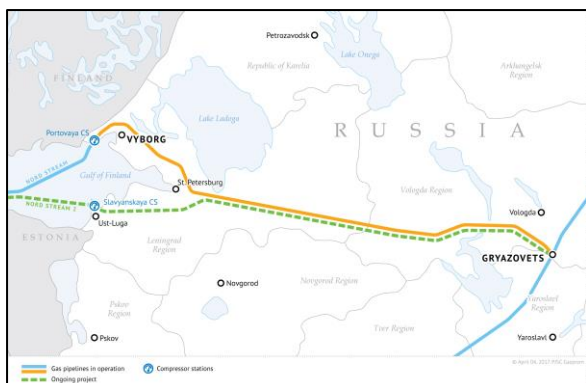
Regarding imports, PTA shipments into Russia were valued at \$191.0 million in the first eleven months in 2021 followed by TDI at \$143.2 million and ethylene glycol at \$74.8 million.

Overall exports of chemicals and chemical products from Russia totalled \$22.7 billion in the first eleven months in 2021 against \$14.5 billion in the same period in 2020. Imports rose from \$26.1 billion to \$32.2 billion. Fertilisers accounted for 47% of total chemical and chemical product exports in January to November 2021, whilst for import activity pharmaceuticals (including all intermediates) accounted for 38.1%.

Russian petrochemical projects

Baltic Gas-Chemical Complex, Ust Luga

Gazprom started work in January a new gas pipeline section in the Russian North West connecting the main gas trunk to the Baltic coast for the transportation of ethane-containing gas. The pipeline will be built in the existing energy corridor, parallel to the existing lines of the unified gas supply system. The total length of its linear part is 601.7 km, and the diameter of the pipe is 1400 mm.



Processing Complex (ECG) at Ust-Luga where construction is underway.

Lukoil-Perm propylene projects

Lukoil-Permnefteorgsintez intends to build and commission a new catalytic cracking complex by the end of 2026, that will facilitate production of propylene polymerization grade in an addition to enabling the production of high-octane motor gasoline. Lukoil-Permnefteorgsintez will use a number of technological processes from Honeywell UOP (USA) to convert low-value vacuum gas oil into gasoline and propylene. By the end of 2026, the catalytic cracking complex should be put into operation. Railway overpasses will be reconstructed, parks will be built for new products (for example, for propylene), which the company will produce simply in huge quantities.

and convertiplanes have been introduced which monitor project progress and behaviour. Locals have complained about the influx of up to 76,000 workers, who may be temporary, but the project itself means there is probably no return to normality for these areas.

Other matters affecting the Baltic Chemical Complex (BHC) include the approval by the Federal Antimonopoly Service for Gazprom's petition to acquire a 50% stake in the authorized capital.

In terms of social development, the project is considered as a disaster by the local villages where barracks have been constructed to house the foreign workers most of whom are Chinese. In order to control the workers on and off-site mechanical dogs, drone cameras

Irkutsk Polymer Plant-40% project completion Jan 2022

The Irkutsk Polymer Plant was rated at around 40% of completion by late January, construction is expected to develop quickly during the course of 2022. In January the active phase of installation of metal structures and pipelines began. Pyrolysis furnaces are to be installed this year whilst in February there are plans to complete the concreting of the foundation at the sites of ethylene and polyethylene, and work on laying underground networks. At the end of 2021, the construction of the Irkutsk Polymer Plant has already been financed for 85 billion roubles (\$1.073 billion).

of foreign investors. Other LNG projects proposed by Gazprom have failed to materialise including Vladivostok, the Black Sea and Vyborg. In terms of logistics the fairway of Ust-Luga Bay is shallow, covered with sand and silt and is unsuitable for the use of super tanker gas carriers, which will also reduce the profitability of the project.

Impact of Ust Luga project on Gazprom

The Ust Luga gas processing and gas chemical projects promise to become one of the largest investment projects in Russia, processing up to 45 billion cubic metres of gas from the Tambey and Tasiysk fields. However, until now Gazprom has had a very unsuccessful history of attempts to build LNG plants. The only existing LNG plant Sakhalin-2 was built in 2009 during the pre-sanctions period which began in the 90s by a consortium

Gazprom is behind Novatek which already has enough LNG capacity to produce liquefied gas for Europe and increases production volumes, as well as increases its fleet for LNG supplies along the Northern Sea Route. Extended delays are almost inevitable for the Ust Luga project by which time European demand for LNG could have fallen. The petrochemical complex at Ust Luga under Baltic Chemical appears a sound investment, but ultimately depends on the gas processing plant and its utilisation rates.

Russian petrochemical markets

Russian ethylene production, Jan-Nov 2021

Russian ethylene production totalled 3.995 million tons in the first eleven months in 2021 against 3.825 million tons in the same period in 2020. ZapSibNeftekhim produced 1.374 million tons in January to

Russian Ethylene Production (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Nov 20
Angarsk Polymer Plant	189.1	188.0
Kazanorgsintez	517.0	532.4
Stavrolen	284.4	313.2
Nizhnekamskneftekhim	554.3	564.0
Novokuibyshevsk Petrochemical	43.2	41.7
Gazprom n Salavat	285.0	345.1
SIBUR-Kstovo	341.7	352.7
SIBUR-Khimprom	49.6	52.3
Tomskneftekhim	270.5	250.6
Ufaorgsintez	85.3	104.8
ZapSibNeftekhim	1374.4	1079.7
Total	3994.6	3824.5

November, up from 1.080 million tons from January to November 2020. In the first eleven months in 2021 Nizhnekamskneftekhim produced 554,300 tons of ethylene against 564,000 tons in the first eleven months in 2020 whilst Kazanorgsintez dropped from 532,400 tons to 517,000 tons.

Other important ethylene producers included SIBUR-Kstovo which produced 341,700 tons versus 352,700 tons. In Bashkortostan Gazprom neftekhim Salavat produced 285,000 tons against 345,100 tons, whilst Ufaorgsintez reduced production from 104,800 tons to 85,300 tons.

Stavrolen at Budyennovsk reduced ethylene production in the first eleven months in 2021 to 284,400 tons against 313,200 tons in 2020. Lukoil has begun supplying electricity to the Stavrolen petrochemical plant at Budyennovsk from its own solar power plant (SPP), located on the territory of the Volgograd refinery. The

use of electricity produced from renewable energy sources has been estimated to reduce indirect energy greenhouse gas emissions at Stavrolen's petrochemical plant by almost 5,000 tpa.

Russian Propylene Production (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Nov 20
Angarsk Polymer Plant	104.3	107.6
Kazanorgsintez	42.8	49.1
Lukoil-NNOS	237.1	198.1
Stavrolen	113.5	116.2
Nizhnekamskneftekhim	276.7	269.9
Novokuibyshevsk	56.3	35.0
Omsk Kaucuk	31.3	33.4
Polyom	175.5	152.9
Gazprom n Salavat	112.2	139.0
SIBUR Kstovo	164.0	154.4
SIBUR-Khimprom	59.7	50.6
Tomskneftekhim	145.5	149.0
SIBUR Tobolsk	3.0	377.4
Ufaorgsintez	152.8	160.3
ZapSibNeftekhim	1089.1	355.4
Total	2764.0	2348.3

Russian propylene production, sales and exports, Jan-Nov 2021

Russian propylene production amounted to 2.764 million tons in the first eleven months in 2021 against 2.348 tons in the same period in 2020. The increase was due largely to the start-up of the plant at ZapSibNeftekhim at Tobolsk in 2020.

The combined ZapSibNeftekhim and SIBUR Tobolsk plants increased production from 732,800 tons in the first eleven months in 2020 to 1.092 million tons in the same period in 2021. In Tatarstan Nizhnekamskneftekhim produced 276,700 tons of propylene in the first eleven months against 269,900 tons last year whilst Kazanorgsintez reduced production from 49,100 tons to 42,800 tons.

Russian Propylene Domestic Sales (unit-kilo tons)		
Company	Jan-Nov 21	Jan-Nov 20
Angarsk Polymer Plant	35.3	46.6
SIBUR-Kstovo	123.9	136.8
Lukoil-NNOS	148.7	153.2
Others	8.9	10.3
Total	320.5	360.3

In Bashkortostan Gazprom neftekhim Salavat produced 112,200 tons of propylene versus 109,000 tons whilst Ufaorgsintez reduced production from 160,300 tons to 152,800 tons.

In the Nizhny Novgorod region SIBUR-Kstovo increased production of propylene from 154,400 tons to 164,400 tons in January to November 2021. Lukoil-NNOS at Kstovo increased production

from 198,100 tons to 237,100 tons.

Russian Propylene Domestic Purchases (unit-kilo tons)		
Consumer	Jan-Nov 21	Jan-Nov 20
Saratovorgsintez	134.4	141.0
Volzhskiy Orgsintez	10.7	9.7
Akrilat	11.7	11.5
SIBUR-Khimprom	47.8	57.7
Omsk-Kaucuk	15.7	15.9
Tomskneftekhim	3.3	10.1
SIBUR Tobolsk	60.9	73.9
Moscow Refinery	8.8	15.9
Ufaorgsintez	9.1	9.1
Khimprom Kemerovo	6.3	3.4
Plant of Synthetic Alcohol	8.2	18
Others	13	7.7
Total	329.9	373.9

Russian sales of propylene on the domestic merchant market amounted to 320,500 tons in the first eleven months in 2021 against 320,500 tons in 2020. The largest propylene supplier to the domestic market in the first eleven months was Lukoil-NNOS, shipping 148,700 tons against 153,200 in January to November 2020 tons followed by SIBUR-Kstovo which fell from 136,800 tons to 123,900 tons.

ZapSibNeftekhim reduced merchant propylene purchases from 69,300 tons in January to November 2020 to 44,200 tons in 2021. Saratovorgsintez reduced purchases of merchant propylene from 114,500 tons to 99,500 tons due to an extended maintenance outage undertaken between May and August. Regarding other consumers, SIBUR-Khimprom reduced purchases from 44,600 tons to 38,700 tons

Russian Propylene Exports (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Nov 20
Lukoil-NNOS	85.8	24.9
SIBUR-Kstovo	15.4	3.4
Angarsk Polymer Plant	35.2	0.0
Stavrolen	1.0	16.4
Total	137.3	44.7

Propylene exports from Russia amounted to 137,300 tons in the first eleven months against 44,700 tons in the first eleven months in 2020. Lukoil-NNOS increased export shipments from 24,900 tons to 85,800 tons whilst the Angarsk Polymer Plant shipped 35,200 tons against no activity in the same period in 2020. Revenues from propylene exports jumped from \$20.1 million in the first eleven months to \$96.3 million in 2021.

Russian Styrene Production (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Nov 20
Nizhnekamskneftekhim	283.0	278.2
Angarsk Polymer Plant	37.1	32.3
SIBUR-Khimprom	119.8	137.9
Gazprom n Salavat	163.4	180.1
Plastik, Uzlovaya	56.4	43.1
Total	659.7	671.6

Russian styrene production, sales and exports, Jan-Nov 2021

Russian styrene production fell from 671,600 tons in the first eleven months in 2020 against 659,700 tons in January to November 2021. Nizhnekamskneftekhim increased production from 278,200 tons to 283,000 tons where most of the styrene is used internally for polystyrene and synthetic rubber output.

Russian Styrene Exports (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Nov 20
Angarsk Polymer Plant	1.8	4.3
Plastik Uzlovaya	0.7	0.0
Gazprom neftekhim Salavat	72.4	59.0
Nizhnekamskneftekhim	1.0	5.1
SIBUR-Khimprom	0.7	5.6
Total	76.6	74.0

Due to extended maintenance downtime last year Gazprom neftekhim Salavat reduced styrene production from 180,100 tons in the first eleven months in 2020 to 163,400 tons. SIBUR-Khimprom also extended its period for maintenance after stopping on 9 August lasting into September and thus overall production dropped from 137,900 tons to 119,800 tons in the first eleven months.

Russian styrene exports amounted to 76,600 tons in first eleven months in 2021 against 74,000 tons.

Gazprom neftekhim Salavat increased exports from 59,000 tons to 72,400 tons whilst SIBUR-Khimprom reduced export shipments from 5,600 tons to 700 tons.

Domestic merchant sales of styrene rose from 109,400 tons in the first eleven months in 2020 to 117,900 tons in the same period in 2021. Angarsk Polymer Plant increased sales from 13,600 tons to 24,800 tons whilst Gazprom neftekhim Salavat reduced sales from 58,400 tons to 55,800 tons and SIBUR-Khimprom increased from 31,900 tons to 34,300 tons. Main styrene consumers include the synthetic rubber producers.

Bulk Polymers

Russian LLDPE Production (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Nov 20
Kazanorgsintez	42.8	30.5
Nizhnekamskneftekhim	191.5	208.4
ZapSibNeftekhim	304.9	255.1
Total	539.2	494.0

Russian LLDPE production, Jan-Nov 2021

Russian LLDPE production increased from 482,900 tons in the first eleven months in 2020 to 553,100 tons in the same period in 2021. ZapSibNeftekhim increased LLDPE production by 20% to 304,900 tons, Nizhnekamskneftekhim reduced by 4% to 205,400 tons and Kazanorgsintez increased from 30,800 tons to 42,800 tons.

Overall, in the first eleven months in 2021 Russian polyethylene production rose to 2.606 million tons against

Russian Polymer Trade Jan-Nov 2021				
	Export	Export	Import	Import
Product	Ktons	\$ mil	Ktons	\$ mil
LDPE	274.5	372.0	183.2	304.2
HDPE	768.9	828.0	206.4	310.3
EVA copolymers	1.6	4.8	36.4	91.9
Polypropylene	691.1	924.9	150.7	246.9
Propylene copolymers	34.4	64.8	102.3	214.6
Other	1.5	3.4	10.4	32.5
Polystyrene, Expansile	40.1	74.1	23.3	44.8
Polystyrene, Other	53.1	92.0	48.4	83.7
SAN copolymers	0.2	0.2	1.6	4.5
ABS copolymers	6.2	17.4	37.8	99.6
PVC not mixed	183.4	246.2	194.7	285.6
Other poly, Non-plasticised	4.7	7.2	2.6	5.0
Other poly, Plasticised	43.5	64.9	31.3	64.0
VCM-VAM copolymers	0.0	0.1	0.9	2.3
Other VCM copolymers	0.0	0.0	0.8	2.3
Vinylidene chloride polymers	0.0	0.0	0.6	2.6
Fluoropolymers	8.4	57.0	0.4	4.8
Polyamide-6, -11, -12, etc	98.9	192.5	12.1	44.4
Other	0.2	1.1	14.6	41.4
Urea resins	106.1	47.2	6.3	8.7
Melamine resins	4.9	4.6	8.3	19.2
MDI	7.3	21.5	170.8	419.5
Phenolic resins	44.6	25.8	34.8	41.6
Polyurethanes	7.1	23.8	50.1	185.9

2.535 million tons in the same period in 2020. Regarding outages Kazanorgsintez partially stopped polyethylene facilities on 21 October due to technical problems. From 12 October Stavrolen stopped its HDPE plant at Budyennovsk for scheduled repairs, restarting on 17 November. Stavrolen's production capacity is 300,000 tpa, in addition to 50,000 tpa of VAM.

Russian polyethylene trade, Jan-Nov 2021

Russian HDPE exports amounted to \$768.9 million in the first eleven months in 2021 for \$828.0 million. In January-November 2021, imports of polyethylene into to Russia fell by 7% to 544,600 tons against 586,300 tons in the same period in 2020. Russian imports of HDPE dropped 15% to 206,400 tons. LDPE imports rose 7% to 183,200 tons whilst LLDPE imports declined 14% to 135,000 tons.

Russian polypropylene trade, Jan-Nov 2021

Russian polypropylene exports amounted to 691,100 tons in the first eleven months in 2021 for \$924.9 million. Russia's imports of polypropylene increased by 12% in the first eleven months compared to 2020 and amounted to 227,600 tons against 202,700 tons. Homopolymer imports amounted to

83,400 tons against 85,400 tons whilst imports of PP block to Russia increased from 53,800 tons to 69,800 tons. Imports of propylene copolymers amounted to 37,200 tons against 33,200 tons.

Russian PVC Production (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Nov 20
Bashkir Soda	245.3	244.5
Kaustik	73.3	69.6
RusVinyl	318.8	305.5
Sayanskkhimplast	281.5	271.6
Total	918.9	891.2

Russian PVC production and trade, Jan-Nov 2021

Russian PVC production amounted to 918,900 tons in the first eleven months in 2021, 3% more than the 891,000 tons in the same period in 2020. RusVinyl produced 318,800 tons against 306,000 tons whilst Sayanskkhimplast increased production to 281,500 tons against 270,900 tons. Bashkir Soda Company reduced production at Sterlitamak by 1% to 245,300 tons and Kaustik at Volgograd increased production by 5% to 73,300 tons. PVC imports into Russia amounted to

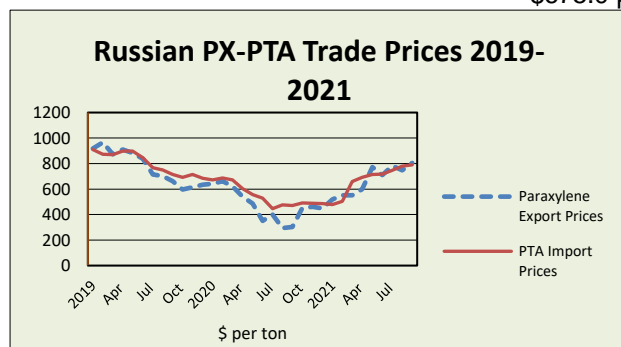
59,600 tons in the first eleven months in 2021, which was 35% more than the 44,200 tons in the same period in 2020. At the same time, export volumes decreased by 8% from 183,900 tons to 168,900 tons.

Paraxylylene-PTA-PET

Russian Paraxylylene Exports (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Sep 20
Gazprom Neft	41.0	84.1
Kirishinefteorgsintez	35.9	38.5
Ufaneftekhim	0.0	11.4
Total	75.9	134.0

Russian paraxylylene exports Jan-Nov 2021

Export shipments of Russian paraxylylene totalled 75,900 tons in January to November 2021 against 134,000 in the same period in 2020. Exports declined last year due to increase in PTA production at Polief which led to increased paraxylylene purchases made by SIBUR. Paraxylylene export prices rose in line with higher feedstock costs last year and averaged \$675.0 per ton in the first eleven months against \$474.1 per ton in January to November 2020. Prices for paraxylylene exports increased to \$805 per ton in September, the highest level since June 2019.



Russian PTA imports, Jan-Nov 2021

Higher export prices for paraxylylene for Russian producers has impacted on PTA import costs where prices rose from \$567.9 per ton in January to September 2020 to \$675.9 per ton in the same period in the same period in 2021.

Russian PTA Imports by Country (unit-kilo tons)		
Country	Jan-Nov 21	Jan-Nov 20
Belgium	15.0	8.0
China	248.0	250.2
South Korea	0.0	7.0
Poland	0.0	3.0
Turkey	5.1	1.2
Others	0.2	2.6
Total	268.0	272.0

PTA imports into Russia totalled 268,000 tons in the first eleven months in 2021 against 272,000 tons in the same period in 2020. China again was the main source of PTA imports in 2021, shipping 248,000 tons in the first eleven months last year for \$173.0 million versus 250,200 tons in January to November 2020 for \$139.0 million. Average prices for PTA imports into Russia rose from \$567.9 per ton in January to November 2020 against \$698.9 per ton in the same period in 2021.

Russian PTA Imports by region (unit-kilo tons)		
Region	Jan-Nov 21	Jan-Nov 20
Kaliningrad	180.2	188.8
Moscow	82.8	78.6
Tyumen	5.0	2.5
Others	0.4	2.2
Total	268.0	272.0

Ekopet at Kaliningrad accounted for 69.2% of Russian PTA imports over the first eleven months in 2021, paying \$120.4 million in value for 180,200 tons. This measures against \$102.5 million in the same period in 2020 for 188,800 tons. PTA supply from China was much tighter last year due to scheduled shutdowns combined with revived demand and this has put upward pressure on pricing. Chinese producers' margins were squeezed in the second quarter due to mounting costs pressure from

feedstocks.

Polief PTA Production 2021						
	Jun	Jul	Aug	Sep	Oct	Nov
Ktons	21.4	29.7	26.6	26.1	6.8	20.6

Polief-PTA production and exports

Polief's PTA production at Blagoveshchensk rose in 2021 due to improved utilisation rates despite a brief outage in October. Higher PTA production by Polief did not reduce the requirements for PTA imports into Kaliningrad but it did allow some scope for exports. In the first eleven months PTA exports from Russia totalled 7,748 tons of which 4,843 tons were shipped to Belarus.

Titan-Polymer BOPET construction progress

The Titan-Polymer plant had assembled almost 80% of the equipment as of January 2022, for the BOPET film plant under construction. Titan-Polymer expects to launch of the first line of the BOPET film at its Pskov site in 2022. The capacity of the BOPET plant will be 35,000 tpa after the first line and after the launch of the second line will rise to 72,000 tpa.

Aromatics

Russian Benzene Production (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Nov 20
Angarsk Polymer Plant	77.3	76.4
Gazprom Neft	96.7	88.7
LUKoil-Neftekhim	0.0	24.4
LUKoil-Permnefteorgsintez	46.0	44.6
Magnitogorsk MK	33.1	39.2
Nizhnekamskneftekhim	261.7	259.2
Novolipetsk MK	8.3	1.1
Gazprom n Salavat	167.8	181.0
Severstal	30.3	32.5
SIBUR-Holding	81.6	66.8
Slavneft-Yaroslavlorgsintez	58.7	61.5
Surgutneftegaz	11.5	58.6
Ryazan RN Holding	31.7	30.2
Ufaneftekhimi	62.5	80.9
Ural Steel	8.4	9.2
Uralorgsintez	84.0	79.3
Zapsib	59.0	53.1
Novokuibyshevsk Petrochemical	18.0	14.8
Total	1136.6	1201.6

Russian benzene production Jan-Nov 2021

Russian benzene production amounted to 1.137 million tons in the period January to November 2021 against 1.202 million tons in the same period in 2020. Nizhnekamskneftekhim increased benzene production slightly from 259,200 tons to 261,700 tons, whilst Gazprom neftekhim Salavat reduced production from 181,000 tons to 167,800 tons.

Extended shutdowns at the aromatics' complexes at Kirishinefteorgsintez and Ufaneftekhimi in the fourth quarter impacted on the domestic supply/demand balance. Neither of those plants sell much benzene on the merchant market, but these outages meant that product is redirected from other suppliers. As a result, deliveries of benzene to the domestic market were tight in the fourth quarter and for the first quarter this year. Stavrolen at Budyennovsk did not produce benzene at all in 2021 but could return to production in 2022.

Russian consumers purchased 650,600 tons of benzene on the merchant market in the first eleven months last year, down from 665,900 tons in the same period in 2020.

Russian Benzene Consumers (unit-kilo tons)		
Consumer	Jan-Nov 21	Jan-Nov 20
Kuibyshevazot	136.1	153.8
Azot Kemerovo	114.1	102.3
Shchekinoazot	64.2	72.4
Kazanorgsintez	55.7	60.3
Khimprom	0.7	1.5
Omsk Kaucuk	34.1	23.6
Chelyabinsk MK	0.1	0.0
Nizhnekamskneftekhim	2.3	0.0
Samarorgsintez	42.8	44.0
Zapsib	27.9	33.4
SIBUR-Khimprom	88.5	99.7
Tumazi Carbon Plant	1.8	0.5
Ufaorgsintez	26.3	8.2
Uralorgsintez	53.0	65.9
Zavod im Ya M Sverdlova	0.2	0.1
Export	33.1	86.0
Total	680.7	751.9

Import deliveries of benzene to Russia from by rail in the period January-November totalled 74,000 tons, exceeding the record of 70,800 tons which was imported in 2020. The largest supplier of benzene to Russia last year was Ukraine. Karpatneftekhim increased shipments in January-November more than five times, to 30,700 tons whilst another 5,200 tons was shipped from the Kremenchug refinery Ukratnafta. Another major supplier was Belarus, which almost doubled the export of benzene to Russia in January-November, to 30,800 tons.

The largest merchant benzene consumer in Russia Kuibyshevazot reduced purchases in the first eleven months from 153,800 tons to 136,100 tons. SDS Azot at Kemerovo increased purchases to 114,100 tons from 102,300 tons. For the production of cumene Kazanorgsintez purchased a total of 55,700 tons of benzene in January to November 2021, versus 60,300 tons in the same period in 2020, whilst Omsk Kaucuk increased purchases from 23,600 tons to 34,100 tons.

SIBUR-Kstovo increased benzene shipments to the merchant market from 71,800 tons in January to November 2020 to 79,100 tons in the same period in 2021, whilst Gazprom Neft at Omsk increased shipments slightly from 57,200 tons to 90,500 tons.

In early December, the Ufaneftekhimi plant resumed operation of the aromatics production complex after extended maintenance and reconstruction. On 8 December the company began to supply the first batches of orthoxylene to the Russian market. Also, Ufaorgsintez plant resumed processing of benzene produced

at nearby Ufaneftkhim which had also been down for repairs. The resumption of operation of the complex at Ufaneftkhim has helped reduce the shortage of benzene and xylenes in Russia.

Russian Caprolactam Production (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Nov 20
Kuibyshevazot	179.7	171.7
Shchekinoazot	52.5	54.3
SDS Azot	108.3	105.9
Total	340.5	331.9

Russian caprolactam production, Jan-Nov 2021

Russian caprolactam production amounted to 340,500 tons in January to November 2021 against 331,900 tons in the same period in 2020. Kuibyshevazot increased production from 171,700 tons to 179,700 tons whilst SDS Azot at Kemerovo increased production to 108,300 from 105,900 tons. Both Azot Kemerovo and Shchekinoazot undertook

scheduled maintenance outages in August last year.

Russian orthoxylene market, Jan-Nov 2021

Orthoxylene domestic sales in Russia amounted to 179,600 tons in the first eleven months in 2021 against 148,900 tons in the same period in 2020. Gazprom Neft increased domestic shipments from 74,400 tons to 123,600 tons whilst Ufaneftkhim reduced shipments from 59,400 tons to 31,100 tons.

Russian Orthoxylene-PA Purchases (unit-kilo tons)		
Consumer	Jan-Nov 21	Jan-Nov 20
Kamteks-Khimprom	63.8	55.5
Gazprom neftekhim Salavat	14.8	9.7
Roshalsky Plasticizer Plant	5.0	0.0
Total	83.6	65.2

Kirishinefteorgsintez increased domestic shipments of orthoxylene from 16,000 tons to 25,000 tons. Sales of orthoxylene for the production of phthalic anhydride totalled 83,600 tons in the first eleven months in 2021 against 65,200 tons in the same period in 2020. The newest producer Roshalsky Plasticizer Plant purchased 5,000 tons whilst the largest producer Kamteks-Khimprom increased purchases from 55,500 tons to 63,800 tons.

Russian Toluene Production (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Nov 20
Kinef	7.4	25.5
Gazprom N Salavat	32.5	19.0
Slavneft-Yaros	33.9	38.0
LUKoil-Perm	33.6	30.7
Gazprom Neft	62.7	70.5
RN Holding	34.7	40.4
Ufaneftkhim	29.5	38.9
Others	16.9	36.5
Total	251.1	233.0

Russian toluene production totalled 251,100 tons in the first eleven months in 2021 against 233,000 tons in the same period in 2020. Gazprom Neft reduced production from 70,500 tons to 62,700 tons whilst Ufaneftkhim reduced from 38,900 tons to 29,500 tons.

Russian phenol market, Jan-Nov 2021

Russian phenol production amounted to 241,600 tons in the first eleven months in 2021 against 213,500 tons in the same period in 2020. Novokuibyshevsk Petrochemical produced 60,900 tons of phenol against 64,700 tons whilst Ufaorgsintez increased production from 57,000 tons to 67,400 tons. Kazanorgsintez increased slightly from 47,300 tons to 50,300 tons. Omsk Kaucuk reduced production from 25,300 tons in the first eleven months in 2020 to 42,400 tons in 2021.

Russian Phenol Production (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Nov 20
Ufaorgsintez	67.4	57.0
Kazanorgsintez	70.9	66.5
Novokuibyshevsk Petrochemical	60.9	64.7
Omsk Kaucuk, Omsk	42.4	25.3
Total	241.6	213.5

Sales of phenol on the domestic market totalled 138,300 tons in the first eleven months in 2021 against 104,400 tons in the same period in 2020 with Ufaorgsintez increasing shipments from 32,400 tons to 56,700 tons.

Omsk Kaucuk increased phenol shipments from 18,800 tons to 36,500 tons, after recovering from technical problems earlier in the year.

Russian Domestic Market Phenol Sales by Supplier (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Nov 20
Omsk Kaucuk	35.5	18.8
Novokuibyshevsk Petrochemical	46.1	53.0
Kazanorgsintez	0.0	0.1
Ufaorgsintez	56.7	32.4
Total	138.3	104.4

Novokuibyshevsk Petrochemical reduced sales from 53,000 tons to 46,100 tons, corresponding with the fall in production.

Synthetic rubber

Russian Synthetic and Natural Rubber Market (unit-kilo tons)		
	Jan-Nov 21	Jan-Nov 20
Production	1548.0	1388.0
Exports	1006.5	870.8
Imports	216.3	180.4;¹/
Supply/Demand Balance	757.8	697.5

Russian rubber production and consumption Jan-Nov 2021

Russian production of synthetic rubbers amounted to 1548,000 tons in January to November 2021 against 1101,000 tons in the same period in 2020. Exports rose from 870,800 tons to 1006,500 tons whilst imports rose from 180,400 tons to 216,300 tons. Export prices of Russian synthetic rubber averaged \$1716 per ton in the

first eleven months in 2021 versus \$1376 per ton in 2020.

Russian Synthetic Rubber Exports (unit-kilo tons)		
Product	Jan-Nov 21	Jan-Nov 20
E-SBR	46.4	31.1
Block	73.4	51.1
SSBR	12.3	7.3
SBR	105.8	115.4
Polybutadiene	233.6	203.0
Butyl rubber	112.8	114.3
Halogenated butyl	124.8	112.3
NBR	36.1	30.9
Isoprene	250.5	190.9
Others	10.7	14.6
Total	1006.5	870.8

Synthetic rubber exports accounted for slightly half of total Russian rubber product exports in the first eleven months in 2021, of which 12% of product revenues came from both India and Poland and another 9% from China. Rubber products which were important last year included tyres and vulcanised rubber which were delivered to countries such as Kazakhstan, Belarus and Germany.

Russian synthetic rubber exports Jan-Nov 2021

Russian exports of synthetic rubber totalled 1.007 million tons in the first eleven months in 2021 against 870,800 tons in the same period in 2020. The increase in exports was enabled by the rise in production in 2021.

Polybutadiene and isoprene exports showed large increases in volume, rising from 203,000 tons to 233,600 tons and from 190,900 tons to 250,500 tons respectively.

Russian Synthetic Exports by Destination (unit-kilo tons)		
Country	Jan-Nov 21	Jan-Nov 20
Belarus	32.2	28.1
Brazil	28.6	25.2
China	141.5	196.3
Czech	30.8	25.4
Germany	35.7	31.8
Hungary	45.7	29.5
India	100.0	88.0
Mexico	40.2	23.4
Poland	110.0	76.9
Romania	36.7	28.9
Serbia	14.1	12.9
Slovakia	35.3	30.3
Turkey	83.6	57.9
Ukraine	27.1	16.0
US	51.3	30.3
Others	193.7	169.7
Total	1006.5	870.8

Exports of butyl rubber and halogenated rubber from Russia increased in the first eleven months, with butyl exports helped by increased production at Togliattikaucuk. Overall, synthetic rubber export prices increased in 2021 from \$1459 per ton in January to \$2048 per ton in November. Natural rubber import prices averaged \$1960 per ton in January to November 2021 against \$1552 in the same period in 2020. The leading suppliers of natural rubber to the Russian market include Indonesia which accounted for 54.5% of shipments in 2021 followed by Malaysia and Thailand.

Regarding Russian exports of synthetic rubber China bought 141,500 tons in January to November 2021 against 196,300 tons in January to November 2020 whilst Poland imported 110,000 tons against 76,000 tons. India took 100,000 tons of synthetic rubber from Russia in the first eleven months last year, rising from 88,000 tons in 2020. Other large buyers included Turkey which increased purchases from 57,900 tons to 83,600 tons.

Nizhnekamskneftekhim rubber exports Jan-Nov 2021

Nizhnekamskneftekhim exported 560,300 tons of synthetic rubber in the first eleven months in 2021, up from 436,300 tons in the same period in 2020. Exports of halogenated butyl rubber increased from 99,600 tons to 124,800 tons with revenues rising from \$217.5 million to \$277.2 million. Revenues from isoprene rubber and polybutadiene exports rose from \$206.7 million to \$306.6 million and from \$124.5 million to \$189.8 million respectively.

Methanol

Russian Methanol Production (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Nov 20
Shchekinoazot	916.3	900.3
Gazprom Methanol	763.2	783.8
Metafrax Chemicals	1098.5	1043.9
Akron	96.0	89.0
Azot Novomoskovsk	234.0	197.2
Angarsk Petrochemical	28.4	52.7
Azot Nevinnomyssk	118.2	113.1
Tomet	625.3	752.8
Ammoni	109.9	96.9
Totals	3989.7	4029.7

Russian methanol production Jan-Nov 2021

The introduction of the M-500 plant by Shchekinoazot in October helped increase the company's methanol production in November to 101,837 tons from 87,114 tons in the preceding month October. From all producers, Russian methanol production rose from 335,261 tons in October to 419,515 tons in November which is the highest monthly volume on record to date. Production was also boosted by the restart of the Gazprom Methanol plant at Tomsk, rising from 1,000 tons to 74,400 tons following a full restart after maintenance. In the first eleven months in 2021 Shchekinoazot produced 916,300 tons of methanol against 900,300 tons in the same period in 2020, whilst for the same timeframe Gazprom Methanol reduced production from 783,800 tons to 763,200 tons.

Regarding other producers Metafrax Chemicals at Gubakha produced 1.099 million tons of methanol in the first eleven months in 2021 against 1.044 million tons in the period January-November 2020, whilst Tomet dropped to 625,300 tons against 752,800 tons. Azot at Novomoskovsk increased production from 197,200 tons to 234,000 tons in January to November 2021 whilst Azot at Nevinnomyssk increased from 113,100 tons to 118,200 tons. By contrast to Azot at Novomoskovsk which sells all of its methanol in the merchant domestic and export markets Azot at Nevinnomyssk consumes most of its methanol in the production of acetic acid and derivatives. Ammoni in Tatarstan increased methanol production from 96,900 tons in the first eleven months in 2020 to 109,900 tons for the same period in 2021. The increase attributed mainly to the introduction of new owners in 2020.

Russian methanol exports Jan-Nov 2021

Russian exports of methanol dropped in the first eleven months to 1.700 million tons from 1.974 million tons in the same period in 2020. The decrease in export supplies was largely down to events at the Tomet plant.

Russian Methanol Exports by Producer (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Nov 20
Azot Nevinnomyssk	5.1	7.5
Azot Novomoskovsk	82.6	68.8
Akron	8.0	14.7
Metafrax Chemicals	365.9	456.5
Gazprom Methanol	372.4	443.9
Tomet	229.3	316.3
Shchekinoazot	636.6	661.0
Ammoni	0.1	5.5
Total	1699.9	1974.2

From January to November 2021, Tomet exported 229,300 tons of methanol, which was down from 316,300 tons in the same period in 2020. The supply of Russian methanol through Finland, the Netherlands and Poland decreased by 21%, 46% and 15%, respectively.

Metafrax reduced exports from 371,400 tons in the first eleven months in 2020 to 456,500 tons in the same period in 2020 which was due largely to increased sales on the domestic market. Gazprom Methanol (Sibmetakhim) reduced exports from 443,900 tons in January to November 2020 to 372,400 tons, with the reduction similarly to Metafrax down to increased domestic market activity.

The largest Russian exporter in the first eleven months in 2021 was Shchekinoazot shipping 636,600 tons versus 661,000 tons in January to November 2020. Lyshchitsy in the Brest region acts as the main export junction for exports to Belarus from Shchekinoazot, whilst for the Polish market the border crossing Bruzgi is used. For the Romanian market Shchekinoazot exports methanol via Vadul-Siret in southern Ukraine and to Slovakia through Chop which is located on the western Ukrainian border town.

Customs data stated that exports totalled 1.724 million tons in 2021 against 1.984 million tons in 2020, thus 23,600 tons and 10,100 tons higher respectively. Russian methanol exports to Belarus increased to 113,500 tons from 102,100 tons in the first eleven months in 2020. The increase in demand for methanol in Belarus was mainly due to an increase in resin production at the Kronochem and Rechitsadrev plants. The volumes of methanol supplies to Kazakhstan in January-November 2021 decreased from 33,000 tons to 20,000 tons.

Russian Methanol Export Destinations (unit-kilo tons)		
Country	Jan-Nov 21	Jan-Nov 20
Belarus	113.5	102.1
Finland	709.2	882.8
Israel	5.0	4.0
Kazakhstan	20.0	33.0
Latvia	9.4	11.8
Lithuania	80.6	77.1
Netherlands	140.7	186.4
Poland	286.8	348.4
Romania	79.6	60.8
Slovakia	202.9	130.0
Turkey	6.4	30.0
UK	3.3	54.7
Ukraine	57.9	41.3
Others	8.2	22.0
Total	1723.5	1984.3

the same period in 2021.

Russian Methanol Domestic Purchases by Consumer (unit-kilo tons)		
Consumer	Jan-Nov 21	Jan-Nov 20
Nizhnekamskneftekhim	285.3	193.5
Togliattikaucuk	108.7	123.6
Uralorgsintez	54.7	60.1
SIBUR-Khimprom	19.4	16.8
SIBUR Tobolsk	41.1	40.0
Ektos-Volga	6.3	36.1
Omsk Kaucuk	82.9	75.0
Novokuibyshevsk NPZ	34.8	37.7
Uralkhimplast	21.1	18.0
Slavneft-Yanos	14.6	10.8
Metadynea	88.8	70.6
Kronospan	107.5	85.6
Gazprom	184.2	119.8
Khimsintez	33.5	15.6
Volzhsky Orgsintez	17.7	9.8
Others	412.4	391.1
Total	1513.0	1303.9

Russian Methanol Domestic Sales (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Nov 20
Azot Nevinnomyssk	21.5	13.9
Azot Novomoskovsk	147.7	130.6
Metafrax Chemicals	404.1	306.5
Gazprom Methanol	352.4	291.6
Tomet	353.6	359.1
Shchekinoazot	172.9	137.6
Ammoni (Mendeleevsk)	63.1	56.1
Total	1515.3	1295.4

hydrates in Siberia from 119,800 tons in the first eleven months in 2020 to 184,200 tons in January to

The decrease in demand for the product in Kazakhstan was due to the extended outage at the MTBE plant at the Atyrau refinery. In addition, the Uzbek methanol producer Navoiyazot significantly increased the supply of methanol to Kazakhstan in 2021 which reduced the need for Russian shipments.

Poland reduced shipments from Russia to 348,400 tons in January to November 2021 against 286,800 tons in the same period in 2020, whilst Slovakia increased volumes from 130,000 tons to 202,900 tons. Romania increased imports from Russia from 60,800 tons to 79,600 tons in January to November 2021, whilst Ukraine increased Russian methanol imports from 41,300 tons to 57,900 tons.

Prices per ton for methanol exports rose from \$193 in January to November 2020 to \$333 in

Russian methanol domestic sales, Jan-Nov 2021

Merchant sales from Russian methanol producers on the Russian domestic market amounted to 1.515 million in the first eleven months in 2021 against 1.295 million tons in the same period in 2020. Despite operating only one line for the part of the first eleven months in 2021 Tomet's sales from the Togliatti plant still amounted to 353,600 tons against 359,100 tons last year.

Gazprom Methanol increased domestic shipments of methanol from 291,600 tons to 352,400 tons whilst Shchekinoazot increased domestic sales from 172,900 tons to 137,600 tons.

Metafrax increased shipments to the domestic market from 306,500 tons in the first eleven months to 404,100 tons. Metafrax supplied 173,000 tons to Nizhnekamskneftekhim in the first eleven months in order to support isoprene and formaldehyde production.

Nizhnekamskneftekhim increased purchases of merchant methanol from 193,500 tons in January to November 2020 to 283,500 tons in the same period in 2021.

Togliattikaucuk reduced methanol purchases from 123,600 tons in January to November 2020 to 108,700 tons due mainly to lower MTBE production. Gazprom increased purchases of methanol for gas

November 2021. Nearly all of the methanol purchases made by Gazprom come from its subsidiary Gazprom Methanol (Sibmetakhim).

Russian Formaldehyde Production (unit-kilo tons)		
Producer	Nov-21	Oct-21
Pigment	3.3	3.6
Shchekinoazot	3.0	3.3
Akron	13.1	10.5
Metafrax	34.1	24.7
Sverdlov Plant	1.4	2.2
Khimsintez	5.5	5.1
Uralkhimplast	4.4	4.6
Nizhnekamskneftekhim	6.3	4.9
Gazprom Methanol	5.1	6.1
Metadynea	3.7	4.9
Total	79.9	70.0

In the area of urea-formaldehyde resins Kronospan and Metadynea recorded higher production volumes in the first eleven months which led to higher methanol purchases.

Kronospan bought 107,500 tons in January to November 2021 against 85,600 tons last year and Metadynea increased purchases from 70,600 tons to 88,800 tons. Uralkhimplast at Nizhniy Tagil increased methanol purchases from 18,000 tons to 21,100 tons.

Shchekinoazot-railway logistics

The modernised Kaznacheevka station in the Tula region was opened in December, after a large-scale reconstruction which took place largely in order to help Shchekinoazot cope with the introduction of new plants. This includes the new 500,000 tpa methanol plant opened in October last year in addition to other units including nitric acid with a capacity of 270,000 tpa and ammonium

nitrate with a capacity of 340,000 tpa. Other projects which are still under construction include the ammonia and urea complex with respective capacities of 525,000 tpa and 700,000 tpa.

As a result of these investments Shchekinoazot has been required to invest in new additional railway tracks.

Shchekinoazot expansion of new M-500 plant

Having started its new M-500 methanol plant in October last year Shchekinoazot is now aiming to undertake modifications that will increase the capacity slightly and at the same time reduce the carbon dioxide emissions. A contract has been signed with Haldor Topsoe under which the licensor will conduct a survey of the production of the M-500 plant. Its goal is to determine the most effective reconstruction scheme, which will increase productivity by around 20% due to the operation of the carbon capture unit. The extracted carbon dioxide will be used to produce methanol, while reducing the carbon footprint. The main source of carbon dioxide emissions in installations based on steam reforming of hydrocarbon raw materials is the flue gas of the reforming furnace. The idea of increasing productivity using a flue gas carbon capture unit is of interest to Shchekinoazot.

The pre-existing rail infrastructure would not have been able to cope with the increasing volume of traffic that is emerging from the new facilities, combined with the plants already in operation. Consequently, the company has developed a large program for the expansion of the entire railway infrastructure which also included track repairs.

Metafrax launch of third formalin plant

Metafrax Chemicals launched its third plant for formalin production at Gubakha at the start of November. Concentrated formalin from the new plant from the new plant at Gubakha is to be used for the production of resins, as well as for production of pentaerythritol and hexamine. The new formalin plant produces 23 tons per hour or 550 tons per day, with formaldehyde content of 55% and less than 1% of methanol. The launch of new installations is aimed at increasing the internal processing of methanol to 450,000 tpa. The addition of the new formalin plant at full capacity will probably remove around another 100,000 tons from the market, either for domestic sales or exports.

Metafrax Chemicals Methanol Balance		
	Jan-Nov 21	Jan-Nov 20
Production	1098.5	1043.9
Exports	365.9	456.5
Domestic sales	404.1	306.5
Captive/Inventory	328.0	280.9

Ammoni-2 construction and methanol expansion

Ammoni is assessing plans for its second chemical complex consisting of units of ammonia, methanol and urea to be built on a site adjacent to the existing Ammoni plant. Construction could finish by the end of 2027.

The production capacity of the new complex has been proposed at 1.2 million tpa for ammonia, 500,000 tpa of methanol and 1.4 million tpa of urea. Investment costs have thus far been estimated at around €1.5 billion. The current Ammoni-1 plant comprises capacities of 717,500 tpa for ammonia and urea, and for methanol 233,800 tpa. Regarding gas feedstocks a new pipeline would be required to supply around 1.1 billion cubic metres per annum to the site. This will be dependent on concluding an agreement between Ammoni's owners SDS Azot at Kemerovo and Gazprom.

Russian N-Butanol Production (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Nov 20
Angarsk Petrochemical company	23.0	26.8
Azot Nevinnomyssk	13.6	15.7
Gazprom neftekhim Salavat	49.4	59.1
SIBUR-Khimprom, Perm	26.3	28.3
Total	112.3	129.9
Russian Isobutanol Production (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Nov 20
Angarsk Petrochemical Company	14.8	17.9
Gazprom neftekhim Salavat	28.0	33.9
SIBUR-Khimprom, Perm	34.9	42.5
Total	77.6	94.3

Russian Butanol Consumption (unit-kilo tons)		
Consumer	Jan-Nov 21	Jan-Nov 20
Akriat	16.6	18.9
Dimitrievsky Chemical	13.7	13.1
Plant of Synthetic Alcohol	0.5	1.8
Volzhskiy Orgsintez	7.4	7.5
Roshalsky Plant of Plasticizers	3.5	1.4
Others	13.3	13.7
Total	55.0	56.4

Russian Butanol Domestic Sales (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Nov 20
Gazprom n Salavat	5.4	6.8
SIBUR-Khimprom	19.4	22.5
Angarsk Petrochemical	35.9	23.7
Azot Nevinnomyssk	0.3	2.3
Totals	61.0	55.3

Russian Acetone Production (unit-kilo tons)		
Producer	Jan-Nov 21	Jan-Nov 20
Ufaorgsintez	42.2	34.8
Kazanorgsintez	41.9	41.6
Novokuibyshevsk Petrochemical	37.8	40.4
Omsk Kaucuk	26.3	16.8
Total	148.1	133.5

16,800 tons in the same period in 2020 whilst Kazanorgsintez increased production from 41,600 tons to 41,900 tons. Acetone exports from Russia totalled 63,300 tons in the first eleven months in 2021 against 47,700 tons in the same period in 2020.

Russian Acetone Exports (unit-kilo tons)		
Country	Jan-Nov 21	Jan-Nov 20
Belarus	10.4	9.7
Netherlands	29.2	13.8
Turkey	5.7	7.2
Lithuania	1.4	3.8
Latvia	8.9	2.0
Others	7.7	11.2
Total	63.3	47.7

Organic chemicals

Russian butanol production Jan-Nov 2021

Russian normal butanol production totalled 112,300 tons in January to November 2021, against 129,900 tons in the same period in 2020. Gazprom neftekhim Salavat was the largest Russian producer, producing 49,400 tons against 59,100 tons in January to November 2020.

Isobutanol production in Russia dropped from 94,300 tons to 77,500 tons in the first eleven months in 2020 during which Gazprom neftekhim Salavat reduced production from 33,900 tons to 28,000 tons, and SIBUR-Khimprom reduced from 42,500 tons to 34,900 tons.

Russian domestic butanol sales, Jan-Nov 2021

Merchant butanol sales on the Russian domestic market dropped in the first eleven months to 44,200 tons from 47,600 tons in January to November 2020. Deliveries directly from Russian producers rose to 61,000 tons in the first eleven months, with the remainder made up by traders. The largest supplier of butanols to the domestic merchant market in the first eleven months came from Angarsk Petrochemical which shipped 35,900 tons against 23,700 tons in the same period in 2020. Most of the butanols produced at Angarsk are currently sold on the merchant market despite the geographical distances from the customers.

The largest butanol buyer on the domestic market in the first eleven months in 2021 was Akriat at Dzerzhinsk which took 14,300 tons against 15,600 tons in January-November 2020 followed by Dimitrievsky Chemical Plant increased purchases from 12,100 tons to 12,300 tons.

Russian acetone market Jan-Nov 2021

Russian acetone production in the first eleven months in 2021 amounted to 148,100 tons against 133,500 tons in the same period in 2020. Omsk Kaucuk produced 26,300 tons of acetone against

Revenues from Russian acetone exports rose from \$20.1 million to \$43.7 million after prices rose sharply last year. The largest market for Russian acetone exports was the Netherlands taking 29,200 tons in the first eleven months against 13,800 tons in the same period in 2020. Belarus imported 10,400 tons of acetone from Russia in January to November 2021 versus 9,700 tons in 2020.

Russian isopropanol production

The new plant for isopropyl alcohol for the Titan Group started production at Omsk in July last year and was part of a simultaneous expansion and modernisation of the cumene plant. The capacity of the isopropyl plant is 60,000 tpa which is now the largest plant in Russia, followed by the Plant of Synthetic Alcohol Plant at Orsk. Russia is now a marginal net exporter after the investment.

Russian Isopropyl Alcohol Production (unit-kilo tons)					
Producer	Jul	Aug	Sep	Oct	Nov
Sintez-Acetone	0.6	0.0	0.0	0.2	0.6
Khimprom	0.1	0.2	0.1	0.2	0.1
Plant of Synthetic Alcohol	0.0	2.8	2.9	2.4	2.9
Omsk Kaucuk	1.3	4.2	4.5	4.0	2.1
Total	1.9	7.2	7.2	6.8	5.6

Omsk Kaucuk plant has completed the installation of a closed-ended filling system for isopropyl alcohol. Modern domestic equipment has been installed, which meets all the requirements of industrial safety.

On the basis of a new isopropyl alcohol, it was possible to establish the production of more environmentally friendly car chemicals for the

Siberian and Far Eastern Federal Districts.

Novatek-low carbon ammonia to Germany

Novatek and Uniper SE signed an agreement at the end of 2021 for the long-term supply of low-carbon ammonia with a volume of up to 1.2 million tpa, mainly to the German market. The agreement sets out the terms of Uniper's supply of low-carbon ammonia, which will be produced at Novatek's promising Ob gas-chemical project using carbon dioxide capture and storage technologies. The products will be supplied to the planned Uniper ammonia import terminal at Wilhelmshaven..

Due to the increase in the production of isopropyl alcohol, Russian exports increased from 3,330 tons in January to November 2020 to 12,100 tons in the same period in 2020 whilst imports dropped from 37,300 tons to 18,900 tons. A share of 50.2% of exports last year were sourced from Omsk Kaucuk.

Russian plasticizers Jan-Nov 2021

SIBUR exported 16,567 tons of DOTP in the period January to November 2021 against 18,800 tons in the same period in 2020. Exports to the Netherlands amounted to 3,949 tons last year followed by Belgium with 2,512 tons. All of the DOTP was produced by SIBUR-Khimprom at Perm. Exports have been falling as domestic consumption has risen.

Russian Imports of DINP (unit-kilo tons)			
Supplier	Oct-21	Nov-21	Jan-Nov 21
BASF	0.6	0.2	4.5
Evonik	1.4	1.4	9.8
Exxon Mobil	0.6	0.6	5.1
Frescom	0.7	0.6	4.4
Deza	0.9	0.1	1.7
Chemnews	0.0	0.1	0.8
LG Vina Chemical	0.2	0.4	1.4
Others	0.8	0.3	4.6
Total	5.2	3.7	32.4

On the domestic market the Bashkir Soda Company announced a tender at the end of 2021 for the purchase of 6,100 tons of dioctyl phthalate (DOP) for delivery in 2022. According to the documentation, the product must be shipped by the supplier in the first half of the year at 450 tons per month and in the second half at 567 tons.

Russian imports of DINP plasticizers totalled 32,400 tons in the first eleven months in 2021 compared to 26,000 tons in the same period in 2020. The largest suppliers last year included Evonik, ExxonMobil and BASF.

Russian acetic acid production

Russian acetic acid production takes place solely at Nevinnomyssk where VAM, butyl acetate and methyl acetate are also produced. Stavrolen also produces VAM, whilst for butyl acetate production is undertaken by Dmitrievsky Chemical Plant and Ashchinsk.

Russian Acetic Acid & Derivative Production (unit-kilo tons)						
Product	Jun	Jul	Aug	Sep	Oct	Nov
Acetic Acid	14.6	15.1	15.1	14.6	15.2	14.6
VAM	6.3	6.2	5.5	5.9	3.4	3.7
N-Butyl Acetate	4.5	3.5	2.7	2.7	4.2	4.5
Methyl Acetate	1.6	1.4	1.4	1.5	1.6	1.3

Acetic acid exports from Russia amounted to 13,200 tons in the first eleven months in 2021 down from 37,000 tons in 2020. Imports dropped slightly from 3,510 tons to 3,070 tons. Normal butyl acetate exports from Russia dropped from 33,400 tons in 2020 to 32,500 tons in 2021.

Russian TDI-MDI Imports

Russian TDI Imports (unit-kilo tons)		
Country	Jan-Nov 21	Jan-Nov 20
Belgium	1.073	0.439
China	17.391	4.837
Germany	5.724	12.519
Hungary	7.365	8.800
Japan	2.160	1.643
Netherlands	1.686	1.887
Saudi Arabia	2.781	7.216
South Korea	13.417	5.583
US	4.375	1.285
Others	1.501	3.914
Total	55.584	47.530

Russian TDI-MDI imports, Jan-Nov 2021

Russian TDI imports totalled 55,584 tons in the first eleven months in 2021 against 47,130 tons in the same period in 2020. Values of Russian TDI imports increased from a total of \$70.758 million in January to November 2020 to \$143.239 million in the same period in 2021. The main Russian regions for TDI purchased imports included Moscow and Tatarstan.

China was the largest supplier of TDI to Russia in the first eleven months last year shipping 17,391 tons for \$42.613 million which compares against 4,837 tons in January to November 2020 for \$6.606 million.

South Korea was the second largest supplier of TDI to Russia in the first eleven months last year shipping 13,417 tons against 5,583 tons in January to November 2020.

Russian Imports of TDI by Region (Jan-Nov 2021)		
Region	Vol (ktons)	Value (\$ mil)
St Petersburg	1.2	3.1
Kaluga	0.6	1.5
Moscow	31.5	78.9
Moscow Oblast	5.0	14.2
Stavropol	2.4	6.9
Vladimir	3.4	9.3
Tatarstan	8.9	22.2
Others	2.7	7.2
Total	55.6	143.2

Other important suppliers included Hungary which shipped 7,365 tons to Russia against 8,800 tons in January to November 2020 and the US which exported 4,375 tons against 1,285 tons in the first eleven months in 2020. TDI supplies from Germany and Saudi Arabia both declined last year.

The most important region for Russian TDI imports was Moscow which accounted for purchases of 31,500 tons in the first eleven months in 2021 for \$78.9 million. The next largest regions included Tatarstan where volumes amounted to 8,900 tons for \$22.2 million and the Moscow Oblast which bought 5,000 tons for \$14.2 million.

Russian Imports of MDI (unit-kilo tons)		
Country	Jan-Nov 21	Jan-Nov 20
Belgium	19.656	15.164
China	40.046	30.808
Germany	17.462	19.737
Hungary	4.767	3.558
Japan	1.7	1.5
Netherlands	37.083	29.140
Portugal	3.674	2.923
Saudi Arabia	41.174	37.667
South Korea	2.642	1.024
Others	2.096	0.618
Total	170.730	142.269

MDI imports into Russia amounted to 170,730 tons in the first eleven months in 2021 against 142,269 tons in the same period in 2020.

Saudi Arabia increased shipments in the first eleven months from 37,667 tons in 2020 to 41,174 tons whilst shipments from the Netherlands rose from 29,140 tons to 37,083 tons.

Other MDI suppliers included China which increased shipments from 30,808 tons in January to November 2020 to 40,086 tons in 2021 and Germany which decreased from 19,737 tons to 17,462 tons. Belgium increased shipments from 15,164 tons to 19,656 tons.

Russian isocyanate import costs Jan-Nov 2021

TDI costs for Russian importers averaged \$2577 per ton in the first eleven months against \$1690 in the same period in 2020. Import costs rose from \$88.0 million to \$143.2 million in the period January to November 2021.

MDI costs per ton for Russian imports rose from \$1338 in the first eleven months in 2020 to \$2413 in the same period in 2021. Overall, for the first eleven months import costs for MDI totalled \$419.458 million against \$206.435 million in the same period in 2020. Imports from China increased from \$42.785 million to \$115.763 million followed by imports from Saudi Arabia rising from \$45.643 million to \$95.613 million.

Ukraine

Ukrainian polymer trade Jan-Nov 2021

Imports of polyethylene to the Ukrainian market decreased in the first eleven months to 246,800 tons, which is 1% higher than the 245,100 tons in the same period in 2020. HDPE imports amounted to

Ukrainian Polymer Imports (unit-kilo tons)		
Product	Jan-Nov 21	Jan-Nov 20
PVC	25.5	31.1
LDPE	75.5	71.0
LLDPE	74.5	70.0
HDPE	80.1	88.6
Ethylene Vinyl Acetate	16.9	12.5
PP	126.0	124.2

80,100 tons against 88,600 tons for the same period in 2020, whilst LDPE imports rose by 3% to 75,500 tons. LLDPE imports rose 5% to 74,400 tons. Imports of other types of polyethylene, including ethylene-vinyl-acetate (EVA) amounted to 16,900 tons against 12,500 tons a year earlier.

Polypropylene imports into the Ukrainian market amounted to 126,000 tons in the first eleven months in 2021 against 124,200 tons in the same period in 2020.

Homopolymer imports dropped 1% to 93,900 tons, whilst block copolymer imports rose from 12,300 tons to 12,700 tons. Imports of random copolymers rose from 15,100 tons in January to November 2020 to 16,200 tons.

PVC imports into Ukraine decreased by 18% in the first eleven months to 25,500 tons against 31,100 tons in the same period in 2020. Imports from Europe accounted for 87% of shipments into Ukraine in

Karpatneftekhim Petrochemical Exports (unit-kilo tons)		
Product	Jan-Nov 21	Jan-Nov 20
Propylene	94.5	89.3
Benzene	77.0	61.1

2021. PVC exports from Ukraine increased from 139,500 tons in the first eleven months in 2020 to 175,300 tons in the same period in 2021.

Karpatneftekhim-production and trade Jan-Nov 2021

Karpatneftekhim increased exports of propylene in the first eleven months in 2020 from 89,300 tons to 94,500 tons, whilst benzene exports rose from 61,100 tons to 77,000 tons. The largest share of propylene shipments was exported to Poland. Ethylene production at Kalush totalled 201,928 tons in the first eleven months, propylene amounted to 101,114 tons whilst benzene production totalled 80,022 tons.

Ukrainian Plasticizer Imports (unit-tons)		
Product/Company	Jan-Nov 21	Jan-Nov 20
DOP	2324.0	1822.2
Boryszew	1345.0	1693.0
Deza	184.0	109.0
Other	161.0	20.2
DOTP	1611.0	2709.6
Grupa Azoty	646.0	771.6
Boryszew	477.0	520.0
SIBUR-Khimprom	0.0	1151.0
Others	489.0	267.0
DINP	10,314.0	9063.6
BASF	836.0	1500.0
Deza	2798.0	2872.0
Exxon Mobil	5009.0	5012.0
KH Chemicals BV	0.0	704.0
Other	1470.0	902.5

Ukrainian plasticizer imports, Jan-Nov 2021

Ukraine increased imports of DOP from 1,822 tons in the first eleven months in 2020 to 2,324 tons in the same period in 2021, whilst DOTP imports dropped from 2,710 tons to 1,611 tons and DINP rose from 9,064 tons to 10,314 tons. The largest suppliers of DOP and DOTP were from Poland, Boryszew and Grupa Azoty respectively whilst the largest suppliers of DINP included Exxon Mobil and Deza from the Czech Republic. Exxon Mobil supplied 5,009 tons of DINP in the first eleven months in 2021 against 5,012 tons in the same period in 2020.

Ukrainian methanol market Jan-Nov 2021

Ukrainian methanol imports totalled 72,300 tons in the first eleven months in 2021 against 65,800 tons in the same period in 2020. In addition to Russian producers Metafrax and Shchekinoazot, Centro Chem from Poland and Vivochem from the Netherlands have also provided supplies in 2021.

For supplies of formalin, urea-formaldehyde concentrate and urea-formaldehyde resins, Ukraine imports from a number of countries including Poland, Belarus, Romania and Slovakia. The major consumers of methanol in Ukraine include Ukratnafta for use in fuels, Ukrgasvydobuvannya in gas supply and KarpatSmol in resin manufacture.

Central Asia

Shurtan Gas Chemical Complex-German banks lend €1.1 billion for expansion

Uzbekneftegaz has launched a project to expand the Shurtan gas chemical complex in Kashkadarya region under which the capacity will increase by threefold. Three German banks have agreed to allocate €1.1 billion to expand the capacity of the Shurtan Gas Chemical Complex. Deutsche Bank will allocate €500 million, Landesbank Baden-Wuerttemberg €300 million and Landesbank Hessen-Thüringen Girozentrale €300 million. The expansion project of the Shurtan Gas Chemical Complex gives an additional production of 280,000 tpa of bimodal polyethylene, 100,000 tpa of polypropylene and 50,000 tpa tons of pyrolysis distillate. The raw material base for the projected expansion facilities will be synthetic naphtha which is to be produced at the new GTL plant. The commissioning of new facilities is expected in 2024.

Uzbek GTL project

Uzbekistan has put into operation its GTL plant in the Kashkadarya region. The cost of the complex amounted to \$3.4 billion and will process 3.6 billion cubic metres of gas per annum. From this volume 1.5 million tpa of synthetic liquid fuel will be produced including 307,000 tons of jet fuel, 724,000 tons of diesel fuel, 437,000 tons of naphtha and 53,000 tons of liquefied gas.

The aim of the project is to reduce Uzbekistan's dependence on imports, mostly from Russia. Started in 2016, a GTL project for producing petroleum products from natural

gas on such a scale is unlikely to be repeated any time soon because of the heavy investments required, the energy inefficiencies inherent in the conversion process and the global backdrop of the energy transition.

Synthetic naphtha will be produced at the UzGTL plant and used as a feedstock for petrochemical industry and steam cracking. Capacity exceeds Uzbek domestic demand for diesel fuel and jet fuel, thus replacing imports of these products, and naphtha to be transferred to the nearby Shurtan gas processing plant, also operated by Uzbekneftegaz, to be used as feedstock for producing polymers.

Gas for processing will be supplied from the Shurtan gas field and gas processing plant. Hyundai Engineering & Construction acted as a turnkey builder of the technological part of the plant, the licensor of products is South African Sasol, and the supplier of synthesis gas production technology is the Haldor Topsoe.

**Kazakh petrochemical investments 2022 and future**

The 500,000 tpa polypropylene plant near Atyrau is expected to start in the first half of 2022 after progress had achieved 96% of the project schedule by the end of 2021. The polypropylene project marks the first major polymer investment in Kazakhstan which is to be followed by polyethylene as soon as KazMunaiGaz can conclude terms with a partner. Other polymer and chemical projects being undertaken include the construction of a PET plant in the Atyrau region with a capacity of

430,000 tpa and a plant for the production of methanol in the West Kazakhstan region, with a capacity of 130,000 tpa.

Kazakh riots may slow investment process

The project to create a chemical cluster in Kazakhstan with the participation of the Bashkir Soda Company (BSK) may be partially suspended due to the January events where riots broke out over rising fuel costs. In December 2021, Kazakh company Kaustik at Pavlodar and Bashkir Soda Company (BSK) signed an agreement on the establishment of a joint venture for projects totalling up to \$1 billion. The companies

signed an agreement that implies cooperation between BSK and Pavlodar Kaustik to obtain chlorine-containing products, including import-replacing products such as zirconium oxychloride for which there are rich deposits (mineral zirconide) in Kazakhstan there are rich deposits of raw materials necessary for the production of zirconium oxychloride. In 2021 BSK supplied 203,000 tons of products to Kazakhstan and received revenue of around \$44 million. The largest share in the export of products produced by BSK was soda ash, sodium bicarbonate, caustic hard soda, and other products.

Kazakh polyolefin trade, Jan-Nov 2021

Imports of polyethylene to Kazakhstan decreased by 9% in the first eleven months to 147,400 tons against 162,400 tons in 2020. HDPE imports dropped 14% to 115,600 tons. LDPE imports rose 28% to 21,400 tons whilst LLDPE dropped 9% to 10,400 tons. Kazakh imports of polypropylene increased by 8% in the first eleven months to 39,700 tons against 36,600 tons. Exports of polypropylene rose by 24% to 28,000 tons against 22,700 tons.

Tatarstan investments in Kazakh petrochemicals

The delegation of Tatarstan held a number of business meetings in Kazakhstan on joint projects. Tatneft entered into an agreement with KazMunayGaz to establish a joint venture, Butadien LLP, for the production of butadiene and its derivatives. Tatneft plans to start industrial production of butadiene rubbers in the Atyrau region of Kazakhstan in 2025. The raw materials will be supplied by Tengizchevroil LLP. The estimated production capacity is 186,000 tpa of butadiene rubbers and 170,000 tpa of isobutane.

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